

**Developing a Market Segmentation Process  
Based on the Salient Correlates of Exercise  
Behaviour**

Paul Morrissey BA, MBS

**Submitted in Fulfilment of the Degree of Doctor of Philosophy**

**School of Business  
Waterford Institute of Technology**

Research Supervisor: Professor Paul Baines BSc, MPhil, PhD

**Submitted to the Higher Education Training Awards Council  
September 2013**

## **Declaration**

*The author hereby declares that, except where duly acknowledged,  
this thesis is entirely his own work.*

Signed: \_\_\_\_\_

Paul Morrissey

September 2013

## **Acknowledgments**

This has been a marathon journey. As is the case with any worthy pursuit, the marathon would not have been possible without the input of a considerable team of people. I am very fortunate to have had such amazing support in this process.

I would like to firstly thank my supervisor Professor Paul Baines. I must have tried your patience to its limit during the last few years, but you never waived in your prompt, constructive, and positive feedback and guidance throughout the journey. I owe you a beer or two!

My colleagues at WIT have been tremendous too. The management and secretarial staff in the WIT School of Business have been extremely accommodating in supporting my endeavours, thank you for that. Sincere gratitude also to Dr. Mary T. Holden, without your invaluable statistical guidance I would still be a long way from the finish of this marathon. I greatly appreciate the co-operation of all the students that participated in the various phases of this research and also to my extensive team of proof readers, thank you and you now know that a cure for insomnia exists if ever you need it. To my office mates in Room 335 and 'sporting lunch' pals, thanks for the humorous banter and interludes that kept me sane!

A final thank you goes to my family. To my Mam and Dad and brother Pat you have never questioned and always supported me in my 'eternal student' career. The last few years have seen the birth of my two 'best boys' Calum and Oran. You might have slowed down the completion of this process and kept Daddy awake at night, but you are so worth it! Finally, to my wife Bernie, your support and input into the completion of the project has been amazing and invaluable. This thesis is dedicated to you and our two boys.

## Abstract

**Study Rationale and Purpose:** An examination of exercise correlate literature reveals multi-faceted influences on physical activity, with motivation being a primary driver of exercise behaviour. However, this understanding of exercise correlates has not translated into more effective exercise interventions. An area that has received inadequate attention in the exercise domain is market segmentation. The primary goal of this research is to create a market segmentation process that integrates salient exercise correlates to produce a differentiated, clearly outlined, and actionable segment outcome.

**Research Approach:** Preliminary discussion group interviews confirmed the importance of motivational variables in determining exercise behaviour, as well as highlighting numerous other potential exercise correlates. The differentiated Exercise Motivations Inventory 2 (EMI-2) is selected as the core basis for segmentation, while the Theory of Planned Behaviour (TPB) emerges as an effective means of capturing salient exercise correlates. A preliminary belief elicitation study establishes the modal salient beliefs of the target audience for inclusion in the final survey. The problematic young adult in tertiary education market is targeted and 775 students completed the survey integrating the EMI-2 scale and TPB beliefs, while 480 of these respondents took part in the behavioural follow-up survey four weeks later.

**Findings:** Two-step cluster analysis reveals a four-segment optimal outcome. The segmentation procedure using the EMI-2 constructs illustrates reasonably strong viability. Differentiation in motivational constructs across segments is pronounced and presents a segment solution that is of practical significance. Segment validity and stability outcomes are reasonably strong, but not without potential issues. Demographic, behavioural, and belief based comparisons between segments are used to enhance understanding and profiling of the segments. Strong support emerges for the profiling worth of gender and recent exercise status. Individual TPB behavioural and normative beliefs also emerge as valuable profiling agents, although control beliefs exhibit minimal differentiation across segments. Summated behavioural, normative, and control belief correlations with exercise behaviour illustrate differences across segments in line with expectations.

**Practical and Academic Contributions:** The core contribution is the development of a segmentation process that is unique in its integration of salient exercise behaviour correlates. This facilitates focused and customised exercise interventions. The segmentation process also has the capacity to be employed in many behavioural domains. It contributes as the first academic study to use the EMI-2 scale as the basis for segmentation, and to employ elicited TPB beliefs in a segment profiling capacity.

**Study Limitations and Future Directions:** The segment outcome emerged in a solution that demonstrates weak evidence of cluster structure, necessitating further validation of the segments. Future studies should incorporate formal measures of self-determination to strengthen the theoretical underpinning of the identified segments. The process of segment profiling using salient TPB needs to be repeated in future studies to further validate the approach. Application of the proposed segmentation process in action research is also advisable. Finally, the segmentation process should be tested in other behavioural domains.

## Glossary

ADNFS	Allied Dunbar National Fitness Survey
AIC	Akaike Information Criteria
ANOVA	Analysis of Variance
BIC	Bayesian Information Criteria
BMI	Body Mass Index
BRSQ	Behavioural Regulation in Sport Questionnaire
CES	Current Exercise Status
CFA	Confirmatory Factor Analysis
CHAID	Chi-squared Automatic Interaction Detection
DA	Direct Measures of Attitude
DSN	Direct Measures of Subjective Norm
EMI	Exercise Motivations Inventory
EMI-2	Exercise Motivations Inventory 2
ESRI	Economic and Social Research Institute
GAA	Gaelic Athletic Association
K-S	Kolmogorov-Smirnov (test)
MPAM	Motivation for Physical Activity Measure
PBC	Perceived Behavioural Control
PCA	Principal Component Analysis
PE	Physical Education
P-P	Probability-Probability (plots)
Q-Q	Quantile-Quantile (plots)
REI	Reasons for Exercise Inventory
RP	Research Proposition
SDT	Self-Determination Theory
SMS	Sports Motivation Scale
SPSS	Statistical Package for the Social Sciences
S-W	Shapiro-Wilk (test)
TACT	Target Action Context and Time
TPB	Theory of Planned Behaviour
TTM	Trans-Theoretical Model
VALS	Values, Attitudes and Lifestyles
VIF	Variance Inflation Factor
WHO	World Health Organisation
WIT	Waterford Institute of Technology

## Table of Contents

Acknowledgments.....	i
Abstract.....	ii
Glossary.....	iii
Table of Contents.....	iv
Table of Tables .....	viii
Table of Figures .....	xi
Chapter 1. Introduction to the Thesis .....	12
1.1 Chapter Overview .....	13
1.2 Background to and Rationale for the Research.....	13
1.3 Core Research Objective and Research Propositions .....	18
1.4 Contribution of the Study to the Body of Knowledge .....	20
1.5 Thesis Structure.....	22
Chapter 2. Identifying the Correlates of Exercise Behaviour.....	25
2.1 Literature Review Overview .....	26
2.2 Overview of Exercise and Physical Activity .....	26
2.3 Trends in Exercise Behaviour .....	28
2.4 Overview of the Correlates of Exercise Participation.....	31
2.5 Psychological, Cognitive, and Emotional Correlates of Exercise Behaviour ..	33
2.6 Exercise Motivation .....	34
2.7 Theory Underpinning Exercise Motivation .....	42
2.8 Self-Efficacy and Exercise.....	48
2.9 Personality and Exercise Behaviour.....	49
2.10 Correlates of Exercise Disengagement/Barriers to Exercise.....	49
2.11 Demographic and Biological Factors.....	52
2.12 Past Exercise Behaviour.....	56
2.13 Social Influences on Exercise Behaviour.....	57
2.14 Physical Environment Influences.....	60
2.15 Activity/Sport Specific Factors .....	61
2.16 Chapter Conclusion.....	63
Chapter 3. Capturing the Multiple Correlates of Exercise Behaviour.....	64
3.1 Chapter Overview .....	65
3.2 Instruments for Measuring Exercise Motivation.....	65
3.3 Instruments for Capturing Other Correlates of Exercise Behaviour .....	68

3.4	Theory of Planned Behaviour Overview.....	70
3.5	Chapter Conclusion.....	77
Chapter 4.	Market Segmentation Strategies and Process .....	79
4.1	Chapter Overview .....	80
4.2	The Evolution of Market Segmentation Theory .....	80
4.3	Selecting Variables for use in the Segmentation Process .....	82
4.4	Segmentation of Exercise Markets.....	87
4.5	Benefit and Motivational Segmentation.....	90
4.6	Critique of Market Segmentation.....	92
4.7	Criteria for Effective Segmentation .....	94
4.8	Segmentation Methods and Approaches .....	95
4.9	Within-Segment Heterogeneity.....	96
4.10	Profiling Segments and Constructing a Typology .....	97
4.11	Chapter Conclusion.....	98
4.12	Literature Review Synopsis .....	100
Chapter 5.	Research Methodology .....	102
5.1	Methodology Overview .....	103
5.2	Philosophical Approach.....	103
5.3	Research Paradigm and Philosophical Approach Adopted for this Study .....	107
5.4	The Core Research Objective and Research Propositions .....	110
5.5	Phases of Research.....	117
5.6	Preliminary Research Phases .....	118
5.7	Main Survey Instrument.....	126
5.8	Analysis of the Main Survey Data .....	130
5.9	Modelling the Proposed Segmentation Process .....	140
5.10	Ethical Considerations .....	143
5.11	Chapter Conclusion.....	143
Chapter 6.	Analysis of Preliminary Phases of Research .....	144
6.1	Chapter Overview .....	145
6.2	Discussion Group Overview .....	145
6.3	Motivating Factors/Benefits Sought from Exercise .....	148
6.4	Impact of ‘Other’ Leisure-Time Activities .....	167
6.5	Influence of Significant Others .....	168
6.6	Availability of and Access to Facilities .....	172
6.7	Other Restricting Factors .....	174
6.8	Discussion Group Conclusion.....	177

6.9	Developing the Main Survey Instrument .....	180
6.10	Belief Elicitation Study .....	180
6.11	Testing the Pilot Questionnaire .....	186
6.12	Retest/Temporal Stability Study and Actual Behaviour Measures .....	189
6.13	Chapter Conclusion .....	191
6.14	Constructing and Administering the Main Survey Instrument .....	191
Chapter 7.	Preparation and Reduction of Data Prior to Cluster Analysis .....	193
7.1	Chapter Overview .....	194
7.2	Data Preparation .....	194
7.3	Data Assumptions in Factor Analysis .....	195
7.4	Principal Component Analysis .....	198
7.5	Construct Labelling .....	202
7.6	Validation of the Factor Analysis .....	206
7.7	Internal Reliability of Revised EMI-2 Constructs .....	207
7.8	Test of Unidimensionality .....	208
7.9	Chapter Conclusion .....	208
Chapter 8.	Analysis and Discussion of Survey Findings .....	210
8.1	Chapter Overview .....	211
8.2	Testing Research Proposition 1 .....	212
8.3	Testing Research Proposition 2 .....	229
8.4	Testing Research Proposition 3 .....	236
8.5	Testing Research Proposition 4 .....	241
8.6	Testing Research Proposition 5 .....	246
8.7	Extended Profiling of the Identified Segments Using Theory of Planned Behaviour Data .....	254
8.8	Testing Research Proposition 6 .....	257
8.9	Examination of the Relationship between Beliefs and Reported Exercise Behaviour .....	269
8.10	Testing Research Proposition 7 .....	270
8.11	Chapter Summary .....	277
Chapter 9.	Segmentation Process Evaluation and Thesis Conclusion .....	278
9.1	Chapter Overview .....	279
9.2	Evaluation of the Segmentation and Profiling Process .....	279
9.3	Four-Segment Outcome Integrating Multiple Exercise Correlate Profiling ..	285
9.4	Value of the Research for Practitioners .....	297
9.5	Contribution of the Research to the Academic Body of Knowledge .....	298
9.6	Limitations of the Study .....	299

9.7	Recommendations for Future Research .....	300
9.8	Chapter Conclusion.....	302
Bibliography .....		304
Appendix A:	Data Collection Instruments Employed.....	348
A.1	Moderator Guidelines for the Discussion Groups.....	348
A.2	Belief Elicitation Study.....	352
A.3	Pilot Questionnaire.....	353
A.4	Temporal Stability Follow-up Survey.....	369
A.5	Final Survey Instrument.....	375
A.6	Behavioural Followup Survey .....	394
Appendix B:	Data Normality Analysis for Each Phase of Research .....	397
Appendix C:	Analysis of Direct TPB Measures .....	401
C.1	Introduction.....	401
C.2	Analysis for the Direct Measures of Attitude .....	401
C.3	Analysis for the Direct Measures of Subjective Norm .....	403
C.4	Analysis for the Direct Measures of Perceived Behavioural Control .....	405
C.5	Analysis for Direct Measure of Behavioural Intention .....	406
Appendix D:	Additional Segment Profiling .....	408
D.1	Introduction.....	408
D.2	Testing Research Proposition ARP1 .....	408
D.3	Evaluating Research Proposition ARP2.....	412
D.4	Testing Research Proposition ARP2.....	414
D.5	Evaluating Research Proposition ARP2.....	417
D.6	Testing Research Proposition ARP3 .....	419
D.7	Evaluating Research Proposition ARP3.....	425
D.8	Discussion .....	427
Appendix E:	Discussion Group Transcripts.....	429
Appendix F:	Discussion Group Coding Report.....	468

## Table of Tables

Table 2.1: Psychological, Cognitive, and Emotional Correlates of Exercise Behaviour .....	34
Table 4.1: Typology for the Classification of Segmentation Bases.....	83
Table 4.2: Summary of Key Exercise Segmentation Studies .....	90
Table 5.1: Framework for Analysing Assumptions About the Nature of Social Science.....	104
Table 5.2: Key Features of Positivist and Anti-Positivist Paradigms .....	106
Table 5.3: Research Process Sequence .....	117
Table 6.1: Discussion Group Profiles .....	147
Table 6.2: Linking Discussion Group Themes and EMI-2 Constructs.....	179
Table 6.3: Elicited Behavioural Beliefs Selected for Inclusion in Main Questionnaire .....	182
Table 6.4: Elicited Behavioural Beliefs Excluded from Main Questionnaire.....	183
Table 6.5: Elicited Normative Beliefs Selected for Inclusion in Main Questionnaire.....	184
Table 6.6: Elicited Normative Beliefs Excluded from Main Questionnaire.....	184
Table 6.7: Elicited Normative Beliefs Selected for Inclusion in Main Questionnaire.....	185
Table 6.8: Elicited Control Beliefs Excluded from Main Questionnaire.....	186
Table 6.9: Internal Reliability of EMI-2 Constructs in Pilot Study .....	188
Table 6.10: Test-Retest Correlation for Elicited Beliefs.....	189
Table 6.11: Internal Reliability and Correlation of Exercise Behaviour Measures .....	190
Table 7.1: Phases of Data Assumption Testing .....	197
Table 7.2: Initial Rotated Component Matrix for the 51 EMI-2 variables .....	199
Table 7.3: Eliminated EMI-2 Items .....	200
Table 7.4: Final Rotated Component Matrix for the EMI-2 Items .....	201
Table 7.5: Interpersonal Motives Construct.....	202
Table 7.6: Aesthetic Motives Construct.....	203
Table 7.7: Stress Management Motives Construct .....	203
Table 7.8: Health Enhancement Motives Construct .....	203
Table 7.9: Social Motives Construct.....	204
Table 7.10: Enjoyment Motives Construct .....	204
Table 7.11: Strength Motives Construct .....	205
Table 7.12: Health Pressures Motives Construct .....	205
Table 7.13: Flexibility Motives Construct .....	205
Table 7.14: Internal Reliability of the 9 Post Principal Components Analysis EMI-2 Constructs .....	208
Table 8.1: Research Propositions and Hypotheses .....	212
Table 8.2: Cluster Solution Using the Nine Motivational Constructs.....	216

Table 8.3: Criterion Validity Test Using Direct Measures of TPB.....	218
Table 8.4: ANOVA Comparisons of Motivational Constructs Between Segments .....	221
Table 8.5: Mean and Relative Ranking of Motivations for Each Segment.....	222
Table 8.6: Segment Membership by Demographic and Behavioural Variable.....	230
Table 8.7: Differences in Motivational Evaluations between Males and Females .....	231
Table 8.8: Differences in Gender Profile Between the Segments and the Overall Sample .....	232
Table 8.9: Differences in Gender Profile Between Each Segment .....	233
Table 8.10: Differences in Motivational Evaluations between Younger and Older Exercisers	237
Table 8.11: Differences in Age Profile Between the Segments and Overall Sample .....	238
Table 8.12: Differences between Each Segment in Age Profile .....	238
Table 8.13: Establishing Differences in Regular and Non-Regular Grouping Evaluations of Motives .....	242
Table 8.14: Differences in Recent Exercise Behaviour Profile Between the Segments and the Overall Sample.....	243
Table 8.15: Differences in Recent Exercise Behaviour Profile between Each Segment .....	244
Table 8.16: Within-Segment Differences in Age Profile.....	248
Table 8.17: Within-Segment Differences in Gender Profile.....	249
Table 8.18: Within-Segment Differences in Recent Exercise Status Profile.....	251
Table 8.19: Correlation Between Direct and Indirect TPB Measures.....	257
Table 8.20: Behavioural Belief Mean and Ranking for Each Segment .....	258
Table 8.21: Between-Segment Comparison in Elicited Behavioural Beliefs .....	260
Table 8.22: Normative Belief Mean and Ranking for Each Segment.....	263
Table 8.23: Between-Segment Comparison in Elicited Normative Beliefs.....	264
Table 8.24: Control Belief Mean and Ranking for Each Segment .....	265
Table 8.25: Between Segment Comparison in Elicited Control Beliefs .....	266
Table 8.26: Summated Belief Means for Overall Sample and the Four Segments.....	272
Table 8.27: Relationship of Summated Belief Means with Reported Exercise Behaviour .....	273
Table 8.28: Synopsis of Research Propositions .....	276
Table 9.1: Descriptive Profile of The Enthusiast Segment .....	286
Table 9.2: Descriptive Profile of the Social Competitor Segment.....	288
Table 9.3: Descriptive Profile of the Healthy Looker Segment.....	290
Table 9.4: Descriptive Profile of the Reluctant Exerciser Segment.....	292
Table B.1: Data Normality Tests for the 51 EMI-2 Variables.....	398
Table B.2: Data Normality Tests for the Reduced 9 Construct EMI-2 Motives .....	399
Table B.3: Data Normality Tests for the Elicited TPB Beliefs.....	399
Table B.4: Data Normality Tests for the Summated TPB Constructs .....	400
Table C.1: Initial Factor Analysis for Direct Measures of Attitude.....	402

Table C.2: Final Factor Analysis for Direct Measures of Attitude .....	403
Table C.3: Initial Factor Analysis for Direct Measures of Subjective Norm.....	404
Table C.4: Final Factor Analysis for Direct Measures of Subjective Norms .....	404
Table C.5: Initial Factor Analysis for Direct Measures of Perceived Behavioural Control .....	405
Table C.6: Final Factor Analysis for Direct Measures of Perceived Behavioural Control.....	406
Table C.7: Initial Factor Analysis for Direct Measures of Behavioural Intention .....	407
Table C.8: Final Factor Analysis for Direct Measures of Behavioural Intention .....	407
Table D.1: Within-Segment Comparisons in Elicited Behavioural Beliefs by Age Group .....	409
Table D.2: Within-Segment Comparisons in Elicited Normative Beliefs by Age Group .....	411
Table D.3: Within-Segment Comparisons in Elicited Control Beliefs by Age Group .....	412
Table D.4: Within-segment Comparisons in Elicited Behavioural Beliefs by Gender.....	415
Table D.5: Within-segment Comparisons in Elicited Normative Beliefs by Gender .....	416
Table D.6: Within-Segment Comparisons in Elicited Control Beliefs by Gender .....	417
Table D.7: Within-Segment Comparisons in Elicited Behavioural Beliefs by Recent Exercise Status.....	421
Table D.8: Within-Segment Comparisons in Elicited Normative Beliefs by Recent Exercise Status.....	424
Table D.9: Within-Segment Comparisons in Elicited Control Beliefs by Recent Exercise Status .....	425

## Table of Figures

Figure 2.1: Continuum of Self-Determination.....	45
Figure 3.1: Theory of Planned Behaviour Model .....	71
Figure 4.1: Flow of the Literature Review and Identification of Research Gaps .....	99
Figure 5.1: Proposed Segmentation Process Diagram .....	141
Figure 8.1: Segment 1: The Enthusiast (n=216) .....	223
Figure 8.2: Segment 2: Social Competitor (n=177) .....	224
Figure 8.3: Segment 3: Healthy Looker (n=237) .....	225
Figure 8.4: Segment 4: Reluctant Exerciser (n=221) .....	226
Figure 9.1: Revision of Proposed Segmentation Process.....	285
Figure F.1: Discussion Group Coding Report .....	468

# Chapter 1. Introduction to the Thesis

“It is very hard at the beginning of a marathon to understand that the whole idea is not to beat the other runners. Eventually you learn that the competition is against the little voice inside you that wants you to quit”

Dr. George Sheehan, Running Author.

## **1.1 Chapter Overview**

The introductory chapter outlines the rationale for this study. It justifies the need for a segmentation study in the exercise domain that uses motivation as the basis for partitioning the chosen market, while integrating a comprehensive array of other exercise correlates as descriptors of the identified segments. The chapter commences with an overview of the exercise environment in which the study takes place. Some of the key literature in the area is introduced, the research gap is identified, and the rationale for how this study can help to bridge that gap is offered. An outline of the core research objective and associated research propositions and hypotheses is also presented. The chapter concludes with an outline of the structure of the thesis.

## **1.2 Background to and Rationale for the Research**

The World Health Organisation (WHO) highlights the importance of regular engagement in exercise and physical activity, outlining that regular participation in physical activities can greatly improve an individual's physiological and psychological well-being (WHO, 2004). Regular exercise plays a significant role in the protection against the onset of many chronic diseases, such as cardiovascular disease, some cancers, type-2 diabetes, stroke, and osteoporosis (WHO, 2004; Warburton *et al.*, 2007). It also has considerable psychological and emotional well-being benefits for individuals (Penedo and Dahn, 2005).

Growing affluence in Irish society in the last generation appears to have corresponded with a downturn in the pursuit of healthy behaviour amongst the general population, although, in recent times exercise levels are exhibiting renewed signs of greater adherence (Irish Sports Council, 2012). National and local level initiatives aimed at promoting more active lifestyles have become commonplace (Lunn, 2007). It could be argued that our population has never been as well informed about the benefits of regular exercise and the risks of a sedentary lifestyle. Despite the greater knowledge of the benefits of regular exercise, a very sizeable portion of the Irish population does not participate in exercise sufficiently to accrue these health benefits (Irish Sports Council, 2012). This poses the question as to why this is happening. While the information and intervention initiatives are laudable, they need to be underpinned by an increased understanding of what drives the leisure and exercise behaviour of individuals.

Much of the research across countries into exercise behaviour has focused on children/adolescents and older adults, with young and middle-aged adults receiving significantly less attention in the research domain and from interventions targeting increased exercise engagement (Rhodes, Mark, and Temmel, 2012). International studies indicate that adolescence is the period of greatest exercise engagement and the most notable and substantial declines in regular exercising commence in early adulthood (Gilmour, 2007; Rhodes, Blanchard, and Blacklock, 2008). Rhodes, Mark, and Temmel (2012) contend that research into explaining this trend amongst young adults has been limited and they recommend increased enquiry into determining the critical motives and beliefs about exercise among this population.

Transitions in core elements of individuals' lives and lifestyles are linked to a drop off in exercise behaviour in a number of studies (Allender, Hutchinson, and Foster, 2008; Bellows-Riecken and Rhodes, 2008). Some interesting trends emerge in these studies, with reductions in exercise linked to moving into tertiary-level education, the move from tertiary education to the workforce, and the transition into parenthood (Bellows-Riecken and Rhodes, 2008; Bray and Born, 2004; Cramp and Bray, 2009; Pullman *et al.*, 2009).

These findings illustrate problems with the levels of regular exercise engagement amongst young adults, particularly those who are undertaking tertiary-level education. It frames the decision to focus on this particular target population in this study. Given the levels of disengagement from exercise evident amongst this cohort, the author seeks to investigate the perspectives of both regular and non-regular exercisers in the target population. This is of considerable benefit to exercise practitioners, as it facilitates them in establishing differentiation in the correlates of exercise behaviour between regular and non-regular exercisers.

With the psychological and physiological benefits of regular exercising apparent, yet the participation rates presenting as underwhelming, the author focuses initially on developing an understanding of the correlates of exercise behaviour. An examination of the exercise correlate literature reveals multi-faceted influences on physical activity (Trost *et al.*, 2002). These correlates have received extensive attention in the academic literature, with motivation in particular emerging as a primary driver of exercise

behaviour. Initial academic attention focused on what are termed ‘surface’ or descriptive motives for exercising. This field has evolved considerably in recent times, with the bulk of contemporary literature concentrating on the psychological processes that underpin exercise motivation.

The understanding of exercise correlates has been enhanced significantly through the academic literature. However, this has not necessarily translated into more effective exercise interventions, as is evidenced by the large number of individuals who still do not meet the minimum recommended exercise criteria (Irish Sports Council, 2012). An area that has received inadequate attention in the exercise domain is market segmentation. Market segmentation is a key bridging strategy between understanding behaviour and implementing marketing mix strategies. However, the insufficient focus on segmenting exercise markets in the literature is even more evident in intervention strategies, where translating an understanding of individuals’ exercise behaviours directly into promotional and access-based campaigns is the predominant *modus operandi*. This may be a manifestation of the lack of guidance in the marketing literature concerning the application of market segmentation strategies. Bailey *et al.*, (2009) contend that the bulk of market segmentation literature has concerned the generation of segments, with insufficient focus given to what segmentation is used for. A key premise of this study is that researchers need to develop an approach to exercise market segmentation that encapsulates the multiple correlates of exercise behaviour. This would be of considerable practical benefit to health and exercise promoters in crafting more focused and effective intervention strategies.

Approaches adopted in exercise segmentation studies traditionally employed demographic or behavioural variables as the bases for partitioning the market (e.g., Howard, 1992). Clausen, Ko, and Rinehart (2008) highlight that targeting diverse market segments based on assumptions about consumer behaviour grounded only on demographics is a problematic approach that is likely to lead to a sub-optimal outcome. Contemporary studies in the domain have seen the growth in popularity of motivation-based segmentation, using the theories underpinning exercise motivation to segment the chosen population (e.g., Gillet, Vallerand, and Rosnet, 2009). This approach lends strong theoretical credibility to the segmentation outcome, but the conceptual nature of

the theoretical constructs does not facilitate ease of description and translation into operational intervention strategies.

The key role of motivation in determining exercise behaviour is apparent, a fact reflected in the growing utility of the concept as a base for segmentation (e.g., Wang and Biddle, 2001; Chian and Wang, 2008). This significance leads to the decision to integrate a measure of motivation as the key segmentation base for this study. The author has also elected to pursue a strategy of using descriptive motives as the segmentation base, with the purpose of producing a segmentation outcome that is more straightforward to operationalise. While the motivational variables used are descriptive in nature, the scale chosen for the process, the Exercise Motivations Inventory 2 (EMI-2, Markland and Ingledew, 1997) is grounded to a large extent in underlying motivational theory. It is anticipated that using the EMI-2 as the basis for segmentation will facilitate a highly meaningful segmentation outcome.

Another feature of many previous exercise segmentation studies is the concentration on a relatively limited number of variables for assessing groupings within markets. This is a reflection of the difficulty in integrating too many variables into a segmentation procedure, a practice which leads to a requirement for substantial sample sizes (Dolnicar, 2003). It also presents difficulties for the stated purpose of this study, namely integrating the multiple correlates of exercise behaviour into a segmentation study. The volume of these potential correlates could render a segmentation process unwieldy or unworkable. Considering this, the author has pursued a strategy where the EMI-2 motivational variables are used as the core base for segmentation. Once the motivational clusters have been extracted, the intention is to use the most pertinent other correlates to facilitate a richer profiling and description of the segments. The next challenge is to establish the most relevant correlates for the target population of this study and how best to capture these for analysis.

A comprehensive review of the literature reveals a broad array of exercise correlates. Biddle and Mutrie (2008) suggest that the use of such variables in a study is context-specific. With this in mind, the author has elected to conduct a series of initial discussion group interviews with a sample of the target population of the chosen tertiary education institute. The purpose is to ascertain which of the multiple exercise correlates

are most relevant for the target population, findings that inform the approach for the main survey phase.

Motivational concepts, particularly many of the concepts represented in the EMI-2 scale, assume prominence in the discussion groups' evaluations of drivers of their exercise behaviour. Notable differences in motivational perceptions and outlook occur between males and females, and regular and non-regular exercisers in particular. There is also evidence of some motivational differential between younger and older contributors. Other correlates of this cohorts' exercising emerge, while a number of barriers to exercise engagement exhibit considerable influence on their behaviour. The findings affirm the motivation-led approach to partitioning the market, with the EMI-2 constructs more than adequately covering the range of motives expressed by discussion group members. The efficacy of the EMI-2 in capturing the motives of both regular and non-regular exercisers is another deciding factor in its favour, as the author intends segmenting all components of the target population, not just regular exercisers. The degree of gender, age, and exercise status differentiation justifies their integration into the analysis of the segmentation output of the main survey.

In choosing or crafting a mechanism for capturing the other correlates of exercise, the author is presented with a number of options. The Theory of Planned Behaviour – TPB (Ajzen, 1985) emerges as the most appropriate option given the ability of the framework to elicit and test individuals' salient underlying beliefs regarding the behaviour under investigation. It is reasoned that human behaviour is determined by an individual's behavioural, normative, and control beliefs (Ajzen, 1985). The premise in this study is that the TPB belief framework is a suitable instrument for capturing the salient additional correlates of the target population's exercise behaviour.

Using a proficient theoretical framework such as the TPB to further profile the extracted segments can enhance behaviour change efforts. Behavioural interventions are reasoned to be more effective when implemented based on evidence derived from validated models of behaviour change (Baranowski, Anderson, and Carmack, 1998; Rhodes and Pfaeffli, 2010). The TPB has been widely applied in the exercise domain and a meta-analysis by Hagger, Chatzisarantis, and Biddle (2002) highlights its efficacy as a mechanism for explaining behavioural intention and behaviour. The majority of these

studies used the global direct measures of attitude, subjective norm, and perceived behavioural control to explain behaviour. However, few studies have utilised the beliefs underlying the global direct measures and adhered to Ajzen's (2002) suggestion that an *a priori* belief elicitation study be carried out on a sample of the target population to identify the common modal salient beliefs<sup>1</sup> towards exercising. Conducting an effective elicitation study ensures the representativeness of the underlying TPB belief constructs for the target audience. It is an approach that has been adopted in this research, with a belief elicitation study taking place after the discussion group phase. The elicitation study identifies the modal salient beliefs for the target population, which are then integrated into the main survey instrument. Employment of the elicited beliefs as segment descriptors is another unique contribution of this study, as TPB beliefs have never been utilised in this manner in previous studies.

### **1.3 Core Research Objective and Research Propositions**

The previous section provided the context and rationale for the study. Segmentation of exercise markets is a critical intermediary step between understanding participant behaviour and operationalising effective intervention strategies. Many potential correlates of exercise behaviour exist and the primary goal of this research is to create a schema whereby these correlates can be interwoven into a segmentation process to produce a differentiated, clearly outlined, and actionable segment outcome. The core research objective is outlined below:

**Core Research Objective: To develop a market segmentation process that integrates the salient correlates of behaviour of exercise participants.**

The core research objective is achieved through assessing seven research propositions, each of which has a number of hypotheses designed to test the proposition. The research propositions can be divided into five categories:

---

<sup>1</sup> Modal salient beliefs are the set of beliefs that are relevant in a given target population.

**Category 1:** The first category examines the procedure for identifying the segments. Research Proposition 1<sup>2</sup> tackles this and contends that the market can be viably segmented using the EMI-2 scale and that a differentiated motivational segmentation outcome will be illustrated.

**Research Proposition 1: The exercise behaviour of the population of an Irish tertiary-level educational institute will contain segments that are clearly differentiable on the basis of participant motivation.**

**Category 2:** Propositions in this category initiate the procedure of adding a richer description to the identified motivational segments. The age, gender, and recent exercise behaviour of individuals emerged in the preliminary discussion group research as prominent influences on their exercising. Research Propositions 2-4 test the influence of these variables on the segments.

**Research Proposition 2: Profiling of the identified segments will be enhanced by identifying differences in gender composition.**

**Research Proposition 3: Profiling of the identified segments will be enhanced by identifying differences in age group composition.**

**Research Proposition 4: Profiling of the identified segments will be enhanced by identifying differences in recent exercise status composition.**

**Category 3:** The literature highlights that segmentation outcomes are rarely close to being perfect and varying degrees of remaining within-segment heterogeneity exist. Research Proposition 5 acknowledges this fact and sets about testing for within-segment differences in motivation, based on a segment member's age, gender, and recent exercise status.

**Research Proposition 5: The identified segments will exhibit within-segment differentiation in motivational profiles, on the basis of age, gender, and recent exercise status.**

---

<sup>2</sup> A detailed rationale for the development and inclusion of each of the research propositions is outlined in Section 5.4.

**Category 4:** The Theory of Planned Behaviour (TPB) has been selected as the mechanism for capturing other key correlates of exercise behaviour. Research Proposition 6 examines the differentiating properties of the elicited TPB beliefs across segments.

**Research Proposition 6: The elicited underlying individual belief components of the Theory of Planned Behaviour will illustrate differentiation across segments.**

**Category 5:** The final proposition category examines the relationship between the TPB beliefs and reported behaviour for the four weeks after the administration of the main survey. The proposition analyses the summated behavioural, normative, and control belief indices of the TPB framework. This adds further richness to the understanding and profiling of the segments.

**Research Proposition 7: The summated behavioural and control belief indices will correlate strongly with reported behaviour, while the correlation between reported behaviour and normative belief indices will be of lesser magnitude.**

#### **1.4 Contribution of the Study to the Body of Knowledge**

The study attempts to bridge what the author perceives as a shortcoming in the academic and practice-based approaches to exercise engagement. As outlined earlier in this chapter, there is abundant academic literature tackling the multiple correlates of exercise behaviour. The majority of exercise interventions are founded on what practitioners perceive to be the most influential correlates of their target audience's behaviour, although there is little evidence of contemporary intervention studies segmenting their target market. This study reasons that the process of operationalising an understanding of behavioural correlates, through experimental and real-life exercise interventions, needs to be mediated by segmenting the targeted market on the basis of selected exercise correlates. Specifically, it postulates that motivation is the most appropriate base for dividing the market, and that a process can be enacted to capture the salient correlates of exercise behaviour and utilise these as additional descriptors of the identified motivational segments. It is envisaged that engaging in this segmentation process will facilitate a thorough understanding of the diverse drivers of behaviour of

the identified segments. This in turn will facilitate more differentiated and effective interventions for exercise practitioners.

The core academic contribution of this research is the development of a segmentation process<sup>3</sup> that integrates multiple correlates of exercise behaviour to extract and profile market segments. A review of the literature reveals that the use of descriptive motives has been neglected as a segmentation base in the exercise domain. This research bridges the gap by employing the validated and broad ranging EMI-2 instrument as the core base for segmentation. This introduces a scale that contains readily actionable concepts to the segmentation domain, while being grounded to a large degree in underlying theory.

The second unique contribution of this study is in the additional profiling process conducted to enhance understanding of the identified segments. Extant exercise segmentation studies have not endeavoured to capture all the salient correlates of their target markets' exercise behaviours. The majority of previous research has relied on combining self-determination theory based motivational constructs, with a limited selection of 'other'<sup>4</sup> correlates to partition and profile markets. The scope of the salient correlates integrated into the segmentation process in this study is unique. Using the target audiences' most salient beliefs about their exercise behaviour facilitates a segmentation outcome that is differentiated by the depth and rigour of understanding of the extracted segments. The use of the elicited TPB beliefs to differentiate and describe the identified motivational segments is another distinctive aspect of this research. Elicited beliefs have not previously been employed in this manner. Considering the assertion that human behaviour is determined by these beliefs, the efficacy that they have illustrated as differentiated segment descriptors affirms the worth of employing this approach in future studies.

The research is also unique in an Irish context, being the first academic segmentation study of any Irish exercise market. Additionally, the targeting of an audience of

---

<sup>3</sup> The segmentation process being tested in this research is illustrated in Figure 5.1.

<sup>4</sup> 'Other' correlates integrated in contemporary exercise segmentation studies include demographic and behavioural variables, such as age, gender, frequency of participation, type of exercise.

predominately young adults in tertiary education adds to the relatively shallow pool of segmentation research for a problematic exercise cohort.

The author contends that the market segmentation process outlined in this study also has the scope to be applied in multiple behavioural domains, particularly leisure-oriented markets. Motivation is a central tenet of all behaviour, and as such validated motivational scales from the chosen field could be used as the core base for segmentation. The TPB has illustrated its efficacy in multiple behavioural areas and it is reasonable to assert that underlying TPB beliefs can be used to enhance profiling of segments derived from studies outside the exercise domain.

### **1.5 Thesis Structure**

The thesis is divided into nine chapters. Chapter 1 gives an overview of the domain of the research, before providing a research gap and outlining the rationale for a study of this nature. The core research objective and seven research propositions that will be tested to achieve the core objective are then introduced. Finally, the contribution of the study to the academic body of knowledge is presented.

Chapter 2 commences a review of the most relevant literature for the study, with an examination of key trends in exercise participation, particularly in an Irish context. The author then evaluates the key correlates of exercise behaviour in some detail, with motivational drivers emerging as important in this regard. The chapter also illustrates and evaluates a broad range of ‘social-environmental’ correlates of exercise behaviour.

Chapter 3 serves as a link between the key literature and the methodology employed to achieve the research objective and test the research propositions. The central purpose of the chapter is to evaluate the potential operational measures for use in the study. How best to capture or measure the multiple correlates for use in the segmentation process is fundamental and this section assesses the various options.

The literature review addresses market segmentation in Chapter 4. The chapter commences with an assessment of the evolution and value of market segmentation. Previous segmentation studies conducted in the sports and exercise domain are

examined and the growth in importance of benefit and motivational segmentation is evaluated. Market segmentation as a concept is critiqued, before the criteria for effective segmentation and potential approaches to segmentation are discussed. The issue of remaining within-segment heterogeneity is assessed, prior to examining approaches to profiling market segments.

The focus in Chapter 5 is three-fold. Initially, the theoretical and philosophical position adopted for the study is established. The review of the literature in the chosen domain and the initial discussion group research phase provided the grounding for the core research objective and associated research propositions, and the reasoning behind the formulation of each of these is outlined next. The methodological pathway that is selected to achieve the objectives and test the propositions is described and justified, before detailing the analytical processes employed to evaluate the captured data.

Chapter 6 outlines the preliminary research undertaken by the author. The initial phases of research took place in four stages: 1) the preliminary discussion group interviews, 2) the belief elicitation study, 3) the pilot questionnaire administration, and 4) the temporal stability test. The output of each of these phases of research is analysed in Chapter 6.

The various preparatory phases of research that were enacted after the administration of the main survey and prior to analysing the findings of the cluster analysis and associated segment profiling, are illustrated in Chapter 7. These include assessing the Principal Component Analysis (PCA) that was performed to establish the structure of the EMI-2 data in the context of this study and reduce the constructs for inclusion in the cluster analysis to manageable proportions.

Chapter 8 presents, analyses, and discusses the results of the various phases of research that were completed to test the seven research propositions and associated hypotheses formulated to achieve the overall research objective. The process undertaken to test each proposition is examined sequentially, with an assessment of the findings of each test conducted. For clarity purposes each set of research findings are also discussed sequentially in the context of the most pertinent literature in the domain.

The thesis concludes with an evaluation of each of the research propositions and their contribution in achieving the overall research objective. Conclusions are drawn about the worth of the segmentation and profiling process, before progressing to examine the detailed and differentiated profiles for each of the identified segments. It is reasoned that both the segment outcome and the procedure put in place to ascertain the detailed description of each segment, will be of considerable value to practitioners and policy makers in the exercise domain and this is discussed. The process and scales employed afford uniqueness to this study and the contribution of the research to the body of knowledge is outlined. Limitations of this research study are highlighted, before concluding with recommendations for future research that emanate from this study.

# **Chapter 2. Identifying the Correlates of Exercise Behaviour**

"Motivation remains key to the marathon: the motivation to begin;  
the motivation to continue; the motivation never to quit"

Hal Higdon, Editor, Running World.

## **2.1 Literature Review Overview**

The introduction chapter outlined the author's reasoning and justification for a study of this nature. This included a brief introduction to the key literature in the study domain. Chapters 2 to 4 expand the depth and rigour of the literature analysis. A review of the most relevant literature for the study commences in Chapter 2 with an examination of the trends in exercise participation, particularly in an Irish context. The author evaluates the key correlates of exercise behaviour in detail, with motivational drivers emerging as a principal player in this regard. The literature also illustrates and evaluates a broad range of 'social-environmental' correlates of exercise behaviour and these are assessed in Sections 2.10 to 2.14.

The principal aim of the study is to develop a process that can identify meaningful market segments from the specified exercise market. Mechanisms for capturing motives for inclusion in segmentation studies are critically evaluated in Chapter 3. Options for integrating the other salient correlates of exercise into a segmentation process are also scrutinised in the second literature review chapter. The literature on market segmentation is explored in Chapter 4, with particular focus on the growing recognition of benefit and motivational segmentation as powerful bases for partitioning markets.

## **2.2 Overview of Exercise and Physical Activity**

In modern society, many people are becoming increasingly conscious of their physical health and fitness. However, the opportunities for sedentary alternatives to an active lifestyle are far greater now than they ever were (Norman *et al.*, 2005). As a result, regular engagement in physical activity and exercise is becoming ever more important.

Caspersen *et al.* (1985, p.126) define physical activity as "*any bodily movement produced by skeletal muscles that results in energy expenditure*". Bouchard *et al.* (2007) explain that physical activity, as a broad term, can be broken down into subsections which include exercise, leisure-time physical activity, and sport. Exercise is regarded as a planned, structured, and repetitive subset of physical activity with the objective of improving or maintaining physical fitness. Bouchard *et al.* (2007) outline that exercise is normally performed repeatedly over an extended period of time. Additionally, the participant will often have an external purpose for exercising (e.g., health improvement or fitness development). Bouchard *et al.* (2007) explain that the

term leisure-time physical activity refers to an activity that an individual participates in during his/her free time that boosts his/her total daily energy expenditure. The main difference that distinguishes sport from exercise and leisure-time physical activity is that, in general, sport involves competition and rules which are pre-determined by a governing body.

An alternative structure for physical activity/exercise is presented by Hendry *et al.* (1993), who outline three categories of exercise participation:

1. Active competition: Where a person competes voluntarily in physical and/or sports activities.
2. Recreational activity: Where a person takes part in physical activity for reasons of enjoyment or health but not for competition.
3. Non-participative: Where a person does not take part in any form of sport or physical activity.

The US Department of Health and Human Services (1996), cited in Bellows-Riecken, Rhodes, and Hoffert (2008), categorise physical activity into a number of groupings.

1. Transportation physical activity: Being physically active to transport oneself to a specific place.
2. Leisure-time physical activity: Activity that takes place outside of the realms of an individual's employment.
3. Occupational physical activity: Activity that is inherent in and required as part of one's job.
4. Household physical activity: Domestic activity such as gardening or cleaning.
5. Exercise: A structured or planned physical activity involving repetitive body movements, usually with the goal of improving physical fitness.

It is important to understand that the structure of the exercise participation market is heterogeneous. Participants can be compelled to engage in physical activity (e.g., in school/college); can do so voluntarily in an organised context (e.g., playing for a local league club); may participate casually (e.g., recreational walking); or exercise in an organised commercial environment (e.g., membership of a gymnasium). Each of these alternative scenarios can constitute different benefits sought by the participant and thus

require different types of persuasion/communication activity to increase the level of participation (Connor, 2000).

The focus in this study is on the exercise behaviour<sup>5</sup> of the target audience. The behaviour is characterised by being planned, structured, and repetitive. It can take place in an organised club or commercial context, or in a casual recreation environment, and integrates participation in sporting activities. The exercise will be conducted in the participant's leisure time and must be of moderate or vigorous intensity<sup>6</sup>.

Advised exercise levels can differ from country to country, so this study adopts the recommendations of the global authority in this domain, the World Health Organisation (WHO). The WHO recommends the following level of exercise to achieve health benefits: healthy adults should complete a minimum of 150 minutes of moderate intensity cardiovascular exercise, or 60 minutes of vigorous cardiovascular exercise, per week. Greater activity levels are associated with further health benefits and to meet the recommended weekly cardiovascular exercise volume, content can consist of a mixture of both vigorous and moderate intensity (WHO, 2004).

### **2.3 Trends in Exercise Behaviour**

The WHO outlines that globally in 2008<sup>7</sup> around 31% of adults were insufficiently physically active to gain any health benefits (28% of men and 34% of women were insufficiently active). Levels of physical inactivity are rising in many countries. This has major implications for the general health of people worldwide and for the prevalence of diseases such as cardiovascular disease, diabetes, and cancer; along with their risk factors such as raised blood pressure, raised blood sugar, and obesity. Approximately 3.2 million deaths globally each year are attributable to insufficient physical activity (WHO, 2010).

---

<sup>5</sup> The study concentrates on exercise behaviour, although at times in the literature the term physical activity is used interchangeably with exercise. Sport is assumed to be exercise where it meets the minimum exercise expenditure criteria.

<sup>6</sup> Moderate intensity exercise is defined as exercise that leads to a noticeable increase in breathing. Vigorous exercise is exercise that leads to heavy breathing and difficulty talking in full sentences (WHO, 2004).

<sup>7</sup> The global physical activity statistics provided for the year 2008 are the most recent ones published by the WHO.

Large-scale surveys of exercise participation have been carried out in many countries, with much analysis focused on the socio-economic and socio-demographic determinants of participation. Across a range of countries, it has been illustrated that women, older people, and those of lower socio-economic status are less likely to participate in sport and exercise (Farrell and Shields, 2002; Stamm and Lamprecht, 2005; Lunn, 2007). A survey conducted in 2004, by the Economic and Social Research Institute (ESRI) in Ireland found that about 22% of adults in Ireland were completely inactive in sport/exercise and/or recreational walking. The balance of 78% engaged in physical activity to some degree, but only about 40% of all adults took part regularly enough and with enough intensity of effort to attain the minimum standards of physical activity recommended by the WHO. Participation varied strongly by gender and age, with men participating more than women and the young more than older groups (Fahey, Layte, and Gannon, 2004).

The major reasons that people give for non-participation in sport have to do with the insufficient interest, willingness, or time availability. Absence of sports facilities or other impediments arising on the supply side of the sports system hardly feature at all in peoples' conscious reasons for non-participation. Supply side problems do play a role in determining participation, since they may have considerable background or conditioning effects. Nevertheless, for most forms of exercise, it appears that supply side factors do not amount to a major direct impediment (Fahey, Layte, and Gannon, 2004).

A longitudinal study by Telama *et al.* (2005) employed a random sample of more than 1,500 Finnish children, who were surveyed in 1980 and 2001, to investigate how their participation evolved in that time period. Scores on a physical activity index displayed a low to moderate correlation between the two dates. Correlations varied by age at the time of the initial survey. This finding suggests that exercise habits formed when young influence participation in later life to a moderate degree. The transition in exercise participation between childhood and adulthood is also critical, this evolution being a phase when many people disengage from regular exercise (Lunn, 2010).

Lunn (2010) addressed this issue in a study using a large sample of *circa* 3,000 Irish adults. The research identified key transition points for participation in sport/exercise that have a lasting impact on the continuation of physical activity in later life. One major finding is the period after leaving school emerging as a phase when many individuals progress from team sports to individual sports/exercise, with lasting consequences. The likelihood of making this transition and continuing to participate throughout adulthood is strongly linked to socio-economic status. Reduced sporting opportunity for the disadvantaged and lower social classes begins in school, where the sporting needs of the higher social classes are more likely to be fulfilled (Connor, 2003; Lunn, 2007).

Additionally, the findings suggest that the relationship between exercise and gender changes across the life-course. Evidence shows that more boys than girls play sport in Ireland, a greater variety of activities are offered to boys, and resources are not evenly allocated between boys and girls (Connor, 2003; De Roiste and Dineen, 2005; Woods *et al.*, 2010). The gender gap in childhood seems to be driven by team sport rather than being consistent across activities. Socialising agents such as family, peers, school, and youth sport settings are crucial in the communication of dominant ideologies. Lunn, Layte, and Watson (2008) suggest that Irish females are not actually less interested in sport; rather, the different treatment of girls from a young age by socialising agents opens up a gender gap in sports participation which never closes. Interestingly, any gender difference in the likelihood of taking up a sport as an adult appears to be small or non-existent, while males give up sport at a faster rate during early adulthood. The findings also indicate a gradual increase in the amount of sporting activity in recent times, both of children and adults, in Ireland. Lunn (2010) acknowledges that this is at odds with the rising levels of obesity in society, but notes that it is important to realise that increased participation in sport and exercise does not necessarily imply increased physical activity overall. He outlines that other factors contribute to the total of physical activity in our lives, including modes of transport, workplace activity, labour-saving devices, and so on.

The patterns contained in the cross-sectional data on sporting participation in Ireland are very similar to those recorded in other countries (Farrell and Shields, 2002; Lunn, 2007). An examination of the data contained in the annual Irish Sports Monitor report

suggests that fluctuations in exercise participation occur on a year to year basis – e.g., the report illustrates that adults who can be categorised as sedentary or just active rose from 48% in 2007 to 50% in 2008, before declining to 38% in 2011 (Irish Sports Council, 2012).

Specific research on exercise trends and engagement amongst tertiary-level students in Ireland is not available, so international studies are used as a barometer for this particular cohort. Research in the US illustrated that *circa* 65% of high school seniors participated in adequate amounts of vigorous physical activity, but this figure declined to only *circa* 37% of students at university level institutions (Pettay, 2008). Baranowski *et al.* (1997) also documented decreases in frequency and intensity of physical activity following high school. These findings suggest stark declines in vigorous physical activity participation. Declines are attributed mainly to changes in social roles, residence, peers, and employment. This trend appears to continue upon college graduation. A study by Calfas *et al.* (1994) found that almost half of college students report a decrease in physical activity after leaving college.

The trends illustrate a decline in exercise engagement as individuals enter adulthood, with this development being quite evident in international studies conducted in the tertiary education sector (e.g., Kilpatrick, Hebert, and Bartholomew, 2005). It is critical for exercise/sports marketers to comprehend the underlying determinants of these behavioural trends. The next phase of this review focuses on the assorted correlates of exercise behaviour documented in the literature.

#### **2.4 Overview of the Correlates of Exercise Participation**

Having outlined what constitutes physical activity and exercise, and the trends in exercise behaviour in both an Irish and international context, a logical progression is to examine the factors that impact on exercise participation. Sections 2.4 to 2.15 inclusive present and synthesise the critical determinants and correlates of exercise as per the extant literature. The focus is principally on the correlates of exercise. Correlates are measures of associations that are consistently reported in related studies. Determinants are deemed to be antecedent causal variables, and while all determinants could be considered correlates, not all correlates are determinants/antecedents of exercise behaviour (Biddle and Mutrie, 2008). The importance of understanding the correlates of

exercise behaviour will become apparent in the succeeding sections. Interventions aimed at increasing exercise participation rates are most effective when they alter the underlying variables that influence exercise. A comprehension of the correlates of exercise is thus a critical prerequisite for designing effective exercise related policies and programmes (Trost *et al.*, 2002).

A series of studies reviewing the body of literature in this area have shown the exercise behaviour of adults, adolescents, and children to be associated with factors from multiple domains (Sallis and Owen 2002; Trost *et al.*, 2002; Bauman and Bull, 2007). The majority of the studies focused on leisure-time activity. These comprehensive reviews developed what are termed ecological models of influence on exercise behaviour. The key hypothesis of an ecological model is that behaviour has multiple levels of influence, often including intrapersonal (biological, psychological), interpersonal (social, cultural), organisational, community, physical environmental, and policy correlates (Biddle and Mutrie, 2008).

The predominant theoretical position adopted for the exercise domain considers an individual's exercise goals or motivations to be a central determinant of exercise participation (Weiss and Chaumeton, 1992; Markland and Ingledew, 1997; Wilson, Mack and Grattan, 2008; Stuntz and Weiss, 2010). However, while motivation is undoubtedly a critical component of understanding exercise behaviour, a closer examination of the correlates of exercise indicates that they are multi-faceted. Contemporary theory and research on motivation in exercise embrace an approach that considers a combination of social-environmental and individual differences to explain motivated behaviour (Weiss and Ferrer-Caja, 2002). These approaches recognise that neither social nor personal factors alone are adequate for understanding variations in motivational orientations and behaviours in exercise contexts. This assertion is reinforced by the findings of others. Mullin, Hardy, and Sutton (2007) distinguish individual and environmental influences, while Shank (2005) highlights the influence of internal, external, and situational factors on exercise behaviour. Similarly, Armstrong and Paretto-Stratta (2004, p.15) emphasise that one of the major challenges for sport managers in the future is “*to ascertain the manner in which socio-cultural and environmental market factors influence sport consumption*”.

A consistent categorisation of exercise participation correlates emerges from ecological studies (Sallis and Owen, 2002; Trost *et al.*, 2002; Bauman and Bull, 2007). Ecological models consider multiple levels of influence on exercise behaviour, incorporating social, psychological, environmental, and policy contexts. This review utilises Trost *et al.*'s (2002) comprehensive framework as a basis for evaluating the broad array of exercise correlates. It integrates five categories of influence:

1. Psychological, cognitive and emotional correlates
2. Demographic and biological correlates
3. Behavioural attributes and skills correlates
4. Social and cultural correlates
5. Physical environmental correlates

The value of such a comprehensive approach is reinforced by Biddle and Mutrie (2008), who argue that to understand exercise and physical activity fully researchers and practitioners need to combine knowledge across these different environments. The multiple components of influence approach are justified in the work of Giles-Corti and Donovan (2002). They compared the ability of psychological, social, and physical environment variables to explain exercise. Each category of variables was significantly related to exercise, but associations were strongest for individual related variables and weakest for physical environment variables. The key components of these five categories of exercise correlates are examined in the succeeding sections of this chapter, while a number of sport-specific determinants that are not categorised in the Trost *et al.* (2002) framework are explored in Section 2.15.

## **2.5 Psychological, Cognitive, and Emotional Correlates of Exercise Behaviour**

Trost *et al.* (2002) highlight many potential psychological, cognitive, and emotional factors that can influence exercise behaviour. Table 2.1 illustrates the correlates identified by Trost *et al.* (2002) and these are grouped by the author into a number of categories that are examined in succeeding sub-sections (Sections 2.6 to 2.14 inclusive).

**Table 2.1: Psychological, Cognitive, and Emotional Correlates of Exercise Behaviour**

<b><u>Psychological, Cognitive, and Emotional Factors</u></b>	
Personality variables	Lack of time
Barriers to exercise	Normative beliefs
Control over exercise	Expect benefits
Enjoyment of exercise	Attitude
Perceived health or fitness	Poor body image
Health locus of control	Psychological health
Intention to exercise	Self-efficacy
Self-schemata for exercise	Self-motivation
Knowledge of health and exercise	Mood disturbance
Value of exercise outcomes	Stage of change
Susceptibility to illness/seriousness of illness	Stress

Source: Trost *et al.* (2002)

Much of the literature on psychological correlates of exercise in individuals has centred on the variables of motivation, attitudes, barriers to exercise, and self-perceptions. As outlined earlier in this chapter, the motives and goals for exercise engagement have featured strongly in many studies in the area. The review of psychological correlates commences with an examination of specific motivations for exercising.

## **2.6 Exercise Motivation**

Motivation for exercise is a key concept that is critical for exercise marketers to understand, due to the complex nature of the behaviour and the plethora of potential benefits inherent in regular exercise. Exercise motivation has been captured in many varied and often conflicting frameworks (Plonczynski, 2000). Given the importance of motivation in developing an understanding of exercise behaviour, considerable attention is devoted to the concept in the following sections. Additionally, as the review progresses through the various categories of exercise correlates, it will become apparent that many of the other exercise correlates can impact on the motivational outlook of exercise participants.

### **2.6.1 Overview of Motivational Concepts**

Motivation is critical to human behaviour and central to the understanding of behavioural choice and decision-making. Weiss and Williams (2004) argue that the term motivation can be best thought of as the ‘because’ answer to a series of ‘why’ questions.

Maehr and Braskamp's (1986) components of motivation framework provides a useful synopsis of the concept. They outline that motivation involves those behaviours you choose to do, how persistent you are, whether you continue over time, and how intensive is your involvement in the behaviour.

Many contemporary views on motivation are 'social-cognitive' in orientation. Bandura (1986, p.18) contends that in the social-cognitive view, people are "*neither driven by internal forces nor automatically shaped and controlled by external stimuli*". People evaluate behaviours, cognitions, and environmental events in a reciprocal way and anticipate future consequences. The self-regulatory and self-reflective aspects of behaviour are critical in this regard. Self-regulation argues that people do not behave just to suit the preferences of others. Instead much of their behaviour is motivated and regulated by internal standards and self-evaluative reactions to their own actions (Bandura, 1986). By this process, people evaluate their actions, often against some expectation or desire, and then modify their actions accordingly. As an example of this people would be motivated to exercise for weight control if they perceive a discrepancy between what they are currently like and what they want to be. The self-reflective elements of Bandura's social-cognitive approach are central to human action. This operation of 'meta-cognition' (thinking about our own thoughts) is recognised through Bandura's seminal work on self-efficacy, which will be discussed in more detail in Section 2.8.

### **2.6.2 Exercise Participation Motivation**

The study of participation motives has been a central tenet of exercise research and much analysis has focused on factors that initiate, influence, and modify behaviour. Within the field of exercise behaviour a large proportion of applied exercise psychology is concerned with motivation or the psychological processes that energise the individual and thereby influence behaviour (Hagger *et al.*, 2001). Exercise psychologists have termed this domain of research 'participation motivation' (Roberts, 1992).

Participation motives are the contents of individuals' goals for participating in a particular sphere of behaviour. Goal content is defined as '*classifications of outcomes or states that individuals approach or avoid*' (Austin and Vancouver, 1996, p. 340). Different participation motives can have different behavioural consequences, a fact that

has been demonstrated in a wider variety of areas such as food choice (e.g., Steptoe and Wardle, 1999), sexual behaviour (e.g., Ingledew and Ferguson, 2007), as well as exercise (e.g., Ingledew, Markland, and Medley, 1998).

Weiss and Amorose (2008) divide the concept of exercise participant motivation into two categories. They argue that an understanding of the antecedents of motivation (what or who influences behaviour) and the anticipated consequences of motivation (the physical, psychological, and social benefits or costs of exercise engagement) highlight the importance of motivation's role in exercise behaviour. This review will examine the antecedents of motivation, otherwise termed the correlates of exercise behaviour, in subsequent sections (Sections 2.8 to 2.15 inclusive). For now the focus is on the plethora of potential motivational consequences of exercise engagement that have been highlighted in the literature. These are synthesised in some detail in the remainder of Section 2.6.

### **2.6.3 Anticipated Consequences of Exercise Engagement**

Research on reasons why young people participate in physical activity consistently points to three major motives (Weiss, 1993; Ferrer-Caja and Weiss, 2000; Weiss and Williams, 2004). Firstly, they want to develop and demonstrate physical competence, such as athletic skills, physical fitness, and physical appearance. Secondly, they seek to gain social acceptance and support. This includes friendships and peer group acceptance and approval. Reinforcement and encouragement by significant adults such as parents, teachers, and coaches, is critical to the initiation and continuation of participation. Thirdly, fun derived from participation maximises the positive and minimises the negative experiences related to physical activity. Enjoyment is likely to enhance the attractiveness of the current activity and decrease the appeal of alternative activities. Morris *et al.* (2003) also noted that sports can be beneficial to the development of youths as they offer reprieve from high levels of boredom, which in turn reduces the probability of adolescents engaging in forms of anti-social behaviour.

Adults also consistently cite similar type motives for exercise engagement. Research has shown that physically active adults/university students exercise to achieve many benefits. These include weight control (Ingledew and Markland, 2008), decreased risk of heart disease (Powell, 1988), and lower incidence of illness (Bray and Born, 2004).

Regular vigorous exercise is linked to psychological well-being. This can be established through lower levels of anxiety (Petruzello, Landers, Hatfield, Kubitz, and Salazar, 1991), depression (Crews and Landers, 1987), and stress (Nguyen-Michel *et al.*, 2006).

Passer (1981) summarised the participation motivation research to that point by categorising the major motives for the playing of sport into six general groupings -

1. Affiliation: This can be further divided into factors reflecting friendship and team atmosphere.
2. Skill Development: Participation to improve or learn new skills, and become competent at the individual's chosen activity.
3. Excitement: Exercising to experience action, challenge, and interesting activities.
4. Success and Status: Experiencing the sensation of winning, feeling important, and gaining rewards and recognition.
5. Fitness: Being active stay in shape and enhance health.
6. Energy Release: Exercising to release pent up tension.

Passer (1981) argues that with the exception of energy release, all of these motives are viewed by most people as important determinants of their exercise involvement. This implies that participants desire more than one benefit from their sporting activity. Passer (1981) also highlights the importance of 'having fun' to almost every athlete. He argues that 'having fun' could be categorised as an individual motive or benefit, as well as being an outcome of the achievement of the other motives.

Wankel and Kreisel (1985) in their review of participation motivation research, outline that 'fun' is the predominant reason cited for youth sport participation. They argue that this offers little real understanding as to why a sport is enjoyed and a more specific analysis is required to comprehend the factors underlying the enjoyment of youth sports. The findings of Wankel and Kreisel's (1985) study illustrated that factors that were considered intrinsic to the sport (e.g., excitement; personal accomplishment and skill development; and competing against others) were most important to the enjoyment of the activity. The social factors such as the building of friendships and participating on a team were found to be of intermediate importance to the enjoyment of the sport, while

the more extrinsic factors (e.g., winning the match or rewards; pleasing significant others) were rated least important in this regard.

Researchers have conducted several studies on sources of enjoyment among participants in various activities such as club volleyball, baseball, age-group swimming, and high-level figure skating (Scanlan and Simons, 1992). Robust enjoyment sources included positive social interactions; support and involvement from parents, coaches, and peers; self-perceptions of physical ability; social recognition of physical competence; effort exerted in learning and demonstrating skills; mastery and achievement of skills; and movement sensations. Movement sensations represent a unique component to physical activity experiences that are not found in other achievement domains (e.g., academic, music, art). Participants often report exhilaration from gliding through the water while swimming or skiing, negotiating a path while speeding on rollerblades, and flipping through the air in gymnastics and skating (Scanlan and Simons, 1992). These studies lend credence to the assertion that fun and enjoyment could be considered an individual stand-alone benefit of exercising, while also being an outcome of the satisfaction of other motives. The pre-eminence of enjoyment as an exercise motive is confirmed by Teixeira *et al.* (2012) in a comprehensive review of studies on exercise motivation. They found that multivariate results showed that intrinsic motives such as enjoyment were positively associated with exercise behaviour in all samples.

Another interesting benefit of playing sport appears to be improved academic performance. Most empirical research points to a positive correlation between athletic participation and academic achievement (Gerber, 1996). However, Coe *et al.* (2006) found little difference in the academic performance of middle school children who took physical education classes and those who did not participate in these classes.

A number of studies have attempted to encapsulate this wide array of motives for exercising (e.g., Sports Council and Health Education Authority, 1992; Wankel and Mummery, 1993; Markland and Hardy, 1993). A comprehensive effort in this regard was conducted by McDonald, Milne, and Hong (2002). They developed an extensive list of exercise motivation constructs, which were distilled from a wide ranging review of the literature on exercise motivation. McDonald, Milne, and Hong (2002) found that participant motivations were quite different across a number of exercise activities.

Additionally, they concluded that motivations are an extremely important determinant of exercise consumer behaviour and sport marketers should focus on such motivations instead of relying solely on demographic information when targeting consumers. This synopsis of participation motivation research frames the analysis of individual motivational constructs that follows (see Sections 2.6.3.1 to 2.6.3.11 inclusive).

### **2.6.3.1 Physical Fitness and Health Motivation**

Among the most commonly cited reasons for exercising are the goals of health and physical fitness. Research has consistently illustrated the long-term protection that regular exercise provides against a variety of serious diseases (Biddle, Fox, and Boutcher, 2000). Fitness motives include the pursuit of a healthy feeling, increased muscle tone, keeping in shape, and gaining greater physical strength. Several studies (Brodkin and Weiss, 1990; Paffenbarger and Lee, 1996; Koivula, 1999; Sternfeld, Ainsworth, and Quesenberry, 1999; King *et al.*, 2000) have concluded that improving health and fitness is a prime motivator for exercise participation. A downside of the drive for positive health and fitness is the potential physical and psychological dangers of excessive exercising (Loumidis and Roxborough, 1995).

### **2.6.3.2 Skill Mastery Motivations**

This relates to the goal of improving performance or skills and eventually excelling at a particular activity (Singer, Hausenblas, and Janelle, 2001). It involves being absorbed in a task for its own sake and is quite indicative of being intrinsically motivated. It also usually entails the athlete evaluating themselves relative to other participants in their activity. The importance of skill mastery as a motivating force increases with the athlete's self-perceptions of physical ability (Ryckman and Hamel, 1993). Duda (2007) links skill mastery to goal perspectives. She reasons that people with this type of motivation are generally self-referenced and mastery-oriented in their exercise behaviour.

### **2.6.3.3 Value Development Motivations**

The development of worthy values is a frequently cited benefit of exercise. Once individuals have been socialised into a sport or exercise activity, they find themselves in a domain where they have the potential to enhance or inhibit their own personal growth. Typical benefits in this regard would include socialisation, building of team spirit and

co-operation, ethical behaviour, and sportsmanship (Horn, 1992). Yan and McCullagh (2004) found cross-cultural differences in this regard, with Chinese young people considerably more motivated by social affiliation and team/group membership benefits of exercise than their equivalent counterparts from the United States.

#### **2.6.3.4 Achievement Motivations**

Achievement motivation is the desire to be successful, persist in the face of failure, and take pride in the final result (Butler, 1993). Exercise psychologists outline that the athlete strives to accomplish a goal, defined in terms of winning and excellence, while coaches and exercise leaders also contribute significantly to the athlete's motivation for achievement (Carpenter and Yates, 1997; Ntoumanis and Biddle, 1998; Harwood, Hardy, and Swain, 2000).

#### **2.6.3.5 Self-Esteem Motivations**

A considerable body of research supports the contention that involvement in exercise activity leads to positive attitudes about one's self (Foon, 1989; Baldwin and Courneya, 1997; Fox, 2000). Indeed, Mullin, Hardy and Sutton (2007) indicate that understanding the impact of sport/exercise on one's self is critical to understanding the motivation for consumption. However, Johnsgard (1989) does highlight that exercise will do little to improve self-esteem if it is deficient primarily in other areas of life. The key self-esteem benefit of exercise occurs when a person's low self-esteem has its roots in lack of fitness or poor body image.

#### **2.6.3.6 Social Facilitation Motivations**

Social facilitation is defined as the social gratification of being with others who enjoy the same activity. Participants are motivated by the opportunity to spend time with family members and friends (Weiss and Duncan, 1992; Jamber, 1999). Other studies have illustrated that social facilitation is particularly salient for female participants (Gill and Overdorf, 1994; Ryckman and Hamel, 1995).

#### **2.6.3.7 Affiliation Motivations**

As social beings, people have a desire to be with others and live as part of a group. Affiliation is generally considered to be an intrinsic motive and takes the form of feeling a sense of affiliation with other individuals or others as part of a group or team.

Social affiliation is generally perceived to be an autonomous motive and as such contributes positively to long-term exercise participation (Ingledeew and Markland, 2008). It also appears to be more prevalently desired by female exercisers (Kilpatrick, Hebert, and Bartholomew, 2005).

#### **2.6.3.8 Aggression Motivations**

Some research has indicated that actively participating in exercise affords the opportunity for athletes to release pent up aggression (Storr, 1970; LeUnes and Nation, 1989). This opportunity is enhanced in competitive situations, particularly in team sports. Jarvis (2006) argues that aggression in sports and exercise can take three broad forms. Innate aggression refers to individual's instinct to behave in a certain way, aggression that is learnt and imitated in a social-learning context, and aggression that is a result of feelings of frustration.

#### **2.6.3.9 Stress Reduction Motivations**

Stress reduction is defined as the process of reducing state anxiety, an emotional state characterised by apprehension, fear, and tension accompanied by physiological arousal (LeUnes and Nation, 1989). Research into the psychological changes associated with exercise illustrates consistent reductions in state anxiety through physical exercise (Dienstbier, 1984; Tucker, 1990; Hobson and Rejski, 1993). Aerobic activities, such as cycling, running, and swimming; offer the most significant psychological benefits (Long and Stavel, 1995). Exercise has also consistently illustrated mood-enhancing properties, generally facilitating a positive influence on mood state (Crabbe, Smith, and Dishman, 1999).

#### **2.6.3.10 Risk-Taking Motivations**

Risk-taking refers to the desire to engage in thrill seeking through one's exercise activities. Zuckerman (1979) maintains that organisms seek a certain level of stress and that stress-seeking behaviour increases when obtained levels fall below this optimal level. The athlete's perception of danger creates excitement and a desire to master the environment (Anshel, 2012). Participants in extreme sports; such as motor cycling, mountain climbing, and skiing; pursue high levels of excitement, thrill and challenge (Robinson, 2004; Brymer and Oades, 2009).

### **2.6.3.11 Self-Actualisation Motivations**

Exercise and sport provide opportunities to exceed personal expectations and provide a natural realm for self-actualisation. Rudnicki and Wankel (1988) found self-challenge to be a predictor of long-term exercise involvement and these findings relating to the importance of self-actualisation as a motivator for exercise engagement are corroborated in a number of other studies (Roberts, Treasure, and Balague, 1998; Treasure, Carpenter, and Power, 2000).

The approach adopted in this section is relatively descriptive in nature, relying on the individual's self-reported perceived reasons for exercise engagement. It is an appropriate mechanism for developing explanatory research designs, as it serves as an informative analysis of a person's 'surface' level motivations for exercising (Biddle and Mutrie, 2008). However, it is recommended that 'surface' motives are assessed in the context of a more detailed examination of the theoretical constructs that underpin participation motivation (Biddle and Mutrie, 2008).

The next section commences the evaluation of some of the key theoretical developments in the exercise motivation sphere.

## **2.7 Theory Underpinning Exercise Motivation**

The literature has illustrated that there can be much variance in the desired benefits of exercise participation. However, simply describing these motives will not necessarily provide sufficient information on how people view the sport/exercise experience (Zahariadis and Biddle, 2000). It is therefore critical to examine the psychological and motivational processes that underpin participation behaviour. This discussion will examine some of the critical theoretical constructs from the area of motivation that help to explain the behaviour of exercise participants.

### **2.7.1 Self-Determination Theory**

Self-Determination Theory (SDT) was developed by Deci and Ryan (1985) and has gained widespread acceptance in the exercise and physical activity domains (e.g., Edmunds, Ntoumanis and Duda, 2006; Hagger and Chatzisarantis, 2007). SDT posits that motivation can be divided into self-determined/autonomous motivational types and non-self-determined/controlling forms of motivation. Self-determination is reasoned to

be the degree of free will that the individual possesses, which means that the option is available to engage in a behaviour (Ryan and Deci, 2000), and that the individual takes the initiative to engage in the particular behaviour (Edmunds, Ntoumanis and Duda, 2006).

Motivation can be divided into three different categories: intrinsic, extrinsic, and amotivation (Deci and Ryan, 1985). Vallerand (2001) argues that these three constructs are crucial for understanding the psychological processes underlying exercise behaviour.

Intrinsic motivation is participating in an activity for itself, out of interest, and/or for the pleasure and satisfaction derived from simply performing it. It stems from the innate psychological needs of competence and self-determination (Fortier *et al.*, 1995). An intrinsically motivated participant will perform the behaviour voluntarily, in the absence of material rewards or external constraints. The majority of theorists in this area highlight enjoyment, interest, and feelings of competence as the primary satisfactions of intrinsically motivated behaviour (Ryan *et al.*, 1997). A movement towards intrinsically motivated forms of behavioural regulation is reflected in stronger levels of intention and sustained involvement in exercise, because they are likely to involve greater perceptions of autonomy and self-identity. Vallerand *et al.* (1992) further probed the concept and contend that intrinsic motivation can be divided into three categories:

1. *Intrinsic motivation to know*: Engaging in an activity for the pleasure and the satisfaction that one experiences while learning, exploring, or trying to understand something new.
2. *Intrinsic motivation to accomplish things*: Engaging in a given activity for the pleasure and satisfaction experienced while one is attempting to surpass one-self or to accomplish or create something.
3. *Intrinsic motivation to experience stimulation*: Engaging in an activity in order to experience pleasant sensations associated mainly with one's senses (e.g., sensory and aesthetic pleasure, fun and excitement).

Extrinsic motivation is not related to satisfaction derived from the activity itself, but from factors external to the activity, such as rewards and punishment. A participant who

competes for prestige, to improve his/her physique, or to avoid punishment is considered to be motivated extrinsically (Vallerand and Perrault, 1999). Ryan and Deci (2000) propose the following four categories of extrinsic motivation:

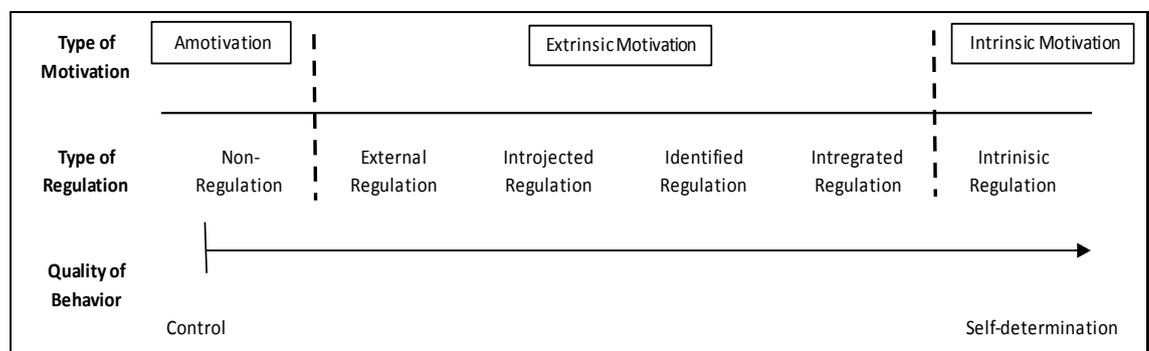
1. *Integrated Regulation*: The most self-determined extrinsic form of behavioural regulation, with primarily volitional behaviour. It is considered important to the achievement of an individual's goals. However, the behaviour is still extrinsically motivated because it may be an instrumental action, done to achieve personal goals rather than for the pure joy of the activity itself.
2. *Identified Regulation*: Identified regulation exists when the individual comes to value and judge the behaviour as important, and therefore, performs it out of choice. The activity is still performed for extrinsic reasons, but is internally regulated and self-determined.
3. *Introjected Regulation*: With introjection, the formerly external source of motivation has been internalised such that its actual presence is no longer needed to initiate behaviour. Instead, these behaviours are reinforced through internal pressures such as guilt or anxiety.
4. *External Regulation*: The constraints and rewards that may regulate behaviour, such as material rewards or constraints imposed by others.

The third motivational category, amotivation, is where the individual has little or no motivation to attempt the behaviour. It is characterised by the thought that actions have no control over outcomes (Deci and Ryan, 1985). In other words, amotivated participants believe that forces out of their control determine behaviours and they often feel a lack of competence. An athlete who is amotivated often ceases to engage in regular exercise. Vallerand and Fortier (1998) suggest that the study of amotivation is beneficial in understanding and predicting lack of persistence in exercise.

The nature of motivated behaviour, according to Deci and Ryan (1985; 1991), is based on striving to satisfy the three basic needs; competence, autonomy, and relatedness. This, they say, leads to a process of 'internalisation', whereby participants internalise behaviours not initially intrinsically motivating. Deci and Ryan (1985) have linked the internalisation concept to that of extrinsic and intrinsic motivation, forming the basis of self-determination theory. They propose a continuum where different types of

extrinsically regulated behaviour can be located (see Figure 2.1). Deci and Ryan (1991) describe the continuum as representing the extent to which the regulation of a non-intrinsically motivated behaviour has been internalised. As Deci and Ryan (1985, p.31-32) outline, “*the need for self-determination is an important motivator that is involved with intrinsic motivation and is closely intertwined with the need for competence. It is important to emphasise that it is not the need for competence alone that underlies intrinsic motivation; it is the need for self-determined competence*”. In other words, intrinsically motivated states must involve competence and autonomy.

**Figure 2.1: Continuum of Self-Determination**



Source: Deci and Ryan (1985)

In recent times, the use of self-determination theory for studying intrinsic motivation in exercise has further evolved (Chatzisarantis *et al.*, 2003; Hagger and Chatzisarantis, 2005). Chatzisarantis *et al.* (2003) conducted a meta-analysis of the self-determination continuum. They found strong correlations between more self-determined forms of motivation and measures of intention and competence. As the individual progresses along this continuum, their motivation becomes less controlled and more autonomous. External and introjected regulations are classed as controlled motivation, while identified, integrated, and intrinsic regulation are considered autonomous forms of motivation. Autonomous regulation has been consistently found to correlate strongly with sustained exercise participation (Daley and Duda, 2006; Fortier, Sweet, O’Sullivan, and Williams, 2007; Hagger and Chatzisarantis, 2009). Amongst the extrinsic motivational constructs, integrated regulation has the strongest links with exercise adherence, although the effect of identified regulation has at times been significant (Ingledeew and Markland, 2008; Peddle *et al.*, 2008). Introjected regulation generally has a negative or neutral impact on participation, although some instances of short-term positive effect have been reported (Rose, Parfitt, and Williams, 2005; Daley

and Duda, 2006). External regulation has predominately been found to have a negative effect on participation (e.g., Edmunds, Ntoumanis and Duda, 2006; Thøgersen-Ntoumanis and Ntoumanis, 2006).

Approaching the study of exercise participation from the perspective of self-determination theory has assumed greater prominence and the theory has shown considerable utility in explaining the antecedents and processes that underpin exercise behaviour. However, some criticisms have been levelled at self-determination theory. McInerney and Van Etten (2004) question the cross-cultural efficacy of this and other motivational models. Brunet and Sabiston (2011) and Brickell and Chatziasarantis (2007) question the regulation structure, arguing that it is difficult to distinguish the integrated from intrinsic regulation in quantitative studies. Despite these criticisms, self-determination theory remains an extremely popular and proficient mechanism for capturing the underlying motivational constructs that drive individual's exercise behaviour.

### **2.7.2 The Trans-Theoretical Model (TTM)**

Prochaska and DiClemente (1983) in their Trans-Theoretical Model (TTM) outline that the transformation from a sedentary lifestyle to regular exercise engagement takes place in a series of stages that involve changes in an individual's behaviour. The TTM has been applied in many domains of health behaviour and was adapted for exercising in numerous studies such as those by Marcus and Owen (1992); Marcus *et al.* 1992; Prochaska and Marcus (1994); and Mullan and Markland (1997). The TTM is founded on the assertion that individual's pass through various stages of readiness before eventually engaging regularly with the desired behaviour. It is also noteworthy that changes in behaviour can be temporary and individuals frequently lapse into previous routines (Prochaska, Redding, and Evers, 2009). This is particularly relevant in the exercise field, where getting people to exercise initially is easier than getting people to maintain regular exercise engagement.

The TTM is comprised of the following five stages. Individuals tend to exhibit differences in their processes of change; perceptions of self-efficacy; evaluation of the pros and cons of the desired behaviour; and susceptibility to alternative behaviour and temptations through the different stages (Prochaska *et al.*, 2008).

**Stage 1 Pre-contemplation:** The individual does not engage in any exercise and does not acknowledge that there is a problem with their sedentary lifestyle. They are resistant to messages and initiatives aimed at facilitating greater exercise engagement and consider the barriers to exercising to outweigh the benefits.

**Stage 2 Contemplation:** Individuals are not regularly physically active but have intentions or plans to become so in the immediate future. There is a realisation that their lifestyle needs to be more active, although the downsides of regular exercise still outweigh the benefits.

**Stage 3 Preparation:** The individual prepares to engage regularly with exercise and their perceptions of the advantages of exercise now exceed the potential drawbacks.

**Stage 4 Action:** The individual is now regularly exercising and has been doing so in the short-term. The intention is normally to make this a long-term approach, but there is a considerable risk of relapsing into old behaviour, as barriers to regular exercise will still be apparent.

**Stage 5 Maintenance:** The individual is regularly exercising and has been for at least six months. The ultimate aim is for this to become an established routine, perhaps even a habitual one. Threats of relapse and barriers are reduced, but the individual and exercise marketers need to be cognisant that this is still a very real threat.

A consistent trend emerges in studies using the TTM. Individuals in the later stages of TTM generally exhibit greater levels of motivation, in particular intrinsic motivation toward exercising (Rose, Parfitt, and Williams, 2005; Buckworth, Lee, Regan, Schneider, and DiClemente, 2007). They also illustrate greater levels of self-efficacy concerning their exercise behaviour than people in the early stages of TTM (Burbank and Riebe, 2001). Original perspectives on the TTM suggested that individuals progressed through the stages in a linear manner, while contemporary thinking contends that many individual's progress and regress through the stages of the TTM (Marshall and Biddle, 2001).

In a critique of the TTM, Adams and White (2004) argue that stage-based exercise promotion interventions are not effective due to the multi-faceted nature of exercise and physical activity. They highlight that people may have very different beliefs and perceptions of self-efficacy about different activities. Some criticism was also expressed regarding the validity of the algorithms used to categorise individuals into different stages. Brug, Oenema, and Ferreira (2005) acknowledge the criticisms expressed by Adams and White (2004), but counter that stage-targeted activity promotion interventions are still likely to induce motivation and behavioural changes. They suggest further research into comprehending the key stage-transition determinants.

## **2.8 Self-Efficacy and Exercise**

Self-efficacy relates to a person's belief in their ability to handle a specific task or certain duties in a satisfactory manner. Self-efficacy theory (Bandura, 1977) posits that if an individual possesses high self-efficacy regarding a specific activity, it is likely that individual will initiate or continue with the selected activity. Bandura (1977) outlined four sources of information that individuals employ to judge their efficacy: performance outcomes, vicarious experiences, verbal persuasion, and physiological feedback. Performance outcomes, or past experiences, are the most important source of self-efficacy. Previous good experiences or positive outcomes enhance the individual's feeling of competence and ability to perform the task well. Individuals can also develop high or low self-efficacy vicariously through observing other people's performances. If a person sees someone similar to them succeed, it can increase their self-efficacy, although observing failure can have the opposite effect. Self-efficacy can also be influenced by encouragement and discouragement relating to an individual's performance or ability to perform. The role of significant others in the exercise context, such as coaches and team-mates, is particularly important in this regard. Finally, physiological and emotional arousal from exercising can influence their belief of efficacy relating to the activity.

Self-efficacy emerges in many studies as a key correlate of exercise behaviour (Bandura, 1997; Rovniak, Anderson, and Winett, 2002; Von Ah *et al.*, 2004) and is predominantly positively associated with exercise behaviour. Other examples of the importance of self-efficacy in an exercise context include Sternfeld, Ainsworth, and Quesenberry's (1999) study which investigated the correlates of physical activity

participation in a large sample of US women. They found that women with high levels of physical activity self-efficacy were considerably more likely than those with low levels of self-efficacy to be in the highest quartile of engagement in physical activity. Additionally, Castro *et al.* (1999) reported changes in self-efficacy and enjoyment to be inversely associated with activity change in physical activity behaviour for women.

## **2.9 Personality and Exercise Behaviour**

There is extensive evidence that personality traits are associated with health-related behaviours (Wiebe and Smith, 1997), although contradictory evidence at times has been reported (Vollrath and Torgersen, 2002). Courneya in a series of studies with assorted colleagues evaluated the relationship between the five-factor model of personality and exercise participation. These studies found participation to be associated with lower neuroticism, higher extraversion, and higher conscientiousness (Courneya and Hellsten, 1998; Courneya, Bobick, and Schinke, 1999; Rhodes, Courneya, and Bobick, 2001). This is at odds with the counter-intuitive findings of Yeung and Hemsley (1997) who established that among participants that were recommended to engage in an aerobics programme, higher extraversion personality traits predicted lower attendance.

Ingledeew, Markland, and Sheppard (2004) outlined that it is difficult to discern a consistent pattern in the research examining the associations between personality traits and surface level exercise participation motives. With that in mind, they examined the relationship between personality and a self-determination theory framework, to assess the impact of personality on motivational processes. They reason that extraverted individuals feel self-determined because exercise can satisfy the need for relatedness, while conscientious individuals feel self-determined because exercise can satisfy the need for competence. Neurotic individuals are less self-determined and exhibit strong signs of introjected regulation.

## **2.10 Correlates of Exercise Disengagement/Barriers to Exercise**

Deficiency of motivation for exercise can be attributed largely to two categories of factors (Teixeira *et al.*, 2012). The first category relates to individuals lacking interest, or insufficiently valuing the benefits of regular activity, to make it a priority in their lives (Ryan *et al.*, 2009). Education, family obligations, and work commitments are frequently cited as taking up time that otherwise could have been devoted to exercising.

Perceived lack of competence at the exercise activity is also considered an impediment. This can manifest itself in perceptions of insufficient skill or fitness, or constraints imposed by health limitations that can act as a barrier to activity (Korkiakangas, Alahuhta, Laitinen, 2009).

Some studies have illustrated that in the region of one third of all junior sports participants drop-out of sport between the ages of 11 and 17 years (Fox and Biddle, 1988; Connor, 2000). However, considerable international research indicates that adolescence is the period of greatest exercise engagement and the most notable and substantial declines in regular exercising commence in early adulthood (Gilmour, 2007; Rhodes and Dean, 2009; Rhodes, Mark, and Temmel, 2012). The number of people in today's society that decide to drop out of exercise participation, rather than continue, is a major concern.

Many perceived barriers to exercise have been noted in studies through the years and they consistently emerge as a strong influence on exercise behaviour (Sports Council and Health Education Authority 1992; Central Statistics Office, 2007; Biddle and Mutrie, 2008). Perceived lack of time is perhaps the most frequently cited barrier to physical activity. A large-scale survey in the UK, the Allied Dunbar National Fitness Survey (ADNFS), collected exercise data from *circa* 4,000 respondents. The ADNFS categorised reported barriers to preventing adults from taking more exercise into five main forms: physical, emotional, motivational, time and availability. The three most frequently cited reasons were associated with work, loss of interest, and the need for time for other things. The impact of marriage or change in partnership, and having or looking after children, were also important factors, but more so for women than men. Time barriers emerge as the most important barrier for both men and women. Women were more likely to cite emotional barriers to exercise than men, this frequently being a manifestation of a perceived lack of competence at the activity. Another notable trend to emerge in the ADNFS is that the influence of physical and emotional barriers became greater with increase in age. Additionally time barriers decreased for older age groups (Sports Council and Health Education Authority, 1992).

A criticism of research in this area is the predominance of 'surface' level explanations for disengagement being offered. It is argued that these lack a theoretical underpinning,

although as with ‘surface’ level motives for exercise engagement, it is reasoned that an understanding of these reasons for disengagement is important from a practical perspective (Biddle and Mutrie, 2008). Klint and Weiss (1986) have identified three different types of drop-out, which may help to distinguish the reasons for ceasing participation. The groupings are:

1. *Reluctant drop-out*: An athlete is forced to withdraw due to uncontrollable external forces, e.g., injury or cost.
2. *Voluntary drop-out*: The individual is content with their current sporting situation but wants to explore other areas of a typical lifestyle.
3. *Resistant drop-out*: The individual is in an unhappy situation and reluctantly leaves the sport.

Conflict from other activities is another commonly cited reason for dropping out. Many young athletes end or curtail their involvement because they have other commitments or develop other interests (Schmidt and Stein, 1991). LeUnes and Nation (1989) reviewed several studies and found this motive to be a major factor in discontinuation decisions. It has been indicated that as many as 84% of young athletes cite conflict from other interests as a reason underlying their discontinuation (Gould *et al.*, 1982).

Another issue influencing drop-out is the reputation and structure of organised sports programmes. With a reputation for focusing on the best, a sports organisation may find it increasingly difficult to attract and retain participants. Comte, Girard, and Starensier (1989) criticised sport organisers for focusing too much on players of greater ability to the neglect of others less talented. Sporting structures have become more organised and contribute to children and adolescents being eliminated or cut from programmes (Gould, 1987). Children become involved in organised sports at novice levels where most programmes adopt a philosophy that guarantees participation for all, providing a situation where a child who wants to play is placed on the team. As children and adolescents move up through the organisation, fewer slots become available, team selection is necessary, and children are eliminated because they are not good enough, leading to a ‘forced’ drop-out. This can create a negative effect associated with their departure from sport and these feelings may influence whether or not they return to sport or other activities (Daly, 2000). Another effect of such organised sports programmes is for individuals to specialise in an activity very early in life. Such

activities could well increase the number of repetitive movement and overuse injuries, resulting in larger numbers of burned-out youth (Rasmussen, 2000).

A number of internal factors also emerge including psychological, physical, and situational conflicts (McPherson and Brown, 1988). Youth clearly want to have fun while participating in exercise, however what is fun for one may not be for another (Bredemeier, 1998). Some define fun as being with friends whereas, for others, it is competitive success. This definition of 'fun' is very volatile and changes with age and perception. Once individuals decide participation is no longer fun, they are inclined to leave. The lack of enjoyment has been associated with exercise participants' decisions to drop out (Gould and Horn, 1984).

Gould (1987) identifies burnout as behaviour resulting from the physical and psychological demands placed on individuals through participation in sport. Burnout occurs when an individual withdraws from, or stops participating in, sport because it is no longer enjoyable, or they are not able to compete at their best. It is characterised by exhaustion, low self-esteem, and at times depression in individual participants (Smith, 1986). Burnout occurs mainly through competitive stress and a feeling of lack of control over one's life. Other factors related to burnout include over-training, experiencing differing coaching styles, perfectionism, parental pressure and performance expectations by self and others (Weinberg and Gould, 1995).

## **2.11 Demographic and Biological Factors**

Demographic correlates of exercise behaviour have been widely assessed in the literature. Typical correlates evaluated in exercise studies include age, gender, ethnicity, and socio-economic status. These variables are often studied as potential moderators of behaviour. Biological correlates usually include body mass index or weight status, and sometimes physical fitness.

### **2.11.1 Age**

Age is a consistent correlate of physical activity behaviour in adults. Exercise participation is generally inversely associated with age, with younger cohorts having greater rates of engagement (Burton, Shapiro, and German, 1999; Clark, 1999; Booth *et al.*, 2000; Irish Sports Council, 2012). Additionally, the reasons why people engage in

exercise may differ during young, middle, and older adulthood. This variation is a consequence of changing values, life tasks, goals, and health circumstances over time (Miller and Iris, 2002). The motives that caused an individual to initiate participation in a particular activity in the first place are likely to change and evolve into reasons why they continue an activity (Twemlow, Lerma, and Twemlow, 1996). Many studies have found differences in motives for different ages, with a common outcome being that the interest in the social and psychological aspects of sports change according to age (Biddle, 1993). Young adults have commonly illustrated extrinsic type motivations for exercise engagement, with physical attractiveness, weight control, and social recognition being regularly cited reasons for engagement (Ingledeew and Sullivan, 2002; Strong *et al.*, 2005). This contrasts with the reasons cited for exercise engagement in studies relating to older adults. The older cohort exhibit differing motivations for exercising, with the challenge of physical exercise, its health and fitness benefits, mastery of the activity, and enjoyment being the critical drivers of behaviour (Finch, 1997; Beck, Lohrenz, and Trafton, 2010).

Young people's means of assessing their physical competence appears to vary with age too. Younger children (about ages 5-9 years) tend to use mastery of simple tasks, trying hard, enjoyment of activity, and feedback from parents as primary means by which to judge physical ability. Over the course of childhood and early adolescent years, a shift from these sources to peer comparison/evaluation and teacher/coach feedback emerges. Youths aged 10 to 15 years typically become more competitive and seek to do better than same-age peers. When their ability stacks up favourably to their classmates, this information conveys that they are physically competent. In later adolescence, emphasis on social comparison and evaluation again shifts, this time to the use of more internal sources. Teenagers aged 16-18 years depend more on achievement of self-set goals, attraction toward physical activity, and personal improvement as primary indicators of competence (Horn and Harris, 1996).

As adolescents move into adulthood the type of exercise engagement evolves. Thuot (1995) found that college students illustrated a transition from competitive to recreational exercise activities. Quindry *et al.* (2011) examined exercise motives of adults across the adult life span, using the Exercise Motivations Inventory 2 (Markland and Ingledeew, 1997) to capture the motivational influences. They highlighted that

young adults are primarily motivated by interpersonal motives such as affiliation and competition, while people in middle age exercise for body-related (appearance, weight management) and psychological (stress relief, enjoyment, revitalisation) benefits. Fitness motives are a constant throughout the life span, while health motives are significant for middle-aged people and continue into older age.

An interesting finding to emerge from a study by Rhodes, Blanchard, and Blacklock (2008) indicates that older adults exhibit greater degrees of control over their exercise behaviour than their younger adult counterparts. Fatigue, lack of time, cost, and social support were the key beliefs underlying these differences. This suggests that while rates of exercise adherence amongst older cohorts may not be as high as with younger groups, those that do regularly exercise exhibit a higher degree of volitional control over their behaviour.

### **2.11.2 Gender**

The literature suggests that there are significant gender differences in exercise participation preference and motivation. The types of sports that men and women play can vary from country to country and culture to culture. Using Connor's (2000) Irish study as an example, females show a marked preference for playing individual sports, whilst there was a slight preference for team sports amongst males. When one further examines the data other gender differences emerge such as girls participating more in team sports like basketball and hockey, with boys exhibiting a preference for sports such as soccer and gaelic football. Gender stereotyping, traditional sporting practices, peer conformity and media/role model influence may explain these patterns. The research conducted by Connor (2000) appears to confirm the gender imbalance in participation rates in indoor and outdoor sports that was highlighted in earlier studies (Hendry *et al.*, 1993; Kremer *et al.*, 1997). It was found that almost 50% of adolescent girls sporting activity took place in an indoor setting, compared to just 22% for boys.

Gender differences in criteria for judging physical competence appear not to emerge until adolescence. Boys cite competitive outcomes and speed and ease of learning new skills as key motives. By contrast, teenage girls attach greater value to their attraction toward physical activity, achievement of goals, and feedback and evaluation by adults and peers (Horn and Harris, 1996). Kelinske, Mayer, and Chen (2001) found that

women are less motivated by a need to compete and win in sport than men, with social orientation and health and fitness being primary motivators. Brustad (1993, 1996) conducted a series of studies on the influence of parental attitudes and behaviours on childrens' physical competence perceptions and affective responses to physical activity. The findings varied by gender, with parents giving more encouragement to their sons than daughters, and girls reporting lower perceived physical competence and positive affect toward physical activity than boys.

Kilpatrick, Hebert, and Bartholomew (2005) conducted a study examining college students' motivation for engaging in both sports and exercise. They used the wide-ranging Exercise Motivations Inventory 2 (Markland and Ingledew, 1997) to assess motivation. Numerous significant gender-based differentials emerged. Women in the target grouping were considerably more motivated by the weight control benefits of exercise, while the males exhibited greater stimulus to exercise by performance and ego-related factors, such as social recognition, challenge, and competition.

### **2.11.3 Ethnic Origin**

The role of ethnicity in exercise engagements has been addressed in a number of reviews (Sallis and Owen, 2002; Biddle *et al.*, 2005; Gustafson and Rhodes, 2006). Reviews suggest that 'white Caucasians' are more likely to be active, particularly at younger ages, than other ethnic groups. However, this relationship was described as 'small' by Biddle *et al.* (2005). Sallis and Owen (2002) illustrated that ethnicity had an inconsistent relationship with physical activity. This is at odds with the findings of Yan and McCullagh (2004) that highlighted significant exercise motivational differences between young people from different nationalities. For example, Chinese participants assigned considerable importance to the social affiliation and health benefits of exercise, which contrasts with their American counterparts who attach greater significance to competitive and skill development motives.

### **2.11.4 Socio-Economic Status**

The role of socio-economic status in exercise behaviour was analysed in the reviews by Sallis and Owen (2002); Biddle *et al.* (2005); Ferreira *et al.* (2007); and Gustafson and Rhodes (2006), with mixed findings emerging. Sallis (1999) reported no association between exercise and socio-economic status for children or adolescents. Similarly,

Ferriera *et al.* (2006) highlighted no association between socio-economic status and exercise in adolescents, and parental education and exercise in children and adolescents. However, they did report a positive association between physical activity and family income in a number of studies that they reviewed. This is reinforced by the findings of Biddle *et al.* (2005) who reported a moderately strong positive association between activity for adolescent girls and family income. In addition, some socio-economic individual level attributes, especially educational attainment and income, are positively related to leisure-time physical activity (Irish Sports Council, 2012).

### **2.11.5 Family Status**

Studies examining the association between marital status and physical activity behaviour produced mixed findings. A number of studies reported a positive association between marital status and physical activity participation (Brown, Young, and Byles, 1999; Salmon *et al.*, 2000). Others, such as (Sternfeld, Ainsworth, and Quesenberry, 1999; Booth *et al.*, 2000; and Brownson *et al.*, 2000), illustrated no association. King, Rejeski, and Buchner (1998) examined the effects of marital transitions on changes in physical activity in a cohort of men and women. The transition from a single to a married state resulted in significant positive changes in physical activity relative to individuals who remained single. In contrast, the transition from a married to a single state did not influence physical activity.

### **2.11.6 Biological Correlates**

Being overweight or obese has emerged as a consistent negative correlate on physical activity. Martinez-Gonzalez *et al.* (1999) found that individuals in the highest quintile for leisure time physical activity were approximately 50% less likely than those in the lowest quintile to be classified as obese. Similar findings were reported in other studies (e.g., Ruchlin and Lachs, 1999; Simonsick, Guralnik, and Fried, 1999). However, in their review, Biddle *et al.* (2005) reported an individual's body mass index (BMI) as being inconsistently associated with activity for both children and adolescents with higher BMI not always correlating as anticipated with lower activity levels.

### **2.12 Past Exercise Behaviour**

Past exercise behaviour or exercise habit emerged as a consistent predictor of current activity status (Brenes, Strube, and Storandt, 1998; Oman and King, 1998; Trost *et al.*,

2002). In an examination of the moderating role of past behaviour on the Theory of Planned Behaviour model of exercise prediction, Norman, Conner, and Bell (2000) found that past behaviour had a direct effect on future exercise behaviour over and above the influence of the TPB variables. Past exercise behaviour and habitual behaviour are also found to be key predictors of future adherence to exercise programmes amongst older adults (Boyette *et al.*, 2002).

### **2.13 Social Influences on Exercise Behaviour**

The literature has provided a clear demonstration that a number of potential social influencers can have a notable impact on a person's motivation to engage in exercise. Much exercise activity is performed in the company of, or competing against, fellow participants and under the instruction of coaches. Vallerand (2001) argues that there are different social aspects within the exercise domain that can determine the type of motivation felt by exercisers. Coaches, family members, peers, and friends can be responsible for creating a motivational climate, which in turn can have a significant effect on exercise behaviour (Ntoumanis and Biddle, 1999). The influence of significant others ensures that exercise engagement is generally quite a social experience.

#### **2.13.1 Socialisation and Family Influence**

Klint and Weiss (1987) suggest that one approach to understanding variations in exercise participation is by examining the factors that initiate it. Initial participation motives may vary from children to adolescents depending on the number of socialising influences (McPherson *et al.*, 1989). Socialisation is the process of learning to live in and understand a culture or subculture, its values, beliefs, attitudes and norms. This is commonly referred to as social imitation, where individuals learn from others (McPherson *et al.*, 1989). Weigand (2000) describes exercise socialisation as the process whereby individuals learn skills, values, attitudes, norms, and knowledge of sport roles, through direct and indirect interaction with social systems, e.g., parents and family, friends/peers, schools, and the media.

Weiss (2000) contends that most of the studies on parental influence on sporting activity are relatively consistent in their findings. Parents who are seen as confident about their child's abilities, supportive of their sporting involvement, and experience enjoyment in their own activity are associated with young participants who report greater ability

perceptions, positive effect, motivation, and frequency and intensity of physical activity. Children who have supportive parents are more likely to initiate and continue their participation in sport more than individuals for whom the support is much lower. In many cases, the family is the primary agent of socialisation and social institutes such as schools and peers only reinforce what has been initiated by the family (Lewko and Greendorfer, 1988; Greendorfer, 1992). Parents are especially important as transmitters of information about their child's competence and the value of physical activity through the mechanisms of modelling and reinforcement behaviours (Brustad, 1996).

In addition to the initial socialisation parents can play a key role in continued participation in sport – providing transport, encouragement, and financial help to facilitate engagement (Connor, 2000). The family can also influence the benefits sought from sport, with parental motivation often cited as a reason for trying to maximise an adolescent's ability at a given sport. However, too much pressure from parents has sometimes been espoused as a reason for dropping out of sports (Scully and Clarke, 1997). Additionally, as children progress into and through adolescence and on to adulthood, the importance of the parent's role in influencing sports participation appears to diminish, with peer impact becoming more pronounced (Horn and Amorose, 1998).

### **2.13.2 Coach/Mentor Influence**

Coaches' feedback and reinforcement comprise informational (e.g., instruction) or evaluative (e.g., praise or criticism) responses to participation and performance. Smith and Smoll (1996), over the course of several studies, found that coaches and mentors who engaged in frequent praise for desirable behaviours, encouragement following skill errors, and instruction following performance attempts, were associated with players who were higher in perceived ability, enjoyment, and intention to keep playing. Coaches that structure a learning environment which encourages a self-referenced definition of success (such as focusing on improvement or enjoyment), rather than normative standards or peer comparison, are likely to positively influence participants' self-perceptions, emotional reactions, and motivation to continue active involvement (Weiss, 2000).

### **2.13.3 Peer and Friend Influence**

Research has shown a strong link between physical competence and peer acceptance (Kunesh, Hasbrook, and Lewthwaite, 1992). Young people who are physically skilled tend to be more popular with their peer groups and are motivated to continue participation to maintain these friendships. Studies have also demonstrated that young people view sports as an arena in which to develop close friendships that allow opportunities for emotional support and self-esteem affirmation (Weiss *et al.*, 1996). Duncan (1993) examined the influence of the esteem support and companionship dimensions of friendship on emotional and motivational outcomes among 12-15 year old schoolchildren. Girls and boys who perceived greater friendship quality in these two areas reported greater enjoyment doing physical activities and interest in choosing activities outside of the school setting. Horn and Amorose (1998) found that peer influence is of great importance in adolescence, with peer comparison and evaluation particularly important sources of information about competence in sport and exercise.

Mahony (1997) contends that one's peers are the dominant reason for taking up sport. A person's peers and close friends (i.e. classmates, team-mates) are powerful socialising agents in children's psychosocial development in school and physical activity involvement (Weiss and Ebbeck, 1996). The impact of one's peers is especially prominent during adolescence when children begin spending less time with their family (Eitzen and Sage, 1986; Weiss and Chaumeton, 1992).

Murcia, Gimeno, and Camacho (2007) found that situations in which peers embrace a task oriented climate by placing emphasis on co-operation, effort, and personal improvement; lead exercisers to feel a greater degree of competence and control. Additionally, this type of peer climate fosters group decision making, which develops a greater sense of autonomy. The co-operative environment also generates less social comparison, thus improving the sense of relatedness to the activity. These issues combine to create a greater sense of self-determination in engaging in exercise, which in itself has been shown to stimulate a greater enjoyment of physical activity (Ntoumanis, 2002).

#### **2.13.4 The Role of Social Support**

Social support consistently exhibits a positive association with exercise (Trost *et al.*, 2002). Leslie *et al.* (1999) examined the role of social support in exercise adherence for Australian college students. Those reporting low levels of social support from either family or friends were 23% to 55% more likely to be insufficiently active for health benefits, than those who reported high levels of support. Similarly, a US study of females also demonstrated that social support was strongly associated with physical activity. Women with high levels of physical activity social support were approximately twice as likely as women with low support to exercise at recommended levels (Eyler *et al.*, 1999).

#### **2.14 Physical Environment Influences**

The literature has shown a developing awareness of potential environmental influences on physical activity (Sallis and Owen, 2002). The influence of the ‘physical environment’ on exercise encapsulates a broad array of influences. Ecological models consider the environment to be anything outside of the individual (Sallis and Owen, 2002), while Davison and Lawson (2006, p.3) offer a specified definition for the physical environment: “*objective and perceived characteristics of the physical context in which children spend their time (e.g., home, neighbourhood, school), including aspects of urban design (e.g., presence and structure of sidewalks), traffic density and speed, distance to and design of venues for physical activity (e.g., playgrounds, parks, and schoolyards), crime, safety, and weather conditions*”.

The strength and direction of the physical environment associations with exercise vary from study to study. Reviews examining the impact of access to facilities illustrate these discrepancies in findings. Davison and Lawson (2006) found a predominately affirmative association with the availability of recreation facilities, with 6 of 8 studies illustrating positive association when perceptions of the environment were assessed by either adults or children. This complements Sallis and Owen’s (2002) findings that opportunities to exercise are associated with greater physical activity. However, Ferreira *et al.* (2007) found no association between activity and access to community physical activity facilities in 32 of 45 studies that they examined. A number of studies have assessed the impact of urban/rural living location on exercise (e.g., Brown, Young, and

Byles, 1999; Wilcox *et al.*, 2000). Notably, all of them found physical activity to be significantly lower among adults living in rural areas than in urban study participants.

### **2.15 Activity/Sport Specific Factors**

A number of what could be deemed to be activity/sport specific correlates of exercise also emerge relatively frequently in the literature. These will be examined in turn in Sections 2.15.1 to 2.15.4 inclusive.

#### **2.15.1 Type of Exercise Engagement**

There is some evidence in the literature to suggest that participant motivation can vary depending on what sport one is playing. Ryan *et al.* (1997) carried out a study contrasting the motives for participating in aerobics and Tae Kwon Do. They found that those taking part in Tae Kwon Do were very much intrinsically driven with competence and enjoyment being the predominate benefits desired from the sport. In contrast, aerobics participants had primarily body-related target benefits and demonstrated considerable extrinsic motives. Different sports can emphasise different motivational orientations and influence whether or not an individual chooses to adopt particular reinforcement systems and goals (Weiss and Chaumeton, 1992). There is also evidence to suggest that an individual's participation motivation can vary depending on whether a team or individual sport is being played (Carron, Widmeyer, and Brawley, 1988).

#### **2.15.2 Level of Sporting Activity**

Klint and Weiss (1987) found that children high in perceived physical competence were more motivated by skill development reasons, while those athletes high in perceived social competence were more motivated by the affiliation aspects of sport. It could be argued that the higher the level or grade of an athletes' participation the more motivated they will be by maximising their competence at the sport. This would contrast with people playing at lower grades or levels who would see fun, health and social benefits as the driving force of their behaviour. This viewpoint is reinforced by the findings of Van Wersch's (1997) study, which demonstrates that young people participating at elite and competitive levels of sport are motivated in a manner significantly different to those who are active at a basic level. Trew (1997) found that young Northern Irish males participating at basic levels spent an average of 3.9 hours a week playing, while those operating at elite level dedicated an average of 6.7 hours a week to their sport. This

suggests a greater drive to excellence and self-actualisation at higher levels of sporting activity.

### **2.15.3 Place of Sporting Activity**

A number of outlets for exercise activity have been identified, e.g., schools, clubs, commercial and casual recreational facilities. Where people engage in exercise can also impact on the benefits they seek from the activity. The very nature of casual sporting activity infers that it is socially motivated, while the research undertaken by Comte, Girard, and Starensier (1989) suggests that playing sports in clubs caters for people with competitive and physical mastery drives. Additionally, participation in different sports seems to be based on varying motivations, with a more casual/fun oriented approach to those activities engaged in outside of clubs. This contrasts with the competitive and skill development focus of most club-based activities (Brennan and Bleakley, 1997). Research into membership of commercial sporting organisations such as gymnasiums suggests that the motives for exercise engagement in these environments are principally derived from health and physical appearance benefits (Crossley, 2005).

### **2.15.4 Media and Role Model Influences**

The influence of the media and of role models is of great importance to exercise promoters. The general consensus is that media exposure has a positive effect on levels of exercise participation, with the media having the affect of socialising and inspiring people to participate in exercise, as well as watch sport and consume sporting goods (Griscogono 1991; Coakley, 1994). Exposure to sports coverage in the media leads to exposure to potential role models. Bandura (1977) developed the concept of role modelling with his vicarious learning theory, which asserts that much of what people learn is through observation and imitation of others.

It is not just sporting heroes who are perceived as role models by exercisers. Role models, heroes, and mentors are part of everyday life and are thought to have a significant impact on the beliefs and actions of individuals. Cialdini (1993) argues that role models persuade through their natural authority (they are perceived to be good at what they do) and through source credibility (they appear to know what they are talking about). The term role model is considered to vary from an individual who is perceived as exemplary, or worthy of imitation, to an individual who inspires individuals or

groups of people, through personal contact and relationship (Yancey, 1998). People such as teachers, spouses, parents, peers and sporting heroes are included within this definition and can have significant influence on behaviour as they are important reference groups

These social influencers also impact on young peoples' motivations for on-going participation. The adaptation of the Harter (1987) model of self-esteem for the physical activity domain by Weiss and Ebbeck (1996) indicates that three forms social support can impact on a young person's perceived competence and self-esteem and thus their enjoyment of an activity. Social support can come from parents or other family members; coaches or teachers; and friends or peers. Further support for the role of coaches comes from intervention studies by Smith and Smoll (1996). They demonstrate that the quantity and quality of the coach's feedback results in positive outcomes for sport participants.

## **2.16 Chapter Conclusion**

The author's review of the exercise participation and motivation literature suggests that engagement correlates should be viewed as a multi-dimensional construct composed of a broad range of social-environmental and psychological elements. A thorough understanding of these varied elements is critical prior to designing effective exercise participation interventions. Motivation consistently emerges one of the critical correlates of exercise behaviour in contemporary studies. Early examinations of motivation in the exercise domain focused on descriptive or surface level motives. The literature progressed to examining theories that underpin the surface motives, with self-determination theory receiving considerable attention from exercise academics. However, the practical worth of descriptive motives has seen a revival of academic interest in their use and in developing the links between surface level motives and the psychological processes that underpin them. It is important to assess potential instruments for capturing multi-dimensional correlates of exercise behaviour, as these are inherent in the proposed segmentation process of this thesis. Chapter 3 of the study identifies the most effective mechanisms in this regard.

# **Chapter 3. Capturing the Multiple Correlates of Exercise Behaviour**

"A marathoner is a marathoner regardless of time. Virtually everyone who tries the marathon has put in training over months, and it is that exercise and that commitment, physical and mental, that gives meaning to the medal, not just the day's effort, be it fast or slow. It is all in conquering the challenge"

Mary R. Wittenberg, President, New York Road Runners Club.

### **3.1 Chapter Overview**

The key purpose of this chapter is to evaluate the potential operational measures for use in the segmentation phase of the study. Chapter 2 examined the considerable literature on the multiple correlates of exercise behaviour. How best to capture or measure the multiple correlates for use in the segmentation process is a fundamental decision and this section assesses the various options. The significance of motivational influences on exercise behaviour has been thoroughly established in Section 2.6 and 2.7 and the various instruments for measuring exercise motivation are evaluated initially. Sections 2.11 to 2.15 highlighted other potentially important correlates of exercise behaviour and methods of encapsulating these multiple determinants are also appraised. This chapter serves as a link between the key exercise correlate literature and the methodology employed to achieve the research objective and test the research propositions.

### **3.2 Instruments for Measuring Exercise Motivation**

A number of instruments have been developed to assess individuals' exercise motives, with some scales assessing exercise motivation from a self-determination perspective, while others evaluate descriptive participant motives.

The Sport Motivation Scale - SMS (Pelletier *et al.*, 1995) - has been widely used in academic literature. The SMS was developed to assess the different types of regulatory processes proposed by self-determination theory (SDT) in a sports context. In line with SDT, the goal of the SMS is to measure the perceived forces that move an individual to act in the domain of sport: that is amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation. The scale has been applied in numerous contexts and has largely exhibited strong validity (Pelletier *et al.*, 1995; Chatzisarantis *et al.*, 2003; Standage, Duda, and Ntoumanis, 2003). Some criticism of the SMS structure has been outlined by Mallett *et al.* (2007), who proposed an alternative version of the SMS containing a revised six-factor structure. However, this amendment was rebuffed by Pelletier, Vallerand, and Sarrazin (2007). Lonsdale, Hodge, and Rose (2008) developed the Behavioural Regulation in Sport Questionnaire (BRSQ) as an alternative measure of sport motivation, and this scale illustrated good validity in the main. Pelletier *et al.* (2013) have developed a revised sport motivation scale, the SMS-II, to reflect legitimate criticisms and proposed

amendments of the original SMS scale and their research indicates that the validity of the SMS-II scale is supported.

One of the most widely used scales examining surface level motives is the Reasons for Exercise Inventory (REI: Silberstein *et al.*, 1988). It originally comprised seven scales labelled Weight Control, Attractiveness, Tone, Fitness, Health, Mood, and Enjoyment. Frederick and Ryan's (1993) Motivation for Physical Activity Measure (MPAM) taps an even more restricted range of motives, comprising only three scales labelled Enjoyment, Competence, and Body-Related motives. Whilst both the REI and MPAM illustrated their worth in testing theoretically driven research questions, they were critiqued for their lack of scope in capturing the full array of exercise motives (Duda and Tappe, 1989; Markland *et al.*, 1992; Markland and Hardy, 1993).

Duda and Tappe's (1989) Personal Incentives for Exercise Questionnaire, comprising ten scales, assesses a broader range of motives. However, Markland and Hardy (1993) criticised this instrument on the grounds that it fails to evaluate enjoyment as a motive for exercising and because a number of variables could be read by respondents as reflecting general beliefs about exercise or about themselves, rather than specifically tapping their reasons for exercising. Markland and Hardy went on to describe the development and initial construct validation of the Exercise Motivations Inventory (EMI), an instrument that also assesses a broad range of reasons for exercising.

The EMI consists of twelve scales labelled Stress Management, Weight Management, Recreation, Social Recognition, Enjoyment, Appearance, Personal Development, Affiliation, Ill-Health Avoidance, Competition, Fitness, and Health Pressures. Despite promising signs concerning the validity of the EMI, Markland and Hardy (1993) also pointed to a number of weaknesses with the instrument, particularly in relation to fitness and health-related motives. A further problem with the EMI was that the phrasing of the original item stem makes the instrument only applicable to individuals who do exercise. Markland and Ingledew (1997) reasoned that it would be useful to be able to assess the reasons that non-exercisers would have for exercising, if they were to do so, in order to determine factors that might motivate initial involvement or re-involvement. Such information would have practical benefits in terms of targeting interventions for sedentary individuals. These issues led to the modification of the original EMI and the

development of the Exercise Motivations Inventory 2 (EMI-2) scale by Markland and Ingledew (1997). The EMI-2 was designed to produce a set of valid and reliable indicators of a broad range of participation motives. Several new variables were generated to overcome the shortcomings of the original scale. Markland and Ingledew employed a confirmatory factor analytic approach to examine the factorial validity of the measures of exercise participation motives. This hypothesis testing approach contrasts with most other exercise motive scales' approaches, which rely on exploratory factor analyses. Importantly, Markland and Ingledew's amended measure was phrased in such a way that it can be answered by individuals who are not currently participating in exercise (but who might do so), as well as those who are currently participating.

A more fundamental issue with the EMI-2, and indeed other measures of exercise motives, concerns the lack of a strong theoretical basis. Several authors have pointed out that the study of participation motives at the descriptive or surface level needs to be embedded within a more theoretical approach (e.g., Gould and Petlichkoff, 1988; Biddle, 1995). Applications of Deci and Ryan's (1985, 1991) self-determination theory to the exercise domain characterised specific participation motives as reflecting intrinsic or extrinsic motivational orientations (Ryan *et al.*, 1984; Frederick and Ryan, 1993, 1995). Whilst the EMI-2 draws loosely on self-determination theory in the sense that some motives can be held to reflect intrinsic or extrinsic motivation, there remain problems with fitting some other motives into this framework. An example of this would be fitness-related reasons for exercising that could be held to be intrinsic to participation if one exercises one does get fitter, or to reflect an extrinsic outcome to which an individual might aspire. This clearly presents problems from the perspective of trying to embed the study of surface level participation motives within self-determination theory. However, Deci and Ryan (1985; 1990) have suggested that a simplistic intrinsic-extrinsic dichotomy may be misleading and some motives can at times be either intrinsic or extrinsic in nature. Biddle (1995) contended that despite the difficulty in underpinning them in theory, knowledge of surface level participation motives is important from a practical perspective in the promotion of exercise. This is because an understanding of individuals' participation motives can help in tailoring exercise interventions to meet personal needs (Willis and Campbell, 1992). Indeed, Teixeira *et al.* (2011), in a review of 66 academic studies on the role of motivation in exercise engagement, outlined that there has been a re-emergence of research in recent

years on the role of descriptive exercise participation motives. They highlight that the ability to categorise motives as being intrinsically or extrinsically oriented lends increased credence to the worth of the research. Studies in their review illustrate a consistent positive association between more intrinsic motives and exercise participation.

The EMI-2 scale has been utilised in a number of contexts in academic research. Kilpatrick, Hebert, and Bartholomew (2005) used the scale to contrast American college students' motivations for both sport and exercise. They found that intrinsic motives such as enjoyment and challenge were key drivers for sports participants, while exercisers were more extrinsically motivated, with appearance, weight management, and stress relief being of particular significance. These specific motives can be grouped into appearance/weight, social engagement, health/fitness, and enjoyment-related composites (Ingledeu and Markland, 2008). According to self-determination theory, appearance/weight motives would be predominantly extrinsic, social engagement and enjoyment-related motives would be predominantly intrinsic, and health/fitness motives could have both intrinsic and extrinsic qualities (Markland and Ingledeu, 2007).

### **3.3 Instruments for Capturing Other Correlates of Exercise Behaviour**

Models examining participant consumption behaviour in exercise domains indicate different sets of factors influencing how and to what extent people become involved with and committed to exercise. Mullin, Hardy, and Sutton (2007) distinguish individual and environmental influences, while Shank (2005) identifies internal, external, and situational factors. Individual factors are linked to internal or psychological processes, such as motivation, perception, learning and memory, attitudes, physical characteristics, and self-concept. Environmental factors refer to external, socio-cultural, and situational factors, including elements such as culture, reference groups, significant others, geographic conditions, market behaviour of firms, cultural norms and values, class, race, gender, and sports opportunity.

Ecological models, which seek to capture the wide array of correlates of exercise behaviour, were introduced in Section 2.4. These models are the most comprehensive in the breadth of their analysis, but the implementation of research using ecological models presents difficulties. Testing hypotheses derived from ecological models

involves particular study design challenges. A central problem is that there may be too little variation in social, environmental, and policy variables across units of study (Giles-Corti and Donovan, 2002). Lack of variation in the variables being measured leads to underestimation of effect sizes and the inability to test some hypotheses. Thus, studies that include assessments of environmental and policy variables must be designed to ensure variation in those factors. Another weakness of many general ecological models of health behaviour is their lack of specificity about the most important hypothesised influences. A related shortcoming is the lack of information about how the broader levels of influence operate or how variables interact across levels. Thus, the models broaden perspectives without identifying specific variables or providing guidance about how to use ecological models to improve research or interventions. By contrast, individual-level psychosocial theories of health behaviour are more likely to specify the variables and mechanisms by which those variables are expected to influence behaviour (Biddle and Mutrie, 2008). A major challenge for those working with ecological models is to develop more sophisticated operational models that lead to testable hypotheses and useful guidance for interventions. Mullin, Hardy, and Sutton. (2007) argue that these models are processes rather than a descriptive formula. They contend that models are useful in establishing the factors to understand and develop consumer interest, involvement, and commitment. However, the models are too complex and detailed to integrate into analyses as a whole. Researchers have to set limits and boundaries in deciding which determinants to include when examining the effect of different variables upon exercise participation behaviour.

Given the potential difficulties in implementing research with ecological models, an examination of other theoretical frameworks that can encapsulate the multiple determinants of exercise is necessary. Researchers have been endeavouring to develop and integrate theoretical models to facilitate a better understanding of individual's exercise behaviour since the 1980s (Godin, 1993). Among the most prominent of these theoretical developments and applications are the Health Belief Model developed in the 1950s by Hochbaum, Rosenstock, and Kegels and frequently applied in the exercise domain (Janz and Becker, 1984), self-efficacy theory (Bandura, 1977), protection motivation theory (Rogers, 1983), and the Theory of Planned Behaviour (Ajzen, 1985). The Theory of Planned Behaviour (TPB: Ajzen, 1985) and the Theory of Reasoned Action (TRA: Fishbein and Ajzen, 1975) from which the TPB evolved, have been

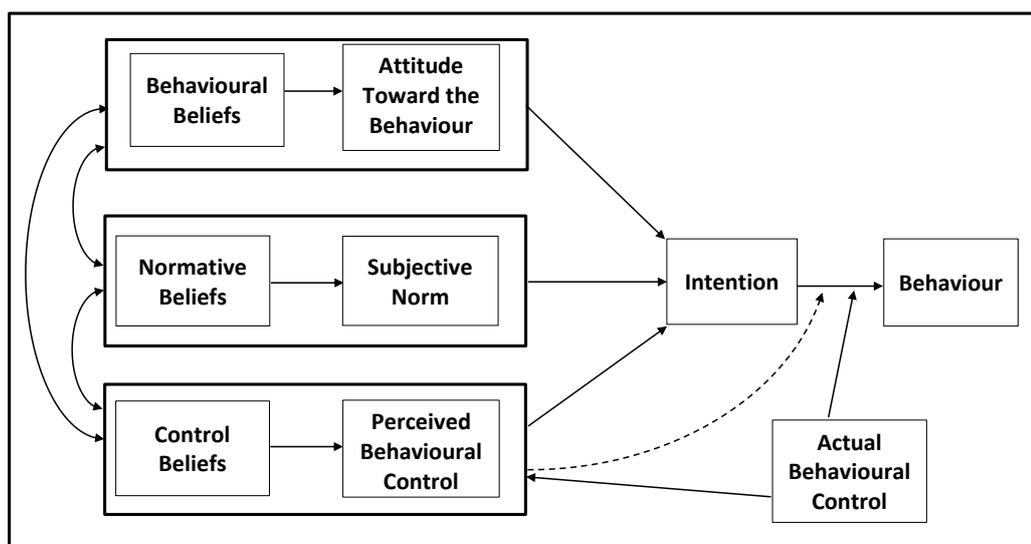
widely applied in many domains and can potentially integrate many of the antecedents of exercise behaviour that have emerged in the literature.

### **3.4 Theory of Planned Behaviour Overview**

The theory of planned behaviour (TPB) is a valuable mechanism for understanding the social cognitive factors that explain behavioural intention and behaviour. The TPB is regarded as one of the most accurate models for behavioural prediction (Armitage and Christian, 2003; Ravis and Sheeran, 2003) and is considered the most validated social cognitive framework for explaining exercise behaviour (Rhodes, Courneya, and Jones, 2002). The theory posits that behavioural intention is the immediate determinant of that behaviour (Armitage and Conner, 1999). Intention, in turn, is determined independently by three social cognitive variables: attitudes toward the behaviour, subjective norm and perceived behavioural control. Blanchard *et al.* (2008) outline that one's intention to behave in a certain way is the most accurate forecaster of his/her willingness to engage in that behaviour.

Attitude toward the behaviour refers to the individual's overall positive or negative personal evaluations of performing the target behaviour. Subjective norm refers to the perceived social pressure from significant others to engage in the target behaviour, while perceived behavioural control (PBC) refers to the individual's perception regarding the ease or difficulty of performing the target behaviour. PBC also captures the internal and external factors that facilitate or inhibit the performance of a given behaviour. While attitude and subjective norm are theorised to exert their effects upon behaviour through intentions, PBC is hypothesised to have both direct and indirect (through intention) influence on behaviour (Ajzen, 1991). Several meta-analyses support this relationship between PBC and health behaviour (e.g., Sheeran and Taylor, 1999; Armitage and Conner, 2001). The TPB can also be tested by examining the salient beliefs that relate to attitude, subjective norm, and PBC. These salient beliefs will be addressed in more detail later in this section. The TPB model is illustrated in Figure 3.1.

**Figure 3.1: Theory of Planned Behaviour Model**



Source: Adapted from Ajzen (2002)

Research into the relationship between the TPB predictors and exercise behaviour can be organised into three streams. The first area of research examines the validity of a more complex factor structure of the TPB predictors, commonly known as the multi-dimensional TPB structure (Ajzen, 2002). Specifically, attitude is theorised to include two components, affective (e.g., the enjoyment or pleasure associated with exercising) and instrumental (e.g., the perceived benefits resulting from exercising). Subjective norm is hypothesised to comprise both the originally measured injunctive component (e.g., the perception of whether people in one's social network want them to exercise) and a descriptive component (e.g., whether one's social network engage in regular exercise). Similarly, PBC is found to consist of two components – perceived control (e.g., individuals' means and resources to exert control over exercising) and self-efficacy (e.g., individuals' capabilities and self-confidence in exercising) (Rhodes and Courneya, 2003).

A second research stream extends the TPB model by adding one or more predictors; such as, social support, past behaviour, and social identity. However, most of these additional predictors are derived in an intuitive manner with varying success (Armitage and Conner, 2001). The final domain of research examines the individuals' salient behavioural, normative, and control beliefs for exercise using elicitation studies. Beliefs are the characteristics, qualities, and attributes that an individual associates with an object and play a central role in the TPB. They are assumed to provide the cognitive and

affective foundations for attitudes, subjective norm, and PBC (Ajzen, 2002). Individuals may hold any number of beliefs that include both negative and positive evaluations of the results of the behaviour, but at any given moment individuals are able to only attend to a limited number of beliefs.

The beliefs that form an individual's attitudes are referred to as salient beliefs. The salient beliefs of any given population are termed modal salient beliefs and should be identified through an elicitation study of a representative sample of the population (Ajzen and Fishbein, 1980). The recommended process is to elicit beliefs directly from the sample through open-ended questions, rather than pre-selecting belief statements for the population (Ajzen and Fishbein, 1980; Ajzen, 1991). Beliefs are grouped and counted through a content analysis to determine the most salient beliefs and included in a model set used to survey the population (Ajzen and Fishbein, 1980). Elicitation studies are important because they provide a foundation for researchers to examine the thoughts and feelings of a population about a particular behaviour. Ajzen and Driver (1991) contend that an examination of the salient beliefs provides a deeper insight into the behaviour in question. The TPB outlines that the engagement or non-engagement in a specific behaviour is a function of these specific salient beliefs and they are considered a key driver of an individual's actions (Ajzen and Driver, 1991). The TPB model highlights three forms of salient beliefs, each of which links the behaviour to a certain outcome (the benefits or costs of engaging in the behaviour).

**Behavioural Beliefs:** These are the beliefs that people have about the behaviour and the expectations that they have about whether the behaviour will deliver the desired outcome (Ajzen and Driver, 1991). This expectancy-value model of attitude formation is derived from multiplying the strength of the belief with the evaluation of whether the behaviour will produce the outcome in question. Ajzen (1985) distinguished between two types of behavioural beliefs: affective beliefs about positive or negative feelings relating to the behaviour; and instrumental beliefs about the benefits or costs of engaging in the behaviour. An example of why this differentiation in behavioural beliefs is necessary can be taken from the exercise domain: an individual may perceive exercising as being good for building their physical fitness, but the effort in doing this may induce unpleasant feelings and emotions.

**Normative Beliefs:** Normative beliefs are the beliefs that people have regarding the expectations of social influences, such as friends and family members (injunctive norms), and what motivates them to conform to expected behaviours set by peers (descriptive norms). An individual's subjective norm is calculated by multiplying the strength of each normative belief by the person's motivation to comply with the social influencer in question. Injunctive norms relate to people's perceptions that they feel pressure from significant others to participate in the specified behaviour (Rivis and Sheeran 2003). According to Smith and Lewis (2008), injunctive norms are a reflection of the perceptions that the majority of one's influential peers regard as being acceptable or unacceptable. Descriptive norms relate to the degree to which one's influential peers participate in the target behaviour (Rivis and Sheeran, 2003). Family members and friends can act as role models to individuals. Such influential peers can promote healthy lifestyles and beneficial behaviour through their actions.

**Control Beliefs:** These are beliefs that people have regarding the external dynamics that can act as facilitators or barriers to the specific behaviour, thus positively or negatively affecting their ability to behave in a certain way, and the apparent power of these dynamics (Ajzen and Driver, 1991). Perceived behavioural control is calculated by multiplying the strength of the control belief with the perceived power of the control belief to facilitate or inhibit the performance of the behaviour. Li and Chan (2008) highlight the fact that an individual may intend to perform a particular task but that the actual execution of the task may be hindered by an unforeseen obstacle. People may intend to carry out a particular behaviour but may run into barriers such as not having the opportunity to do so, not having the necessary resources or equipment that are essential to perform the behaviour, or not having the perceived skills or confidence in their own ability to execute the behaviour. Those who perceive the task as being difficult may be less likely to undertake the task (Rhodes and Courneya, 2004).

Ajzen and Driver (1991) argue that the overall intention to perform a behaviour will be greatly leveraged by the three types of beliefs listed above. The individual will be more likely to intend to perform the behaviour if he/she believes that the behaviour will be beneficial or enjoyable, that he/she will be looked upon more favourably by friends/family for performing the behaviour, and if there are no barriers to performing the behaviour.

### **3.4.1 Theory of Planned Behaviour and Exercise**

The TPB has been applied to the prediction of a wide range of social and health behaviours. Meta-analyses affirm the ability of the TPB to predict health behaviours in general (Conner and Sparks, 2005) and specific health behaviours such as condom use (Sheeran and Taylor, 1999; Albarracín *et al.*, 2001), screening attendance (Cooke and French, 2008), and exercise (Hagger, Chatzisarantis, and Biddle, 2002).

Assessing belief based determinants of the TPB allows identification of the underlying beliefs that distinguish between individuals who perform (or intend to perform) and individuals who do not perform (or do not intend to perform) the behaviour under investigation (Fishbein and Stasson, 1990). A number of studies have utilised belief-based analysis to increase understanding of health behaviours. Conn, Tripp-Reimer, and Mass's (2003) TPB based study found that in a sample of older women, a number of specific control beliefs (e.g., 'Exercise is difficult because I am too tired') and a behavioural belief ('Exercise is good for my health') were related to exercise, with regression analyses of the summated combined belief sets supporting the results.

Ajzen and Driver (1991) found that individuals often participated in physical activities because they believed that by participating in such activities, they would achieve favourable outcomes (behavioural belief). They also concluded that those who took part in physical activity did so because they believed that their friends/family showed support for their participation (normative belief), and that they possessed the necessary resources to engage in the activity (control belief).

Behavioural beliefs have been noted as being important determinants in measuring intentions to participate in physical activity. Marttila and Nupponen (2000) found that people who engage in regular forms of outdoor aerobic exercise and everyday commuting activity have much more positive attitudinal beliefs toward such activities. In terms of outdoor aerobic exercise, individuals who seldom engaged referred to such behaviour as being 'sensible', while those who engaged in outdoor aerobic exercise more frequently used words such as 'pleasant, nice, and fun' to describe the activity. Marttila and Nupponen (2000) also noted that those who regularly engaged in physical activity associated the activities with positive outcomes. Behavioural beliefs also

influence peoples' intentions to participate in physical activity because they are aware of the negative consequences of non-participation. This is particularly true in a team-based sports context, whereby individuals will be motivated to train in order to be selected to participate in competition. Indeed in professional sports, failure to participate in training may result in a player not being paid (Palmer *et al.*, 2005).

In many cases, subjective norms have proven to be a major influencing factor for adolescents and university students to participate in physical activity. Influential peer groups have been found to enhance the ability to forecast the intention of university students, who significantly relate to the norms of the group, to participate in physical activity on a regular basis (Terry and Hogg 1996, cited by Hamilton and White 2008). In terms of youth engagement in physical activity, studies have shown that other factors can influence the prediction of young peoples' intentions to engage in physical activity. These factors include association with groups of other physically active individuals; and support and assistance from peer groups such as friends and family; in carrying out the activity itself (Smith, 2003; Voorhees *et al.*, 2005). Research conducted in Australia reported that college students who received little support from significant others were 23 to 55% less likely to engage in physical activity for the benefit of their personal health, than those who claimed that they received a high level of support (Leslie *et al.*, 1999).

Perceived behavioural control can also be an influential factor in predicting individuals' intentions to engage in physical activity. Trost *et al.* (2002) found that people's intentions to participate in exercise were hindered by their perceived barriers to physical activity. Examples of perceived barriers listed include, lack of access to exercise amenities, lack of access to necessary apparatus, and dissatisfaction with recreational amenities in the surrounding area. It is also claimed that a sudden change in an individual's intention to engage in exercise could be the result of goal conflict, whereby the goal of exercise clashes with another goal (e.g., a career or academic goal). If the intention to achieve the second goal surpasses the intention to engage in physical activity, then the actual behaviour (i.e. performing the physical activity) may be put on hold in favour of achieving the other primary objective (Karoly *et al.*, 2005). Other barriers to participation include illness, tiredness/lack of energy and time constraints (Brownson *et al.*, 2001). Zahariadis and Biddle (2000) claim that many children and

adolescents participate in structured physical activity in the form of physical education modules in school. From this one can deduce that one reason for lack of exercise participation among adults is a lack of structure.

### **3.4.2 Critiquing the Theory of Planned Behaviour**

The value of the TPB for use in the study of physical activity has been illustrated in the previous section. It is especially relevant in this domain, as exercise is a behaviour that has many barriers and is only partly under volitional control, a situation that enhances the worth of integrating a measure of PBC. However, in the prediction of exercise intention the TPB model illustrates mixed results. Godin (1993) claimed that about 30% of the variance in intention is explained by the attitude and social norm components and that anything between 4% and 20% per cent extra variance is accounted for by perceived behavioural control. A comprehensive analysis of the TPB was conducted by Hagger, Chatzisarantis, and Biddle (2002). They meta-analysed seventy-two exercise studies that allowed calculations of the relationships proposed in either the TRA or TPB. Results supported the TPB. Intention was the only direct predictor of behaviour, intention was predicted more strongly by attitudes than subjective norms (the latter showing a small contribution), and PBC was associated with behaviour through intention. Self-efficacy (a more internal aspect of PBC) added to the prediction of both intentions and behaviour, while past behaviour was associated with all TPB variables. Hagger, Chatzisarantis and Biddle's (2002) analysis also showed that intentions are more strongly associated with behaviour in older participants, possibly because of their greater experience. Young people may also have additional controls, such as parental influence, precluding full translating of intentions.

The TPB predicts behaviour from measures of behavioural intention taken at one point in time. However, similar attitudinal models of behaviour (Bentler and Speckart, 1981; Triandis, 1977) take into account prior behaviour and this is considered a shortcoming of the standard TPB model. Hagger, Chatzisarantis, and Biddle (2002) found that adding past behaviour to the model reduced the strength of other paths, suggesting that studies that do not assess past behaviour may be obtaining artificially high correlations. In the exercise context, 'habitual' physical activity might entail less conscious modes of processing e.g., routine of walking or cycling to work, so the distinction between activity adoption and maintenance is important (Biddle and Mutrie, 2008). The role of

past behaviour is a difficult one to judge at times. It can appear rather obvious, and even unhelpful if the goal is to identify behavioural determinants, to state that past behaviour is the best predictor of current or intended behaviour. However, it does suggest that prior activity habits are important (Buckworth and Dishman 2002).

Another potential issue with the TPB is the lack of consistency in defining and assessing perceived behavioural control. Ajzen (1991) highlights that perceived behavioural control can integrate both perceived resources/opportunities, as well as perceived power or efficacy to overcome obstacles. The construct is reasoned to represent both control beliefs and perceived power. However, a number of studies have found that the self-efficacy and behavioural control aspects of the PBC construct can make independent contributions to the prediction of intentions or behaviour. An example of this potential division in the construct emerges in a study by Terry and O’Leary (1995), who found that self-efficacy predicted intentions to be physically active, but not activity itself, whereas PBC predicted physical activity but not intention.

### **3.5 Chapter Conclusion**

The purpose of the chapter was to identify and evaluate instruments for capturing the multiple correlates of exercise behaviour. The author contends that this enhances the process of survey design for this research. The EMI-2 is revealed as a validated and differentiated scale for assessing the broad range of exercise motivation variables. It has been critiqued as being deficient in theoretical grounding. However, it is reasoned that the alignment of many of the EMI-2’s motivational constructs to underlying self-determination theory concepts, allied to the rich and actionable descriptive power of the EMI-2 variables/constructs, render it a suitable mechanism for a segmentation study of this nature.

The challenge of finding a mechanism for establishing the other key exercise correlates of the target population is then tackled. Ecological models exhibited promise with their extremely broad ranging categorisation of exercise correlates. However, the ecological models present difficulties in implementation, predominately associated with the sheer volume of variables that they embrace. This led the author to seek out a model that could integrate the correlate categories of the ecological models, but in a manner that reduced the number of variables to those that are most relevant to the target population.

The TPB, and specifically the underlying belief components of the TPB model, illustrate considerable potential in this regard. Behavioural, normative, and control beliefs have the scope to capture many of the correlates highlighted in the ecological models. They also should be identified in an elicitation study designed to extract the most salient beliefs of the target population. It is reasoned that this would enable a more manageable and effective research design, utilising only those correlates that are salient to the target populations exercise behaviour. The next chapter section examines the evolution of segmentation theory, the growing appreciation of the value of motivational segmentation, and its application in the exercise domain.

# **Chapter 4. Market Segmentation Strategies and Process**

"Concentrate on small segments of your race at a time. For example, rather than obsessing about the distance that remains, simply complete the next mile in good form, try another, then another, until the race is done"

Jerry Lynch, Marathon Runner.

## **4.1 Chapter Overview**

The introduction chapter outlined the core research objective and propositions of this study. Market segmentation and profiling of the segments derived from the chosen exercise population are critical elements in the achievement of the research objective and propositions. Chapter 1 also highlighted the role that segmentation can play in bridging the divide between the understanding of exercise correlates and the implementation of effective exercise intervention programmes to increase engagement in regular exercise.

This chapter commences with an assessment of the evolution and value of market segmentation. Previous segmentation studies conducted in the sports and exercise domain are then examined and the growth in importance of benefit and motivational segmentation is evaluated. Market segmentation as a concept will be critiqued, before the criteria for effective segmentation and potential approaches to segmentation are discussed. The issue of remaining within-segment heterogeneity is assessed, prior to examining approaches to profiling market segments.

## **4.2 The Evolution of Market Segmentation Theory**

Market segmentation is a tool for dividing a heterogeneous market into homogeneous subgroups. An early definition by Smith (1956, p.6) suggests that “*market segmentation consists of viewing a heterogeneous market as a number of smaller homogenous markets in response to differing preferences among important market segments*”. Wind and Bell (2007) argue that all markets are heterogeneous, reflecting the fact that no offering will attract all customers, and varying reasons or motivations may exist even for those individuals who consume the same offering. This ubiquitous heterogeneity in markets confirms the critical role of market segmentation in the strategic marketing process.

Segmentation has been an integral part of marketing theory since the 1950s and there is widespread agreement that practically all markets can be profitably segmented. Market segmentation can enhance marketing effectiveness and facilitate an organisation’s ability to benefit from marketing opportunities (Weinstein, 1987). The segmentation process can also enable a clearer understanding of consumers, which can aid more targeted and appropriate marketing programmes (Dibb, Stern, and Wensley, 2002).

The core concept for all market segmentation is that a market is seldom entirely homogenous and that segments within any market do exist. It should be noted that market segmentation is not always a suitable or meaningful method for dividing markets. Smith (1989) argues that segmentation is only appropriate when one or more groups of people with similar characteristics exist and they are relatively distinct from each other. When segmentation is suitable, a key question for marketers is to determine which of the numerous segmentation variables are the most appropriate for use in their market place. This critical decision is evaluated in more detail in Section 4.3.

In the developing years of the market segmentation concept, a key area of focus was on the selection of appropriate bases to be used in identifying market segments (Martineau, 1958). Twedt (1964) argued that markets could be segmented on the basis of volume of consumption and that marketing efforts should be focused on high volume customers, the so-called 'heavy half' of customers that represented in the region of 80% of total consumption. Segmentation theory continued to evolve throughout the 1960s. Frank, Massey, and Boyd (1967) argued that when adopting the approach, it is assumed that the heavy purchasers of a product have certain socio-economic characteristics that can differentiate them from the population. The concept of benefit segmentation was introduced by Haley (1968). Benefit segmentation is based on the premise that not all consumers desire the same benefits from a product. This will be explored in more detail later in this review (see Section 4.5). Segmentation theory gradually progressed towards the integration of lifestyle related factors as the base for dividing markets. The Values, Attitudes, and Lifestyles (VALS) system and its successor VALS 2 (Mitchell, 1983) were innovative methods of encapsulating consumers' values and lifestyles into segmentation studies. However, many implementation issues were observed in the use of these and other complex segmentation models (Piercy and Morgan, 1993; Dibb and Simkin, 1997).

Changes in lifestyle, income levels, and demographic compositions are further increasing the diversity of customer needs and buying behaviour (Sheth, Sisodia, and Sharma, 2000). Consequently, this means that market segmentation approaches are arguably becoming less effective and less efficient than they are often perceived to be (Firat and Shultz, 1997; Sheth *et al.*, 1999). This realisation has framed a recognition of

these fragmented consumer needs in much of the market segmentation output of recent years. There has been an increasing movement towards segmenting markets based on benefits sought and motivation for engaging in differing types of behaviour, as this approach correlates more closely with consumers' needs.

Yankelovich and Meer (2006) criticise the bulk of the psychographic segmentation approaches that are frequently employed in segmentation studies. They contend that while psychographics can extract some information about peoples' attitudes, lifestyles, or self-image, its predictive capability regarding individuals' purchase intentions is questionable. Quinn, Hines, and Bennison (2007) argue that there is much work to be done in improving the performance of segmentation strategies and bridging the gap between theory and the managerial implementations of a marketing segmentation approach. They purport that there is a need for a change in research focus emphasising the development of, rather than the validation of, existing market segmentation theory.

#### **4.3 Selecting Variables for use in the Segmentation Process**

The selection of appropriate variables to use as the basis for segmentation is a critical and often neglected element of the segmentation process (Mooi and Sarstedt, 2011). Wind and Bell (2007) outlined that effective segmentation variables should explain differentiation in the adoption of a company's products. Segmentation bases are sets of variables or characteristics used to assign potential customers into homogeneous groups (Wedel and Kamakura, 2000). Conceptual borderlines between different categories of segmentation variables are not always clear and the bases upon which markets can be segmented are numerous. Kotler *et al.* (2012) outline four major categories of variables that can be used as the basis for segmenting consumer markets. These are based on descriptive characteristics such as geographic, demographic, psychographic bases, and approaches centred on behavioural considerations. Geographic segmentation involves dividing the market into different geographical units, such as nations, states, regions, counties, cities, or neighbourhoods. Demographic segmentation entails the division of the market into groups based on variables such as age, gender, sexual orientation, family size, family life cycle, income, occupation, education, religion, ethnic community, and nationality. Psychographic segmentation breaks consumers into groups based on social class, lifestyle, or personality characteristics. Finally, behavioural

segmentation breaks buyers into groups based on their knowledge, attitudes, motivations, benefits sought, uses of, or responses to a product.

Wedel and Kamakura (2000) proposed a typology for the classification of segmentation bases (see Table 4.1), based on:

1. General characteristics (independent of products, services, or circumstances) versus product-specific characteristics (related to the customer and the product, service, and/or particular circumstances).
2. Observable characteristics (i.e., measured directly) versus unobservable characteristics (i.e., inferred).

The ‘general-observable’ quadrant includes cultural, geographic, demographic, and socio-economic variables. The ‘observable-product-specific’ group includes user status, usage frequency, store loyalty and patronage, and situation. The ‘unobservable-general’ base consists of psychographics, values, personality, and lifestyle. Finally, the fourth quadrant, the ‘unobservable-product-specific’ is about benefits, perceptions, elasticities, attributes, preferences, and intentions.

**Table 4.1: Typology for the Classification of Segmentation Bases**

	<b>General</b>	<b>Product-Specific</b>
<b>Observable</b>	Cultural, geographic, demographic, socio-economic variables.	User status, usage frequency, store loyalty and patronage, situations.
<b>Unobservable</b>	Psychographics, values, personality, life-style.	Psychographics, benefits, perceptions, elasticities, attributes, preferences, intention.

Source: Wedel and Kamakura (2000).

Examining market segmentation from a sports marketing perspective, Mullin, Hardy, and Sutton. (2007) identify four categories of potential segmentation base: 1) the consumer’s base of being (demographics); 2) the consumer’s state of mind (psychographics); 3) product usage; and, 4) benefits sought or derived from the product.

Geographic and demographic forms of segmentation are the easiest to comprehend and implement, and as such are relatively popular amongst practitioners. However, as outlined earlier, there has been suggestions that market segmentation has become

increasingly difficult to operationalise, rendering traditional segmentation strategies less and less useful (Mitchell, 1984). Haley (1995) contends that these traditional forms of segmentation are flawed, as they are based on an *ex-post facto* analysis of market segments and as such rely on descriptive factors rather than causal factors to categorise market segments. This mitigates against them being efficient predictors of future buying behaviour. Haley (1995) goes on to outline that this has led to an increasing movement towards segmenting markets based on benefits sought and motivation for engaging in differing types of behaviour, as this approach correlates more closely with consumers' needs. The relative importance that they attach to individual motives and benefits sought can differ, and accordingly be used as an effective lever in segmenting markets. This viewpoint complements the opinions of Blattberg *et al.* (1978) and Saunders (1980) who emphasise the need for managerially useful segmentation, which puts customers with similar buying needs and characteristics into groups. Indeed, Haley (1995) argued that if marketers segmented their markets based on benefits, rather than customer characteristics, they are more likely to uncover the customer's reasoning regarding purchase and consumption.

With any approach to market segmentation a vast inventory of possible segmentation variables is available and although the reasons for choosing any one or any combination may sometimes be clear and obvious this is not always the case. Dibb and Simkin (1996, p.13) propose that "*It is important to be aware that choosing segmentation bases is a fairly subjective process, so it is rarely possible to assert categorically that there is one best way to segment a particular market*". The trend in segmentation studies has seen the focus shift from the use of more general variables, toward product-specific unobservable variables. The latter generally provide better guidance for decisions on effective specification and implementation of marketing instruments. Wedel and Kamakura (2000) outline that segments derived from the use of product-specific unobservable variables are usually more homogenous and stimulate consistent consumer responses to marketing interventions. The principal issue with using these variables lies in the difficulty in identifying consumers, in comparison with easily discernible variables such as demographics. Conversely, segments determined by means of generally observable variables usually stand out due to their identifiability, but often lack a unique response structure. Consequently, many segmentation studies now combine the use of specific unobservable variables, with other items such as the more

readily identifiable general observable variables (Mooi and Sarstedt, 2011). The variables are often combined in the clustering procedure to identify segments, although they are also frequently used to enhance the profiling of segments that are derived using specific unobservable variables.

Choosing an appropriate segmentation basis is fundamental in enhancing the worth of a cluster analysis process to identify segments. The importance of this decision is not always reflected in practice, where a mixture of intuition and data availability guide most analyses in marketing practice. However, faulty assumptions may lead to improper market segments, and consequently, to deficient marketing strategies (Mooi and Sarstedt, 2011).

Given the wide array of segmentation basis options available, selection criteria are required (Tonks, 2009). However, there is limited guidance for the process of selecting segmentation bases. While many academics agree that situation-specific variables are better at predicting buyers' preferences and behaviour than general ones (Vriens *et al.*, 1996; Wedel and Kamakura, 2000; Allenby *et al.*, 2002), two different positions on this issue emerge. Some authors (e.g., Frank and Massy, 1965; Elrod, Russell, and Winer, 1982) argue that response elasticities are the ideal bases for segmentation as they allow the identification of different demand schedules. Other authors argue for needs or benefits-based segmentation (e.g., Haley, 1968; ter Hofstede, Steenkamp and Wedel, 1999), because the benefits buyers seek in consuming an offering are considered to be the reason for the existence of true market segments and also are thought to have a causal relationship with future purchase behaviour.

Reviewing this strand of literature, Steenkamp and ter Hofstede (2002) concluded that most segmentation studies were of exploratory nature and the segmentation bases were selected on *ad hoc* criteria. They were also critical of the gains that the segmentation results provided, as these types of studies did not provide explicit guidelines for the development of optimal marketing programmes. Hair *et al.* (2010) emphasise that whichever variables are chosen, it is important to select those that provide a clear-cut differentiation between the segments regarding a specific managerial objective.

It is recommended to avoid using too many segmentation variables, as this increases the likelihood of collinearity between variables and also has serious implications for the sample size requirements of a research study (Dolnicar and Grun, 2008). If there is a high degree of collinearity between the variables, insufficient distinctiveness exists to facilitate the identification of unique market segments. The potential difficulty of collinearity is frequently overcome by reducing the number of variables in a factor analysis prior to clustering, although this practice has been critiqued by a number of parties – see the discussion in Section 5.8.1.2. Milligan (1996) warns of the folly of including too many variables, arguing that a variable should only be included if there is strong justification that the variable helps to define the underlying clustering. Sample size issues are also a key consideration, as each additional variable being used requires an over-proportional increase in respondents to ensure validity (Mooi and Sarstedt, 2011).

Other considerations when selecting variables to integrate into a segmentation study include data quality and researcher intuition. Dolnicar and Lazarevski (2009) argue that only variables that ensure high quality data and are based on firm theoretical underpinnings should be included in the clustering procedure. Data are considered of high quality if the questions asked have a firm theoretical basis; if it is recently collected data reflecting current market status; if it were collected specifically for the purpose of segmentation; and variables are not uncritically included, but carefully developed in pre-studies (Dolnicar and Lazarevski 2009). This is very important if a segmentation solution is to be managerially useful. It must also be acknowledged that some degree of subjective interpretation normally takes place regarding what constitutes relevant and important variables for inclusion in the segmentation process (Mooi and Sarstedt, 2011).

Hair *et al.* (2010) argue that applications of cluster analysis must include carefully chosen variables with the core research objective at the crux of this selection. They contend that it is important to include only variables that reflect the people being clustered and relate specifically to the objectives of the clustering procedure.

To aid the process of selecting a basis of segmentation, the review next examines the bases used and nature of previous segmentation studies in the sports and exercise domain.

#### **4.4 Segmentation of Exercise Markets**

The majority of segmentation studies to date in the sphere of exercise and sports have been carried out to determine profiles and styles of sports spectators (e.g., Trail, Fink, and Anderson, 2003; Trail *et al.*, 2003; Armstrong and Paretto-Stratta, 2004; James and Ross, 2004). These studies predominately use psychological variables, such as attitudes, value-orientation, perceived benefit and/or motivation as the basis for segmentation. Taks and Scheerder (2006) identified five main types of consumer-based studies in a review of exercise and sports marketing segmentation literature: 1) spectator sport studies using psychological variables; 2) spectator sport studies using demographic variables; 3) spectator sport studies using both psychological and demographic variables; 4) participant studies using psychological variables; and, finally, 5) studies which analyse the interrelationship between spectator and participant markets using demographic and psychographic variables as a basis for segmentation (e.g., Milne, Sutton, and McDonald 1996). The participant reviews are of principal interest in this study.

An early participant study was conducted by Howard (1992). Respondent's behavioural frequency (light, medium, heavy user) was used as the basis for segmentation and a number of sports and fitness activities were examined. The findings indicated that while the light user segment had the greatest number of consumers across activities, the heavy user segment, although smallest in size, accounted for very high volumes of the total consumption in most of the measured activities. Fullerton and Dodge (1995) segmented golfers using their self-reported playing ability as the primary base for market classification. However, they found that the outcome did not reveal meaningful segments using the playing ability variable as the sole base for segmentation. They integrated additional psychographic variables into the segmentation process and clearer characteristics for each segment emerged. This led Fullerton and Dodge (1995) to conclude that segmenting sport consumers by psychographic elements, such as motivation, is the most appropriate segmentation methodology.

This assertion is reinforced by contemporary studies (e.g., McDonald, Milne, and Hong, 2002) involving sports consumers, as well as assessments of sport consumer research (Funk, Mahoney, and Havitz, 2003). These studies suggest that effective segmentation

practices can result from developing a deep understanding, beyond mere demographic profiles, of the consumer and the psychological reasons driving motivations and participation. Indeed, Funk, Mahoney, and Havitz, (2003) suggest that future consumer behaviour studies should attribute considerable importance to the examination of environmental and developmental issues in exercise.

Consumers possess multiple and complex motivations for sport and exercise participation (Shank, 2002; Stewart, Smith, and Nicholson, 2003). The intricacy of understanding consumers' underlying motivations for exercise participation points to both the opportunity and challenge for marketers in developing effective and meaningful market segmentation practices that are based on these motives. An important question facing both exercise researchers and marketers, however, is not only how to generate a deeper understanding of their consumers, but also how to analyse and use this information (such as motivation and participation data) that involves multiple dimensions. In analysis, multi-dimensional data such as this can result in too fine a segmentation approach. Consumer profiles could be revealed that may not be sufficiently distinct from each other to warrant the execution of unique marketing communications approaches targeting the derived consumer groups (Rohm, Milne, and McDonald, 2006). Given this, there is a growing realisation that the benefits of finer consumer typologies should be weighed against the efficacy and cost of executing those typologies in marketing strategy (Stewart, Smith, and Nicholson, 2003). Ideally, analysis of participant motivation data would involve both qualitative data, to elicit in-depth information about participation motivation, as well as quantitative data in order to reduce the dimensionality of consumer types and to better understand the underlying structure of the data (Rohm, Milne, and McDonald, 2006).

Segmentation studies grounded in motivational theory have become more prevalent. McNeill and Wang (2005) conducted a study to determine the psychological profiles of elite school sports players. Self-determination motivation types and achievement goals and beliefs about aspects of sport were used as the basis for profiling. Cluster analysis revealed three distinct segments of participants: a highly motivated cluster; a high task-mastery cluster; and an amotivated cluster. A similar study was carried out by Gillet, Vallerand, and Rosnet (2009). This research examined the motivational profiles of elite adolescent athletes and the effect that this had on their athletic performance in the

subsequent season. The Sports Motivation Scale (Briere *et al.*, 1995) was used as the basis for segmentation. The study examined participants in two sports, elite tennis players and elite fencing. Four motivational clusters emerged for the tennis players: high autonomous-high controlled; moderate autonomous-low controlled; high autonomous-low controlled; and moderate autonomous-high controlled segments. The elite fencer cohort revealed three clusters using these motivational profiling criteria: moderate autonomous-low controlled, moderate autonomous-moderate controlled, and high autonomous-high controlled segments.

Wang and Biddle (2001) highlighted the important research that has been carried out in analysing the motivations and determinants of young peoples' physical activity behaviours. However, they outlined that little work has been done in identifying groups or clusters of individuals who illustrate different combinations of scores, based on validated indicators of motivation. They argued that engaging in a process of this nature may help identify homogenous groups for which more targeted exercise intervention strategies could be designed. Wang and Biddle (2001) contended that while there are many useful motivational constructs relating to the exercise domain, most studies have assessed these in isolation. They postulated that a combined analysis of these variables facilitates the construction of distinct motivational profiles for identified clusters of respondents. Achievement goal orientations, sport ability beliefs, self-determination/relative autonomy indices, amotivation, and perceptions of competence and physical self-worth were all analysed for a large sample of adolescents. A five cluster solution emerged from the analysis, containing two highly motivated, two less motivated clusters, and one amotivated cluster.

A similar segmentation study was conducted by Chian and Wang (2008) using combined achievement goal orientations, self-determination, sport ability beliefs, perceived competence, and other motivational indices as the basis for market division. Four clusters emerged in this instance a maladaptive motivated group, a low competence cohort, a highly motivated cluster, and an amotivated segment.

Table 4.2 illustrates a summary of the key segmentation studies in the exercise and sports participation domain.

**Table 4.2: Summary of Key Exercise Segmentation Studies**

Author(s)	Population Characteristic	Sample Size	Segmentation Base(s)	Additional Profiling Employed	Segmentation Outcome
Howard (1992)	Adult sport and exercise participants across multiple activities	Extracted from a national survey	<b>Single:</b> Consumption frequency	Gender	<b>3 segments:</b> Heavy Participants; Medium Participants; Light Participants.
Havitz <i>et al.</i> (1994)	Adult exercise and fitness participants	346	<b>Single:</b> Involvement profile	Frequency of behaviour; Money invested in activity; Equipment ownership	<b>6 segments:</b> Undramatised Risk Involvement; Conformist Purchase; Pleasure Involvement; Riskless Involvement; Low Involvement; Knowledgeable Involvement.
Fullerton and Dodge (1995)	Golf participants	663	<b>Multiple:</b> Consumption frequency; playing ability; motivation; demographics.	None	<b>5 segments:</b> Competitors; Players; Sociables; Aspires; Casuals.
Wang and Biddle (2001)	12-15 year olds	2510	<b>Multiple:</b> Achievement goal; self-determination; sport ability beliefs; perceived competence	Gender	<b>5 segments:</b> Self-Determined; Highly Motivated; Poorly Motivated; Moderately Motivated Externals; Amotivated
Chian and Wang (2008)	16-19 year old athletes	303	<b>Multiple:</b> Achievement goal; self-determination; sport ability beliefs; perceived competence	None	<b>3 segments:</b> Maladaptive Motivated; Low Competence; Highly Motivated
Gillet, Vallerand, and Rosnet (2009)	Elite junior tennis players	170	<b>Single:</b> Sport Motivation Scale	Sports performance	<b>4 segments:</b> High Autonomous–High Controlled; Moderate Autonomous–Low Controlled; High Autonomous–Moderate Controlled; Moderate Autonomous–High Controlled groups.
Gillet, Vallerand, and Rosnet (2009)	Elite junior fencers	250	<b>Single:</b> Sport Motivation Scale	Sports performance	<b>3 segments:</b> Moderate Autonomous–Low Controlled; Moderate Autonomous–Moderate Controlled; High Autonomous–High Controlled groups.
Caglar and Hulya Ascı (2010)	Adolescent Athletes	216	<b>Single:</b> Sport Motivation Scale	Physical Self Perceptions	<b>4 segments:</b> Amotivated; Low Motivated; Moderate Motivated; Highly Motivated

The prominence of benefits sought and motivation as the basis for segmentation in the exercise and sports literature is apparent, although the majority of these studies have been based on the theoretic concepts underpinning motivation. Little evidence emerges of integrating descriptive motives as segmentation bases. Additionally, other potential correlates of exercise behaviour are used in a very selective manner to support the motivational segmentation. None of the previous studies in the exercise domain has attempted to integrate the multiple salient correlates of exercise behaviour into their segmentation processes. The next section seeks to examine the development and use of benefit and motivational segmentation.

#### **4.5 Benefit and Motivational Segmentation**

The belief underlying benefit segmentation is that benefits sought by people when consuming a given product are the basic reasons for the existence of true market segments (Haley, 1968). Benefits as a means of satisfying personal goals and values are suggested to predict behaviour better than personality and lifestyle, volumetric, demographic, or geographic measures, which merely describe behaviour without

explaining it (Myers, 1996). Haley (1995) in an update on the practice of benefit segmentation affirms that the benefits sought by consumers are very pertinent to the identification of market segments by causal rather than descriptive factors. This does not mean that traditional segmentation data are redundant, as once benefit segments are identified each segment could be contrasted to the others in terms of its demography, volume of consumption, geographics, and so on.

For benefit segmentation to be feasible, each group seeking a different benefit should be dissimilar in some aspect, which can be readily observed and acted upon (Beane and Ennis, 1987). Each segment can be identified by the benefits it is seeking, but individual benefits are likely to be of importance to several segments. Research conducted would indicate that while consumers of a product/service desire as many benefits as possible from the exchange, they tend to attach differing degrees of importance to each of the benefits. Thus, it is the total configuration of benefits sought that differentiates one segment from another and facilitates the segmentation of a market (Haley, 1995). Once people have been classified into segments in accordance with the benefits they are seeking, each segment is contrasted with all of the other segments in terms of demographics, volume of consumption, brand perceptions, media habits, personality, and lifestyle (Beane and Ennis, 1987). Over the longer term, systematic benefit segmentation research is likely to produce a higher proportion of successes (Haley, 1995).

Young, Ott, and Feigin (1978) argue that segmentation based on benefits desired is usually the most meaningful type to use from a marketing standpoint as it directly facilitates product planning, positioning, and advertising communications. They do however highlight three common situations where benefit segmentation is of less value; where traditional price lines have developed so that all marketing activities are based on price levels; where the benefits are determined by the occasion or purpose for which the product is used; and on occasions where the style or appearance of the product is the overriding criterion of success.

Apostolakis (2003) posits that motive-based segmentation is advantageous because it is consumer-centred and thus embraces the consumers' needs, expectations, and experiences. However, the body of academic literature is relatively light on

segmentation studies that utilise a specifically termed ‘motivational segmentation’ approach. It is reasoned that this is because of the prominence of benefit segmentation studies and the inter-changeability of the terminology used in these pieces of research. Many authors equate the benefits sought from an exchange or experience to an individual’s motives for consumption of the particular behaviour. Section 4.4 highlighted the popularity of motivation as a segmentation base in sports and exercise studies. Motivational segmentation is also particularly prevalent in tourism studies, where consumers are clustered on the basis of their underlying motivations for visiting destinations or consuming tourism products/services (e.g., Tkaczynski and Rundle-Thiele, 2011).

The discourse to this point has been relatively positive toward market segmentation’s critical role as a strategic marketing tool. However, the application of segmentation strategies has not remained above criticism and the next section endeavours to engage in a balanced discussion of the worth of segmentation.

#### **4.6 Critique of Market Segmentation**

Despite the widespread application of market segmentation strategies and the frequent academic analysis of the topic, it has been argued that progressive developments in marketing segmentation theory have been few. It has been reasoned that as the process often fails to provide a manageable solution, fundamental flaws in the academic development of segmentation strategies exist (Quinn, Hines, and Bennison, 2007). Palmer and Millier (2004) conclude that segmentation is problematic because so many prescriptions for segmentation are context dependent. This brings into question some of the assumptions involved in the application of a segmentation strategy.

In general, the academic literature focuses on segmentation variables and techniques (Wind, 1978), while offering relatively little detailed guidance on how to handle the segmentation process and deal with the outputs. Traditionally some of the decisions inherent in the segmentation process have been quite arbitrary in nature. Hoek, Gendall, and Esslemont (1996) contend that this can lead to segmentation solutions that are neither robust nor stable. They believe that there are no governing principles for decisions concerning the base to be used for segmentation, the variables to be used to measure the base, the analytical method used to identify segments, and the number and

composition of the segments they choose to have. It is frequently left to the researcher's intuition, as to what approach to adopt and it is argued that for each of these decisions there is no reason why any alternative decision should necessarily produce better results than another (Quinn, Hines, and Bennison, 2007). This contributes to many businesses adopting relatively simplistic and intuitive segmentation approaches (Dibb, 2003). Indeed, Hoek, Gendall, and Esslemont (1996) contend that even in structured and planned approaches to segmentation, there is still a considerable arbitrary element to the process, which can lead to flaws if researchers choose to adopt strategies that do not reflect diverse and dynamic consumer needs.

This criticism of the potential lack of precision in segmentation studies is counterbalanced by the acknowledgment that segmentation models are only an approximation of reality. Wedel and Kamakura (2000) reason that segments are not homogenous clusters of consumers that naturally occur in the market, rather they are determined by the researcher/manager's perspective and interpretation of the market. A particular problem with any claim for the value of market segmentation is the general absence of controlled experiments to test for alternative policies, including the results of using alternative segmentation variables. Hoek, Gendall and Esslemont (1996) have argued that despite sophisticated approaches to market segmentation, one of the key difficulties in undertaking such studies is that the selection of variables involves significant subjective judgements. An example of this would be researchers using consumption benefits as a segmentation base must determine which benefits to measure and select appropriate means of assessing their relative importance to respondents. It needs to be recognised that this process may have a significant impact on the research outcome. However, the subjective decisions and assumptions inherent in segmentation studies do not preclude the studies from being potentially useful to gaining an improved understanding of the key factors influencing exercise participation. The key is for these assumptions to be made explicit and transparent so that users of the models understand the limitations of any findings.

Developing an appropriate segmentation model therefore requires the researcher to make a series of subjective judgements based on a sound knowledge of the behavioural domain's marketing environment (Young, Ott, and Feigin 1978). Despite the on-going proliferation of new variables with which markets may be segmented, there are few

guidelines as to which approach is the most appropriate in a given market context. It is generally recognised that there is no one best solution, as each approach has certain merits and limitations depending on the product(s) and market(s) being considered and the managerial objectives sought (Wind, 1978; Kara and Kaynak, 1997). Effective market segmentation is therefore context-specific and allows for creative approaches that should be determined through correct analysis of the research problem. A decision-making framework that can help define the parameters of a segmentation study will be discussed in detail in Chapter 5.

#### **4.7 Criteria for Effective Segmentation**

The literature suggests a number of different criteria for effective market segmentation. The criteria that consistently emerge include identifiability, substantiality, accessibility, stability, responsiveness, and actionability (e.g., Wedel and Kamakura, 2000; Mullin, Hardy, and Sutton, 2007). Wilkie (1994) identifies three requirements for adequate market segments. Firstly, he refers to high group identity which means that members of a segment must be similar to each other in the segment and different from members of other segments. Secondly, he suggests that members of a segment should behave in a similar manner and respond similarly to a specific marketing mix. Thirdly, he refers to the marketing mix efficiency potential, which means an organisation's ability to develop an efficient marketing mix for each segment.

A comprehensive set of criteria have been suggested by Kotler *et al.* (2012), who propose five key characteristics which segments must exhibit. Segments should be:

- Measurable: The key characteristics and size of the segments should be able to be captured.
- Substantial: The segments must be large enough to justify the customisation of marketing mix strategies.
- Accessible: Marketers should be able to reach and serve the targeted segments.
- Differentiable: Conceptual diversity exists between the segments and they will respond differently to different marketing mix elements.
- Actionable: The marketer can create effective strategies for targeting the identified segments.

#### 4.8 Segmentation Methods and Approaches

The literature discusses two principal approaches to segmentation: *a priori* segmentation and *a posterior* or *post hoc* segmentation (Smith, 1989; Moscardo, Pearce, and Morrison, 2001; Chen, 2003; Dolnicar, 2003). In *a priori* segmentation, categorical variables (e.g., nationality, age) are selected in advance as descriptors manifesting the similarities and differences in the variables of interest among the categorical groups. In other words, the segments are pre-determined and they are profiled further with some selected descriptors. While an *a priori* approach may guarantee within-segment similarity by ensuring, for example, that all segment members come from similar geographic regions and income ranges, this does not necessarily mean that all segment members will respond in the same way to marketing stimuli (Hoek, Gendall and Esslemont, 1996). Further, the selection of variables in *a priori* studies, to some degree, reflect underlying assumptions concerning the market and about which variables are most likely to respond to marketing stimuli.

Alternatively, in *post hoc* (data-driven or factor-cluster) segmentation, segments are delineated by the means of factor/cluster techniques on the basis of a selected set of attitudinal or behavioural variables. Respondents are divided into clusters whose average within-group similarity is high and whose between-group similarity is low (Wind, 1978). Once the segments are determined, they are profiled with the selected variables. Most importantly, beyond the initial choice of base variables, the segments are determined by the data, not the researcher, and the number of clusters and their relative size is not known until the process has been completed (Green and Krieger, 1995). This approach may result in segments that are not necessarily internally consistent. Even if researchers can identify groups with similar attitudes or usage habits, members often possess different demographic characteristics making marketing decisions, such as media buying, difficult to action (Hoek, Gendall, and Esslemont, 1996).

The nature of this study favours a *post hoc* segmentation approach. Baines, Fill, and Page (2010) recommend that researchers adopting a *post hoc* approach to segmentation pursue the following process:

1. Sample design: Quota or random sampling approaches are predominately employed.

2. Identification of suitable statistical methods of analysis.
3. Data collection.
4. Data analysis - formation of distinct segments using multivariate statistical methods (e.g., cluster analysis, chi-squared automatic interaction detection - CHAID).
5. Establishment of the profile of the segments using multivariate statistical methods (e.g., factor analysis, analysis of variance - ANOVA) and selection of segment descriptors (based on the key aspects of the profile for each segment).
6. Translation of the findings about the segments' estimated size and profile into specific marketing strategies, including the selection of target segments and the design or modification of specific marketing strategy.

The author broadly adheres to steps 1-5 in the primary research phase of this study. The multivariate statistical options available to the researcher for formulating market segments will be discussed in more detail in Section 5.8.

#### **4.9 Within-Segment Heterogeneity**

Cluster analysis is not a perfectly precise art and some degree of within-cluster heterogeneity is to be expected. Few studies assess the level of this, but of those that do an average level of remaining within-cluster heterogeneity of *circa* 39% is reported (Franke, Reisinger, and Hoppe, 2009). This is a problematic issue in market segmentation, as high remaining within-cluster heterogeneity can lead to strategic activities that are imprecise or unresponsive to consumer needs (Von Hippel, 2005). There is a trade-off between addressing within-segment heterogeneity and ensuring that the segments are sufficiently large to ensure that targeted marketing programmes are profitable. Micro-marketing to small segments of consumers can be an expensive undertaking. Consequently, a certain degree of within-cluster heterogeneity is generally accepted (Mooi and Sarstedt, 2011). Wind and Bell (2007) highlight the importance of recognising that segments almost always retain some degree of within-cluster heterogeneity. They recommend augmenting the basic segmentation with additional sub-segmentation. A number of approaches have been formulated to tackle within-segment heterogeneity, including the multi-mode Bayesian methods developed Allenby *et al.* (1998) and the empirical Bayes approach of Kamakura and Wedel (2004).

#### **4.10 Profiling Segments and Constructing a Typology**

Profiling segments involves interpreting the output of the segmentation process, specifically in this study interpreting the output of the cluster analysis. Interpreting clusters always involves examining the cluster centroids. This procedure is critical, as the analysis sheds light on whether or not the segments are conceptually distinguishable. It also facilitates the researcher in labelling the identified clusters to adequately reflect the objects in the cluster. When unobservable variables are used for the initial cluster profiling, a problem arises in how a new object should be assigned to a segment if its unobservable characteristics, such as motivation, are unknown. Researchers should try to identify observable variables that best mirror the partition of the objects. These variables can then also be used to characterise specific segments, an action commonly called profiling (Mooi and Sarstedt, 2011).

Tsiptsis and Chorianopolous (2009) outline that cluster profiling usually involves two stages. They suggest that the researcher should begin by determining the distinctiveness of each cluster with respect to the clustering inputs used. Comparing cluster centroids across clusters and between the cluster and the overall population should reveal significant deviations that aid the profiling of each cluster. The second phase of the profiling process evaluates the clusters on the basis of external criteria that were not involved in the original cluster formation. Tsiptsis and Chorianopolous (2009) argue that cluster separation is not limited to the clustering inputs, with separation also being reflected in what they term ‘key performance indicators’ and pertinent demographic data. They suggest that continuous variable means are compared across clusters, and between the cluster and the overall population, for this purpose. Additionally, comparison of categorical attributes is established via frequencies and percentages.

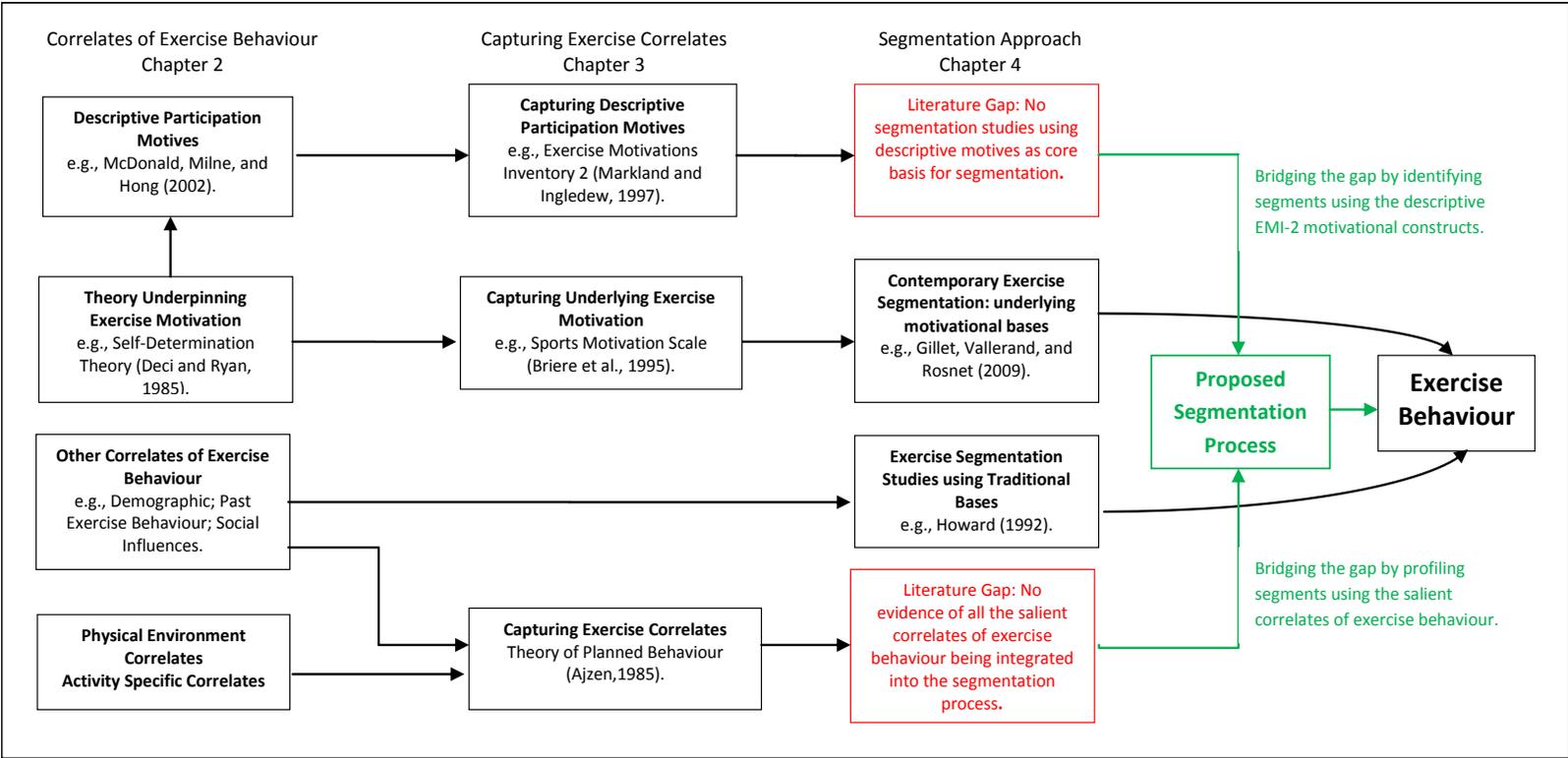
Hair *et al.* (2010) argue that the interpretation and profiling of clusters facilitates not only a thorough description of segments, they also aid the selection of the most appropriate outcome when more than one cluster solution presents itself. The profiling procedure allows the researcher to assess the correspondence of the derived clusters with existing theory, as well as facilitating an evaluation of the practical significance of the clustering solution.

#### **4.11 Chapter Conclusion**

A *post hoc* segmentation process emerges as the most pertinent for this research study. The choice of segmentation basis and nature and number of segmentation variables to include is a critical decision. The bases chosen should provide a clear-cut differentiation between the segments and be relevant to the goals of the research. Benefit and motivational segmentation have emerged as key contemporary approaches to market segmentation and have been the subject of increased adoption in the exercise domain. Distinct motivational profiles emerge in the extant exercise domain research and a number of the studies integrate several of the critical contemporary approaches to exercise motivation. In some cases, the authors have then tried to link the identified motivational profiles to surface level motives. However, in the majority of studies the identified segment profiles are rather conceptual in nature, a problem that could manifest itself in difficulty in operationalising promotional intervention strategies. Segment solutions based on comprehensible ‘surface’ level motives would offer greater operational clarity for exercise intervention strategies. Additionally, extant research has been selective in the integration of ‘other exercise correlates’ to add to the profiling of identified motivational segments. This study argues that segmentation outcomes would be greatly enhanced by the inclusion of a mechanism that can capture the most salient correlates of exercise behaviour for inclusion in the segment profiling process.

These two deficiencies in the exercise market segmentation literature are exhibited in the red boxes in Figure 4.1, which synopsis the flow of the literature through Chapters 2 to 4 of this study. The proposed segmentation process that has been developed to rectify these academic and practical deficiencies is represented by the green text and box in Figure 4.1.

**Figure 4.1: Flow of the Literature Review and Identification of Research Gaps**



#### **4.12 Literature Review Synopsis**

The review of the literature suggests that exercise participation and consumption motives should be viewed as a multi-dimensional construct composed of a broad range of both social-environmental and psychological elements, and that understanding consumers at levels deeper than mere demographic profiles is of critical importance to the effectiveness of exercise interventions. It points to the significance of understanding the motivations for exercise participation in the development of segmentation and marketing communication strategies, while illustrating the importance of reducing these multiple dimensions in a structured approach to better interpret and understand the findings. The literature also highlights the differentiating value of profiling or describing segments using variables not originally included in the segment formation process. The author proposes that segmenting the market using motivational bases and engaging in a subsequent phase of segment profiling using the most salient 'other' exercise correlates, is the most appropriate method of integrating the multi-dimensional exercise behaviour influences.

Mullin, Hardy, and Sutton (2007) outline that all-inclusive models are complex and not a descriptive formula for addressing exercise engagement. They suggest that researchers set parameters in deciding which determinants will be included in assessing exercise participation behaviour and that these variables can form a basis to segment the market. The review of the segmentation literature confirms the value of benefit/motivational segmentation as a base for analysing exercise markets. The majority of segmentation studies in the exercise domain are grounded in self-determination theory. However, the author reasons that the segment outcome from these studies may not be as conducive to promotional interventions as segment outcomes based on descriptive motivational variables. The EMI-2 is revealed as a scale with richly descriptive motivational variables inherent, while being grounded to a reasonable extent in self-determination theory. Recognition of the very broad scope of exercise correlates is illustrated in the ecological models, but they present implementation difficulties in research practice and have not been fully explored in previous segmentation studies. The TPB emerges as a viable alternative for capturing multi-dimensional exercise correlates in a way that reduces the variables being tested to only those that are most salient to the target population.

Rohm, Milne, and McDonald (2006) argue that ideally an analysis of participant motivation data would involve a qualitative analysis to elicit in-depth information about participation motivation, allied with a quantitative approach to reduce the dimensionality of consumer types. This facilitates a better understanding of the underlying structure of the data. The author has given due consideration to these issues and elected to engage in a series of discussion group studies with a sample of the target population. Employment of the discussion groups enables the author to establish the nature and content of the target population's motives for exercising and the key social-environmental influences on their behaviour. It is reasoned that this qualitative analysis will aid the design of the segmentation study, by extracting the most relevant correlates of the target audience's behaviour. Establishing these influences will also inform the author of the efficacy of the EMI-2 and TPB frameworks in capturing the drivers of the populations' exercising. Prior to analysing the outcome of the discussion group interviews the methodological philosophy and approach of the author are examined in Chapter 5.

# Chapter 5. Research Methodology

"The marathon has so many elements to prepare for. I think that is one reason I always want to come back for more. There is always something to change in your preparation and I am still trying to discover what I am capable of. I guess I just love the challenge"

Dathan Ritzenhein, Elite Marathoner.

## **5.1 Methodology Overview**

The focus in this chapter is threefold. Initially the theoretical and philosophical position adopted for the study is established. The review of the literature in the chosen domain, and the initial discussion group research phase, provide the grounding for the core research objective and associated research propositions. The reasoning behind the formulation of each of the research propositions is outlined, prior to describing and justifying the methodological pathway that is selected to achieve the objectives and test the propositions. Finally, the analytical processes employed to evaluate the captured data are detailed.

The research is a social science study, a field that is characterised by employing a range of data collection methods to capture individuals in their social contexts. The philosophical approach adopted in this study reflects the social science nature of the research.

## **5.2 Philosophical Approach**

Social scientists approach their research via implicit or explicit assumptions about the nature of the social world and the means of investigating it. A number of sociological paradigms are discussed in this section, with the researcher adhering to a philosophy that is most appropriate for this particular study. Holden and Lynch (2004, p. 407) assert that *“a review of philosophy is a vital aspect of the research process as it opens researchers minds to other possibilities, which can lead to both an enrichment of their research skills and an enhancement in their confidence that they are using an appropriate methodology”*. Easterby-Smith, Thorpe, and Lowe (2002) outline three reasons why an understanding of philosophical issues is very useful. Firstly, it can help to clarify research designs, particularly the overall configuration of a piece of research, the kind of evidence gathered, and how such evidence is interpreted in order to provide good answers to the basic research question. Secondly, knowledge of philosophy can help the researcher to recognise which designs will work, and which will allow the researcher to avoid blind alleys and recognise the limitations of particular approaches. Finally, they contend that knowledge of philosophy can help the researcher identify designs that may be outside his or her past experience.

Laughlin (1995) argues that researchers need to be aware of the assumptions that their research approach is based upon. Similarly, Burrell and Morgan (1979) contend that social scientists approach their research via explicit or implicit assumptions about the nature of the social world that they are addressing. A researcher’s ontological and epistemological positions are critical in this process (Jankowicz, 2000). Researchers must also deal with a set of assumptions related to human nature, and these combined with their ontological and epistemological positions, serve as a pertinent framework in assisting the researcher with the design and implementation of their study (Burrell and Morgan, 1979; Holden and Lynch, 2004). Table 5.1 highlights the polar points of the assumptions regarding the nature of social science. Each of these positions and assumptions are considered, commencing with a review of the debate surrounding ontological positions in the next section.

**Table 5.1: Framework for Analysing Assumptions About the Nature of Social Science**

<b>Subjective Approach</b>		<b>Objective Approach</b>
Nominalism	<b>Ontology</b>	Realism
Anti-Positivism	<b>Epistemology</b>	Positivism
Voluntarism	<b>Human Nature</b>	Determinism
Ideographic	<b>Methodology</b>	Nomothetic

Source: Burrell and Morgan (1979).

### **5.2.1 The Ontological Debate**

Ontology is defined as “*the study of the essence of phenomena and the nature of their existence*” (Gill and Johnson, 2010, p.241). Ontological assumptions give us our beliefs about the world and are concerned with the reality of the issues and phenomena under review (De Burca, 1995; Jankowicz 2000; Bryman and Bell, 2011). Holden and Lynch (2004) contend that the researcher’s outlook on reality is critical and can have a considerable impact on the researcher’s other suppositions. Burrell and Morgan (1979) outline that the basic ontological question facing researchers is whether or not reality is external to the individual, imposing itself on individual consciousness from without, or the product of individual consciousness. The ontological debate is polarised between the nominalist and the realist position. Nominalists believe that the external world is a social process created by the individuals concerned, whereas the realists reject the idea of innate knowledge, instead contending that all knowledge is derived ultimately from

experience (De Burca, 1995). Thus the nominalist position assumes that the social world exists external to individual cognition and is made up of nothing more than names, concepts, and labels, which are used to structure reality. Realism holds that the social world external to individual cognition is a real world that exists independently of individual understanding of it, and has an actuality that is as hard and concrete as the natural world (Gill and Johnson, 2010). Bryman and Bell (2011) propose an alternative labelling for the polar ontological positions: categorising them as objectivism and constructivism. According to Bryman and Bell (2011, p. 21), the objectivism position professes that “*social phenomena and their meanings have an existence that is independent of social actors*”. Constructivism infers that social phenomena and categories are produced through the interaction of social actors and are constantly changed and adjusted. The evidence that the researcher decides to utilise or disregard in their research will depend on their ontological position (Jankowicz, 2000).

### **5.2.2 The Epistemological Debate**

Epistemology is concerned with the study of the reliability of knowledge itself and the criteria by which we determine what does and does not constitute valid knowledge (De Burca, 1995; Maylor and Blackmon, 2005; Bryman and Bell, 2011). Burrell and Morgan (1979, p.4) describe epistemological assumptions as the “*grounds of knowledge about how one might begin to understand the world and communicate this as knowledge to fellow human beings*”.

The epistemological debate is polarised between the positivist and anti-positivist viewpoints (Burrell and Morgan, 1979). Anti-positivism has also been assigned the labels of phenomenology (Easterby-Smith, Thorpe, and Lowe, 2002) and interpretivism (Remenyi *et al.*, 1998; Bryman and Bell, 2011). Positivists attempt to apply methods presumed to be used in the natural sciences to the social sciences, and thus seek theories of knowledge which have a predictive or explanatory (normative) value. It suggests that the world exists externally and that its properties can and should be measured objectively. It embraces quantitative methods, utilising rigorous statistical analysis to collate large amounts of data, which in turn can be employed to validate or reject a hypothesis (Crossan, 2003; Remenyi *et al.*, 1998).

By contrast anti-positivists emphasise the importance of viewing social scientific research as a subjective process, and involves studying phenomena and seeking to understand why they behave in a certain way (Cresswell, 1998; Robson 2007). Phenomenology accepts that reality is not objectively determined, but is socially constructed. The focus of the researcher should be on trying to understand and explain people’s behaviour, rather than concentrating on facts or measuring the frequency of events. Such knowledge has what philosophers call descriptive value. Burrell and Morgan (1979) outline the key features of the positivist and anti-positivist paradigms, see Table 5.2.

**Table 5.2: Key Features of Positivist and Anti-Positivist Paradigms**

	<b>Positivist Paradigm</b>	<b>Phenomenological Paradigm</b>
Beliefs:	The world is external and objective. The observer is independent.	The world is socially constructed and subjective. The observer is part of what is observed.
Researcher Should:	Focus on facts. Reduce phenomena to simplest levels. Formulate hypotheses and test them.	Focus on meanings. Look at totality of situation. Develop ideas through induction from data.
Preferred Methods:	Operationalise concepts so that they can be measured. Take large samples.	Use multiple methods to establish different views of phenomena. Use small samples investigated in depth or over time.

Source: Adapted from Easterby-Smith, Thorpe, and Lowe (2002).

### 5.2.3 Human Nature

Human nature deals with the relationship between humans and the environment that they function within. Burrell and Morgan (1979) contend that human beings can be deterministic, where they are conditioned by external events. Alternatively, humans can be voluntarist where one acts of their own volition and is fully autonomous. The bulk of social science research assumes a middle ground, acknowledging the effect of both situational and voluntary influences in accounting for humans actions (Burrell and Morgan, 1979).

### 5.2.4 The Methodological Argument

Burrell and Morgan (1979) outline that there are two approaches to methodology, ideographic and nomothetic, which are based on the ontological, epistemological, and human nature positions adopted by the researcher. The ideographic approach is

subjective, with Hallebone and Priest (2009, p.76) explaining that this approach is used to “*describe the nuances of specific instances and their distinctively idiosyncratic meanings and, from this, form an integrating set of descriptive and/or explanatory concepts and principles*”. The nomothetic approach is objective and Bryman and Bell (2011, p.60) contend that this approach “*is concerned with generating statements that apply regardless of time or place*”. Gill and Johnson (2010) provide a useful comparison of both the ideographic and nomothetic approaches, with the former highlighting an inductive approach, emphasising meanings through the use of qualitative data. The nomothetic approach is deductive, focusing more on causal relationships through the use of quantitative data.

### **5.3 Research Paradigm and Philosophical Approach Adopted for this Study**

The making of methodological choices must examine trade-offs between the relative merits and demerits of the various available approaches. Particular consideration must be given to the nature and context of the substantive question to be investigated, the resources available, and any potential ethical dilemmas. The philosophical assumptions adopted by the researcher with regard to methodology will explicitly or implicitly influence what Morgan (1983) specified as the mode of engagement. Indeed, the manner in which a researcher engages with the research process is guided by their attitude and views regarding the three key assumptions relating to ontology, epistemology, and human nature.

Sekaran (1992 p.4) described research as “*a systematic and organised effort to investigate a specific problem that needs a solution*”. If research is indeed to be ‘systematic and organised’ one must have clear objectives and an appropriate methodology. Bulmer (1984) defines methodology as the process through which research is conducted to answer the research question, while Hindess (1977) links the choice of methods to the validity of results. He argues that methodology lays the procedures to be used in the generation or in the testing of hypotheses by those who wish to obtain valid knowledge. Scientific knowledge is thought to be valid only if its production conforms to the prescribed procedures. This is admittedly a relatively positivist perspective, and while scholars disagree about which procedures can be considered correct, it is evident that the choice of methods is a highly important consideration in any research project. This point is reinforced by Gill and Johnson

(2010), who argue that in establishing a personal philosophical perspective one is confronted with a philosophical choice regarding the nature and rationale of human action, which has direct methodological implications. The importance of utilising the correct methodology for the collection of the required information cannot be overstated.

The researcher must choose at an early stage which philosophy he adheres to. An examination of the debate on research philosophy has allowed the author to form a belief that a positivist oriented approach appears to be pertinent given the information required to achieve the core objective of the research. However, the study does not adopt an extreme positivist position, as the author's philosophical outlook is appreciative of the benefits of both sides of the philosophical debate. This position is reflected in the use of an initial qualitative phase of discussion group research to inform the design of the main quantitative survey element of the study<sup>8</sup>. Holden and Lynch (2004) argue that an intermediate philosophical stance facilitates the investigator in combining philosophy, research methodology, and the research question, with Burrell and Morgan (1979) explaining that such intermediate positions have become more common in social science research.

The implications of a researcher's adherence to positivism or phenomenology are significant for the choice of research methods. The positivist approach suggests the use of a quantitative methodology to obtain hard facts, data, and causes. The phenomenological approach is more likely to involve the use of qualitative research methods in an attempt to interpret human behaviour. Both processes endeavour to understand and explain behaviour, but in very different ways. Broadly speaking, the literature examining segmentation bases and models is grounded in the micro-economic school of thought and most studies adopt a positivistic perspective. Some criticisms of the positivistic assumptions of market segmentation have emerged. The thrust of these criticisms is that the positivistic outlook does not accurately reflect the current market and marketing reality (e.g., Firat and Schultz, 1997; Hines and Quinn, 2005). However, it is reasoned that the preliminary qualitative discussion groups and belief elicitation research phases of this study, facilitate the researcher in constructing a survey

---

<sup>8</sup> See Table 5.3 for an illustration of the research design.

instrument that is quite representative of the current market situation of the population of interest.

Engaging in mixed method enquiry is a pragmatic approach to the research process. The researcher integrates methodological traditions to elicit a better understanding of the social world and phenomena under investigation (Johnson, Onwuegbuzie, and Turner, 2007). Mixed methodology involves the gathering of qualitative and quantitative data either simultaneously or sequentially to best tackle research problems (Creswell and Plano Clark, 2007). Each method can offer valuable insights to facilitate a greater comprehension of a research domain. A key advantage of using such an approach is that a researcher does not have to choose one method to the total exclusion of the other, but can combine both methodologies to offset particular weaknesses inherent in all research methods (Easterby-Smith, Thorpe, and Lowe, 2002).

Triangulation of the data is the principal benefit to emerge from combining qualitative and quantitative techniques (Bryman and Bell, 2011). Triangulation occurs when data are collected from more than one source and at different times, thereby increasing its reliability and reducing potential bias associated with the single method approach (Bryman and Bell, 2011). Amaratunga *et al.* (2002), state that the effectiveness of triangulation rests on the premise that the weaknesses in each single method will be compensated by the counter-balancing strengths of another. Triangulation is a useful business research method as it “*obtains evidence from multiple sources to ensure that a biased view is not being obtained from one informant*”, although it is also often a time-consuming and costly activity (Remenyi *et al.* 1998, p.142).

The study employs an exploratory sequential mixed methodological approach. Creswell and Plano Clark (2011) contend that the exploratory design begins with and prioritises the collection and analysis of qualitative data in the first phase. Building from the exploratory results, the researcher conducts a second, quantitative phase to test or generalise the initial findings. The researcher then interprets how the quantitative results build on the initial qualitative results. In applications of this iterative design, the researcher develops an instrument as an intermediate step between the phases that builds on the qualitative results and is used in the subsequent quantitative data collection. For that reason, this design has also been referred to as the instrument development design

(Creswell, Fetters, & Ivankova, 2004) and the quantitative follow-up design (Morgan, 1998). This design is particularly useful when the researcher needs to develop and test an instrument because one is not available or to identify important variables to study quantitatively when the variables are unknown (Creswell and Plano Clark, 2011).

The preliminary qualitative/discussion group phase of this study serves a number of purposes. The primary goal is to ascertain the correlates of exercise behaviour for the population of interest. Output from this stage informs the measures and scales to be integrated into the quantitative survey instrument for the main phase of research. Although triangulation is not the principal goal of combining qualitative and quantitative methodologies in this instance, the output of the discussion groups can be used to further confirm the validity and reliability of the quantitative findings. This research employs a format for developing theoretical propositions and hypotheses that was first espoused by Reynolds (1971). The study deduces the core research objective based on a thorough review of the pertinent literature and the preliminary discussion group interviews. Assumptions that emerge from these facilitate the researcher in developing a series of relatively abstract theoretical propositions, which in turn are tested by specific hypotheses. The methodological approach that is adopted reflects the moderately positivist nature of the researcher's outlook. Before examining the methodology employed, it is important to establish and justify the core research objective, and the research propositions and associated hypotheses that are crafted to achieve the core objective.

#### **5.4 The Core Research Objective and Research Propositions**

Chapter 1 provided the reasoning for and justification of a study of this nature, culminating in the formation of the core research objective of the thesis. The literature and preliminary discussion groups highlighted that exercise behaviour has multiple correlates (Shank, 2005). Foremost among these is motivation (Hagger *et al.*, 2001), although Trost *et al.* (2002) outline that an understanding of the multiple correlates of behaviour is an essential prerequisite to formulating focused exercise interventions. Segmentation of exercise markets is a critical intermediary step between understanding participant behaviour and operationalising effective intervention strategies. Contemporary segmentation theory confirms the pre-eminence of benefit/motivational segmentation (Haley, 1995; Apostolakis, 2003). It also highlights the difficulty of

including too many variables into a segmentation process (Dolnicar and Grun, 2008) which has obvious consequences for trying to integrate multiple exercise correlates into a segmentation study. Tackling this issue is the focus for the core objective of the research:

**Core Research Objective: To develop a segmentation process that integrates the salient correlates of behaviour of exercise participants.**

The researcher has adopted the approach of using motivation as the segmentation basis of the chosen market. The other correlates of exercise behaviour are then integrated into the study as additional descriptors of, and differentiators between, the identified segments. This process has the goal of enhancing segment profiling, creating a rich comprehension of the distinctive behaviour of each segment. Seven research propositions and sixteen hypotheses have been formulated to develop and test a segmentation process that captures the multiple correlates of exercise behaviour. The rationale behind each of the propositions is now outlined.

#### **5.4.1 Research Proposition 1**

The literature review (e.g., Markland and Ingledew, 1997; McDonald, Milne, and Hong, 2002; Biddle and Mutrie, 2008) highlighted the importance of motivation in understanding exercise behaviour. Motivational segmentation has also attained greater prominence in the exercise domain. A large portion of these studies utilise self-determination constructs as the basis for segmentation (e.g., McNeill and Wang, 2005; Gillet, Vallerand, and Rosnet, 2009). While these studies have strong theoretical underpinning, the outcomes are not easily operationalised in exercise interventions. This research addresses this difficulty by utilising the Exercise Motivations Inventory 2 (EMI-2) as the basis for market segmentation. The EMI-2 captures a broad array of comprehensible ‘surface’ level motives, while also being grounded to a significant extent in self-determination theory (Ingledew and Markland, 2008).

**Research Proposition 1: The exercise behaviour of the population of an Irish tertiary-level educational institute will contain segments that are clearly differentiable on the basis of participant motivation.**

Two hypotheses have been developed to test Research Proposition 1 and these are outlined below.

**Hypothesis 1a:** The chosen exercise participation market will be viably segmented using the nine motivational constructs derived from the Exercise Motivations Inventory 2 (EMI-2) scale as the key base for segmentation.

**Hypothesis 1b:** Each identified segment will exhibit a distinctly different motivational profile.

#### **5.4.2 Research Proposition 2**

The preliminary discussion groups revealed considerable differentiation in the attitude, motivation, and actual exercise behaviour of males and females. This is in keeping with much of the literature in the domain, where females have generally been found to have lower rates of exercise engagement (e.g., Irish Sports Council, 2012) and differing motivations for participation (e.g., Kelinske, Mayer, and Chen, 2001; Kilpatrick, Hebert, and Bartholomew, 2005). It is postulated that gender analyses will enhance the profiling of the identified segments.

**Research Proposition 2: Profiling of the identified segments will be enhanced by identifying differences in gender composition.**

Research Proposition 2 is evaluated through two hypotheses. These assess differences in gender composition across segments, and between the segments and the overall sample.

**Hypothesis 2a:** The gender composition will vary significantly between each segment and the overall sample.

**Hypothesis 2b:** The gender composition will vary significantly across segments.

#### **5.4.3 Research Proposition 3**

The age of the exercise participant has been consistently illustrated as a correlate of their behaviour (Trost *et al.*, 2002). Different age groups exhibit differing rates of exercise adherence (e.g., Irish Sports Council, 2012). The literature also demonstrates variation in the motives for exercising that the different age groups exhibit (e.g.,

Twemlow, Lerma and Twemlow, 1996). These findings are reinforced by the output of the preliminary discussion groups, where considerable variation in motivational profile and exercise engagement was exhibited by respondents of different age groups. It is thus proposed that age differentiation can enhance the profiling of the segment solution.

**Research Proposition 3: Profiling of the identified segments will be enhanced by identifying differences in age group composition.<sup>9</sup>**

This research proposition is tested by two hypotheses that evaluate differences in age group composition across segments, and between the segments and the overall sample.

**Hypothesis 3a:** The age group composition will vary significantly between each segment and the overall sample.

**Hypothesis 3b:** The age group composition will vary significantly across segments.

#### **5.4.4 Research Proposition 4**

Past and current exercise behaviour has considerable bearing on an individual's beliefs and motivations for exercising. The fulfilment of motivations and enjoyment of previous exercise experiences directly impacts on future physical activity behaviour (Trost *et al.*, 2002). Regular and non-regular exercisers consistently illustrate differing motivational profiles (Norman, Conner, and Bell, 2000), a finding that was also apparent in the preliminary discussion groups. Considering this, it is reasoned that an examination of differences in regular and non-regular exercisers will augment segment profiling.

**Research Proposition 4: Profiling of the identified segments will be enhanced by identifying differences in recent exercise status composition.<sup>10</sup>**

This proposition is tested by two hypotheses that evaluate differences in recent exercise status composition across segments, and between the segments and the overall sample.

---

<sup>9</sup> Age groupings are divided into two, respondents aged 18-24 and those in the 25 or older category..

<sup>10</sup> Recent Exercise Status of respondents is categorised into regular and non-regular exercise, based on the reported exercise behaviour for the six months prior to survey administration.

**Hypothesis 4a:** The recent exercise status composition will vary significantly between each segment and the overall sample.

**Hypothesis 4b:** The recent exercise status composition will vary significantly across segments.

#### **5.4.5 Research Proposition 5**

No cluster or segment solution is ever perfect. Franke, Reisinger, and Hoppe (2009) outline that on average *circa* 39% of within-segment heterogeneity remains in cluster outcomes. How to address this is problematic. This research does not endeavour to scientifically establish the extent of heterogeneity within clusters, rather it focuses on motivational differences within segments based on specified criteria<sup>11</sup>. Considerable differentiation in behaviour, beliefs, and motivation was exhibited between age groups, genders, and regular/non-regular exercisers in the discussion groups. Examining within-segment differences in motivation on the basis of age, gender, and exercise status is a potential mechanism for alleviating the difficulty of remaining within-segment heterogeneity. It also offers the scope to customise interventions to different groupings within segments on the basis of varying motivations. This forms the basis for Research Proposition 5 and its associated hypotheses.

**Research Proposition 5: The identified segments will exhibit within-segment differentiation in motivational profiles, on the basis of age, gender, and recent exercise status.**

It is tested by three hypotheses that seek to establish differences in motivational profile within-segments, based on age, gender, and recent exercise status.

**Hypothesis 5a:** Significant differences in motivation will emerge between the two age groups within each segment.

**Hypothesis 5b:** Significant differences in motivation will emerge between males and females within each segment.

---

<sup>11</sup> A number of techniques (e.g. Bayesian measures) exist to measure the level of remaining within-segment heterogeneity in clusters. Using these would not add to the profiling of the segments, so the focus in this research is on testing for within-segment motivational differences, based on the three global influences that emerged in the discussion group interviews: age, gender, and recent exercise status.

**Hypothesis 5c:** Significant differences in motivation will emerge between regular and non-regular exercisers within each segment.

#### **5.4.6 Research Proposition 6**

Multiple correlates of exercise behaviour were identified in the literature (e.g., Trost *et al.*, 2002; Shank, 2005), a situation that was confirmed for this study's target cohort in the preliminary discussion group phase of research. Capturing the vast array of potential correlates of behaviour is challenging, with ecological models proving difficult to operationalise (Giles-Corti and Donovan, 2002). It is postulated that the TPB (Ajzen, 1985) has the scope to integrate many of these correlates into an analysis. This is especially the case for the underlying beliefs of the TPB model. Ajzen (2002) outlines that these beliefs, if correctly elicited, reflect the most relevant salient feelings that the respondents have about a domain of behaviour. It can capture the behavioural beliefs that influence individuals' attitudes towards behaviour, the normative beliefs that assess the positive or negative influence of significant others on the behaviour, and the control beliefs that represent other factors that can help or hinder engagement in the behaviour (Ellis *et al.*, 2007; Rhodes and Conner, 2010). Consequently, it is propositioned that these beliefs will exhibit significant differences across segments.

**Research Proposition 6: The elicited underlying individual belief components of the theory of planned behaviour will illustrate differentiation across segments.**

This proposition is examined by three hypotheses that seek to establish differences in behavioural, normative, and control beliefs across segments.

**Hypothesis 6a:** Significant differences will emerge in the elicited behavioural beliefs across the identified segments.

**Hypothesis 6b:** Significant differences will emerge in the elicited normative beliefs across the identified segments.

**Hypothesis 6c:** Significant differences will emerge in the elicited control beliefs across the identified segments.

#### 5.4.7 Research Proposition 7

The final phase of data collection involves respondents reporting their exercise behaviour for the four weeks immediately after the main survey completion. It facilitates the researcher in examining relationships between summated beliefs and reported behaviour and this analysis provides the basis for Research Proposition 7. The focus is on the underlying belief components of the TPB model, rather than the general, direct measures of attitude, subjective norm, and perceived behavioural control.

Rhodes, Blanchard, and Blacklock (2008) argue that the direct measures while sufficient for testing the TPB model do not contain adequate measurement precision to differentiate between groups in a target population. They propose utilising the beliefs underlying each of the three TPB components to derive a more specified outcome. Additionally, Ajzen (1991) argues that using composite beliefs eliminates the need to include the global measures of attitude, subjective norm, and perceived behavioural control in examining the relationship with behaviour. Several studies including Rhodes, Blanchard, and Blacklock (2008), Weinstein (2007), and Sutton (2002) conclude that examining the belief-intention relationship is problematic, as intention is a mediating variable that can determine misleading outcomes in examining the predictive capability of the underlying causal beliefs on behaviour. These studies propose directly assessing the relations and predictive abilities of the underlying beliefs with behaviour.

Summated beliefs are the focus of Research Proposition 7. Previous studies illustrate varying degrees of correlation between summated belief indices and reported behaviour (Ajzen and Driver, 1991), although a synopsis of studies in the exercise domain reveals that summated behavioural and control beliefs generally correlate strongly with behaviour, with normative beliefs exhibiting indifferent associations in this regard. Furthermore, Rhodes, Plotnikoff, and Spence (2004) highlight that the summated belief indices account for *circa* 80% of the predictive variance of the TPB model in the exercise domain.

**Research Proposition 7: The summated behavioural and control belief indices will correlate strongly with reported behaviour, while the correlation between reported behaviour and normative belief indices will be of lesser magnitude.**

Two hypotheses test this assertion for the overall sample and for each of the identified segments.

**Hypothesis 7a:** The summated belief indices for behavioural and control beliefs will illustrate a highly significant correlation with reported behaviour for the overall sample, while the correlation between behaviour and normative belief indices in this context will be of lesser magnitude.

**Hypothesis 7b:** The summated belief indices for behavioural and control beliefs will illustrate a highly significant correlation with reported behaviour for each segment, while the correlation between behaviour and normative belief indices in this context will be of lesser magnitude.

### 5.5 Phases of Research

A number of phases of research are conducted to test the seven research propositions formulated to achieve the core research objective. The rationale for and process employed in each of these research phases are outlined in Sections 5.6 and 5.7. The research process sequence employed for the study is outlined in Table 5.3.

**Table 5.3: Research Process Sequence**

1	Literature Review	- On-going review of pertinent literature throughout the process.
2	Preliminary Discussion Groups	- 5 discussion group interviews conducted in October 2010. - Data gathered were synthesised and key themes highlighted.
3	Belief Elicitation Phase	- 50 respondents completed this study in December 2010. - Responses were independently analysed by 3 academics and agreement reached as to what the most salient beliefs were for inclusion in the pilot survey.
4	Pilot Survey	- Administered to 52 respondents in January 2011. - Temporal stability test for the TPB belief measures administered to 45 of the original 52 respondents at a two-week interval. - Analysis of the findings conducted and subsequent revision of the questionnaire for the main survey administration.
5	Main Survey	- Main survey questionnaire completed by 775 respondents in March 2011.
6	Follow-up Behavioural Survey	- Follow-up survey measuring respondent's behaviour in the four weeks post main survey. Survey completed by 480 respondents in April 2011.

## **5.6 Preliminary Research Phases**

Preliminary research took place in four stages: 1) the preliminary discussion groups, 2) the belief elicitation study, 3) the pilot questionnaire administration, and 4) the temporal stability test. The preliminary research process is outlined in this section beginning with an outline of the initial discussion group research phase.

### **5.6.1 Preliminary Discussion Group Interviews**

The first step in the methodological process was to carry out a series of preliminary discussion group interviews with a sample of the target audience. Five discussion groups were conducted using a cross section of third level students. Three of the discussion groups involved mixed male and female participants, while there was one male-only and one female-only discussion group conducted. A total of 46 individuals participated in these detailed discussion group sessions. The discussion groups were very much exploratory in nature and were intended to inform the creation of the main survey instruments. This process served a number of purposes:

- The primary objective of this phase was to determine what the key influences on the target audiences' exercise behaviours were. From the preceding review of the key literature on exercise behaviour, it is apparent that the benefits sought from/motives for exercise are key drivers of behaviour in an exercise context. These issues were explored in some detail during the discussion groups to elicit the most relevant motives in this context.
- The EMI-2 (Markland and Ingledew, 1997) was identified in the literature as a comprehensive tool for engaging in an analysis of participant motivation. The EMI-2 motivational constructs were examined in the discussion groups to ascertain their relevance and importance in the domain of this study.
- The key demographic, geographic, and behavioural issues that will aid the profiling of the extracted segments were identified and evaluated.
- The discussion groups also facilitated the identification of critical behavioural influences. A range of what could be described as 'socio-contextual' factors emerged that can significantly influence exercise behaviour.
- The non-regular exercisers amongst the discussion group participants were also facilitated in outlining the reasons/factors behind their non-participative

behaviour. Additionally they were probed as to what motives could determine a return for them to regular exercise behaviour.

#### **5.6.1.1 Analysing Discussion Group Findings**

Qualitative data can be analysed in several ways and involves deriving meanings from a vast array of data (Patton, 2002). In order to analyse data it must be organised and then interpreted. Data analysis involves an iterative process that encompasses describing, classifying, and connecting data (Dey, 1993).

A commonly used approach for analysing qualitative data is the identification of key themes in the data (Kumar, 2005; Robson, 2007). The author transcribed the output of each of the five discussion groups and set about extracting critical themes from the considerable volume of data. Additionally, observational notes taken by the author during the discussion groups were integrated in this process. Kumar (2005) suggests four steps when analysing the output of qualitative research and this process was adhered to in this instance. Initially the main themes are identified. These themes are given codes. Data are then classified under the main themes. Finally, the themes and responses are integrated into the report (Kumar, 2005). The findings were coded using QSR NVivo 9<sup>12</sup> and the empirical findings from the discussion groups were categorised into the most pertinent themes. These are discussed in some detail in later sections (see Chapter 6.2 to 6.8). A narrative approach is used to present the qualitative findings and quotations obtained from the discussion groups are interspersed to support the empirical findings.

#### **5.6.2 Construction and Administration of the Pilot Questionnaire<sup>13</sup>**

The construction and administration of the pilot questionnaire took place in three phases.

##### **5.6.2.1 Phase 1: Belief Elicitation Study**

An integral part of the development of a Theory of Planned Behaviour (TPB) study is the identification of the behavioural, normative, and control beliefs that underpin the direct measures of attitude, subjective norms, and perceived behavioural control.

---

<sup>12</sup> QSR International is the company that design and manufacture the NVivo software.

<sup>13</sup> The Pilot Questionnaire is contained in Appendix A.3

Ajzen's (2002) suggested that researchers carry out an *a priori* belief elicitation study on a pilot sample of the target population to identify the common modal salient beliefs toward exercise engagement. This ensures that the TPB belief constructs are representative of the target population. It is recommended that respondents are given a description of the behaviour and then asked a series of questions designed to access these beliefs (Ajzen, 2002).

In this case a sample of 50 members of the target population completed a series of nine open-ended questions, three each relating to the three underlying belief constructs. The questions were administered in a class context, and respondents were given ample time to assess, reflect upon, and respond to each question. The questions employed were:

### **Behavioural Belief Measures**

1. What do you believe are the advantages/benefits of you engaging in regular leisure-time exercise in the forthcoming month?
2. What do you believe are the disadvantages of you engaging in regular leisure-time exercise in the forthcoming month?
3. Is there anything else you associate with your engagement in regular leisure-time physical activity in the forthcoming month?

### **Normative Belief Measures**

1. Are there any individuals or groups who would approve of you engaging in regular leisure-time physical activity in the forthcoming month?
2. Are there any individuals or groups who would disapprove of you engaging in regular leisure-time physical activity in the forthcoming month?
3. Are there any other individuals or groups who come to mind with regard to you engaging in regular leisure-time physical activity in the forthcoming month?

### **Control Belief Measures**

1. What factors or circumstances would enable you to engage regularly in leisure-time physical activity in the forthcoming month?
2. What factors or circumstances would make it difficult for you to engage regularly in leisure-time physical activity in the forthcoming month?

3. Are there any other issues that come to mind when you think about the difficulty of you engaging regularly in leisure-time physical activity in the forthcoming month?

The responses to these questions were content analysed and divided into themes and the extracted themes were labelled. This process was carried out independently by the author, a research assistant, and a fellow marketing academic from the educational institute. Independent analysis of elicited beliefs is recommended by Ajzen (2002) and increases the validity of the analysis. An agreed set of themes were then listed in order, from most frequently mentioned to least frequently mentioned. The most frequently listed beliefs were chosen and converted into a set of statements for inclusion in the pilot questionnaire. These statements reflect the beliefs that might affect the behaviour of the target population. Inclusion of 75% of all beliefs stated should give adequate coverage of the belief 'population' (Francis *et al.*, 2004) and this was used as a guideline for the inclusion of the salient elicited beliefs in this study.

#### **5.6.2.2 Phase 2: The Pilot Questionnaire**

The pilot questionnaire was constructed with due consideration given to the findings of the literature review, the preliminary discussion group research phase, and the elicitation study conducted at the outset of this research stage. The proposed pilot questionnaire was first tested on five people from the relevant population, asking them to complete the questionnaire and highlight any issues regarding comprehension and clarity. A few grammatical errors were highlighted and rectified prior to the delivery of the questionnaire to the chosen sample. The pilot study was administered to a sample of 52 respondents drawn from the target population in a classroom setting. It was structured in the following fashion:

**Section A:** This section was aimed at gathering demographic, geographic, and behavioural data that would facilitate the profiling of the identified segments. The author is particularly keen to integrate a measure of recent exercise behaviour and the Trans-Theoretical Model (TTM) which was discussed in Section 2.7.2 is a commonly used and effective mechanism for measuring recent behaviour. However, the discussion on the TTM also highlighted difficulties in allocating individuals to the different stage categories of the TTM. With this in mind the author's intention was to utilise the TTM,

but simplify the categorisation of individuals' recent exercise behaviours to two groupings: regular exercisers and non-regular exercisers.

**Section B:** The EMI-2 was included as the measure to capture participant motivation. As outlined in the literature the EMI-2 scale is a differentiated mechanism for assessing exercise participation motives. The motivational constructs inherent in the EMI-2 were examined in the preliminary discussion groups and satisfactorily represent the majority of the motivations expressed in this phase.

**Section C:** Measures for the constructs of the Theory of Planned Behaviour (TPB) were included in this section. Justification for the inclusion of each of the measures is now outlined:

The TPB questionnaire begins with a statement outlining the behaviour to be measured. The context of the study relates to regular leisure-time exercise. This is based on the WHO (2004) recommendation of at least three 20 minute or longer vigorous intensity or five 30 minute or longer moderate intensity exercise sessions in your leisure-time per week. The exercise should involve the participant expending at least a moderate effort, which equates to a noticeable increase in breathing, when engaging in the activity. Ajzen (2002) outlines that the Target Action Context and Time (TACT) acronym contains essential elements of behaviour being measured by the TPB. The TACT elements are as follows -

- 1) Target: Regular defined as 3 x 20 minutes of vigorous exercise per week or 5 x 30 minutes of moderate exercise per week.
- 2) Action: Exercise defined as at least moderate level participation in exercise or sport.
- 3) Context: Exercise that takes place in the leisure-time of the respondents.
- 4) Time: The behaviour to be assessed for the next month.

The TPB measures include:

**Direct Measures of Attitude:** Direct measures of attitude are captured with twelve bipolar adjectives that were from Osgood's Semantic Differential Scale. Ajzen (2002) outlines that to make sure that the bipolar adjectives selected for inclusion in a final

study evaluative in nature (for the behaviour and population of interest), the investigator should start with a relatively large set, perhaps ten or twelve scales. The initial set can be taken from the list of published adjective scales that, across concepts and populations, tend to load highly on the evaluative factor of the semantic differential (Osgood, Suci, and Tannenbaum, 1957). The adjectives used also reflect both the instrumental evaluation (six adjectives) and experiential evaluation (five adjectives) of the behaviour, as well as the good-bad scales which tends to capture overall evaluation very well.

**Direct Measures of Subjective Norm:** Direct measures of subjective norm are measured with six variables, which were adapted from Ajzen's (2002) guide to creating a TPB questionnaire. Three questions have an injunctive quality, consistent with the concept of subjective norm. However, these often have low variability because important others are generally perceived to approve of desirable behaviours (Ajzen, 2002). A further three questions alleviate this problem by examining descriptive norms, that is whether important others themselves perform the behaviour in question.

**Direct Measures of Perceived Behavioural Control:** Six measures are used to directly measure perceived behavioural control. These include three measures of an individual's perceived capability. Additionally, three measures are included to assess peoples' beliefs that they have control over the behaviour.

**Direct Measures of Behavioural Intention:** Four measures are used to directly assess behavioural intention. The measures for subjective norm, perceived behavioural control, and behavioural intention are adapted from Ajzen's (2002) TPB guide.

It is important to note that the direct measures of the TPB are not being included in the survey as potential profiling agents. It is intended that the indirect/belief measures will fulfil this function. The direct TPB measures are being utilised in a predictive validity role for the segment outcome. A criterion or predictive validity test using data not otherwise included in the analysis is recommended by Hair *et al.* (2010) to establish and enhance the validity of a cluster solution. In this instance the TPB direct measure variables; attitude; subjective norm; perceived behavioural control; and behavioural intention; are reasoned to be a useful measure of criterion validity of the cluster

solution. Mooi and Sarstedt (2011) illustrate that criterion validity evaluates the extent to which independent clustering variables, in this instance the motivational constructs used in the cluster analysis, are associated with one or more dependent variables not included in the analysis. They contend that there should be significant differences between the dependent variables across the clusters, and that the clustering variables should differentiate the dependent variables significantly. There is ample evidence in the literature illustrating that greater levels of exercise motivation are associated with a more favourable attitude, stronger normative beliefs, greater perceptions of control, and enhanced behavioural intention (Hausenblas, Carron, and Mack, 1997; Armitage and Conner 2001; Hagger, Chatzisarantis, and Biddle, 2002). This lends credence to the use of the TPB direct measures as a source of criterion validity for the identified segments.

The underlying TPB beliefs selected for inclusion in the survey include:

**Measuring Behavioural Beliefs:** - The beliefs highlighted in the elicitation study are formulated as measures here to gain an insight into the underlying cognitive foundation concerning why people hold certain attitudes. Fourteen underlying behavioural beliefs categories emerged. The behavioural beliefs are measured from the perspective of both belief strength and outcome evaluation. This combination can serve to compute a belief composite that is assumed to determine the attitude toward the behaviour in accordance with an expectancy-value model (Ajzen and Driver, 1991). The endpoints unlikely/likely are used to measure behavioural beliefs in preference to disagree/ agree as they are a better indicator of the probability of a given item being true (Francis *et al.*, 2004). The endpoints undesirable/desirable are used to measure outcome evaluation in preference to unimportant/important as they are directional, thereby enabling the respondent to say what are positive or negative endpoints (Francis *et al.*, 2004).

**Normative Belief Measures:** The assessment of normative beliefs follows logic similar to that involved in the measurement of behavioural beliefs. Issues emerged in the belief identification elicitation questionnaire, which were formulated as measures of normative beliefs. Four salient normative beliefs emerged. Two questions are asked with respect to each factor, assessing normative belief strength and motivation to comply. An overall normative belief composite is obtained by applying the expectancy-value formula to these measures (Ajzen and Driver, 1991).

**Measures of Control Beliefs:** The assessment of control beliefs also follows logic similar to that involved in the measurement of behavioural and normative beliefs. Five pertinent control beliefs emerged. Two questions are asked with respect to each factor, assessing control belief strength and control belief power. An overall control belief composite is obtained by applying the expectancy-value formula to these measures (Ajzen and Driver, 1991).

**Pilot Questionnaire Data Analysis:** The pilot study was analysed in a number of respects. The demographic, geographic, and behavioural questions contained in Section A were tested for clarity and comprehension. A satisfactory outcome was exhibited and they were included unchanged in the final questionnaire.

The EMI-2 was also analysed from a comprehension perspective. Respondents demonstrated no issues in this regard and an internal reliability analysis of the fourteen motivational constructs inherent in the scale appears to confirm this, with all sub-scales illustrating strong internal reliability. This facilitated the inclusion of an unchanged EMI-2 scale in the final survey.

The direct measures of each of the four TPB constructs were analysed with a view to reducing the number of variables to be included in the final questionnaire. A small subset of scales that exhibited high internal consistency was selected for the final attitude measure. Finally, a series of simple bi-variate correlations between the direct and indirect measures of the same construct were conducted to confirm the validity of the indirect measures. These correlations were all of significant magnitude indicating that the indirect measures covered the breadth of the measured construct.

### **5.6.2.3 Phase 3: Temporal Stability Study**

Ajzen (2002) recommends that the indirect measures of the TPB are tested for temporal stability in a test-retest process, as internal consistency is not a suitable mechanism for measuring the reliability of the indirect measures. Temporal stability is an important characteristic in prospective studies that attempt to predict behaviour at a later point in time. If measures of the theory's constructs lack temporal stability, they cannot be expected to predict later behaviour (Ajzen, 2002). This was recognised in this study,

when the indirect measures of the TPB were retested after a two-week interval to the same sample audience. Of the original respondents, 45 out of 52 completed the temporal stability/retest phase of the research.

The retest indicated very strong temporal stability amongst the indirect measures of the TPB. A Cronbach's Alpha analysis was used and all variables illustrated highly significant correlations when measured at two different points in time. This outcome facilitated the inclusion of an unadjusted set of variables for the final questionnaire.

### **5.7 Main Survey Instrument**

The composition of the final survey instrument was determined by the comprehensive review of the literature on the correlates of exercise behaviour, the preliminary discussion groups that evaluated these correlates in the context of the population of interest for this study, and the preliminary survey which tested the proposed instruments for inclusion in the main survey. The content for the final survey is broadly similar to the pilot questionnaire, the principal modifications coming in Section C<sup>14</sup>, where the number of variables gauging the TPB direct measures was reduced. The reasoning outlined for the inclusion of the different measures in the pilot questionnaire also applies for the final instrument.

An additional phase of research was enacted following the main survey. Fishbein and Ajzen, (1975) outline the value of integrating an actual behavioural analysis into research. The use of the TPB in this study provides an appropriate mechanism for capturing the influences on the survey participants' exercise behaviour post the administration of the main survey. Ajzen and Driver (1991) highlight the insightful value of examining the relationships between the elicited TPB beliefs and respondent behaviour. The author crafted a brief questionnaire based on the moderate and vigorous regular exercise recommendations of the WHO (2004), to collect the behavioural data in this phase.

---

<sup>14</sup> See Section 6.11 for an analysis of the pilot questionnaire data and Chapter 7 for a discussion on the reduction of the TPB measures for the main survey.

### 5.7.1 Selecting the Sampling Procedure

The rationale for targeting a predominately young adult audience has been elucidated in Section 1.2, it being a cohort where disengagement from regular exercise is particularly pronounced. The author has elected to gather the data at a tertiary education institute, which affords the opportunity of capturing both the salient exercise correlates of the problematic young adult group, and contrasting this to the perspectives of the sizeable ‘older’<sup>15</sup> grouping in the institute population. Focusing solely on the population of the chosen educational institute does have the potential for creating a cohort effect. Research Proposition 1<sup>16</sup> narrows the domain of study to this particular population and care is taken to ensure that the sample chosen from within the population is selected using probability sampling methods. However, the narrow target audience focus, and resulting scope for a cohort effect, means that the segment outcome may not be generalisable across populations. It does not impact on the core segmentation process development objective of this research, as this is a process that is not dependent on the audience targeted.

Pure random sampling of the target population was not an option for the researcher, primarily due to restrictions in accessing a full census list of the students of the chosen tertiary institute<sup>17</sup>. The author wanted to engage in probability sampling and a simple cluster sampling approach emerged as an appropriate alternative to simple random sampling. Cluster sampling involves dividing the population into discrete groups prior to sampling, which can be based on any naturally occurring grouping (Henry, 1990). The sampling frame is the complete list of clusters, rather than a complete list of individual cases within the population. Clusters are then chosen for inclusion in the study using simple random sampling. The entire population of each of the chosen clusters will then be surveyed.

This approach is most appropriate for the unit of population of this study. The fact that the research was administered at the target population’s place of education means that

---

<sup>15</sup> For the purposes of this study age groupings have been defined as: the ‘older’ cohort being categorised as those aged 25 or more, while the ‘younger’ group are aged between 18 and 24.

<sup>16</sup> Research Proposition 1: The exercise behaviour of the population of an Irish tertiary-level educational institute will contain segments that are clearly differentiable on the basis of participant motivation.

<sup>17</sup> Data protection policies in Irish tertiary educational institutes preclude the issuing of a full list of students enrolled in the institutes.

they are already grouped in naturally occurring clusters, i.e. their course class. A list of each class in the chosen educational list was available to the researcher and a simple random sampling approach was employed to choose cluster units for the study. Each member of the chosen cluster/class was then surveyed.

The random selection of clusters makes cluster sampling a probability sampling technique. However, the technique normally results in a sample that represents the total population less accurately than simple or stratified random sampling. It is recommended that the researcher maximises the number of clusters surveyed to allow for variations in the population and thus increase the representativeness of the sample (Saunders, Lewis, and Thornhill, 2009). The clusters in this case varied considerably in size, with within-cluster maximum populations ranging from 5 to 68. The random selection of clusters meant that 55 different clusters were surveyed to reach the desired sample size, which represents a broad cross section of potential clusters in the target population.

### **5.7.2 Determining the Sample Size**

The size of the sample used for a segmentation study is a key decision. The intention is to employ a cluster analysis procedure to identify market segments. Mooi and Sarstedt (2011) highlight that there is no generally accepted rule of thumb concerning minimum sample sizes or recommendations regarding the number of objects to be surveyed per the number of clustering variables used. This is a particularly important consideration as every additional variable requires an over-proportional increase in observations to ensure valid results.

Formann (1984) recommends a sample size of at least  $2^v$  where  $v$  is the number of variables used in the clustering procedure. Mooi and Sarstedt (2011) argue that this can only provide an approximate guideline. In a related field, Hair *et al.* (2010) outline the importance of sample size in multiple regression analysis. The size of the sample has a direct impact on the appropriateness and the statistical power of a multiple regression. Hair *et al.* (2010) suggest that a general rule is that the ratio of observations to independent variables should never fall below 5:1. They state that the desired level is between 15 and 20 observations for each independent variable. Using Hair *et al.*'s (2010) rule of thumb, ideally 15-20 observations per independent variable, a sample size in the region of 765 (51 variables x 15) is required.

Taking 765 as the guideline minimum sample size, the actual number of objects in the population to be targeted can be calculated using the following formula suggested by Saunders, Lewis, and Thornhill (2009):

$$Na = \frac{N \times 100}{re\%}$$

*Na* = actual sample size required

*n* = minimum sample size

*re%* = estimated response rate expressed as a percentage

The study was carried out in a classroom situation, so potential response rate was relatively easy to calculate. The average class attendance rate in the tertiary institute in question is estimated to be *circa* 70%. In the pilot study 98% of respondents that were requested to actually completed the survey. If one allows for a slightly higher figure *circa* 5% of non-compliance with the request to complete the survey, an estimated response rate of 65% appears reasonable.

$$(765 \times 100)/65 = 1,177.$$

This figure of 1,177 was used as the basis for calculating the number of clusters that were required for targeting to gather a sample in region of 765.

The research adopted a factor-cluster approach to the segmentation process, whereby the 51 EMI-2 variables were reduced into higher order factor constructs to improve the manageability of the clustering procedure. The number of constructs that emerged post-factor analysis obviously would not have been known prior to the survey administration, so the sample size calculations outlined above remain pertinent. The factor analysis of the EMI-2 variables is outlined in Section 7.5 and reveals a 9 factor solution. The 9 factors are then processed through the chosen cluster analysis process. Taking this into account, the minimum sample size required for the cluster analysis according to Formann's (1984) guideline is  $2^9 = 512$  observations.

Another useful guideline for determining sample size is proposed by Baines and Chansarkar (2002). They suggest using the following equation for determining sample size using sample proportions:

$$n = (Z^2 \times p(1-p)) / e^2$$

Where: **n** = sample size

**Z** = standard score from Z scores table for required confidence interval, 95% = 1.96, for 99% z = 2.58

**p** = estimated sample proportion

**e** = half of the desired width (because of the symmetry of the distribution of the estimate assuming normal distribution) of the acceptable error (usually 0.05)

**o** = estimated sample standard deviation.

Using 50% as the proportion, 95% confidence interval, and 0.05 error level, a required sample size of 384 is obtained for this study.

A final point to note concerns the demographic/geographic/behavioural variables being examined in Section A, and the TPB variables evaluated in Section C of the survey. The data derived in Sections A and C are not involved in the cluster analysis process and as such are considered to be not relevant to the sample size decision. Sections A and C data are used solely as segment profiling and description agents for the derived segments.

In summary, the sample size decision is based on Hair *et al.*'s (2010) rule of thumb of between 10-20 observations per variable being examined. It uses Saunders, Lewis, and Thornhill (2009) formula for determining how many objects need to be targeted to ensure that the sample size requirements are met. This process also establishes a sample size that exceeds the minimum size recommendations of Formann (1984) and Baines and Chansarkar (2002).

## **5.8 Analysis of the Main Survey Data**

The analysis of the data accumulated from the main survey takes place in two distinct phases. Phase 1 involves the process enacted to identify segments of the target population based on their motivation for exercising regularly. It also entails an additional description and profiling of the extracted segments, using the demographic

and behavioural data from Section A of the survey and the TPB belief measures contained in Section C<sup>18</sup>.

Phase 2 of the survey was the follow-up behavioural questionnaire administered four weeks after the main survey. The purpose of this was to measure the survey participants' exercise behaviours in the intervening time period.

### **5.8.1 Phase 1 Analysis**

Research Proposition 1 and its associated hypotheses are examined in Phase 1 of the analysis. Identification of market segments typically involves classification of consumers into a set of mutually exclusive and exhaustive groups with high levels of intra-group homogeneity and inter-group heterogeneity (Arndt, 1974). The core goals of the study favour a *post hoc* approach to segment identification. Foremost among *post hoc* methods are clustering, Chi Square Automatic Interaction Detection (CHAID), and finite mixture models (Bassi, 2007). Finite mixture models (FMM) are considered to be a viable alternative to heuristic-based algorithms, with the notable advantage of facilitating the provision of a formal statistical model for the segmentation procedure. However, in practice many of the problems and decisions that cluster analysis presents pertain for FMM analysis too: selecting the type of FMM, selection of appropriate variables, determination of the number of variables and sample size, data pre-processing requirements, selecting the optimal number of segments, validity and stability tests on the segmentation outcome and interpretation and profiling of the segments (Tuma and Decker, 2013). Model-based approaches to market segmentation are assuming greater prominence although concerns remain about how they perform relative to non-model based segmentation approaches (Andrews, Brusco and Currim, 2010). New models are regularly emerging and practice based implementation has been hindered by restricted availability user friendly software, although the Latent GOLD software package has gone somewhat offset this deficiency.

CHAID (Kass 1980; Magidson 1988, 1994) is used when a categorical dependent variable, and a set of categorical independent variables are present, CHAID looks for the relationships between the dependent variable and the rest of the variables and ultimately selects a set of predictors and their respective interactions that optimally

---

<sup>18</sup> The main survey instrument can be viewed in Appendix A.5

predict the dependent measure (Magidson 1994). The result is a classification tree that shows how certain sets formed from the predictor variables differentially predict the dependent variable. The principal difference with a standard cluster analysis is that the segments are based on a dependent variable, and are thus derived for prediction. Another difference with standard cluster analysis is that with CHAID the derived segments are not based on the same variable – that is, it discovers interaction effects among variables (Galguera, Luna, and Mendez, 2006).

Clustering methods are the most popular tool for segmentation and have been chosen as the means of identifying the segments inherent in the surveyed market. Cluster analysis seeks to identify homogeneous subgroups of cases in a population and is used when the researcher does not know the number of groups in advance, but wishes to establish groups and then analyse group membership. The goal of cluster analysis is to identify a set of groups that minimises within-group variation and maximises between-group variation (Hair *et al.*, 2010). The assorted clustering algorithm options are evaluated in Section 5.8.1.3.

Tuma, Decker, and Scholz (2011) argue that market segmentation is a critical strategic concept and when conducted well can facilitate a fuller understanding of, and prediction of, the behaviour of markets. This in turn facilitates more effective targeting of identified market segments. However, they acknowledge considerable shortcomings in market segmentation practice. Implementation issues are plentiful, particularly as there is frequently a poor understanding of how segments are derived, which can lead to an overestimation of the segmentation solution (Dolnicar and Lazarevski, 2009). Given this, Tuma, Decker, and Scholz (2011) outline a six-stage process for using cluster analysis techniques to segment markets effectively. The study integrates contemporary developments in the application of cluster analysis to market segmentation, building upon previous reviews of the area provided by Arabie and Hubert (1984) and Dolnicar (2003). This is used as a guiding framework for this study.

#### **5.8.1.1 Stage 1: Variable Selection and Sample Size**

The selection of appropriate variables to be used in the clustering process is of critical importance (Tonks, 2009). Tuma, Decker, and Scholz (2011) contend that the

researcher must evaluate the relevance of the variables in the context of the type of segments being sought. Consideration must also be given to the contribution of the chosen variables in improving the meaningfulness and validity of the cluster outcome. It is postulated that motivation-related variables can provide a more differentiated analysis of consumer behaviour. Consequently, it is a more appropriate base for segmentation than general descriptors such as demographic and psychographic variables (Allenby *et al.*, 2002). This underpins the reasoning to use the EMI-2 scale as the core base for segmentation. The author outlined his proposed strategy for determining the required sample size in Section 5.7.2.

### **5.8.1.2 Stage 2: Data Pre-processing**

The next stage determines if the data needs some form of pre-processing. The comprehensive 51 item EMI-2 scale was chosen as the base for segmentation. However, the volume of variables being measured in the EMI-2 scale is problematic from a clustering perspective. Mooi and Sarstedt (2011) warn that researchers should avoid using large volumes of clustering variables, as this can present complications with variable multi-collinearity. A common approach to redressing this problem is to apply cluster analysis to factor scores derived from a factor analysis of a larger number of variables (Hair *et al.*, 2010). Employing this approach has been critiqued in a number of quarters (Ketchen and Shook, 1996; Dolnicar and Grun, 2008). Dolnicar and Grun (2008) argue that applying a factor analysis prior to clustering results in a sub-optimal outcome, as a sizeable proportion of the information inherent in the data are not used in the cluster formation. This is a reasonable assertion, but it is felt that in this case the inclusion of all 51 variables in the clustering procedure would be unwieldy and the author reasons that it is necessary to reduce the number of variables for clustering to eliminate any multi-collinearity issues. Additionally, data reduction facilitates a manageable sample size, as a literal application of Formann's (1984) rule of thumb to the 51 variables would lead to an astronomical sample requirement ( $2^{51}$ ). Thus, it is acknowledged that the clusters are going to be determined in a transformed data space. This must be reflected in the analysis and profiling of the derived segments.

Tuma, Decker and Scholz (2011) also discuss the standardisation of variables, particularly where different scales are being used in the analysis. In this study, the core bases for the segmentation are measured using the same continuous scale, although a

number of potential profiling variables use different categorical scales. Any issue in this regard is overcome with the application of the IBM Statistical Package for the Social Sciences (SPSS) two-step clustering procedure, which automatically standardises all data used.

### **5.8.1.3 Stage 3: Selecting the Appropriate Clustering Algorithm**

Choosing an appropriate clustering method from the large number of methods available is one of the most critical issues in utilising cluster analysis (Romesburg, 1990). Each method has its advantages and inherent biases, as well as advocates and critics. Different types of clustering procedures have been shown to generate markedly different results for the same data set (Edelbrock 1979; Milligan 1980). Ultimately, choice of a clustering method depends upon several considerations. These include the characteristics of the various clustering techniques with respect to the given purpose of the research, and characteristics of the data (i.e., whether the measurement scale of the variables measured for each entity are quantitative, qualitative, or a mixture of both) (Romesburg 1990).

Tuma, Decker and Scholz (2011) outline that three major forms of clustering method predominate, those being non-overlapping, overlapping and fuzzy methods. Non-overlapping methods are applied in this study and these can be categorised as hierarchical and non-hierarchical methods. The relative merits of these methods are outlined in subsequent paragraphs, but it is felt that neither are the optimal method for this study. Instead, the author focuses on the two-step clustering procedure, which overcomes many of the difficulties of the other methods. The use of two-stage procedures is recommended by Punj and Stewart (1983), who suggest its use in the absence of *a priori* information. With the two-stage procedure a hierarchical algorithm is used to define the seed points for the subsequent non-hierarchical clustering, which addresses the problem of poor initial classification.

Hierarchical clustering allows users to select a definition of distance, then select a linking method for forming clusters, then determine how many clusters best suit the data. It generates representation of clusters in icicle plots and dendrograms. Hierarchical clustering is appropriate for smaller samples (typically < 250) (Hair *et al.*, 2010). When

there is a large sample, the algorithm will be very slow to reach a solution and given the sample size in this study (775) the use of hierarchical clustering would be unwieldy.

K-means clustering requires the researcher to specify the number of clusters in advance, before the algorithm calculates how to assign cases to the K clusters. Large datasets are possible with K-means clustering, unlike hierarchical clustering, because K-means clustering does not require prior computation of a proximity matrix of the distance/similarity of every case with every other case (Hair *et al.*, 2010). However, the researcher must specify in advance the desired number of clusters and the exploratory nature of this study makes the practice of pre-prescribing the number of clusters an uncertain one.

A two-stage clustering approach in which hierarchical clustering is used in conjunction with an iterative partitioning (reallocation) method is often considered an optimal way to perform classifications. This is primarily because the approach allows one to take advantage of the beneficial characteristics of both hierarchical and iterative methods (Punj and Stewart 1983; Milligan 1996). Unlike hierarchical clustering methods, iterative methods work directly on the raw data and do not require the calculation and storage of a large (N x N) matrix of similarities among cases. Consequently, they allow researchers the opportunity to analyse substantially larger data sets than hierarchical methods (Aldenderfer and Blashfield 1984). More importantly, iterative methods make more than one pass through the data and can compensate for a poor initial partition of the data.

The author contends that two-step clustering is the most applicable approach for this study. Two step clustering is proficient at handling large data sets and is the method chosen when data are both continuous and categorical. The two-step method requires only one data pass in the procedure. It identifies pre-clusters in a first step, before treating these as single cases in a second step which uses hierarchical clustering. An additional advantageous feature is that the researcher can let the two-step algorithm determine the number of clusters automatically, or the researcher may set the number of clusters. The SPSS two-step procedure extends work of Banfield and Raftery (1993), whose work developed a clustering method for continuous variables based on the reduction in log-likelihood when two clusters are merged. It also developed the work of

Melia and Heckerman (1998) using a similar probabilistic approach for categorical variables. While traditional K-means and hierarchical clustering procedures were effective for small and medium datasets, they did not cluster accurately for very large datasets. SPSS incorporated the two-step concept developed for BIRCH<sup>19</sup> clustering (Zhang, Ramakrishnon, and Livny, 1996). In this process a very large dataset would be reduced to sub-clusters, which in a second step could each be analysed accurately by largely traditional clustering methods.

A number of factors influenced the choice of the two step clustering approach:

- Simulation studies have shown this method to outperform other clustering procedures. SPSS conducted simulations on datasets ranging from 8,400 to 2.5 million records and found:
  - 1) For all datasets, the two-stage cluster algorithm correctly identified the number of clusters and
  - 2) The percentage of cases wrongly clustered ranged from 0% to 1.2%, with the median being between .03% and .07% (SPSS, 2001).
- It handles large data sets more proficiently than other methods, which is a necessary consideration given the sample size of this study (n=775).
- Although normal distributions of data are recommended, the two-step procedure is thought to be quite robust in handling non-normal data. Normality tests on the data in this study presented some issues and various adjustments to the data brought about only minimal improvement in the situation<sup>20</sup>. Thus it was essential to utilise a procedure that could robustly deal with non-normal data.
- It has a facility for handling outliers. A small number of outliers were identified in the initial stages of data analysis. Close examination revealed these outliers to be all true/real values, so the clustering procedure was run both with and without the outlier cases, with no major differences in the outcome emerging.
- It automatically standardises all data, which eliminates any potential scaling issues.
- It affords the option of automatically selecting the number of clusters using BIC or AIC, which is necessary given the lack of *a priori* knowledge of the number of market segments present. The auto-clustering statistics table in SPSS output

---

<sup>19</sup> Balanced Iterative Reducing and Clustering using Hierarchies (BIRCH).

<sup>20</sup> See Section 8.2.1 for the discussion on the data assumptions in the cluster analysis for this study.

can be used to assess the optimal number of clusters in two-step cluster analysis. As a rule of thumb, the solution with the lowest information criterion measure, either the Schwarz Bayesian Information Criterion (BIC) or the Akaike Information Criterion (AIC), and the highest ratio of distance measures is optimal. When auto-clustering is selected, SPSS will first pick a solution (number of clusters) based on lowest BIC/AIC and then will adjust the solution by taking into account solutions with a large ratio of distance measures. Simulation studies have shown these criteria in combination work better than BIC or AIC alone (SPSS, 2001)

An important issue to note with two-step clustering is that the cluster feature tree and the associated clustering solution can be affected by the order of the data (Tsiptsis and Chorianopoulos, 2009). This problem is magnified with smaller datasets. A recommended strategy to overcome this difficulty is to run the cluster procedure with different random orderings of the data. This establishes the stability of the cluster solution (Hair *et al.*, 2010).

#### **5.8.1.4 Stage 4: Determining the Number of Clusters**

The default option within SPSS uses an algorithm based in part on a Bayesian (BIC) or Akaike (AIC) Information Criterion loss to determine automatically the optimal number of clusters. The researcher can also override this and specify a fixed number of clusters. BIC is now the more accepted criterion in research (Hair *et al.*, 2010).

#### **5.8.1.5 Stage 5: Evaluation and Validation of Clusters**

The fifth step of cluster analysis involves evaluating and validating the extracted cluster solution. This is an essential process as clustering methods can often impose a cluster solution rather than perform a cluster-seeking function. The stability and validity of the cluster solution is important, while the practical significance of the final cluster solution must also be evaluated (Hair *et al.*, 2010). Numerous methods, that have been interchangeably described as stability or validity tests exist for performing this analysis.

In a good cluster solution, the elements within a cluster are similar to one (cohesive) while the clusters themselves are quite different (separated) (Tsiptsis and Chorianopoulos, 2009). The default SPSS measure for quantifying the ‘goodness’ of a

cluster solution is the popular silhouette coefficient, which is a measure of both cohesion and separation. For each element in a cluster, you calculate the average distance to all other elements in its cluster and the average distance to all elements in each of the other clusters. In a good solution, the within-cluster distances are small and the between-cluster distances are large, resulting in a silhouette measure close to the maximum value of 1. If the silhouette measure is negative, the average distance of a case to members of its own cluster is larger than the average distance to cases in other clusters, an undesirable feature. The silhouette measure for a cluster is just the average of the silhouette measures for the cases within the cluster. The silhouette measure ranges from  $-1$  to  $+1$  (Kaufman and Rousseeuw, 1990).

Tsiptsis and Chorianopoulos (2009) suggest that cluster validity should be assessed by three criteria:

- 1) Size: Clusters should be large enough to be meaningful, while a solution with one dominant cluster and/or very small clusters is problematic.
- 2) Meaningfulness: The meaning and initial profile of each cluster should be evident from the constituent variables used to create the clusters.
- 3) Criterion Validity: The examination of the identified clusters with other variables known from theory to correlate with the concept that the cluster analysis is reflecting, should reveal the expected level of association.

Hair *et al.* (2010) recommend some approaches for the validation of cluster solutions. The most direct approach is to analyse the cluster solutions of different samples of the target population and assess the conformity of the results. However, there are considerable time and cost constraints associated with having to survey multiple samples, so Hair *et al.* (2010) suggest splitting the sample into two groups and then comparing the results for each cluster. Cross-tabulation can be used to assess any differences in membership of each cluster.

#### **5.8.1.6 Stage 6: Interpretation, Description, and Profiling of Clusters**

The stage begins by evaluating each cluster in terms of the cluster variables used. This process will facilitate the assignment of a label or name that accurately describes the composition of each cluster. Cluster centroid analyses are recommended to aid the interpretation and profiling process (Decker *et al.*, 2005), while Tuma, Decker, and

Scholz (2011) suggest that even data that have not been used to describe cluster members can be processed to help distinguish one cluster from others. Hair *et al.* (2010) contend that the cluster interpretation facilitates an assessment of the practical significance of identified clusters.

Segment profiling involves outlining the differentiating characteristics of each cluster. The profile analysis evaluates the cluster characteristics after they have been identified, rather than focusing on the variables that directly determine the clusters. Data that were not used in the original clustering procedure can be used to profile the characteristics of the identified clusters (Hair *et al.*, 2010).

The cluster centroids are used as the basis for the initial description of clusters in the study. An ANOVA is used to compare the motivational variable centroids across clusters and this contributes toward the verification of Research Proposition 1.

A key thrust of this research is to look beyond the clustering variables to enhance the description and profiling of the extracted motivational segments. This integrates other key correlates of exercise behaviour into the analysis, creating a richer understanding of each segment. Research Propositions 2 to 4 assess the gender, age, and recent exercise status of segment members. A series of ANOVA and chi-square analyses are employed to determine differences in segments based on these behavioural correlates. Within-segment differences in motivational profile based on gender, age, and recent exercise status are examined to test Research Proposition 5 and a series of independent samples t-tests perform this analysis. Research Proposition 6 examines differences in the elicited TPB beliefs across segments. A sequence of ANOVA tests evaluates this proposition.

### **5.8.2 Phase 2 Analysis**

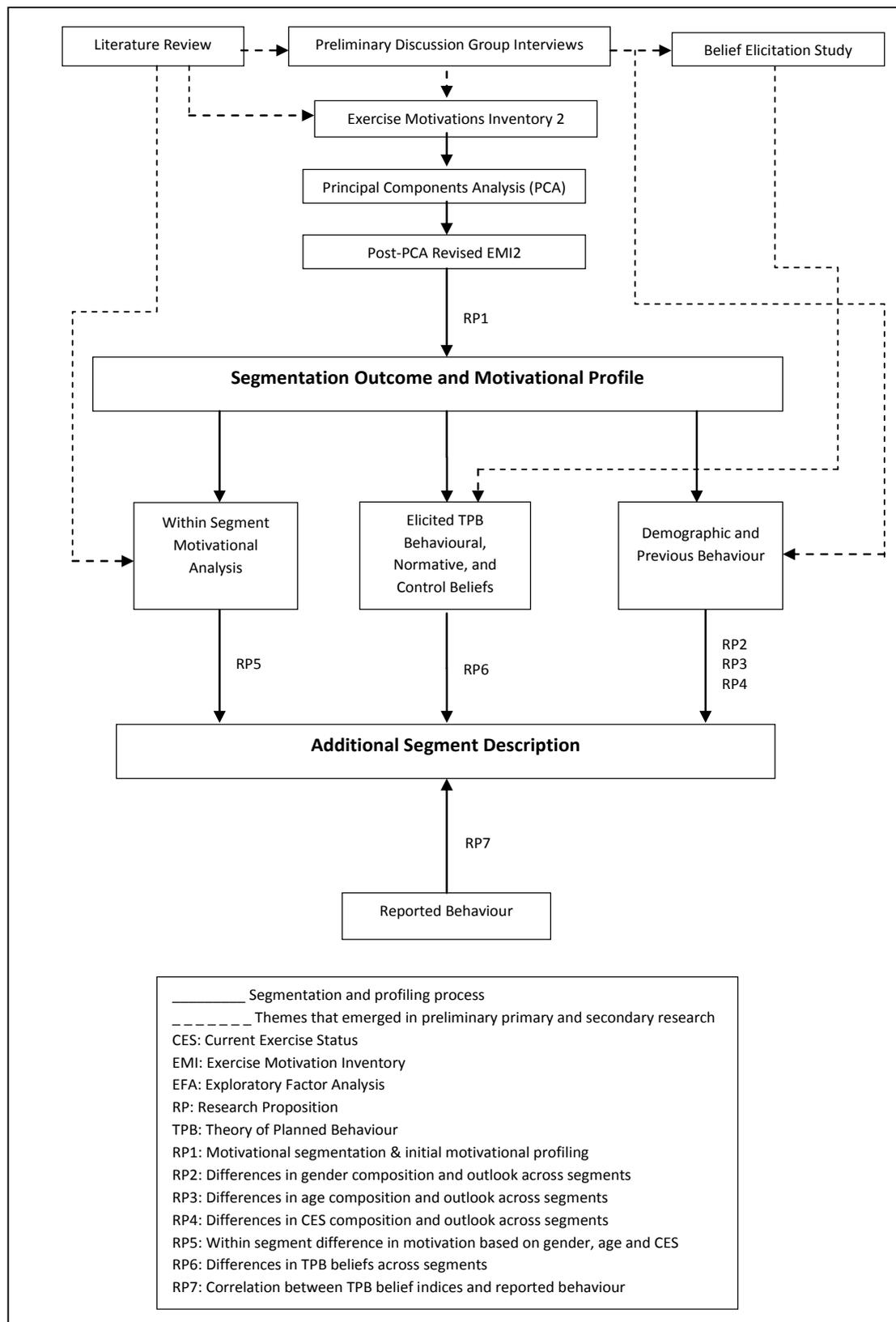
The final phase of data collection involves respondents reporting their exercise behaviour for the four weeks immediately after the main survey completion. It facilitates the researcher in examining relationships between summated beliefs and reported behaviour. This analysis provides the basis for Research Proposition 7. A brief questionnaire, based on the moderate and vigorous regular exercise recommendations of the WHO (2004), is employed to collect the behavioural data. The resulting behavioural output is correlated with the summated behavioural, normative, and control

belief indices. A Pearson correlation analysis is conducted to assess the summated beliefs' relationships with behaviour for each segment.

### **5.9 Modelling the Proposed Segmentation Process**

The core objective of this study is to establish a segmentation process that effectively captures the multiple correlates of exercise behaviour. The proposed process is diagrammatically represented in Figure 5.1.

**Figure 5.1: Proposed Segmentation Process Diagram**



The segmentation and segment description process is informed by a thorough review of the literature, the preliminary discussion group research phase, and the belief elicitation study. Broken lines in the diagram illustrate the linkage between these preliminary

phases of research and the proposed segmentation process. This preparatory phase should be engaged in prior to the administration of the author's proposed segmentation process.

The actual process can be divided into five phases. It commences with a factor analysis of the EMI-2 variables<sup>21</sup> to reduce the constructs for inclusion in the cluster analysis to manageable proportions. The two-step cluster analysis is then enacted on the post-principal component analysis EMI-2 constructs and a segment outcome is derived. Research Proposition 1 tests this phase of the process, proposing that the segment output will contain segments that are clearly differentiable on the basis of the EMI-2 constructs used in their identification. The literature and preliminary discussion group interviews highlighted the key role played by gender, age, and recent exercise behaviour in differentiating exercise motivation and engagement. An analysis of differences in segment membership and variation in motivation on the basis of these three variables is at the core of the second phase of analysis. Research Propositions 2 to 4 test these differences and it is reasoned that this will aid distinctive profiling of each segment.

Remaining within-segment heterogeneity is highlighted in the literature as an issue in many segmentation studies. The next phase of the process (Research Proposition 5) addresses this issue by examining each segment for differences in their motivational process based on their gender, age, and recent exercise behaviour. This will add a further layer of richness to the segment description and facilitate increasingly differentiated intervention approaches. The literature and preliminary discussion groups also suggest the pertinence of the TPB as a mechanism for capturing other key correlates of exercise behaviour. The belief elicitation phase extracts the most salient of these beliefs for the target audience, facilitating their inclusion in the main survey instrument. Research Proposition 6 examines the differentiating properties of the elicited TPB beliefs across segments. The final research proposition category examines the relationships between the TPB beliefs and reported behaviour for the four weeks after the administration of the main survey. The literature suggests that the relationship between reported behaviour and the summated belief components of the TPB can differ across groups and this is tested by Research Proposition 7. As this final phase of the

---

<sup>21</sup> The decision to use the EMI-2 scale was informed by the literature review and preliminary discussion groups.

segmentation process integrates a measure of reported behaviour, it provides a further unique descriptive facet for the identified segments.

### **5.10 Ethical Considerations**

The author gave consideration to ethical issues relating to the treatment of respondents, and also to the management and retention of the collected data throughout the research process. Guideline structures set out by Saunders, Lewis, and Thornhill (2009) were employed in this regard. The proposed research process and survey was approved by the research ethics committee at the institute where the author is registered for the dissertation. All participants in the various phases of research were asked to sign a consent form indicating their willingness to participate in a study of this nature. The collected survey data is stored under lock and key, while discussion group interview files have been transferred to the author's personal computer and password protected. The interview files were immediately wiped from the dictaphone upon successful transfer. All issues with regard to confidentiality and anonymity are respected, and codes are given instead of respondent's names in the interview transcripts and the quotes inserted in the main body of the text. The researcher will keep the files in a secure manner for the required number of years, after which they will be disposed of in accordance with the Data Protection Act 2003. Finally the researcher has remained impartial and unbiased throughout all aspects of the research process.

### **5.11 Chapter Conclusion**

The chapter commenced with an examination of the philosophical assumptions of social science research and outlines the moderately positivistic philosophic viewpoint of the author. This outlook is reflected in the research approach adopted, combining an initial phase of exploratory qualitative data collection, with a quantitative main survey instrument. The rationale behind the core research objective and associated research propositions is outlined and the author sets out in some detail the research process and analytical techniques employed to achieve the objective and test the hypotheses. Finally, the proposed segmentation process employed to achieve the core research objective of the study is illustrated.

# **Chapter 6. Analysis of Preliminary Phases of Research**

"Like the marathon, life can sometimes be difficult, challenging and present obstacles, however if you believe in your dreams and never ever give up, things will turn out for the best"

Meb Keflezighi, U.S. Olympic Marathoner.

## **6.1 Chapter Overview**

Preliminary research took place in four stages: the preliminary discussion groups, the belief elicitation study, the pilot questionnaire administration, and the temporal stability test. The output of each of these phases of research is analysed in this chapter, commencing with a review of the preliminary discussion group interviews. Sections 6.2 to 6.8 assess the key output of this qualitative research. The process enacted to develop and analyse the pilot questionnaire is evaluated in Sections 6.9 to 6.11.

## **6.2 Discussion Group Overview**

This initial phase of the research involved the in-depth interviewing of five cohorts of respondents in discussion groups. The groups were drawn from the target population of students of a tertiary educational institute in Ireland. Identifying the key correlates and influences of the target audiences' exercise behaviours was the central purpose of the discussion groups. The literature highlighted many potential correlates of exercise behaviour and a number of frameworks for encapsulating these. It was envisaged that the discussion group phase of the study would aid the researcher in identifying and understanding the key influences on exercising for this particular target population. This facilitates the implementation of an appropriate research design to best capture the correlates of the exercise behaviour of the chosen cohort.

Groups were drawn from randomly selected class units from a full list of classes within the tertiary institute. The next step was to seek consensual volunteers from within the identified class units. Where the level of volunteers exceeded requirements, discussion group participants were randomly selected. Each group consisted of between eight and ten participants, three of the groups were a mix of male/female contributors, while there was one all-male and one all-female discussion group.

The discussion groups contained a wide variety of individuals, with varying levels of interest and participation in exercise. Participants in the research each completed a brief preliminary questionnaire which aided the profiling of respondents. Additionally, a number of open-ended questions were posed to elicit what the respondents felt were the key determinants and influencing factors on their exercise behaviour. Data gathered at this point were synthesised and combined with issues that emerged from the earlier review of the literature to provide the basis for the discussion group interview guide.

Scope was also given during the interviews to examine any additional exercise influencing issues that emerged.

Discussion group members are profiled in Table 6.1. In total there were 46 participants of whom 36 were aged between 18-24, while 10 respondents were aged 25 or more. 24 of the contributors were male, 22 female. Regular exercisers represented 27 of the 46 discussion group members, with 19 non-regular exercisers partaking. Lack of motivation, study and work commitments, and other leisure interests are the most cited reasons for not engaging in regular exercise. The bulk of respondents live in urban areas. Team sports such as soccer and hurling, in addition to individual gym sessions, are the most favoured activities amongst regular exercisers. Most regular exercise takes place in organised sports clubs or commercial gymnasiums. It should be noted that in excess of 95% of respondents report being regular exercisers at some stage in their life and many still exercise to an extent that falls below the recommended threshold. Individuals classified as non-regular exercisers were requested to draw upon previous experiences with exercise, as well as any physical activity currently engaged in, to outline the correlates of their recent exercise behaviour.

**Table 6.1: Discussion Group Profiles**

	Age	Gender	Residence	Exercise Status	Reasons for Not Participating	Favoured Exercise	Place of Exercising
Mixed Discussion Group A: <b>G1</b>	36	M	Urban	Non-Reg	Family	n/a	n/a
	20	M	Urban	Reg	n/a	Hurling	Sports Club
	19	F	Urban	Non-Reg	Motivation, Cost	n/a	n/a
	20	M	Urban	Reg	n/a	Gym	Gym
	42	F	Rural	Non-Reg	Motivation	n/a	n/a
	19	M	Rural	Non-Reg	Other Interests	n/a	n/a
	20	F	Urban	Non-Reg	Injury	n/a	n/a
	26	M	Rural	Reg	n/a	Horse Riding	Public Places
	19	F	Urban	Non-Reg	Study/Work	n/a	n/a
All Male Discussion Group: <b>G2</b>	20	F	Urban	Reg	n/a	Walking	Public Places
	22	M	Urban	Non-Reg	Study/Work	n/a	n/a
	22	M	Urban	Reg	n/a	Soccer	Sports Club
	20	M	Urban	Reg	n/a	Soccer	Sports Club
	22	M	Urban	Reg	n/a	Soccer	Sports Club
	22	M	Urban	Non-Reg	Study/Work, Motivation	n/a	n/a
	25	M	Rural	Reg	n/a	Rugby	Sports Club
	22	M	Urban	Non-Reg	Study/Work, Motivation	n/a	n/a
	24	M	Urban	Reg	n/a	Soccer	Sports Club
Mixed Discussion Group B: <b>G3</b>	25	M	Rural	Reg	n/a	Gaelic Football	Sports Club
	25	M	Urban	Reg	n/a	Gym	Gym
	22	M	Urban	Reg	n/a	Gym	Gym
	43	F	Urban	Reg	n/a	Gym	Gym
	25	M	Urban	Non-Reg	Study/Work, Motivation	n/a	n/a
	31	M	Urban	Reg	n/a	Gym	Gym
	25	F	Rural	Reg	n/a	Horse Riding	Public Places
	23	F	Urban	Non-Reg	Injury	n/a	n/a
	22	M	Urban	Reg	n/a	Soccer	Sports Club
All Female Discussion Group: <b>G4</b>	27	M	Urban	Reg	n/a	Hurling	Sports Club
	21	F	Urban	Reg	n/a	Ladies Football	Sports Club
	24	F	Urban	Reg	n/a	Walking	Public Places
	19	F	Rural	Non-Reg	Study/Work, Family,	n/a	n/a
	21	F	Urban	Reg	n/a	Aerobics	Gym
	19	F	Urban	Non-Reg	Study/Work	n/a	n/a
	23	F	Urban	Non-Reg	Other Interests	n/a	n/a
	20	F	Rural	Non-Reg	Study/Work,	n/a	n/a
	21	F	Urban	Reg	n/a	Horse Riding	Public Places
Mixed Discussion Group C: <b>G5</b>	20	F	Urban	Non-Reg	Study/Work, Motivation	n/a	n/a
	19	F	Urban	Reg	n/a	Walking	Public Places
	19	M	Urban	Reg	n/a	Soccer	Sports Club
	21	F	Urban	Reg	n/a	Figure Skating	Ice Rink
	19	F	Urban	Non-Reg	Cost, Study/Work	n/a	n/a
	20	F	Urban	Non-Reg	Study/Work, Motivation,	n/a	n/a
	20	F	Urban	Reg	n/a	Running	Track
	20	M	Rural	Reg	n/a	Soccer	Club
	21	M	Urban	Non-Reg	Other Interests	n/a	n/a
22	M	Urban	Reg	n/a	Soccer	College	

Reg = Regular Exerciser; Non-Reg = Non-Regular Exerciser

The data<sup>22</sup> from the five discussion groups were transcribed verbatim and input into the QSR NVivo 9 software package. All the transcripts were read thoroughly in order to organise, manage, and retrieve the most relevant themes. Theme based analysis of qualitative data is frequently recommended in the literature (e.g., Coffey and Atkinson,

<sup>22</sup> In total five hours and forty seven minutes of total recorded interview time was transcribed.

1996; Robson, 2007). The researcher adopted this strategy by coding and content-analysing the data. Coding affords the researcher the opportunity to contextualise their data, although care needs to be taken as to how the codes are connected (Coffey and Atkinson, 1996). Once the interviews were coded, key issues from the research were identified. The coding structure that emerged is illustrated in Appendix F.

Foremost amongst the themes that presented are a series of motivational determinants of exercise. These critical motivating factors or benefits sought from exercise are reviewed initially. A detailed analysis of the additional correlates of exercise behaviour follows. These are categorised as the impact of other leisure-time activities, influence of significant others, availability of, and access to, facilities, and other restricting factors. Many of the themes that emerged also appear to be moderated by the age, gender, and recent exercise status of the respondents and this is integrated into the discussion of each of the themes. The findings are presented in a narrative manner, with quotations obtained from the interviews used to support the empirical findings.

### **6.3 Motivating Factors/Benefits Sought from Exercise**

As outlined in Section 6.2, a number of motivational issues emerged as key determinants of the exercise behaviour. These will be discussed in some detail in the following sections. The evaluation is interspersed with pertinent quotations from discussion group members. An outline of who the quotation is attributed to is included with each quote using abbreviations e.g., **G1 M20 Reg** incorporates:

**G1:** Discussion group that respondent is a member of, in this instance Group 1.

**M:** Male or **F:** Female

**20:** Age of Respondent, in this instance 20

**Reg:** Regular Exerciser or **Non Reg:** Non-Regular Exerciser

#### **6.3.1 Winning and Success**

The respondents were questioned on the importance of them winning and/or being successful at their activity. The impact of them being unsuccessful in their desired outcome was also discussed. Participants operating at a competitive sports level broadly cited winning and success as critical motivating factors:

I think winning is everything. If you are not winning I do not see a point. It can be very demoralising and not enjoyable (G2 M22 Reg).

The impact of not being successful at their activities is varied for the competitive sports cohort though, with sentiments ranging from that cited by the individual above, to lack of success driving on the individual even more:

I think it would lead to extra motivation, for me personally anyway (G3 M27 Reg).

The casual and non-regular exercise participants illustrated varied opinions on the importance of success, with some expressing the taking part as being all important:

[Winning] is not everything, once you are taking part it is ok. Participating is one goal. You are still going to have fun even if you are not winning (G4 F21 Reg).

Others need to see positive results for their efforts:

No it has to be successful. I am not a big fan of exercise for the sake of it. There has to be something at the end of it (G4 F19 Reg).

The female cohort in general appears less driven by the desire for winning/success in their exercise activities. An interesting issue to emerge amongst some female non-regular participants was the relative expense of some of the weight loss and keep fit programmes that they have taken part in, and the need to see a return on their investment in this. If they were not successful in this, they expressed a feeling of demotivation toward the activity:

I used to go to aerobics class every week, but it was not working for me. It cost a lot and I really did not think I was getting value for it, so I dropped out (G1 F19 Non).

Another relevant point to emerge during the discussion on winning and success is the issue of comparison to peers<sup>23</sup> who demonstrate superior skills or ability. This appears to be a motivating force for driving people on despite a relative lack of success to date:

I think as well that you tend to compare yourself to other people; you look at them and think I wish I could do that. So you are kind of egged on by them. I used to do cardio-kickboxing and used to think I really want to be as good as that person. I knew I had to get to a certain level before I could be as good as them, so it meant making sure I did it on a regular basis and built up my fitness (G5 F20 Reg).

The desire for success to result from exercise engagement is an extrinsic motivation, with the associated loss of control leading to uncertain outcomes that can lead to disillusionment and at times disengagement from exercise. When success is achieved it

---

<sup>23</sup> The issue of peer comparison is specifically addressed in Section 6.3.10.

appears to reinforce the individual's decision to participate, the downside occurring when expectations are not met. Females and non-regular females in particular, appear to be turned off by an excessive focus on success, while older cohorts appear more accepting of a successful outcome not materialising. It is a critical driver in team-based situations, sometimes demotivating when not achieved, on other occasions driving on the individual and team to succeed next time.

### **6.3.2 Team and Club Affiliation**

Discussion group members were requested to assess the significance of membership of a team or a club to them and the importance of this as a driving force for their participation. This topic is inherently more relevant for those that play team sports or represent clubs, but it was interesting to see how even casual and individual activity participants related to some of the benefits associated with team affiliation.

The consensus amongst the majority of the contributors was that team/club affiliation and identity is hugely significant. A sense of pride at representing your club, team, and/or local area emerges across all the discussion groups and appears to underpin a lot of the team based activities of those interviewed:

It brings the community together with everyone going, everyone has the same goal, and even people with no interest in sport go along to see how the team does (G2 M22 Reg).

One contributor did however make the point that while club and local area affiliation is commonplace in sports like GAA, in other sports such as soccer there tends to be less loyalty amongst players and switching of clubs is a regular occurrence.

The sense of a bond with one's team-mates is seen as extremely important. The desire to achieve something as a group is widely cited by participants in team sports as being a key motivator:

It is probably the most important thing, because it keeps you coming back year after year. The fact that you are part of a team, you get to know the other members of the team very closely, and you are trying to achieve something together. You have set out a goal, you might even have set out the goal 5 years ago and still have not achieved it, but you still come back for more. Often some lad might say I am not coming back this year and then a few lads will call round to his house and talk him round by saying come on - go back and give it another year, you know how great it would be if we could all achieve this together. I think the team-mates are very important (G3 M27 Reg).

A couple of contributors do point out however that individuals within a team context that have goals that are at odds with yours and those of other team-mates, can often ruin the activity for the wider group. This is particularly the case where group activity is not driven by the need to be successful:

I was a member of an athletics club with a few friends. We just wanted to train to keep fit, but there were a few girls in the training group that were really good and they kept pushing and pushing us and when we did not keep up there was a bit of tension. It kind of put us off the sport and most of us ended up leaving the club (G5 F20 Non-Reg).

Those who do not currently participate in team activities acknowledge its worth. Some have done so previously and still feel a sense of affiliation with the club and their former team-mates:

You would miss the craic<sup>24</sup> but you would still be in contact with them. Sometimes if they won you would go out with them as well, because you still know them and feel a sense of attachment (G2 M22 Non-Reg).

Even with more casual and individual type activities such as walking, the benefits of doing something like this in a group and the capacity of group members to bond and motivate each other is recognised.

A point worthy of note is the difficulty in breaking into or coming from outside into what may already be a closely-knit team. One individual expressed her frustration at this kind of situation:

I found they all knew each other, a lot of them were from the same class and I just found they all had a close bond. I found that kind of awkward. I felt like an outcast (G4 F20 Non-Reg).

A broad enough consensus on this matter was illustrated across discussion groups. The majority of respondents appear to have been part of a team/club at some stage and perhaps surprisingly still value the affiliation benefit of being part of a collective, even if they no longer regularly engage in exercise. Females compose the majority of those that question or have no opinion on the affiliation benefits of regular exercise.

---

<sup>24</sup> Craic is an Irish colloquialism for the fun or enjoyment inherent in an activity.

### 6.3.3 Social Interaction

Social interaction has been widely cited as a key incentive for participants' exercise behaviours. The discussion group members evaluated the importance of the social aspects of exercise. The overriding opinion emerging in this area is that it is an extremely important constituent of most individuals' exercise behaviours. It is a mechanism for bonding with your friends, and friends appear to play a significant role in motivating each other to engage in exercise. This is particularly important for casual participants, who appear especially dependent on the co-operation and support of friends when exercising:

If you have got a friend to go along with you, it makes it a lot easier because you will be more motivated to go if they are going to motivate you back as well (G4 F19 Reg).

The importance of the social aspects and bonding inherent in a lot of team sports is highlighted:

It is a great way to stick together, all the lads that I played hurling with in Tramore, we are all still in touch, whereas the guys that did not play have sort of drifted away. If they moved to Dublin they do not stay in touch, whereas some of the lads that play hurling have moved to Dublin, but still come home to play it (G3 M27 Reg).

Perhaps, surprisingly, even those who engage in individual activities cite social interaction as being very important to them:

Horse-riding can be very individualised as well, but you go off to shows every week like the Dublin horse shows or Millstreet and you get to meet everybody from all over the country, I like that part of it (G4 F21 Reg).

Indeed when questioned as to what their key motivation for exercising is, a number of respondents highlighted socialising and meeting people as being critical to them:

I just do it to meet my friends and new people. It gets me out of the house and allows me to keep in touch with people (G1 F20 Reg).

A potential downside of the social benefits of exercise emerges in its dependency on fellow participants to be achieved. Some respondents appear to lose motivation for an activity if their friends disengage, in effect removing a social outlet from them:

I used to love going to the gym and aerobics with my friends, it was a great buzz working out together. Then one by one we stopped going because of work and college and things and for me it just was not the same without them (G1 F19 Non-Reg).

Overall, the social benefits of exercise are well-recognised and appreciated and are a key motivator for a wide range of participants. It is somewhat surprising that

competitive athletes appear to cherish this benefit as much as their casual counterparts. Some non-participants cite a reduction or removal of these benefits as a reason behind their exercise engagement. The age of the respondent does not appear to affect their perspective on this issue, although females do exhibit a slightly stronger preference for the social advantages of exercise.

#### **6.3.4 Stress Relief and Mental Refreshing**

There was general agreement amongst the discussion group participants regarding the stress-relieving benefits of exercise and its ability to refresh individuals and make them feel good about themselves:

If I am annoyed or something, there is nothing I like more than going out to the field on the horse because you are on your own. It is just nice to get de-stressed (G4 F21 Reg).

The often pressurised situation of student life appears to enhance the importance of regular exercise as a means of getting away from the stresses of study and exams:

It clears your head as well, if you are trying to study and getting nowhere you will go for a walk or whatever. You will go to Curves<sup>25</sup> and come back grand again (G4 F21Reg).

Across most of the discussion groups exercise is cited as an important release from educational related pressures. Feeling good about oneself and having a fresh mental state is also widely viewed as an important benefit of exercise:

It is kind of an outlet that once you get used to it, it is very hard to give it up. It does release stress and keeps a healthy mind and healthy body, very true (G1 M20 Reg).

The importance of these benefits is perhaps best synthesised by a discussion group participant that is currently unable to exercise due to injury restrictions:

You miss it when you cannot exercise. I have a back injury at the moment so I am not able to run, I have to stay off it for about a year and it is horrible when you are not able to do anything. When you are so used to being able to do something to relieve stress, it is horrible when you cannot do that anymore and have to find new ways of having to relieve stress (G3 F23 Non-Reg).

Although the stress relief and mentally refreshing benefits of exercise were acknowledged by the majority of respondents, there is a clear indication that it assumes

---

<sup>25</sup> Curves is a gym exclusively for women, developed around a 30 minute fitness workout session.

more importance for the female cohort. A respondent in the all-male group reflects an opinion expressed by several males across the groups:

It is a nice release from things I suppose, but it would not be the reason I play sport. The competition and winning would do it for me (G2 M22 Reg).

The stress relief benefits, particularly in a pressurised study environment, are recognised by respondents of all ages. However, the more holistic ‘feeling good about oneself’ benefit that can be derived from exercising, assumes greater significance for older respondents across groups:

I feel really good after exercising. I normally go to the gym in the morning and it freshens me up nicely for the day (G3 M22 Reg).

It also clearly emerges as an aspirational benefit for many non-regular exercisers. For many of this cohort it is perceived as a realistic and achievable gain from exercising, often creating an intention to behave that is not always carried through:

I know how great it feels after a run or a workout, it would definitely be the reason for me to do it again. But I am busy and a bit lazy and always seem to find an excuse not to do it (G1 F19 Non-Reg).

While the stress relief and mental freshness gains from exercising are broadly accepted and acknowledged across the discussion groups, it appears to be a greater motivating force for females and older participants, while also emerging as potential driver to exercise for non-participants.

### **6.3.5 Appearance and Weight Control**

Respondents were questioned about the importance of their appearance and looking good to them and the role that regular exercise plays in achieving this improved appearance and controlling of their weight. The female discussion group members were more forthcoming in their acknowledgement of these benefits as a driving force behind their exercise behaviour:

I used to get bullied for being fat so I said I have to do start doing something to lose a bit of weight (G4 F21 Reg).

There was less recognition of the significance of these benefits amongst the male audience, although a couple of male contributors did acknowledge wanting to look good and the role regular exercise played in this:

You look better and feel better and have more confidence in everyday aspects of life. I think it is a huge motivating factor for me anyway. (G2 M24 Reg).

The boost that looking good as a result of exercise gives to an individual's confidence and self-esteem was established by a number of individuals, both male and female. A significant aspect of this area of discussion was the importance that many of the casual and lapsed participant females attached to these benefits. Exercising to look good for particular occasions or events appears to be significant for this cohort:

If you have an upcoming event and you want to wear a certain dress or a certain outfit or something, that really motivates you to lose weight or to look better in yourself (G4 F23 Non-Reg).

It is unclear from the discussion groups if this leads to sustained participation, although an examination of the profiles of those that expressed this type of motivation would indicate that in most cases it does not. Not achieving these benefits, particularly weight control targets, can lead to demotivation regarding the activity:

I was doing aerobics classes twice a week. [I] kept it up for about a month or so, but I was not losing any weight, so I kind of lost interest in it then (G4 F20 Non-Reg).

Appearance and weight control motives appear to be more important for females. This is especially, but not exclusively, the case for younger respondents. A potential dilemma also emerges for sports/exercise marketers. While many non-regular exercisers in the female cohort cite these motives as being important drivers for exercise engagement, non-achievement of the perceived benefits can turn them away from the activity. This suggests that in many instances appearance and weight control are extrinsic motives and promoting these benefits is not necessarily the harbinger of regular exercise engagement.

### **6.3.6 Additional Physical Benefits**

Discussion group members' viewpoints were sought on the importance of some additional physical benefits that can result from regular exercise. These have been cited as antecedents of exercise behaviour in the literature and benefits such as building strength; improving muscle tone; increasing endurance and speed; and improving agility and flexibility, were examined.

Once again, there was relatively broad recognition of the importance of these attributes for improving an individual's performance at various activities, with some being more important than others for specific sports:

It would depend on what you are doing the exercise for. If you are doing it to lose weight the toning part would be more important to you, whereas if you are doing it for matches, then you want to be stronger and faster (G3 M31 Reg).

The identification of these benefits as key reasons for engaging in regular exercise is minimal and confined in the main to those engaged in weight training activities in gymnasiums:

I was going to the gym regularly, it was not even to look macho or anything. They say if you go to the gym regularly three times a week, it could take 6 months before you see an increase in muscle mass. For me every week I was doing it I felt stronger and this made me feel better (G3 M25 Reg).

Regular exercisers in the main perceive these benefits as being ones that can improve their performance and perception of competence in their chosen activity, rather than being a pure driver of their exercise engagement:

These days in rugby, you really have to be well-conditioned to take the hits and that. It means spending a lot more time in the gym than the lads years ago would have (G2 M25 Reg).

Few of the female respondents cited strength and endurance as motivating factors, although speed and agility are considered important for some regular female exercisers:

You really need to be fit and agile for skating. My coach gives me an intense set of stretching moves to do every day to increase my agility (G5 F21 Reg).

These additional physical benefits are significant to individuals in boosting their performance at their exercise activity, rather than being the underlying reason for them participating. Regular exercisers, in particular, are interested in these gains. Amongst the non-regular exercisers there was very little recognition of any of these benefits being a motivating factor for them engaging more regularly. Males are significantly more motivated by strength and conditioning gains, while females and older respondents cite the flexibility and agility gains more frequently.

### **6.3.7 Thrill Seeking or Risk Taking in Exercise/Sport**

The respondents were asked to evaluate how risky their activities are and whether the risk involved the seeking of a thrill from their chosen sport. The majority of respondents

appeared to be quite risk averse and not particularly interested in the risky or thrill-seeking aspects of sports and exercise:

I do not like risks. I always think of the worst case scenario (G5 F19 Non-Reg).

This was a sentiment expressed by one of the female participants and is quite representative of the viewpoint of most of the individuals concerned. The element of risk in some activities would be enough to turn many individuals away from participating in them. However, a significant minority did express an appreciation of the riskier aspects of their activities. They were participants in individual sports such as figure-skating and horse-riding and sports that would be deemed to be quite physical in nature like rugby:

Risk taker? Yes I am. Sometimes you can go tackle someone way bigger when you are playing rugby for the risk and buzz of it (G2 M25 Reg).

The female respondents were just as energised by risk taking as their male counterparts. The overriding benefit to emerge from thrill seeking or risk taking activities is the enjoyment and self-satisfaction that the participants gain from engagement:

The benefit is the feeling when you actually succeed, you can get a double jump or whatever, it is a fantastic feeling you get a good buzz from it (G5 F21Reg).

A couple of other interesting points to emerge were that people with a high level of competence at their activity do not perceive what they do to be risky, whereas people of lesser ability may feel that way. Additionally there was an acknowledgement that most exercise and sports activities do carry some degree of risk, particularly the danger of sustaining an injury. In some cases this is perceived as being off-putting:

It would be on my mind coming up to exams, I am thinking I do not want to pick up an injury or something that would affect my exams, so I tend to ease off around then (G4 F21 Reg).

The general sentiment relating to risk-taking is that it is not a motivating factor for most people's exercise engagement. In fact for some respondents, particularly non-regular exercisers, the risks associated with some exercise engagement are counter-productive and at times are put forward as a barrier to participation. A small portion of regular exercisers cite the risky aspects of their activity as being important to them. Of these, females are represented in more or less equal proportion. No age differential is evident for this motivating factor.

### 6.3.8 Value Acquisition

Discussion group members were asked to determine whether their participation in exercise and sports helped to ingrain values that they would not develop through other aspects of their lives and to evaluate the extent that this motivated them to participate. A number of values emerged indicating that people do see exercise as a means of developing values that are of benefit in other life situations. The benefits of commitment to an activity emerged strongly from individuals with varying profiles:

I think it is a good example of the saying 'you only get out of things what you put into [them]'. It is true, like say you want to lose weight you get out of it what you put into it. Say you see some results, if you start getting fitter and stuff like that, it will show you if you relate it back to things like study, you will get out of your study and exams what you put into it. It is a life example (G2 M22 Reg).

Other important exercise related values to emerge during the discussion group debates include social and team skills:

I think it helps your social skills as well, if you are in a team, you are thinking of other people as well and you are used to working in groups (G4 F21 Reg).

The importance of discipline also emerges as significant, especially amongst participants in individual activities:

When you set yourself a timetable for exercise it goes back to discipline. Sometimes when you are tired you know you have to go and train, you force yourself to do it. It makes you a focused person (G3 M25 Reg).

It is apparent from the reflections of the discussion group members that the respondents recognised these values as benefits of exercise participation. However, when probed in more depth, the relative importance that they attach to the acquisition of these values does not appear that noteworthy and as such is not a significant motivational force behind their participation. Older respondents exhibit greater consciousness of the value development benefits of exercise and some cite it as one of the key motivators for their exercise engagement. Evidence of any gender differentiation in this regard is sparse, while regular and non-regular exercisers recognise its worth, neither grouping alludes to value development as a key motivating force.

### 6.3.9 Skill Maximisation

The groups were requested to evaluate the importance of maximising their ability and skills at their chosen activities. This issue elicited a mixed reaction from the respondents, with casual participants in particular expressing little interest in this as a motivating factor for engagement in exercise. Indeed for current non-participants the skill deficit in comparison with existing participants appears to be a de-motivating force:

I would like to play something, but I think if I went into them now they would be way too advanced for me (G4 F20 Non-Reg).

Even amongst regular exercisers, some of whom would be competing at a relatively advanced level, there are mixed views on skill maximisation. The majority of contributors recognise a ceiling to their abilities and are either not capable, or not inclined to advance their ability levels:

I was a sprinter and I had an athletics scholarship with Carlow IT for 3 years. When I was doing my undergraduate studies, I had too much work to do and I felt that I had to work on somebody else's schedule, so I just had to take a step back. That is why I took up the gym, because I can work it in my own time. At the same time I knew I was getting too old and was not going to make an Olympic quality type athlete. I felt like I was good enough for the level I was competing at, but at the same time I knew I was not going to make it to the top levels (G3 M25 Reg).

A couple of individuals reached what they felt was the highest level they could achieve and having attained this actually stepped back and withdrew from the activity:

Well I was in karate and I achieved my black belt and I just stopped then, I had achieved the highest grade there was, so I was satisfied with that (G5 F20 Non-Reg).

A number of respondents did acknowledge the importance of developing one's skills and how this adds to the enjoyment of their sport:

Getting better at it is important to me. I know when I was doing gymnastics I was terrible at first, but then you get better and better and I got to an All-Ireland<sup>26</sup>[championship]. Seeing your progression is great, I could do handstands and back flips and it gives you a sense of achievement being able to say I can do this (G3 F23 Non-Reg).

A related point may be the age profile of the discussion group members, with the implication being that several of them were more motivated to develop their abilities at

---

<sup>26</sup> The All-Ireland is the name given to the national championships in hurling and gaelic football at various age levels, but is colloquially applied in many sporting domains.

a younger age than they are now. Indeed, many in the older cohort express the opinion that their time has passed in this regard:

When I was younger I was mad keen to get better and better at soccer, I would do anything to make myself better. Now I know I am too old to improve, it is all about enjoying it for what it is these days (G2 M24 Reg).

There is recognition amongst participants in team sports of the responsibility that individuals have to develop their skills to maximise their worth to a team. It is reasoned that team members do not want to let their team mates down and as such are driven on to improve.

You have to work hard at your game, the same goes for all my team mates, we are in it together and you have got to try your best for the team (G3 M27 Reg).

Skill maximisation is a motivational construct that is illustrated as predominately the preserve of regular exercise participants. For non-regular participants, it can reinforce the perception of lacking the competence to engage enjoyably with the activity. Both individual and team participants express similar levels of desire to maximise their abilities. Males, with their seemingly more competitive orientation, portray stronger motives to be the best that they can be, while older participants appear aware of their limitations, and it is not as significant a motivating force for them.

### **6.3.10 Peer Recognition and Comparison**

The issues of recognition from peers and significant others, and comparison of one's abilities with their peers, were also addressed in the discussion groups. Peer recognition appears to be a significant motivation for many respondents. In particular, the feedback on peer motivation could be interpreted as having particular importance for continued participation at an activity:

Even say you were going to the gym and someone said you had lost weight that would motivate you to go there a bit more (G4 F23 Non-Reg).

The appreciation of team mates and coaches is valued and appears to drive individuals on:

That is what makes it enjoyable when your team mates say 'well done' or even if you do not do something well they say 'head up keep going'. It is your peers on the team - you want to impress them as well (G5 M19 Reg).

Some team sports participants stress the precedence of the team over the individual, while recognising that many individuals crave individual recognition, sometimes at the cost of the team ethic:

Some would be happy if they got beaten in a final but they play well and they stood out on the big stage whereas other people would rather win the final. People go for self-recognition and in team sports there is nothing worse than a team where people just care about themselves (G2 M25 Reg).

Another interesting point is the boost to the confidence and self-esteem of the participant that the recognition of peers delivers. The topic of comparison of your abilities to peers is very much related to the competitiveness of individuals (see section 6.3.11). For some the comparison of abilities serves as a spur for increased commitment:

Myself and my sister are very competitive, it is never spoken that I am better than you or anything but it would always be in the back of each other's heads. [You might think] she is after getting to whatever level and I have to step up my game a bit. I always want to be on a par or a bit better [than her] (G5 F21 Reg).

Others emphasise the enjoyment and fun derived from competitive banter between two friendly, but rival participants. A number of the casual and/or lapsed participants cite peer comparison as a turn-off from exercise activities:

If I am good at something I would be very competitive at it. But if I see other people that are really, really good at it and I do not see myself getting up to that standard I just do not bother [participating] (G1 F42 Non-Reg).

A common theme amongst this cohort was that if their peers took the activity too seriously then they would be alienated by this attitude:

I played ladies football for the fun of it, but a lot of my team mates were dead serious about it and if you did not get into it as much as they did, they would look down at you (G4 F19 Non-Reg).

Peer recognition attains a prominent position in the motivational outlook of many respondents across the discussion groups. It serves not so much as a motivating factor for initiating engagement, more a source of reinforcement that they are competent at what they do and have achieved what they set out to do. It has particular relevance in team activities, where the positive recognition of abilities by team mates is critical. The downside of this is when team mates have differing levels of commitment and objectives this can lead to friction and be de-motivating. Gender distinction is apparent in the desire for peer recognition for females (from coaches, fellow competitors) in individual activities and males in team sports (from team mates). No significant age

differentiation is apparent, while non-participants in the main have either had bad experiences with, or are indifferent to, peer recognition in exercise.

### **6.3.11 Competitiveness**

Exercise as an outlet for individual's competitive desires was explored. This issue provided a relatively stark contrast in attitude and motivation between male and female respondents. The majority of the male participants, even those exercising in a casual setting, cited competitiveness as being a pre-requisite of their activity:

We could not play without some kind of competition involved, we just could not go on playing casual games, it is kind of sad, it is in our nature I suppose (G5 M2 Reg).

It seems that competitiveness is inherent in the psyche of most of the male respondents. When questioned as to whether they would enjoy non-competitive activities as much, the response was again a relatively comprehensive statement of the need for competitive aspects:

Everything needs to be competitive to be honest with you. Even in the gym, I always am [competitive] with someone else, I do not even mean to do it but I just do it anyway (G2 M22 Reg).

A contrasting viewpoint emerges from the female respondents. A couple of female contributors did outline that they are competitive individuals and enjoy these aspects of exercise participation. However, there is a sense from these participants that they enjoy non-competitive exercise just as much:

Yes definitely, just to go for a run or a walk in the evening is very enjoyable (G1 F20 Reg).

For a lot of females, especially the casual or lapsed participants, an overly competitive exercise environment is a barrier to participation:

No, I do not like people when they get like that. I just cannot be around them, I do not know why. I would not compete just to satisfy them, I mean I would not try to compete with them, it does turn me off a bit when it is so competitive (G4 F19 Non-Reg).

Older members of the discussion groups, even some older males, appear less motivated by the competitive aspects of exercise:

I like challenging myself to do my best, but I would not say being competitive is a big driver for me. I get satisfaction from doing it well and am not worried about competing with others (G3 M31 Reg).

A competitive motivational disposition appears to be inherent and a big driver of exercise activity in most males and a smaller portion of females, even amongst casual participants. Many females are turned off by excessive competitiveness in sports and exercise and this seemingly has contributed to some level of disengagement from exercise activities. Older participants are not quite as driven by competitive instincts, although quite a high level of this trait is still apparent amongst older males.

### **6.3.12 Challenge**

The discussion groups were asked to evaluate the importance of a challenge in their exercise contexts to them. The nature of the feedback on this topic suggests that it is quite closely aligned with the competitive and skill maximisation motivations discussed in sections 6.3.9 and 6.3.11. For the individuals operating at competitive levels this seems to be a significant driver:

You always want to better yourself. You know what I mean if you are doing weights or whatever you want to increase and try and build on what you have done in the past. Same as if you win an All-Ireland title or something, you want to try to reproduce the same result next year. Everyone is going to want to challenge you and you are going to want to win it again and develop you more (G3 M22 Reg).

This sentiment is echoed by people who participate in both individual and team environments. There is however recognition of the need to be realistic in setting a challenge and not aiming too high as this can lead to a sense of alienation at not being able to achieve one's goals:

We had a manager before and he raised the level of intensity unbelievably and a lot of people kind of got discouraged with it and just thought it was not worth the effort (G5 M22 Reg).

A number of the casual participants also reflect positively on the need for challenge in their activity:

I find that if you are in a gym that once you have built up your fitness levels you want to challenge yourself more. Things are becoming easier, so obviously you want to set yourself a new challenge and go to a higher level on different machines (G3 F43 Reg).

Others among the casual or lapsed participant cohort contend that increased challenges lead to increased competitiveness, which in turn lends itself to alienation from the activity for them.

### **6.3.13 Physical Fitness and Health Benefits**

Physical fitness and improved health have been widely cited as among the most prominent of benefits of regular exercise. The discussion group members were asked to elicit their feelings regarding the importance of these issues to them.

There is a general recognition of the health benefits of regular exercise and being fit, but surprisingly in the majority of cases it does not appear to be a primary motivator. For many of the casual and lapsed participants looking good and losing weight as a result of improved fitness is more important – the actual health benefits are viewed as incidental and a bonus:

It would not really cross my mind to be honest. I do not stop and think I feel healthy like. Fair enough I would be fit and lose weight and stuff, if you want to consider that as a health benefit, that maybe I would be slimmer. But I would never really say I am doing this to be healthier (G4 F19 Non-Reg).

This appears to be particularly the case for the female respondents who associate improved fitness, with improved appearance:

I think it is important for girls. Girls are very into their image, keeping fit and that (G4 F24 Reg).

For those participating at a more advanced level, fitness is viewed as a means of maintaining or improving performance levels, with the health benefits also widely viewed as incidental. Others stress the enjoyment of participating and the love of the activity as being the prime motivators, with the health boosts being a nice by-product of this:

It is like you are out enjoying what we do, but you are getting the health benefits with it. When we go out and play football we are doing it because we love playing football and we love the competitiveness (G5 M20 Reg).

A number of individuals acknowledged that recent media coverage of health issues relating to rising levels of obesity is influential in relation to their exercise behaviour:

I think also we are persuaded to a large extent by the media, because there are a lot of issues now around obesity and diabetes and heart disease, and there is a push on people to get involved and to do something about their health and fitness levels (G3 F43 Reg).

Age also has an impact here with some of the older members of the discussion groups recognising that health and fitness has a greater bearing on their behaviour now compared to a few years back:

I never used to think about how good exercising was for my health. I am a lot more aware of it now. You have to be as you get older. It definitely is a key reason for me going to the gym (G3 M31 Reg).

There is some acknowledgement amongst the younger groups that these issues may become more significant as they get older, while it appears to be a potentially key determinant for non-exercisers re-engaging with regular physical activity:

It is something I will have to do. I do not want to go on through life being unfit. It would be bad for your health, so sooner or later I am going to have to get into it again (G4 F20 Non-Reg).

Health and fitness gains from exercising are surprisingly not a primary motive for many of the respondents, they being considered incidental benefits of exercise driven by other motives. This outlook is not as engrained in the older cohort, many of whom consciously engage in physical activity to derive these benefits. Increased volume and prominence of promotional interventions and media coverage has raised the profile of the health gains from regularly exercising, although it still seems that the majority of young respondents feel it is something to be concerned about at an older age. However, it does seem to be a key factor that may entice non-exercisers back to activity, as many recognise the potential long-term difficulties associated with their current sedentary lifestyle.

#### **6.3.14 Enjoyment and Fun**

Perhaps the ultimate goal of many types of human behavioural activities is the enjoyment of the behaviour. The literature illustrates that exercise is no different. With this in mind the discussion groups were asked to assess how important the enjoyment of their chosen activity is to them. To lend further depth to this analysis, an outline was requested of the key issues that contributed most to their enjoyment of their exercise.

A large proportion of the respondents highlight enjoyment as being an important motivating force in their exercise behaviour:

I would do it for the pure enjoyment. I love running. I love lots of sports and trying out new sports (G5 F20 Reg).

The factors that contribute most to their enjoyment of the activity vary significantly and in fact read like a summary of many of the factors outlined already in this discussion:

If you do well at it and win things you are going to enjoy it more (G5 M20 Reg).

I really like being part of a team (G2 M22 Reg).  
When you feel good about yourself afterwards, it is very satisfying (G5 F20 Reg).

These are among the many sentiments expressed regarding why people enjoy exercise and sports. It could be argued that doing it for the ‘pure enjoyment’ and ‘when you win you enjoy it more’ are fundamentally different types of enjoyment. The former statement is an expression of a definite intrinsic motivation toward the activity, while the latter could be construed as being extrinsic in orientation, as the enjoyment of the activity is contingent on success being achieved.

It also appears that the enjoyment of activities may lessen as people get older:

I think enjoyment might get less the older you get. I think you enjoy it more as a kid, I still think you enjoy it but it does lessen a bit (G3 F23 Non-Reg).

Similarly enjoyment appears to be diminished when there is a sense of obligation to exercise. This is perhaps a reflection of a loss of control over one’s activities.

Having to train at certain times to suit the team definitely lessened the fun of it for me. I would rather do my own thing, in my own time (G4 F23 Non-Reg).

When questioned as to whether they would persist with an activity that they were not enjoying, mixed opinions emerged. Several people expressed the opinion that lack of enjoyment can have adverse consequences on people’s participation behaviour, a finding that was particularly common amongst non-regular exercisers:

If you are not enjoying it then it can have a negative effect on you. If you are going with the attitude that I do not want to do this, then it will have a negative [outcome] for you (G1 M19 Non-Reg).

Others maintained that they would be determined to persist regardless:

Yes, you do not always like going to the gym, but you know it is good for you. I might not want to go, I might be tired but I know I will regret it if I cannot fit into my jeans or whatever (G3 F43 Reg).

Amongst non-regular exercisers lack of enjoyment is a frequently-cited reason for disengagement from/barrier to future exercise. Again this lack of enjoyment can range from just not finding the activity intrinsically enjoyable anymore, to the anticipated benefits of the activity not accruing:

I just did not enjoy it anymore. I found it hard to motivate myself to get up and go to the gym, [I] did not really think it was worth my while (G4 F19 Non-Reg).

Enjoyment emerges as a key motivator for a broad cross-section of respondents. It can come in the form of the pure enjoyment of an activity or enjoyment derived through the achievement of other goals. Although at times enjoyment can be derived in intrinsic or extrinsic formats, little diversity is apparent in the types of enjoyment cited as being important by regular and non-regular exercisers. A similar situation pertains between genders, while a drop in the level of enjoyment experienced is a trend amongst some older respondents. What is evident however is that many non-regular exercisers cite lack of enjoyment of exercise as a reason for their disengagement from regular physical activities.

#### **6.4 Impact of ‘Other’ Leisure-Time Activities**

The respondents were asked to evaluate the impact of their other leisure-time activities on their exercise participation behaviour. The majority of the activities mentioned were deemed to have a negative influence.

##### **6.4.1 Socialising**

Perhaps the most significant ‘other’ leisure activity is socialising. Many of those interviewed highlighted socialising as an integral part of ‘college life’:

I think it was touched on earlier, with college your social life plays a bigger part than your sporting life (G1 M19 Non-Reg).

It is perceived to be a considerable detriment to exercise, impacting on fitness and energy levels, and generally serving as a de-motivator:

You just would not be in the form for exercising after a night out and that can kind of get a lazy thing going for a few days (G4 F20 Non-Reg).

This is particularly the case with lapsed or infrequent participants, and female respondents also illustrated a greater susceptibility to socialising impinging negatively on their exercise activities. The impact of socialising is less pronounced on older participants:

It would not really impact on me. I do not go out a lot these days and it does not affect my exercising (G3 M27 Reg).

There are indications that some of the more committed exercisers are willing to put their social life on hold to aid their performance:

You might have times of the year where you say I am not going out for a few weeks because I have a big match coming up, or [because] you are trying to increase your fitness (G2 M25 Reg).

Socialising appears to be a significant exercise behaviour correlate of the student cohort. It is perceived as being an attractive activity and in the main has a negative effect on the target populations' exercise adherence. This is especially the case for non-regular exercisers, females, and younger respondents.

#### **6.4.2 Other Exercise Activities**

Another point worthy of observation is the effect of individuals participating in multiple exercise/sports activities. A number of individuals seemed to reach a point where they had to forego some activities and concentrate on others:

I found that when I was in school, I played gaelic football, basketball, and soccer. When I was coming to the Leaving Certificate<sup>27</sup>, I found that I could not spend three days a week going off playing matches, so I had to choose one above another (G2 M25 Reg).

Similarly, peer pressure to train and focus on one activity, led to drop-out from other sporting activities. This is especially the case where individuals are operating at higher levels:

It is hard to keep everything going when you get a bit older. The older you get, the more competitive it becomes in a club. So if you want your place in the team, especially at a higher level, you are going to have to concentrate on that [sport] (G5 M22 Reg).

Other exercise activities appear to impinge on the exercise behaviour of a small number of regular exercisers, who have or do still engage in multiple sporting disciplines. Participants in team sports in particular appear to on occasion be compelled to make a choice due to time pressures or perhaps coach influence. No gender differential is evident in this regard. A similar situation pertains with age, although there is some suggestion that in their earlier teenage years respondents were forced to choose between different sporting activities.

#### **6.5 Influence of Significant Others**

The literature highlighted the potential exercise social support role played by significant others. The key support or inspirational cohorts that emerged are examined in this section.

---

<sup>27</sup> The Leaving Cert. (Certificate) is the final examination in the Irish secondary school system.

### 6.5.1 Friends and Peers

Discussion group members were asked to determine the influence of their friends on their exercise activity. The findings are varied. For many, their friends played a significant role in them taking up a particular activity:

The premier reason why I started playing sport was that all my friends were into it (G5 M19 Reg).

However, in some cases the importance of having friends that engage in your activity wanes as one gets older:

When we were kids, me and my friends all did pony club together, but they did not continue it and I have, so at the moment they would not have much of an influence (G5 F21 Reg).

A number of casual participants stressed the importance of their friends being involved in their activities:

With walking, your friends are obviously going to motivate you. As I said earlier if there is someone else with you, you are more inclined to go. They would encourage you (G1 F19 Reg).

Friends play a prominent motivational role with this cohort. Similarly, they can also stimulate sedentary behaviour amongst non-committed exercisers:

Well you kind of end up mocking their lifestyle. You are going to fit into what they do and so if you are with friends who just sit around all day, you are going to end up sitting around all day. But if you have friends that are like 'come on, lets go for a walk' you are going to do more and if they are active then you will think maybe I should join something (G4 F24 Reg).

Non-exercisers also highlight the potential significance of friends motivating them to re-engage with regular exercise. Younger respondents in particular illustrate a greater degree of peer dependence for their exercise behaviour:

I think it would need my pals doing it for me to start going to classes again. One or two of them would be the ones that drive us all into action (G1 F19 Non-Reg).

Regular exercisers, particularly among the more committed or advanced participants, downplay the role of friends and peers in their current behaviour:

Yes it would be nice to have them working out with you, but at the end of the day I will be doing it regardless of whether they are there or not (G3 M25 Reg).

Friends and peers appear to have a mixed level of influence on the respondent's exercise behaviour. For casual and non-exercisers, they have a significant influence, which

contrasts with the majority of regular, competitive participants, who do not perceive friends as being that important to the exercise behaviour.

### **6.5.2 Family**

There was almost unanimous agreement on the positive role of family in influencing exercise behaviour, although it is felt that their input is not as important as in earlier years. Family are widely perceived to have helped initiate exercise activity, the choice of activity, and where to engage in the activity:

The fact that my dad was involved in football is what got me into it, that is where family is vital in what sports you do play and how you become involved and who you become involved with (G5 M20 Reg).

On-going support from family is seen as important by regular exercisers:

I think family is massive as well. When everyone is young everyone tends to play, but you see as people get to 15 or 16 [years old], those that do not get parental support kind of drift away from it (G2 M24 Reg).

Additionally, a number of regular participants outlined that making their family proud of them through their sporting achievements is a considerable motivational driver:

I think you like to think you are doing your family proud. When you see them on the sideline at a match it gives you a little boost (G4 F21 Reg).

There is a general feeling that peer influence has now superseded the contribution of the family to exercise behaviour:

It is more peer influence now. Some people are not even living with their parents anymore, so they cannot be a direct influence (G1 M20 Reg).

However, this is not perceived as having positive consequences for exercise engagement, especially amongst non-regular exercisers:

When you are living at home it is different, the family are always there to support you and drive you on. Whereas I think if you are living away from home it is a lot harder. You kind of have to motivate yourself (G3 M22 Reg).

Although positive family influence is evident with younger cohorts, older participants at a different stage of the family life cycle may find their exercise behaviour constrained by their family situation:

Family is my priority now, I have two young kids and I just do not have the same time to get out exercising (G1 M36 Non-Reg).

Family influence is very apparent in the respondent's socialisation into exercise and sport. It is also evident that this influence has waned to a large degree. No gender

differentiation in family influence is evident, as is the case for regular and non-regular participants. The younger respondent's still ascribe importance to the positive input of family members, while changed family roles and situations can potentially negatively impact on older individual's exercising.

### **6.5.3 Influence of Coaches and Mentors**

The role of coaches and mentors on participants' behaviours appear to be quite significant. For those who exercise in an organised or club context this is particularly pronounced, although the nature of the influence varies considerably. For some, the coach is a guiding light and motivator:

If you get on well with your trainer or coach you would not want to let them down, so it makes you work and try harder (G2 M20 Reg).

Competitive participants in individual sports appear to be particularly dependent on coaches and mentors:

I know for me what my coach says is gospel like. If he said to me do not drink before the competition or take a week off training or do not go out, I know I would definitely listen to him (G5 F21 Reg).

A significant portion of respondents, both regular and lapsed exercisers, highlight the negative consequences of over-zealous coaches:

We have a coach that some people do not like and it has led to a few people giving up the sport, they feel that strongly about it. It can be divisive (G2 M22 Reg).

Coaches of this nature can have the effect of reducing the enjoyment of the activity:

Sometimes they can be a negative influence, sometimes you are going for fun and they have to know that. Most coaches know your standards, but some push you outside your limits and that drives you away from your sport (G5 M20 Non-Reg).

Nonetheless, despite the sometimes negative perception of coaches, even lapsed participants credit them with the role that they played in their behaviour:

They are a colossal influence, absolutely massive. I met my old soccer coach a few years later and he was the first person up to me wondering how I was getting on. People like that would have a huge influence on me (G1 M19 Non-Reg).

Coaches in the main play a significant role in inspiring and motivating many regular exercisers. In some instances they have had the opposite effect and over-zealous coaching and feedback has demotivated the participant, at times leading to

disengagement. Some female respondents in particular have been affected in this manner.

#### **6.5.4 Media Coverage and Role Models**

The discussion groups were asked to assess the significance of media coverage of sports and sporting role models on their exercise behaviour. The general consensus is that while media coverage and sporting role models had a considerable influence in the formative years of their sporting behaviour, this waned as participants moved into adulthood:

Growing up I adored Liverpool and their players, wanting to be like them was definitely a reason for taking up soccer (G5 M19 Reg).

Media coverage of non-mainstream sports also appeared to be an influence on the initiation of certain exercise activities:

I started doing gymnastics after I saw it at the Olympics. I loved the movement and jumping around and really wanted to have a go at it (G3 F23 Non-Reg).

However, both regular and non-participants believe that although they remain fans of sports stars and viewers of media coverage of sports, this has minimal influence on their exercise behaviour.

#### **6.6 Availability of and Access to Facilities**

A number of issues arose in the discussion on facilities. The general feeling amongst regular exercisers is that although at times their exercise environment leaves a bit to be desired, they just got on with their activity regardless:

Wintertime is awful. A lot of pitches are playing catch up with no floodlights and the likes, it is not enjoyable when you do not have proper facilities, but you just get on with it (G2 M22 Reg).

Some casual or lapsed participants point to a lack of facilities in the locality being an issue, particularly those from rural areas:

Where I am from they are only after forming a girls football team in the past two years, and there was no camogie<sup>28</sup> or anything. So there was no real opportunity for us to play this (G4 F20 Non-Reg).

---

<sup>28</sup> Camogie is an Irish stick and ball sport, played exclusively by women..

This problem appears to be exacerbated for females, with a lot of the activities favoured by girls not available in several rural areas. For casual participants in activities such as jogging and walking, access is not really an issue. The quality of the facilities available is a factor for some of the lapsed participants:

We used to get shoved out into the freezing cold, wet, and rain, onto a swamp like pitch. I think the outside put me off an awful lot, [especially] being out in the rain (G1 F19 Non-Reg).

Many participants' initial engagements with sport were with teams/clubs in their immediate locality, but they tend to expand their horizons as they grow older. A couple of respondents engage in what could be considered to be specialised sports (e.g., figure skating). They stressed the considerable effort that they, and their fellow participants, must expend to actually participate in their sports. This often includes undertaking regular long distance travelling, which can be problematic for the participants in the long-term. Others stressed a willingness to put a greater effort into finding a facility that best suited them:

I think that is important, if you know a particular gym has really good facilities you might be prepared to go there, rather than one close by that is not as good. Access is not necessarily an issue, it is the quality of facilities and equipment that matters (G3 F43 Reg).

A number of contributors spoke of the pride they have in the facilities that their club offers and how this made the club an attractive proposition to potential new players. It also serves as a motivating force for existing members:

Our club at home has invested big money into developing the club. The facilities are second to none and it certainly makes you think that if you cannot get up of your backside and train there, then you might as well give up (G2 M25 Reg).

There is a clear divide between regular and lapsed exercisers on the issue of facilities for physical activity. It is pretty well encapsulated by the contribution of one regular exerciser:

I do not think lack of access is a barrier, there are so many facilities out there, clubs and gyms everywhere and you can walk and run anywhere (G2 M22 Reg).

Although lack of access is a genuine barrier in some instances, it appears as though it can also be a convenient excuse for lack of regular exercise engagement.

## 6.7 Other Restricting Factors

A number of potentially restricting factors emerged in the discussion groups and literature review. These are outlined below.

### 6.7.1 Cost of Engagement

The cost of engagement at some facilities is cited as a constraint on exercise activity by a number of respondents. Being a student cohort, it is perhaps understandable that the cost of exercise is a key consideration:

Cost would discourage me. It costs money to do something like an aerobics course so I would be afraid I would not do it so and it would be a waste of money. I would like to join something like that but I would be really afraid that I would just waste it (G4 F23 Non-Reg).

There is a clear distinction in attitude toward cost between regular and lapsed exercisers.

Current exercisers generally see it as barrier that can be overcome:

A lot of gyms have good offers, good deals, pay by direct debit, and are making it easier all the time. It [Cost] is not a huge factor if you want to do it you will do it (G3 M22 Reg).

Some lapsed exercisers feel the cost of their favoured activities prohibits their engagement, although a large portion of non-exercisers would have a preference for cheap or cost-free exercise. Another interesting point that emerges is the potential costs of many individual sports and the determination of regular participants to overcome this barrier:

As a student yes cost is a huge issue for me. It is so expensive to do what I do, for my skates alone I think the actual boots were about €750 and the blades were about €400. Just even the equipment that you need and then the lessons, they can be up to €100 per hour. I have to work part-time and get support from my parents to keep up my skating (G5 F21 Reg).

Older participants and males also emerge as being slightly less inhibited by the potential cost of their activity. This is particularly the case when they have been engaged in the activity over a long period of time:

I have been in the same gym for years, it costs a bit and even though I returned to full-time education, I made sure I set aside enough money for the gym fees (G3 M31 Reg).

The determination of many regular exercisers to overcome cost factors relating to their sports and exercise activities is somewhat surprising, given the limited financial

situation of many students. However, cost does emerge as key barrier for a fair proportion of non-regular respondents.

### **6.7.2 Increased use of Car as a Mode of Transport**

Recent years have seen a substantial increase in the number of students who commute to college using their own car as the mode of transport. This appears to have had negative consequences for the exercise engagement of some lapsed participants in particular:

With a car you just get so lazy. You do not have legs anymore (G1 F19 Non-Reg).

However, having access to a car helps to overcome the lack of exercise facilities in their immediate vicinity in certain instances:

I really need the car to get to training, I stopped going for a while when I did not have one, so the car actually motivates me to go (G4 F21 Reg).

Although changes in modes of commuting to the student's place of education have evolved in recent times, evidence of this negatively impacting on their overall exercise behaviour is ambiguous. It appears to have affected females the most, as walking as a means of commuting was considered their main form of exercise in previous times:

I used to walk to school and back, it was about 30 minutes each way. Since I moved to college I got a car and now drive in every day, so I miss that bit of exercise (G4 F20 Non-Reg).

### **6.7.3 Time Pressures/Study Commitments**

Not having the time to exercise, and in particular the pressures that study and work commitments put on the respondents appears to be a serious impediment to exercise engagement:

You do not have as much time when you are in college, like I had to give up the horse-riding after 12 years because I did not have enough time, so that puts a stop to it as well, time pressures (G5 F19 Non-Reg).

Time issues also seem to contribute to intermittent periods of engagement, with previously regular exercisers lapsing in their activities for a period of time:

There will not be much done next month I would say. With the exams coming up, it will be [the] head in the books (G1 M20 Reg).

It also appears that the necessity for many students to work influences their activities:

We have a family business at home and it is very busy in summer, so work would get in my way of playing (G2 M22 Non-Reg).

Again this is particularly the case amongst lapsed and casual participants. In the main regular exercisers appear to find a mechanism for overcoming the demands that their studies put on their time:

To be honest, with me it is all about discipline so I have to. I set up my timetable so I just have to follow it. If it means giving up something it will not be exercising anyway (G2 M22 Reg).

Study and work commitments can negatively impact on exercise behaviour. For casual and non-regular exercisers it is an oft cited barrier to their engagement. This is especially the case amongst the female and younger groupings. The majority of regular exercisers overcome time impediments, although in some cases a reduction in the frequency and volume of exercising was detected.

#### **6.7.4 Injury Restrictions**

One formerly regular participant has had his exercise activity restricted due to a serious injury and injury is cited as a reason for occasional disengagement from exercising. The potential for injury was also cited by a couple of respondents as a reason for not currently engaging:

With everything I have going on with college and work at the moment I just cannot risk getting injured playing sport and losing out on time (G1 F20 Non-Reg).

In the main, injury is accepted as a risk inherent in many sports and exercise activities and does not appear to affect the motivation and behaviour of regular participants. Some female non-regular exercisers cite a fear of injury as a demotivating force for them:

I tried playing hockey in school and camogie with my local club. To be honest I was a bit intimidated by the physical side of it and did not fancy getting hurt when playing, so it was not to be (G4 F20 Non-Reg).

Overall, it is reasonable to contend from the discussion groups that fear of injury is of minimal significance in affecting the exercise behaviour of the majority of the target audience. Being injured is an obvious impediment, but the consensus is that injured exercisers desire a return to regular exercise engagement.

### **6.7.5 Feeling of Inadequacy**

A lack of self-efficacy in relation to exercise and sport is a commonly cited reason for disengagement from exercise in the literature and it emerges quite frequently amongst the non-participating cohort in this study:

I gave up playing because I did not feel I was any good at it. Everything was getting very competitive and I was just not enjoying it anymore (G5 M21 Non-Reg).

Female non-exercisers in particular appear to have self-efficacy issues with exercising:

I tried fitness classes, but was not anywhere near as fit as the other girls in the class. I found that off-putting, I did not think I would ever get to their levels (G4 F23 Non-Reg).

Some participants in team sports have also illustrated feelings of inadequacy that ultimately led to disengagement from the activity:

I played soccer for a while, but as I got older I became more aware that maybe I was not as good as the lads I was playing with. It kind of dented my confidence and I just really did not want to play anymore (G1 M19 Non-Reg).

Lack of self-esteem relating to an exercise activity has considerable negative consequences in the majority of instances. Long-term engagement is unlikely and drop-out is the most prevalent consequence. Females appear more affected by this psychological state. Some evidence also emerges of younger exercisers being subjected to peer comparison. This ultimately leads to feelings of inadequacy that impact damagingly on behaviour.

### **6.8 Discussion Group Conclusion**

Five broad categories of influence on exercise behaviour emerge from the discussion group analysis. Numerous benefits sought/motivational factors were cited and the discussions confirm what is evident in the literature, that motivation is one of the principal correlates of exercise behaviour. Discussion group members differed in the nature and extent of their exercise motivation outlook and this further reinforces the choice of motivational variables measures as the core basis for segmentation in this study. Additionally, four groupings of significant social-environmental correlates of exercise were established for this target group.

The dynamics of the different discussion groups were interesting to observe. The all-male group was comprised of predominately regular exercisers and they exhibited a very positive attitude toward exercise. This contrasted with the all-female group, half of whom were non-regular exercisers, where the perceived barriers to exercise appeared more influential. This attitude was reflected in the main amongst males across the discussion groups, while females across the groups illustrated a mixed outlook toward exercise. The variables that motivated males contrasted with females across the groups. The male cohort in general attach greater significance to the competitive, challenge, strength, and skill-maximisation benefits, while many females are, or would be, driven more by the appearance, weight management, and other health gains of exercise.

The expected differences in outlook between regular and non-regular exercisers were also evident. Regular exercisers unsurprisingly illustrate a much more positive attitude to exercise engagement, while many non-regulars cite some of the highlighted constraining factors as having a strong influence on their behaviour. The social support offered by significant others also differentiates regular exercisers from their inactive counterparts.

Some notable differences in viewpoint emerge between younger and older respondents. The younger members could be loosely broken into two groupings. The first would include those who are committed to their activity, quite motivated, predominately operating in a competitive setting, and very aware of their responsibility to team mates and/or coaches. The second younger grouping exhibits a more casual outlook to their exercising. For some it is something that they do not have much interest in and can take or leave. For others it is a means of maintaining their weight and appearance, or an escape to have some fun. The older members of the groups illustrate a more holistic appreciation of the benefits of exercising. Those who regularly exercise are quite focused and determined in their motivation for their activities. The non-regulars in the older grouping are constrained in the main by life-cycle limitations such as family or work commitments, but still exhibit a desire to re-engage with regular exercise to reap the perceived gains of this.

It is reasoned that this detailed review lends credence and validity to the measurement tools that are used in subsequent phases of the research. The EMI-2 scale captures the

majority of the motivational sentiments expressed by the discussion group members. The parallels between the themes that emerged in the discussion groups and the variables inherent in the EMI-2 scale are illustrated in Table 6.2. In many instances, the alignment between discussion group theme and EMI-2 motivational construct is very strong. An example of this is the sentiments expressed by the discussion group members about the social interaction benefits of exercising, which corresponds with the affiliation motivational construct of the EMI-2. The connection between the discussion group findings and EMI-2 motive is not as evident in some cases. For instance, the bond with team mates and club that is important to a number of discussion group participants is not directly measured within the EMI-2 scale, although one could argue that the item examining social affiliations built through exercising with others, addresses the matter to some extent.

**Table 6.2: Linking Discussion Group Themes and EMI-2 Constructs**

Discussion Group Themes	Summary	EMI-2 Constructs	Summary
Winning and Success	Desire to win and be successful.	Competition	I like trying to win in physical activities.
Team and Club Affiliation	Bond with team mates and affiliation with the club.	Affiliation	Social affiliations built through exercising with others.
Social Interaction	Interacting and participating with friends, meeting new people.	Affiliation	Spend time having fun with friends, making new friends.
Stress Relief and Mental Refreshment	Outlet for releasing the tensions of college life, feels good after exercise.	Stress Management Revitalisation	Reduces tension, space to think. Makes me feel good, recharges the batteries.
Appearance and Weight Control	Losing weight, looking and feeling better about yourself.	Weight Management Appearance	Stay slim, lose weight. Look better and have a good body.
Additional Physical Benefits	Building strength, speed, agility.	Strength & Endurance Nimbleness	Build strength and endurance. Maintain and increase flexibility and agility.
Thrill Seeking	Exhilaration of risk taking, accomplishment when you succeed.	Revitalisation	Because I find exercise invigorating.
Value Acquisition	Commitment, discipline, social, and team skills.	Challenge	Develop personal skills measure myself against personal standards.
Skill Maximisation	Self-improvement and progression.	Challenge Social Recognition	Gives me personal challenges to face. Accomplishing things that others are incapable of.
Peer Recognition	Recognition and approval from family, team-mates, and friends.	Social Recognition	Gain recognition for my accomplishments and compare abilities to others.
Competitiveness	Need for competitive exercise environment.	Competition	Enjoyment and fun derived from physical competition.
Challenge	Challenging oneself for self-improvement.	Challenge	Personal challenges and goals.
Physical Fitness & Health Benefits	Fitness for feeling good and health boosts, long-term illness prevention.	Ill-Health Avoidance	Feel healthier and prevent health problems.
Enjoyment and Fun	Exercising for the pure fun of it, enjoyment linked to achievement of other benefits.	Enjoyment	Enjoyment of the experience and exertion of exercising.

An examination of the four socio-contextual groupings confirms the potential of the TPB to capture these influences. The impact of ‘other’ leisure-time activities, availability and access to facilities, and other restricting factors such as cost, time, and injury could all be deemed to be potentially controlling factors on exercise behaviour. Additionally, the influence of significant others would be very much aligned to the normative beliefs exhibited in many TPB studies. These findings impart further credibility to the use of the TPB as a means of capturing the most salient correlates of the target populations’ exercise behaviour. Finally, significant age, gender, and recent exercise behaviour differences in motivational and ‘other’ correlate assessments are exhibited across the discussion groups. The author reasons that these differences need to be captured in the main survey analyses.

### **6.9 Developing the Main Survey Instrument**

Sections 6.10 to 6.12 and associated sub-sections examine the process implemented to develop and test the survey instrument. The process is enacted in three phases. It begins by reviewing the elicitation study where the underlying Theory of Planned Behaviour (TPB) beliefs are derived. This phase facilitated the integration of measures of the behavioural, normative, and control beliefs in the pilot questionnaire. Stage two involved the administration of the pilot questionnaire. The review of this phase includes the scrutinising of the internal reliability of the EMI-2 variables to be used in the final questionnaire and an examination of the direct TPB and underlying TPB measures to be included in the final instrument. Finally, a temporal stability test of the underlying TPB beliefs is conducted to establish their reliability.

### **6.10 Belief Elicitation Study**

Prior to administering the pilot questionnaire, it was essential to engage in an elicitation study to determine the modal salient beliefs of the target population about regular exercising. The output of this phase facilitates the integration of measures of the behavioural, normative, and control beliefs in the pilot questionnaire.

The literature and discussion group findings both indicate a broad array of exercise correlates. The TPB, and particularly the underlying belief components of the TPB, have been identified as a potential mechanism for capturing these correlates. Pilot work is required to identify accessible behavioural, normative, and control beliefs (Ajzen,

1985). In this case a sample of 54 members of the target population completed a series of nine open-ended questions, three questions relating to each of the three underlying belief constructs. The questions were administered in a class context and respondents were given ample time to assess, reflect upon, and respond to each question. The questions used in the elicitation study can be seen in Section 5.6.2.1 and Appendix A.2.

The responses to these questions were content-analysed and the full set of elicited beliefs were listed and collated as behavioural, normative, or control beliefs. The elicited individual beliefs were then grouped into various belief categories from which the most frequently cited beliefs were extracted for inclusion in the pilot questionnaire. This process was carried out independently by the author, a fellow marketing academic, and a research assistant. Broad consensus was reached on which beliefs to include in the pilot survey instrument. The guidelines used for the selection of beliefs for inclusion in the pilot survey are the 75% most frequently cited beliefs and/or beliefs that were expressed by at least 20% of respondents, as advocated by Ajzen and Fishbein (1980).

### **6.10.1 Elicited Behavioural Beliefs**

The chosen behavioural beliefs are outlined in Table 6.3. Nine belief categories are created from the beliefs elicited from asking respondents what they felt the advantages of engaging in regular exercise are. Beliefs selected for inclusion in the survey are 1) regular exercise allowing individuals to experience success; 2) to foster a sense of team affiliation; 3) to engage in social interaction; 4) to relieve stress; 5) to improve their appearance; 6) to feel energised; 7) to improve health and fitness; 8) to experience fun and enjoyment; and 9) to feel good about oneself and build self-esteem. A further five beliefs are included, having been derived from statements resulting from asking respondents what they felt the disadvantages of engaging in regular exercise are. These include assertions that 1) regular exercise is very time-consuming; 2) can be excessively costly<sup>29</sup>; 3) can take place in off-putting weather conditions; 4) carries the risk of injury; and 5) requires a considerable amount of effort and dedication<sup>30</sup>. The viewpoints

---

<sup>29</sup> Cost issues emerge as both behavioural and control beliefs. Both are included in the final questionnaire as it is reasoned that cost being perceived as a disadvantage of exercising is sufficiently different to the cost of exercising being a controlling influence on individuals' behaviours. For clarity these have been labelled as cost being a behavioural belief, while affordability is included as a control belief.

<sup>30</sup> A similar situation pertains for effort and dedication. The perceived dedication required to exercise regularly is a frequently cited disadvantage of exercising, while a significant cohort are controlled in their

contained in each of these behavioural beliefs are formulated into a series of questions for inclusion in the main questionnaire.

**Table 6.3: Elicited Behavioural Beliefs Selected for Inclusion in Main Questionnaire**

	<b>Behavioural Beliefs Chosen for Inclusion in Main Questionnaire</b>	<b>Number of Citings</b>	<b>Categorised as</b>
Elicited Advantages of Engaging in Regular Exercise	Buzz of winning things	7	Experience Success
	To win trophies and medals	4	
	Team building	2	Team Affiliation
	Team work	2	
	Being part of a team	4	
	Chance to meet new people	3	Social Interaction
	Social aspects	10	
	Playing with friends	6	
	Exercise is relaxing	3	Stress Relief
	Means of relieving stress	10	
	Improve physical condition	6	Appearance
	Building body muscle	1	
	Look better	2	
	Lose weight/manage weight	9	
	Mental refreshedness	3	Feeling Energised
	Cancels out negative effects of lifestyle	1	
	More energy	4	
	Feel better after it	1	
	Improves concentration and motivation	3	
	Improves standard of college work	3	
Better attitude	1		
Better sleep	1		
Take a break from studying	7		
Increases strength and endurance	3	Health and Fitness	
Better control of diabetes and cholesterol	1		
Health benefits	30		
To prevent injuries	2		
Extending my life	1		
Increased fitness	28		
Help me reduce smoking	1		
Enjoyment from exercising	8	Fun and Enjoyment	
Fun of playing	3		
Self-esteem/feel good about yourself	6	Self Esteem	
Feeling more positive	1		
Make me feel better	2		
Emotional benefits	4		
Makes you happier	1		
Positive mental health	1		
Increased confidence	3		
Elicited Disadvantages of Regular Exercise	Time away from college work	11	Time Consuming
	Missed tv time	1	
	Less time at home	1	
	Time consuming	23	
	Less time for social life	4	
	Missing other activities	3	
	Costly	12	Costly
	Getting wet if outdoors	4	Poor Weather
	Dark evenings are demotivating	3	
	Weather	5	Injury Risk
Risk of hyperglycemia	1		
Fear of injuries	10	Dedication Required	
Takes will power and dedication	4		
Needs a lot of effort	9		

exercise behaviour by a lack of will power and willingness to expend sufficient effort. For clarity these have been labelled as required dedication being a behavioural belief, while effort needed is included as a control belief.

Table 6.4 outlines some of the elicited behavioural beliefs that were not chosen due to infrequency of expression.

**Table 6.4: Elicited Behavioural Beliefs Excluded from Main Questionnaire**

	<b>Behavioural Beliefs Excluded from Main Questionnaire</b>	<b>Number of Citings</b>	<b>Categorised as</b>
<b>Elicited Advantages of Engaging in Regular Exercise</b>	Get a buzz/adrenaline rush	2	Adrenaline Rush
	Spend time outside	1	Experience Outdoors
	Provides goals to work towards	1	Goal Motivation
	More money because less socialising	1	Improved Finances
	Interest as a hobby	2	Exercise as a Hobby
	History of playing sport	1	Tradition
	Kickboxing provides personal safety	1	Personal Safety
	Get recognition from others	2	Peer Recognition
	Compare myself to others	1	Peer Comparison
	Competitiveness of playing a game	2	Competitiveness
	Satisfaction from bettering performance	2	Self Improvement
	Improve skills	1	
	Testing your limits in a match situation	1	
Good for building character	1	Value Acquisition	
<b>Elicited Disadvantages of Regular Exercise</b>	Difficult to travel to train/play	2	Access Issues
	Muscle pain	1	Fatigue Issues
	Being tired a lot of the time	4	
	I am not fit so physical activity is difficult	1	Lack of Competence
	Feeling of inadequacy	2	Inconvenience
It is hassle for me	2		

### 6.10.2 Elicited Normative Beliefs

The selected normative beliefs are outlined in Table 6.5. Four belief categories have been created from the beliefs elicited from the question asking respondents to outline the individuals or groups that approve of them engaging in regular exercise. The normative beliefs identified for inclusion in the survey instrument are regular exercise being approved by 1) assorted family members; 2) friends, 3) classmates and workmates; 4) exercise groups and team mates; 5) coaches and managers. The family, friends, and coach groups were also elicited as potentially disapproving of the individual's regular exercise engagement. The viewpoints comprised in each of these normative beliefs are formulated into a series of questions for inclusion in the main questionnaire.

**Table 6.5: Elicited Normative Beliefs Selected for Inclusion in Main Questionnaire**

	<b>Normative Beliefs Chosen for Inclusion in Final Questionnaire</b>	<b>Number of Citings</b>	<b>Categorised as</b>
Individuals/Groups that approve of your regular exercise	Family members	31	Family
	Friends as I would exercise with them	28	Friends
	Classmates	2	
	Co-workers and colleagues	3	
	Manager of my team	5	Coach
	Coach/group leader	7	
	Healthy living and fitness groups	3	Exercise Partners
	Community	1	
Team/Team Mates	20		
College sports and social groups	1		
Individuals/Groups that disapprove of your regular exercise	My mother (thinks I'm worn out)	1	Family
	Parents if doing a dangerous sport	4	
	Extended family don't approve of too much exercise	1	
	Girlfriend/Boyfriend	3	Friends
	Friends as they feel bad they are not exercising	3	
	Friends as might not see them as much	8	
Manager might not approve of other leisure activities	1	Coach	

Table 6.6 outlines some of the elicited normative beliefs that were not chosen due to infrequency of expression.

**Table 6.6: Elicited Normative Beliefs Excluded from Main Questionnaire**

	<b>Normative Beliefs Excluded from Final Questionnaire</b>	<b>Number of Citings</b>	<b>Categorised as</b>
Individuals/Groups that approve of your regular exercise	Health Service	2	Health Professionals
	Doctor	3	
	Lecturers because we would have clear head to study	1	Education
	Gym	2	Commercial Entities
	Sports drinks makers	1	
	Sports goods / equipment makers	1	
My dog - he gets walked!	1	Personal	
People that disapprove	Lecturers because less time to study	5	Education
	My thesis supervisor	1	
	College project groups -less time for meetings	6	

### 6.10.3 Elicited Control Beliefs

The chosen control beliefs are outlined in Table 6.7. Five belief categories have been formulated from the beliefs elicited from the question asking respondents to outline the factors that enable regular exercise or make regular engagement more difficult. The control beliefs to be included in the questionnaire have potentially positive or negative influences on regular exercise. These include 1) the impact of study and work commitments; 2) other leisure activities; 3) the affordability of the activity; 4) the effort

and dedication needed; and 5) friends and team mates' co-operation. The viewpoints comprised in each of these control beliefs are formulated into a series of questions for inclusion in the main questionnaire.

**Table 6.7: Elicited Normative Beliefs Selected for Inclusion in Main Questionnaire**

	<b>Control Beliefs Chosen for Inclusion in Final Questionnaire</b>	<b>Number of Citings</b>	<b>Categorised as</b>
Factors that enable regular exercise	Less hours in work	2	Study/Work Commitments
	Less college work	9	
	College exams finished	1	
	If there was no television	1	Other Leisure Activities
	Having more free time	6	
	Less time given to other activities	5	
	Cheaper gym membership	6	Affordability
	If it is free/cheap	8	
	Desire to look good and feel better	2	Effort
	Stick to a specific exercise programme	1	
More energy and commitment	5		
Spending time with friends	1	Friends Co-operation	
Being part of a team	2		
Meeting others who have same interests	1		
Friends to exercise with/friends encouragement	9		
Factors that make regular exercise more difficult	Volume of study commitments	19	Study/Work Commitments
	Need to work	7	
	Don't have time	5	
	Social life	5	Other Leisure Activities
	Friends doing other stuff	2	
	Exercise not as enjoyable as other activities	1	
	Other leisure commitments	1	
	No money/cost	17	Affordability
	Expiration of gym membership	1	
	Lethargic attitude towards activity	4	Effort
	Laziness	3	
	Effort required to exercise	1	
	Lack of motivation	3	
	No friends to exercise with	5	Friends Co-operation
Lack of friends involved in exercise	1		
If friends organised something	1		
Lack of commitment from team mates	2		

Table 6.8 outlines some of the elicited control beliefs that were not chosen due to infrequency of expression.

**Table 6.8: Elicited Control Beliefs Excluded from Main Questionnaire**

	<b>Control Beliefs Excluded from the Final Questionnaire</b>	<b>Number of Citings</b>	<b>Categorised as</b>
Factors that enable regular exercise	Good health with no injuries	2	Injury Free
	Current injury gets better	1	
	Having closer facilities to home/Access	3	Facility Access
	If the commute home was shorter	1	
	I would need to stop smoking	1	
	Better Physical condition	2	Competence
	Teams doing well or training going good	2	Team Motivation
Trying to get on a team	1		
	Good weather	4	Weather
Factors that make regular exercise more difficult	Injury prevents it	3	Injury Concerns
	Ill Health	2	Health Concerns
	Pitches water logged /flooded	1	Facility Access
	Club season ends	2	
	No pay per go facility in college gym	2	
	Getting a lift /Transport	2	
	Poor physical condition	2	Competence
	Bad weather	5	Weather
Family commitments	3	Family Issues	

## 6.11 Testing the Pilot Questionnaire

The proposed pilot questionnaire was first tested on five people from the relevant population, who were asked to complete the questionnaire and highlight any issues regarding comprehension and clarity. A few grammatical errors were highlighted and rectified prior to the delivery of the questionnaire to the chosen sample. It was administered to a sample of 52 respondents, again drawn from the target population.

### 6.11.1 Pilot Questionnaire Structure

This phase of the Pilot Questionnaire was administered in a classroom setting and structured by including:

- A number of questions assessing specified demographic and behavioural characteristics of the target population.
- The EMI-2 scale. The internal reliability of the 14 motivational constructs inherent in this scale is assessed later in Section 6.11.2.1.
- A series of twenty four statements with bipolar adjectives, which are used as direct measures of the Theory of Planned Behaviour (TPB) constructs attitude, subjective norm, perceived behavioural control and intention. These are included for two purposes. A criterion/predictive validity test on the extracted segments is recommended by Hair *et al.* (2010). The direct measure variables of the TPB are used in this predictive validity test to validate the segmentation outcome. It is

reasoned that segments with a more positive motivational outlook should illustrate the strongest attitudes and subjective norms toward exercise, while also being less constrained by perceived behavioural control issues. Inclusion of the direct measures also facilitates comparison with the corresponding indirect behavioural beliefs. This is achieved through the calculation of a series of simple bivariate correlations between direct and indirect measures of the same construct, to confirm the validity of the indirect measures. These tests will only take place using the data from the final questionnaire, as the pilot sample size is not large enough to facilitate accurate clustering of the data.

- A series of questions/statements examining each of the three indirect belief constructs of the TPB. Fourteen behavioural beliefs are included examining the strength of each belief and the relevant outcome evaluation. Similarly, the strength of the four normative beliefs and the motivation to comply are probed. Finally, the strength of the five control beliefs and the power of the control beliefs are assessed. The relevant measures are multiplied together to ascertain the actual belief, as outlined below:

Behavioural Belief Strength x Outcome Evaluation = Behavioural Belief

Normative Belief Strength x Motivation to Comply = Normative Belief

Control Belief Strength x Control Belief Power = Control Belief

The individual beliefs are also summated to create a composite score for behavioural, normative and control beliefs. The individual beliefs are tested for temporal stability in a test-retest process, as internal consistency is not considered a suitable mechanism for measuring the reliability of the indirect measure (Ajzen, 2002). The process employed for the temporal stability test is examined in Section 6.12.

### **6.11.2 Pilot Questionnaire Data Analysis**

A number of tests are performed on the pilot questionnaire data, commencing with a review of the internal reliability of the EMI-2 constructs.

#### **6.11.2.1 Analysis of the Internal Reliability of the EMI-2 Constructs**

The internal reliability of the variables designed to measure the fourteen motivational constructs of the EMI-2 were examined. Although the sample size is small, it is

envisaged that this test will lend confirmation that the EMI-2 scale as constituted is appropriate for use with the chosen target population.

**Table 6.9: Internal Reliability of EMI-2 Constructs in Pilot Study**

Motivational Construct	Cronbach 's Alpha	Number of Motives
Affiliation Motives	.810	4
Appearance Motives	.860	4
Challenge Motives	.779	4
Competition Motives	.936	4
Enjoyment Motives	.851	4
Health Pressure Motives	.710	3
Ill Health Avoidance Motives	.886	3
Nimbleness Motives	.844	3
Positive Health Motives	.868	3
Revitalisation Motives	.784	3
Social Recognition Motives	.839	4
Strength Endurance Motives	.884	4
Stress Management Motives	.881	4
Weight Management Motives	.906	4

Table 6.9 illustrates that the items measuring all fourteen motivational constructs illustrate satisfactory internal reliability – Cronbach’s Alpha all exceed .6 as per Hair *et al.* (2010). This suggests that the interpretation of the items by this target audience is as intended for the EMI-2 scale.

#### **6.11.2.2 Analysis for the Direct TPB Measures**

The pilot questionnaire integrated twelve bipolar adjectives used to directly measure attitude, six items measuring subjective norm, six measures for perceived behavioural control, and four measures used to directly assess behavioural intention. The analysis of the pilot questionnaire output regarding these items is outlined in Appendix C, as is the process enacted to reduce the number of items for inclusion in the final questionnaire. Six direct measures of attitude, four subjective norm, four perceived behavioural control, and three measures of behavioural intention are selected for inclusion in the final survey resulting from this analysis.

## 6.12 Retest/Temporal Stability Study and Actual Behaviour Measures

Ajzen (2002) recommends that the indirect measures of the TPB are tested for temporal stability in a test-retest process, as internal consistency is not suitable for measuring the reliability of the indirect measures. This is recognised in this study, with the indirect measures of the TPB being retested after a two-week interval on the same sample audience. 45 of the original 52 respondents completed the temporal stability/retest phase of the research. The test-retest correlations are outlined in Table 6.10.

**Table 6.10: Test-Retest Correlation for Elicited Beliefs**

Behavioural Belief	Correlation	Sig.	Normative Belief	Correlation	Sig.
Success	.792	.000	Family	.806	.000
Affiliation	.670	.000	Friends	.750	.000
Social Interaction	.742	.000	Coaches	.805	.000
Stress Relief	.705	.000	Exercise Partners	.761	.000
Appearance	.679	.000			
Health & Fitness	.815	.000	<b>Control Belief</b>	<b>Correlation</b>	<b>Sig.</b>
Fun & Enjoyment	.724	.000	Studies	.706	.000
Feeling Energised	.752	.000	Other Leisure Activities	.713	.000
Feeling Good	.773	.000	Affordability	.680	.000
Time Consuming	.815	.000	Effort Required	.842	.000
Costly	.890	.000	Friends Co-operation	.713	.000
Poor Weather	.889	.000			
Injury Risk	.726	.000			
Dedication Required	.754	.000			

Correlations are all significant at the  $p < .01$  level and of large magnitude

Table 6.10 illustrates that all the beliefs illustrate a highly significant correlation between the original pilot and the retest survey two weeks later. The magnitude of the correlation is large in all instances. The good temporal stability outcome indicates validity for the belief measures.

Some debate pertains in the literature concerning optimal scaling for the belief measures of the TPB (East, 1993), especially relating to the choice of seven-point bi-polar (-3 to +3) or uni-polar (1 to 7) scaling. This is a particular issue for the belief measures as they are the composite of two separate items, as illustrated below:

Behavioural Belief Strength x Outcome Evaluation	=	Behavioural Belief
Normative Belief Strength x Motivation to Comply	=	Normative Belief
Control Belief Strength x Control Belief Power	=	Control Belief

The author employed uni-polar scaling for all TPB beliefs in the preliminary questionnaire. Data were re-coded to different combinations of uni-polar and bi-polar scaling. The individual belief items were summated and four separate analyses were conducted to establish which scaling combination for the belief products, correlated best with the global/direct measure<sup>31</sup> of the three beliefs. Minimal correlation differences were illustrated, with uni-polar measures for all belief composites demonstrating the highest correlation. This is consistent with the findings of East (1993), who ran similar tests and found that the scaling made little difference and as such the researcher's discretion can be used when selecting the scaling option. Considering these arguments the author elected to maintain the uni-polar scaling for all the belief composites for the final survey and its subsequent analysis.

The retest phase also presented the opportunity to measure the respondents' actual exercise behaviour. A brief questionnaire based on the moderate and vigorous regular exercise recommendations of the WHO (2004) is employed to collect the behavioural data in this phase. The internal reliability of both the vigorous and moderate exercise measures and the correlation between the measures are evaluated to validate the instrument – see Table 6.11.

**Table 6.11: Internal Reliability and Correlation of Exercise Behaviour Measures**

Exercise Behaviour	Number of Items	Cronbach's Alpha	Correlation	Sig.
Vigorous	2	.924	.859**	.000
Moderate	2	.863	.761**	.000

Correlations are significant at the  $p < .01$  level and of large magnitude.

The measures of actual behaviour exhibit satisfactory outcomes in the pilot study. The correlation between the two vigorous exercise items is highly significant and of strong magnitude and the Cronbach's Alpha test of internal reliability between the two vigorous exercise items is very strong. A similar situation arises for the two moderate

---

<sup>31</sup> The summated behavioural belief product should correlate highly with the global measure of Attitude; the normative belief product should correlate strongly with Subjective Norm, while the control belief product should demonstrate strong correlation with Perceived Behavioural Control.

exercise measures, again exhibiting highly significant correlations and very strong internal reliabilities.

### **6.13 Chapter Conclusion**

The pilot study was an essential step in the formulation of an optimally-structured final questionnaire. Firstly, the author went through a preliminary phase of eliciting salient behavioural beliefs for inclusion in the pilot questionnaire. The pilot study was administered and a number of analyses conducted to validate the survey instrument for use in the main research phase. The analysis of the EMI-2 motivational constructs illustrated strong internal reliability for all fourteen constructs, suggesting that the instrument is interpreted as intended by this target audience. The various direct measures of the TPB constructs were then analysed and the number of items was reduced considerably. Six measures of attitude, four measures of subjective norm, four measures of perceived behavioural control, and three items measuring behavioural intention remain for inclusion in the main survey. The temporal stability study of the salient beliefs illustrates satisfactory results, with no case emerging for the exclusion of any of the beliefs. Finally, the measures designed to capture actual behaviour at a four week interval, exhibit satisfactory internal reliability.

### **6.14 Constructing and Administering the Main Survey Instrument**

The main survey was formulated with consideration given to the outcomes of the pilot study. A number of modifications to the pilot questionnaire were made, as outlined in Section 6.11. The questionnaire was administered in two phases. Phase 1 was the main questionnaire containing the demographic measures and gauges of previous behaviour; the EMI-2 scale; and the assorted items measuring the indirect and direct constructs of the TPB. Phase 2 was the follow-up questionnaire measuring the target audience's regular exercise behaviour in the intervening four week period.

The Phase 1 survey was distributed in February 2011. Questionnaires were completed in class at the target respondent's place of education. The classes were randomly chosen from a full list of class units at the chosen educational institute and a full census of people attending the class on the day of the survey were asked to complete the questionnaire. It was stressed to all individuals that participation in the survey was entirely of their own volition and less than 2% of individuals opted out of the study. In

all 804 questionnaires were returned from a random sample<sup>32</sup> of 55 classes throughout the institute. A close examination of each questionnaire highlighted a number of potential difficulties. Due to excessive missing data in the EMI or response bias issues, 29 questionnaires were deemed non-usable and thus removed, leaving a total usable sample of 775 respondents.

Phase 2 of the main survey was administered four weeks later in March 2011. The respondents from Phase 1 were targeted with this questionnaire and a total of 480 (*circa* 62% of the original sample) usable questionnaires resulted from this process. This is consistent with typical response rates for a follow-up TPB study, which from the author's examination of many TPB studies appears to be in the region of 60-75%.

---

<sup>32</sup> Class units were randomly selected as part of the cluster sampling procedure that is outlined in Section 5.6.1.

# **Chapter 7. Preparation and Reduction of Data Prior to Cluster Analysis**

"There are times when you run a marathon and you wonder, Why am I doing this?  
But you take a drink of water, and around the next bend, you get your wind back,  
remember the finish line, and keep going"

Steve Jobs.

## 7.1 Chapter Overview

Chapter 7 presents the various preparatory phases of analysis that were enacted after the administration of the main survey and prior to conducting the cluster analysis. The perils of integrating too many variables into a clustering process have been highlighted in Section 4.3 (e.g., Dolnicar and Grun, 2008) and the author has elected to reduce the 51 item EMI-2 variables, prior to their processing through the two-step clustering procedure. This is undertaken through a Principal Component Analysis<sup>33</sup> (PCA), which facilitates the identification of a structure amongst the EMI-2 variables that is relevant to the target market of this study. The preparatory work took place in a number of phases.

The preparation of the data for the PCA is described in Section 7.2. Section 7.3 scrutinises the EMI-2 output for data assumptions<sup>34</sup> that pertain to factor analysis and actions are proposed on the basis of this testing. The PCA used to reduce the EMI-2 constructs for inclusion in the cluster analysis is assessed in Section 7.4. Nine constructs are chosen for inclusion in the two-step cluster analysis, and these are reviewed and labelled in Section 7.5. Issues relating to the validity of the factor outcome are tackled in Section 7.6. Finally, in Section 7.7 the revised data and components are again tested for data assumptions.

## 7.2 Data Preparation

The complexity of multivariate analysis requires the researcher to have a thorough comprehension of the underlying data. Hair *et al.* (2010)<sup>35</sup> highlight two procedures that aid the researcher in preparing the data for multivariate analysis and these are examined in Sections 7.2.1 and 7.2.2.

---

<sup>33</sup> Principal Component Analysis is a variable reduction technique, similar to exploratory or common factor analysis, which should be used when data reduction is a primary concern (Hair *et al.*, 2010). The same data assumptions apply as for a common factor analysis.

<sup>34</sup> Several tests for data assumptions are conducted in Chapters 7 and 8. The first series of tests relate to the data assumptions for factor analysis and are examined in Section 7.2. The data extracted from the principal component analysis are subjected to the data assumption tests for cluster, ANOVA, independent samples t-tests and chi-square tests in Section 8.2.1. The introduction of the TPB data requires similar data assumption tests for ANOVA tests, which are examined in Section 8.7.1. Finally, the TPB beliefs are subjected to correlation analyses and the pertinent data assumptions for these tests are examined in Section 8.12.1.

<sup>35</sup> The Hair *et al.* (2010) text on Multivariate Data Analysis has received widespread acclaim amongst research practitioners. It is used as a guide, and cited extensively, throughout the data analysis sections of this thesis.

### **7.2.1 Missing Data Analysis**

It is important to screen the data for missing values and establish if a missing data process is in operation. A thorough review of the 804 survey responses highlighted some potential issues. The author established that 14 of the surveys contained a considerable systematic missing data pattern. Additionally, a further 10 cases illustrated excessive response bias. These shortcomings led to the decision to exclude the 24 surveys from the subsequent data analysis procedures. Other missing data cases were deemed to be random and a missing value code was assigned to each of these in SPSS.

### **7.2.2 Detecting and Handling Outliers**

Outliers can be detected at univariate or multivariate level. The data were examined to ascertain the frequency and impact of outliers. Outliers can contribute to non-normality in the data and also present difficulties when engaging in some multivariate analyses. In the descriptive analysis at a univariate level (all 51 EMI-2 variables), a number of outliers were identified. The researcher removed these outliers and retested the data for normality. Some minimal improvements were evident, but the data were still non-normal after the removal of outliers. Hair *et al.* (2010) highlight four classes of outliers: 1) Those that arise from a procedural error; 2) Observations that occur as the result of an extraordinary event; 3) Extraordinary observations for which the researcher has no explanation; and 4) Observations that fall within the ordinary ranges of values on each of the variables, but are unique in their combinations across the variables. An examination of the outliers that emerged suggests that they fit in the fourth category and Hair *et al.* (2010) recommends that the researcher should retain the observation unless specific evidence exists that discounts the outlier as a valid population member. Thus, the author has elected to leave the outliers unadjusted at this juncture, although further outlier analysis will be conducted at the multivariate level.

### **7.3 Data Assumptions in Factor Analysis**

The first point to note is that all the data examined throughout this study are measured at interval level, and do not violate any assumptions in that regard. Following the initial data screening, the first phase of actual data analysis involves a PCA. The purpose of this stage is very much exploratory, with the goal of reducing the 51-item EMI-2 variables to more manageable proportions for inclusion in the cluster analysis

procedure, whilst also defining the underlying structure of the data in the context of this study. Prior to conducting the PCA, it is important to assess the data assumptions for a test of this nature. Hair *et al.* (2010) outline that the critical assumptions underlying factor analysis, are more conceptual than statistical in nature.

### **7.3.1 Conceptual Assumptions**

Factor analysis assumes that some degree of underlying structure exists in the chosen variables. Hair *et al.* (2010) contend that two conceptual assumptions underpin factor analysis. Firstly, the researcher must ensure that the variables selected for inclusion in the analysis are conceptually valid. The EMI-2 scale is a validated instrument that has been used quite extensively in previous studies and as such satisfies this assumption. The second assumption is that the sample is homogenous with respect to the underlying factor structure. The original paper that established the validity of the EMI-2 exhibited strong support for the invariance of the factor structure across gender (Markland and Ingledew, 1997), indicating sufficient homogeneity of factor structure between males and females.

### **7.3.2 Statistical Assumptions**

Hair *et al.* (2010) argue that statistical assumptions are not as important as conceptual assumptions for factor analysis. Departures from normality, homoscedasticity, and linearity apply only to the extent that they diminish the observed correlations. Consequently, the author has elected to only give a detailed assessment of the data normality at this juncture<sup>36</sup>. A number of different data sets and statistical tests are being analysed in this study, and as such data assumption tests are conducted at various points in Chapters 7 and 8. For the purpose of clarity, the author has summarised the various phases of data assumption tests in Table 7.1.

---

<sup>36</sup> Homoscedasticity tests on this data set revealed no issues. Some linearity problems presented in the data examination, but given the assertions of Hair *et al.* (2010) about departures from linearity in factor analysis, the author elected to leave the non-linear data unadjusted at this point.

**Table 7.1: Phases of Data Assumption Testing**

Addressed in Section	Data Being Used	Statistical Tests Being Employed	Data Assumptions Tested For
7.3 and 7.6	51 EMI-2 Variables	Explorator Factor Analysis	Interval Data; Independence of Data; Handling Outliers, Conceptual Assumptions; Data Normality; Covergent Validity; Discriminant Validity; Face Validity; Internal Reliability; Unidimensionality;
8.2.1	Adjusted EMI-2 Constructs	Cluster Analysis; ANOVA and Independent Samples T-Tests	Interval Data; Independence of Data; Handling Outliers, Data Normality; Equality of Variance; Multicollinearity
8.7.1	Individual TPB Beliefs	ANOVA and Independent Samples T-Tests	Interval Data; Independence of Data; Handling Outliers; Data Normality; Equality of Variance; Data Linearity; Multicollinearity
8.9.1	Summated TPB Beliefs	Correlation Analysis	Interval Data; Independence of Data; Handling Outliers; Data Normality; Homoscedascity; Data Linearity

**7.3.2.1 Data Normality**

The Kolmogorov-Smirnov (K-S) and Shapiro-Wilk (S-W) tests are used to examine whether the distribution as a whole deviates from a comparable normal distribution. The K-S and S-W test results for each of the 51 variables have significance values that are below .05, indicating that the data are non-normal. However, this is tempered by a major limitation of these tests. With large sample sizes it is very easy to get significant results from small deviations from normality. Accordingly, a significance test does not necessarily tell the researcher whether the deviation from normality is enough to bias any statistical procedures that are applied to the data (Field, 2009). Field (2009) recommends that these tests are not used in isolation, rather they should be conducted in tandem with the data plots in order to make an informed decision about the extent of non-normality.

The researcher then examined the skewness and kurtosis data for all 51 variables. Additionally, as recommended by Field (2009), the histograms, probability-probability (P-P) plots and quantile-quantile (Q-Q) plots for the data were examined. The descriptive table for these data is contained in Appendix B and illustrates varying degrees of skewness and kurtosis issues, which are indicative of some non-normality in the data. An examination of the plots also indicates non-normality, with the normality curves in the histograms being problematic for many items. The P-P and Q-Q plots do

not illustrate these issues to the same extent, although for many items they still could not be considered normal in appearance.

Consideration was given to the fact that the 51 variables of the EMI-2 were designed to measure 14 different motivational concepts, and as such should be examined in their summated format. This process was enacted and although it once again failed the normality tests (the caveats of the K-S and S-W tests apply in this situation also), there are improvements in the skewness and kurtosis data and the various plots. This is typical of the smoothing effect of using summated data.

Following the analysis of the summated scales, the data can still be described as non-normal, although not radically so. The author gave consideration to the various options suggested for handling non-normal data, such as transforming the data. However, as will be discussed in later sections of this chapter, the necessity for normal data in both factor and cluster analysis is not as critical as it might be in some other multivariate analyses. Additionally, the interpretation of transformed data can present considerable difficulties (Hair *et al.*, 2010). Consequently, a decision was made to leave the data unadjusted and not subject it to any of the suggested procedures for handling non-normal data.

#### **7.4 Principal Component Analysis**

The next decision to be made concerned the data to be used for the cluster analysis. Section 5.8.1.2 presented the arguments for and against employing a PCA in advance of cluster analysing the data. Having considered these arguments the author elected to use a PCA approach for two reasons. Firstly, the literature suggests that researchers should be parsimonious in the inclusion of variables in a clustering procedure (Dolnicar, 2003). Consequently, the author reasons that data reduction in the 51-item EMI-2 scale is required. Additionally, a PCA allows the researcher to determine if the data in this study revealed a different underlying factor structure to the original 14 motivational constructs outlined in EMI-2 scale.

A PCA was performed on the 51 variables of the EMI-2 scale to initiate the process of data reduction and to identify the underlying structure of the data. The initial solution revealed a 9 construct outcome, see Table 7.2.

**Table 7.2: Initial Rotated Component Matrix for the 51 EMI-2 variables**

	Rotated Component Matrix								
	Component								
	1	2	3	4	5	6	7	8	9
Weight Management 1		.789							
Ill Health Avoidance 1			.797						
Revitalisation1			.433	.599					
Appearance1		.343	.354						
Social Recognition 1	.583								-.429
Stress Management 1						.644			
Positive Health 1			.662		.327				
Strength Endurance 1					.740				
Enjoyment 1				.697					
Affiliation 1							.804		
HealthPressures1								.641	
Competition 1	.796								
Nimbleness 1	.390				.393				.322
Challenge 1	.490			.381					
Weight Management 2		.860							
Ill Health Avoidance 2			.719						
Revitalisation 2				.663					
Appearance 2		.493	.341		.398				
Social Recognition 2	.791								
Stress Management 2						.773			
Positive Health 2			.765						
Strength and Endurance 2				.346	.505				
Enjoyment 2				.731					
Affiliation 2							.830		
Health Pressures 2								.763	
Competition 2	.804								
Nimbleness 2	.325				.432				.439
Challenge 2	.604			.370					
Weight Management 3		.877							
Ill Health Avoidance 3		.305	.435					.488	
Revitalisation 3						.513		.328	
Appearance 3		.702							
Social Recognition 3	.721								
Stress Management 3						.832			
Positive Health 3			.587		.313				
Strength and Endurance 3					.812				
Enjoyment 3				.592			.325		
Affiliation 3							.833		
Health Pressures 3								.655	
Competition 3	.796								
Nimbleness 3	.309				.489				.459
Challenge 3	.469						.425		
Weight Management 4		.860							
Appearance 4		.706							-.306
Social Recognition 4	.725								
Stress Management 4						.835			
Strength and Endurance 4					.735				
Enjoyment 4	.341			.598					
Affiliation 4	.384						.693		
Competition 4	.760						.337		
Challenge 4	.709			.312					

Loadings <.3 not included in Table 7.2, as per Hair *et al.*'s (2010) minimum threshold for inclusion in initial model.

An examination of the solution highlighted some issues with the cross-loading of items across constructs. The author employed the rule of thumb<sup>37</sup>, whereby items without any loadings above .4 were eliminated first, then any items with two loadings above .40 were discarded, and finally items that did not reach the threshold of a .50 loading were eliminated. Offending items were removed sequentially, with the data rotated<sup>38</sup> again after each item was removed. After ten iterations of this process, a satisfactory solution emerged, with all variables exhibiting loadings of  $\pm .50$  or greater for their respective factors. This exceeds the threshold whereby Hair *et al.* (2010) consider the variable loadings to be practically significant. The items removed during this process are listed in Table 7.3:

**Table 7.3: Eliminated EMI-2 Items**

Nimbleness 1	To stay/become more agile
Appearance 1	To help me look younger
Ill Health Avoidance 3	To avoid heart disease
Challenge 3	To develop personal skills
Appearance 2	To have a good body
Strength and Endurance 2	To increase my endurance
Revitalisation1	Because it makes me feel good
Challenge 2	To give me personal challenges to face
Challenge 1	To give me goals to work towards

The final solution also has a 9 construct outcome, as can be evidenced from the Table 7.4.

---

<sup>37</sup> Hair *et al.* (2010) outline that loadings should be greater than .40 to be significant, but ideally should be greater than .50 to be practically significant. Variables should have communalities of greater than .50 to be retained in the analysis.

<sup>38</sup> The VARIMAX rotation approach is adopted, as an orthogonal method is preferred when data reduction is the goal of the factor analysis (Hair *et al.*, 2010).

**Table 7.4: Final Rotated Component Matrix for the EMI-2 Items**

	Rotated Component Matrix								
	Component								
	1	2	3	4	5	6	7	8	9
Social Recognition 2	.805								
Competition 1	.788								
Competition 2	.784								
Competition 3	.778								
Competition 4	.745								
Social Recognition 4	.735								
Social Recognition 3	.720								
Challenge 4	.697								
Social Recognition 1	.584								
Weight Management 3		.881							
Weight Management 2		.867							
Weight Management 4		.863							
Weight Management 1		.792							
Appearance 4		.704							
Appearance 3		.699							
Stress Management 3			.845						
Stress Management 4			.845						
Stress Management 2			.780						
Stress Management 1			.670						
Revitalisation 3			.502						
Ill Health Avoidance 1				.810					
Positive Health 2				.804					
Ill Health Avoidance 2				.745					
Positive Health 1				.683					
Positive Health 3				.630					
Affiliation 2					.845				
Affiliation 3					.845				
Affiliation 1					.822				
Affiliation 4					.692				
Enjoyment 2						.749			
Enjoyment 1						.741			
Revitalisation 2						.711			
Enjoyment 3						.633			
Enjoyment 4						.613			
Strength and Endurance 3							.802		
Strength and Endurance 1							.748		
Strength and Endurance 4							.703		
Health Pressures 2								.761	
Health Pressures 3								.695	
Health Pressures 1								.685	
Nimbleness 3									.637
Nimbleness 2									.635

Loadings <.5 not included in Table 7.4, as they are not considered to be practically significant (Hair *et al.*,2010)<sup>39</sup>

<sup>39</sup> All cross-loadings not included in Table 7.3 were actually <.04, which is evidence of further reduced practical significance.

## 7.5 Construct Labelling

The nine constructs have been labelled based on the motivational variables inherent in each construct. The author adheres to Hair *et al.*'s (2010) assertion that variables with higher loadings are considered more influential in assigning a representative name to the factor. A brief reasoning for these choices are outlined for each construct:

### 7.5.1 Component 1 - Interpersonal Motives

This component is comprised of Social Recognition variables 1, 2, 3, and 4; Competition variables 1, 2, 3, and 4; and the Challenge number 4 variable and is illustrated in Table 7.5.

**Table 7.5: Interpersonal Motives Construct**

Interpersonal Motives		
Social Recognition 2	.805	To compare my abilities with other peoples'
Competition 1	.788	Because I like trying to win in physical activities
Competition 2	.784	Because I enjoy competing
Competition 3	.778	Because I enjoy physical competition
Competition 4	.745	Because I find physical activities fun, especially when competition is involved
Social Recognition 3	.735	To gain recognition for my accomplishments
Social Recognition 4	.720	To accomplish things that others are incapable of
Challenge 4	.697	To measure myself against personal standards
Social Recognition 1	.584	To show my worth to others

All the variables included in the component could be considered to be 'interpersonal' in orientation, in the majority of instances requiring the presence of others in the exercise activity to compete or compare oneself against. Additionally, the composition of the component is similar in content to the Interpersonal construct derived by Markland and Ingledew (1997) in their factor analytical sub-modelling of the fourteen EMI-2 motivational groupings and this explains the use of the Interpersonal label for the construct.

### 7.5.2 Component 2 - Aesthetic Motives

Component 2 is comprised of Weight Management variables 1, 2, 3, and 4; and Appearance variables 3 and 4 (see Table 7.6).

**Table 7.6: Aesthetic Motives Construct**

Aesthetic Motives		
Weight Management 3	.881	To help control my weight
Weight Management 2	.867	To lose weight
Weight Management 4	.863	Because exercise helps me to burn calories
Weight Management 1	.792	To stay slim
Appearance 4	.704	To look more attractive
Appearance 3	.699	To improve my appearance

The thrust of the variables is toward an individual looking better as a result of exercising, so it is felt that Aesthetic motives is an appropriate label for this collection of items.

### 7.5.3 Component 3 - Stress Management Motives

Component three integrates the four Stress Management variables and Revitalisation variable 3, which has the lowest influence on the nature of the factor (see Table 7.7).

**Table 7.7: Stress Management Motives Construct**

Stress Management Motives		
Stress Management 3	.845	To help manage stress
Stress Management 4	.845	To release tension
Stress Management 2	.780	Because it helps to reduce tension
Stress Management 1	.670	To give me space to think
Revitalisation 3	.502	To recharge my batteries

It is logical to assign the Stress Management label to the construct, given the pre-eminence of the four stress relief oriented variables in this construct.

### 7.5.4 Component 4 - Health Enhancement Motives

The component is comprised of Ill Health Avoidance variables 1 and 2; and the Positive Health variables 1, 2, and 3 and is illustrated in Table 7.8.

**Table 7.8: Health Enhancement Motives Construct**

Health Enhancement Motives		
Ill Health Avoidance 1	.810	To avoid ill-health
Positive Health 2	.804	Because I want to maintain good health
Ill Health Avoidance 2	.745	To prevent health problems
Positive Health 1	.683	To have a healthy body
Positive Health 3	.630	To feel more healthy

This construct is very much reflective of the health-enhancing benefits of exercise, containing five of the six variables measuring ill health avoidance and positive health motives. Considering this, it is felt that Health Enhancement motives is an appropriate label.

### 7.5.5 Component 5 - Social Motives

This component is comprised of all the four Affiliation variables (see Table 7.9).

**Table 7.9: Social Motives Construct**

Social Motives		
Affiliation 2	.845	To enjoy the social aspects
Affiliation 3	.845	To have fun being active with other people of exercising
Affiliation 1	.822	To spend time with friends
Affiliation 4	.692	To make new friends

The author has elected to label the construct as Social Motives for two reasons. Firstly, the variables represent the social interaction benefits of exercising. Secondly, in the behavioural belief analysis outlined in Section 6.3.2, affiliation with a team or club emerges as a positive influence on exercise attitude formation. The author sought to avoid confusion in the interpretation of what affiliation represents in this context.

### 7.5.6 Component 6 - Enjoyment Motives

This component is comprised of all four Enjoyment variables and the Revitalisation 2 variable (see Table 7.10).

**Table 7.10: Enjoyment Motives Construct**

Enjoyment Motives		
Enjoyment 2	.749	Because I find exercising satisfying in and of itself
Enjoyment 1	.741	Because I enjoy the feeling of exerting myself
Revitalisation 2	.711	Because I find exercise invigorating
Enjoyment 3	.633	For enjoyment of the experience of exercising
Enjoyment 4	.613	Because I feel at my best when exercising

The construct is characterised by the fun and positive stimulation that people experience while exercising, represented by the four enjoyment variables and one revitalisation variable. It is reasoned that enjoyment is still the predominant sentiment and Enjoyment motives is the chosen label.

### 7.5.7 Component 7 – Strength Motives

Component seven is comprised of three of the four Strength and Endurance variables, those numbered 1, 3, and 4 and is illustrated in Table 7.11.

**Table 7.11: Strength Motives Construct**

Strength Motives		
Strength and Endurance 3	.802	To get stronger
Strength and Endurance 1	.748	To build up my strength
Strength and Endurance 4	.703	To develop my muscles

The exception is the one variable that relates to endurance, leaving the three predominately strength-oriented variables to describe this construct. With this in mind, Strength motives is deemed the most pertinent title.

### 7.5.8 Component 8 – Health Pressure Motives

This component is comprised of the Health Pressures 1, 2, 3 variables (see Table 7.12).

**Table 7.12: Health Pressures Motives Construct**

Health Pressure Motives		
Health Pressure 2	.761	To help prevent an illness that runs in my family
Health Pressure 3	.695	To help recover from an illness/injury
Health Pressure 1	.685	Because my doctor advised me to exercise

The construct is made up solely of the three Health Pressure variables from the EMI-2, so it is reasoned that maintaining the Health Pressure name is fitting.

### 7.5.9 Component 9 – Flexibility Motives

This construct is comprised of the Nimbleness 2 and 3 variables (see Table 7.13).

**Table 7.13: Flexibility Motives Construct**

Flexibility Motives		
Nimbleness 3	.637	To stay/become flexible
Nimbleness 2	.635	To maintain flexibility

The final component is made up of two of the three nimbleness variables from the EMI-2. The variable relating to agility was eliminated, leaving the two variables that specify flexibility as a benefit of exercising as the defining features of the construct. Flexibility

motives is therefore the chosen label.

## **7.6 Validation of the Factor Analysis**

Hair *et al.* (2010) outline that the most direct method for validating the results of a factor analysis is to engage in a confirmatory factor analysis to assess the replicability of the results. This is a complex process that requires the use of structural equation modelling. There is ongoing debate amongst research practitioners concerning the appropriate role of factor analysis and many researchers consider it to be only an exploratory tool (Hair *et al.*, 2010). The author contends that the exploratory objectives of this research phase - searching for structure amongst the EMI-2 variables and corresponding reduction in the number of variables for inclusion in subsequent data analysis - render a confirmatory factor analysis superfluous at this point.

Factor stability is largely dependent on the size of the sample and the number of cases per variable (Hair *et al.*, 2010). The size of the sample in this study ensures that *circa* 15 cases-per-51 variables are assessed at the outset of the PCA. Elimination of the variables to achieve model parsimony boosts the cases-to-variables ratio to *circa* 18, thus ensuring a relatively stable factor model outcome.

Construct validity tests were conducted to test the validity of the summated scales. Convergent and discriminant tests are both considered sub-categories of construct validity. These tests work together. If the researcher can demonstrate evidence for both convergent and discriminant validity then construct validity is displayed (Hair *et al.*, 2010). To establish convergent validity, the researcher must demonstrate that measures that should be related are in reality related (Hair *et al.*, 2010). Thus, in the convergent analysis the variables that comprise each of the nine motivational constructs are correlated with each other. The vast majority of the variables illustrate a large positive correlation effect ( $r > .5$ ), while a number of variables demonstrate medium correlational effects ( $r > .3$ ), although for these variables all correlation coefficients are in excess of .4. The reasonably strong nature of the majority of correlations indicates that the summated scales are measuring the intended concepts.

Establishing discriminant validity requires the researcher to illustrate that measures that should not be related, are in reality not related (Hair *et al.*, 2010). The discriminant

validity tests were conducted by correlating the variables contained in each of the nine motivational constructs with behavioural belief/attitudinal variables that the author reasoned to be conceptually related, but different to the motivational constructs. The analysis revealed some that the majority of the motivational variables do not correlate significantly with the selected behavioural beliefs. A number illustrate significant correlations, but all of weak magnitude and considerably lower than the correlations illustrated in the convergent validity tests.

The correlation pattern supports discriminant and convergent validity, but this is not sufficient to show that each of the motivational constructs is actually measuring what it is designed to capture. To capture this, the researcher needs to define the concept and engage in a face validity test. The conceptual definition outlines the concept being measured in a manner relevant to the research in question and is based on prior research that establishes the character of the concept. Face validity subjectively evaluates the association between the individual items and the concept (Hair *et al.*, 2010). This type of validation can take many formats. For this study, the author has elected to examine the nine post-factor analysis EMI-2 constructs, in comparison with validated constructs from the original EMI-2 scale. In the majority of instances the original EMI-2 motivational constructs dominate the revised motivational constructs, offering considerable face validity to the revised constructs. Three notable exceptions emerge, the interpersonal, aesthetic, and health enhancement constructs, which extensively integrate variables from two or more of the original EMI-2 constructs (See Tables 7.4, 7.5, and 7.7), making face validity for these revised constructs difficult to establish. However, support for the three constructs comes from the original EMI-2 development paper published by Markland and Ingledew (1997). As part of the validation procedure for the EMI-2 scale, they identified five higher order factors which were derived from the fourteen motivational constructs of the EMI-2. The five higher order factors were comprised of conceptually related motivational constructs. Three of the five higher order motivational constructs correspond quite closely with, and afford face validity to, the interpersonal, aesthetic, and health enhancement constructs of this study.

### **7.7 Internal Reliability of Revised EMI-2 Constructs**

The sub-scales were then tested for internal reliability and all results were satisfactory with the exception of Health Pressure motives with a Cronbach's score of 0.609. This is

is below the oft-cited threshold of 0.7 – see Table 7.14 . However, as outlined earlier (Section 7.3) in exploratory circumstances as is the case in this study, a number of prominent authors recommend setting the internal reliability threshold at 0.6 (e.g., Tabachnik and Fidell, 2007; Hair *et al.*, 2010).

**Table 7.14: Internal Reliability of the 9 Post Principal Components Analysis EMI-2 Constructs**

Motivational Construct	Cronbach's Alpha	Number of Motives
Interpersonal Motives	.928	9
Aesthetic Motives	.907	6
Stress Management Motives	.854	5
Health Enhancement Motives	.864	5
Social Motives	.890	4
Enjoyment Motives	.870	5
Strength Motives	.850	3
Health Pressure Motives	.609	3
Flexibility Motives	.873	2

### 7.8 Test of Unidimensionality

The unidimensionality of the nine constructs was also examined and all constructs illustrated unidimensionality. This satisfactory outcome facilitates the use of the nine identified constructs as the basis for the motivational data to be processed through the cluster analysis procedure.

### 7.9 Chapter Conclusion

This chapter reviewed the process that was enacted to reduce the 51 variable EMI-2 scale to a more parsimonious tool for inclusion in the cluster analysis process. A PCA was conducted to reveal the structure amongst the EMI-2 variables, a structure that is relevant to the target market of this study. Nine motivational constructs emerged from the PCA and each are ascribed a label. Convergent, discriminant, and face validity tests of the PCA all illustrate relatively positive outcomes, as do the internal reliability and unidimensionality analyses. Several of the nine constructs also exhibit a conceptual similarity to the salient behavioural beliefs that were elicited and discussed in Section 6.10.1. This may provide the opportunity to further validate the profile of the derived market segments. The cluster analysis procedure employed to identify segments in the

chosen market is examined in the next chapter, along with the process set out to capture the salient exercise correlates and enrich the segment profiling.

# **Chapter 8. Analysis and Discussion of Survey Findings**

"Marathons are extraordinarily difficult, but if you've got the training under your belt, and if you can run smart, the races take care of themselves. When you have the enthusiasm and the passion, you end up figuring how to excel."

Deena Kastor, US Marathon Record Holder.

## 8.1 Chapter Overview

This chapter presents, analyses, and discusses the results of the various phases of multivariate analysis that were completed to test the seven research propositions and associated hypotheses formulated to achieve the overall research objective. The process enacted to test each proposition is examined sequentially, together with an assessment of the findings of each test. For clarity and ease of reading each of these assessments is followed by a discussion of the research findings in the context of the most pertinent literature in the domain. Following on from the analysis and discussion of the individual propositions, an evaluation of the proposed segmentation and profiling schema is conducted and a detailed profiling of each of the identified segments is discussed in Chapter 9<sup>40</sup>.

Section 8.2 reviews the two-step cluster analysis process employed to derive a meaningful segmentation solution for the population of interest. The four-cluster outcome is then summarised, before assessing the validity and stability of the solution. An ANOVA procedure establishes the motivational profile of each of the clusters and the four segments are assigned labels based on their motivational orientation. A number of chi-square and independent samples t-tests are performed to compare and profile the segments on the basis of gender, age, recent exercise status and these are examined in Sections 8.3 to 8.5. Section 8.6 examines the gender, age, and recent exercise status groupings within segments, to ascertain significant differences in their motivational outlook.

The analysis of the individual TPB beliefs, and their integration into the profiling of the identified segments, commences with the testing of the data assumptions for the TPB data in Section 8.7. Section 8.8 evaluates a series of ANOVA procedures which examine differences in underlying beliefs between segments.

The final phase of analysis examines the relationship between the summated TPB belief indices and exercise behaviour reported by respondents four weeks after the administration of the main questionnaire. Data assumptions for this analysis are examined in Section 8.9. Significant differences in the nature of the relationships

---

<sup>40</sup> A detailed profile of each of the segments is illustrated in Section 9.3

between the summated TPB belief indices and reported exercise behaviour, for both the overall sample and the identified segments, are assessed in Section 8.10. The seven Research Propositions and associated hypotheses are illustrated in Table 8.1.

**Table 8.1: Research Propositions and Hypotheses**

Research Proposition	Hypothesis
RP 1: The exercise behaviour of the population of an Irish tertiary-level educational institute will contain segments that are clearly differentiable on the basis of participant motivation	<b>Hyp 1a:</b> The chosen exercise participation market will be viably segmented using the nine motivational constructs derived from the Exercise Motivation Inventory 2 (EMI-2) scale as the key base for segmentation.
	<b>Hyp 1b:</b> Each identified segment will exhibit a distinctly different motivational profile
RP 2: Profiling of the identified segments will be enhanced by identifying differences in gender composition and outlook	<b>Hyp 2a:</b> The gender composition will vary significantly between each segment and the overall sample
	<b>Hyp 2b:</b> The gender composition will vary significantly across segments.
RP 3: Profiling of the identified segments will be enhanced by identifying differences in age group composition and outlook	<b>Hyp 3a:</b> The age group composition will vary significantly between each segment and the overall sample
	<b>Hyp 3b:</b> The age group composition will vary significantly across segments
RP 4: Profiling of the identified segments will be enhanced by identifying differences in recent exercise status composition and outlook	<b>Hyp 4a:</b> The recent exercise status composition will vary significantly between each segment and the overall sample
	<b>Hyp 4b:</b> The recent exercise status composition will vary significantly across segments
RP 5: The identified segments will exhibit within-segment differentiation in motivational profiles, on the basis of age, gender, and recent exercise status	<b>Hyp 5a:</b> Significant differences in motivation will emerge between the two age groups within each segment
	<b>Hyp 5b:</b> Significant differences in motivation will emerge between males and females within each segment
	<b>Hyp 5c:</b> Significant differences in motivation will emerge between regular and non-regular exercisers within each segment
RP 6: The elicited underlying individual belief components of the theory of planned behaviour will illustrate differentiation across segments	<b>Hyp 6a:</b> Significant differences will emerge in the elicited behavioural beliefs across the identified segments
	<b>Hyp 6b:</b> Significant differences will emerge in the elicited normative beliefs across the identified segments
	<b>Hyp 6c:</b> Significant differences will emerge in the elicited control beliefs across the identified segments
RP 7: The summated behavioural and control belief indices will correlate strongly with reported behaviour, while the correlation between reported behaviour and normative belief indices will be of lesser magnitude	<b>Hyp 7a:</b> The summated belief indices for behavioural and control beliefs will illustrate a highly significant correlation with reported behaviour for the overall sample, while the correlation between behaviour and normative belief indices in this context will be of lesser magnitude
	<b>Hyp 7b:</b> The summated belief indices for behavioural and control beliefs will illustrate a highly significant correlation with reported behaviour for each segment, while the correlation between behaviour and normative belief indices in this context will be of lesser magnitude

## 8.2 Testing Research Proposition 1

Research Proposition 1 and the two hypotheses designed to test the proposition are outlined below.

**Research Proposition 1: The exercise behaviour of the population of an Irish tertiary-level educational institute will contain segments that are clearly differentiable on the basis of participant motivation.**

**Hypothesis 1a:** The chosen exercise participation market will be viably segmented using the nine motivational constructs derived from the Exercise Motivations Inventory 2 (EMI-2) scale as the key base for segmentation.

**Hypothesis 1b:** Each identified segment will exhibit a distinctly different motivational profile.

Research Proposition 1 and the two hypotheses are evaluated in the course of the cluster analysis process. The process commences by examining the assumptions associated with cluster analysis.

### **8.2.1 Assumptions in Cluster Analysis and ANOVA Testing**

The items contained within the 9-factor solution that was illustrated in Section 7.4 are summated to create the motivational constructs for inclusion in the cluster process. Hair *et al.* (2010) outline that requirements deemed critical for many other statistical tests, such as normality, linearity, and homoscedasticity, have little bearing on cluster analysis. They contend that in cluster analysis the researcher must focus on two critical issues: representativeness of the sample and multicollinearity. In this study, a census of the population was not available due to data protection constraints. All members of the target population were attending the chosen educational institution and, as such, the researcher employed a cluster sampling procedure to make the sample as representative of the total population as possible<sup>41</sup>. The population was divided into naturally occurring units (their college class) and classes were then randomly selected to be part of the study.

Three assumptions should be met for ANOVA test procedures; normality of data; independence of observations, and equality of variance/covariance; although Hair *et al.* (2010) argue that ANOVA tests are robust with regard to these assumptions. Initially, the new set of data is examined for outliers.

#### **8.2.1.1 Outlier Analysis**

The multivariate data of the nine motivational constructs were examined for outliers. A regression analysis was run which revealed four outliers, one case for each of four

---

<sup>41</sup> See Section 5.6.1 for justification of using a cluster sampling approach

summated scales. An examination of the data for the highlighted cases revealed that the outliers were all real values. The initial outliers were deleted and diagnostics were run again and no further outliers emerged. At this stage a choice had to be made whether or not to delete the outlier observations.

The cluster analysis procedure was run with the outliers included in the data set and then again with the outliers removed. The removal of the outlier data brought about no improvement in the quality of the cluster solution and presented a very similar clustering solution. This is not surprising given the robustness of the two-step clustering procedure in handling outlier data. However, the data is also being processed in ANOVA and independent sample t-tests, which are especially sensitive to outliers. Hair *et al.* (2010) strongly recommend the elimination of outliers prior to ANOVA tests, given their disproportionate impact on results. Thus, the decision was made to eliminate the four outliers from the data set at this juncture, due to the sensitivity of ANOVA tests, and the similarity in the clustering solution with and without the outliers included. The elimination of the outliers leaves a total sample of 775 for inclusion in the cluster analysis procedure.

#### **8.2.1.2 Data Normality**

The normality of the multivariate data was then considered. The descriptive statistic tests revealed some difficulties with skewness and kurtosis (See Appendix B), even though the outcome was an improvement on the tests carried out previously at the individual item level. Additionally, the P-P plots illustrate normality for most of the sub-scales. These findings, allied to the arguments put forward for handling the non-normal data during the cluster analysis phase, led to the decision to proceed with the data unadjusted. The author has elected to run a bootstrapping test for the ANOVA procedures, despite the robustness of the ANOVA in handling non-normal data when large samples are involved. Bootstrapping can provide more accurate inferences when the data are not normally distributed (Hair *et al.*, 2010). The bootstrap was conducted in tandem with each of the ANOVA and independent samples t-tests that used non-normal data. This facilitated the researcher in determining the extent of the impact of the non-normal data on these tests.

### **8.2.1.3 Independence of Data**

The data gathered throughout the quantitative phase of this study are entirely independent. The responses to all phases of the study have been carefully collected, ensuring that the behaviour/response of one participant has no influence of the behaviour/response of other respondents.

### **8.2.1.4 Equality of Variance**

The nine summated constructs of the EMI-2 scale were tested for homogeneity of variance, using reported recent exercise as the grouping variable. For all of the nine constructs, the variances are not equal across the groups. This is indicative of an issue with heterogeneity in variance, although Field (2009) points out that when the sample size is large, small differences in group variances can produce significant Levene's test results. Nevertheless, the lack of equality in variance across groups is sufficient for the author to select the Tamhane's T2 post-hoc test when conducting the ANOVA. The Tamhane's T2 test does not assume equality of variance across groups and all the ANOVA output is assessed using Tamhane's T2 data.

### **8.2.1.5 Testing for Linearity**

Linearity of the data is an important assumption for ANOVA and independent samples t-tests. The data for the nine motivational constructs shows no significant deviation from linearity, which satisfies the assumption for tests of this nature.

### **8.2.1.6 Testing for Multicollinearity**

The data were tested for multicollinearity and all variance inflation factor (VIF) scores were below 3, which is substantially under Hair *et al.*'s (2010) threshold of 10 for multicollinearity issues.

## **8.2.2 Outcome of the Two-Step Cluster Analysis**

The methodology chapter discussed the various options for engaging in cluster analysis and justified the choice of the two-step cluster analysis procedure as the means of identifying the market segments (see Section 5.8.1.3). The two-step cluster analysis was conducted using the nine EMI-2 motivational constructs identified in the PCA. For two-step cluster analysis in SPSS, the researcher can select between Euclidean and log-likelihood distance measures. The author selected the log-likelihood distance measure

for use in this study. A four-cluster solution emerged from this procedure and the output is illustrated in Table 8.2.

**Table 8.2: Cluster Solution Using the Nine Motivational Constructs<sup>42</sup>**

Motives	Segment 1		Segment 2		Segment 3		Segment 4	
	Mean	Standard Deviation						
Interpersonal	4.03	1.08	4.43	1.07	2.46	0.93	1.70	0.81
Aesthetic	4.64	1.11	2.71	1.03	4.48	1.17	3.54	1.62
Stress	4.66	0.81	3.18	1.10	3.74	0.96	2.52	1.02
Health	5.35	0.66	3.94	0.96	4.90	0.73	3.76	1.13
Strength	5.32	1.28	4.85	1.11	4.22	1.15	3.09	1.28
Social	4.11	0.67	4.20	0.89	3.07	0.86	2.35	0.85
Enjoyment	4.97	0.63	4.41	0.86	3.74	0.99	2.43	1.33
Health Pressures	2.66	1.17	1.49	0.60	2.21	1.04	1.40	0.67
Flexibility	4.98	0.81	3.79	1.17	3.74	1.13	2.27	1.14

As outlined earlier, two hypotheses have been designed to verify Research Proposition 1 and Hypothesis 1a is now examined in conjunction with the next phase of the cluster analysis evaluation, while Hypothesis 1b is examined in Section 8.2.6.

### 8.2.3 Assessing the Validity and Stability of the Cluster Solution

Hypothesis 1a is outlined below and contends that using the nine motivational constructs derived from the EMI-2 scale is a viable basis for segmenting the specified exercise market. This is tested by examining the validity and stability of the outcome of the two-step cluster analysis using the nine motivational constructs.

**Hypothesis 1a:** The chosen exercise participation market will be viably segmented using the nine motivational constructs derived from the Exercise Motivations Inventory 2 (EMI-2) scale as the key base for segmentation.

As indicated in the following sections, the outcome of the two-step cluster analysis using the reduced EMI-2 constructs as the base for segmentation, indicates that a meaningful and workable four-segment solution has emerged from the analysis, and as

---

<sup>42</sup> The EMI-2 scale used in the survey included statements assessing respondents' motivations for exercising. The statements were assessed on a scale ranging from 0 to 5, with 0 denoting the motivational statement was not at all true for the respondent, while 5 was rated as very true for me.

such the null hypothesis is rejected. However, cluster solutions need to be subjected to further procedures to test their veracity and the next section outlines this process.

#### **8.2.4 Cohesion and Separation of Clusters**

One of the key steps in assessing the validity of a cluster solution is the tightness of cohesion and the degree of separation of the identified clusters. The silhouette measure of cohesion and separation is a combined measure that evaluates both the internal cohesion and external separation of a clustering solution (Kaufman and Rousseeuw, 1990). The silhouette coefficient ranges between -1 and 1, with a positive value sought and coefficients close to 1 indicative of an optimal clustering outcome.

The solution using all of the nine EMI-2 constructs extracted during the PCA presented some issues. The silhouette measure of cohesion and separation attained a result of 0.3, which is a fair result, but representative of weak evidence of cluster structure (Kaufman and Rousseeuw, 1990). Because of the weak nature of the determined cluster structure, the least important construct was eliminated and the solution re-examined. This procedure was followed sequentially in order to determine the optimal solution, with the nine constructs being eliminated one construct at a time, until the two most important constructs remained. The progressive reduction in constructs again resulted in solutions with no cluster variable distinction issues. However, only minimal improvement in the silhouette measure of cohesion and separation was attained - ranging from staying at 0.3, to marginally improving to 0.4, which is still categorised as being a fair result and representative of weak evidence of cluster structure. Additionally, the initial four-cluster solution makes conceptual sense when examined in the context of previous research in the area. The process of sequentially eliminating constructs brings about a considerable reduction in the conceptual meaningfulness of the cluster solutions. Therefore, on balance, it has been decided that the solution using all nine constructs is the most appropriate clustering outcome in this instance.

A criterion, or predictive, validity test was also performed, as recommended by Hair *et al.* (2010). The direct measure variables (Attitude, Subjective Norm, Perceived Behavioural Control and Behavioural Intention) of the TPB are used in this validation procedure. An examination of the motivational data exhibited in the cluster solution (see Table 8.3) would suggest that Segment 1 members should illustrate the most favourable

attitude, the strongest subjective norms, the greatest perceived control over their behaviour, and the strongest behavioural intention to regularly exercise. The motivational data would indicate that Segment 2 should have relatively similar perceptions, albeit slightly weaker than Segment 1. Segment 3 has clearly the third strongest motivational profile regarding regular exercise, while Segment 4 is the least motivated in this regard, a profile that should be reflected in the weakest expression of attitude, subjective norm, behavioural control, and behavioural intention. An ANOVA test was conducted to test if significant differences exist across the segments on the foregoing four direct measure variables. The results of this test are illustrated in Table 8.3:

**Table 8.3: Criterion Validity Test Using Direct Measures of TPB**

ANOVA			Multiple Comparisons				ANOVA			Multiple Comparisons											
	F	Sig.		Mean Diff.	Std. Error	Sig.		F	Sig.		Mean Diff.	Std. Error	Sig.								
Attitude	39.905	.000	Segment 1	Segment 2	0.13	0.08	.521	Subjective Norms	30.931	.000	Segment 1	Segment 2	0.18	0.10	.387						
				Segment 3	0.54	0.08	.000					Segment 3	0.56	0.09	.000						
				Segment 4	0.87	0.09	.000					Segment 4	0.96	0.11	.000						
			Segment 2	Segment 1	-0.13	0.08	.521				Segment 2	Segment 1	-0.18	0.10	.387						
				Segment 3	0.41	0.08	.000					Segment 3	0.37	0.10	.004						
				Segment 4	0.74	0.09	.000					Segment 4	0.78	0.11	.000						
			Segment 3	Segment 1	-0.54	0.08	.000				Segment 3	Segment 1	-0.55	0.09	.000						
				Segment 2	-0.41	0.08	.000					Segment 2	-0.37	0.10	.004						
				Segment 4	0.33	0.09	.003					Segment 4	0.41	0.11	.002						
			Segment 4	Segment 1	-0.87	0.09	.000				Segment 4	Segment 1	-0.96	0.11	.000						
				Segment 2	-0.74	0.09	.000					Segment 2	-0.78	0.11	.000						
				Segment 3	-0.33	0.09	.003					Segment 3	-0.41	0.11	.002						
			Perceived Behavioural Control	11044	.000	Segment 1	Segment 2				-0.08	0.12	.934	Behavioural Intention	25.278	.000	Segment 1	Segment 2	0.07	0.14	.969
							Segment 3				0.31	0.11	.058					Segment 3	0.65	0.13	.000
							Segment 4				0.60	0.13	.000					Segment 4	1.15	0.15	.000
						Segment 2	Segment 1				0.08	0.12	.934				Segment 2	Segment 1	-0.07	0.14	.969
Segment 3	0.39	0.12					.015	Segment 3	0.58	0.14	.001										
Segment 4	0.69	0.14					.000	Segment 4	1.08	0.16	.000										
Segment 3	Segment 1	-0.31				0.11	.058	Segment 3	Segment 1	-0.65	0.13	.000									
	Segment 2	-0.39				0.12	.015		Segment 2	-0.58	0.14	.001									
	Segment 4	0.29				0.13	.164		Segment 4	0.49	0.15	.012									
Segment 4	Segment 1	-0.60				0.13	.000	Segment 4	Segment 1	-1.15	0.15	.000									
	Segment 2	-0.69				0.14	.000		Segment 2	-1.08	0.16	.000									
	Segment 3	-0.29				0.13	.164		Segment 3	-0.49	0.15	.012									

Mean differences significant at <.05 are depicted in green text.

The results of the ANOVA test are broadly in line with expectation<sup>43</sup>. Segment 1 has the most favourable attitude toward regular exercise, the strongest subjective norms, and the greatest intention to regularly exercise in the coming month. Segment 2 exhibits the

<sup>43</sup> The bootstrap output for this ANOVA test illustrated very minimal differences with the original ANOVA findings, indicating that the non-normality of the data had very little impact on the outcome.

strongest control over their exercise behaviour. In all of these instances, the differences between Segment 1 and Segment 2 are not significant, but both segments' means are significantly higher than Segments 3 and 4. Segment 3 consistently exhibits the third strongest ratings across all four direct measures, significantly lower than Segments 1 and 2 in all cases. One exception is in the perception of behavioural control, where Segment 3 is only significantly lower than Segment 1 at  $p \leq .1$  level. Segment 3 has higher ratings than Segment 4 for all four variables, significantly so for three of the four TPB variables, with no significant difference existing between Segments 3 and 4 for their perception of behavioural control. This analysis confirms that the majority of individuals with more favourable motivations toward exercise have more positive attitudes, stronger normative beliefs, greater perceptions of behavioural control and increased intentions to regularly exercise. This provides a qualified validation of the derived cluster solution.

### **8.2.5 Assessing the Stability of the Clusters**

The stability of the solution is tested in a number of ways, as proposed by Hair *et al.* (2010). Firstly, the full sample was analysed with the cases randomly assigned in three different sequences to the original sequence. The results of this were compared to the results of the original sample. This was aimed at overcoming a shortcoming of cluster analysis, whereby the order in which cases are analysed can potentially have a destabilising influence on cluster structure. The outcome of this test provided a satisfactorily similar clustering solution.

Additionally a split-half test was performed on the data, with the data randomly divided in two and the clustering procedure enacted for both split halves. The outcome of this process presented a difficulty, as a two-cluster solution emerged for both of the split-half samples. These solutions are broadly similar to each other, but substantially different from the four-cluster solution that emerged for the full sample. This is perhaps indicative of a lack of stability in the cluster solution. However, when one examines the four- and two-cluster solutions in the context of existing literature, the four-cluster solution offers greater nomological validity.<sup>44</sup>

---

<sup>44</sup> Previous motivational segmentation studies in the exercise domain indicate segmentation outcomes that are considerably more differentiated (See Section 4.4) than the 'highly motivated' and 'demotivated' two cluster solutions that this test presented.

The hypothesis is largely upheld with strong predictive validity illustrated and reasonable segment stability being ascertained. The lack of stability in the split-half test is a concern<sup>45</sup>, while there is also some concern about the silhouette measure of cohesion and separation outcome that emerged. The 0.3 outcome is somewhat ambiguous, being positioned between what Tsiptsis and Chorianopoulos (2009) indicate is reasonable partitioning ( $>0.5$ ), and a problematic solution ( $<0.2$ ).

### **8.2.6 Evaluating the Distinctiveness of the Motivational Profile of Each Segment**

Hypothesis 1b is outlined below and examines the distinctiveness of the motivational profile of the four identified segments. An ANOVA analysis is conducted to establish significant differences between segments for the nine motivational constructs.

**Hypothesis 1b:** Each identified segment will exhibit a distinctly different motivational profile.

The ANOVA analysis of the means of the nine motivational constructs reveals significant differences between segments in the majority of instances (see Table 8.4)<sup>46</sup>, meaning that the null hypothesis is rejected. This analysis facilitates the identification of a distinct motivational profile for each segment. It also serves as further validation of the identified segments, by illustrating the clear distinctions in motivational profile between each segment.

---

<sup>45</sup> While the outcome of the split-half is problematic, it must be evaluated in the context of the analyses outlined in subsequent sections, which indicate that the four-segment solution is quite differentiated. Analyses in these analyses (see Sections 8.3 to 8.10) increase the validity of the original four-segment outcome.

<sup>46</sup> The bootstrap output for this ANOVA test illustrates no meaningful differences with the original ANOVA findings, indicating that the non-normality of the data had little impact on the outcome.

**Table 8.4: ANOVA Comparisons of Motivational Constructs Between Segments<sup>47</sup>**

ANOVA			Multiple Comparisons				ANOVA			Multiple Comparisons											
	F	Sig.	Segments		Mean Diff.	Std. Error	Sig.		F	Sig.	Segments		Mean Diff.	Std. Error	Sig.						
Aesthetic	103.57	.000	The Enthusiast	Social Competitor	190	0.12	.000	Employment	####	.000	The Enthusiast	Social Competitor	0.57	0.08	.000						
				Healthy Looker	0.71	0.12	.710					Healthy Looker	123	0.08	.000						
				Reluctant Exerciser	107	0.13	.000					Reluctant Exerciser	2.53	0.09	.000						
			Social Competitor	Healthy Looker	-1.77	0.12	.000				Healthy Looker	0.67	0.08	.000							
				Reluctant Exerciser	-0.84	0.14	.000				Reluctant Exerciser	196	0.09	.000							
				Healthy Looker	0.93	0.13	.000				Healthy Looker	130	0.09	.000							
			Stress Management	158.25	.000	The Enthusiast	Social Competitor				149	0.10	.000	Health Pressures	75.53	.000	The Enthusiast	Social Competitor	15	0.10	.000
							Healthy Looker				0.95	0.09	.000					Healthy Looker	0.44	0.09	.000
							Reluctant Exerciser				2.15	0.10	.000					Reluctant Exerciser	123	0.10	.000
Social Competitor	Healthy Looker	-0.53				0.10	.000	Healthy Looker	-0.71	0.10	.000										
	Reluctant Exerciser	0.67				0.11	.000	Reluctant Exerciser	0.09	0.11	.888										
	Healthy Looker	120				0.10	.000	Healthy Looker	0.80	0.10	.000										
Health	146.55	.000				The Enthusiast	Social Competitor	139	0.09	.000	Nimbleness	169.80	.000				The Enthusiast	Social Competitor	121	0.11	.000
							Healthy Looker	0.44	0.08	.000								Healthy Looker	124	0.10	.000
							Reluctant Exerciser	158	0.09	.000								Reluctant Exerciser	2.70	0.12	.000
			Social Competitor	Healthy Looker	-0.95	0.09	.000	Healthy Looker	0.03	0.11				.994							
				Reluctant Exerciser	0.19	0.10	.258	Reluctant Exerciser	148	0.12				.000							
				Healthy Looker	114	0.09	.000	Healthy Looker	145	0.11				.000							
			Strength & Endurance	172.89	.000	The Enthusiast	Social Competitor	0.47	0.10	.000				Interpersonal	233.95	.000	The Enthusiast	Social Competitor	0.11	0.10	.767
							Healthy Looker	1.10	0.09	.000								Healthy Looker	158	0.09	.000
							Reluctant Exerciser	2.25	0.10	.000								Reluctant Exerciser	2.32	0.11	.000
Social Competitor	Healthy Looker	0.63				0.10	.000	Healthy Looker	147	0.10	.000										
	Reluctant Exerciser	1.77				0.11	.000	Reluctant Exerciser	2.21	0.11	.000										
	Healthy Looker	115				0.10	.000	Healthy Looker	0.74	0.11	.000										
Affiliation	92.84	.000				The Enthusiast	Social Competitor	-0.08	0.12	.927								Social Competitor			
							Healthy Looker	107	0.11	.000								Healthy Looker			
							Reluctant Exerciser	182	0.13	.000								Reluctant Exerciser			
			Social Competitor	Healthy Looker	115	0.12	.000	Healthy Looker													
				Reluctant Exerciser	190	0.14	.000	Reluctant Exerciser													
				Healthy Looker	0.75	0.13	.000	Healthy Looker													

Mean differences significant at <.05 are depicted in green text.

The motivational differentiation of each segment is examined in the following paragraphs. The author has assigned labels to each segment, based on the motivational

<sup>47</sup> The EMI-2 scale used in the survey included statements assessing respondents' motivations for exercising. The statements were assessed on a scale ranging from 0 to 5, with 0 denoting the motivational statement was not at all true for the respondent, while 5 was rated as very true for me.

outline graphs (Figure 8.1 to Figure 8.4), and the ANOVA analysis illustrated in Table 8.4. The labels assigned are Segment 1: The Enthusiast; Segment 2: Social Competitor; Segment 3: Healthy Looker; Segment 4: Reluctant Exerciser. The SPSS output diagrams for each of the four clusters are exhibited in Figure 8.1 to Figure 8.4 inclusive. These figures illustrate the relative importance of the nine EMI-2 motivational constructs in distinguishing the segments from each other. Only motivational constructs that exceed the critical value line<sup>48</sup> are included in the charts. Brief motivational profiles of each segment accompany the figure illustrations. The strength of evaluation and relative ranking of each of the nine motivational constructs for the four segments are outlined in Table 8.5. Some notable trends are evident and are discussed in the succeeding analysis of the four segments.

**Table 8.5: Mean and Relative Ranking of Motivations for Each Segment<sup>49</sup>**

Motives	The Enthusiast		Social Competitor		Healthy Looker		Reluctant Exerciser	
	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean
Interpersonal	8	4.03	2	4.43	8	2.46	8	1.70
Aesthetic	6	4.64	8	2.71	2	4.48	2	3.54
Stress Management	5	4.66	7	3.18	4	3.74	4	2.52
Health Enhancement	1	5.35	5	3.94	1	4.90	1	3.76
Strength	2	5.32	1	4.85	3	4.22	3	3.09
Social	7	4.11	4	4.20	7	3.07	6	2.35
Enjoyment	3	4.97	3	4.41	4	3.74	5	2.43
Health Pressures	9	2.66	9	1.49	9	2.21	9	1.40
Flexibility	4	4.98	6	3.79	4	3.74	7	2.27

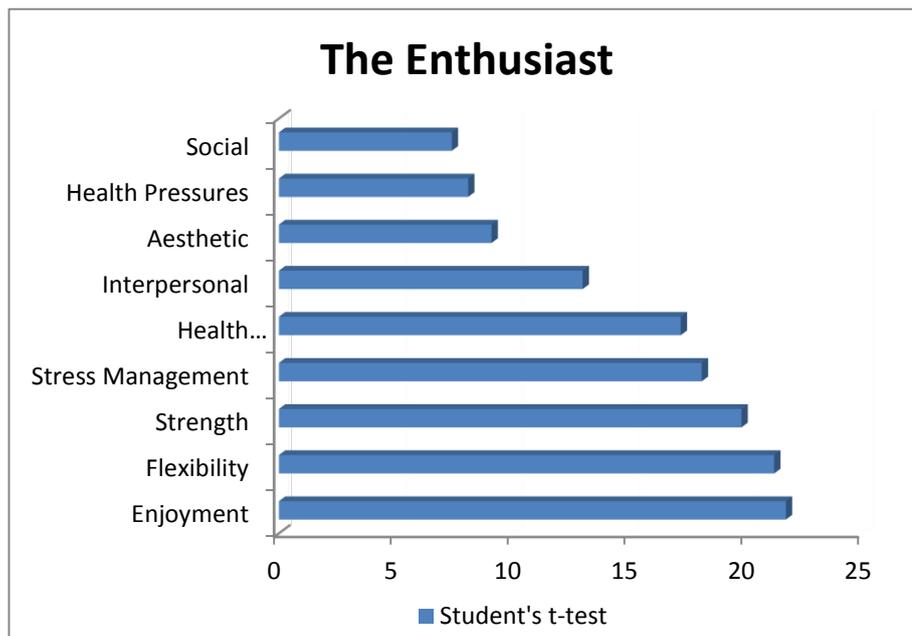
<sup>48</sup> The variables that exceed the critical value are important in distinguishing that cluster from the others.

<sup>49</sup> The EMI-2 scale used in the survey included statements assessing respondents' motivations for exercising. The statements were assessed on a scale ranging from 0 to 5, with 0 denoting the motivational statement was not at all true for the respondent, while 5 was rated as very true for me.

### 8.2.7 Segment 1: The Enthusiast

All nine motivational constructs exhibit importance in distinguishing this segment from the other three, which is a reflection of the predominately high mean rating ascribed to the motives relative to the other segments. Multiple motives for exercising are apparent. Enjoyment, strength and, flexibility motives illustrate greatest importance, but members of this cluster attach significance to a wide spectrum of exercise engagement benefits. This segment's mean scores for 7 of the 9 motivational constructs are the highest of all four segments (the interpersonal and social motives are the exception), indicating a very positive and enthusiastic attitude toward exercise. There is no significant difference in motivation between The Enthusiast and Social Competitor segments for the social motives and between The Enthusiast and Healthy Looker segments for the aesthetic motive.

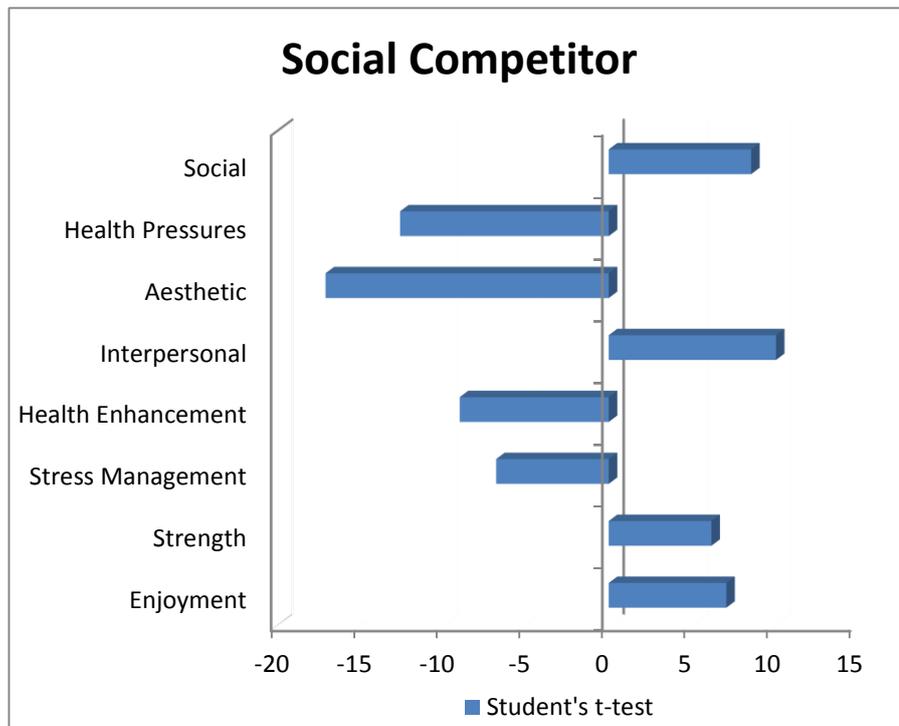
**Figure 8.1: Segment 1: The Enthusiast (n=216)**



### 8.2.8 Segment 2: Social Competitor

The Social Competitor cohort demonstrates a more specific motivational outlook than The Enthusiasts. Strength, enjoyment, and particularly interpersonal and social motives, exhibit importance in differentiating the Social Competitor segment from the other three clusters. This is reflected in significantly higher evaluations of these motives in comparison with the Healthy Looker and Reluctant Exerciser segments. Aesthetic, health pressure, health enhancement, and stress management motives also exhibit importance in differentiating the Social Competitors from the other three segments, but this time in a negative direction. Interpersonal motives reflect individuals that are driven by the competitive and challenging aspects of exercise, in addition to peer recognition. Social motives indicate a desire for social interaction and building of friendship through exercise. Another notable feature of this segment is the reduced influence of aesthetic, health enhancement, stress management, and health pressure motives. These are all significantly lower than for The Enthusiast and Healthy Looker segments. Aesthetic motives are significantly lower in importance than for the Reluctant Exerciser cluster, while there is no significant difference with the Reluctant Exercisers in the evaluation of the health enhancement and health pressure motives.

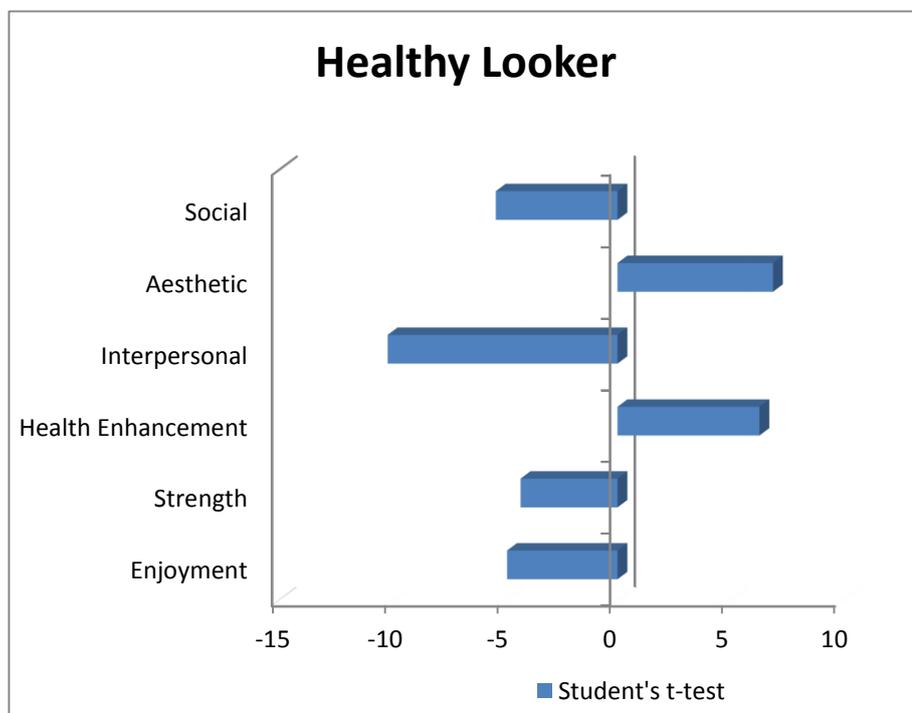
**Figure 8.2: Segment 2: Social Competitor (n=177)**



### 8.2.9 Segment 3: Healthy Looker

As with the Social Competitor segment, the Healthy Looker grouping illustrates a relatively distinct motivational profile. Aesthetic and health enhancement motives illustrate importance in differentiating the Healthy Looker segment from the other three clusters. Interpersonal, social, enjoyment, and strength motives also exhibit importance in differentiating the Healthy Lookers from the other three segments, but this time in a negative direction. Aesthetic motives are considered particularly important, with a significantly higher rating than for the Social Competitor and Reluctant Exerciser segments. When one compares the importance of aesthetic motives between The Enthusiast and Healthy Looker segments, there is no significant difference, the only motivational construct where the Healthy Looker's evaluation is not significantly lower than The Enthusiasts. Additionally, health enhancement, stress management, and health pressure motives assume prominence, being considered significantly more important than is the case for the Social Competitor and Reluctant Exerciser clusters.

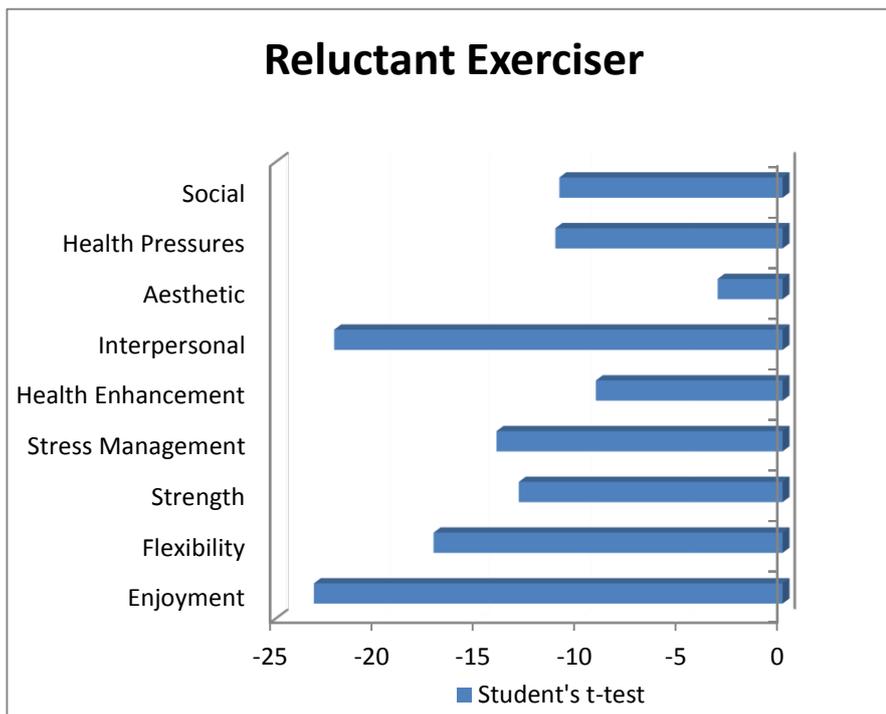
**Figure 8.3: Segment 3: Healthy Looker (n=237)**



### 8.2.10 Segment 4: Reluctant Exerciser

All nine motivational constructs exhibit importance in distinguishing the Reluctant Exerciser segment from the other three, but in a negative direction. Interpersonal and enjoyment motives exhibit greatest importance in this regard. This may be reflective of the competitive and challenge aspects of exercise being off putting, while a lack of enjoyment of exercise can add to member's reluctance to engage in physical activity. Reluctant Exerciser segment members have consistently low motivation across the range of motivational constructs. The motivational ratings are significantly lower than the other segments across all constructs, with a couple of exceptions. As outlined earlier, segment members rate aesthetic motives significantly higher than the Social Competitor grouping, while there is no significant difference in the evaluation of health enhancement and health pressure motives between these two clusters.

**Figure 8.4: Segment 4: Reluctant Exerciser (n-221)**



Hypothesis 1b is strongly supported by the findings of the ANOVA comparing the motivational constructs between segments. Significant differences in each of the motivational constructs between all four segments emerge in the majority of circumstances. This provides an informative initial profiling of the segments. Each of the subsequent research propositions builds the segment profiles and an overall synopsis of the ultimate profile for each segment can be viewed in Section 9.3 and Tables 9.1 to 9.4.

### **8.2.11 Evaluating Research Proposition 1**

The proposition is examined in two respects<sup>50</sup>. Firstly, the viability of using the EMI-2 as the basis for segmentation is assessed, with the stability and validity of the cluster outcome evaluated. Secondly, the motivational distinctiveness of the segment solution is evaluated.

The requirements for segment viability that are outlined by Hair *et al.* (2010) are segment validity, segment stability, and practical significance of the final cluster solution. The proposition is largely upheld with strong predictive validity being ascertained, reasonable segment stability illustrated, and a quite differentiated and practically relevant motivational profile emerging for each segment.

Additionally, many of the criteria for effective segmentation set out by Dolnicar and Lazarevki (2009) are satisfied. They contend that a lack of comprehension about how segments are derived can result in an overestimation of the validity of a segmentation solution. To counteract this issue they propose that a six-step process be employed. Firstly, 1) data should be of high quality: this study fulfils many of the criteria set out for ensuring high data quality; 2) data are recent: this condition is fulfilled; 3) data are carefully vetted to ensure non-contamination with response fatigue or response styles: this analysis was thoroughly performed in the data preparation stage; 4) questions asked have a reasonably strong theoretical foundation: this again is the case, as set out in the justification for using the EMI-2 measures<sup>51</sup>; and 5) data were collected specifically for the purpose of a market segmentation study: the objectives of the research confirm this

---

<sup>50</sup> Research Proposition 1: The exercise behaviour of the population of an Irish tertiary-level educational institute will contain segments that are clearly differentiable on the basis of participant motivation.

<sup>51</sup> See Section 3.2 for an analysis of the theoretical underpinning of the EMI2 scale.

is the case. Whether this study fulfils Dolnicar and Lazarevski's (2009) final criterion for ensuring data quality is debatable. Finally, 6) they argue that data should not be uncritically included, but rather be developed in pre-segmentation studies. This study used the commonly applied factor-cluster approach to segmentation, initiating the process with a factor analysis which reduced the number of variables being included in the cluster analysis to a manageable volume, while also ensuring that only the most relevant variables in the context of this study were included in the segmentation procedure. However, Dolnicar in several publications (Dolnicar, 2003, Dolnicar and Grun, 2008; Dolnicar and Lazarevski, 2009) has been critical of the factor-cluster approach to segmentation. She argues that this inherently results in a loss of what could be valuable information from the segmentation process. Thus, while the author would contend that the variables and data included in this study are an accurate reflection of the reality of the market situation for the chosen population, it was compiled using a process that has provoked considerable debate in the segmentation literature.

Dolnicar and Lazarevski (2009) also highlight the exploratory nature of clustering procedures and the need to overcome the randomness of the clustering algorithm through multiple computations with the same data. They argue that this is an oversight of many segmentation practitioners, who assume that naturally occurring market segments exist, when the reality is that most consumer data market segments are constructed. Consumer data are usually not particularly well-structured and rarely contain clear density clusters. The more structured a data set, the greater the similarity of repeated calculations of segmentation solutions. Less structure in the data usually reveals increased variation in the solution when repeated computations are performed. This study addresses these issues by running repeated computations with the objects in the dataset ordered in different manners, a process that reveals similar segment outcomes. It also employs a split-half test. The output of this test is challenging, with only two segments emerging for each of the halves. It is reasoned that this is symptomatic of a data set which perhaps lacks structural differentiation, a trait that is problematic, but not entirely unexpected in light of Dolnicar and Lazarevski's (2009) assertions.

Some concern emerges about the silhouette measure of cohesion and separation outcome. The 0.3 measure falls in the threshold between what Tsipstis and

Chorianopoulos (2009) indicate is reasonable partitioning ( $>0.5$ ) and a problematic solution ( $<0.2$ ). Kaufman and Rousseeuw (1990) argue that this is a concern. However, Tsiptsis and Chorianopoulos (2009) take the view that while technical measures like the silhouette procedure are useful, it is just as critical for the analyst to try to comprehend the true underlying meaning of each cluster through a thorough profiling process. This facilitates more focused subsequent marketing interventions.

The weak outcome may be indicative of reduced cohesion in the cluster solution, which could suggest further partitioning of the dataset. This will be addressed in Section 8.6, which examines within-segment heterogeneity of the four clusters.

The four-segment solution illustrates a quite distinct motivational profile, with an analysis of the cluster centroids for the variables revealing significant differences across segments in the majority of instances. Mooi and Sarstedt (2011) highlight the importance of this approach, arguing that the analysis should exhibit significantly different means for the selected variables, to determine whether the segments are conceptually distinguishable.

The extracted segments find some support in the extant literature. McNeill and Wang (2005) segmented a market of elite school sports players and derived three segments based on self-determination motivation types and achievement goals. Two of the three segments identified by McNeill and Wang - a highly motivated cluster and an amotivated cluster - correspond quite closely with The Enthusiast and Reluctant Exerciser groupings of this study. Chian and Wang (2008) identified a four-cluster solution in their study of Singaporean college athletes. Two of the four groups were categorised as highly motivated and amotivated clusters, again illustrating similarities with The Enthusiast and Reluctant Exerciser segments. The similarity in motivational orientation exhibited between the descriptive EMI-2 based segments of this research and the self-determination based segments that are reported in other studies provides further affirmation of the partial theoretical underpinning of the EMI-2 constructs.

### **8.3 Testing Research Proposition 2**

The preliminary discussion groups and literature review illustrated the importance of participants' age, gender, and recent exercise participation on their attitudes and

motivation towards regular physical activity. The next phase of analysis assesses the value of these issues in enhancing the profiling of the motivational segments derived in the preceding section. Research Propositions 2 to 4 and associated hypotheses assess the veracity of using these demographic and behavioural issues as profiling agents. Levine *et al.* (2008) highlighted that the chi-square test can be performed to identify differences in the proportions of two categorical variables. This test is employed for Research Propositions 2 to 4, to establish differences in male/female; younger/older; regular/non-regular composition between segments. Prior to examining the research propositions associated with these issues, it is instructive to view a summary table of segment membership based on gender, age, and recent exercise status – see Table 8.6.

**Table 8.6: Segment Membership by Demographic and Behavioural Variable**

Main Survey Statistics		Overall Sample		The Enthusiast		Social Competitor		Healthy Looker		Reluctant Exerciser	
Number of Members		775		216		177		237		145	
		No.	%	No.	%	No.	%	No.	%	No.	%
Gender	Male	426	55%	117	54%	143	80%	105	44%	61	42%
	Female	349	45%	99	46%	34	20%	132	56%	84	58%
Age	18-24	634	82%	172	80%	163	92%	181	76%	118	81%
	25 or more	141	18%	44	20%	14	8%	56	24%	27	19%
Recent Exercise Status (Previous 6 months)	Non-Regular	356	46%	75	35%	51	29%	138	58%	92	63%
	Regular	419	54%	141	65%	126	71%	99	42%	53	37%

Research Proposition 2 and the two hypotheses formulated to test the proposition are outlined below. Research Proposition 2 evaluates the enhancement to the profiling of each segment wrought by examining differences in gender composition and outlook between segments.

**Research Proposition 2: Profiling of the identified segments will be enhanced by identifying differences in gender composition.**

**Hypothesis 2a:** The gender composition will vary significantly between each segment and the overall sample.

**Hypothesis 2b:** The gender composition will vary significantly across segments.

Hypotheses 2a and 2b have been formulated to test Research Proposition 2. Before examining the first hypothesis, it is instructive to compare gender differences in the evaluations of the exercise motives used in the cluster analysis. This is examined in Section 8.3.1.

### 8.3.1 Establishing Differences in Gender Evaluations of Motives

An independent samples t-test established significant differences in motivational evaluations between males and females<sup>52</sup>. These are illustrated in Table 8.7.

**Table 8.7: Differences in Motivational Evaluations between Males and Females<sup>53</sup>**

Group Statistics						Equality of Variance		Independent Samples t-test		
Motive	Gender	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
Interpersonal	Male	426	3.58	132	0.064	0.00	.965	8.34	.000	0.79
	Female	349	2.79	129	0.069					
Aesthetic	Male	426	3.47	138	0.067	2.55	.10	-10.87	.000	-1.06
	Female	349	4.52	131	0.070					
Stress Management	Male	426	3.49	124	0.060	1.82	.178	-3.80	.000	-0.33
	Female	349	3.82	119	0.063					
Health Enhancement	Male	426	4.49	110	0.053	1.00	.317	-2.92	.004	-0.22
	Female	349	4.72	103	0.055					
Strength	Male	426	4.77	111	0.054	10.44	.001	8.12	.000	0.69
	Female	349	4.07	127	0.068					
Social	Male	426	3.61	135	0.066	2.18	.140	2.87	.004	0.29
	Female	349	3.33	144	0.077					
Enjoyment	Male	426	4.11	114	0.055	2.84	.092	3.18	.002	0.27
	Female	349	3.84	125	0.067					
Health Pressures	Male	426	1.98	102	0.049	5.91	.015	-0.99	.321	-0.08
	Female	349	2.06	113	0.060					
Flexibility	Male	426	3.89	135	0.065	3.59	.058	1.58	.115	0.16
	Female	349	3.73	146	0.078					

Mean differences significant at <.05 are depicted in green text.

The variation in motivational outlook between genders is quite considerable, with seven of the nine motivational constructs illustrating significant difference between genders. The exceptions are the health pressures and flexibility motives. Females are significantly more motivated by aesthetic, stress management, and health enhancement

<sup>52</sup> The bootstrap output for this independent samples t-test test illustrated minimal differences with the original t-test findings, indicating that the non-normality of the data had little impact on the outcome.

<sup>53</sup> The EMI-2 scale used in the survey included statements assessing respondents' motivations for exercising. The statements were assessed on a scale ranging from 0 to 5, with 0 denoting the motivational statement was not at all true for the respondent, while 5 was rated as very true for me.

motives. The interpersonal, strength and endurance, social, and enjoyment benefits of regular exercise are significantly more important for males.

### 8.3.2 Difference in Gender Profile Between the Segments and the Overall Sample

Hypothesis 2a tests the difference in gender profile between each segment and the overall sample.

**Hypothesis 2a:** The gender composition will vary significantly between each segment and the overall sample.

A chi-square test was conducted to test this hypothesis<sup>54</sup>, the findings of which are outlined in Table 8.8.

**Table 8.8: Differences in Gender Profile Between the Segments and the Overall Sample**

	Overall Sample		The Enthusiast		Social Competitor		Healthy Looker		Reluctant Exerciser	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<b>Observed Number</b>	426	349	117	99	143	34	105	132	61	84
<b>Observed Proportion</b>	0.5497	0.4503	0.5417	0.4583	0.8079	0.1921	0.4430	0.5570	0.4207	0.5793
<b>Expected Number</b>			119	96	97	80	130	107	80	65
<b>Chi-Square</b>			.06		47.68		10.89		9.75	
<b>Asymp. Sig.</b>			.812		.000		.001		.002	

Differences significant at <.05 are depicted in green text.

Significant differences in the gender profile of the segments exist between three of the four segments and the overall sample. This indicates quite strong support for the hypothesis and rejection of the null hypothesis. There is no significant difference in the gender balance of The Enthusiast segment and the overall sample. The Social Competitor contains a significantly higher proportion of males, while the Healthy Looker and Reluctant Exerciser cohorts comprise significantly higher ratios of females.

<sup>54</sup> The two main assumptions of the chi-square test, the independence of data and the expected frequencies to be greater than five, are both met for all 6 hypotheses using chi-square analysis (Hypotheses 2a, 2b, 3a, 3b, 4a, and 4b).

### 8.3.3 Assessing Differences in Gender Profile Across the Segments

Hypothesis 2b evaluates significant differences in gender profile between the four segments.

**Hypothesis 2b:** The gender composition will vary significantly across segments.

Another chi-square test was conducted to test this hypothesis<sup>55</sup>, the findings of which are outlined in Table 8.9.

**Table 8.9: Differences in Gender Profile Between Each Segment**

	Male	Female	Segment	Segment Comparison	Chi-Square	Asymp. Sig
Observed Number	117	99	<b>The Enthusiast</b>	Social Competitor	50.53	.000
Observed Proportion	0.54	0.46		Healthy Looker	9.29	.002
				Reluctant Exerciser	8.55	.003
Observed Number	143	34	<b>Social Competitor</b>	The Enthusiast	98.65	.000
Observed Proportion	0.81	0.19		Healthy Looker	203.29	.000
				Reluctant Exerciser	140.08	.000
Observed Number	105	132	<b>Healthy Looker</b>	The Enthusiast	8.52	.004
Observed Proportion	0.44	0.56		Social Competitor	95.52	.000
				Reluctant Exerciser	.29	.589
Observed Number	61	84	<b>Reluctant Exerciser</b>	The Enthusiast	12.97	.000
Observed Proportion	0.42	0.58		Social Competitor	108.89	.000
				Healthy Looker	.49	.486

Differences significant at <.05 are depicted in green text.

Significant differences exist in the majority of cases when one compares the gender profile of each of the four segments. This is again indicative of quite strong support for the hypothesis and a rejection of the null hypothesis. There are a significantly higher proportion of males in the Social Competitor segment than any of the other three groupings, and the ratio of males in The Enthusiast cluster is significantly greater than that of the Healthy Looker and Reluctant Exerciser segments. There is no significant difference in the gender balance of these two segments, but they have significantly greater proportions of females in their ranks than The Enthusiast or Social Competitor cohorts.

<sup>55</sup> The two main assumptions of the chi-square test, the independence of data and the expected frequencies to be greater than five, are both met for all 6 hypotheses using chi-square analysis (Hypotheses 2a, 2b, 3a, 3b, 4a and 4b).

### 8.3.4 Evaluation of Research Proposition 2

The two hypotheses testing Research Proposition 2 are strongly supported, giving robust backing to the assertion that differences in gender profile across segments and varying motivational evaluations between males and females enhance segment profiling<sup>56</sup>. A closer examination of the findings reinforces much of the literature examining the role of gender in exercise engagement.

Females are represented in significantly greater proportions in the Healthy Looker and Reluctant Exerciser segments. These are also the segments with the lowest rates of exercise adherence, indicating lesser regular engagement amongst females. This underpins the finding that 56% of female respondents in the overall sample were categorised as non-regular exercisers in the six months prior to survey administration. This contrasts with the male cohort, where only 38% were non-regular exercisers. The outcome reflects a trend evident in many previous studies in the domain, where females have consistently illustrated lower rates of exercise adherence. Non-regular engagement rate for females in this study is notably high however. Hallal *et al.* (2012) found that globally in 2008, 34% of women were deemed insufficiently physically active, as opposed to 28% of their male counterparts, a considerably smaller differential than in this study. Similarly, the Irish Sports Monitor has been tracking rates of exercise and sports engagement amongst Irish people since 2007 and consistently illustrates higher levels of exercise participation amongst males (Irish Sports Council, 2012). Although, greater male adherence to regular exercise regimes is evident, interesting observations emerge from a review of sedentary behaviour studies conducted by Rhodes, Mark, and Temmel (2012). They found relatively small differences in the sedentary behaviour of males and females across 45 studies. On balance, males were more engaged in sedentary behaviours that could be deemed to be competing with regular physical exercise. These include computer use, television viewing, general sitting behaviour, video-game use, and reading, although differences are only especially notable for the greater male engagement in video-gaming. These findings raise the legitimate enquiry as to just what is preventing greater regular exercise engagement amongst the female cohort in the targeted population?

---

<sup>56</sup> Research Proposition 2: Profiling of the identified segments will be enhanced by identifying differences in gender composition.

A similar trend pertains in the Social Competitor segment, which illustrates strong rates of exercise adherence (71%) and is largely male in composition (80%). The Enthusiast segment is the least clear-cut in evaluating gender influence. Females are represented in close proportion to the overall sample in a segment that illustrates the highest levels of regular exercise adherence. Further analysis reveals that 73% of male members of this segment were regular exercisers, compared to 56% of females. This could reflect that while females hold a positive attitude toward exercising, they do not always translate this into an actioning of this favourable attitude. This assertion finds some support in the work of Rhodes and de Bruijn (2013) who performed a meta-analysis of ten TPB studies in the physical activity domain. They found that only 54% of people who intended to engage in physical activity behaviour translated the intention into actual engagement in the behaviour. However, no evidence of any gender differential in the intention-behaviour gap is apparent in the meta-analysis.

An examination of the motives that differentiate males and females is also informative. The motives that differentiate females: aesthetic, stress management, and health enhancement, have all received attention in previous research. Gill *et al.* (1996) found that adult females across four different sports were positively differentiated by fitness, flexibility, affiliation, and appearance motives. Kilpatrick, Hebert, and Bartholomew (2005) illustrated similar findings in their study of college students' exercise and sports motives, with female exercisers more motivated by appearance, weight management, health oriented, and stress management motives. The differentiating motives for males (interpersonal, strength, social, and enjoyment motives) also receive considerable support from the existing body of work. Gill *et al.* (1996) established that males were significantly more motivated than females on competitiveness and win orientation, interpersonal type motives. Similarly in Kilpatrick, Hebert, and Bartholomew's (2005) study males ascribe significantly higher rating to challenge, competition, social recognition, and strength motives.

Males in this study are significantly more motivated by the enjoyment derived from exercising. The literature illustrates that participants motivated by the enjoyment of exercising are consistently more self-determined in their activities, leading to higher rates of exercise adherence. Teixeira *et al.* (2012) reviewed 66 studies that addressed motivation in the exercise and physical activity domain. Multivariate results in this

research area showed that intrinsic motives such as enjoyment were positively associated with exercise behaviour in 100% of the studies. This is consistent with the greater evaluation of enjoyment by males and higher rate of male engagement demonstrated in this study. However, the importance attributed by males to the social benefits of regular exercise is at odds with much extant research in the area. Many studies in the domain illustrate the considerable significance that females attach to the social benefits of exercising (e.g., Ryckman and Hamel, 1995; Kilpatrick, Hebert, and Bartholomew, 2005).

#### **8.4 Testing Research Proposition 3**

The next phase of analysis addresses Research Proposition 3, which evaluates how determining differences in age group composition and outlook can enhance segment profiling.

**Research Proposition 3: Profiling of the identified segments will be enhanced by identifying differences in age group composition.**

**Hypothesis 3a:** The age group composition will vary significantly between each segment and the overall sample.

**Hypothesis 3b:** The age group composition will vary significantly across segments.

Hypotheses 3a and 3b address the worth of profiling the identified segments using their age grouping (two groups: respondents aged between ‘18-24’ and ‘25 or older’). Before examining the first hypothesis, it is informative to compare age differences in the evaluations of the exercise motives used in the cluster analysis. This is examined in Section 8.4.1.

##### **8.4.1 Establishing Differences in Age Grouping Evaluations of Motives**

The differences in motivational evaluations between the two age groups are outlined in Table 8.10<sup>57</sup>.

---

<sup>57</sup> The bootstrap output for this independent samples t-test illustrated practically differences with the original t-test findings, indicating that the non-normality of the data had very little impact on the outcome.

**Table 8.10: Differences in Motivational Evaluations between Younger and Older Exercisers<sup>58</sup>**

Group Statistics						Equality of Variance		Independent Samples t-test		
Motive	Age Category	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
Interpersonal	18-24	634	3.33	136	0.054	3.51	.061	4.96	.000	0.62
	25 or more	141	2.71	126	0.106					
Aesthetic	18-24	634	3.94	142	0.056	3.29	.070	0.06	.952	0.01
	25 or more	141	3.94	158	0.133					
Stress Management	18-24	634	3.55	121	0.048	0.34	.561	-4.19	.000	-0.47
	25 or more	141	4.03	124	0.104					
Health Enhancement	18-24	634	4.51	107	0.043	1.99	.159	-4.63	.000	-0.46
	25 or more	141	4.96	0.98	0.083					
Strength	18-24	634	4.50	122	0.048	0.32	.572	2.31	.021	0.26
	25 or more	141	4.24	127	0.107					
Social	18-24	634	3.63	137	0.055	0.12	.734	6.36	.000	0.81
	25 or more	141	2.82	133	0.112					
Enjoyment	18-24	634	3.98	119	0.047	1.73	.188	-0.70	.484	-0.08
	25 or more	141	4.05	127	0.107					
Health Pressures	18-24	634	1.97	103	0.041	9.12	.003	-2.43	.015	-0.24
	25 or more	141	2.22	122	0.103					
Flexibility	18-24	634	3.79	141	0.056	1.98	.160	-1.47	.143	-0.19
	25 or more	141	3.98	134	0.113					

Mean differences significant at <.05 are depicted in green text.

Six of the nine motivational constructs illustrate significant difference between age groupings, the exceptions being aesthetic, enjoyment, and flexibility motives. Younger respondents are significantly more motivated by interpersonal, strength, and social motives, while the three health-oriented motives differentiate the older cohort.

#### 8.4.2 Difference in Age Profile Between the Segments and the Overall Sample

**Hypothesis 3a:** The age group composition will vary significantly between each segment and the overall sample.

The segments exhibit some significant variation in their age profile in comparison with the overall sample (See Table 8.11), giving moderate support to the hypothesis and rejecting the null hypothesis. Both The Enthusiast and Reluctant Exerciser groups have a similar age composition to the overall sample. However, the younger age grouping is

<sup>58</sup> The EMI-2 scale used in the survey included statements assessing respondents' motivations for exercising. The statements were assessed on a scale ranging from 0 to 5, with 0 denoting the motivational statement was not at all true for the respondent, while 5 was rated as very true for me.

represented in significantly higher proportion in the Social Competitor cluster, while the ratio of older members is significantly higher for the Healthy Looker group.

**Table 8.11: Differences in Age Profile Between the Segments and Overall Sample**

	Overall Sample		The Enthusiast		Social Competitor		Healthy Looker		Reluctant Exerciser	
	18-24	25 or more	18-24	25 or more	18-24	25 or more	18-24	25 or more	18-24	25 or more
Observed Number	634	441	172	44	163	14	181	56	118	27
Observed Proportion	0.8181	0.1819	0.7963	0.2037	0.9209	0.0791	0.7637	0.2363	0.8188	0.1812
Expected Number			177	39	145	32	194	43	119	26
Chi-Square			.68		12.59		4.69		.02	
Asymp. Sig.			.408		.000		.030		.896	

Differences significant at <.05 are depicted in green text.

### 8.4.3 Assessing Differences in Age Profile Across the Segments

**Hypothesis 3b:** The age group composition will vary significantly across segments.

Significant differences exist in a number of cases when the age profile of each of the four segments is compared (See Table 8.12), again illustrating moderate support for the hypothesis and rejecting the null hypothesis. There are a significantly higher proportion of younger exercisers in the Social Competitor segment compared to the other three groupings. Additionally, younger respondents are represented in considerably higher proportion in the Reluctant Exerciser segment, when compared to the Healthy Looker cluster.

**Table 8.12: Differences between Each Segment in Age Profile**

	18-24	25 or Over	Segment	Segment Comparison	Chi-Square	Asymp. Sig
Observed Number	172	44	The Enthusiast	Social Competitor	16.94	.000
Observed Proportion	0.80	0.20		Healthy Looker	1.55	.213
				Reluctant Exerciser	.27	.601
Observed Number	163	14	Social Competitor	The Enthusiast	46.04	.000
Observed Proportion	0.92	0.08		Healthy Looker	80.39	.000
				Reluctant Exerciser	22.84	.000
Observed Number	181	56	Healthy Looker	The Enthusiast	1.27	.259
Observed Proportion	0.76	0.24		Social Competitor	24.24	.000
				Reluctant Exerciser	2.02	.156
Observed Number	118	27	Reluctant Exerciser	The Enthusiast	.44	.509
Observed Proportion	0.81	0.19		Social Competitor	13.40	.000
				Healthy Looker	3.92	.048

Differences significant at <.05 are depicted in green text.

#### 8.4.4 Evaluation of Research Proposition 3

The hypotheses relating to the differentiating characteristics of age receive partial support.<sup>59</sup> An examination of the findings presents contradictory evidence of the value of age as a profiling mechanism for the four segments. Only two of the four segments illustrate significantly different age profiles to the overall sample. The Social Competitor group contains significantly greater younger members, while the Healthy Looker segment profile is older than the norm for the population. Social Competitors have a high rate of recent regular exercise adherence and the younger profile of the segment is reflective of much literature that suggests greater exercise engagement amongst younger cohorts (e.g., Burton, Shapiro, and German, 1999; Irish Sports Council, 2012). The older composition of the Healthy Looker segment also finds support in the literature. It is consistent with the findings of Finch (1997) and Van Stralen *et al.* (2009), who outline that older exercisers attach great significance to the health benefits of exercising.

The lack of differentiation in age profile between the other two segments and the overall sample is problematic. The fact that both the most (The Enthusiasts) and least (Reluctant Exercisers) engaged and motivated segments illustrate no significant differences in age profile is at odds with the bulk of the research in the area. The literature review illustrated that age is a consistent correlate of physical activity behaviour in adults. Exercise participation is normally inversely associated with age, with younger cohorts exhibiting greater rates of engagement (Burton, Shapiro, and German, 1999; Clark; 1999; Booth *et al.*, 2000; Irish Sports Council, 2012). These previous studies would indicate that The Enthusiast segment should have a younger profile than is evident and the Reluctant Exercise cohort should have a greater older composition.

A similar situation pertains when comparing age profile across segments. The age profile of the Social Competitor segment is significantly differentiated from all other segments, young participants being the dominant age group in this segment. However,

---

<sup>59</sup> Research Proposition 3: Profiling of the identified segments will be enhanced by identifying differences in age group composition.

the only other significant differentiation is between the Healthy Looker and Reluctant exerciser segments, the Healthy Lookers having a significantly higher proportion of older members. Both these findings are in line with the literature discussed in the previous paragraph. The lack of age profile differentiation between the other segments is somewhat surprising, particularly where The Enthusiast segment is concerned.

A review of the motives that differentiate younger and older respondents is more clear-cut. Six of the nine motivational constructs illustrate significant differences between the age groups. The motives that differentiate the younger grouping: interpersonal, strength, and social; collate well with the findings of previous research. Quindry *et al.* (2011) highlight that young adults are primarily motivated by interpersonal (such as competition) and social (such as affiliation) motives. In other studies, young adults have commonly illustrated extrinsic type motivations for exercise engagement, with physical attractiveness, weight control, and social recognition being regularly cited reasons for engagement (Ingledeew and Sullivan, 2002; Strong *et al.*, 2006).

Stress management, health enhancement, and health pressures motives emerge as significant differentiators for the older cohort in this study. This again finds some support in the literature. Quindry *et al.* (2011) found that older groups exercise for body-related (appearance, weight management) and psychological (stress relief, enjoyment, revitalisation) benefits. Similar research highlighted that older exercisers cite the challenge of physical exercise, its health and fitness benefits, mastery of the activity, and enjoyment being the critical drivers of their behaviour (Van Stralen *et al.* 2009; Finch, 1997).

It is perhaps a little surprising that aesthetic motives do not exhibit differences between age groups. The bulk of the literature points to looking good and weight control being motives that are more associated with younger groups. However, the fact that Quindry *et al.* (2011) found that the older cohort in their study assigned greater importance to this, may indicate that aesthetic motives can be important to different age groups in different contexts.

## 8.5 Testing Research Proposition 4

Survey respondents were categorised into regular and non-regular exercisers based on their reported exercise behaviour in the six months prior to survey administration. This section evaluates how determining differences in recent exercise status composition and motivational outlook can enhance segment profiling.

**Research Proposition 4: Profiling of the identified segments will be enhanced by identifying differences in recent exercise status composition.**

**Hypothesis 4a:** The recent exercise status composition will vary significantly between each segment and the overall sample

**Hypothesis 4b:** The recent exercise status composition will vary significantly across segments

Two hypotheses were designed to test this proposition. This first of these examines differences in motivational evaluations between regular and non-regular exercisers. Before examining this the first hypothesis, it is informative to compare differences between regular and non-regular exercisers' evaluations of the exercise motives used in the cluster analysis and this is examined in Section 8.5.1.

### 8.5.1 Establishing Differences in Regular and Non-Regular Exercisers Evaluation of Motivations

The differences in motivational evaluations between regular and non-regular exercisers are outlined in Table 8.13<sup>60</sup>.

---

<sup>60</sup> Again, the bootstrap output for the independent samples t-test exhibited very little difference with the original t-test findings, indicating that the non-normality of the data had very little impact on the outcome.

**Table 8.13: Establishing Differences in Regular and Non-Regular Grouping Evaluations of Motives<sup>61</sup>**

Group Statistics						Equality of Variance		Independent Samples t-test		
Motive	Current Exercise Status	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
Interpersonal	Non-Regular	356	2.94	1.21	0.064	4.45	.035	-9.57	.000	-0.89
	Regular	419	3.83	1.36	0.066					
Aesthetic	Non-Regular	356	4.08	1.49	0.079	1.41	.235	2.46	.014	0.26
	Regular	419	3.83	1.40	0.068					
Stress Management	Non-Regular	356	3.50	1.21	0.064	0.03	.862	-2.94	.003	-0.26
	Regular	419	3.76	1.23	0.060					
Health Enhancement	Non-Regular	356	4.63	1.01	0.054	4.19	.041	1.01	.314	0.08
	Regular	419	4.56	1.12	0.055					
Strength	Non-Regular	356	4.18	1.29	0.068	10.30	.001	-5.75	.000	-0.50
	Regular	419	4.68	1.13	0.055					
Social	Non-Regular	356	3.19	1.36	0.072	0.14	.705	-5.45	.000	-0.54
	Regular	419	3.73	1.39	0.068					
Enjoyment	Non-Regular	356	3.55	1.15	0.061	1.85	.175	-9.98	.000	-0.81
	Regular	419	4.36	1.11	0.054					
Health Pressures	Non-Regular	356	2.07	1.12	0.059	4.14	.042	1.19	.236	0.09
	Regular	419	1.98	1.02	0.050					
Flexibility	Non-Regular	356	3.68	1.42	0.075	1.34	.248	-2.58	.010	-0.26
	Regular	419	3.94	1.37	0.067					

Mean differences significant at <.05 are depicted in green text.

Significant differences exist in motivational evaluations between regular and non-regular exercisers in the majority of instances. Seven of the nine motivational constructs illustrate significant difference between regular and non-regular exercisers, the exceptions being the health enhancement and health pressure motives. Regular exercisers are significantly more motivated by interpersonal, stress management, strength, social, enjoyment, and flexibility motives. The aesthetic benefits of exercise is the sole motive where non-regular exercisers exhibit significant positive differentiation.

### 8.5.2 Differences in Recent Exercise Behaviour Profile Between the Segments and the Overall Sample

Hypothesis 4a evaluates if significant differences in recent exercise status exist when contrasting individual segments and the overall population and when comparing between each segment.

<sup>61</sup> The EMI-2 scale used in the survey included statements assessing respondents' motivations for exercising. The statements were assessed on a scale ranging from 0 to 5, with 0 denoting the motivational statement was not at all true for the respondent, while 5 was rated as very true for me.

**Hypothesis 4a:** The recent exercise status composition will vary significantly between each segment and the overall sample.

The segments exhibit significant variation in their recent exercise status in all cases, when compared to the overall sample. This gives full support to the stated hypothesis and rejects the null hypothesis - see Table 8.14.

**Table 8.14: Differences in Recent Exercise Behaviour Profile Between the Segments and the Overall Sample.**

	Overall Sample		The Enthusiast		Social Competitor		Healthy Looker		Reluctant Exerciser	
	Non-Regular	Regular	Non-Regular	Regular	Non-Regular	Regular	Non-Regular	Regular	Non-Regular	Regular
Observed Number	356	419	75	141	51	126	138	99	92	53
Observed Proportion	0.4594	0.5406	0.3472	0.6528	0.2881	0.7119	0.5823	0.4177	0.6345	0.3655
Expected Number			99	117	81	96	109	128	67	78
Chi-Square			10.95		20.91		14.41		17.90	
Asymp. Sig.			.001		.000		.000		.000	

Differences significant at <.05 are depicted in green text.

Both The Enthusiast and Social Competitor segments have significantly higher proportion of regular exercisers, when compared with the overall population of the study. The Social Competitor group contains the highest proportion of regular participants. The Healthy Looker and Reluctant Exerciser groups both contain significantly lower ratios of regular exercisers than is the case for the overall sample, with the Reluctant Exerciser cohort exhibiting the lowest rate of regular exercise engagement.

### 8.5.3 Assessing Differences in Recent Exercise Behaviour Profile Across the Segments

**Hypothesis 4b:** The recent exercise status composition will vary significantly across segments.

Significant differences exist in the majority of cases when the recent exercise status profile of each of the four segments is contrasted, as illustrated in Table 8.15. These findings illustrate reasonably strong support for the hypothesis, while rejecting the null hypothesis.

**Table 8.15: Differences in Recent Exercise Behaviour Profile between Each Segment**

	Non-Regular	Regular	Segment	Segment Comparison	Chi-Square	Asymp. Sig
Observed Number	75	141	<b>The Enthusiast</b>	Social Competitor	2.72	.099
Observed Proportion	0.35	0.65		Healthy Looker	57.79	.000
				Reluctant Exerciser	52.80	.000
Observed Number	51	126	<b>Social Competitor</b>	The Enthusiast	3.68	.055
Observed Proportion	0.29	0.71		Healthy Looker	100.00	.000
				Reluctant Exerciser	84.82	.000
Observed Number	138	99	<b>Healthy Looker</b>	The Enthusiast	49.08	.000
Observed Proportion	0.58	0.42		Social Competitor	62.97	.000
				Reluctant Exerciser	162	.203
Observed Number	92	53	<b>Reluctant Exerciser</b>	The Enthusiast	76.87	.000
Observed Proportion	0.63	0.37		Social Competitor	91.56	.000
				Healthy Looker	2.79	.095

Differences significant at <.05 are depicted in green text.

There is a significantly higher proportion of regular exercisers and significantly lower share of non-regular exercisers females in both The Enthusiast and Social Competitor segments, than in the Healthy Looker and Reluctant Exerciser groupings. No significant differences emerge when The Enthusiast and Social Competitor segments are evaluated and the same outcome surfaces in the comparison of the Healthy Looker and Reluctant Exerciser clusters.

#### 8.5.4 Evaluation of Research Proposition 4

The two hypotheses testing Research Proposition 4 were strongly supported<sup>62</sup>, giving robust backing to the assertion that differences in recent exercise profile across segments and varying motivational evaluations between regular and non-regular exercisers enhance segment profiling. A closer examination of the findings reinforces much of the literature examining the role of previous exercise engagement.

An overview of these analyses discloses a relatively distinct picture. There are significantly more regular exercisers in The Enthusiast and Social Competitor groupings in contrast with the overall sample. These segments contain the highest ratio of males, reinforcing Kilpatrick, Hebert, and Bartholomew's (2005) findings that male college

---

<sup>62</sup> Research Proposition 4: Profiling of the identified segments will be enhanced by identifying differences in recent exercise status composition.

students had significantly higher rates of regular physical activity participation than their female counterparts. The Social Competitor group possesses a noticeably higher proportion of younger members, while The Enthusiast group age profile is broadly in line with the overall sample. The youthful composition of the Social Competitor grouping in particular corresponds with much of the literature where higher levels of exercising are demonstrated amongst younger people (Booth *et al.*, 2000; Trost *et al.*, 2002; Irish Sports Council, 2012). The motivational profiles of these two segments are also consistent with higher rates of exercise adherence (see Figure 8.1 and Figure 8.2). The Enthusiasts exhibit the strongest motivational profile for most of the constructs, displaying a very positive and predominately intrinsic motivational perspective, as is illustrated by the importance of enjoyment and fitness motives in differentiating this segment. Ryan *et al.* (1997) outline that enjoyment, competence, and social interaction were strongly associated with exercise adherence, although their findings regarding fitness are ambivalent in this regard. Social Competitors demonstrate strong preference for the interpersonal, social, and enjoyment aspects of exercising. The social and enjoyment benefits tally with Ryan *et al.*'s (1997) findings regarding intrinsic motivation and exercise adherence. Interpersonal motives can be construed as being more extrinsic in composition. However, it could also be argued that where the interpersonal benefits facilitate the individual in demonstrating their competence e.g., being successful in competition; then they become rather more enjoyable and intrinsic in outlook. This would be consistent with Ryan *et al.*'s (1997) finding of perceived competence being a strong indicator of exercise adherence, and Frederick-Recascino and Schuster-Smith (2003), who found greater levels of enjoyment and interest amongst competitive cyclists.

A similar comparison with the Healthy Looker and Reluctant Exerciser cohorts reveals that these segments contain significantly greater numbers of non-regular exercisers and the corresponding higher proportions of females and older member in these groups are consistent with the literature outlined earlier in this section. The motivational outlook of these two segments is significantly more negative. The Healthy Looker segment is positively differentiated by aesthetic and health enhancement motives. Aesthetic motives in particular are perceived as being extrinsic in orientation and not indicative of exercise adherence (Kilpatrick, Hebert, and Bartholomew, 2005; Ingledew and Markland, 2008). The Reluctant Exerciser grouping exhibits the lowest ratings for all

motivational constructs. It is indicative of a cohort that does not find exercise intrinsically enjoyable. This position is confirmed in the illustration in Figure 8.4 that enjoyment is the construct that demonstrates greatest differentiation in a negative sense for the Reluctant Exercisers. The lack of intrinsic motivation, stretching perhaps as far as amotivation toward exercise for some segment members, is reflected in the lower exercise adherence of this grouping.

An analysis of the motives that differentiate regular and non-regular respondents is informative. Seven of the nine motivational constructs illustrate significances between the groups. The motives that differentiate the regular grouping: interpersonal, stress management, strength, social, enjoyment, and flexibility all find support at varying degrees in the literature. Earlier discussions in this section highlight the intrinsic nature and positive linkages of social and enjoyment motives with exercising. Stress management and health and fitness motives, such as strength and flexibility, are also strongly aligned to exercise participation (Ingledeew and Markland, 2008). Considering this, it is a little surprising that health enhancement and health pressure motives exhibit no significant differences between regular and non-regular exercisers. Perhaps, this is a reflection of these motives being critical for non-regulars if they were to re-engage with regular activity, a position supported by the findings of Kahn *et al.* (2002). Non-regulars ascribe a significantly higher rating to aesthetic motives, which on the surface is also a little surprising. However, when the extrinsic nature of these motives and the indifferent or at times negative associations of aesthetic motives with behaviour are considered, their importance to non-regular exercisers becomes more understandable. As with health oriented motives, promoting the aesthetic benefits of exercising may facilitate re-engagement with regular activity. However, even if these interventions worked, whether the reengagement would sustain is debatable given the findings of the literature in the area.

## **8.6 Testing Research Proposition 5**

The next phase of analysis involves examining the clusters for within-segment differences in their motivational profile, based on their age category, gender, and recent

exercise status. A series of independent samples t-tests are conducted for this analysis<sup>63</sup>. The research proposition and three hypotheses relating to this analysis are outlined below.

**Research Proposition 5: The identified segments will exhibit within-segment differentiation in motivational profiles, on the basis of age, gender, and recent exercise status.**

**Hypothesis 5a:** Significant differences in motivation will emerge between the two age groups within each segment

**Hypothesis 5b:** Significant differences in motivation will emerge between males and females within each segment

**Hypothesis 5c:** Significant differences in motivation will emerge between regular and non-regular exercisers within each segment

### **8.6.1 Assessing Within-Segment Motivational Differences by Age Group**

The first of the hypotheses relates to the within-segment differences in motivation for the two age groups.

**Hypothesis 5a:** Significant differences in motivation will emerge between the two age groups within each segment.

Significant differences between the age groups emerge within-segments for a number of the motivational constructs (See Table 8.16), which indicates moderate support of the hypothesis and a rejection of the null hypothesis.

---

<sup>63</sup> Bootstrapping was conducted for each of the three independent samples relating to Hypotheses 5a-5c. The bootstrapping output again illustrates very little difference to the original t-test findings, indicating that the test was robust in handling the non-normal data.

**Table 8.16: Within-Segment Differences in Age Profile<sup>64</sup>**

Group Statistics						Equality of Variance		Independent Samples t-test		
Segment	Motives	Age Category	N	Mean	Std. Deviation	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Stress Management Motives	18-24	168	4.59	0.778	1975	.161	-3.347	.001	-.434
		25 or more	44	5.03	0.720					
	Health Motives	18-24	168	5.28	0.663	1523	.219	-2.801	.006	-.307
		25 or more	44	5.58	0.580					
	Affiliation Motives	18-24	168	4.34	1.169	4.968	.027	5.068	.000	1.041
		25 or more	44	3.30	1.372					
Interpersonal Motives	18-24	168	4.18	1.007	4.146	.043	3.958	.000	.698	
	25 or more	44	3.48	1.161						
Social Competitor	Affiliation Motives	18-24	158	4.27	1.048	.894	.346	2.764	.006	.851
		25 or more	13	3.42	1.284					
	Enjoyment Motives	18-24	158	4.35	0.870	.985	.322	-2.880	.004	-.710
		25 or more	13	5.06	0.605					
	Interpersonal Motives	18-24	158	4.03	0.991	1903	.170	4.527	.000	1.317
		25 or more	13	2.71	1.213					
Healthy Looker	Stress Management Motives	18-24	175	3.65	0.945	.047	.828	-2.265	.024	-.333
		25 or more	55	3.98	0.966					
	Health Motives	18-24	175	4.81	0.754	3.606	.059	-3.561	.000	-.396
		25 or more	55	5.20	0.589					
	Affiliation Motives	18-24	175	3.20	1.083	1.179	.279	3.575	.000	.612
		25 or more	55	2.59	1.184					
Interpersonal Motives	18-24	175	2.56	0.916	.155	.694	2.898	.004	.413	
	25 or more	55	2.15	0.936						
Reluctant Exerciser	Aesthetic Motives	18-24	114	3.78	1.561	.057	.812	3.495	.001	1.183
		25 or more	26	2.60	1.542					

Mean differences significant at <.05 are depicted in green text.

Within both The Enthusiast and Healthy Looker segments, the 18-24 group are significantly more motivated by interpersonal and affiliation benefits, while the 25 plus cohort attach greater importance to health and stress management motives. The younger Social Competitors are also distinguished by interpersonal and affiliation aims, while enjoyment motives differentiate the older grouping in this segment. Finally, the younger members of the Reluctant Exerciser group are significantly more motivated by aesthetic drives.

### 8.6.2 Assessing Within-Segment Motivational Differences by Gender

The next hypothesis assesses the differences in motivation between genders within each of the four segments.

<sup>64</sup> The EMI-2 scale used in the survey included statements assessing respondents' motivations for exercising. The statements were assessed on a scale ranging from 0 to 5, with 0 denoting the motivational statement was not at all true for the respondent, while 5 was rated as very true for me.

**Hypothesis 5b:** Significant differences in motivation will emerge between males and females within each segment.

Table 8.17 illustrates that significant differences between genders emerge within segments for a number of the motivational constructs, findings that are indicative of reasonably strong support for the hypothesis and a rejection of the null hypothesis.

**Table 8.17: Within-Segment Differences in Gender Profile<sup>65</sup>**

Group Statistics						Equality of Variance		Independent Samples t-test		
Segment	Motives	Gender	N	Mean	Std. Deviation	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Aesthetic Motives	Male	114	4.31	1.133	3.065	.081	-4.757	.000	-0.69
		Female	98	5.00	0.955					
	Stress Management Motives	Male	114	4.52	0.802	16.15	.205	-3.356	.001	-0.35
		Female	98	4.87	0.722					
	Strength Motives	Male	114	5.46	0.590	.345	.557	3.674	.000	0.31
		Female	98	5.15	0.637					
	Health Pressures Motives	Male	114	2.49	1.097	2.267	.134	-2.189	.030	-0.35
		Female	98	2.84	1.223					
	Interpersonal Motives	Male	114	4.29	1.054	.048	.826	3.893	.000	0.56
		Female	98	3.73	1.027					
Social Competitor	Stress Management Motives	Male	138	3.08	1.072	.689	.408	-2.974	.003	-0.60
		Female	33	3.68	0.937					
	Strength Motives	Male	138	4.93	0.821	.029	.864	2.908	.004	0.47
		Female	33	4.46	0.845					
	Social Motives	Male	138	4.12	1.087	.390	.533	-2.320	.022	-0.48
		Female	33	4.60	1.013					
Healthy Looker	Aesthetic Motives	Male	102	3.96	1.123	3.000	.085	-6.835	.000	-0.96
		Female	128	4.91	1.000					
	Strength Motives	Male	102	4.54	0.885	.618	.433	4.662	.000	0.59
		Female	128	3.95	1.010					
	Health Pressures Motives	Male	102	2.41	1.056	.192	.662	2.496	.013	0.34
		Female	128	2.07	1.020					
	Interpersonal Motives	Male	102	2.74	0.811	7.799	.006	4.129	.000	0.50
		Female	128	2.24	0.973					
Reluctant Exerciser	Aesthetic Motives	Male	57	2.72	1.509	.799	.373	-5.597	.000	-1.41
		Female	83	4.13	1.437					
	Stress Management Motives	Male	57	2.23	1.013	.297	.586	-2.974	.003	-0.51
		Female	83	2.74	0.991					
	Health Enhancement Motives	Male	57	3.53	1.053	.013	.909	-2.101	.038	-0.39
		Female	83	3.92	1.089					
	Strength Motives	Male	57	3.41	1.467	7.219	.008	2.632	.009	0.58
		Female	83	2.83	1.129					
	Interpersonal Motives	Male	57	1.97	1.015	14.243	.000	3.211	.002	0.44
		Female	83	1.54	0.595					

Mean differences significant at <.05 are depicted in green text.

<sup>65</sup> The EMI-2 scale used in the survey included statements assessing respondents' motivations for exercising. The statements were assessed on a scale ranging from 0 to 5, with 0 denoting the motivational statement was not at all true for the respondent, while 5 was rated as very true for me.

The male cohort within each of the four segments attaches significantly higher importance to strength and endurance motives. Similarly, males in three of the segments rate interpersonal motives significantly higher than females, the exception being the Social Competitor segment, where there is no significant difference in evaluation. A final noteworthy point for the male grouping is the significantly higher evaluation of health pressures motives within the Healthy Looker segment. Females in three of the four segments assign significantly higher ratings to aesthetic motives, with Social Competitors exhibiting no significant difference. Stress management is also a key differentiator, being significantly higher for females in all but the Healthy Looker segment. Health pressures motives are higher for females in The Enthusiast segment. Health motives are higher for females in the Reluctant segment, while affiliation motives are significantly higher for females in the Social Competitor grouping.

### **8.6.3 Assessing Within-Segment Motivational Differences by Recent Exercise Profile**

Hypothesis 5c evaluates the significance of the differences in motivation between regular and non-regular exercisers, within the four segments.

**Hypothesis 5c:** Significant differences in motivation will emerge between regular and non-regular exercisers within each segment.

A number of significant differences emerge in this context (See Table 8.18), findings which indicate moderate support of the hypothesis and a rejection of the null hypothesis.

**Table 8.18: Within-Segment Differences in Recent Exercise Status Profile<sup>66</sup>**

Group Statistics						Equality of Variance		Independent Samples t-test		
Segment	Motives	Current Exercise Status	N	Mean	Std. Deviat.	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Aesthetic Motives	Non-Regular	75	4.92	0.870	6.326	.03	2.944	.004	.460
		Regular	137	4.46	1.190					
	Enjoyment Motives	Non-Regular	75	4.65	0.641	.497	.482	-5.502	.000	-.498
		Regular	137	5.15	0.624					
	Health Pressures Motives	Non-Regular	75	2.90	1.215	.592	.443	2.286	.023	.380
		Regular	137	2.52	1.122					
	Interpersonal Motives	Non-Regular	75	3.85	0.887	7.379	.007	-1.890	.060	-.290
		Regular	137	4.14	1.157					
Social Competitor	Aesthetic Motives	Non-Regular	48	2.44	0.995	.000	.983	-2.260	.025	-.386
		Regular	123	2.83	1.007					
	Health Motives	Non-Regular	48	4.18	0.886	1.197	.276	1.961	.051	.314
		Regular	123	3.87	0.961					
	Strength & Endurance Motives	Non-Regular	48	4.63	0.852	.409	.523	-2.105	.037	-.299
		Regular	123	4.92	0.828					
	Interpersonal Motives	Non-Regular	48	3.96	1.082	.344	.558	-4.150	.000	-.719
		Regular	123	4.67	0.991					
Healthy Looker	Aesthetic Motives	Non-Regular	136	4.62	1.119	.609	.436	2.100	.037	.323
		Regular	94	4.30	1.190					
	Enjoyment Motives	Non-Regular	136	3.53	0.806	.213	.645	-4.665	.000	-.512
		Regular	94	4.04	0.837					
Reluctant Exerciser	Enjoyment Motives	Non-Regular	90	2.33	0.846	.709	.401	-2.080	.039	-.312
		Regular	50	2.64	0.860					
	Health Pressures Motives	Non-Regular	90	1.53	0.753	12.701	.001	2.534	.012	.299
		Regular	50	1.23	0.483					
	Interpersonal Motives	Non-Regular	90	1.59	0.631	20.048	.000	-2.569	.011	-.364
		Regular	50	1.95	1.045					

Mean differences significant at <.05 are depicted in green text.

Enjoyment is a key differentiating motive between regular and non-regular exercisers in three of the four segments, the Social Competitor group being the exception. Regular exercisers in The Enthusiast and Reluctant Exerciser cohorts exhibit stronger interpersonal motives, while stress management and aesthetic goals are more prominent for the regular participants in the Social Competitor group. Non-regular exercisers rate aesthetic motives as significantly more important in The Enthusiast and Healthy Looker groups. They rate health pressures motives as more significant within The Enthusiast and Reluctant Exerciser clusters, and health motives distinguish them within the Social Competitor segment.

<sup>66</sup> The EMI-2 scale used in the survey included statements assessing respondents' motivations for exercising. The statements were assessed on a scale ranging from 0 to 5, with 0 denoting the motivational statement was not at all true for the respondent, while 5 was rated as very true for me.

#### 8.6.4 Evaluation of Research Proposition 5

Franke, Reisinger, and Hoppe (2009) exhibit that cluster solutions typically contain in the region of 39% remaining within-segment heterogeneity. This proposition aimed to address the issue of remaining within-segment heterogeneity by examining differences in motivational profile within groups on the basis of age, gender, and recent exercise status.<sup>67</sup>

The analysis for age grouping illustrates within-segment heterogeneity in motivational profile for *circa* 25% of the motivational constructs. This rises to *circa* 35% of motivational constructs illustrating heterogeneity within-segments when assessed on recent exercise status. Gender analysis reveals the highest level of within-segment heterogeneity, with approximately 45% of motivational constructs illustrating significant differentials in this regard.

Older respondents within The Enthusiast segment illustrate significantly higher disposition toward the health oriented motives (stress management and health enhancement), a situation that also pertains within the Healthy Looker cluster. Previous studies have illustrated that healthier outcomes are a critical driver of the exercise behaviour of older cohorts, while not being as significant for younger groupings (e.g., Quindry *et al.*, 2011). Health oriented motives also assume greater importance for females within The Enthusiast, Social Competitor, and Reluctant Exerciser segments, although males are significantly more motivated by health pressures in the Healthy Looker group. This reinforces the outcomes that females have consistently exhibited a stronger health benefit desire from exercising in the literature (e.g., Kilpatrick, Bartholomew, and Hebert, 2005), although there is some literature that illustrates no differences between males and females in this regard (e.g., Kelinske, Mayer, and Chen, 2001). Health related motives are significantly more important for non-regular exercisers within three of the four segments, Healthy Lookers illustrating no differences in this regard. This suggests that the scope for healthy outcomes could be a potential driver of non-exercisers taking up regular exercise activity. This is consistent with the assertions in Section 8.5.4, which suggested that health motives may be critical for attracting members of the two less motivated segments (Healthy Lookers and Reluctant

---

<sup>67</sup> Research Proposition 5: The identified segments will exhibit within-segment differentiation in motivational profiles, on the basis of age, gender, and recent exercise status.

Exercisers) to regular exercise engagement. It is also affirmed in a study by Kahn *et al.* (2002), which examined how to make exercise intervention strategies more effective.

The younger age grouping demonstrates significantly stronger interpersonal and social motives within The Enthusiast, Social Competitor, and Healthy Looker groupings. This is unsurprising for interpersonal motives, as the literature has frequently illustrated that younger athletes are highly motivated by the competitive aspects of their activities (e.g., Twemlow, Lerma and Twemlow, 1996), while social recognition from their exercise engagement is another prominent driver for younger participants (Kilpatrick, Hebert, and Bartholomew, 2005). The outcome for social motives is a little more ambiguous. Markland and Ingledew (1997) and Kelinske, Mayer, and Chen (2001) outline that social interaction and building of friendships through exercise engagement is very important to younger people, in particular younger females. However, social motives are also shown to be of considerable significance for older cohorts in several studies (e.g., Chiang *et al.*, 2008). Social motives are notably more important for females in the Social Competitor segment. There are a substantially higher proportion of males to females (*circa* 4.5:1) in this cluster and social motives appear to be a key differentiator for the female cohort here. As outlined earlier, social interaction motives have been illustrated to be of importance to females in previous exercise studies (e.g., Ryckman and Hamel, 1995; Kilpatrick, Hebert, and Bartholomew, 2005). Studies of competitive athletes also illustrate this finding (Fortier *et al.*, 1995). This would justify the assertion that even within competitive environments (as is the preferred exercise context for many social competitors), females desire social benefits from exercise participation. Strength motives are more important for males within all four segments. Again, this is consistent with much of the output of the exercise literature (e.g., Markland and Ingledew, 1997).

Aesthetic motives are significantly more important for younger respondents in the Reluctant Exerciser grouping. This tallies with the findings of Ingledew and Sullivan (2002) and Strong *et al.* (2006), who illustrate the significance of the physical attractiveness and weight control benefits for younger people. However, this is not always a positive influence on exercise behaviour. Aesthetic motives are of considerably greater magnitude for females within three of the segments, the exception being the Social Competitor segment. The literature is quite emphatic in highlighting the importance of aesthetic type motives for females (e.g., Kilpatrick, Hebert, and

Bartholomew, 2005; Markland and Ingledew, 1997). It is reasoned that the competitive nature of Social Competitors might offset the effect of seeking aesthetic benefits for females in this segment.

The within-segment differential for enjoyment motives within the Social Competitor segment is interesting, with older members considerably more motivated by this perceived benefit. Regular exercisers exhibit significantly stronger enjoyment motives within three of the segments, Social Competitors being the exception. Teixeira *et al.* (2012) illustrate that lack of enjoyment or perception of enjoyment can lead to less self-determined exercise outcomes and ultimately amotivation and disengagement from the activity. This suggests that the perception of exercise not being enjoyable could have a significant impact on the behaviour of sizeable portions of individuals within these segments.

### **8.7 Extended Profiling of the Identified Segments Using Theory of Planned Behaviour Data**

This section examines the Theory of Planned Behaviour (TPB) data that have been gathered as a mechanism for enhancing the profiling of the identified segments. Research Proposition 6 and associated hypotheses have been set out to achieve this goal. A series of ANOVA procedures have been carried out on the data to test the hypotheses. With this in mind, the TPB data are assessed for the requisite data assumptions for these types of tests.

#### **8.7.1 Scrutinising for Data Assumptions of the TPB Data**

A number of data assumptions should be met for the ANOVA and t-tests to follow. A new set of data (TPB data) is being used in these tests, so the data assumptions need to be scrutinised again. These are considered in the following four sections:

##### **8.7.1.1 Identification and Treatment of Outliers**

The data were examined to ascertain if there were any issues regarding outliers, as these can have an adverse effect on ANOVA tests (Hair *et al.*, 2010)<sup>68</sup>. Each TPB measure was regressed on the other TPB variables and outlier cases were deleted, a process recommended by Hair *et al.* (2010). This process of regression, followed by outlier

---

<sup>68</sup> See the discussion in Section 7.7.1 for the author's rationale in deleting outliers prior to ANOVA tests.

deletion continued until no further outliers were identified. A total of 22 outlier cases were deleted, leaving a data set of 753 cases for subsequent analysis.

#### **8.7.1.2 Testing for Normality**

The Kolmogorov-Smirnov (K-S) and Shapiro-Wilk (S-W) tests are used to examine whether the distribution as a whole deviates from a comparable normal distribution. The K-S and S-W test results for each of the 23 TPB variables have significance values that are below .05 indicating that the data are non-normal. However, this is tempered by a major limitation of these tests, that is, with large sample sizes, it is very easy to obtain significant results from small deviations from normality. Consequently, a significance test does not necessarily tell the researcher whether the deviation from normality is enough to bias any statistical procedures that are applied to the data (Field, 2009). Field (2009) recommends that these tests should be conducted in tandem with data plots in order to make an informed decision about the extent of non-normality.

The researcher examined the skewness and kurtosis data for all 23 variables. Additionally, as recommended by Field (2009), the histograms, probability-probability (P-P) plots and quantile-quantile (Q-Q) plots for the data were examined. The descriptive table for this data is contained in Appendix B. It illustrates varying degrees of skewness and kurtosis issues, which are indicative of some non-normality in the data. An examination of the plots also indicates non-normality, with the histograms being problematic for many variables. The P-P and Q-Q plots do not illustrate these issues to the same extent, although for many variables they still could not be considered normal in appearance.

The author gave due consideration to the various options suggested for handling non-normal data, such as transforming the data. However, the interpretation of transformed data can present considerable difficulties (Hair *et al.*, 2010). The decision was therefore made not to transform the data, but instead use the bootstrapping facility at each stage of analysis. As outlined previously in this thesis, this procedure for handling non-normal data can be readily applied to ANOVA tests and facilitates the researcher in determining the impact of non-normal data on the output (Hair *et al.*, 2010).

### **8.7.1.3 Homogeneity of Variance**

Many of the 23 TPB variables exhibit significant heterogeneity of variance. In these instances, the difficulty is overcome by using data derived from post-hoc analysis where equal variances are not assumed – in this instance using Tamhane's T2 comparison. The variables that exhibit homogeneity of variance are interpreted using the Scheffe comparison.

### **8.7.1.4 Independence of Data**

As outlined previously, the data gathered throughout the quantitative phase of this study is entirely independent.

### **8.7.1.5 Testing for Linearity**

Linearity of the data is a key assumption for ANOVA tests. The data for the twenty one of the twenty three of the TPB beliefs show no significant deviation from linearity and satisfy the assumption for tests of this nature. Two of the belief variables (Enjoyment .050 and Friends Co-operation .048) are bordering on significant deviation. However, as both variables are very proximal to the accepted threshold .05 (Hair *et al.*, 2010), the author has elected to leave the data unadjusted.

### **8.7.1.6 Testing for Multicollinearity**

The twenty three TPB belief variables were tested for multicollinearity and all variance inflation factor (VIF) scores were below 3, which is substantially under Hair *et al.*'s (2010) threshold for multicollinearity issues of 10.

### **8.7.1.7 Assessing the Correlation Between the TPB Direct and Indirect Measures**

Ajzen (2002) argues that there should be a strong correlation between the corresponding direct and indirect measures of the TPB. Table 8.19 outlines these relationships and they are all significant and of large magnitude:

**Table 8.19: Correlation Between Direct and Indirect TPB Measures**

Comparison	Correlation
Attitude and Behavioural Belief	.748
Subjective Norm and Normative Belief	.588
Perceived Behavioural Control and Control Belief	.692

All correlations are significant at  $p < .01$  and of large magnitude.<sup>69</sup>

## 8.8 Testing Research Proposition 6

This section evaluates a series of ANOVA tests conducted to compare each segment on the elicited underlying behavioural, normative, and control beliefs. The ANOVA tests are performed to assess Research Proposition 6 and its three associated hypotheses, which are outlined below<sup>70</sup>.

**Research Proposition 6: The elicited underlying individual belief components of the theory of planned behaviour will illustrate differentiation across segments.**

**Hypothesis 6a:** Significant differences will emerge in the elicited behavioural beliefs across the identified segments

**Hypothesis 6b:** Significant differences will emerge in the elicited normative beliefs across the identified segments

**Hypothesis 6c:** Significant differences will emerge in the elicited control beliefs across the identified segments

### 8.8.1 Testing for Significant Differences in Elicited Behavioural Beliefs between Segments

Significant differences in elicited behavioural beliefs between segments are examined to test Hypothesis 6a.

**Hypothesis 6a:** Significant differences will emerge in the elicited behavioural beliefs across the identified segments.

---

<sup>69</sup> The reporting of the size of correlation effects in this thesis is based on Field's (2009) rule of thumb. Correlation coefficients with values in the range of + or - .1 to .3 represent a small effect; values in the range of + or - .3 to .5 represent a moderate effect; while values of + or - .5 or greater represent a strong effect.

<sup>70</sup> The ANOVA test output for all three hypotheses (6a to 6c) was compared to the bootstrapping output of the same tests, and as with all the other bootstrapping tests in this study, the differences were minimal. This confirms the robustness of the ANOVA and independent samples t-tests in handling non-normal data.

The strength of evaluation and relative ranking of each of the behavioural belief variables for the four segments are outlined in Table 8.20. These have the scope to provide a measure of confirmation of the motivational profile that emerged for each of the segments during the cluster analysis.

**Table 8.20: Behavioural Belief Mean and Ranking for Each Segment**

Behavioural Beliefs	The Enthusiast		Social Competitor		Healthy Looker		Reluctant Exerciser	
	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean
<b>Positive Beliefs</b>								
Success	6	35.67	6	33.51	7	27.38	7	22.42
Affiliation	9	28.67	7	33.31	9	16.97	9	16.17
Social Interaction	8	29.58	5	33.74	8	21.14	8	19.13
Stress Relief	5	37.35	8	27.53	4	30.88	6	23.75
Appearance	7	32.60	9	21.65	5	30.68	5	24.40
Health and Fitness	1	42.21	2	36.58	1	38.80	1	32.30
Fun and Enjoyment	4	38.29	1	36.78	6	29.91	4	25.21
Energised	3	40.69	4	36.09	3	35.61	3	29.51
Feeling Good	2	41.20	3	36.29	2	36.91	2	30.90
<b>Negative Beliefs</b>								
Time Consuming	4	18.58	5	18.08	4	13.19	3	11.75
Costly	1	22.87	2	21.86	1	20.27	1	19.51
Poor Weather	5	17.13	3	20.12	3	13.30	4	11.37
Injury Risk	2	22.14	1	24.61	2	19.76	2	18.24
Dedication Required	3	19.39	4	19.43	5	12.28	5	7.90

Some notable trends are evident and largely confirm the motivational outcome for three of the four segments:

- The strength of the beliefs relating to the health and fitness benefits of regular exercise is apparent across segments.
- The multiple motives for exercising that emerged in the cluster analysis for The Enthusiast segment are reflected in the very positive behavioural beliefs expressed across the range of beliefs by this grouping.
- The belief composition illustrated by the Social Competitor grouping is surprising. Strong interpersonal and social motives characterised this group in the cluster analysis. The beliefs relating to success and affiliation should align closely with interpersonal and social motives, but are ranked quite low amongst the portfolio of behavioural beliefs for this segment.

- Health oriented and appearance beliefs assume prominence for the Healthy Looker group, which is consistent with their motivational outcome.
- The Reluctant Exerciser segment illustrates the lowest rating for most of the behavioural beliefs, leading to a more negative attitude toward exercise. This corresponds with the cluster's weak motivational profile in this regard.
- The dedication required and time needed to regularly exercise, emerge as the strongest negative behavioural beliefs<sup>71</sup> across segments. The Enthusiast and Social Competitor groupings are generally more positive about the potential downsides of exercising, findings that are again consistent with the motivational profile exhibited by these segments.

The hypothesis is tested by ANOVA which reveals that significant differences in behavioural beliefs are illustrated in many instances between the segments (See Table 8.21). These findings reflect reasonably strong support of the hypothesis and a rejection of the null hypothesis.

---

<sup>71</sup> The lower the mean score for the negative oriented beliefs, the greater the contribution toward a negative attitude formation.

**Table 8.21: Between-Segment Comparison in Elicited Behavioural Beliefs**

ANOVA			Multiple Comparisons				ANOVA			Multiple Comparisons											
	F	Sig.	Segments		Mean Diff.	Std. Error	Sig.		F	Sig.	Segments		Mean Diff.	Std. Error	Sig.						
<b>Success</b>	49.38	.000	The Enthusiast	Social Competitor	2.14	1.16	.332	<b>Energised</b>	39.55	.000	The Enthusiast	Social Competitor	4.85	0.97	.000						
				Healthy Looker	8.13	1.07	.000					Healthy Looker	5.12	0.89	.000						
				Reluctant Exerciser	13.42	1.22	.000					Reluctant Exerciser	11.09	1.02	.000						
			Social Competitor	Healthy Looker	5.99	1.14	.000				Healthy Looker	0.27	0.95	.994							
				Reluctant Exerciser	11.29	1.28	.000				Reluctant Exerciser	6.24	1.08	.000							
			Healthy Looker	Reluctant Exerciser	5.29	1.21	.000				Reluctant Exerciser	5.97	1.01	.000							
			<b>Affiliation</b>	67.17	.000	The Enthusiast	Social Competitor				-5.02	1.45	.008	<b>Feeling Good</b>	38.44	.000	The Enthusiast	Social Competitor	5.11	0.95	.000
							Healthy Looker				11.58	1.34	.000					Healthy Looker	4.63	0.88	.000
							Reluctant Exerciser				12.49	1.54	.000					Reluctant Exerciser	10.72	1.00	.000
Social Competitor	Healthy Looker	16.61				1.43	.000	Healthy Looker	-0.49	0.94	.966										
	Reluctant Exerciser	17.51				1.61	.000	Reluctant Exerciser	5.60	1.06	.000										
Healthy Looker	Reluctant Exerciser	0.90				1.51	.949	Reluctant Exerciser	6.09	0.99	.000										
<b>Social Interaction</b>	49.73	.000				The Enthusiast	Social Competitor	-3.81	1.36	.051	<b>Time Consuming</b>	16.20	.000				The Enthusiast	Social Competitor	1.07	1.13	.828
							Healthy Looker	8.88	1.26	.000								Healthy Looker	5.12	1.04	.000
							Reluctant Exerciser	11.07	1.44	.000								Reluctant Exerciser	7.02	1.19	.000
			Social Competitor	Healthy Looker	12.69	1.34	.000	Healthy Looker	4.05	1.11				.004							
				Reluctant Exerciser	14.88	1.52	.000	Reluctant Exerciser	5.96	1.25				.000							
			Healthy Looker	Reluctant Exerciser	2.19	1.42	.500	Reluctant Exerciser	1.91	1.17				.451							
			<b>Stress Relief</b>	44.46	.000	The Enthusiast	Social Competitor	10.06	1.19	.000				<b>Costly</b>	4.16	.006	The Enthusiast	Social Competitor	1.15	1.04	.747
							Healthy Looker	6.84	1.10	.000								Healthy Looker	2.63	0.95	.056
							Reluctant Exerciser	13.48	1.26	.000								Reluctant Exerciser	3.37	1.09	.023
Social Competitor	Healthy Looker	-3.22				1.17	.057	Healthy Looker	1.48	1.02	.547										
	Reluctant Exerciser	3.42				1.32	.084	Reluctant Exerciser	2.22	1.14	.288										
Healthy Looker	Reluctant Exerciser	6.64				1.24	.000	Reluctant Exerciser	0.74	1.07	.923										
<b>Appearance</b>	30.54	.000				The Enthusiast	Social Competitor	10.67	1.29	.000	<b>Poor Weather</b>	18.29	.000				The Enthusiast	Social Competitor	-2.34	1.17	.258
							Healthy Looker	15.3	1.19	.045								Healthy Looker	4.04	1.07	.003
							Reluctant Exerciser	7.88	1.36	.000								Reluctant Exerciser	5.83	1.23	.000
			Social Competitor	Healthy Looker	-9.14	1.27	.000	Healthy Looker	6.38	1.15				.000							
				Reluctant Exerciser	-2.79	1.43	.285	Reluctant Exerciser	8.17	1.29				.000							
			Healthy Looker	Reluctant Exerciser	6.35	1.34	.000	Reluctant Exerciser	1.79	1.21				.533							

**Table 8.21 continued: Between-Segment Comparison in Elicited Behavioural Beliefs**

ANOVA			Multiple Comparisons				ANOVA			Multiple Comparisons											
	F	Sig.	Segments		Mean Diff.	Std. Error	Sig.		F	Sig.	Segments		Mean Diff.	Std. Error	Sig.						
Health & Fitness	3155	.000	The Enthusiast	Social Competitor	5.37	0.95	.000	Injury Risk	1189	.000	The Enthusiast	Social Competitor	-2.19	1.04	.217						
				Healthy Looker	3.28	0.88	.003					Healthy Looker	2.11	0.95	.180						
				Reluctant	9.51	1.01	.000					Reluctant	4.13	1.09	.003						
			Social Competitor	Healthy Looker	-2.10	0.94	.171				Social Competitor	Healthy Looker	4.30	1.02	.001						
				Reluctant	4.13	1.06	.002					Reluctant	6.32	1.15	.000						
			Healthy Looker	Reluctant	6.23	0.99	.000				Healthy Looker	Reluctant	2.02	1.07	.315						
			Fun & Enjoyment	6164	.000	The Enthusiast	Social Competitor				1.91	1.04	.339	Dedication Required	4156	.000	The Enthusiast	Social Competitor	-0.06	1.19	1.000
							Healthy Looker				8.37	0.96	.000					Healthy Looker	6.78	1.10	.000
							Reluctant				13.23	1.10	.000					Reluctant	11.88	1.25	.000
Social Competitor	Healthy Looker	6.46				1.02	.000	Social Competitor	Healthy Looker	6.84	1.17	.000									
	Reluctant	11.32				1.16	.000		Reluctant	11.94	1.32	.000									
Healthy Looker	Reluctant	4.86				1.08	.000	Healthy Looker	Reluctant	5.10	1.24	.001									

Mean differences significant at <.05 are depicted in green text.

The Enthusiast segment members exhibit the most favourable set of behavioural beliefs concerning regular exercise. In comparison with the Healthy Looker and Reluctant Exerciser segments, significantly higher ratings are recorded for the range of positively oriented behavioural beliefs. These include the beliefs that regular exercise facilitates the achievement of success, a sense of affiliation, social interaction, stress relief, improved appearance, health and fitness, a sense of fun and enjoyment, a feeling of increased energy, and feeling good about oneself. The Enthusiasts also exhibit significantly stronger beliefs than the Social Competitors concerning stress relief, appearance, health and fitness, feeling energised and feeling good. The only instance where Enthusiasts have a significantly lower rating for the positively oriented beliefs is for exercise enabling a feeling of affiliation. In this case, the Social Competitors exhibit a significantly more positive attitude. With regard to the potentially negative outcomes of exercising, the higher the score, the lower the impact of the belief on the formation of the individual's attitude toward regular exercise. When compared with the Reluctant Exercisers, The Enthusiast segment have a significantly more positive evaluation of the impact of the time required to exercise, poor weather, cost of participating, risk of injury, and dedication required. Additionally, The Enthusiasts have significantly more positive beliefs than the Healthy Lookers concerning the time required to exercise, poor weather and dedication needed to regularly participate.

Notable evaluations for the Social Competitor cohort include their positive assessment of regular exercise facilitating success, social interaction, and fun and enjoyment. For each of these beliefs the appraisal is significantly higher than that of the Healthy Looker and Reluctant Exerciser groupings. Their most favourable behavioural belief relates to affiliation and in this instance the Social Competitors' assessment is significantly higher than the other three segments. As outlined above, the Social Competitors have significantly lower ratings than The Enthusiasts across a number of the positively oriented behavioural beliefs, while they also have a significantly more negative assessment of the appearance benefits of regular exercise than the Healthy Lookers. An examination of the potentially undesirable issues relating to exercise, shows that the Social Competitor grouping has a similar attitude to The Enthusiasts in this context. They also illustrate a significantly more positive outlook than the Healthy Lookers and Reluctant Exercisers for all negative beliefs, except for the cost of exercising.

The Healthy Lookers exhibit significantly more positive attitudes than the Reluctant Exercisers in most instances, the exceptions being the beliefs relating to affiliation and social interaction. The only other case when they illustrate noticeably more positive attitudes is for the appearance belief, where their evaluation is significantly higher than the Social Competitors. Indeed, appearance is the only belief where they are not significantly lower than The Enthusiasts. Additionally, significant lower differences exist compared to the Social Competitors for the success, affiliation, social interaction, and fun and enjoyment beliefs. The evaluation of the negative behavioural beliefs presents some interesting issues. The comparison with the Reluctant Exercisers for the dedication belief provides the only case where the Healthy Lookers differentiate themselves positively. The cost of exercising appraisal is indistinguishable from the other segments, but the Healthy Looker's assessment of the time required for exercise, impact of poor weather, and dedication required is significantly more negative than that of The Enthusiasts and Social Competitors.

The Reluctant Exerciser segment illustrates significantly more negative attitudes than all the other groupings for the majority of beliefs. For the affiliation and social interaction beliefs, their ratings are not distinct from the Healthy Lookers, while a similar situation prevails when comparing with the Social Competitor cluster for the stress relief and

appearance beliefs. This grouping also has the most negative perception of the less favourable behavioural beliefs. Their evaluation is significantly lower than The Enthusiasts across all these beliefs, and lower than the Social Competitors across all beliefs with the exception of the cost of exercising. It has similar ratings to the Healthy Lookers for this set of beliefs, except for the assessment of the dedication required to exercise, where the Healthy Lookers have a significantly more positive attitude.

### 8.8.2 Testing for Significant Differences in Elicited Normative Beliefs between Segments

The next hypothesis contends that significant distinction in normative beliefs exist between segments.

**Hypothesis 6b:** Significant differences will emerge in the elicited normative beliefs across the identified segments.

The strength of evaluation and relative ranking of each of the normative belief variables of the four segments are outlined in Table 8.22.

**Table 8.22: Normative Belief Mean and Ranking for Each Segment<sup>72</sup>**

Normative Beliefs	The Enthusiast		Social Competitor		Healthy Looker		Reluctant Exerciser	
	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean
Family	3	20.27	3	20.65	1	17.91	1	13.30
Friends	4	18.68	4	19.09	2	15.33	4	11.29
Coach	1	23.45	1	24.91	4	12.55	3	11.96
Exercise Partners	2	22.59	2	24.04	3	14.82	2	12.43

Key trends that emerge include:

- The more positive perception of normative support exhibited by The Enthusiast and Social Competitor segments.
- Coaches and exercise partners play a particularly significant role for these two segments.
- The Healthy Looker and Reluctant Exerciser groups ascribe greater importance to the role of family in their exercising.

<sup>72</sup> The mean ratings for the individual TPB normative belief items are the product of an assessment of the strength of the normative belief multiplied by the motivation to comply with the referent. Both the strength of the normative belief and the motivation to comply are measured on a 1-7 scale.

This hypothesis is tested using an ANOVA, which illustrates that significant differences exist in some cases between the segments (See Table 8.23). This is indicative of moderate support of the hypothesis and a rejection of the null hypothesis.

**Table 8.23: Between-Segment Comparison in Elicited Normative Beliefs**

ANOVA			Multiple Comparisons				ANOVA			Multiple Comparisons											
	F	Sig.	Segments		Mean Diff.	Std. Error	Sig.		F	Sig.	Segments		Mean Diff.	Std. Error	Sig.						
<b>Family</b>	12.18	.000	The Enthusiast	Social Competitor	-0.71	126	.956	<b>Coaches</b>	46.38	.000	The Enthusiast	Social Competitor	-2.11	142	.528						
				Healthy Looker	2.49	116	.205					Healthy Looker	10.62	131	.000						
				Reluctant Exerciser	6.87	133	.000					Reluctant Exerciser	11.08	149	.000						
			Social Competitor	Healthy Looker	3.20	124	.084				Social Competitor	Healthy Looker	12.73	139	.000						
				Reluctant Exerciser	7.58	140	.000					Reluctant Exerciser	13.19	157	.000						
			Healthy Looker	Reluctant Exerciser	4.38	131	.011				Healthy Looker	Reluctant Exerciser	0.46	147	.992						
			<b>Friends</b>	17.96	.000	The Enthusiast	Social Competitor				-0.57	115	.969	<b>Exercise Partners</b>	35.34	.000	The Enthusiast	Social Competitor	-2.01	129	.485
							Healthy Looker				3.48	106	.013					Healthy Looker	7.42	119	.000
							Reluctant Exerciser				7.49	120	.000					Reluctant Exerciser	9.61	135	.000
Social Competitor	Healthy Looker	4.05				113	.005	Social Competitor	Healthy Looker	9.43	126	.000									
	Reluctant Exerciser	8.06				127	.000		Reluctant Exerciser	11.62	142	.000									
Healthy Looker	Reluctant Exerciser	4.01				119	.010	Healthy Looker	Reluctant Exerciser	2.19	133	.442									

Mean differences significant at <.05 are depicted in green text.

The Enthusiast segment members exhibit no significant difference in any of the normative beliefs, when compared with the Social Competitors. Their normative beliefs are significantly stronger than the Reluctant Exercisers in all cases, while their beliefs relating to the influence on their participation of friends, coaches, and exercise partners are significantly greater than the Healthy Looker grouping.

Social Competitor group members have a very similar profile to The Enthusiasts. As outlined above, they illustrate no significant differences in normative beliefs with their Enthusiast counterparts. Additionally, their normative beliefs are significantly higher than the Reluctant Exercisers in all cases. As with The Enthusiasts, their beliefs relating to the influence on their participation of friends, coaches, and exercise partners are significantly greater than the Healthy Looker grouping.

The Healthy Looker cohort’s normative beliefs are significantly greater than the Reluctant Exercisers concerning the influence of family and friends. Their belief relating to family influence exhibits no significant difference with The Enthusiast and Social Competitor groups. However, their evaluation of the role of friends, coaches, and exercise partners is considerably lower than The Enthusiasts and Social Competitors.

The Reluctant Exerciser cluster has the lowest normative beliefs across the board, significantly lower than The Enthusiasts and Social Competitors for all four beliefs, and lower than the Healthy Lookers for the family and friends beliefs.

### 8.8.3 Testing for Significant Differences in Elicited Control Beliefs between Segments

The final hypothesis in this section tests differentiation in control beliefs between segments.

**Hypothesis 6c:** Significant differences will emerge in the elicited control beliefs across the identified segments.

The strength of evaluation and relative ranking of each of the control belief variables for the four segments are outlined in Table 8.24.

**Table 8.24: Control Belief Mean and Ranking for Each Segment<sup>73</sup>**

Control Beliefs	The Enthusiast		Social Competitor		Healthy Looker		Reluctant Exerciser	
	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean
Studies	1	32.58	1	29.82	1	32.67	1	29.57
Other Leisure Activities	2	24.79	2	21.24	3	21.81	3	20.01
Affordability	4	16.81	5	14.48	4	17.59	4	16.57
Effort Required	3	22.23	3	20.13	2	23.80	2	23.54
Friends Co-operation	5	15.91	4	16.54	5	14.98	5	13.62

Noteworthy points to emerge include:

- The substantial controlling influence of segment members’ studies across all groupings.
- A lack of differentiation in each control belief between segments is evident.

<sup>73</sup> The mean ratings for the individual TPB control belief items are the product of an assessment of the strength of the control belief multiplied by the perceived power of the control factor. Both the strength of the control belief and the perceived power of the control factor are measured on a 1-7 scale.

The ANOVA tests for this hypothesis reveals minimal significant differences between segments for control beliefs – see Table 8.25. This is indicative of very weak support for the hypothesis.

**Table 8.25: Between Segment Comparison in Elicited Control Beliefs**

ANOVA			Multiple Comparisons				ANOVA			Multiple Comparisons											
	F	Sig.	Segments		Mean Diff.	Std. Error	Sig.		F	Sig.	Segments		Mean Diff.	Std. Error	Sig.						
Studies	3.23	.022	The Enthusiast	Social Competitor	2.48	142	.382	Affordability	163	.182	The Enthusiast	Social Competitor	2.16	138	.533						
				Healthy Looker	-0.67	130	.966					Healthy Looker	-0.84	126	.985						
				Reluctant Exerciser	3.07	149	.237					Reluctant Exerciser	0.26	152	1000						
			Social Competitor	Healthy Looker	-3.15	139	.163				Social Competitor	Healthy Looker	-3.00	136	.167						
				Reluctant Exerciser	0.59	157	.986					Reluctant Exerciser	-1.90	160	.800						
			Healthy Looker	Reluctant Exerciser	3.75	147	.090				Healthy Looker	Reluctant Exerciser	1.10	150	.976						
			Other Leisure Activities	5.01	.002	The Enthusiast	Social Competitor				3.47	125	.053	Effort Required	3.68	.012	The Enthusiast	Social Competitor	2.38	132	.356
							Healthy Looker				2.93	115	.090					Healthy Looker	-1.62	122	.625
							Reluctant Exerciser				4.66	131	.006					Reluctant Exerciser	-1.42	140	.793
Social Competitor	Healthy Looker	-0.54				123	.979	Social Competitor	Healthy Looker	-4.01	130	.024									
	Reluctant Exerciser	1.20				138	.861		Reluctant Exerciser	-3.80	146	.080									
Healthy Looker	Reluctant Exerciser	1.73				129	.616	Healthy Looker	Reluctant Exerciser	0.20	137	.999									
Friends Co-operation	1.51	.211				The Enthusiast	Social Competitor	-0.21	118	1000								Social Competitor			
							Healthy Looker	0.85	110	.969								Healthy Looker			
							Reluctant Exerciser	2.21	122	.351								Reluctant Exerciser			
			Social Competitor	Healthy Looker	1.05	111	.920		Healthy Looker												
				Reluctant Exerciser	2.42	123	.266		Reluctant Exerciser												
			Healthy Looker	Reluctant Exerciser	1.37	115	.800	Healthy Looker	Reluctant Exerciser												

Mean differences significant at <.05 are depicted in green text.

Two notable differentiations occur. The first is The Enthusiast having a significantly higher evaluation than the Reluctant Exercisers relating to the controlling influence of other leisure activities. The second case is the Healthy Looker’s significantly higher evaluation of the controlling impact of the effort required for regular exercise, when compared to the Social Competitor segment.

#### **8.8.4 Evaluation of Research Proposition 6**

Behavioural beliefs exhibit significant across-segment differentiation in the majority of instances.<sup>74</sup> Positive behavioural beliefs and attitudes toward regular exercise are predominately differentiated. A similar situation prevails with normative beliefs, although to a slightly lesser extent, while control beliefs exhibit minimal differentiation across segments.

Behavioural beliefs are the accessible beliefs about consequences of a particular behaviour and these determine the individual's attitude to the behaviour in question. Research has consistently shown that people with more favourable attitudes toward exercise are more likely to intend to, and actually engage in regular exercising (Hagger, Chatzisarantis, and Biddle, 2002). Support for this trend is forthcoming in this instance. The Enthusiast and Social Competitor have the most favourably disposed attitudes toward exercise behaviour, and the highest rates of exercise adherence in the six months prior to survey administration (The Enthusiast 64% and Social Competitor 71%). This appears to further verify much of the existing research findings in the area. However, the fact that The Enthusiast segment exhibits a more positive attitude than Social Competitors across the majority of behavioural beliefs, while illustrating a lower rate of exercise adherence, is somewhat puzzling. An explanation may lie in the body of work on the TPB, which consistently illustrates that the behavioural intention of people with positive attitudes toward exercise does not always translate into actual behaviour (Rhodes and Courneya, 2003). Translation of a positive attitude and intention to behave into behaviour is evidently more efficient amongst the Social Competitor cohort. The competitive motivational orientation of many within this segment could offer some clarity. Fortier *et al.* (1995) suggested that individuals with a competitive outlook tend to be more committed to and persistent in their chosen domain. Additionally, many individuals in this segment also exhibit a strong sense of affiliation and attachment toward their activity/club and the desire to do your best for the team has been exhibited a key correlate of exercise behaviour in studies by Ryckman and Hamel (1995) and MacPhail, Kirk, and Kinchin (2004).

---

<sup>74</sup> Research Proposition 6: The elicited underlying individual belief components of the theory of planned behaviour will illustrate differentiation across segments.

The other two segments are characterised by having a less favourable attitude toward exercise, a fact reflected in lower regular exercise adherence rates (Healthy Looker 42% and Reluctant Exerciser 37%). One positive belief is for the Healthy Lookers who illustrate a strong favourable belief concerning the appearance benefits of exercising. This is consistent with the motivational profile illustrated in the cluster analysis by this segment. A review of the beliefs relating to the potentially negative outcomes of exercising, illustrates that both the Healthy Lookers and Reluctant Exercisers have significantly higher ratings of these issues. This undoubtedly contributes to the formation of a less positive attitude toward exercising. A review of the literature on barriers to exercise behaviour reinforces many of the negative oriented behavioural beliefs. Cost issues, lack of time, insufficient dedication and willpower, and injury risks have emerged in assorted studies as having adverse consequences on exercise engagement (Troost *et al.*, 2002). These factors evidently contribute toward the less-engaged behaviour of these segments.

As with behavioural beliefs, The Enthusiast and Social Competitor groups illustrate significantly stronger normative beliefs than their counterparts in the Healthy Looker and Reluctant Exerciser segments. The positive impact of significant others on the exercise behaviour of these segments is apparent and consistent with their greater exercise adherence. Fraser and Spink (2002) illustrate the significant role of social support from family and friends in exercise. Similarly, the high rating given by Social Competitors to the influence of coaches is also notable, as the significance of their role has been acknowledged in studies of participants in competitive sports domains (Pensgaard and Roberts, 2002). While the Healthy Looker segment illustrates lower normative beliefs in the main, the relatively high evaluation of family influence is interesting. This group contains a higher portion of female members (56%) and Smith (2003) highlights that family play an especially important role in female exercise activities. A number of studies have shown the importance of social support to females in particular (King, Tergerson, and Wilson, 2008), and given the high proportion of females in the Healthy Looker and Reluctant Exerciser groups the low rating ascribed to normative beliefs in these segments is somewhat surprising. It could be construed that the lack of support offered by significant others may be having a negative influence on the exercise engagement of females in the two segments.

The lack of differentiation in control beliefs across segments was not anticipated. It is at odds with numerous studies in the domain, which indicate the strong effect that control beliefs and perceived behavioural control can have on exercise intention and behaviour (Hagger, Chatzisarantis, and Biddle, 2002). Given the differentiated motivational and behavioural profile exhibited across segments, it would have been reasonable to assume that the control beliefs would also illustrate diversity between groups. The minimal significant differences illustrated find some support in the literature. The Healthy Looker's notable perception of the limiting attributes of the effort required to regularly exercise, fits with the findings of Teixeira *et al.* (2012), who illustrate that female non-exercisers frequently cite the effort required as a barrier to their exercise participation. Overall though, the underwhelming level of across segment diversity for control beliefs is surprising and difficult to explain at this stage in the analysis.

## **8.9 Examination of the Relationship between Beliefs and Reported Exercise Behaviour**

The final phase of analysis examines differences across segments in the relationships between the elicited TPB beliefs and exercise behaviour that was reported four weeks after the administration of the main survey. A total of 481 of the 753 respondents used in the TPB analysis took part in this follow-up survey. The data assumptions again need to be examined at this juncture, as a correlation analysis is to be conducted on the data derived from this reduced sample.

### **8.9.1 Scrutinising for Data Assumptions of the TPB and Reported Behaviour Data**

A number of data assumptions should be met for the correlation analyses to follow, as discussed in the following sub-sections.

#### **8.9.1.1 Identification and Treatment of Outliers**

The data were examined to ascertain if there were any issues regarding outliers. Outlying cases in the original sample of 775 respondents were assessed at an earlier juncture, so it was not envisaged that many new outlying cases would emerge. Each TPB item and the summated belief measures were regressed on the other TPB variables and one further outlier case emerged and was deleted as outliers can have a distorting effect on correlation analyses (Hair *et al.*, 2010). A data set of 480 cases remained for subsequent analysis.

### **8.9.1.2 Testing for Normality**

The normality tests reveal that the data set being used for the forthcoming correlation analyses are normal (see Appendix B). The K-S test and S-W test presented a normal outcome for the summated belief scales and measure of behaviour. Additionally the skewness and kurtosis data are of an acceptable level, while the histograms, probability-probability (P-P) plots, and quantile-quantile (Q-Q) plots also indicate normality.

### **8.9.1.3 Independence of Data**

As outlined previously, the data gathered throughout the quantitative phase of this study is entirely independent.

### **8.9.1.4 Testing for Linearity**

Linearity of the data is an important assumption for correlation analysis. The data for the three summated belief constructs shows no significant deviation from linearity, which satisfies the assumption for tests of this nature.

### **8.9.1.5 Tests for Homoscedasticity**

The assumption of homoscedasticity is met in this case, as behaviour exhibits relatively equal levels of variance across the three predictor variables.

### **8.9.1.6 Internal Reliability of the Behavioural Measures**

The four items included to measure reported behaviour in the four week follow-up survey were tested for internal reliability. Two items measure the moderate exercise behaviour of the target population and two items measure their vigorous exercise behaviour in the four weeks immediately after administration of the main survey. The items exhibit satisfactory internal reliability of .920.

## **8.10 Testing Research Proposition 7**

Research Proposition 7 and two associated hypotheses have been formulated to analyse differences in the relationship between summated beliefs and reported behaviour.

**Research Proposition 7: The summated behavioural and control belief indices will correlate strongly with reported behaviour, while the correlation between reported behaviour and normative belief indices will be of lesser magnitude.**

#### **8.10.1 Assessing the Relationship between the Summated Belief Indices and Reported Behaviour**

Two hypotheses test this proposition for the overall sample and for each of the identified segments and these will be examined in tandem. A Pearson correlation analysis was conducted to establish the nature of these relationships.

**Hypothesis 7a:** The summated belief indices for behavioural and control beliefs will illustrate a highly significant correlation with reported behaviour for the overall sample, while the correlation between behaviour and normative belief indices in this context will be of lesser magnitude.

**Hypothesis 7b:** The summated belief indices for behavioural and control beliefs will illustrate a highly significant correlation with reported behaviour for each segment, while the correlation between behaviour and normative belief indices in this context will be of lesser magnitude.

Before examining the output of the correlation analysis, it is instructive to illustrate the summated belief means for the overall sample and each of the four segments – see Table 8.26.

**Table 8.26: Summated Belief Means for Overall Sample and the Four Segments<sup>75</sup>**

		Summated Behavioural Beliefs	Summated Normative Beliefs	Summated Control Beliefs
<b>Overall Sample</b>	Mean	26.69	18.33	21.31
	Std. Deviation	6.69	10.86	8.51
	N	479	470	472
<b>The Enthusiast</b>	Mean	30.65	21.45	22.28
	Std. Deviation	5.67	10.62	8.84
	N	138	136	136
<b>Social Competitor</b>	Mean	28.78	22.24	20.23
	Std. Deviation	5.86	11.66	8.70
	N	111	108	109
<b>Healthy Looker</b>	Mean	24.41	15.40	21.76
	Std. Deviation	4.99	9.67	7.89
	N	142	139	139
<b>Reluctant Exerciser</b>	Mean	21.53	13.28	20.41
	Std. Deviation	6.75	8.54	8.62
	N	88	87	88

The correlations for each of the belief indices with reported exercise behaviour are highly significant, and of moderate magnitude for the overall sample. The belief indices for the behavioural and normative beliefs both exhibit highly significantly positive relationships, both of which are of moderate magnitude<sup>76</sup> (Behavioural Beliefs .442; Normative Beliefs .307). The summated Control Beliefs (-.242) illustrate a highly significant negative relationship of moderate magnitude with exercise behaviour – see Table 8.27. These findings afford moderate support to the hypothesis and lead to a rejection of the null hypothesis.

<sup>75</sup> The mean scores for each of the summated beliefs are the product of all the individual belief items, divided by the number of variables represented in each summated construct.

<sup>76</sup> Measures for assessing the strength of correlation relationships taken from Field (2009).

**Table 8.27: Relationship of Summated Belief Means with Reported Exercise Behaviour**

	Relationship		Pearson Correlation	Sig. (1 tailed)	Number
Overall Sample	Summated Behavioural Beliefs	Exercise Behaviour	.442	.000	470
	Summated Normative Beliefs		.307	.000	470
	Summated Control Beliefs		-.242	.000	470
The Enthusiast	Summated Behavioural Beliefs		.406	.000	136
	Summated Normative Beliefs		.203	.018	136
	Summated Control Beliefs		-.232	.007	136
Social Competitor	Summated Behavioural Beliefs		.322	.001	108
	Summated Normative Beliefs		.328	.001	108
	Summated Control Beliefs		-.199	.039	108
Healthy Looker	Summated Behavioural Beliefs		.213	.012	139
	Summated Normative Beliefs		.110	.197	139
	Summated Control Beliefs		-.321	.000	139
Reluctant Exerciser	Summated Behavioural Beliefs	.310	.003	87	
	Summated Normative Beliefs	.190	.078	87	
	Summated Control Beliefs	-.365	.001	87	

Correlations that are significant at  $p < .05$  are depicted in green text

Behavioural beliefs exhibit similar levels of high significance across segments. The relationships are all of medium scope and positively correlated with reported exercise behaviour, with the exception of the correlation for the Healthy Looker segment which is only significant at  $p < .05$  and is representative of a small correlational effect. The strongest correlation is for The Enthusiast (.406) segment.

Normative beliefs also illustrate a highly significant and moderate magnitude relationship with behaviour for The Enthusiast (.203) and the Social Competitor (.328) segments. No significant correlation exists in this case for the Healthy Looker (.110) and Reluctant Exerciser (.190) clusters.

Control beliefs exhibit similar levels of high significance across three of the four segments. The relationships for these three segments are all of moderate scope, and negatively correlated with reported exercise behaviour. The strongest correlation is for the Reluctant Exerciser (-.365) segment. The weakest correlation is for the Social Competitor (-.199) grouping, which is only significant at  $p < .05$  level and of small magnitude.

### 8.10.2 Evaluation of Research Proposition 7

Research Proposition 7 is partially upheld.<sup>77</sup> Behavioural beliefs demonstrate highly significant ( $p < .01$ ) correlations of moderate magnitude with behaviour for the overall sample and three of the four segments. The relationship is significant ( $p < .05$ ) and of lower magnitude for the Healthy Looker segment. The results are in line with many previous studies in the exercise domain. Ajzen and Driver (1991) found that behavioural beliefs correlated strongly with the behaviour of exercise participants across a number of different exercise activities. They reasoned that the behavioural beliefs underpinned a favourable attitude toward the chosen activity and influenced participation behaviour. A similar situation emerged in the research of Marttila and Nupponen (2000). Both these studies examined regular exercisers only, so the slightly lower behavioural belief correlations in this research may be attributable to the collection of data from both regular and non-regular exercisers. The lower magnitude of the correlation for the Healthy Looker grouping could be explained by the larger proportion of females in the group. Brownson *et al.* (2001) found that females were more influenced by the potentially negative behavioural beliefs about exercise behaviour, with the effect of reducing the positivity of their attitude toward exercising. This in turn had a negative effect on their exercise adherence.

The impact of normative beliefs on behaviour is greater than expected prior to the study. The summated normative belief indices correlate in moderate magnitude and high significance with behaviour for the overall sample, The Enthusiast segment, and Social Competitor grouping. However, when taken in the context of the findings that emerged about normative beliefs in Section 8.8.2, it is perhaps understandable. Respondents with strong normative beliefs are found in considerably greater proportions in The Enthusiast and Social Competitor groupings. The role of significant others in their exercise participation is validated by the correlation analysis in this section. This outcome differs from many studies in the area, where normative beliefs have demonstrated limited or no significant impact on behaviour (Hagger, Chatzisarantis, and Biddle, 2002). Evidence of normative beliefs impacting directly on behaviour is illustrated to a reasonable degree in

---

<sup>77</sup> Research Proposition 7: The summated behavioural and control belief indices will correlate strongly with reported behaviour, while the correlation between reported behaviour and normative belief indices will be of lesser magnitude.

Ajzen and Driver's (1991) study, but this is more the exception than the rule. The correlation is particularly significant for the Social Competitor segment, for which normative beliefs have a higher correlation with behaviour than is the case for behavioural beliefs. This is quite unusual and reinforces the findings of earlier sections where the key role of significant others for this segment is outlined. The relationship is not significant for the Healthy Looker and Reluctant Exerciser groups. While this is in keeping with the bulk of the literature, it may also be a reflection of the larger older, female, and recently non-regular exerciser representation in these segments.

The influence of control beliefs on behaviour is largely as expected. The correlations for the overall sample and three of the four segments are highly significant and of moderate magnitude, the Social Competitor segment being the exception with no significant correlation. All correlations are of negative orientation, which is in line with previous studies which consistently illustrate the negative impact of controlling factors on exercise behaviour (Hagger, Chatzisarantis, and Biddle, 2002). The strongest correlation for control beliefs is with the behaviour of the Reluctant Exerciser grouping, followed by the Healthy Lookers. Given the weak regular exercise adherence data of both these groups, it is reasonable to speculate that control beliefs impact significantly on the behaviour of the two segments.

A synopsis of the outcomes for the research propositions and hypotheses addressing the proposed segmentation process is illustrated in Table 8.28:

**Table 8.28: Synopsis of Research Propositions**

Research Proposition	Hypothesis	Analysis Employed	Outcome
<p><b>RP 1:</b> The exercise behaviour of the population of an Irish tertiary level educational institute will contain segments that are clearly differentiable on the basis of participant motivation</p>	<p><b>Hyp 1a:</b> The chosen exercise participation market will be viably segmented using the nine motivational constructs derived from the Exercise Motivations Inventory 2 (EMI-2) scale as the key base for segmentation .</p>	<p>Principal Components Analysis to reduce variables. Two-step Cluster Analysis to identify segments.</p>	<p>Reasonably strong support for Hyp 1a with the EMI-2 emerging as a viable basis for segmentation, although some stability and validity issues arise in this instance. Strong support for Hyp 1b as a quite distinct motivational profile emerges for each segment. Overall RP 1 receives considerable backing.</p>
	<p><b>Hyp 1b:</b> Each identified segment will exhibit a distinctly different motivational profile</p>	<p>One-way ANOVA</p>	
<p><b>RP 2:</b> Profiling of the identified segments will be enhanced by identifying differences in gender composition and outlook</p>	<p><b>Hyp 2a:</b> The gender composition will vary significantly between each segment and the overall sample</p>	<p>Chi-Square Analysis</p>	<p>Strong backing for all three hypotheses and RP 2, confirming differences in gender profiles across segments and varying motivational evaluations between males and females. This serves to enrich segment descriptions.</p>
	<p><b>Hyp 2b:</b> The gender composition will vary significantly across segments.</p>	<p>Chi-Square Analysis</p>	
<p><b>RP 3:</b> Profiling of the identified segments will be enhanced by identifying differences in age group composition and outlook</p>	<p><b>Hyp 3a:</b> The age group composition will vary significantly between each segment and the overall sample</p>	<p>Chi-Square Analysis</p>	<p>Partial support for RP 3 with varying degrees of differentiation in age profile across segments. Variation in motivational evaluations between age groupings is quite strong.</p>
	<p><b>Hyp 3b:</b> The age group composition will vary significantly across segments</p>	<p>Chi-Square Analysis</p>	
<p><b>RP 4:</b> Profiling of the identified segments will be enhanced by identifying differences in recent exercise status composition and outlook</p>	<p><b>Hyp 4a:</b> The recent exercise status composition will vary significantly between each segment and the overall sample</p>	<p>Chi-Square Analysis</p>	<p>Very strong support for all hypotheses and RP 4. Differences in recent exercise profile across segments and varying motivational evaluations between regular and non-regular exercisers enhance segment profiling.</p>
	<p><b>Hyp 4b:</b> The recent exercise status composition will vary significantly across segments</p>	<p>Chi-Square Analysis</p>	
<p><b>RP 5:</b> The identified segments will exhibit within-segment differentiation in motivational profiles, on the basis of age, gender, and recent exercise status</p>	<p><b>Hyp 5a:</b> Significant differences in motivation will emerge between the two age groups within each segment</p>	<p>Independent Samples T-Test</p>	<p>Varying degrees of support for the hypotheses, ranging from c.25% of motivational constructs exhibiting within heterogeneity based on age, to c.35% based on gender, to c.45% based on recent exercise status. Therefore RP 5 is only partially supported, although the differences highlighted find considerable backing in the literature.</p>
	<p><b>Hyp 5b:</b> Significant differences in motivation will emerge between males and females within each segment</p>	<p>Independent Samples T-Test</p>	
	<p><b>Hyp 5c:</b> Significant differences in motivation will emerge between regular and non-regular exercisers within each segment</p>	<p>Independent Samples T-Test</p>	
<p><b>RP 6:</b> The elicited underlying individual belief components of the theory of planned behaviour will illustrate differentiation across segments</p>	<p><b>Hyp 6a:</b> Significant differences will emerge in the elicited behavioural beliefs across the identified segments</p>	<p>One-way ANOVA</p>	<p>Partial support for RP 6. Behavioural and normative beliefs illustrate quite strong levels of differentiation across segments. However, control beliefs exhibit minimal variation in this regard.</p>
	<p><b>Hyp 6b:</b> Significant differences will emerge in the elicited normative beliefs across the identified segments</p>	<p>One-way ANOVA</p>	
	<p><b>Hyp 6c:</b> Significant differences will emerge in the elicited control beliefs across the identified segments</p>	<p>One-way ANOVA</p>	
<p><b>RP 7:</b> The summated behavioural and control belief indices will correlate strongly with reported behaviour, while the correlation between reported behaviour and normative belief indices will be of lesser magnitude</p>	<p><b>Hyp 7a:</b> The summated belief indices for behavioural and control beliefs will illustrate a highly significant correlation with reported behaviour for the overall sample, while the correlation between behaviour and normative belief indices in this context will be of lesser magnitude</p>	<p>Pearson Correlation</p>	<p>RP 7 receives partial support. Both behavioural and control beliefs correlate as anticipated with reported behaviour. However the relationship between summated normative and reported behaviour is much stronger than expected.</p>
	<p><b>Hyp 7b:</b> The summated belief indices for behavioural and control beliefs will illustrate a highly significant correlation with reported behaviour for each segment, while the correlation between behaviour and normative belief indices in this context will be of lesser magnitude</p>	<p>Pearson Correlation</p>	

## 8.11 Chapter Summary

This chapter evaluated the process that has been employed in analysing the findings of the main survey instrument and analysed the findings of the survey and the four week behavioural follow-up instrument. The findings can be divided into five categories.

Category 1 propositions examined the process of identifying the segments. Research Proposition 1 contended that the market can be viably segmented using the EMI-2 scale and that a differentiated motivational segmentation outcome would be illustrated. Strong support for this proposition is exhibited. The second category of propositions initiates the procedure of adding a richer description to the identified motivational segments. The age, gender, and recent exercise behaviour composition and motivational orientation of the segments are evaluated by Research Propositions 2-4. The hypotheses relating to gender and recent exercise status receive strong support, while the age related proposition obtains only partial support.

The category 3 proposition tested for within-segment differences in motivation, based on segment members' age, gender, and recent exercise status. Partial support is illustrated for this research proposition. The fourth category examines the value of the elicited TPB beliefs in identifying differentiation between segments. Behavioural and normative beliefs differentiate significantly across segments. However, control beliefs exhibit disappointing levels of differentiation, so Research Proposition 6 is only partially supported.

Relationships between the summated TPB beliefs and reported behaviour for the four weeks post-administration of the main survey are examined in the final proposition category. Research Proposition 7 is partially upheld, with summated behavioural and control beliefs correlating significantly with behaviour in the majority of instances. However, the summated normative belief index correlates with reported behaviour in a stronger manner than expected. Although this doesn't uphold the proposition, it contributes to an increased segment profile differentiation.

Promising outcomes have been revealed in the testing of the research propositions, with strong support for the findings emerging from the literature. Chapter 9 evaluates the veracity of the segmentation identification and profiling process in more detail.

# **Chapter 9. Evaluation of the Segmentation Process and Thesis Conclusion**

"At mile 20, I thought I was dead. At mile 22, I wished I was dead. At mile 24, I knew I was dead. At mile 26.2, I realised I had become too tough to kill"

Source Unknown.

## **9.1 Chapter Overview**

Chapter 9 evaluates the worth of the segmentation and profiling process that was enacted to, firstly use descriptive motives as the key basis for segmenting the chosen exercise market, and secondly profile the identified segments using the most salient ‘other’ correlates of the market’s exercise behaviour. Creating a segmentation process that integrates the salient correlates of behaviour for exercise participants is the core research objective, and it is tested through seven research propositions. Section 9.2 draws conclusions about the effectiveness of this process, before the discussion progresses to examining the detailed and differentiated profiles of the four-segment solution in Section 9.3. It is reasoned that both the segment outcome, and the procedure put in place to ascertain the detailed description of each segment, will be of considerable interest to practitioners and policy-makers in the exercise domain. This is discussed in Section 9.4. The process and scales employed afford uniqueness to this study, and the contribution of the research to the body of knowledge is outlined in Section 9.5. Limitations of the research are highlighted in Section 9.6, before recommendations for future research that emanate from the study are illustrated in Section 9.7.

## **9.2 Evaluation of the Segmentation and Profiling Process**

The segmentation and profiling process, which was outlined in Section 5.8 and Figure 5.1, is evaluated in this section. Each of the seven research propositions and their associated hypotheses are assessed sequentially, before a concluding process diagram is outlined.

### **9.2.1 Evaluation of the Segment Identification Process**

Research Proposition 1 sets out that the chosen market contains segments that are clearly differentiable on the basis of participant motivation. The EMI-2 is the chosen basis for segmentation and two hypotheses are tested. The first hypothesis establishes the efficacy of this scale as a basis for segmentation. Requirements for segment viability that are outlined by Hair *et al.* (2010) are largely upheld, with strong predictive validity being ascertained, reasonable segment stability illustrated, and a quite differentiated and practically relevant motivational profile emerging for each segment.

A factor-cluster approach was employed to reduce the 51 point EMI-2 scale to more manageable proportions, and to ensure that only the most relevant variables in the context of this study were included in the segmentation procedure. There is considerable debate in the literature (Dolnicar, 2003; Dolnicar and Grun, 2009), about the shortcomings of adopting a factor-cluster approach to segmentation, particularly relating to the loss of information resulting from elimination and/or factoring of variables. However, the author feels that the approach is justified in this context, as using an unadjusted 51 variable EMI-2 would necessitate an unachievable sample size<sup>78</sup> and also have collinearity problems inherent in the data with so many variables involved. Simplifications are essential to facilitate policy maker's comprehension of the issues. The segmentation procedure employed using the reduced EMI-2 constructs illustrates reasonably strong viability. Differentiation in motivational constructs across segments, which was tested using the second hypothesis, is quite pronounced and presents a segment outcome that is of considerable practical significance. Other tests of segment viability (segment validity and segment stability) illustrated more ambiguous outcomes. The criterion validity test exhibits strong support for the process and outcome, as do a number of the other validity and stability tests. However, some issues emerge regarding the split-half test of segment stability and the silhouette measure of cohesion and separation.

Mooi and Sarstedt (2011) highlight the importance of segments exhibiting significantly different means for the selected variables, to determine whether the segments are conceptually distinguishable. The employment of the factor reduced EMI-2 constructs as the specific segmentation bases illustrates considerable promise, as a distinct and practically relevant segmentation solution emerges. Furthermore, the extracted segments align quite closely with clusters that were identified in previous studies that used self-determination constructs as the segmentation basis. This similarity in motivational orientation provides further affirmation of the partial theoretical underpinning of the EMI-2 constructs. Overall, the segment identification process using the factor-adjusted EMI-2 constructs exhibits a very promising outcome, notwithstanding the concerns raised about loss of information and the problems with elements of the stability and validity tests.

---

<sup>78</sup> Using Formann's (1984) guide to sample size requirements for segmentation studies:  $2^v$  where  $v$  is the number of variables being included in the clustering procedure.

### 9.2.2 Evaluation of the Segment Profiling Process

Research Propositions 2 to 4 initiate the procedure of adding a richer description to the identified motivational segments. These propositions, and associated hypotheses, test the influence of the gender, age, and recent exercise behaviour of individuals on the segments. Strong support emerges for the profiling worth of gender (see Section 8.3), as the gender composition of each segment is significantly different than the overall sample and exhibits notable differences across segments in the majority of instances. Females are represented in significantly greater proportions in the Healthy Looker and Reluctant Exerciser segments, which are also the segments with the lowest rates of exercise adherence. The outcome reflects a trend evident in many previous studies in the domain, where females have consistently illustrated lower rates of exercise adherence (e.g., Hallal *et al.*, 2012; Irish Sports Council, 2012). However, the non-regular engagement rate for females in this study is notably high, a finding which necessitates further enquiry as to what barriers are preventing exercise participation amongst the female cohort in the targeted population

Support for age as a profiling agent is not as strong (see Section 8.4). Age category composition is significantly different than the overall sample for only two of the four segments, with a similarly indifferent illustration of significant differences in age profile across segments. This is not entirely consistent with the general consensus in the literature, where age is regularly illustrated as a correlate of exercise motivation and behaviour (e.g., Burton, Shapiro, and German, 1999; Irish Sports Council, 2012). A couple of possible explanations for these findings emerge. Firstly, the chosen age categories are represented in quite radically different proportions: 82% aged between 18-24 *versus* 18% aged 25 or more. This would be typical of the age profile of the targeted tertiary student audience, but a more balanced division between age categories may reveal an increased differentiation in the profiling outcome. Secondly, *circa* 94% of the respondents are aged between 18 and 30 and perhaps there is just not enough of a differential in age composition for significant differences in behaviour based on age to emerge. However, the differentiation in motivational construct evaluations between age categories is significant in many cases. Six of the nine motivational constructs illustrate significant variation between the age groups. Motives that differentiate the younger grouping: interpersonal, strength, and social; collate well with the findings of previous

research (e.g., Quindry *et al.*, 2011). Stress management, health enhancement, and health pressures motives emerge as significant differentiators for the older cohort in this study and this again finds some support in the literature (Beck *et al.*, 2010). Overall, age presents as a reasonable profiling device for this study's cohort, but the lack of differentiation in age composition necessitates further testing before the author can be definitive about its profiling worth.

Strong support also surfaces for the profiling capability of recent exercise status (see Section 8.5). The recent exercise status composition of each segment is significantly different than the overall sample and exhibits considerable differences across segments in many cases. There are significantly more regular exercisers in The Enthusiast and Social Competitor groupings, which contain the highest ratio of males and younger members in the Social Competitors case. This reinforces extant literature that male college students have significantly higher rates of regular physical activity (Kilpatrick, Hebert, and Bartholomew, 2005) and where higher levels of exercising are demonstrated amongst younger people (Booth *et al.*, 2000; Irish Sports Council, 2012). Additionally, the differentiation in motivational construct evaluations between genders is significant in the majority of instances. These findings are supported in the literature, where past and proximal exercise behaviour is frequently considered to be a significant correlate of exercise motivation and behaviour (Trost *et al.*, 2002; Norman, Conner, and Bell, 2000)

The literature illustrates that segmentation outcomes are normally not close to being perfect and varying degrees of remaining within-segment heterogeneity exist (Franke, Reisinger, and Hoppe, 2009). This research does not endeavour to scientifically measure the extent of heterogeneity within clusters. Instead, it focuses on the profiling benefits that can be garnered from within-segment differences in motivation, based on segment members' gender, age, and recent exercise status (see Section 8.6). Research Proposition 5 receives partial support; with within-segment heterogeneity based on age profile being exhibited for 25% of motivational constructs; within-segment heterogeneity based on recent exercise status profile being illustrated for 35% of motivational constructs; and within-segment heterogeneity based on gender profile being demonstrated for 45% of motivational constructs. Although the extent of within-segment heterogeneity for the motivational constructs is not quite as pronounced as

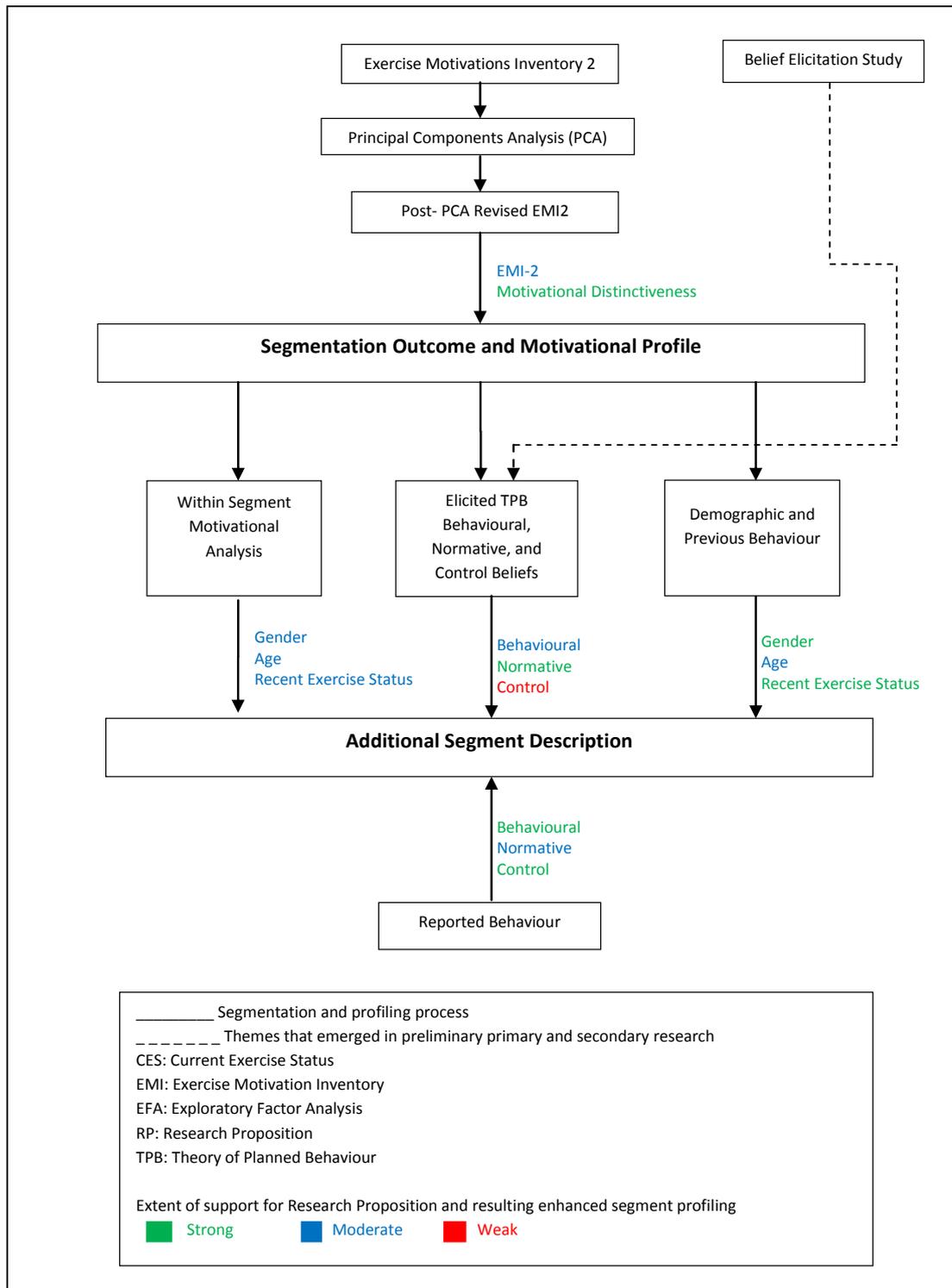
expected, the testing of the three hypotheses still reveals some informative findings that can further aid the understanding of the target population, and consequently facilitate more differentiated exercise interventions.

The TPB was selected as the mechanism for capturing other key correlates of exercise behaviour. Research Proposition 6 examined the differentiating properties of the elicited individual TPB beliefs across segments. The trend in the analyses relating to the TPB beliefs is relatively clear-cut. The elicited behavioural and normative beliefs exhibit significant differentiation across segments in the majority of instances (see Section 8.8). This variation is expected in light of previous research that has illustrated differences in beliefs across groupings (e.g., Ajzen and Driver, 1991). The two segments with the highest rates of exercise adherence, The Enthusiasts and Social Competitors, also illustrate the most positive attitude and perception of the constructive influence of significant others on their exercise behaviour. Findings of this nature have been demonstrated in the literature to be consistent with greater exercise adherence (e.g., Hagger, Chatzisarantis, and Biddle, 2002). Surprisingly, control beliefs exhibit minimal differentiation in the tests. This lack of differentiation across segments in control beliefs is problematic, as previous research and the discussion group consensus, indicate that groups/individuals with lower recent exercise adherence rates would illustrate significantly stronger control over their behaviour. There is no obvious explanation for this discrepancy.

Relationships between the summated TPB beliefs and reported exercise behaviour for the four weeks post main survey administration were assessed in Research Proposition 7. The result of the correlation analyses testing this proposition provides a reasonably differentiated outcome. Summated behavioural and control belief correlations exhibit differences across segments in line with expectations. Behavioural beliefs for all segments demonstrate significant positive correlations with reported behaviour. All the control belief correlations are of negative orientation, which is in line with previous studies that consistently illustrate the negative impact of controlling factors on exercise behaviour (Hagger, Chatzisarantis, and Biddle, 2002). The significant impact of summated normative beliefs on behaviour is greater than expected prior to the study, although given the strength of individual normative beliefs illustrated in other tests it is perhaps understandable.

It is reasonable to assert that the core objective of this research – creating a market segmentation process that integrates the salient correlates of behaviour of exercise participants – has been achieved to a large extent. The majority of the research propositions receive at least reasonably strong support and it is postulated that these propositions enhance the richness of the understanding and description of the identified segments. The outcome for two of the research propositions and elements of some hypotheses exhibit ambiguity in this regard and require further testing before they could be definitively said to enhance segment profiling. A revised segmentation process diagram is outlined in Figure 9.1. This process diagram is colour coded based on the outcome of the seven research hypotheses, with distinction being drawn between those propositions that gained strong support and thus enhanced segment profiling, and those that received moderate or weak support and cannot definitively be included as segment descriptors.

**Figure 9.1: Revision of Proposed Segmentation Process**



### 9.3 Four-Segment Outcome Integrating Multiple Exercise Correlate Profiling

The examination of the outlined research propositions and hypotheses is a central tenet of the review of the proposed segmentation process. However, enhancing the profiling and understanding of the identified segments is a consistent theme that pervades all the

analysis. An illustration and synopsis of the key descriptive profiling findings for each of the four segments is outlined in the next four sub-sections.

### 9.3.1 The Enthusiast Segment

A descriptive profile of The Enthusiast segment is presented in Table 9.1:

**Table 9.1: Descriptive Profile of The Enthusiast Segment**

<b>Summary Statistics</b>	54% Male; 80% 18-24; 65% Regular Exercisers	46% Female; 20% 25 or more; 35% Non-Regular Exercisers
<b>Motivational Differentiators</b>	<b>Positive:</b> Enjoyment; Flexibility; Strength; Stress Management; Health Enhancement; Interpersonal; Aesthetic; Health Pressures; Social	<b>Negative:</b> None
<b>Gender Differentiation</b>	Not significantly different than the Overall Sample Significantly more males than Healthy Looker/Reluctant Exerciser segments, significantly less males than Social Competitor segment.	
<b>Age Differentiation</b>	Not significantly different than the Overall Sample Significantly more older members than the Social Competitor segment. No significant differences in age profile when compared to Healthy Looker and Reluctant Exerciser segments.	
<b>Recent Exercise Status Differentiation</b>	Significantly more regular exercisers than the Overall Sample Significantly more regular exercisers than Healthy Looker/Reluctant Exerciser segments. No significant difference in recent exercise behaviour profile when compared to the Social Competitor segment.	
<b>Within Segment Differences in Motivational Profile by Gender</b>	<b>Male:</b> Strength; Interpersonal	<b>Female:</b> Aesthetic; Stress Management; Health Pressures
<b>Within Segment Differences in Motivational Profile by Age</b>	<b>24 or less:</b> Social; Interpersonal	<b>25 or more:</b> Stress Management; Health Enhancement
<b>Within Segment Differences in Motivational Profile by Recent Exercise Status</b>	<b>Regular:</b> Enjoyment; Interpersonal	<b>Non-Regular:</b> Aesthetic; Health Pressures
<b>Significant Behavioural Beliefs for Full Segment Population</b>	<b>Positive:</b> Stress Relief; Appearance; Health and Fitness; Feeling Energised; Feeling Good; Time Consuming; Poor Weather; Dedication	<b>Negative:</b> Affiliation
<b>Significant Normative Beliefs for Full Segment Population</b>	<b>Positive:</b> Coaches; Friends, Exercise Partners	<b>Negative:</b> None
<b>Significant Control Beliefs for Full Segment Population</b>	<b>Positive:</b> Other Leisure Activities	<b>Negative:</b> None
<b>Significant Correlation With Reported Behaviour</b>	Summated Behavioural Beliefs .406 Summated Control Beliefs -.232 Summated Normative Beliefs .203	

The Enthusiast segment has the highest rate of exercise adherence. The segment is differentiated on all nine motivational constructs, with enjoyment and fitness oriented motives emerging as especially important.

The segment exhibits the most positive attitude across the majority of behavioural beliefs. The importance of this is underscored by the summated belief scale exhibiting the strongest correlation with reported behaviour. Highest rated behavioural beliefs relate to the likelihood of fun/enjoyment and health/wellness being an outcome of regular exercise. This reflects a segment membership that are intrinsically motivated

and self-determined in their exercise behaviour. The normative belief profile indicates that segment members enjoy the support of significant others in their exercising. The support of coaches and exercise partners is especially prominent. The summated normative beliefs correlate significantly with reported behaviour, but do not offer significant explanation of variation in behaviour. Control beliefs are not especially differentiated from other segments. Perceptions of not being as constrained by the effort required for regular exercise is backed up by the high rate of regular exercise adherence. Studies and other leisure activities appear on ratings to be potentially constraining factors on segment members' exercise behaviours. However, this is not illustrated in the findings relating to previous exercise (*circa* 65%). The summated control beliefs illustrate a significant negative correlation of modest magnitude with behaviour.

Gender breakdown within the segment is similar to the overall study population 54% male and 46% female, although there are significantly more males in the cluster than is the case for the Healthy Looker and Reluctant Exerciser segments, while the Social Competitor group contains significantly more males. Males within the group are distinguished by their strength and interpersonal motives, while the female cohort is differentiated by aesthetic, stress management, and health pressures motives.

Age composition in the segment is also similar to the overall population of the study with 80% of the segment members aged 18-24 and 20% aged 25 or more, although there are significantly more younger members in the cluster than in the Social Competitor segment. Younger members of the segment are also distinguished by their enjoyment and interpersonal motives. The older grouping is differentiated by significantly stronger stress management and health enhancement motivations.

Recent exercise status breakdown illustrates that the segment has a substantially greater proportion of regular exercisers than the overall sample and the Healthy Looker and Reluctant Exerciser clusters. Regular exercisers in the segment are differentiated by their enjoyment and interpersonal motives. The non-regular grouping is differentiated by significantly stronger aesthetic and health pressures motivations.

### **9.3.2 Social Competitor Segment**

A descriptive profile of the Social Competitor segment is presented in Table 9.2:

**Table 9.2: Descriptive Profile of the Social Competitor Segment**

<b>Summary Statistics</b>	80% Male; 92% 18-24; 71% Regular Exercisers	20% Female; 8% 25 or more; 29% Non-Regular Exercisers
<b>Motivational Differentiators</b>	<b>Positive:</b> Interpersonal; Social; Enjoyment; Strength	<b>Negative:</b> Aesthetic; Health Pressures; Health Enhancement; Stress Management
<b>Gender Differentiation</b>	Significantly more males than the Overall Sample Significantly more males than The Enthusiast/Healthy Looker/Reluctant Exerciser segments	
<b>Age Differentiation</b>	Significantly more younger members than the Overall Sample Significantly more younger members than The Enthusiast/Healthy Looker/Reluctant Exerciser segments	
<b>Recent Exercise Status Differentiation</b>	Significantly more regular exercisers than the Overall Sample Significantly more regular exercisers than Healthy Looker/Reluctant Exerciser segments	
<b>Within Segment Differences in Motivational Profile by Gender</b>	<b>Male:</b> Strength	<b>Female:</b> Stress Management; Social
<b>Within Segment Differences in Motivational Profile by Age</b>	<b>24 or less:</b> Social, Interpersonal	<b>25 or more:</b> Enjoyment
<b>Within Segment Differences in Motivational Profile by Recent Exercise Status</b>	<b>Regular:</b> Aesthetic; Strength; Interpersonal	<b>Non-Regular:</b> Health Enhancement
<b>Significant Behavioural Beliefs for Full Segment Population</b>	<b>Positive:</b> Affiliation; Success; Social Interaction; Fun and Enjoyment; Time; Poor Weather; Dedication	<b>Negative:</b> Cost
<b>Significant Normative Beliefs for Full Segment Population</b>	<b>Positive:</b> Coaches; Friends, Exercise Partners	<b>Negative:</b> None
<b>Significant Control Beliefs for Full Segment Population</b>	<b>Positive:</b> Effort	<b>Negative:</b> None
<b>Significant Correlation With Reported Behaviour</b>	Summated Normative Beliefs .328 Summated Behavioural Beliefs .322	

The Social Competitor segment also has a high rate of exercise adherence and possesses a distinct motivational profile. Interpersonal, social, enjoyment, and strength motives distinguish this cohort. Interpersonal and social motives are especially important. Interpersonal motives relate to the individuals' desire for competition and challenge, while social motives concern the potential for social interface through exercise. Segment members exhibit significantly below average motivations for aesthetic, health enhancement, health pressures, and stress management motives.

Motivational findings are broadly reinforced by the behavioural beliefs for the Social Competitor cluster. A more positive attitude about the likelihood and importance of success, and feelings of team affiliation being the outcome of regular exercise, differentiates the group from Healthy Lookers and Reluctant Exercisers. The positive belief relating to the social interaction benefits of regular exercise distinguishes the segment from the other three groupings. Segment members also illustrate a significantly more positive attitude relating to the time and dedication needed to exercise and their willingness to endure poor weather during exercising. Normative beliefs of this

grouping are strong, reflective of a cohort that both desire and receive strong social support for their exercise behaviour, although family influence does not exhibit any significant difference. Coach and exercise partner support is again particularly important. The strength of the segments' normative beliefs is confirmed by the summated normative belief scale exhibiting the strongest of the three summated scale correlations with reported behaviour. This group are the least constrained by the effort needed for regular exercise, which is reflected in strong adherence rates. The summated control belief scale has the weakest negative correlation with reported behaviour, a finding that is again consistent with the strong exercise participation rates of this group.

The segment is also characterised by having higher proportions of male and younger members than the overall sample and all three of the other segments, and significantly more regular exercisers than the overall sample, Healthy Looker, and Reluctant Exerciser groups. Males within the group are distinguished by the extent of their strength related motives. Females are differentiated by social and stress management motives.

Younger members of the segment are distinguished by the strength of their social and interpersonal motives, while they attach greater importance to their beliefs concerning the success, affiliation and social interaction benefits of exercising. They illustrate a significantly more positive attitude about the dedication needed for regular exercise. Additionally, younger members are notably more positive in their assessment of the role of all four normative referent groups. The older grouping is differentiated by their notably stronger enjoyment motives.

Regular exercisers in the segment are distinguished by their interpersonal, health enhancement, strength, and aesthetic motives; while they attach greater importance to a number of behavioural beliefs: the success, affiliation, social interaction benefits of exercising and their willingness to be dedicated enough to regularly exercise. They are notably more positive in their assessment of the role of coaches and exercise partners in their exercising. Additionally, their exercising is also significantly less constrained by effort needed to exercise regularly and the affordability of the activity. The non-regular grouping is differentiated by significantly stronger health enhancement motives.

### 9.3.3 Healthy Looker Segment

The profile for the Healthy Looker segment is presented in Table 9.3.

**Table 9.3: Descriptive Profile of the Healthy Looker Segment**

<b>Summary Statistics</b>	44% Male; 76% 18-24; 42% Regular Exercisers	56% Female; 24% 25 or more; 58% Non-Regular Exercisers
<b>Motivational Differentiators</b>	<b>Positive:</b> Aesthetic; Health Enhancement	<b>Negative:</b> Interpersonal; Social; Enjoyment; Strength
<b>Gender Differentiation</b>	Significantly more females than the Overall Sample Significantly more females than The Enthusiast and the Social Competitor segments. No significant In gender profile comparison with Reluctant Exerciser segment	
<b>Age Differentiation</b>	Significantly more older members than Overall Sample Significantly more older members than the Social Competitor segment. No significant difference in age profile when compared to The Enthusiast and Reluctant Exerciser segments.	
<b>Recent Exercise Status Differentiation</b>	Significantly more non-regular exercisers than the Overall Sample Significantly more non-regular exercisers than The Enthusiast and Social Competitor segments. No significant difference in recent exercise behaviour profile when compared to the Reluctant Exerciser segment.	
<b>Within Segment Differences in Motivational Profile by Gender</b>	<b>Male:</b> Strength; Health Pressures; Interpersonal	<b>Female:</b> Aesthetic
<b>Within Segment Differences in Motivational Profile by Age</b>	<b>24 or less:</b> Social, Interpersonal	<b>25 or more:</b> Stress Management; Health Enhancement
<b>Within Segment Differences in Motivational Profile by Recent Exercise Status</b>	<b>Regular:</b> Enjoyment	<b>Non-Regular:</b> Aesthetic
<b>Significant Behavioural Beliefs for Full Segment Population</b>	<b>Positive:</b> Appearance	<b>Negative:</b> Affiliation; Social Interaction; Time Required; Poor Weather; Dedication
<b>Significant Normative Beliefs for Full Segment Population</b>	<b>Positive:</b> Family	<b>Negative:</b> Friends; Coaches; Exercise Partners
<b>Significant Control Beliefs for Full Segment Population</b>	<b>Positive:</b> None	<b>Negative:</b> Effort
<b>Significant Correlation With Reported Behaviour</b>	Summated Control Beliefs -.321 Summated Behavioural Beliefs .213	

The Healthy Looker segment has lower regular exercise adherence rates (42% regular participants). It illustrates a distinctive motivational profile, with aesthetic and health oriented motives being particularly important to this grouping. The behavioural belief relating to the appearance benefits of exercising contributes in a significant and positive manner to their attitude. Family members are perceived to lend strong social support to their exercise activities. A number of motivations and beliefs distinguish the segment in a negative sense. Interpersonal motives emerge as substantially below average, while ratings for enjoyment, social, and strength drivers are also weak. Segment members' attitudes toward exercise are negatively affected by low evaluation of the affiliation and social interaction benefits of exercising. Additionally, their willingness to give the requisite time and dedication to exercise and exercise in poor weather is significantly below average. The strength of some negative behavioural beliefs is significant. Lower adherence rates within this segment may be a reflection of these negative perceptions,

with the summated behavioural beliefs illustrating a moderate significant relationship with behaviour. Segment members' weaker evaluations of the support offered by friends, coaches, and exercise partners is also a distinguishing feature, while the effort needed to exercise emerges as a significant controlling factor. Summated control beliefs present as the most significant correlation influence on reported behaviour.

The segment is also characterised by having higher proportions of female members than the overall sample and The Enthusiast and Social Competitor segments. Older members are represented in greater proportions than in the overall sample and Social Competitor cluster. There are significantly more non-regular exercisers than is the case for the overall sample and The Enthusiast and Social Competitor segments. Males within the group are distinguished by the extent of their interpersonal, health pressures, and strength-related motives. Females in the segment are differentiated by aesthetic motives. Younger members of the segment are distinguished by the strength of their social and interpersonal motives. The older grouping is differentiated by their notably stronger stress management and health enhancement motives. Regular exercisers in the segment are differentiated by their enjoyment motives, while the non-regular grouping is differentiated by significantly stronger aesthetic motives.

### 9.3.4 Reluctant Exerciser Segment

A descriptive profile of the Reluctant Exerciser segment is presented in Table 9.4.

**Table 9.4: Descriptive Profile of the Reluctant Exerciser Segment**

<b>Summary Statistics</b>	42% Male; 8% 18-24; 37% Regular Exercisers	58% Female; 19% 25 or more; 63% Non-Regular Exercisers
<b>Motivational Differentiators</b>	<b>Positive:</b> None	<b>Negative:</b> Enjoyment; Interpersonal; Flexibility; Stress Management; Strength; Health Pressures; Social: Health Enhancement; Aesthetic
<b>Gender Differentiation</b>	Significantly more females than the Overall Sample Significantly more females than The Enthusiast and the Social Competitor segments. No significant in gender profile comparison with Healthy Looker segment	
<b>Age Differentiation</b>	No significant difference in age profile in comparison with the Overall Sample Significantly more older members than the Social Competitor segment. No significant difference in age profile when compared with the Healthy Looker and The Enthusiast segments.	
<b>Recent Exercise Status Differentiation</b>	Significantly more no-n-regular exercisers than the Overall Sample Significantly more no-n-regular exercisers than The Enthusiast and Social Competitor segments. No significant difference in recent exercise behaviour profile when compared to the Healthy Looker segment.	
<b>Within Segment Differences in Motivational Profile by Gender</b>	<b>Male:</b> Strength; Interpersonal	<b>Female:</b> Aesthetic; Stress Management; Health Enhancement
<b>Within Segment Differences in Motivational Profile by Age</b>	<b>24 or less:</b> Aesthetic	<b>25 or more:</b> None
<b>Within Segment Differences in Motivational Profile by Recent Exercise Status</b>	<b>Regular:</b> Enjoyment; Interpersonal	<b>Non-Regular:</b> Health Pressures
<b>Significant Behavioural Beliefs for Full Segment Population</b>	<b>Positive:</b> None	<b>Negative:</b> Success; Fun and Enjoyment; Health and Fitness; Feeling Energised; Feeling Good; Time; Poor Weather; Dedication
<b>Significant Normative Beliefs for Full Segment Population</b>	<b>Positive:</b> None	<b>Negative:</b> Coaches; Friends, Exercise Partners; Family
<b>Significant Control Beliefs for Full Segment Population</b>	<b>Positive:</b> None	<b>Negative:</b> None
<b>Significant Correlation With Reported Behaviour</b>	Summated Control Beliefs -.365 Summated Behavioural Beliefs .310	

The Reluctant Exerciser segment has the lowest motivational ratings for most constructs, as well as the lowest regular exercise adherence rates (37% regular exercisers). It is distinguished by significantly below average ratings for all nine motivational constructs, with enjoyment and interpersonal motives being particularly weak. Many of the behavioural beliefs differentiate the segment in a negative sense. Segment member's weaker evaluation of the support offered by family, friends, coaches, and exercise partners is also a distinguishing feature. Summated behavioural and control beliefs emerge as the most significant correlational influences on reported behaviour.

The segment is also characterised by having higher proportions of female members than the overall sample and The Enthusiast and Social Competitor segments. Older members are represented in greater proportions than in the Social Competitor cluster, while there are significantly more non-regular exercisers than is the case for the overall sample and The Enthusiast and Social Competitor segments. The males within the group are distinguished by the extent of their interpersonal and strength related motives. The female cohort is differentiated by health pressures motives.

Younger members of the segment are distinguished by the strength of their aesthetic motives. Regular exercisers in the segment are differentiated by their enjoyment and interpersonal motives. The non-regular grouping is differentiated by significantly stronger health pressures motives.

### **9.3.5 Summary Evaluation of the Segmentation Outcome**

Positive ratings assigned to multiple motives by **The Enthusiasts** are indicative of a cohort that affects a strong degree of self-determination over their exercise behaviour. This is consistent with the findings of Mullan and Markland (1997) who assert that individuals in the action and maintenance cohort of the stages of change for exercise are the most self-determined in their behavioural regulation. The segment exhibits the most positive attitude across the majority of behavioural beliefs. The importance of this positivity is underscored by the summated belief scale exhibiting the strongest correlation with reported behaviour. The highest-rated behavioural beliefs relate to the likelihood of fun/enjoyment and health/wellness being an outcome of regular exercise and again this reflects a segment that are intrinsically motivated and self-determined in their exercise behaviour. Additionally, the significantly higher proportion of males in this grouping is reflective of the substantially greater engagement in regular sports and exercise activities by males in the Irish populace (Irish Sports Council, 2012). The normative belief profile indicates that this segment enjoy the support of significant others and are motivated to comply with the wishes of others in relation to their exercise behaviour. This is consistent with the findings of Leslie *et al.* (1999) who found that college students reporting low levels of social support from either family or friends were considerably less likely to adhere to regular exercise. Of particular importance in this regard is the support of coaches and exercise partners, a finding that is enhanced by the fact that summated normative beliefs correlate significantly with reported behaviour.

This may appear slightly surprising, as an examination of the TPB literature illustrates that normative beliefs and the associated subjective norms have the weakest influence of the three TPB constructs (Armitage and Connor, 2001). Control beliefs are not especially differentiated from other segments. The perception of not being as constrained by the effort required for regular exercise is backed up by the high rate of regular exercise adherence. Studies and other leisure activities appear on ratings to be potentially constraining factors on segment members exercise behaviour, however this is not borne out in the findings relating to previous exercise rates (*circa* 65%). The summated control beliefs illustrate a significant negative correlation of modest magnitude with behaviour and offer the second strongest explanation of variation in behaviour, albeit in a negative manner. These findings may offer some explanation as to why such a strongly motivated cluster, with a positive attitude to exercising, still has a 35% non-regular exercise cohort.

The **Social Competitor** segment exhibits a differentiated motivational and behavioural belief profile, with interpersonal and social motives particularly important for this cohort. The segment is also characterised by having higher proportions of male, younger, and regular exerciser members. This reinforces extant literature. The younger portion of Irish adults has consistently been shown to have the highest rates of sports and exercise engagement, especially amongst males (Irish Sports Council, 2012). Gill *et al.* (1996) found that younger males have a stronger competitive orientation, while social motives were a significant motivator for females. This may indicate a potential male/female divide within the Social Competitor segment, although a within-segment analysis does not exhibit significant differences in this regard. Normative beliefs for this grouping are strong, reflective of a cohort that both desire and receive strong social support for their exercise behaviour. It reinforces the findings of Estabrooks (2000), who contend that support from key others, such as family and friends, is consistently related to increased physical activity. This support is also reflected in the strong correlation between normative beliefs and reported behaviour. The Social Competitor group are the least constrained by the effort needed for regular exercise, which is again mirrored in strong adherence rates.

The **Healthy Looker** segment also has a distinctive motivational profile, although their exercise adherence rates are considerably lower than The Enthusiast and Social

Competitor groups. Aesthetic and health oriented motives are especially significant for this cohort. The higher proportion of females in the Healthy Looker segment is consistent with the findings of Wilson *et al.*, (2002) who highlighted appearance/feeling good as being key motivators for women. Additionally, the findings reflect the consensus of health related outcomes being significant motivators for older participants (Trujillo, Brougham, and Walsh, 2004), who are represented in slightly higher proportions in this segment. Healthy Lookers hold strong behavioural beliefs about several negative aspects of exercising. The lower adherence rates of this segment may be a reflection of these, with the summated behavioural beliefs illustrating a moderate significant relationship with behaviour. The cluster also derives less support from significant others for their exercising than their contemporaries in The Enthusiast and Healthy Looker segments. Social support can contribute to higher levels of self-efficacy, which in turn can facilitate regular involvement in physical activity (Rovniak *et al.*, 2002). This allied to the contention that women appear to be more influenced in their lifestyle behaviours by those they feel are important to them (Kaplan and Hartwell, 1987), could offer some explanation of the lower exercise adherence rates of this grouping. However, this needs to be evaluated in the context of normative beliefs not correlating significantly with reported behaviour and not significantly explaining variation in behaviour for this segment. Control beliefs illustrate the strongest correlation, with a negative relationship observed with behaviour, perhaps enhancing the impact of the negative perception of the effort required for regular exercise.

**Reluctant Exercisers** have the weakest motivational outlook of all four segments. This is reflected in the lowest regular exercise adherence rates among the groupings. The behavioural belief profile of the cluster also illustrates the most negative attitude of all the segments, confirming a relatively adverse outlook regarding exercise. Below-average motivational ratings of respondents is indicative of less self-determined motivations or an amotivational outlook. This would be consistent with the literature which illustrates that individuals that exercise regularly tend to be more self-determined (Mullan and Markland, 1997). Aesthetic and health enhancement motives are highest rated by this cluster, and aesthetic motives in particular could be considered to be extrinsic and less self-determined. The grouping also contains a relatively high proportion of females. Participation rates amongst females have been traditionally lower (Sallis and Owen, 2002), a situation reinforced in the Irish context (Irish Sports Council,

2012). Previous studies highlighted that some people maintain exercise participation despite being driven by low self-determination extrinsic type motives (Frederick and Ryan, 1993), so a proportion of regular exercisers in this segment is to be expected. A similar situation to the Healthy Lookers prevails for normative beliefs, with the Reluctant Exercisers least positive in their assessment of support for regular exercising emerging from significant others. This may also contribute to the low adherence rate of all the groupings. However, as with the Healthy Lookers, the findings for normative beliefs need to be taken in the context of them not significantly correlating with behaviour. Additionally, control beliefs for this segment illustrate the strongest negative correlation with reported behaviour.

In summary, the analysis illustrates that the identified segments are conceptually sound and reveal distinct motivational profiles. The specified demographic and behavioural exercise correlates provide further differentiation between segments and add to the richness of the segment profiling. Additional correlates of exercise behaviour were captured through the TPB belief framework. The elicited TPB beliefs add to varying degrees to the profiling of the segments. The significant contribution of behavioural beliefs is reinforced by the nature of its correlation with behaviour for all segments. Normative beliefs also make a broadly positive contribution to profiling the segments, but this has to be considered in the context of them significantly correlating with behaviour for only two of the four segments. Control beliefs add to the profiling to a lesser extent. This is somewhat surprising given the significance of their influence on behaviour. A further issue that emerged in the segmentation and profiling analysis is that of within-segment heterogeneity. Cluster analysis is not a perfectly precise art and some degree of within-segment heterogeneity is to be expected. The motives and beliefs of each segment were tested for within-segment heterogeneity based on age, gender, and recent exercise status. Although the variation by age group is limited, reasonable differentiation was exhibited between males/females and regulars-non-regulars in this regard. Consequently, the within-segment analyses further embellish the profiling of each segment.

Another interesting product of the research is the close conceptual alignment of many of the EMI-2 motivational constructs and the salient TPB behavioural beliefs. This could not have been anticipated at the outset of the study, as neither the outcome of the

principal component analysis of the 51 EMI-2 variables nor the behavioural beliefs that emerged in the elicitation study were known. Members of each of the segments ascribe consistent ratings to the related concepts. This serves as a form of conceptual triangulation that adds further validity to the segmentation outcome.

#### **9.4 Value of the Research for Practitioners**

The study sets out a segmentation and profiling process that is potentially of real value to practitioners targeting exercise markets. It facilitates a rich understanding of the key drivers of the target audience's behaviour, which in turn should enable differentiated and ultimately more effective intervention strategies. It is evident from reviewing the literature and examining practical exercise interventions that in many instances exercise markets are not segmented prior to intervention, or if segmentation does take place it is frequently conducted on an *ad hoc* basis (often based on geo-demographic variables and sport/exercise types). The approach adopted in this study allows a comprehensive understanding of the salient correlates of the exercise behaviour of each extracted segment. It also enables the practitioner to understand the key correlates of exercise behaviour for both regular and non-regular exercisers and to determine key differences in drivers of behaviour between the regular and non-regular cohorts. This added comprehension of the market-place would facilitate exercise practitioners in customising their marketing offering to different segments and to those not currently regularly participating. There is significant extra value in the fact that the segmentation process developed is based on previously tested and reliable exercise motivation constructs and that the segmentation process outcome displays nomological, as well as statistical, validity.

The segments derived in this study are relevant for practitioners targeting the problematic young adult cohort, particularly as the four-segment solution reveals consumer profiles that allow the execution of differentiated marketing communications approaches. It is reasoned that the four-segment outcome of the segmentation process enacted in this study has the scope to be generalisable to the tertiary student market as a whole, including in countries other than Ireland. However, additional research is required to validate the segment outcome and its applicability to young adults in Irish and international markets.

The proposed segmentation process also has the capacity to be employed in most behavioural domains, particularly those with similar experiential contexts (e.g. leisure, tourism). Motivation is a central tenet of behaviour in multiple spheres and it is reasoned that it can be gainfully employed as the core segmentation base for a wide variety of behaviours. Similarly practitioners would be advised to assess the relative influence of demographic (e.g., age, gender) and behavioural (e.g., recent exercise behaviour) variables on their particular domain of behaviour. The TPB has illustrated its efficacy in multiple spheres, so it is reasonable to contend that the process enacted to enhance the profiling of the segments using the salient beliefs of the target audience can be replicated in other fields. Finally, validated measures of behaviour exist in most domains and integration of these as additional profiling measures would add to the understanding of the segments identified in the specified behavioural context.

### **9.5 Contribution of the Research to the Academic Body of Knowledge**

The study attempts to bridge what the author perceives as a shortcoming in the academic- and practice-based approaches to exercise engagement. The majority of exercise interventions are based on what practitioners perceive to be the most influential correlates of their target audience's behaviour. However, there is little evidence of contemporary intervention studies segmenting their target market. This study reasons that the process of operationalising an understanding of behavioural correlates, through experimental and real-life exercise interventions, needs to integrate a segmentation of the targeted market based on selected exercise correlates. Specifically, it postulates that motivation is the most appropriate base for dividing the market and that a process can be enacted to capture the salient correlates of exercise behaviour and utilise these as additional descriptors of the identified motivational segments. Engaging in this segmentation process will facilitate a thorough understanding of the diverse drivers of behaviour of the identified segments, which in turn will enable more differentiated and effective interventions. Thus, the core contribution of this research is the development of a segmentation process that integrates the multiple correlates of exercise behaviour in extracting and profiling market segments.

A number of other unique aspects of the research also contribute to the body of knowledge:

It is the first occasion that the validated and broad ranging EMI-2 instrument has been used as a basis for segmentation. This introduces a scale that contains readily actionable concepts, while being grounded to a large degree in underlying theory, into the segmentation sphere.

The use of elicited TPB beliefs to differentiate and describe the identified motivational segments is another distinctive aspect of this research. Elicited beliefs have not previously been employed in this manner. Considering the assertion that human behaviour is determined by these beliefs, the efficacy that they have illustrated as differentiated segment descriptors affirms the substance of employing this approach in future studies.

The research is also unique in an Irish context, being the first academic segmentation study of any Irish exercise market. The targeting of an audience of predominately young adults in tertiary education while not original in an international context, adds to the relatively shallow pool of segmentation research for a problematic exercise cohort.

## **9.6 Limitations of the Study**

The author has assumed sole responsibility for all aspects of this study, including the collection and analysis of the considerable volume of data. This has meant that the study is subject to the time and personal resource constraints of the author. An absence of this constraint, and/or working with other researchers, would have facilitated further data collection.

The study is conducted amongst a student population, of which 82% are 18-24 years of age. Additionally, the research was conducted using a cluster sampling, rather than a pure random sampling, approach. Both these factors mean that the segmentation findings of this study cannot be generalised across the Irish population. The student population in the chosen tertiary institute is quite diverse, but it has to be acknowledged that the use of a student only sample has the potential of creating a 'cohort' effect in the findings.

Socio-economic status emerged in the literature as a prominent correlate of exercise behaviour. Many of the student target audience are still dependent on parents and not socio-economically independent. Because of this the author elected not to integrate a measure of socio-economic status into the study, which is a limitation.

Some respondent bias may be inherent in the discussion group output. While the author diligently prepared for and managed the discussion groups, a possibility exists that the responses provided an inaccurate reflection of the respondents' evaluations of their exercise experiences. Similarly, the author has considerable personal and professional experience in the exercise domain, which is accompanied by some degree of pre-conception about individuals' exercise behaviour. This is acknowledged as a potential limitation of the research, despite the author systematically planning and executing all aspects of the study to minimise the effect of any inherent bias or pre-conception.

A confirmatory factor analysis (CFA) is the most direct way of validating a factor solution, and ideally a CFA could have been conducted on the nine-construct PCA solution. Despite the other factor validity tests illustrating strong results, see Section 7.6, a positive CFA would add enhanced credence to the factor solution. Similarly, the analysis of the segmentation output highlighted some concerns about the stability and validity of the four-cluster outcome. While further stability and validity tests exhibited more positive results, the concerns that emerged must be acknowledged as a potential limitation of the study.

## **9.7 Recommendations for Future Research**

Application of the proposed segmentation process in action research is advisable. The process is intended to be a practical tool that aids the proficiency and effectiveness of exercise segmentation studies. Consequently, future research should entail a study that initially uses the process to identify and profile segments, and then follows up by targeting the identified segments with differentiated interventions. This would be both informative, and add credence to the worth of the segmentation process.

The segmentation process requires testing in other behavioural domains. It is reasoned that it should be as effective in other contexts, as motivation is central to all human behaviour, and the TPB has been applied in multiple behavioural spheres. This would

take the form of employing validated motivational scales from other domains to identify market segments, in conjunction with profiling the segments using the salient elicited beliefs for that behavioural domain and target market. An informative and effective segmentation outcome would be facilitated.

Future studies using the EMI-2 as a segmentation base would be advised to incorporate formal measures of self-determination, to comprehensively appraise the extent of the self-determination of identified segments. This would lend further theoretical underpinning to the approach. If studies using the EMI-2 as the basis for segmentation utilise a PCA to reduce variables for inclusion in the cluster analysis, then consideration should be given to employing a confirmatory factor analysis. This could take the format of assessing the replicability of the results using a split-half test, and would add further validation to the outcome of the PCA.

Additionally, as meaningful as the identified segments appear, they must be assessed in the context of emerging in a solution that demonstrates weak evidence of cluster structure. Therefore, whilst this study is a promising first foray into analysing the value of motivational segmentation in the exercise participation context, further research is required to validate the segments, particularly amongst other target populations and in other countries. This might take the format of a similar study using a different sample population, with a view to determining if similar segment structures emerge.

The process of deriving TPB beliefs to assess additional correlates of exercise behaviour and integrating them into the profiling process has revealed a promising outcome. Future studies need to repeat this process to further validate the approach. The nature of the proposed segmentation process means that it has to be conducted in several phases, utilising time and resources that may not always be available in research studies. It is therefore recommended that future research also examines alternative mechanisms for integrating motivational segmentation and other key correlates of exercise behaviour in segmentation studies.

Findings relating to the differentiation in motives and beliefs based on age grouping were underwhelming and did not contribute to the profiling of the segments to the extent that was expected. Future research should encompass a wider range or diversity

of age groups, to determine if this can add increased richness to the segment profiling. Similarly, the differentiation in control beliefs in a number of tests was minimal. This is very surprising given the outcome of previous research and the apparent influence of the summated control belief index on behaviour. Further research is required to establish if the lack of differentiation in control beliefs is unique to this study or consistent across a number of target populations.

Integration of both regular and non-exercisers into this research almost certainly influenced the segment structure, so an assessment of the output from only regular exercisers or only non-regular exercisers would also be revealing. This is particularly the case for females. The participation rates for the female cohort in this study are significantly lower than for their male counterparts, a finding that is consistent with much of the extant literature. Further analysis is required to understand the barriers to female participation across market segments such as the ones identified in this study. Similarly, a study that builds a profile of non-regular exercisers that integrates measures of why they do not exercise or barriers to exercise engagement would be revealing. Given the cultural nature of sport and exercise, determining the composition of motivational segments that emerge in other countries and how this differs from the Irish outcome is advisable.

As indicated in the previous section the socio-economic status not being integrated as a profiling agent is a limitation of the study. Additional research of this nature should include a measure of this nature if possible, given its prominence in the literature as a correlate of exercise behaviour.

## **9.8 Chapter Conclusion**

The chapter synopsis the outcome of the process employed by the researcher. The literature highlights multiple correlates of exercise behaviour and the limited integration of these in exercise segmentation studies. A segmentation process is proposed, with the scope to integrate the most salient of these correlates. Motivation is a key driver of behaviour. Using motivation as the core segmentation base produces a differentiated and reasonably validated and stable segmentation solution. Gender and recent exercise status analyses add considerably to the understanding of the identified segments, although age based comparisons illustrate lesser differentiation. Analyses using TPB

beliefs also produce promising outcomes, with behavioural and normative beliefs illustrating significant differentiation between segments. The proposed segmentation process is largely endorsed, although further research is required to validate it in different behavioural domains, amongst alternative populations, and across cultures. Additionally, the propositions that did not receive strong backing require further testing before they can be satisfactorily included in the segmentation process. The research addresses a shortcoming in the academic body of knowledge and is of benefit to practitioners seeking to design more effective exercise interventions.

"I am never going to run this again!"

Grete Waitz, after winning her first of nine New York City marathons.

## Bibliography

- Abraham, C. and Sheeran, P. (2004) 'Deciding to exercise: the role of anticipated regret', *British Journal of Health Psychology*, 9(2), pp. 269-278.
- Adams, J. and White, M. (2004) 'Why don't stage-based activity promotion interventions work?' *Health Education Research*, 20(2), pp. 237-243.
- Adkins, E.C. and Keel, P.K. (2005) 'Does 'excessive' or "compulsive" best describe exercise as a symptom of bulimia nervosa?' *International Journal of Eating Disorders*, 38(1), pp. 24-29.
- Ajzen, I. (1985) 'From intentions to actions: a theory of planned behavior', in Kuhl, J. and Beckmann, J. (eds) *Action control: from cognition to behaviour*, New York: Springer-Verlag.
- Ajzen, I. (1991) 'The theory of planned behaviour', *Organizational Behaviour and Human Decision Processes*, 50, pp. 179-211.
- Ajzen, I. (2002) 'Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior', *Journal of Applied Social Psychology*, 32(4), pp. 665-683.
- Ajzen, I. and Driver, B.L. (1991) 'Prediction of leisure participation from behavioral, normative and control beliefs: an application of the theory of planned behavior', *Leisure Sciences*, 13(3), pp. 185-204.
- Ajzen, I. and Fishbein, M. (1980) *Understanding attitudes and predicting social behaviour*, Englewood Cliffs: Prentice-Hall.
- Albarracín, D., Johnson, B.T., Fishbein, M., and Muellerleile, P. (2001) 'Theories of reasoned action and planned behavior as models of condom use: a meta analysis', *Psychological Bulletin*, 127(1), pp. 142-161.
- Aldenderfer, M.S. and Blashfield, R.K. (1984) *Cluster Analysis*, Beverly Hills: Sage.
- Allen, J.B. (2003) 'Social Motivation in Sport', *Journal of Sport and Exercise Psychology*, 25(4), pp. 551-567.
- Allenby, G., Arora, N., Diener, C., Kim, J., Lotti, M., and Markowitz, P. (2002) 'Distinguishing likelihoods, loss functions and heterogeneity in the evaluation of marketing models', *Canadian Journal of Marketing Research*, 20(1), pp. 44-59.
- Allenby, G.M., Arora, N., and Ginter, J.L. (1998) 'On the heterogeneity of demand', *Journal of Marketing Research*, 35(3), pp. 384-389.
- Allender, S., Hutchinson, L.A., and Foster, C., (2008), 'Life-change events and participation in physical activity: a systematic review', *Health Promotion International*, 23(2), pp. 160-172.

- Amaratunga, D., Sarshar, M., and Baldry, D. (2002) 'Process improvement in Facilities Management: the SPICE approach', *Business Process Management Journal*, 8(4), pp. 318-337.
- Andrews, R. L., Brusco, M. J. and Currim, I. S., (2010) 'Amalgamation of partitions from multiple segmentation bases: A comparison of non-model-based and model-based methods', *European Journal of Operational Research*, 201, pp. 608-618.
- Anshel, M.H. (2012) '*Sport psychology: from theory to practice*', 5th ed., San Francisco: Benjamin-Cummings.
- Apostolakis, A. (2003) 'The convergence process in heritage tourism', *Annals of Tourism Research*, 30(4), pp. 795-812.
- Arabie, P. and Hubert, L.J. (1994) 'Cluster Analysis in Marketing Research', in Bagozzi, R.P. (eds) *Advanced methods in marketing research*, Oxford: Blackwell, pp. 160-189.
- Armitage, C.J. (2003) 'From attitudes to behaviour: basic and applied research on the theory of planned behaviour', *Current Psychology: Research & Reviews*, 22(3), pp. 187-195.
- Armitage, C. J. and Christian, J. (2003) 'From attitudes to behaviour: Basic and applied research on the theory of planned behaviour', *Current Psychology*, 22, pp. 187-195.
- Armitage, C.J. and Conner, M. (1999) 'Distinguishing perceptions of control from self-efficacy: predicting consumption of a low-fat diet using the theory of planned behaviour', *Journal of Applied Social Psychology*, 29(1), pp. 72-90.
- Armitage, C.J., and Conner, M. (2001) 'Efficacy of the theory of planned behaviour: A meta-analytic review', *British Journal of Social Psychology*, 40, pp. 471-499.
- Armstrong, K.L. and Paretto-Stratta, T.M. (2004) 'Market analyses of race and sport consumption', *Sport Marketing Quarterly*, 13(1), pp. 7-16.
- Arndt, W.B. (1974) *Theories of Personality*, New York: Macmillan.
- Arts, H., Verplanken, B., and van Knippenberg, A. (1998) 'Predicting behavior from actions in the past: repeated decision making or a matter of habit?' *Journal of Applied Social Psychology*, 28(15), pp. 1355-1374.
- Austin, J.T. and Vancouver, J.B. (1996) 'Goal constructs in psychology: Structure, process, and content', *Psychological Bulletin*, 120(3), pp. 338-375.
- Bagozzi, R.P. and Kimmel, S.K. (1995) 'A comparison of leading theories for the prediction of goal-directed behaviours', *British Journal of Social Psychology*, 34(4), pp. 437-461.
- Baines, P. and Chansarkar, B. (2002) *Introducing Marketing Research*, England: John Wiley and Sons.

Baines, P., Fill, C., and Page, K.L. (2010) *Marketing*, 2nd ed., New York: Oxford University.

Bailey, C., Baines, P. R., Wilson, H. and Clark, M. (2009) 'Segmentation and customer insight in contemporary services marketing practice: why grouping customers is no longer enough', *Journal of Marketing Management*, 25 (3), pp. 227-252.

Bailey, R.P., Wellard, I., and Dismore, H. (2004) *Girls' participation in physical activities and sports: benefits, patterns, influences and ways forward*, Geneva: World Health Organisation.

Baldwin, M.K. and Courneya, K.S. (1997) 'Exercise and self-esteem in breast cancer survivors: an application of the Exercise and Self-esteem Model', *The Journal of Sport and Exercise Psychology*, 19(4), pp. 347-359.

Bandura, A. (1977) 'Self-efficacy: toward a unifying theory of behavior change', *Psychological Review*, 84(2), pp. 191-215.

Bandura, A. (1986) *Social Foundations of Thought and Action*, Englewood Cliffs: Prentice-Hall.

Bandura, A. (1997) *Self-efficacy: The exercise of control*, New York: W.H. Freeman.

Banfield, J.D. and Raftery, A.E. (1993) 'Model-Based Gaussian and Non-Gaussian Clustering', *Biometrics*, 49, pp. 803-821.

Baranowski, T., Anderson, C., and Carmack, C. (1998) 'Mediating variable framework in physical activity interventions - How are we doing? How might we do better?' *American Journal of Preventive Medicine*, 15(4), pp. 266-297.

Baranowski, T., Lin, L.S., Wetter, D.W., Resnicow, K., and Hearn, M.D. (1997) 'Theory as mediating variables: Why aren't community interventions working as desired?' *Annals of Epidemiology*, 7(7), pp. S89-S95.

Baron, R.A. (1991) 'Motivation in work settings: reflections on the core of organizational research', *Motivation and Emotion*, 15 (1), pp. 1-8.

Bassi, F., (2007) 'Latent class factor models for market segmentation: an application to pharmaceuticals', *Statistical Methods and Applications*, 16(2), pp. 279-287.

Bauman, A.E. and Bull, F.C. (2007) 'Environmental correlates of physical activity and walking in adults and children: a review of reviews', *National Institute of Health and Clinical Excellence* [Online]. Available at: <http://www.nice.org.uk> (Accessed: 15 July 2012).

Beane, T.P. and Ennis, D.M. (1987) 'Market segmentation: a review', *European Journal of Marketing*, 21(5), pp. 20-42.

Beck, K., Thompson, R.L., Allen, K., Wiseman, M., and Marmot M. (2010) 'Policies and Actions for Cancer Prevention: Food, Nutrition and Physical Activity', *The Open Obesity Journal*, pp. 81-94.

- Bellows-Riecken, K.H. and Rhodes, R.E. (2008) 'A birth of inactivity? A review of physical activity and parenthood', *Preventive Medicine*, 46(2), pp. 99-110.
- Bellows-Riecken, K.H., Rhodes, R.E., and Hoffert, K. (2008) 'Motives for lifestyle and exercise activities: A comparison using the theory of planned behaviour', *European Journal of Sport Sciences*, 8(5), pp. 305-313.
- Bentler, P.M. and Speckart, G. (1981) 'Attitudes 'cause' behaviors: A structural equation analysis', *Journal of Personality and Social Psychology*, 40(2), pp. 226-238.
- Biddle, S. (1993) 'Attribution Research and Sport Psychology', in Singer, R.N., Murphey, N., and Tennant L.K. (eds) *Handbook of Research on Sport Psychology*, New York: Macmillan, pp. 437-464.
- Biddle, S.J.H., (1995) 'Exercise motivation across the lifespan', in Biddle S.J.H. (eds), *European perspectives on exercise and sport psychology*, Champaign: Human Kinetics, pp. 5-25.
- Biddle, S.J.H. (1999) 'Motivation and perceptions of control: Tracing its development and plotting its future in exercise and sport psychology', *Journal of Sport Exercise Psychology*, 21(1), pp. 1-23.
- Biddle, S.J.H., Fox, K., and Boutcher, S.H. (2000) 'The way forward for physical activity and the promotion of psychological well-being', in Biddle, S.J.H., Fox, K., and Boutcher, S.H. (eds) *Physical activity and psychological well-being*, London: Routledge.
- Biddle, S.J.H. and Mutrie, N. (2008), *Psychology of physical activity: determinants, well-being and interventions*, 2nd ed., London: Routledge.
- Biddle, S.J.H. and Nigg, C.R. (2000) 'Theories of exercise behaviour', *International Journal of Sport Psychology*, 31, pp. 290-304.
- Biddle, S.J.H., Whitehead, S.H., O'Donovan, T.M., and Nevill, M.E. (2005) 'Correlates of participation in physical activity for adolescent girls: A systematic literature review and update', *Journal of Physical Activity and Health*, 2(4), pp. 423-434.
- Blanchard, C.M., Kupperman, J., Sparling, P., Nehl, E., Rhodes, R.E., Courneya, K.S., Baker, F., and Rupp, J.C. (2008) 'Ethnicity and the theory of planned behavior in an exercise context: A mediation and moderation perspective', *Psychology of Sport and Exercise*, 9(4), pp. 527-545.
- Blattberg, R.C., Buesing, T., Peacock, P., and Sen, S. (1978) 'Identifying the deal prone segment', *Journal of Marketing Research*, 15(3), pp. 369-377.
- Bolter, N.D. and Weiss, M.R. (2013) 'Coaching behaviors and adolescent athletes' sportpersonship outcomes: Further validation of the Sportsmanship Coaching Behaviors Scale (SCBS)', *Sport, Exercise, and Performance Psychology*, 2(1), pp. 32-47.
- Booth, T., Ainscow, M., Black-Hawkins, K., Vaughan, M., and Shaw, L. (2000) *The index for inclusion: developing learning and participation in schools*, Bristol: CSIE.

Botschen, G., Thelen, E., and Pieters, F.G.M. (1999) 'Using means-end structures for benefit segmentation: an application to services', *European Journal of Marketing*, 33(1/2), pp. 38-58.

Bouchard, C., Blair, S.N., and Haskell, W.L (2007) *Physical activity and health, USA: Human Kinetics*.

Boyette, L.W., Lloyd, A., Boyette, J.E., Watkins, E., Furbush, L., and Dunbar, S.B. (2002) 'Personal characteristics that influence exercise behaviour of older adults', *Journal of Rehabilitation and Research and Development*, 39(1), pp. 95-103.

Brannick, T. and Roche, W.K (1997) *Business research methods: strategies, techniques and sources*, Dublin: Oak Tree Press.

Bray, S.R. and Born, H.A. (2004) 'Transition to university and vigorous activity: Implications for health and psychological well-being', *Journal of American College Health*, 52(4), pp. 181-188.

Bredemeier, C. (1998) *Experience vs. Understanding: understanding yourself in the twenty first century*, Brunswick: Transaction.

Brennan, D. and Bleakley, E.W. (1997) 'Predictors patterns and policies of post school participation in sport', in Kremer, J., Trew, K., and Ogle, S. (eds) *Young peoples' involvement in sport*, London: Routledge, pp.79-97.

Brenes, G.A., Strube, M.J., and Storandt, M. (1998) 'An application of the theory of planned behavior to exercise among older adults', *Journal of Applied Social Psychology*, 28, pp. 2274-2290.

Brickell, T.A. and Chatzisarantis, N.L.D. (2007) 'Using self-determination theory to examine the motivational correlates and predictive utility of spontaneous exercise implementation intentions', *Psychology of Sport and Exercise*, 8(5), pp. 758-770.

Brière, N.M., Vallerand, R.J., Blais, M.R., and Pelletier, L.G. (1995) 'Développement et validation d'une mesure de motivation intrinsèque, extrinsèque et d'amotivation en contexte sportif: L'Echelle de Motivation dans les Sports (EMS)', *International Journal of Sport Psychology*, 26, pp. 465-489.

Brodkin, P. and Weiss, M.R. (1990) 'Developmental differences in motivation for participating in competitive swimming', *Journal of Sport and Exercise Psychology*, 12(3), pp. 248-263.

Brown, J. and Graham, D. (2008) 'Body satisfaction in gym-active males: An exploration of sexuality, gender, and narcissism', *Sex Roles*, 59, pp. 94-106.

Brown W.J., Young A.F., and Byles J.E. (1999) 'Tyranny of distance? The health of mid-aged women living in five geographical areas of Australia', *Australian Journal of Rural Health*, 7(3), pp. 148-154.

Brownson, R.C., Baker, E.A., Housemann, R.A., Brennan, L.K., and Bacak, S.J. (2001) 'Environmental and policy determinants of physical activity in the united states', *American Journal of Public Health*, 91(12), pp. 1995-2003.

- Brownson, R.C., Houseman, R.A., Brown, D.R., Jackson-Thompson, J., King, A.C., Malone, B.R., and Sallis, J.F. (2000) 'Promoting physical activity in rural communities', *American Journal of Preventive Medicine*, 18(3), pp. 235-241.
- Brug J., Oenema A., and Ferreira I. (2005) 'Theory, evidence and intervention mapping to improve behavioral nutrition and physical activity interventions', *International Journal of Behavioral Nutrition and Physical Activity*, 2(2). Pp. 1-7.
- Brunet, J. and Sabiston, C.M. (2011) 'Exploring motivation for physical activity across the adult lifespan', *Psychology of Sport and Exercise*, 12(2), pp. 99-105.
- Brustad, R.J. (1993) 'Youth in sport: psychological considerations', in Singer, R.N., Murphy, M., and Tennant, L.K. (eds) *Handbook of Research on Sport Psychology*. New York: Macmillan, pp. 695-717.
- Brustad, R.J. (1996) 'Attraction to physical activity in urban school children: parental socialization and gender influences', *Research Quarterly for Exercise and Sport*, 67(3), pp. 316-323.
- Bryman, A. and Bell, E. (2011) *Business Research Methods*, 3rd ed., Oxford: Oxford University Press.
- Brymer, E. and Oades, L. (2009) 'Extreme sports: A positive transformation in courage and humility', *Journal of Humanistic Psychology*, 49(1), pp. 114-126.
- Buckworth, J. and Dishman, R. (2002) *Exercise psychology*, Champaign: Human Kinetics.
- Buckworth, J., Lee, R.E., Regan, G., Schneider, L.K., and DiClemente, C.C. (2007) 'Decomposing intrinsic and extrinsic motivation for exercise: application to stages of motivational readiness', *Psychology of Sport and Exercise*, 8(4), pp. 441-461.
- Bulmer, M. (1984) *The Chicago School of Sociology: institutionalization, diversity and the rise of sociological research*, Chicago: University of Chicago Press.
- Burbank, P.M. and Riebe, D.R. (2001) *Promoting exercise and behavior change in older adults: interventions with the Transtheoretical model*, New York: Springer.
- Burrell, W.G. and Morgan, G. (1979) *Sociological paradigms and organizational analysis*, London: Heinemann.
- Burton, L.C, Shapiro S., and German P.S. (1999) 'Determinants of physical activity initiation and maintenance among community-dwelling older persons', *American Health Foundation*, 29(5), pp. 422-430.
- Butler, R. (1993) 'Effects of task- and ego-achievement goals on information seeking during task engagement', *Journal of Personality and Social Psychology*, 65(1), pp.18-31.
- Caffray, C.M. and Schneider, S.L. (2000) 'Why do they do it? Affective motivators in adolescents' decisions to participate in risk behaviours', *Cognition and Emotion*, 14(4), pp. 543-576.

- Çağlar, E. and Hülya A.F. (2010) 'Motivational cluster profiles of adolescent athletes: an examination of differences in physical-self perception', *Journal of Sports Science and Medicine*, 9(2), pp. 231-238.
- Calfas, K.J., Sallis, J.F., Lovato, C.Y., and Campbell, J. (1994) 'Physical activity and its determinants before and after college graduation', *Medicine, Exercise, Nutrition, and Health*, 3, pp. 323-334.
- Carmines, E.G. and Zeller, R.A. (1979) *Reliability and Validity Assessment*, Newbury Park: Sage.
- Carpenter, P. and Yates, B. (1997) 'Relationship between achievement goals and the perceived purposes of soccer for semiprofessional and amateur players', *Journal of Sport and Exercise Psychology*, 19(3), pp. 302-311.
- Carron, A.V. (1980) *Social psychology of sport*. Ithaca: Movement Publications.
- Carron, A.V., Widmeyer, W.N., and Brawley, L.R. (1988) 'Group cohesion and individual adherence to physical activity', *Journal of Sport and Exercise Psychology*, 10(2), pp. 127-138.
- Cash, T.F., Novy, P.L., and Grant, J.R. (1994) 'Why do women exercise? Factor analysis and further validation of the reasons for exercise inventory', *Perceptual and Motor Skills*, 78(2), pp. 539-544.
- Castro, C.M., Sallis, J.F., Hickman, S.A., Lee, R.E., and Chen, A.H. (1999) 'A prospective study of psychosocial correlates of physical activity in minority women', *Psychology and Health*, 14(2), pp. 277-293.
- Caspersen, C.J., Powell, K.E., and Christenson G.M. (1985) 'Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research', *Public Health Report*, 100(2), pp. 126-131.
- Chatzisarantis, N.L.D. and Hagger, M.S. (2008) 'Influences of personality traits and continuation', *Psychology and Health*, 23(3), pp. 347-367.
- Chatzisarantis, N.L.D., Hagger, M.S., Biddle, S.J.H., and Smith, B. (2005) 'The stability of the attitude-intention relationship in the context of physical activity', *Journal of Sports Sciences*, 23(1), pp. 49-61.
- Chatzisarantis, N.L.D., Hagger, M.S., Smith, B., and Wang, C.K. (2003) 'A meta-analysis of perceived locus on causality in exercise, sport, and physical education contexts', *Journal of Sport and Exercise Psychology*, 25(3), pp. 284-306.
- Chian, L.K.Z. and Wang, C.K.J. (2008) 'Motivational profiles of junior college athletes: A cluster analysis', *Journal of Applied Sport Psychology*, 20(2), pp. 137-156.
- Chen, J.S. (2003) 'Market segmentation by tourists' sentiments', *Annals of Tourism Research*, 30(1), pp. 178-193.
- Cialdini, R. (1993) *Influence: The Psychology of Persuasion*. New York: HarperCollins.

- Claeys, C., Swinnen, A., and Abeele, P.V. (1995) 'Consumers' means-end and chains for "think" and "feel" products', *International Journal of Research in Marketing*, 12(3), pp. 193-208.
- Clark, D.O. (1999) 'Physical activity and its correlates among urban primary care patients aged 55 years or older', *Journal of Gerontology*, 54B (1), pp. S41-S48.
- Clark, D.B., Blair, S.N., and Culan, M.R. (1988) 'Are HPE teachers good role models?' *Journal of Physical Education, Recreation and Dance*, 59(7), pp. 76-80.
- Claussen, C.L., Ko, Y.J., and Rinehart, R.E. (2008) 'Cultural diversity: An alternative approach to understanding sport consumer behaviour', *Sport Management and Related Topics Journal*, 4(2), pp. 58-71.
- Coakley, J.J. (1994) *Sport in society: issues and controversies*, 5th ed., London: Mosby.
- Coakley, J.J. and White, A. (1992) 'Making decisions: gender and sport participation among british adolescents', *Sociology of Sport Journal*, 9(1), pp. 20-35.
- Coe, D.P., Pivarnik, J.M., Womack, C.J., Reeves, M.J., and Malina, R.M. (2006) 'Effect of physical education and activity levels on academic achievement in children', *Medicine and Science in Sports and Exercise*, 38(8), pp. 1515-1519.
- Coffey, A. and Atkinson, P. (1996) *Making sense of qualitative data analysis: complementary strategies*, Thousand Oaks CA: Sage.
- Comte, E., Girard, L., and Starensier, A. (1989) 'Embracing stars, ignoring players', *Sports Inc*, 2, pp. 42-43.
- Conn, V.S. (1997) 'Older women: social cognitive theory correlates of health behavior', *Women and Health*, 26(3), pp. 71-85.
- Conn, V.S., Tripp-Reimer, T., and Maas, M.L. (2003) 'Older women and exercise: Theory of planned behavior beliefs', *Public Health Nursing*, 20(2), pp. 153-163.
- Conner, M. and Abraham, C. (2001) 'Conscientiousness and the theory of planned behavior: Toward a more complete model of the antecedents of intentions and behaviour', *Personality and Social Psychology Bulletin*, 27(11), pp. 1547-1561.
- Conner, M. and Armitage, C.J. (1998) 'Extending the theory of planned behavior: A review and avenues for further research', *Journal of Applied Social Psychology*, 28(15), pp. 1429-1464.
- Conner, M. and Sparks, P. (2005) 'Theory of Planned Behaviour and Health Behaviour', in Conner, M. and Sparks, P. (eds) *Predicting health behaviour: Research and practice with social cognition models*, 2nd ed., Buckingham: Open University Press, pp. 170-222.
- Connor, S. (2000) *The sporting, leisure and lifestyle patterns of school-going adolescents in Waterford city*, unpublished thesis (PhD.), Waterford Institute of Technology.

Connor, S. (2003) *Youth sport in Ireland: The sporting, leisure and lifestyle patterns of Irish adolescents*, Dublin: Liffey Press.

Cooke, R. and French, D.P. (2008) 'How well do the theory of reasoned action and theory of planned behaviour predict intentions and attendance at screening programmes? A meta-analysis', *Psychology and Health*, 23(7), pp. 745-765.

Cooper, D. and Schindler, P. (1998) *Business research methods*, 6th ed., New York: Irwin/McGraw-Hill.

Courneya, K.S. (1995) 'Understanding readiness for regular physical activity in older individuals: an application of the theory of planned behavior', *Health Psychology*, 14(1), pp. 80-87.

Courneya, K.S. and Bobick, T.M. (2000) 'Integrating the theory of planned behavior with the processes and stages of change in the exercise domain', *Psychology of Sport and Exercise*, 1(1), pp. 41-56.

Courneya, K.S., Bobick, T.M., and Schinke, R.J. (1999) 'Does the theory of planned behavior mediate the relationship between personality and exercise behavior?' *Basic and Applied Social Psychology*, 21(4), pp. 317- 324.

Courneya, K.S. and Hellsten, L.M. (1998) 'Personality correlates of exercise behavior, motives, barriers and preferences: An application of the five-factor model', *Personality and Individual Differences*, 24(5), pp. 625-633.

Courneya, K.S. and McAuley, E. (1995) 'Cognitive mediators of the social influence-exercise adherence relationship: a test of the theory of planned behavior', *Journal of Behavioral Medicine*, 18(5), pp. 499-515.

Crabbe, J.B., Smith, J.C., and Dishman, R.K. (1999) EEG and emotional response after cycling exercise, *Medicine and Science in Sports and Exercise*, 31, pp. S173.

Cramp, A.G. and Bray, S.R. (2009) 'Understanding leisure-time physical activity during pregnancy: A prospective examination of perceived barriers and self-efficacy', *Annals of Behavioral Medicine*, 37, pp. 325-334.

Creswell, J. W., Fetters, M. D., and Ivankova, N. V., (2004) 'Designing a mixed methods study in primary care', *Annals of Family Medicine*, 2(1), pp. 7-12.

Creswell, J.W. and Plano Clark, V.L. (2007) *Designing and conducting mixed methods research*, Thousand Oaks: Sage.

Crews, D.J. and Landers, D.M. (1987) 'A meta-analytic review of aerobic fitness and reactivity to psychosocial stressors', *Medicine and science in sports and exercise*, 19(5), pp. S114-S120.

Crossan, F. (2003) 'Research philosophy: towards an understanding', *Nurse Researcher*, 11(1), pp. 46-55.

Crossley, N. (2005) 'In the gym: motives, meanings and moral careers', Working Paper, Series No. 6. The University of Manchester.

Central Statistics Office (2007) *Quarterly National Household Survey, Sport and Physical Exercise, Quarter 3 - 2006* [Online]. Available at: <http://www.cso.ie> (Accessed: 02 December 2012).

Curtis, J., McTeer, W., and White, P. (1999) 'Exploring affects of school experiences on sports participation in later life', *Sociology of Sport Journal*, 16(4), pp. 348-365.

Daley, A. and Duda, J.L. (2006) 'Self-determination, stage of readiness to change for exercise, and frequency of physical activity in young people', *European Journal of Sport Science*, 6(4), pp. 231-243.

Daly, P. (2000) *The complete coaching guide to hurling and football*, Dublin: Dublin Gaelic Athletic Association.

Damrosch, S. (1991) 'General strategies for motivating people to change their behavior', *The Nursing Clinics of North America*, 26, pp. 833-843.

Davis, C., Fox, J., Cowles, M., Hastings, P., and Schwass, K. (1990) 'The functional role of exercise in the development of weight and diet concerns in women', *Journal of Psychosomatic Research*, 34(5), pp. 563-574.

Davison, K. and Lawson, C. (2006) 'Do attributes in the physical environment influence children's physical activity: A review of the literature', *The International Journal of Behavioral Nutrition and Physical Activity*, 3(19), pp.1-31.

De Burca, S. (1995) 'A Network approach to business to business exchange relationships: Key meta-theoretical assumptions', *Irish Marketing Review*, 8, pp. 117-125.

De Knop, P., Engström, L.M., Skirstad, B., and Weiss, M.R. (1996) *Worldwide trends in youth sport*, Champaign: Human Kinetics.

De Vaus, D. (2002) *Surveys in Social Research*, 5th ed., St. Leonards: Allen & Unwin.

De Roiste, A. and Dineen, J. (2005) *Young people's views about opportunities, barriers and supports to recreation and leisure: A Research Report by Cork Institute of Technology on behalf of the National Children's Office*, Dublin: Brunswick Press.

Deci, E.L. and Ryan, R.M. (1985) *Intrinsic motivation and self-determination in human behaviour*, New York: Plenum Press.

Deci, E.L. and Ryan, R.M. (1991) 'A motivational approach to self: Integration in personality', in Dienstbier, R. (eds) *Nebraska symposium on motivation: Perspectives on motivation*, Lincoln: University of Nebraska Press, pp. 237-288.

Deci, E.L. and Ryan, R.M. (2000) 'The 'what' and 'why' of goal pursuits: Human offer and the self determination of behaviour', *Psychological Inquiry*, 11(4), pp. 227-268.

Decker, R.B., Krimigis, S.M., Roelof, E.C., Hill, M.E., Armstrong, T.P., Gloeckler, G., Hamilton, D.C., and Lanzerotti, L.J. (2005) 'Voyager 1 in the foreshock, termination shock, and heliosheath', *Science*, 309(5743), pp. 2020-2024.

- Dey, I. (1993) *Qualitative Data Analysis: A user-friendly guide for social scientist*, London: Routledge.
- DiBartolo, P.M. and Shaffer, C. (2002) 'A comparison of female college athletes and nonathletes: Eating disorder symptomatology and psychological well being', *Journal of Sport and Exercise Psychology*, 24(1), pp. 33-42.
- DiClemente, C.C., Prochaska, J.O., and Gibertini, M. (1985) 'Self-efficacy and the stages of self-change of smoking', *Cognitive Therapy and Research*, 9(2), pp. 181-200.
- DiClemente, C.C., Prochaska, J.O., Fairhurst, S.K., Velicer, W.F., Velasquez, M.M., and Rossi, J.S. (1991) 'The process of smoking cessation: an analysis of precontemplation, contemplation, and preparation stages of change', *Journal of Consulting and Clinical Psychology*, 59(2), pp. 295-304.
- Dibb, S. (1999) 'Criteria guiding segmentation implementation: Reviewing the evidence', *Journal of Strategic Marketing*, 7(2), pp. 107-129.
- Dibb, S. (2003) 'Market segmentation: changes and challenges', in Hart, S. (eds) *Marketing Changes*, London: International Thomson.
- Dibb, S. (2003) 'Diagnosing and treating segmentation barriers in business-to-business', *Thesis*, 4, pp. 40-46.
- Dibb, S. and Simkin, L. (1996) *The market segmentation workbook: target marketing for marketing managers*, London: Thomson Learning, pp. 219.
- Dibb, S. and Simkin, L. (1997) 'A programme for implementing market segmentation', *Journal of Business and Industrial Marketing*, 12(1), pp. 51-65.
- Dibb, S., Stern, P., and Wensley, R. (2002) 'Marketing knowledge and the value of segmentation', *Marketing Intelligence and Planning*, 20(2), pp. 113-119.
- Dienstbier, R.A. (1984) 'The role of emotion in moral socialization', in Izard, C., Kagan, J., and Zajonc, R.B. (eds) *Emotions, cognitions and behaviour*, New York: Cambridge University Press, pp. 484-513.
- Dolnicar, S. (2003) 'Using cluster analysis for market segmentation - typical misconceptions, established methodological weaknesses and some recommendations for improvement', *Australasian Journal of Market Research*, 11(2), pp. 5-12.
- Dolnicar, S. and Grun, B. (2008) 'Challenging "Factor-Cluster Segmentation"', *Journal of Travel Research*, 47(1), pp. 6-71.
- Dolnicar, S. and Lazarevski, K. (2009) 'Methodological reasons for the theory/practice divide in market segmentation', *Journal of Marketing Management*, 25(3-4), pp. 357-373.
- Donnelly, P. and Young, K. (1988) 'The Construction and Confirmation of Identity in Sport Subcultures', *Sociology of Sport Journal*, 5(3), pp. 223-240.

Downs, D.S. and Hausenblas, H.A. (2005), 'The theories of reasoned action and planned behavior applied to exercise: a meta-analytic update', *Journal of Physical Activity and Health*, 2(1), pp. 76-97.

DuCharme, K.A. and Brawley, L.R. (1995) 'Predicting the intentions and behavior of exercise initiates using two forms of self-efficacy', *Journal of Behavioral Medicine*, 18(5), pp. 479-497.

Duda, J.L. (1993) 'Goals: A social cognitive approach to the study of achievement motivation in sport', in Singer, R.N., Murphy, M., and Tennant, L.K. (eds) *Handbook of research in sport psychology*, St. Louis: Macmillan, pp. 421-436.

Duda, J.L. (2007) 'Motivation in sport setting: a goal perspective approach' in Smith, D. and Bar-Eli, M. (eds) *Essential Reading in Sport and Exercise Psychology*, Champaign: Human Kinetics, pp. 78-93.

Duda, J.L. and Tappe, M.K. (1989) 'The personal incentives for exercise questionnaire: preliminary development', *Perceptual and Motor Skills*, 68, pp. 1122.

Duncan, S.C. (1993) 'The role of cognitive appraisal and friendship provisions in adolescents' affect and motivation toward activity in physical education', *Research Quarterly for Exercise and Sport*, 64(3), pp. 314-323.

Dunn, A.L., Marcus, B.H., Kampert, J.B., Garcia, M.E., Kohl, H.W., III and Blair, S.N. (1999) 'Comparison of lifestyle and structured interventions to increase physical activity and cardiorespiratory fitness: a randomized trial', *Journal of the American Medical Association*, 281(4), pp. 329-334.

East, R. (1993) 'Investment decisions and the theory of planned behaviour', *Journal of Economic Psychology*, 14(2), pp. 337-375.

Easterby-Smith, M., Thorpe, R., and Lowe, A. (2002) *Management Research An Introduction*. London: Sage.

Edelbrock, C. (1979) 'Mixture Model Tests Of Hierarchical Clustering Algorithms: The problem of classifying everybody', *Multivariate Behavioral Research*, 14(3), pp. 367-384.

Edmunds, J.K., Ntoumanis, N., and Duda, J.L. (2006) 'A test of self-determination theory in the exercise domain', *Journal of Applied Social Psychology*, 36(9), pp. 2240-2265.

Eitzen, S. and Sage, H. (1986) *Sociology of North American sport*, 4th ed., Dubuque: W.C. Brown.

Ellis, E. M. (2001) 'The impact of race and gender on graduate school socialization, satisfaction with doctoral study, and commitment to degree completion', *The Western Journal of Black Studies*, 25, pp. 30-45.

Ellis, R., Kosma, M., Cardinal, B.J., Bauer, J.J., and McCubbin, J.A. (2007) 'Physical activity beliefs and behaviour of adults with physical disabilities', *Disability and Rehabilitation*, 29(15), pp. 1221-1227.

- Elrod, T. and Winer, R.S. (1982) 'An empirical evaluation of aggregation approaches for developing market segments', *Journal of Marketing*, 46(4), pp. 65-74.
- Ekkekakis, P. and Lind, E. (2006) 'Exercise does not feel the same when you are overweight: the impact of self-selected and imposed intensity on affect and exertion', *International Journal of Obesity*, 30, pp. 652-660.
- Estabrooks, P.A. (2000) 'Sustaining exercise participation through group cohesion', *Exercise and Sport Sciences Reviews*, 28(2), pp. 63-67.
- Evans, D. and Norman, P. (1998) 'Understanding pedestrians' road crossing decisions: an application of the theory of planned behaviour', *Health Education Research*, 13(4), pp. 481-489.
- Eyler, A.A., Brownson, R.C., Donatelle, R.J., Kind, A.C., Brown, D.R., and Sallis, J.F. (1999) 'Physical activity social support and middle- and older- aged minority women: Results from a US survey', *Social Science and Medicine*, 49(6), pp. 781-789.
- Ewing, M. and Seefeldt, V. (1989) *Participation and attrition patterns in American agency-sponsored and interscholastic sports: An executive summary*, North Palm Beach: Sporting Goods Manufacturer's Association.
- Fahey, T., Layte, R., and Gannon, B. (2004) *Sports participation and health among adults in Ireland*, Dublin: ESRI.
- Farrell, L. and Shields, M.A., (2002) 'Investigating the economic and demographic determinants of sporting participation in England', *Journal of the Royal Statistical Society*, 165(2), pp. 335-348.
- Ferrer-Caja, E. and Weiss, M.R. (2000) 'Predictors of Intrinsic Motivation Among Adolescent Students in Physical Education', *Research Quarterly for Exercise and Sport*, 71(3), pp. 267-279.
- Ferreira, I., van der Horst, K., Wendel-Vos, W., Kremers, S., van Lenthe, F.J., and Brug, J. (2007) 'Environmental correlates of physical activity in youth: a review and update', *Obesity Reviews*, 8(2), pp. 129-154.
- Festinger, L. (1957) *A Theory of Cognitive Dissonance*, Stanford: Stanford University Press.
- Field, A. (2009) *Discovering statistics using SPSS*, 3rd ed., London: Sage.
- Finch H. (1997) *Physical activity 'at our age'. Qualitative research among people over the age of 50*, London: Health Education Authority.
- Finlay, K.A., Trafimow, D., and Villarreal, A. (2002) 'Predicting exercise and health behavioral intentions: attitudes, subjective norms, and other behavioral determinants', *Journal of Applied Social Psychology*, 32(2), pp. 342-358.
- Firat, A.F. and Shultz II, C.J. (1997) 'From segmentation to fragmentation: markets and marketing strategy in the post-modern era', *European Journal of Marketing*, 31(3/4), pp. 183-207.

- Fishbein, M. and Ajzen, I. (1975) *Belief, attitude, intention, and behavior: An introduction to theory and research*, Reading: Addison-Wesley.
- Fishbein, M. and Stasson, M., (1990) 'The role of desires, self-predictions, and perceived control in the prediction of training session attendance', *Journal of Applied Social Psychology*, 20(3), pp. 173-198.
- Fontaine, K.R. and Shaw, D.F. (1995) 'Effects of self-efficacy and dispositional optimism on adherence to step aerobic exercise classes', *Perceptual and Motor Skills*, 81(1), pp. 251-255.
- Foon, A.E. (1989) 'Sports participation among adolescent females: effects of self-esteem, affiliation patterns and locus of control', *Journal of Human Movement Studies*, 16, pp. 225-231.
- Foot, N.N. (1969) 'Market segmentation as competitive strategy', in Bogart, L. (eds) *Current controversies in marketing research*, Chicago: Markham Publishing, pp.129-139.
- Formann, A.K. (1984) *Die latent-class-analyse: Einführung in die theorie und anwendung*, Weinheim: Beltz.
- Fortier, M.S., Sweet, S.N., O'Sullivan, T.L., and Williams, G.C. (2007) 'A self-determination process model of physical activity adoption in the context of a randomized controlled trial', *Psychology of Sport and Exercise*, 8(5), pp. 741-757.
- Fortier, M.S., Vallerand, R.J., Brière, N.M., and Provencher, P.J. (1995) 'Competitive and recreational sport structures and gender: A Test of their relationship with sport motivation', *International Journal of Sport Psychology*, 26, pp. 24-39.
- Fox, K.R. (2000) 'The effects of exercise on self-perceptions and self-esteem', in Biddle, S.J.H., Fox, K.R., and Boutcher S.H. (eds) *Physical activity and psychological well-being*, Routledge: London, pp. 88-117.
- Fox, K.R. and Biddle, S.J.H. (1988) 'The use of fitness tests: educational and psychological considerations', *Journal of Physical Education, Recreation, and Dance*, 59(2), pp. 47-53.
- Fox, K.R. and Corbin, C.B. (1989) 'The physical self-perception profile: development and preliminary validation', *Journal of Sport and Exercise Psychology*, 11(4), pp. 408-430.
- Francis, J.J., Eccles, M.P., Johnston, M., Walker, A., Grimshaw, J., Foy, R., Kaner, E.F.S., Smith, L., and Bonett, D. (2004) *Constructing questionnaires based on the theory of planned behaviour: A manual for health services researchers*, New Castle: Centre for Health Services Research, pp.1-42.
- Frank, R.E. and Massey, W.F. (1965) 'Market segmentation and the effectiveness of a brand's price and dealing policies', *The Journal of Business*, 38(2), pp. 186-200.
- Frank, R.E., Massey, W., and Boyd, H.W. (1967) 'Correlates of grocery product Consumption rates', *Journal of Marketing Research*, 4(2), pp. 184-190.

- Franke, N., Reisinger, H., and Hoppe, D. (2009) 'Remaining within-cluster heterogeneity: A meta-analysis of the "dark side" of clustering methods', *Journal of Marketing Management*, 25(3-4), pp. 273-293.
- Fraser, S.N., and Spink, K.S. (2002) 'Examining the role of social support and group cohesion in exercise compliance', *Journal of Behavioral Medicine*, 25(3), pp. 233-249.
- Frederick, C.M., Morrison, C., and Manning, T. (1996) 'Motivation to participate, exercise affect, and outcome behaviors toward physical activity', *Perceptual and Motor Skills*, 82(2), pp. 691-701.
- Frederick, C.M. and Ryan, R.M. (1993) 'Differences in motivation for sport and exercise and their relations with participation and mental health', *Journal of Sport Behavior*, 16(3), pp. 124-146.
- Frederick, C.M. and Ryan, R.M. (1995) 'Self-determination in sport: A review using cognitive evaluation theory', *International Journal of Sport Psychology*, 26, pp. 5-23.
- Frederick-Recascino, C.M. and Schuster-Smith, H. (2003) 'Competition and intrinsic motivation in physical activity: A comparison of two groups', *Journal of Sport Behavior*, 26(3), pp. 240-254.
- Fullerton, S. and Dodge, H.R. (1988) 'The impact of colour on response rates for mail questionnaires', *Academy of Marketing Science Proceedings*, 11, pp. 413-415
- Fullerton, S. and Dodge, R.H. (1995) 'An application of market segmentation in a sports marketing arena: we all can't be Greg Norman', *Sport Marketing Quarterly*, 4(3), pp. 43-61.
- Furnham, A., Titman, P., and Sleeman, E. (1994) 'Perception of female body shapes as a function of exercise', *Journal of Social Behavior and Personality*, 9(2), pp. 335-352.
- Funk, D.C., Mahony, D.F., and Havitz, M.E. (2003) 'Sport consumer behaviour: assessment and direction', *Sport Marketing Quarterly*, 12(4), pp. 200-205.
- Galguera, L., Luna Gomez, D., and Méndez, M. P., (2006) 'Predictive Segmentation Across Cultures: Using CHAID to Segment Loyalty Card Holders', *International Journal of Market Research*, 4(48), pp. 459-479.
- Gebhardt, W.A. and Maes, S. (1998) 'Competing personal goals and exercise behaviour', *Perceptual and Motor Skills*, 86(3), pp. 755-759.
- Gerber, S.B. (1996) 'Extracurricular activities and academic achievement', *Journal of Research and Development in Education*, 30(1), pp. 42-50.
- Giles-Corti, B. and Donovan, R. (2002) 'The relative influence of individual, social and physical environmental determinants of physical activity', *Social Science and Medicine*, 54(12), pp. 1793-1812.
- Gill, J. and Johnson, P. (2010) *Research Methods for Managers*, 4th ed., London: Sage.

- Gill, D.L., Williams, L., Dowd, D.A., Beaudoin, C.M., and Martin, J.J. (1996) 'Competitive orientations and motives of adult sport and exercise participants', *Journal of Sport Behavior*, 19(4), pp. 307-318.
- Gill, K. and Overdorf, V. (1994) 'Incentives for exercise in younger and older women'. *Journal of Sport Behavior*, 17(2), pp. 87-97.
- Gillet, N., Vallerand, R.J., and Rosnet, I. (2009) 'Motivational clusters and performance in a real-life context', *Motivation and Emotion*, 33, pp. 49-62.
- Gillison, F.B., Standage, M., and Skevington, S.M. (2006) 'Relationships among adolescents' weight perceptions, exercise goals, exercise motivation, quality of life and leisure-time exercise behaviour: a self-determination theory approach', *Health Education Research*, 21(6), pp. 836-847.
- Gilmour, H. (2007) 'Physically active Canadians', *Health Reports*, 18(3), pp. 45-66.
- Godin, G. (1993) 'The theories of reasoned action and planned behavior: overview of the findings, emerging research problems and usefulness for the exercise promotion', *Journal of Applied Sport Psychology*, 5(2), pp. 141-157.
- Godin, G. and Kok, G. (1996) 'The Theory of Planned behaviour: A review of its application to health-related behaviours', *American Journal of Health Promotion*. 11(2), pp. 87-98.
- Godin, G. (1994) 'Theories of reasoned action and planned behavior: usefulness for exercise promotion', *Medicine and Science in Sports and Exercise*, 26(11), pp. 1391-1394.
- Godin, G., DeSharnais, R., Valois, P., and Bradet, R. (1995) 'Combining behavioral and motivational dimensions to identify and characterize the stages in the process of adherence to exercise', *Psychology and Health*, 10(4), pp. 333-344.
- Godin, G. and Shephard, R.J. (1997) 'Godin Leisure-Time Exercise Questionnaire', *Medicine and Science in Sports and Exercise*, 29(6), pp. S36-S38.
- Godin, G., Valois, P., Lepage, L., and Desharnais, R. (1992) 'Predictors of smoking behaviour: an application of Ajzen's theory of planned behaviour', *British Journal of Addiction*, 87(9), pp. 1335-1343.
- Gordon, A. (1995) 'Career transitions in competitive sport', in Morris, T. and Summers, J. (eds) *Sport psychology. Theory, applications and issues*, New York: John Wiley, pp. 474-515.
- Gould, D. (1987) 'Understanding attrition in children's sport', in Gould, D. and Weiss, M.R. (eds) *Advances in Paediatric Sport Sciences*, Champaign: Human Kinetics, pp. 61-85.
- Gould, D. and Horn, T. (1984) 'Participation motives in youth athletes', in Silva, J. and Weinberg, R.S. (eds) *Psychological foundations of sport*, Champaign: Human Kinetics.

- Gould, D. and Petlichkoff, L. (1988) 'Participation motivation and attrition in young athletes', In Smoll, F.L., MaGill, R.A., and Ash, M.J. (eds) *Children in sport*, Champaign: Human Kinetics, pp. 161-178.
- Gould, D., Petlichkoff, L., Simons, H., and Vevera, M. (1982) 'The relationship between Competitive State Anxiety Inventory-2 Subscale Scores and Piston Shooting Performance', *Journal of Sport and Exercise Psychology*, 9(1), pp. 33-42.
- Gray, P.S., Williamson, J.B., Karp, D.A., and Dalphin, J.R. (2007) *The Research imagination: an introduction to qualitative and quantitative methods*, Cambridge: Cambridge University Press.
- Green, P.E. and Krieger, M.K. (1995) 'Attribute importance weights modification in assessing a brand's competitive potential', *Marketing Science*, 14(3), pp. 253-270.
- Greendorfer, S.L. (1992) 'Sport socialisation', in Horn, T.S. (eds) *Advances in Sport Psychology*, Champaign: Human Kinetics, pp. 210-218.
- Grisogono, V. (1991) *Children and sport: fitness, injuries and diet*, London: Murray.
- Gustafson, S.L. and Rhodes, R.E. (2006) 'Parental correlates of physical activity in children and early adolescents', *Sports Medicine*, 36(1), pp. 79-97.
- Haber, D. (1996) 'Strategies to promote the health of older people: an alternative to readiness stages', *Family and Community Health*, 19, pp. 1-10.
- Hagger, M.S. and Chatzisarantis, N.L.D. (2005) 'First- and higher- order models of attitudes, normative influence, and perceived behavioural control in the theory of planned behaviour', *British Journal of Social Psychology*, 44(4), pp. 513-535.
- Hagger, M.S. and Chatzisarantis, N.L.D. (2007) *Intrinsic motivation and self-determination in exercise and sport*, Champaign: Human Kinetics.
- Hagger, M.S. and Chatzisarantis, N.L.D. (2008) 'Youth attitudes', in Smith, A.L. and Biddle, S.J.H. (eds) *Youth physical activity and sedentary behavior: challenges and solutions*, Champaign: Human Kinetics, pp. 167-192.
- Hagger, M.S. and Chatzisarantis, N.L.D. (2009) 'Integrating the theory of planned behaviour and self-determination theory in health behaviour: A meta- analysis', *British Journal of Health Psychology*, 14(2), pp. 275-302.
- Hagger, M.S., Chatzisarantis, N.L.D., and Biddle, S.J.H. (2001) 'The influence of self-efficacy and past behaviour on the physical activity intentions of young people', *Journal of Sports Sciences*, 19(9), pp. 711-725.
- Hagger, M.S., Chatzisarantis, N.L.D., and Biddle, S.J.H. (2002) 'A meta-analytic review of the theories of reasoned action and planned behavior in physical activity: Predictive validity and the contribution of additional variables', *Journal of Sport and Exercise Psychology*, 24, pp. 3-32.
- Hair, J.F. Jr., Black, W.C., Babin, B.J., and Anderson, R.E. (2010) *Multivariate Data Analysis: A Global Perspective*, 7th ed., New Jersey: Pearson Education.

- Haley, R.I. (1968) 'Benefit segmentation: a decision-oriented research tool', *Journal of Marketing*, 32, pp. 30-35.
- Haley, R.I., (1995) 'Benefit segmentation: a decision-oriented research tool', *Marketing Management*, 4(1), pp. 59-62.
- Hallal, P.C., Bauman, A.E., Heath, G.W., Kohl, H.W., Lee I., and Pratt, M. (2012) 'The challenge of assessing physical activity in populations - Authors' reply', *The Lancet*, 380(9853), pp. 1555-1556.
- Hallebone, E. and Priest, J. (2009) *Business and management research: paradigms and practices*, Basingstoke: Palgrave Macmillan.
- Hamilton, K. and White, K.M. (2008) 'Extending the Theory of Planned Behavior: the role of self and social influences in predicting adolescent regular moderate-to-vigorous physical activity', *Journal of Sport and Exercise Psychology*, 30(1), pp. 56-74.
- Haq, M.B. and Griffin, M. (1996) 'Health motivation: key to health promoting behavior?' *The Nurse Practitioner*, 21(11), pp. 155-156.
- Hardman, A.E. and Stensel, D.J (2003) *Physical Activity and Health: The evidence explained*, London: Routledge.
- Hardy, L., Jones, G., and Gould, D. (1996) *Understanding psychological preparation for sport: theory and practice of elite performers*, Chichester: Wiley.
- Harter, S. (1987) 'The determinants and mediational role of global self-worth in children', in Eisenberg, N. (eds) *Contemporary topics in developmental psychology*, New York: John Wiley & Sons, pp. 219-242.
- Harwood, C.G., Hardy, L., and Swain, A. (2000) 'Achievement goals in sport: A critique of conceptual and measurement issues', *Journal of Sport and Exercise Psychology*, 22(3), pp. 235-255.
- Hausenblas, H.A., Carron, A.V., and Mack, D.E. (1997) 'Application of the theories of reasoned action and planned behavior to exercise behavior: A meta-analysis', *Journal of Sport and Exercise Psychology*, 19(1), pp. 36-51.
- Helsen, K. and Green, P.E. (1991) 'A computational study of replicated clustering with an application to market segmentation', *Decision Sciences*, 22(5), pp. 1124-1141.
- Henry, G.T. (1990) *Practical sampling. Volume 21 of Applied Social Research Methods*, New Bury Park: Sage.
- Hendry, L.B., Shucksmith, J., Love, J.G., and Glendinning, A. (1993) *Young people, leisure and lifestyles*, New York: Routledge.
- Hindess, B. (1977) *Philosophy and methodology in the social science*, Hassocks: Harvester Press.
- Hines, T. and Quinn, L. (2005) 'Socially constructed realities and the hidden face of market segmentation', *Journal of Marketing Management*, 21(5), pp. 529-543.

- Hobson, M.L. and Rejeski, W.J. (1993) 'Does the dose of acute exercise mediate psychophysiological response to mental stress', *Journal of Sport and Exercise Psychology*, 15(1), pp. 77-87.
- Hoek, J., Gendall, P., and Esslemont, D. (1996) 'Market segmentation: A search for the Holy Grail?' *Journal of Marketing Practice*, 2(1), pp. 25-34.
- Hofstede, F.T., Steenkamp J.E.M., and Wedel, M. (1999) 'International market segmentation based on consumer-product relations', *Journal of Marketing Research*, 36(1), pp. 1-17.
- Holden, M.T. and Lynch, P. (2004) 'Choosing the appropriate methodology: Understanding research philosophy', *The Marketing Review*, 4(4), pp. 397-409.
- Hollyforde, S. and Whiddett, S. (2002) *The Motivation Handbook*, London: The Chartered Institute of Personnel and Development.
- Horn, T.S. (1992) 'Leadership effectiveness in the sport domain', in Horn, T.S. (eds) *Advances in sport psychology*. Champaign: Human Kinetics, pp. 181-199.
- Horn, T.S. and Amorose, A.J. (1998) 'Sources of competence information', in Duda, J.L. (eds) *Advances in sport and exercise psychology measurement*, Morgantown: Fitness Information Technology, pp. 49-63.
- Horn, T.S. and Harris, A. (1996) 'Perceived competence in young athletes: research findings and recommendations for coaches and parents', in Smoll, F.L. and Smith, R.E. (eds) *Children and youth in sport: a biopsychosocial perspective*, Madison: Brown and Benchmark, pp. 309-329.
- Howard, D.R. (1992) 'Trend analysis of participation rates in selected sport and fitness activities from 1980 to 1989', *Journal of Sport Management*, 6, pp. 191-205.
- Hubert, L. and Arabie, P. (1985) 'Comparing partitions', *Journal of Classification*, 2, pp. 193-218.
- Humphreys, K. and Rosenheck, R. (1995) 'Sequential validation of cluster analytic subtypes of homeless veterans', *American Journal of Community Psychology*, 23(1), pp. 75-98.
- Hunt, P. and Hillsdon, M. (1996) *Changing eating and exercise behaviour: a handbook for professional*, Cambridge: Wiley-Blackwell.
- Hurrell, R.M. (1997) 'Factors associated with regular exercise', *Perceptual and Motor Skills*, 84(3), pp. 871-874.
- Ingledeu, D.K. and Ferguson, E. (2007) 'Personality and riskier sexual behaviour: Motivational mediators', *Psychology and Health*, 22(3), pp. 291-315.
- Ingledeu, D.K. and Markland, D.A. (2008) 'The role of motives in exercise participation', *Psychology and Health*, 23(7), pp. 807-828.

- Ingledeu, D.K. and Sullivan, G. (2002) 'Effects of body mass and body image on exercise motives in adolescence', *Psychology of Sport and Exercise*, 3(4), pp. 323-338.
- Ingledeu, D.K., Hardy, L., and de Sousa, K. (1995) 'Body shape dissatisfaction and exercise motivations', *Journal of Sports Sciences*, 13, pp. 60.
- Ingledeu, D.K., Markland, D.A., and Medley, A.R. (1998) 'Exercise motives and stages of change', *Journal of Health Psychology*, 3(4), pp. 477-489.
- Ingledeu, D.K., Markland, D., and Sheppard, K.E. (2004) 'Personality and self-determination of exercise behaviour', *Personality and Individual Differences*, 36(8), pp. 1921-1932.
- Irish Sports Council (2012) *Irish Sports Monitor 2011*. Dublin: MRBI and Irish Sports Council.
- Iso-Ahola, S.E. (1999) 'Motivational foundations of leisure', in Jackson, E.L. and Burton, T.L. (eds) *Understanding leisure and recreation: mapping the past, charting the future*, State College: Venture, pp. 35-51.
- Jackson, S.A. and Marsh, H.W. (1986) 'Athletic or antisocial? The female sport experience', *Journal of Sport Psychology*, 8(3), pp. 198-211.
- Jackson, C., Smith, R.A., and Conner, M. (2003) 'Applying an extended version of the Theory of Planned Behaviour to physical activity', *Journal of Sports Sciences*, 21(2), pp. 119-133.
- James, J. and Ross, S. (2004) 'Motives for attending non-revenue collegiate sports', *Sport Marketing Quarterly*, 13(1), pp. 17-25.
- Jambor, E.A. (1999) 'Parents as children's socializing agents in youth soccer', *Journal of Sport Behavior*, 22(3), pp. 350-359.
- Jankowicz, A. (2000) *Business Research Projects*, 3rd ed., London: Thomson Learning.
- Janz, N.K. and Becker, M.H. (1984) 'The health belief model: A decade later', *Health Education Quarterly*, 11(1), pp. 1- 47.
- Janz, K.F. and Mahoney, L.T. (1997) 'Maturation, gender and video game playing are related to physical activity intensity in adolescents: The Muscatine study', *Paediatric Exercise Science*, 9(4), pp. 353-363.
- Jarvis, M. (2006) *Sport Psychology: A Student's Handbook*, Hove: Routledge.
- Johnsgard, K.W. (1989) *The exercise prescription for depression and anxiety*, New York: Plenum Press.
- Johnson, R.B., Onwuegbuzie, A.J., and Turner, L.A. (2007) 'Toward a definition of mixed methods research', *Journal of Mixed Methods Research*, 1(2), pp. 112-133.
- Johnston, K.L. and White, K.M. (2003) 'Binge-drinking: A test of the role of group norms in the Theory of Planned Behaviour', *Psychology and Health*, 18(1), pp. 63-77.

Jones, L.W. and Courneya, K.S. (2002) 'Exercise discussions during cancer treatment consultations', *Cancer Practice*, 10(2), pp. 66-74.

Jones, M. and Nies, M.A. (1996) 'The relationship of perceived benefits of and barriers to reported exercise in older African American women', *Public Health Nursing*, 13(2), pp. 151-158.

Kahn, E.B., Ramsey, L.T., Brownson, R.C., Heath, G.W., Howze, E.H., Powell, K.E., Stone, E.J., Rajab, M.W., and Corso, P. (2002) 'The effectiveness of interventions to increase physical activity: A systematic review', *American Journal of Preventive Medicine*, 22(4S), pp. 73-107.

Kamakura, W. and Wedel, M. (2004) 'An Empirical Bayes Procedure for Improving Individual-level Estimates and Predictions from Finite Mixture Logit Models', *Journal of Business and Economic Statistics*, 22, pp. 121-125.

Kaplan, R.M. (1990) Behavior as the central outcome in health care, *American Psychologist*, 45, pp. 1211-1220.

Kaplan, R.M. and Hartwell, S.L. (1987) 'Differential effects of social support and social network on physiological and social outcomes in men and women with type II diabetes mellitus', *Health Psychology* 6(5), pp. 387-398.

Kara, A. and Kaynak, E. (1997) 'Markets of a single customer: exploiting conceptual developments in market segmentation', *European Journal of Marketing*, 31(11/12), pp. 873-875.

Karoly, P., Ruehlman, L.S., Ojun, M.A., Lutz, R.S., Newton, C., and Fairholme, C. (2005) 'Perceived self-regulation of exercise goals and interfering goals among regular and irregular exercisers: A life space analysis', *Psychology of Sport and Exercise*, 6(4), pp. 427-442.

Kass, G. V., (1980) 'An exploratory technique for investigating large quantities of categorical data', *Applied Statistics*, 29 (2), pp. 119-127.

Kaufman, L. and Rousseeuw, P.J. (1990) *Finding groups in data: an introduction to cluster analysis*, New York: Wiley Interscience.

Kelinske, B., Mayer, B.W., and Chen K.L. (2001) 'Perceived benefits from participation in sports: A gender study', *Women in Management Review*, 16, pp. 75-84.

Ketchen, D.J. and Shook, C.L. (1996) 'The application of cluster analysis in strategic management research: An analysis and critique', *Strategic Management Journal*, 17, pp. 441-458.

Kilpatrick, M., Herbert, E., and Bartholomew, J. (2005) 'College students' motivation for physical activity: Differentiating men's and women's motives for sport participation and exercise', *Journal of American College Health*, 54(2), pp. 87-94.

King, A.C., Blair, S.N., Bild, D.E., Dishman, R.K., Dubbert, P.M., Marcus, B.H., Oldridge, N.B., Paffenbarger, R.S., Jr, Powell, K.E., and Yaeger, K.K. (1992)

'Determinants of physical activity and interventions in adults', *Medicine and Science in Sports and Exercise*, 24(6), pp. S221-S236.

King, A.C., Pruitt, L.A., Phillips, W., Oka, R., Rodenburg, A., and Haskell, W.L. (2000) 'Comparative effects of two physical activity programs on measured and perceived physical functioning and other health-related quality of outcomes in older adults', *The Journals of Gerontology*, 55(2), pp. M74-M83.

King A.C., Rejeski J., and Buchner D.M. (1998) 'Physical activity interventions targeting older adults - a critical review and recommendations', *American Journal of Preventative Medicine*, 15(4), pp. 316-333.

King, K.A., Tergerson, J.L., and Wilson, B.R. (2008) 'Effect of social support on adolescents' perceptions of and engagement in physical activity', *Journal of physical activity and Health*, 5(3), pp. 374-384.

Klint, K.A. and Weiss, M.R. (1986) 'Dropping in and dropping out: participation motives of current and former youth gymnasts', *Canadian Journal of Applied Sport Sciences*, 11(2), pp. 106-114.

Klint, K.A. and Weiss, M.R. (1987) 'Perceived competence and motives for participating in youth sports: a test of Harter's competence motivation theory', *Journal of Sport Psychology*, 9(1), pp. 385-396.

Koestner, R., Lekes, N., Powers, T.A., and Chicoine, E., (2002) 'Attaining personal goals: self-concordance plus implementation intentions equals success', *Journal of Personality and Social Psychology*, 83(1), pp. 231-244.

Koivula, N. (1999) 'Gender stereotyping in televised media sport coverage', *Sex Roles*, 41(7/8), pp. 589-604.

Korkiakangas, E.E., Alahuhta, M.A., and Laitinen, J.H. (2009) 'Barriers to regular exercise among adults at high risk or diagnosed with type 2 diabetes: a systematic review', *Health Promotion International* 24(4), pp. 416-427.

Korman, A.K. (1974) *The psychology of motivation*, Englewood Cliffs: Prentice-Hall.

Kotler, P., Armstrong, G., Saunders, J., and Wong, V. (2002) *Principles of Marketing*, 3rd ed., Harlow: Pearson.

Kotler, P., Keller, K.L., Brady, M., Goodman, M., and Hansen, T. (2012) *Marketing Management*, 2nd ed., Harlow: Pearson.

Kremer, J. and Busby, G. (1998) 'Modelling participation motivation in sport and exercise: An integrative approach', *Irish Journal of Psychology*, 19(4), pp. 447-463.

Kremer, J., Trew, K., and Ogle, S. (1997) *Young people's involvement in sport*, London: Routledge.

Krosnick, J.A. and Smith, W.R. (1994) 'Attitude Strength', *Encyclopedia of Human Behavior*, 1, pp. 279-289.

- Kumar, R. (2005) *Research methodology: a step by step guide for beginners*, Thousand Oak: Sage.
- Kunesh, M.A., Hasbrook, C.A., and Lewthwaite, R. (1992) 'Physical activity socialization: peer interactions and effective responses among a sample of sixth grade girls', *Sociology of Sport Journal*, 9(4), pp. 385-396.
- Larson, E.B., Wang, L., Bowen, J.D., McCormick, W.C., Teri, L., Crane, P., and Kukull, W. (2006) 'Exercise is associated with reduced risk for incident dementia among persons 65 years', *Annals of Internal Medicine*, 144(2), pp. 73-81.
- Laughlin, R. (1995) 'Methodological Themes: Empirical Research in Accounting: Alternative Approaches and a Case for "Middle-Range" Thinking', *Accounting, Auditing and Accountability Journal*, 8(1), pp. 63-87.
- LePage, M.L. and Crowther, J.H. (2010) 'The effects of exercise on body dissatisfaction and affect', *Body Image*, 7(2), pp. 124-130.
- Leslie, E., Owen, N., Salmon, J., Bauman, A., Sallis, J.F., and Lo, S.K. (1999) 'Insufficiently active Australian college students: perceived personal, social and environmental influences', *Preventive Medicine*, 28(1), pp. 20-27.
- LeUnes, A. (2008) *Sport Psychology*, 8th ed., New York: Psychological Press.
- LeUnes, A.D. and Nation, J.R. (1989) *Sport psychology: an introduction*, Chicago: Nelson Hall.
- Levine, D.M., Stephan, D.F., Krehbiel, T.C., and Berenson, M.L. (2008) *Statistics for managers using Microsoft Excel*, 5th ed., Upper Saddle River: Pearson Prentice-Hall.
- Lewko, J.H. and Greendorfer, S.L. (1988) 'Family influences in sport socialization of children and adolescents', in Smoll, F.L., Magill, R.A., and Ash, M.J. (eds) *Children in Sport*, 3rd ed., Champaign: Human Kinetics.
- Lewthwaite, R. and Piparo, A.J. (1993) 'Goal orientations in young competitive athletes: physical achievement, social-relational and experiential concerns', *Journal of Research in Personality*, 27(2), pp. 103-117.
- Li, K.K. and Chan, D.K.S. (2008) 'Goal conflict and the moderating effects of intention stability in intention-behavior relations: physical activity among Hong Kong chinese', *Journal of Sport and Exercise Psychology*, 30(1), pp. 39-55.
- Lombard, D.N., Lombard, T.N., and Winett, R.A. (1995) 'Walking to meet health guidelines: the effect of prompting frequency and prompt structure', *Health Psychology*, 14(2), pp. 164-170.
- Long, B.C. and van Stavel, R. (1995) 'Effects of exercise training on anxiety: A meta-analysis', *Journal of Applied Sport Psychology*, 7(2), pp. 167-189.
- Lonsdale, C., Hodge, K., and Rose, E.A. (2008) 'The behavioral regulation in sport questionnaire (BRSQ): instrument development and initial validity evidence', *Journal of Sport and Exercise Psychology*, 30(3), pp. 323-355.

- Loomes, G. and Sugden, R. (1982) 'Regret theory: An alternative theory of rational change under uncertainty', *Economic Journal*, 92(368), pp. 805-824.
- Loumidis, K. and Roxborough, H. (1995) 'A cognitive behavioural approach to excessive exercising', British Psychological Society Sports and Exercise Psychology Section (Warwick).
- Lunn, P. (2007) *Ballpark Figures: Key research for Irish Sports Policy*, Dublin: Economic and Social Research Institute.
- Lunn, P. (2010) 'The sports and exercise life-course: a survival analysis of recall data from Ireland', *Social Science and Medicine*, 70(5), pp. 711-719.
- Lunn, P., Layte, R., and Watson, D. (2008) *The Irish Sports Monitor, First Annual Report – 2007*, Dublin: Economic and Social Research Institute.
- MacPhail, A., Kirk, D., and Kinchin, G. (2004) 'Sport education: Promoting team affiliation through physical education', *Journal of Teaching in Physical Education*, 23, pp. 106-122.
- Maehr, M.L. and Braskamp, L.A. (1986) *The motivation factor: a theory of personal investment*, Lexington: Lexington Books.
- Magidson, J., (1988) 'Improved statistical techniques for response modeling: Progression beyond regression', *Journal of Direct Marketing*, 2(4), pp. 6-18.
- Magidson, J., (1994) 'The CHAID approach to segmentation modeling: chi-squared automatic interaction detection', in Bagozzi, R.P. (ed999s) *Advanced Methods of Marketing Research*, Blackwell, Oxford: GB, pp. 118-159.
- Mahony, C. (1997) 'Age and sport participation', in Kremer, J., Trew, K., and Ogle, S. (eds) *Young people's involvement in sport*, London: Routledge.
- Malhotra, N.K. and Birks, D.F (1999) *Marketing research: an applied approach - European Edition*. England: Prentice Hall.
- Mallett, C.J., Kawabata, M., Newcombe, P., Otero-Forero, A., and Jackson, S. (2007) 'Sport motivation scale-6 (SMS-6): A revised six-factor sport motivation scale', *Psychology of Sport and Exercise*, 8(5), pp. 600-614.
- Maltby, J. and Day, L. (2001) 'The relationship between exercise motives and psychological well-being,' *The Journal of Psychology*, 135(6), pp. 651-660.
- Manson, J.E., Rimm, E.B., Stampfer, M.J., Colditz, G.A., Willet, W.C., Krolewski, A.S., Rosner, B., Hennekens, C.H., and Speizer, F.E. (1991) 'Physical activity and the incidence of non-insulin-dependent diabetes mellitus in women', *Lancet*, 338(8770), pp. 774-778.
- Marcus, B.H., Banspach, S.W., Lefebvre, R.C., Rossi, J.S., Carleton, R.A., and Abrams, D.B. (1992) 'Using the stages of change model to increase the adoption of physical activity among community participants', *American Journal of Health Promotion*, 6(6), pp. 424-429.

- Marcus, B.H., King, T.K., Clark, M.M., Pinto, B.M., and Bock, B.C. (1996) 'Theories and techniques for promoting physical activity behaviours', *Sports Medicine*, 22(5), pp. 321-331.
- Marcus, B.H. and Owen, N. (1992) 'Motivational readiness, self efficacy and decision making for exercise', *Journal of Applied Social Psychology*, 22(1), pp. 3-16.
- Markland, D. and Hardy, L. (1993) 'The exercise motivations inventory: preliminary development and validity of a measure of individuals' reasons for participation in regular physical exercise', *Personality and Individual Differences*, 15(3), pp. 289-296.
- Markland, D. and Ingledew, D.K. (1997) 'The measurement of exercise motives: factorial validity and invariance across gender of a revised exercise motivations inventory', *British Journal of Health Psychology*, 2(4), pp. 361-376.
- Markland, D. and Ingledew, D.K. (2007) 'Exercise participation motives: A self-determination theory perspective', in Hagger, M.S. and Chatzirisantis, N. (eds) *Intrinsic motivation and self-determination theory in exercise and sport*, Champaign: Human Kinetics, pp. 23-34.
- Markland, D., Ingledew, D.K., Hardy, L., and Grant, L. (1992) 'A comparison of the exercise motivations of aerobics participants and weight-watcher exercisers', *Journal of Sports Sciences*, 10, pp. 609-610.
- Marsh, H.W. (1993) 'The multidimensional structure of physical fitness: Invariance over gender and age', *Research Quarterly for Exercise and Sport*, 64(3), pp. 256-273.
- Marshall, S. and Biddle, S.J. (2001) 'The transtheoretical model of behavior change: a meta-analysis of applications to physical activity and exercise', *Annals of Behavioral Medicine*, 23(4), pp. 229-246.
- Martens, R. (1987) *Coaches guide to sport psychology*, Illinois: Human Kinetics.
- Martineau, P. (1958) 'Social classes and spending behavior', *Journal of Marketing*, 23(2), pp. 121-130.
- Martinez-Gonzalez, M.A., Martinez, J.A., Hu, F.B., Gibney, M.J., and Kearney J. (1999) 'Physical inactivity, sedentary lifestyle and obesity in the European Union', *International Journal of Obesity and Related Metabolic Disorders*, 23(11), pp. 1192-1201.
- Marttila, J. and Nupponen, R. (2000) 'Health enhancing physical activity as perceived in interviews based on the theory of planned behaviour', *Psychology and Health*, 15(5), pp. 593-608.
- Maylor, H. and Blackmon, K. (2005) *Researching Business and Management*, Palgrave Macmillan: NY.
- McArdle, W.D., Katch, F.I., and Katch, V.L. (1991) *Exercise physiology: energy, nutrition and human performance*, Philadelphia: Lea & Febiger.

- McAuley, E. and Blissmer, B. (2000) 'Social cognitive determinants and consequences of physical activity', *Exercise and Sports Science Reviews*, 21, pp. 85-88.
- McAuley, E., Courneya, K.S., Rudolf, D.L., and Lox, C.L. (1994) 'Enhancing exercise adherence in middle-aged males and females', *Preventive Medicine*, 23(4), pp. 495-506.
- McAuley, E., Peña, M.M., and Jerome, G.J. (2001) 'Self-efficacy as a determinant and an outcome of exercise', in Roberts, G.C. (eds) *Advances in motivation in sport and exercise*, United States: Human Kinetics, pp. 235-261.
- McDonald, M.A., Milne, G.R., and Hong, J. (2002) 'Motivational factors for evaluating sport spectator and participant markets', *Sports Marketing Quarterly*, 11(2), pp. 100-113.
- McDonald, K. and Thompson, J.K. (1992) 'Eating disturbance, body image dissatisfaction, and reasons for exercising: Gender differences and correlational findings', *The International Journal of Eating Disorders*, 11(3), pp. 289-292.
- McInerney, D.M., and Van Etten, S. (2004) *Big Theories Revisited: Research on Sociocultural Influences on Motivation and Learning*, USA: Information Age.
- McNabb, D.E. (2002) *Research methods in public administration and nonprofit management: quantitative and qualitative approaches*, New York: M.E. Sharpe.
- McNeill, M.C. and Wang, C.K.J. (2005) 'Psychological profiles of elite school sports players in Singapore', *Psychology of Sport and Exercise*, 6(1), pp. 117-128.
- McPherson, B.D. and Brown, B.A. (1988) 'The structure, processes and consequences of sport for children', in Smoll, F.L., Magill, R.A., and Ash, M.J. (eds) *Children in Sport*, Champaign: Human Kinetics, pp. 265-286.
- McPherson, B.D., Curtis, J.E., and Loy, J.W. (1989) *The social significance of sport: An Introduction to the Sociology of Sport*, Illinois: Human Kinetics.
- Melia, M. and Heckerman, D. (1998) 'An experimental comparison of several clustering and initialization methods', *Microsoft Research Technical Report* [Online]. Available at: <http://research.microsoft.com> (Accessed: 10 December, 2011).
- Melillo, K.D., Williamson, E., Futrell, M., and Chamberlain, C. (1997) 'A self-assessment tool to measure older adults' perceptions regarding physical fitness and exercise activity', *Journal of Advanced Nursing*, 25(6), pp. 1220-1226.
- Miller, A.M. and Iris, M. (2002) 'Health promotion attitudes and strategies in older adults', *Health Education and Behavior*, 29(2), pp. 249-267.
- Milligan, G.W. (1980) 'An examination of the effect of six types of error perturbation on fifteen clustering algorithms', *Psychometrika*, 45(3), pp. 325-342.
- Milligan, G.W. (1996) 'Clustering validation: Results and implications for applied analyses', in Arabie, P., Hubert, L.J., and de Soete G. (eds) *Clustering and Classification*, pp. 341-375, Singapore: World Scientific.

- Milne, G.R., Sutton, W.A., and McDonald, M.A. (1996) 'Niche analysis: a strategic measurement tool for sport managers', *Sport Marketing Quarterly*, 5(3), pp. 15-22.
- Mitchell, A. (1983) *The nine American lifestyles: Who we are and where we're going*, New York: Warner.
- Mitchell, A. (1984) *Inner selves: Americans as they see themselves*, California: Values and Lifestyles Program.
- Mooi, E. and Sarstedt, M. (2011) *A concise guide to market research: the process, data, and methods (using IBM SPSS statistics)*, Heidelberg: Springer.
- Morgan, D. L., (1998) 'Practical strategies for combining qualitative and quantitative methods: Applications to health research', *Qualitative Health Research*, 8(3), pp. 362-376.
- Morgan, G. (1983) 'Research strategies: Modes of engagement', in Morgan, G. (eds) *Beyond method: Strategies for Social Research*, Beverly Hills: Sage, pp. 19-42.
- Morris, L., Sallybanks, J., Willis, K., and Makkai, T. (2003) 'Sport, physical activity and antisocial behaviour in youth', *Australian Institute of Criminology - Research and Public Policy Series*, 49, pp. 41-46.
- Moscardo, G., Pearce, P., and Morrison, A. (2001) 'Evaluating different bases for market segmentation: a comparison of geographic origin versus activity participation for generating tourism market segments', *Journal of Travel and Tourism Marketing*, 10(1), pp. 29-49.
- Motulsky, H.J. and Brown, R.E. (2006) 'Detecting outliers when fitting data with nonlinear regression - a new method based on robust nonlinear regression and the false discovery rate', *BMC Bioinformatics*, 7(123), pp. 1-20.
- Mullan, E. and Markland, D. (1997) 'Variations in self-determination across the stages of change for exercise in adults', *Motivation and Emotion*, 21(4), pp. 349-362.
- Mullan, E., Markland, D., and Ingledew, D.K. (1997) 'A graded conceptualization of self-determination in the regulation of exercise behaviour: development of a measure using confirmatory factor analytic procedures', *Personality and Individual Differences*, 23(5), pp. 745-752.
- Mullen, P.E., Burgess, P., Wallace, C., Palmer, S., and Ruschena, D. (2000) 'Community care and criminal offending in schizophrenia', *Lancet*, 355(9204), pp. 614-617.
- Mullin, B., Hardy, S., and Sutton, W.A. (2007) *Sport Marketing*. 3rd ed., Champaign: Human Kinetics.
- Murcia, J.A.M., Gimeno E.C., and Camacho A.M. (2007) 'Measuring self-determination motivation in a physical fitness setting: validation of the Behavioral Regulation in Exercise Questionnaire-2 (BREQ-2) in a Spanish sample', *Journal of Sports Medicine and Physical Fitness*, 47(3), pp. 366-374.

- Mutrie, N., Carney, C., Blamey, A., Crawford, F., Aitchison, T., and Whitelaw, A. (2002) '“Walk in to workout”: A randomised controlled trial of self help intervention to promote active commuting', *Journal of Epidemiology and Community Health*, 56(6), pp. 407-412.
- Myers, L.B. (1996) 'The attributional style of repressive individuals', *Journal of Social Psychology*, 136(1), pp. 127-128.
- Nicholls, J.G. (1984) 'Achievement motivation: conceptions of ability, subjective experience, task choice, and performance', *Psychological Review*, 91(3), pp. 328-346.
- Nigg, C.R., Courneya, K.S., and Estabrooks, P.A. (1997) 'Maintaining attendance at a fitness center: an application of the decision balance sheet', *Behavioral Medicine*, 23(3), pp. 130-137.
- Nguyen-Michel, S.T., Unger, J.B., Hamilton, J., and Spruijt-Metz, D. (2006) 'Associations between physical activity and perceived stress/hassles in college students', *Stress and Health*, 22(3), pp. 179-188.
- Norman, P., Conner, M., and Bell, R. (2000), 'The theory of planned behaviour and exercise: Evidence for the moderating role of past behaviour', *British Journal of Health Psychology*, 5(3), pp. 249-261.
- Norman, G.J., Schmid, B.A., Sallis, J.F., Calfas, K.J., and Patrick, K. (2005) 'Psychosocial and environmental correlates of adolescent sedentary behaviours', *Pediatrics*, 116(4), pp. 908-916.
- Ntoumanis, N. (2002) 'Motivational clusters in a sample of British physical education classes', *Psychology of Sport and Exercise*, 3(3), pp. 177-194.
- Ntoumanis, N. and Biddle, S.J.H. (1998) 'The relationship between competitive anxiety, achievement goals, and motivational climates', *Research Quarterly for Exercise and Sport*, 69(2), pp. 176-187.
- Ntoumanis, N. and Biddle, S.J.H. (1999) 'A review of motivational climate in physical activity', *Journal of Sport Sciences*, 17(8), pp. 643-665.
- Ntoumanis, N., Biddle, S.J.H., and Haddock, G. (1999) 'The mediating role of coping strategies on the relationship between achievement motivation and affect in sport', *Anxiety, Stress, and Coping: An International Journal*, 12(3), pp. 299-327.
- Oman, R.F. and King, A.C. (1998) 'Predicting adoption and maintenance of exercise participation using self-efficacy and previous exercise participation rates', *American Journal of Health Promotion*, 12(3), pp. 154-161.
- Orbell, S., Hodgkins, S., and Sheeran, P. (1997) 'Implementation intentions and the Theory of Planned Behavior', *Personality and Social Psychology Bulletin*, 23(9), pp. 953-962.
- Orbell, S. and Sheeran, P. (2000) 'Motivational and volitional processes in action initiation: A field study of implementation intentions', *Journal of Applied Social Psychology*, 30(4), pp. 780-797.

- Osgood, C.E., Suci, G.J., and Tannenbaum, P.H. (1957) *The measurement of meaning*, Chicago: University of Illinois Press.
- Paffenbarger, R.S., Jr. and Lee, I-M. (1996) 'Physical activity for health and longevity', *Research Quarterly for Exercise and Sport*, 67(3), pp. S11-S28.
- Palmer, C.L., Burwitz, L., Dyer, A.N., and Spray, C.M. (2005) 'Endurance training adherence in elite junior netball athletes: A test of the theory of planned behaviour and a revised theory of planned behaviour', *Journal of Sports Sciences*, 23(3), pp. 277-288.
- Palmer, R.A. and Millier, P. (2004) 'Segmentation: Identification, intuition, and implementation', *Industrial Marketing Management*, 33(8), pp. 779-785.
- Paluska, S.A. and Schwenk, T.L. (2000) 'Physical activity and mental health: current concepts', *Sports Medicine*, 29(3), pp. 167-180.
- Passer, M.W. (1981) 'Children in sport: participation motives and psychological stress', *Quest*, 33(2), pp. 231-244.
- Patton, M.Q. (2002) *Qualitative research and evaluation methods*, 3rd edn. Thousand Oaks, CA: Sage.
- Peddle, C.J., Plotnikoff, R.C., Wild, T.C., Au, H.J., and Courneya, K.S. (2008) 'Medical, demographic, and psychosocial correlates of exercise in colorectal cancer survivors: An application of self-determination theory', *Supportive Care in Cancer*, 16(1), pp. 9-17.
- Pelletier, L.G., Fortier, M.S., Vallerand, R.J., Tuson, K.M., Brière, N.M., and Blais, M.R. (1995) 'Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The Sport Motivation Scale (SMS)', *Journal of Sport and Exercise Psychology*, 17, pp. 35-53.
- Pelletier, L.G., Rocchi, M.A., Vallerand, R.J., Deci, E.L., and Ryan, R.M. (2013) 'Validation of the revised sport motivation scale (SMS-II)', *Psychology of Sport and Exercise*, 14(33), pp. 329-341.
- Pelletier, L.G., Vallerand, R.J., and Sarrazin, P. (2007) 'The revised six-factor sport motivation scale (Mallett, Kawabata, Newcombe, Otero-Forero, and Jackson, 2007): Something old, something new, and something borrowed', *Psychology of Sport and Exercise*, 8(5), pp. 615-621.
- Pender, N.J. (1996) *Health promotion in nursing practice*, Stamford: Appleton and Lange.
- Penedo, F.J. and Dahn, J.R. (2005) 'Exercise and well-being: A review of mental and physical health benefits associated with physical activity', *Current Opinion in Psychiatry*, 18(2), pp. 189-193.
- Pensgaard, A.M., and Roberts, G.C. (2002) 'Elite athletes' experiences of the motivational climate: The coach matters', *Scandinavian Journal of Medicine and Science in Sports*, 12, pp. 54-59.

- Perugini, M. and Bagozzi, R.P. (2001) 'The role of desires and anticipated emotions in goal-directed behaviours: Broadening and deepening the Theory of Planned Behaviour', *British Journal of Social Psychology*, 40(1), pp. 79-98.
- Peter, J.P. and Olson, J.C. (1987) *Consumer Behaviour: Marketing Strategy Perspectives (The Irwin series in marketing)*, Illinois: Irwin.
- Petruzzello, S.J., Landers, D.M., Hatfield, B.D., Kubitz, K.A., and Salazar, W. (1991) 'A meta-analysis on the anxiety-reducing effects of acute and chronic exercise. Outcomes and mechanisms', *Sports Medicine*, 11(3), pp. 143-182.
- Pettay, R.F. (2008) 'Motivational interviewing in advising: Working with student to change', *National Conference 2008 - Taking advising to new heights*, Chicago: National Academic Advising Association.
- Piercy, N.F. and Morgan, N.A. (1993) 'Strategic and operational market segmentation: A managerial analysis', *Journal of Strategic Marketing*, 1(2), pp. 123-140.
- Plante, T.G., Coscarelli, L., and Ford, M. (2001) 'Does exercising with another enhance the stress-reducing benefits of exercise?' *International Journal of Stress Management*, 8(3), pp. 201-213.
- Plante, T.G. and Rodin, J. (1990) 'Physical fitness and enhanced psychological health', *Current Psychology: Research & Reviews*, 9(1), pp. 3-24.
- Plonczynski, D.J. (2000) 'Measurement of motivation for exercise', *Health Education Research*, (15)6, pp. 695-705.
- Plummer, O.K. and Koh, Y.O. (1987) 'Effect of "aerobics" on self-concepts of college women', *Perceptual and Motor Skills*, 65, pp. 271-275.
- Powell, K.E. (1988) 'Habitual exercise and public health: An epidemiologic view', in Dishman, R. (eds) *Exercise adherence: its impact on public health*, Champaign: Human Kinetics, pp.15-39.
- Prestwich, A., Lawton, R.J., and Conner, M.T. (2003) 'The use of implementation intentions and the decision balance sheet in promoting exercise behaviour', *Psychology and Health*, 18(6), pp. 707-721.
- Prochaska, J.O., Butterworth, S., Redding, C.A., Burden, V., Perrin, N., Leo, M., Flaherty-Robb, M., and Prochaska, J.M. (2008) 'Initial efficacy of MI, TTM tailoring and HRI's with multiple behaviors for employee health promotion', *Preventive Medicine*, 46(3), pp. 226-231.
- Prochaska, J.O. and DiClemente, C.C. (1983) 'Stages and processes of self-change of smoking: Toward an integrative model of change', *Journal of Consulting and Clinical Psychology*, 51(3), pp. 390-395.
- Prochaska, J.O. and Marcus, B.H. (1994) 'The transtheoretical model: applications to exercise', in Dishman, R.K. (eds) *Advances in Exercise Adherence*, Champaign: Human Kinetics, pp. 161-180.

- Prochaska, J.O., Redding, C.A., and Evers, K.E. (2009) 'The transtheoretical model and stages of change', in Glanz, K., Rimer, B.K., and Viswanati, K. (eds) *Health behavior and health education: theory, research and practice*, 4th ed., San Francisco: Jossey-Bass.
- Pullman, A.W., Masters, R.C., Zalot, L.C., Carde, L.E., Saraiva, M.M., Dam, Y.Y., Randall Simpson, J.A., and Duncan, A.M., (2009) 'Effect of the transition from high school to university on anthropometric and lifestyle variables in males', *Applied Physiology Nutrition and Metabolism*, 34(2), pp. 162-171.
- Punj, G. and Stewart, D.W. (1983) 'Cluster analysis in marketing research: review and suggestions for application', *Journal of Marketing Research*, 20(2), pp. 134-148.
- Quindry, J.C., Yount, D., O'Bryant, H., and Rudisill, M.E. (2011) 'Exercise engagement is differentially motivated by age-dependent factors', *American Journal of Health Behavior*, 35(3), pp. 334-345.
- Quinn, L., Hines, T., and Bennison, D. (2007) 'Making sense of market segmentation: a fashion retailing case', *European Journal of Marketing*, 41(5/6), pp. 439-465.
- Ransford, H.E. and Palisi, B.J. (1996) 'Aerobic exercise, subjective health and psychological well-being within age and gender subgroups', *Social Science and Medicine*, 42(11), pp. 1555-1559.
- Rasmussen, K. (2000) 'The Changing Sports Scene', *Educational Leadership*, 57(4), pp. 26-29.
- Remenyi, D., Williams, B., Money, A., and Swartz, E. (1998) *Doing research in business and management*, London: Sage Publications, pp. 309.
- Reynolds, P.D. (1971) *A Primer in theory construction*, New York: Bobbs-Merrill.
- Rhodes, R.E. and Conner, M. (2010) 'Comparison of behavioral belief structures in the physical activity domain', *Journal of Applied Social Psychology*, 40(8), pp. 2105-2120.
- Rhodes, R.E. and Courneya, K.S. (2003) 'Investigating multiple components of attitude, subjective norm, and perceived control: An examination of the theory of planned behaviour in the exercise domain', *British Journal of Social Psychology*, 42(1), pp. 129-146.
- Rhodes, R.E. and Courneya, K.S. (2004) 'Differentiating motivation and control in the Theory of Planned Behavior', *Psychology, Health and Medicine*, 9(2), pp. 205-215.
- Rhodes, R.E. and de Bruijn, G.J. (2013) 'How big is the physical activity intention-behaviour gap? A meta-analysis using the action control framework', *British Journal of Health Psychology*, 18(2), pp. 296-309.
- Rhodes, R.E. and Dean, R.N. (2009) 'Understanding physical inactivity: Prediction of four leisure-time sedentary behaviors', *Leisure Sciences*, 31(2), pp. 124-135.

- Rhodes, R.E. and Pfaeffli, L.A. (2010) 'Mediators of behaviour change among adult non-clinical populations: a review update', *International Journal of Behavioral Nutrition and Physical Activity*, 7(37), pp. 1-11.
- Rhodes, R.E. Blanchard, C.M., and Blacklock, R.E. (2008) 'Do physical activity beliefs differ by age and gender?' *Journal of Sport and Exercise Psychology*, 30(3), pp. 412-423.
- Rhodes, R.E., Blanchard, C.M., and Matheson, D.H. (2006) 'A multicomponent model of the theory of planned behaviour', *British Journal of Health Psychology*, 11(1), pp. 119-137.
- Rhodes, R.E., Courneya, K.S., and Bobick, T.M. (2001) 'Personality and exercise participation across the breast cancer experience', *Psycho-Oncology*, 10(5), pp. 380-388.
- Rhodes, R.E., Coumeya, K.S., and Hayduk, L.A. (2002) 'Does personality moderate the theory of planned behavior in the exercise domain?', *Journal of Sport and Exercise Psychology*, 24(2), pp. 120-132.
- Rhodes, R.E., Courneya, K.S., and Jones, L.W. (2002) 'Personality, the theory of planned behavior, and exercise: A unique role for extroversion's activity facet', *Journal of Applied Social Psychology*, 32(8), pp. 1721- 1736.
- Rhodes, R.E, Mark, R.S., and Temmel, C.P. (2012) 'Adult sedentary behavior: a systematic review', *American Journal of Preventive Medicine*, 42(3), pp. 3-28.
- Rhodes, R.E., Plotnikoff, R.C., and Spence, J.C. (2004) 'Creating parsimony at the expense of precision? Conceptual and applied issues of aggregating belief-based constructs in physical activity research', *Health Education Research*, 19, pp. 392-405.
- Rivis, A. and Sheeran, P. (2003) 'Descriptive norms as an additional predictor in the theory of planned behaviour: A meta-analysis', *Current Psychology: Developmental, Learning, Personality, Social*, 22(3), pp. 218-233.
- Robbins, L.B., Stommel, M., and Hamel, L.M. (2008) 'Social support for physical activity of middle school students', *Public Health Nursing*, 25(5), pp. 451-460.
- Roberts, G.C. (1992) *Motivation in sport and exercise*, Champaign: Human Kinetics.
- Roberts, G.C. (2001) *Advances in motivation in sport and exercise*, Champaign: Human Kinetics.
- Roberts, G.C., Treasure, D.C., and Balague, G. (1998) 'Achievement goals in sport: Development and validation of the perception of success questionnaire', *Journal of Sport Sciences*, 16(4), pp. 337-347.
- Robinson, V. (2004) 'Taking risks: identity, masculinities and rock climbing', in Wheaton, B. (eds) *Understanding lifestyle sports: consumption, identity and difference*, London: Routledge, pp. 113-130.

- Robison, J.I. and Rogers, M.A. (1994) 'Adherence to exercise programmes. Recommendations', *Sports Medicine*, 17(1), pp. 39-52.
- Robson, C. (2007) *How to do a research project: a guide for undergraduate students*, Oxford: Blackwell.
- Rogers, R.W. (1975) 'A protection motivation theory of fear appeals and attitude change', *Journal of Psychology*, 91(1), pp. 93-114.
- Rogers, R.W. (1983) 'Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation', in Cacioppo, J. and Petty, R. (eds) *Social Psychophysiology*, New York: Guilford Press.
- Rodgers, W.M., Brawley, L.R. (1991) 'The role of outcome expectancies in participation motivation', *Journal of Sport and Exercise Psychology*, 13(4), pp. 411-427.
- Rodgers, W.M. and Gauvin, L. (1998) 'Heterogeneity of incentives for physical activity and self-efficacy in highly active and moderately active women exercisers', *Journal of Applied Social Psychology*, 28(11), pp. 1016-1029.
- Rohm, A.J., Milne, G.R., and McDonald, M.A. (2006) 'A mixed-method approach for developing market segmentation typologies in the sports industry,' *Sport Marketing Quarterly*, 15(1), pp. 29-39.
- Romesburg, H.C. (1990) *Cluster analysis for researchers cluster analysis for researchers*, Malabar: Robert E. Krieger Publishing Co.
- Rose, E.A., Parfitt, G., and Williams, S. (2005) 'Exercise causality orientations, behavioural regulation for exercise and stage of change for exercise: Exploring their relationships', *Psychology of Sport and Exercise*, 6(4), pp. 399-414.
- Rosenstock, I.M. (1974) 'The health belief model and preventive health behavior', *Health Education and Behavior*, 2(4), pp. 354-386.
- Rovniak L.S., Anderson E.S., Winett R.A., and Stephens R.S. (2002) 'Social cognitive determinants of physical activity in young adults: A prospective structural equation analysis', *Annals of Behavioral Medicine*, 24(2), pp. 149-156.
- Rowland, T.W. and Freedson, P.S. (1994) 'Physical activity, fitness, and health in children: a close look', *Pediatrics*, 93(4), pp. 669- 672.
- Ruchlin, H.S. and Lachs, M.S. (1999), 'Prevalence and correlates of exercise among older adults', *Journal of Applied Gerontology*, 18(3), pp. 341-357.
- Rudnicki, J. and Wankel, L. (1988) 'Employee fitness program effects upon long-term fitness involvement', *Fitness in Business*, 3(2), pp. 123-129.
- Ryan, R.M. (1991) 'The nature of the self in autonomy and relatedness', in Strauss, J. and Goethals G.R. (eds) *The self: Interdisciplinary approaches*. New York: Springer-Verlag.

- Ryan, R.M. and Deci, E.L. (2000) 'Self-determination theory and the facilitation of intrinsic motivation, social development and well-being', *American Psychologist*, 55(1), pp. 68-78.
- Ryan, R.M., Fredrick, C.M., Lepas, D., Rubio, N., and Sheldon, K.M. (1997) 'Intrinsic motivation and exercise adherence', *International Journal of Sport Psychology*, 28(4), pp. 335-354.
- Ryan, R.M., Vallerand, R.J., and Deci, E.L. (1984) 'Intrinsic motivation in sport: A cognitive evaluation theory interpretation', in Straub, W.F. and Williams, J.M. (eds) *Cognitive sport psychology*. New York: Sport Science Associates, pp. 230-242.
- Ryan, R.M., Williams, G.C., Patrick, H., and Deci, E.L. (2009) 'Self-determination theory and, physical activity: the dynamics of motivation in development and wellness', *Hellenic Journal of Psychology*, 6, pp. 107-124.
- Ryckman, R.M. and Hamel, J. (1993) 'Perceived physical ability differences in sport participation motives of young athletes', *International Journal of Sport Psychology*, 24(3), pp. 270-283.
- Ryckman, R.M. and Hamel, J. (1995) 'Male and female adolescents' motives related to involvement in organised team sports', *International Journal of Sports Psychology*, 26, pp. 383-397.
- Sallis, J.F. (1999) 'Influences on physical activity of children, adolescents, and adults', in Corbin, C.B. and Pangrazi, R.P. (eds) *Toward a better understanding of physical fitness and activity*, Scottsdale: Holcomb Hathaway, pp. 27-32.
- Sallis, J.F. and Owen, N. (2002) 'Ecological models of health behavior', in Glanz, K., Rimer, B.K., and Lewis, F.M. (eds) *Health Behavior and Health Education: Theory, Research, and Practice*, 3rd ed., San Francisco: Jossey-Bass, pp. 462-484.
- Sallis, J.F., Zakarian, J.M., Hovell, M.F., and Hofstetter, C.R. (1996) 'Ethnic, socioeconomic, and sex differences in physical activity among adolescents', *Journal of Clinical Epidemiology*, 49(2), pp. 125-134.
- Salmon, J., Owen, N., Bauman, A., Schmitz, M.K.H., and Booth, M. (2000) 'Leisure-time, occupational, and household physical activity among professional, skilled, and less-skilled workers and homemakers', *Preventive Medicine*, 30(3), pp. 191-199.
- Sapsford, R. and Jupp, V. (2006) *Data collection and analysis*, 2nd ed., London: Sage.
- Satariano, W.A., Haight, T.J., and Tager, I.B. (2000) 'Reasons given by older people for limitation or avoidance of leisure time physical activity', *Journal of the American Geriatric Society*, (48), pp. 505-512.
- Saunders, J.A. (1980) 'Cluster analysis for market segmentation', *European Journal of Marketing*, 14(7), pp. 422-435
- Saunders, M., Lewis, P., and Thornhill, A. (2009) *Research methods for business students*, 5th ed., Harlow: Pearson.

- Scanlan, T.K. and Simons, J.P. (1992) 'The construct of sport enjoyment', in Roberts, G.C. (eds) *Motivation in sport and exercise*, Champaign: Human Kinetics, pp. 199-215.
- Scanlan, T.K., Carpenter, P.J., Schmidt, G.W., Simons, J., and Keeler, B. (1993) 'An introduction to the sport commitment model', *Journal of Sport and Exercise Psychology*, 15(1), pp. 1-15.
- Schilling, T.A. and Hayashi, C.T. (2001) 'Achievement motivation among high school basketball and cross-country athletes: a personal investment perspective', *Journal of Applied Sport Psychology*, 13(1), pp. 103-128.
- Schmidt, G.W. and Stein, G.L. (1991) 'Sport commitment: a model integrating enjoyment, dropout and burnout', *Journal of Sport and Exercise Psychology*, 13(3), pp. 254-265.
- Scully, D. and Clarke, J. (1997) 'Gender Issues in Sport Participation', in *Young people's involvement in sport* (eds) Kremer, J., Trew, K., and Ogle, S., London, Routledge, pp. 25-63.
- Scully, D., Kremer, J., Meade, M.M., Graham, R., and Dudgeon, K. (1998) 'Physical exercise and psychological well being: a critical review', *British Journal of Sports Medicine*, 32(2), pp. 111-120.
- Sekaran, U. (1992) *Research Methods for Business - A skill building approach*, 2nd ed., United States of America: John Wiley and Sons.
- Shank, G.D. (2002) *Qualitative research: a personal skills approach*, Upper Saddle River: Prentice Hall.
- Shank, M.D. (2005) *Sports marketing: a strategic perspective*, 3rd ed., Upper Saddle River: Prentice Hall.
- Shannon, J.R. (1999) 'Sports marketing: an examination of academic marketing publication', *Journal of Services Marketing*, 13(6), pp. 517-535 .
- Sheeran, P., Norman, P., and Orbell, S. (1999) 'Evidence that intentions based on attitudes better predict behaviour than intentions based on subjective norms', *European Journal Of Social Psychology*, 29(2-3), pp. 403-406.
- Sheeran, P. and Orbell, S. (2000) 'Using implementation intentions to increase attendance for cervical cancer screening', *Health Psychology*, 19(3), pp. 283-289.
- Sheeran, P. and Taylor, S. (1999) 'Predicting intentions to use condoms: A meta-analysis and comparison of the theories of reasoned action and planned behavior', *Journal of Applied Social Psychology*, 29(8), pp. 1624-1675.
- Sheth, J.N., Mittal, B., and Newman, B.I. (1999) *Customer behaviour: consumer behaviour and beyond*, Dryden Press: Illinois.
- Sheth, J.N., Sisodia R.S., and Sharma, A. (2000) 'The antecedents and consequences of customer-centric marketing', *Journal of the Academy of Marketing Science*, 28(1), pp. 55-66.

- Silberstein, L.R., Striegel-Moore, R.H., Timko, C., and Rodin, J. (1988) 'Behavioural and psychological implications of body dissatisfaction: Do men and women differ?', *Sex Roles*, 19(3/4), pp. 219-232.
- Simkin, L.R. and Gross, A.M. (1994) 'Assessment of coping with high-risk situations for exercise relapse among healthy women', *Health Psychology*, 13(3), pp. 274-277.
- Simonsick, E.M., Guralnik J.M., and Fried, L.P. (1999) 'Who walks? Factors associated with walking behavior in disabled older women with and without self-reported walking difficulty', *Journal of American Geriatric Society*, 47(6), pp. 672-680.
- Singer, R.N., Hausenblas, H.A., and Janelle, C.M. (2001) *Handbook on sport psychology*, New York: John Wiley & Sons.
- Skelton, D.A., Greig, C.A., Davies, J.M, and Young, A. (1994) 'Strength, power and related functional ability of healthy people aged 65-89 years', *Age and Aging*, 23(5), pp. 371-377.
- Skelton, D.A., Young, A., Greig, C.A., and Malbut, K.E. (1995) 'Effects of resistance training on strength, power, and selected functional abilities of women aged 75 and older', *Journal of the American Geriatric Society*, 43(10), pp. 1081-1087.
- Skinner, E.A. (1995) *Perceived control, motivation, and coping*, Newbury Park: Sage.
- Skinner, E.A. (1996) 'A guide to constructs of control', *Journal of Personality and Social Psychology*, 71(3), pp. 549-570.
- Smith, W.R. (1956) 'Product differentiation and market segmentation as alternative marketing strategies', *Journal of Marketing*, 21(1), pp. 3-8.
- Smith, R.E. (1989) 'Athletic stress and burnout: Conceptual models and intervention strategies', in Hackfort, D. and Spielberger, C.D. (eds) *Anxiety in sport: an international perspective*, New York: Hemisphere.
- Smith, A.L. (2003) 'Peer relationships in physical activity contexts: A road less travelled in youth sport and exercise psychology research', *Psychology of Sport and Exercise*, 4, pp. 25-39.
- Smith, B.L., Handley, P., and Eldredge, D.A. (1998) 'Sex differences in exercise motivation and body-image satisfaction among college students', *Perceptual and Motor Skills*, 86(2), pp. 723-732.
- Smith, J.R. and Lewis, W.R. (2008) 'Do as we say and as we do: The interplay of descriptive and injunctive group norms in the attitude-behavior relationship', *British Journal of Social Psychology*, 47(4), pp. 647-666.
- Smith, R.E. and Smoll, F.L. (1996) *Way to go, Coach! A scientifically proven approach to coaching effectiveness*, Portola Valley: Warde.
- Smith, J.R. and Terry, D.J. (2003) 'Attitude-behaviour consistency: the role of group norms, attitude accessibility, and mode of behavioural decision-making', *European Journal of Social Psychology*. 33(5), pp. 591-608.

- Smith, R.E. (1986) 'Toward a cognitive-affective model of athletic burnout', *Journal of Sport Psychology*, 8(1), pp. 36-50.
- Smoll, F.L. and Smith, R.E. (1996) *Children and youth in sport: a biopsychosocial perspective*, Madison: Brown and Benchmark.
- Sonstroem, R.J. (1988) 'Psychological models', in Dishman, R.K. (eds) *Exercise adherence: Its impact on public health*, Champaign: Human Kinetics, pp. 125-153.
- Sparks, P. and Guthrie, C.A. (1998) 'Self-identity and the theory of planned behavior: A useful addition or an unhelpful artifice?' *Journal of Applied Social Psychology*, 28(15), pp. 1393-1410.
- Sparks, P., Guthrie, C.A., and Shepherd, R. (1997) 'The dimensional structure of the perceived behavioral control construct', *Journal of Applied Social Psychology*, 27(5), pp. 418-438.
- Sports Council and Health Education Authority (1992) *Allied Dunbar National Fitness Survey: Main Findings*. London: Author.
- SPSS (2001) *The SPSS TwoStep Cluster Component: A scalable component enabling more efficient customer segmentation* [Online]. Available at: <http://www.spss.ch/> (Accessed: 18 October 2012)
- Stamm, H. and Lamprecht, M. (2005) 'Structural and cultural factors influencing physical activity in Switzerland', *Journal of Public Health*, 13(4), pp. 203-211.
- Standage, M., Duda, J.L., and Ntoumanis, N. (2003) 'A model of contextual motivation in physical education: Using constructs and tenets from self-determination and goal perspective theories to predict leisure-time exercise intentions', *Journal of Educational Psychology*, 95, pp. 97-110.
- Steenkamp, J.B.E.M., and ter Hofstede, F. (2002) 'International market segmentation: Issues and perspectives', *International Journal of Research in Marketing*, 19(3), pp. 185-21.
- Steptoe, A. and Wardle, J. (1999) 'Motivational factors as mediators of socioeconomic variations in dietary intake patterns', *Psychology & Health*, 14(3), pp. 391-402.
- Sternfeld, B., Ainsworth, B.E., and Quesenberry, C.P. Jr., (1999) 'Physical activity patterns in a diverse population of women', *Preventive Medicine*, 28(3), pp. 313-323.
- Stewart, D.W. and Kamins, M.A. (1993) *Secondary research. Information sources and methods*, 2nd ed., Newbury Park: Sage.
- Stewart, B., Smith, A.C.T., and Nicholson, M. (2003) 'Sport consumer typologies: a critical review', *Sport Marketing Quarterly*, 12(4), pp. 206-216.
- Storr, A. (1970) *Human Aggression*, New York: Atheneum.
- Strelan, P. and Hargreaves, D. (2005) 'Reasons for exercise and body esteem: men's responses to self-objectification', *Sex Roles*, 53(7/8), pp. 495-503.

Strelan, P., Mehaffey, S.J., and Tiggemann, M. (2003) 'Self-objectification and esteem in young women: the mediating role of reasons for exercise', *Sex Roles*, 48(1/2), pp. 89-95.

Strong, H.A., Ginis, K.A.M., Mack, D.E., and Wilson, P.M. (2006) 'Examining self presentational exercise motives and social physique anxiety in men and women', *Journal of Applied Biobehavioral Research*, 11(3-4), pp. 209-225.

Strong, W.B., Malina, R.M., Bumkie, C.J., Dishman, R.K., Gutin, B., Hergenroeder, A.C., Must, A., Nixon, P.A., Pivarnik, J.M., Rowland, T., Trost, S., and Trudeau, F. (2005) 'Evidence based physical activity for school-age youth', *Journal of Pediatrics*, 146(6), pp. 732-737.

Stuntz, C.P. and Weiss, M.R. (2010) 'Motivating children and adolescents to sustain a physically active lifestyle', *American Journal of Lifestyle Medicine*, 4(5), pp. 433-444.

Sutton, S. (2003) 'Testing attitude-behavior theories using non-experimental data: An examination of some hidden assumptions', *European Review of Social Psychology*, 13(1), pp. 293-323.

Tabachnick, B.G. and Fidell, L.S. (2001) *Using multivariate statistics*, 5th ed., Harlow: Pearson International.

Taks, M. and Scheerder, J. (2006) 'Youth sport participation styles and market segmentation profiles: evidence and applications', *European Sport Management Quarterly*, 6(2), pp. 85-121.

Taylor, W.C., Baranowski, T., and Sallis, J.F. (1994) 'Family determinants of childhood physical activity: a social-cognitive model', in Dishman, R.K. (eds) *Advances in Exercise Adherence*. Champaign: Human Kinetics, pp. 319-342.

Taylor, W.C., Blair, S.N., Cummings, S.S., Wun, C.C., and Malina, R.M. (1999) 'Childhood and adolescent physical activity patterns and adult physical activity', *Medicine and Science in Sports and Exercise*, 31(1), pp. 118-123.

Teixeira, P.J., Carraça, E.V., Markland, D.A., Silva, M.N., and Ryan, R.M. (2012) 'Exercise, physical activity, and self-determination theory: a systematic review', *International Journal of Behavioral Nutrition and Physical Activity*, 9(78), pp. 1-30.

Telama, R., Yang, X., Viikari, J., Välimäki, I., Wanne, O., and Raitakari, O. (2005) 'Physical activity from childhood to adulthood: a 21-year tracking study', *American Journal of Preventive Medicine*, 28(3), pp. 267-273.

Terry, D.J. and Hogg, M.A. (1996) 'Group norms and the attitude-behavior relationship: a role for group identification', *Personality and Social Psychology Bulletin*, 22(8), pp. 776-793.

Terry, D.J. and O'Leary, J.E. (1995) 'The theory of planned behavior: the effects of perceived behavioural control and self-efficacy', *British Journal of Social Psychology*, 34(2), pp. 199-220.

- Theodorakis, Y. (1994) 'Planned behavior, attitude strength, role identity, and the prediction of exercise behavior', *The Sport Psychologist*, 8(2), p149-165.
- Thøgersen-Ntoumanis, C. and Ntoumanis, N. (2006) 'The role of self-determined motivation in the understanding of exercise-related behaviours, cognitions and physical self-evaluations', *Journal of Sports Sciences*, 24(4), pp. 393-404.
- Thuot, S.M. (1995) 'College students' attitudes toward anticipated sport participation', *Perceptual and Motor Skills*, 80(1), pp. 155-160.
- Tiggemann, M. and Williamson, S. (2000) 'The effect of exercise on body satisfaction and self-esteem as a function of gender and age', *Sex Roles*, 43(1/2), pp. 119-127.
- Tkaczynski, A. and Rundle-Thiele, S.R. (2011) 'Event segmentation: A review and research agenda', *Tourism Management*, 32(2), pp. 426-434.
- Tonks, D.G. (2009) 'Validity and the design of market segments', *Journal of Marketing Management*, pp. 341-356.
- Trail, G.T., Fink, J.S., and Anderson, D.F. (2003) 'Sport spectator consumption behavior', *Sport Marketing Quarterly*, 12(1), pp. 8-17.
- Treasure, D.C., Carpenter, P.J., and Power, K.T.D. (2000) 'Relationship between achievement goal orientations and the perceived purposes of playing rugby union for professional and amateur players', *Journal of Sport Sciences*, 18(8), pp. 571-577.
- Triandis, H.C. (1977) *Interpersonal behaviour*, Monterey: Brooks/Cole.
- Trew, K. (1997) 'Time for sport? Activity diaries of young people', in Kremer, J., Trew, K., and Ogle, S. (eds) *Young people's involvement in sport*. London: Routledge, pp. 126-151.
- Trost, S.G., Owen, N., Bauman, A.E., Sallis, J.F., and Brown, W. (2002) 'Correlates of adults' participation in physical activity: review and update', *Medicine and Science in Sports and Exercise*, 34(12), pp. 1996-2001.
- Trujillo, K.M., Brougham, R.R., and Walsh, D.A. (2004) 'Age differences in reasons for exercising', *Current Psychology: Research & Reviews*, 22(4), pp. 348-367.
- Tsiptsis K. and Chorianopoulos, A. (2009) *Data mining techniques in CRM: inside customer segmentation*, West Sussex: Wiley & Sons.
- Tu, W., Stump, T.E., Damush, T.M., and Clark, D.O. (2004) 'The effects of health and environment on exercise class participation in older urban women', *Journal of Aging and Physical Activity*, 12(4), pp. 480-496.
- Tucker, L.A. (1990) 'Physical fitness and psychological distress', *International Journal of Sport Psychology*, 21(3), pp. 185-201.
- Tuma, M. N., and Decker, R., (2013) 'Finite Mixture Models in Market Segmentation: A Review and Suggestions for Best Practices', *Electronic Journal of Business Research Methods*, 11(1), pp. 2-15.

- Tuma, M.N., Decker, R., and Scholz, S. (2011) 'A survey of the challenges and pitfalls of cluster analysis application in market segmentation', *International Journal of Market Research*, 53(3), pp. 391-414.
- Twedt, D.W. (1964) 'How important to marketing strategy is the "heavy user"?' *Journal of Marketing*, (2), pp. 71-72.
- Twemlow, S., Lerma, B., and Twemlow, S.W. (1996) 'An analysis of student's reasons for studying martial arts', *Perceptual and Motor Skills*, 83(1), pp. 99-103.
- Ulbrich, S.L. (1999) 'Nursing practice theory of exercise as self-care', *Journal of Nursing Scholarship*, 31(1), pp. 65-70.
- US Department of Health and Human Services (1996) *Physical Activity and Health: A Report of the Surgeon General*, Atlanta: Centers for Disease Control and Prevention.
- US Department of Health and Human Services (1998) *Clinician's Handbook of Preventive Services: Put Prevention into Practice*, 2nd ed., McLean: International Medical Publishing.
- Vallerand, R.J. (1997) 'Toward a hierarchical model of intrinsic and extrinsic motivation', in Zanna, M.P. (eds) *Advances in Experimental Social Psychology*, New York: Academic Press, pp. 271-360.
- Vallerand, R.J. (2001) 'A hierarchical model of intrinsic and extrinsic motivation in sport and exercise', in Roberts, G.C. (eds) *Advances in motivation in sport and exercise*. Champaign: Human Kinetics, pp. 263-319.
- Vallerand, R.J. and Fortier, M.S. (1998) 'Measures of intrinsic and extrinsic motivation in sport and physical activity: A review and critique', in Duda, J.L. (eds) *Advancements in sport and exercise psychology measurement*, Morgantown: Fitness Information Technology, pp. 81-101.
- Vallerand, R.J., Fortier, M.S., and Guay, F. (1997) 'Self-determination and persistence in a real-life setting: toward a motivational model of high school dropout', *Journal of Personality and Social Psychology*, 72, pp. 1161-1176.
- Vallerand, R.J. and Losier, G.F. (1999) 'An integrative analysis of intrinsic and extrinsic motivation in sport', *Journal of Applied Sport Psychology*, 11(1), pp. 142-169.
- Vallerand, R.J., Pelletier, L.G., Blais, M. R., Brière, N.M., Senécal, C.B., and Vallières, E.F. (1992). 'The academic motivation scale: a measure of intrinsic, extrinsic, and amotivation in education', *Educational and Psychological Measurement*, 52, pp. 1003-1017.
- Vallerand, R.J. and Perrault, S. (1999) 'Intrinsic and extrinsic motivation in sport: toward a hierarchical model', in Lidor, R. and Bar-Eli, M. (eds) *Sport psychology: linking theory and practice*, Morgantown: Fitness Information Technology, pp. 191-212.

- Van Stralen, M.M., de Vries, H., Mudde, A.N., Bolman, C., and Lechner, L. (2009) 'Determinants of initiation and maintenance of physical activity among older adults: a literature review', *Health Psychology Review*, 3, pp. 147-207.
- Van Wersch, A. (1997) 'Individual differences and intrinsic motivations for participating in sport', in Kremer, J., Trew, K., and Ogle, S. (eds) *Young people's involvement in sport*, London: Routledge.
- Vollrath, M. and Torgersen, S. (2002) 'Who takes health risks? A probe into eight personality types', *Personality and Individual Differences*, 32(7), pp. 1185-1197.
- Von Ah, D., Ebert, S., Ngamvitroj, A., Park, N., and Kang, D. (2004) 'Predictors of health behaviours in college students', *Journal of Advanced Nursing*, 48(5), pp. 463-474.
- Von Hippel, E. (2005) *Democratizing innovation*, Cambridge: MIT Press.
- Voorhees, C.C., Murray, D., Welk, G., Birnbaum, A., Ribisl, K.M., Johnson, C.C., Pfeiffer, K.A., Saksvig, B., and Jobe, J.B. (2005) 'The role of peer social network factors and physical activity in adolescent girls', *American Journal of Health Behavior*. 29(2), pp. 183-190.
- Vriens, M., Wedel, M., and Wilms., T. (1996) 'Metric conjoint segmentation methods: a Monte Carlo comparison'. *Journal of Marketing Research*, 33(1), pp. 73-85.
- Walliman, N. (2005) *Your research project: a step-by-step guide for the first-time researcher*, 2nd ed., London: SAGE.
- Wang, C.K. and Biddle, S.J.H. (2001) 'Young people's motivational profiles in physical activity: a cluster analysis', *Journal of Sport and Exercise Psychology*, 23(1), pp. 1-22.
- Wankel, L.M. and Kreisel, P.S.J. (1985) 'Factors underlying enjoyment in youth sports: sport and age group comparisons', *Journal of Sport and Exercise Psychology*, 7(1), pp. 51-64.
- Wankel, L.M. and Mummery, W.K. (1993) 'Using national survey data incorporating the theory of planned behavior: Implications for social marketing strategies in physical activity', *Journal of Applied Sport Psychology*, 5(2), pp. 158-177.
- Wankel, L.M. and Sefton, J.M. (1989) 'A season-long investigation of fun in youth sports', *Journal of Sport and Exercise Psychology*, 11(4), pp. 355-366.
- Warburton, D.E.R., Katzmarzyk, P.T., Rhodes, R.E., and Shephard, R.J. (2007) 'Evidence-informed physical activity guidelines for Canadian adults', *Applied Physiology, Nutrition and Metabolism*, 32 (2E), pp. S16-S68.
- Wedel, M. and Kamakura, W.A. (2000) *Market segmentation: conceptual and methodological foundations*, 2nd ed., Norwell: Kluwer Academic.
- Weigand, D. (2000) Social influence on youth sport motivation: relative influence of significant others, in Proceedings of the (2000) Conference International de la SFPS - Paris INSEP - Symposia.

Weinberg, R.S. and Gould, D. (1995) *Foundations of sport and exercise psychology*, Illinois: Human Kinetics.

Weinstein, N. D. (1987) 'Unrealistic optimism about susceptibility to health problems: conclusions from a community-wide sample', *Journal of Behavioral Medicine*, 10(5), pp. 481-498.

Weinstein, N.D. (2007) 'Misleading tests of health behavior theories', *Annals of Behavioral Medicine*, 33(1), pp. 1-10.

Weiss, M. R. (1993) 'Psychological effects of intensive sport participation on children and youth: self-esteem and motivation', in Cahill, B.R. and Pearl, A.J. (eds) *Intensive Participation in Children's Sports*, Illinois: Human Kinetics.

Weiss, M.R. (2000) 'Motivating kids in physical activity', *President's Council on Physical Fitness and Sports Research Digest*, 3(11), pp. 1-8.

Weiss, M.R. and Amorose, A.J. (2008) 'Motivational orientations and sport behaviour', in Horn, T.S. (eds) *Advances in sport psychology*, Champaign: Human Kinetics, pp. 115-155.

Weiss, M.R. and Chaumeton, N. (1992) 'Motivational orientations in sport', in Horn, T.S. (eds) *Advances in sport psychology*, Champaign: Human Kinetics, pp. 61-99.

Weiss, M.R. and Duncan, S.C. (1992) 'The relationship between physical competence and peer acceptance in the context of children's sport participation', *Journal of Sport and Exercise Psychology*, 14(2), pp. 177-191.

Weiss, M.R. and Ebbeck, V. (1996) 'Self esteem and perceptions of competence in youth sport: theory, research, and enhancement strategies', in Bar-Or, O. (eds) *The encyclopaedia of sports medicine, an IOC Medical Commission publication, the child and adolescent athlete*, Oxford: Blackwell Scientific Publications.

Weiss, M.R. and Ferrer-Caja, E. (2002) 'Motivational orientations in sport' in Horn, T.S. (eds) *Advances in sport psychology*, Champaign: Human Kinetics, pp. 101-183.

Weiss, M.R. and Horn, T.S. (1990) 'The relation between children's accuracy estimates of their physical competence and achievement-related characteristics', *Research Quarterly for Exercise and Sport*, 61(3), pp. 250-258.

Weiss, M.R., Smith, A.L., and Theeboom, M. (1996) 'That's what friends are for: children's and teenagers' perceptions of peer relationships in the sport domain', *Journal of Sport and Exercise Psychology*, 18(4), pp. 347-379.

Weiss, M.R. and Williams, L. (2004) 'The why of youth sport involvement: A developmental perspective on motivational processes', in Weiss, M.R. (eds) *Developmental sport and exercise psychology: a lifespan perspective*, Morgantown: Fitness Information Technology, pp. 223-268.

White, S.A. and Duda, J.L. (1994) 'The relationship of gender, level of sport involvement, and participation motivation to task and ego orientation', *International Journal of Sport Psychology*, 25(1), pp. 4-18.

- Wiebe, D.J. and Smith, T.W. (1997) 'Personality and health: Progress and problems in psychosomatics', in Hogan, R., Johnson, J. and Briggs S. (eds) *Handbook of personality psychology*, London: Academic Press, pp. 891-918.
- Wiersma, U.J. (1992) 'The effects of extrinsic rewards in intrinsic motivation: A meta-analysis', *Journal of Occupational and Organizational Psychology*, 65(2), pp. 101-114.
- Wilcox, S. and Storandt, M. (1995) 'Relations among age, exercise, and psychological variables in a community sample of women', *Health Psychology*, 15(2), pp. 110-113.
- Wilcox, S., Castro, C., King, A.C., Housemann, R., and Brownson, R.C. (2000) 'Determinants of leisure time physical activity in rural compared with urban older and ethnically diverse women in the United States', *Journal of Epidemiology and Community Health*, 54(9), pp. 667-672.
- Wilkie, W.L. (1994) *Consumer Behavior*, 3rd ed., New York: John Wiley & Son.
- Willis, J.D. and Campbell, L.F. (1992) *Exercise Psychology*, Champaign: Human Kinetics.
- Wilson, P.M., Mack, D.E., and Grattan, K.P. (2008) 'Understanding motivation for exercise: A self-determination theory perspective', *Canadian Psychology*, 49(3), pp. 250-256.
- Wilson, P.M., Rodgers, W.M., and Fraser, S.N. (2002) 'Examining the psychometric properties of the behavioral regulation in exercise questionnaire', *Measurement in Physical Education and Exercise Science*, 6(1), pp. 1-21.
- Wilson, P.M., Rodgers, W.M., Fraser, S.N., and Murray, T.C. (2004) 'Relationships between exercise regulations and motivational consequences in university students', *Research Quarterly for Exercise and Sport*, 75(1), pp. 81-91.
- Wind, Y. (1978) 'Issues and advances in segmentation research', *Journal of Marketing Research*, 15(3), pp. 317-337.
- Wind, Y. and Bell, D. (2007) 'Market Segmentation' in Baker, M. and Hart, S. (eds) *The Marketing Book*, London: Routledge.
- Woods, C.B., Tannehill, D., Quinlan, A., Moyna, N., and Walsh, J. (2010) *The Children's Sport Participation and Physical Activity Study (CSPPA) - Research Report No. 1*. Dublin: School of Health and Human Performance, Dublin City University and The Irish Sports Council.
- World Health Organisation (2004) *WHO Global Strategy for Diet, Physical Activity and Health*, Geneva: World Health Organisation.
- World Health Organisation (2010) *Physical Activity* [Online] Available: <http://www.who.int/> (Accessed: 12 February 2011).
- Wurtele, S.K. and Maddux, J.E. (1987) 'Relative contributions of protection motivation theory components in predicting exercise intentions and behavior', *Health Psychology*, 6(5), pp. 453-466.

- Yan, J.H. and McCullagh, P. (2004) 'Cultural influence on youth's motivation of participation in physical activity', *Journal of Sport Behavior*, 27(4), pp. 378-389.
- Yancey, A.K. (1998) 'Building positive self-image in adolescents in foster care: the use of role models in an interactive group approach', *Adolescence*, 33(130), pp. 253-267.
- Yankelovich, D. and Meer, D. (2006) 'Rediscovering Market Segmentation', *Harvard Business Review* [Online]. Available at: <http://hbr.org/> (Accessed: 5 March 2013).
- Yeung, R.R. and Hemsley, D.R. (1997) 'Exercise behaviour in an aerobics class: The impact of personality traits and efficacy cognitions', *Personality and Individual Differences*, 23(3), pp. 425-431.
- Young, S., Ott, L., and Feigin, B. (1978) 'Some practical consideration in market segmentation', *Journal of Marketing Research*, 15(3), pp. 405-512.
- Zahariadis, P.N. and Biddle, S.J.H., (2000) 'Goal orientations and participation motives in physical education and sport: their relationships in English schoolchildren', *Athletic Insight*, 2(1), pp. 1-11.
- Zhang, T., Ramakrishnon, R., and Livny, M. (1996) 'BIRCH: an efficient data clustering method for very large databases', *Proceedings of the ACM SIGMOD international conference on Management of data*, Montreal: ACM, pp. 103-114.
- Zikmund, W.G. (1997) *Business Research Methods*, 5th ed., Orlando: Harcourt College.
- Zmijewski, C.F. and Howard, M.O. (2003) 'Exercise dependence and attitudes toward eating among young adults', *Eating Behaviors*, 4(2), pp. 181-195.
- Zuckerman, M. (1979) *Sensation seeking: beyond the optimal level of arousal*, Hillsdale: Lawrence Erlbaum.

## **Appendix A: Data Collection Instruments Employed**

Data collection in this thesis took place in a number of phases. Appendix A contains the various measurement instruments employed through each of these phases, commencing with the moderator guide used for the preliminary discussion group interviews.

### **A.1 Moderator Guidelines for the Discussion Groups**

The moderator introduces himself, explains the purpose of the session, alerts the group to such aids as dictaphones, and gives participants the opportunity to introduce themselves.

#### **Introduction:**

Hello. My name is Paul Morrissey and I am the moderator for today's group discussion. I am a lecturer in marketing at Waterford Institute of Technology (WIT) and am also conducting a PhD research thesis within WIT. My purpose today is twofold:

This discussion is one of a series being held in WIT. It is a preliminary piece of research that will play a critical role in the conducting of my Doctor of Philosophy study into the segmentation of the Irish youth exercise participation market. Feel free to make any negative or positive comments about any of the things that we will be discussing today. This is a free flowing discussion and there is no right or wrong answers. Before we get started, here are some ground rules and points of information:

#### **Disclosures:**

1. **CONFIDENTIALITY.** Everything that you say here will be kept strictly confidential. Nothing said in this group will ever be associated with any individual by name. We would also ask that you similarly maintain the confidentiality of what is said in the group.
2. **VOLUNTARY PARTICIPATION.** Your participation in this group is entirely voluntary. You may stop participating at any time. You do not have to answer any questions that you do not wish to answer. You may withdraw from the group at anytime with no consequences. The consent forms provide more detailed information regarding confidentiality and the voluntary nature of participation. If you have not already done so, please sign the consent form and pass it to the moderator.
3. **AUDIO.** This session is being audio recorded so that I can write an accurate report of the proceedings. If there are any objections we will not record the session.

4. THANKS. Thank you for arranging your schedule today to be here for this session. I really appreciate you giving me your time and opinions.

**Ground Rules:**

1. Please talk one at a time in a voice as loud as mine.
2. Avoid side conversations with your neighbours.
3. I need to hear from everyone in the course of the discussion, but you do not have to answer every question.
4. Feel free to respond directly to someone who has made a point. You do not have to address your comments to me to get them on the table.
5. Say what is true for you and your experiences. Do not let the group sway you and do not adhere to group opinion if you have a different point of view that you want to communicate.

**Warm-up Questions:**

General issues related to the topic are discussed at this stage. A brief questionnaire will be issued to gather the demographic and participation details of the focus group members. This will be followed by an introductory discussion where the members outline their background and their existing exercise behaviour.

Please introduce yourself to the group and tell us your name, age, where you live?

Can you also outline what exercise regularly you play on a regular basis (i.e.: at least once a month)?

Which of these activities would you consider to be your favourite form of regular exercise?

Where do you engage in this regular exercise casual/school/club?

At what level do you participate casual/competitive/advanced?

How long have you been participating in your favourite activity?

**Key Content Questions:**

In this part inputs are gained from the participants about the research topic itself. The moderator's guide includes categories of interest to the research and identifies the areas that have to be probed during this session to ensure that the discussion of the topic is thorough. The moderator will exhibit the ability to probe without suggesting any desired answers.

This discussion will be broken down into two sections with questions on the ‘socio-contextual’ factors that influence participant behaviour being followed by an examination of the motives or benefits that they seek from the participation experience.

<b>Socio-Contextual Questions</b>	
General	Just a general question to start off with – why do you exercise regularly? What were the key factors in you taking up your favourite exercise/sport in the first place?
Family	Do/Have members of your family played this exercise/sport regularly? Assess the influence that family members had on you taking up the exercise/sport and your continued participation.
Cost	How expensive is it for you to exercise regularly? Is the cost of participation a factor in your decision making? Has expense prevented you engaging in other activities that you would like to try out?
Coach	Assess the importance of your coach to your exercise behaviour? To what extent do they apply pressure for you to participate, or try harder, or increase level of participation?
Friends	Do any of your close friends exercise regularly with you? Assess the influence of your friends on your participation?
Other Leisure Activities	What other leisure activities do you engage in? How important are they to you relative to your regular exercise? Have these alternative activities become more or less important to you as you have gotten older?
Facility Access	How far do you travel to exercise? Would it be an issue to travel further to participate? How would you rate the quality of the facilities that you use?
College Exercise	Do you exercise in college? To what extent are you pressurised or feel obliged to participate in a college context? Do you find the college experience as enjoyable as your casual/club exercise experiences?
<b>Benefit Related Questions</b>	
Stress	How important is exercising to you as a means of getting away from the daily pressure of life and relieving stress?
Wellbeing	Do you use exercise as a way of making you feel good? Does regular exercise make you feel mentally refreshed?
Enjoyment	How important is the enjoyment of regular exercise to you? Do you find exercise enjoyable?
Achievement	To what extent do you feel that you have maximised your potential at your chosen exercise/sport? How important is it for you to be the best you can be? Assess the importance of a feeling of accomplishment from your participation?
Competition	Would you describe yourself as a competitive individual? How does regular exercise satisfy your competitive instincts? Do you enjoy non-competitive exercise regularly as much?
Social	Assess the importance of the social aspects of regular exercise? Is regular interaction with friends and peers that also participate important to you? Is exercise an opportunity to meet new people and make new friendships?
Health	How important is physical fitness to you? To what extent the health benefits of exercise a factor in your participation

	behaviour? What impact does exercise participation have on the way you feel and look?
Risk	Would you class yourself as a risk taker/thrill seeker? What level of risk or buzz is there in participating in your exercise/sport? To what extent does the feeling of risk/stress creation enhance the experience? How willing are you to risk injury to succeed?
Aggression	Do you enjoy the physical and aggressive nature of exercise/sport? How important is the display of your physical prowess in exercise/sport? Does the viewing of aggression in live sport affect you in any way?
Association	How important is representing your team/club/school to you? Are you proud to be associated with your team/club? Do you feel a bond with the people that play sport/exercise regularly with you?
Confidence	Does playing/exercising make you feel good about yourself? How is your confidence affected by your exercise participation? Does success at exercise/sport translate into your everyday life in any way?
Success	How important is being successful at exercise/sport to you? What efforts are you willing to go to be successful? Does lack of success lead to a sense of alienation for you?
Challenge	How important is a challenge to you in exercise/sport? How much effort do you put into the mastery of the skills of your exercise/sport? Is a comparison with your competitors' skill levels important to you?
Aesthetically Pleasing	Is exercise/sport a means of expressing yourself in an artistic fashion? How important is it to you to play in a 'proper pleasing' fashion?
Value Development	How important has exercise/sport been in helping you to develop a good work ethic? Does exercise/sport engrain any values that you may not acquire elsewhere? What input has exercise/sport had into the person that you are today?

**Summary:**

This part of the session gives the participants the opportunity to share whatever they may have forgotten or omitted.

Is there anything else regarding your exercise participation that you would like to add?

Please feel free to touch upon issues that we have not raised in our discussion thus far.

## **A.2 Belief Elicitation Study**

An integral step in the development of a survey integrating Theory of Planned Behaviour belief measures, is the identification of the behavioural, normative, and control beliefs that underpin the attitude, subjective norms and perceived behavioural control relating to the behaviour in question. Pilot work, in the form of a belief elicitation study, is required to identify accessible behavioural, normative, and control beliefs. It is recommended that respondents are given a description of the behaviour and are asked a series of questions designed to access these beliefs (Ajzen, 2002).

In this case a sample of 50 members of the target population completed a series of 9 open-ended questions, 3 each relating to the three underlying belief constructs. The questions were administered in a class context and respondents were given ample time to assess, reflect upon and respond to each question. The questions used in the elicitation study are listed below:

### **Behavioural Belief Measures**

1. What do you believe are the advantages/benefits of you engaging in regular leisure-time exercise in the forthcoming month?
2. What do you believe are the disadvantages of you engaging in regular leisure-time exercise in the forthcoming month?
3. Is there anything else you associate with your engagement in regular leisure-time physical activity in the forthcoming month?

### **Normative Belief Measures**

1. Are there any individuals or groups who would approve of you engaging in regular leisure-time physical activity in the forthcoming month?
2. Are there any individuals or groups who would disapprove of you engaging in regular leisure-time physical activity in the forthcoming month?
3. Are there any other individuals or groups who come to mind with regard to you engaging in regular leisure-time physical activity in the forthcoming month?

### **Control Belief Measures**

1. What factors or circumstances would enable you to engage regularly in leisure-time physical activity in the forthcoming month?
2. What factors or circumstances would make it difficult for you to engage regularly in leisure-time physical activity in the forthcoming month?
3. Are there any other issues that come to mind when you think about the difficulty of you engaging regularly in leisure-time physical activity in the forthcoming month?

## A.3 Pilot Questionnaire

### Section A

1. Name: \_\_\_\_\_

2. WIT Course and Year: \_\_\_\_\_

3. Student Number: \_\_\_\_\_

4. What age are you? \_\_\_\_\_

5. Gender:  Male  Female

6. Marital Status  Single  Married

7. Which of the following best describes where you live?

During the school/college year  Urban \*  Rural\*\*

During holiday periods  Urban \*  Rural\*\*

For the purpose of this question the following definitions of urban and rural dwelling apply:

\* Urban, resident in one of the following areas:

- Cities
- Suburbs of cities
- Mixed urban or rural areas bordering on the suburbs of cities
- Towns and their environs with populations of 5,000 or over
- Mixed urban or rural areas bordering on the environs of larger towns.
- Towns and their environs with a population of 1,000 to 5,000

\*\* Rural, resident in one of the following areas:

- Mixed urban or rural areas
- Rural areas

8. Please rate the following items in terms of how accurately they describe your current leisure-time physical activity situation. Tick the appropriate box.

Please read the definition of Regular Leisure-Time Physical Activity in the box below.

\* **Regular Leisure-Time Physical Activity:** This is defined by the WHO (2004) as -  
 At least three 20 minute or longer **vigorous physical activity** sessions in your leisure-time per week.  
 Or  
 At least five 30 minute or longer **moderate physical activity** sessions in your leisure-time per week.

**Moderate Physical Activity:** Exercise that leads to a noticeable increase in breathing  
**Vigorous Physical Activity:** Exercise that leads to heavy breathing and difficulty talking in full sentences

		Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
	1	2	3	4	5	
I currently do not exercise, and I do not intend to start exercising in the next 6 months						
I currently do not exercise, but I am thinking about starting exercising in the next 6 months						
I currently exercise a little, but not regularly.						
I currently exercise regularly, but I have only begun doing so within the last 6 months						
I currently exercise regularly, and have done so for longer than 6 months.						
I have exercised regularly in the past, but I am not doing so currently.						

**If you currently exercise regularly, please address Questions 9-12.**

**If you do not currently exercise regularly, please proceed to Section B of the survey.**

The questionnaire will now focus on what you consider to be your main or most regular form of leisure-time physical activity. Please consider questions/statements in the context of your most regular form of exercise.

9. What is your most regular form of leisure-time physical activity?

\_\_\_\_\_

10. Which of the following best describes the intensity of effort involved when you participate in your favoured form of leisure-time physical activity?

- No Effort (no increase in breathing)
- Light Effort (mild increase in breathing)
- Moderate Effort (noticeable increase in breathing)
- Vigorous Effort (heavy breathing, difficulty talking in full sentences)
- Extremely Vigorous Effort (Gasping for breath, not able to talk at all)

11. Where do you participate in your main leisure-time physical activity?

- Gymnasium/Leisure Centre
- Sports Club
- College or University
- Community Hall
- Public Swimming Pool
- Athletics Track
- At Home
- Public Places\*
- Other\_\_\_\_\_

\* Public places include public roadways, parks, paths etc.

12. Which of the following physical activities have you participated in over the last 6 months? Please tick the appropriate activities in the first column and indicate in one of the five remaining columns how regularly you have participated in each chosen activity in the last 6 months.

Physical Activity		4 or more	2-3 days	2-3 days	1 day	Less Often
		days per week	per week	per month	per month	
Swimming	<input type="checkbox"/>					
Horse Riding	<input type="checkbox"/>					
Rugby Union	<input type="checkbox"/>					
Hockey	<input type="checkbox"/>					
Martial Arts	<input type="checkbox"/>					
Golf	<input type="checkbox"/>					
Aerobics or Gym/Keep Fit	<input type="checkbox"/>					
** Cycling for leisure	<input type="checkbox"/>					
Gaelic Football or Ladies Football	<input type="checkbox"/>					
Tennis	<input type="checkbox"/>					
Jogging	<input type="checkbox"/>					
Hurling or Camogie	<input type="checkbox"/>					
Soccer or 5-a-side football	<input type="checkbox"/>					
Weight Lifting	<input type="checkbox"/>					
Basketball	<input type="checkbox"/>					
*** Vigorous Walking or Hiking	<input type="checkbox"/>					
* Other: _____	<input type="checkbox"/>					
* Other: _____	<input type="checkbox"/>					
* Other: _____	<input type="checkbox"/>					
* Other: _____	<input type="checkbox"/>					

\* If you have participated in leisure time physical activities other than the ones listed below, please include them in the other category/categories in the table.

\*\* If you participate in cycling at a club/competitive level, please include this in the other category in the table.

\*\*\* Vigorous walking is defined for the purpose of this study as the participant expending at least a moderate effort (ie: a noticeable increase in breathing) when engaging in the activity. This doesn't include walking that involves no effort or a light effort (mild increase in breathing). Non-vigorous walking (i.e. walking that involves no effort or a light effort) is not considered a physical activity for the purpose of this study.

Please proceed to Section B of the survey.

## **Section B**

On the following pages are a number of statements concerning the reasons people often give when asked why they exercise.

Whether you currently exercise regularly or not, please read each statement carefully and indicate, by circling the appropriate number, whether or not each statement is true for you personally, or would be true for you personally if you did exercise. If you do not consider a statement to be true for you at all, circle the '0'. If you think that a statement is very true for you indeed, circle the '5'. If you think that a statement is partly true for you, then circle the '1', '2', '3' or '4', according to how strongly you feel that it reflects why you exercise or might exercise.

Remember, we want to know why you personally choose to exercise or might choose to exercise, not whether you think the statements are good reasons for anybody to exercise.

### **Personally, I exercise (or might exercise) ...**

		Not at all true for me					Very true for me	
		0	1	2	3	4	5	
1	To stay slim	0	1	2	3	4	5	
2	To avoid ill-health	0	1	2	3	4	5	
3	Because it makes me feel good	0	1	2	3	4	5	
4	To help me look younger	0	1	2	3	4	5	
5	To show my worth to others	0	1	2	3	4	5	
6	To give me space to think	0	1	2	3	4	5	
7	To have a healthy body	0	1	2	3	4	5	
8	To build up my strength	0	1	2	3	4	5	
9	Because I enjoy the feeling of exerting myself	0	1	2	3	4	5	

**Personally, I exercise (or might exercise) ...**

		Not at all true for me	0	1	2	3	4	Very true for me	5
10	To spend time with friends	0	1	2	3	4	5		
11	Because my doctor advised me to exercise	0	1	2	3	4	5		
12	Because I like trying to win in physical activities	0	1	2	3	4	5		
13	To stay/become more agile	0	1	2	3	4	5		
14	To give me goals to work towards	0	1	2	3	4	5		
15	To lose weight	0	1	2	3	4	5		
16	To prevent health problems	0	1	2	3	4	5		
17	Because I find exercise invigorating	0	1	2	3	4	5		
18	To have a good body	0	1	2	3	4	5		
19	To compare my abilities with other peoples'	0	1	2	3	4	5		
20	Because it helps to reduce tension	0	1	2	3	4	5		
21	Because I want to maintain good health	0	1	2	3	4	5		
22	To increase my endurance	0	1	2	3	4	5		
23	Because I find exercising satisfying in and of itself	0	1	2	3	4	5		
24	To enjoy the social aspects of exercising	0	1	2	3	4	5		

**Personally, I exercise (or might exercise) ...**

		Not at all					Very true
		0	1	2	3	4	5
		0	1	2	3	4	5
25	To help prevent an illness that runs in my family	0	1	2	3	4	5
26	Because I enjoy competing	0	1	2	3	4	5
27	To maintain flexibility	0	1	2	3	4	5
28	To give me personal challenges to face	0	1	2	3	4	5
29	To help control my weight	0	1	2	3	4	5
30	To avoid heart disease	0	1	2	3	4	5
31	To recharge my batteries	0	1	2	3	4	5
32	To improve my appearance	0	1	2	3	4	5
33	To gain recognition for my accomplishments	0	1	2	3	4	5
34	To help manage stress	0	1	2	3	4	5
35	To feel more healthy	0	1	2	3	4	5
36	To get stronger	0	1	2	3	4	5
37	For enjoyment of the experience of exercising	0	1	2	3	4	5
38	To have fun being active with other people	0	1	2	3	4	5
39	To help recover from an illness/injury	0	1	2	3	4	5

**Personally, I exercise (or might exercise) ...**

		Not at all				Very true	
		true for me				for me	
		0	1	2	3	4	5
40	Because I enjoy physical competition	0	1	2	3	4	5
41	To stay/become flexible	0	1	2	3	4	5
42	To develop personal skills	0	1	2	3	4	5
43	Because exercise helps me to burn calories	0	1	2	3	4	5
44	To look more attractive	0	1	2	3	4	5
45	To accomplish things that others are incapable of	0	1	2	3	4	5
46	To release tension	0	1	2	3	4	5
47	To develop my muscles	0	1	2	3	4	5
48	Because I feel at my best when exercising	0	1	2	3	4	5
49	To make new friends	0	1	2	3	4	5
50	Because I find physical activities fun, especially when competition is involved	0	1	2	3	4	5
51	To measure myself against personal standards	0	1	2	3	4	5

## Section C

Please assess your feelings on the following statements that relate to your beliefs regarding engaging in Regular Leisure-Time Exercise in the forthcoming month.

The statements should be evaluated by all respondents, both current regular exercisers and individuals that do not engage in regular leisure-time exercise. Please circle the number that best describes your opinion.

**\* Regular Leisure-Time Physical Activity:** This is defined by the WHO (2004) as -

At least three 20 minute or longer **vigorous physical activity** sessions in your leisure-time per week.

Or

At least five 30 minute or longer **moderate physical activity** sessions in your leisure-time per week.

**Moderate Physical Activity:** Exercise that leads to a noticeable increase in breathing

**Vigorous Physical Activity:** Exercise that leads to heavy breathing and difficulty talking in full sentences

1. I feel that regularly engaging in regular leisure-time exercise in the next month will be important      1      2      3      4      5      6      7      unimportant
  
2. Most people who are important to me feel that I should not      1      2      3      4      5      6      7      I should regularly engage in leisure-time exercise.
  
3. For me to regularly engage in regular leisure-time exercise in the coming month would be easy      1      2      3      4      5      6      7      difficult
  
4. I feel that regularly engaging in regular leisure-time exercise in the next month will be dull      1      2      3      4      5      6      7      interesting
  
5. The people in my life whose opinions I value would disapprove      1      2      3      4      5      6      7      approve of me regularly engaging in leisure-time exercise.
  
6. If I wanted to I could engage in regular leisure-time exercise in the coming month. Strongly disagree      1      2      3      4      5      6      7      Strongly agree

7. I intend regularly engaging in leisure-time exercise in the next month.  
 Unlikely      1      2      3      4      5      6      7      Likely
8. I feel that regularly engaging in regular leisure-time exercise in the next month will be boring      1      2      3      4      5      6      7      stimulating
9. It is expected of me that I regularly engage in regular leisure-time exercise in the next month.  
 Unlikely      1      2      3      4      5      6      7      Likely
10. How important is regular leisure-time exercise to you?  
 Important      1      2      3      4      5      6      7      Unimportant
11. I feel that regularly engaging in regular leisure-time exercise in the next month will be pleasant      1      2      3      4      5      6      7      unpleasant
12. Many people like me engage in regular leisure-time exercise.  
 Unlikely      1      2      3      4      5      6      7      Likely
13. I feel that regularly engaging in regular leisure-time exercise in the next month will be bad      1      2      3      4      5      6      7      good
14. I am confident that I could regularly engage in leisure-time exercise in the next month.  
 Strongly disagree 1      2      3      4      5      6      7      Strongly agree
15. I will try to regularly engaging in leisure-time exercise in the next month.  
 Definitely true 1      2      3      4      5      6      7      Definitely false
16. I feel that regularly engaging in regular leisure-time exercise in the next month will be useless      1      2      3      4      5      6      7      useful
17. How much control do you believe you have over engaging in regular leisure-time exercise?  
 No control      1      2      3      4      5      6      7      Complete control

18. I feel that regularly engaging in regular leisure-time exercise in the next month will be  
 unhealthy      1      2      3      4      5      6      7      healthy
19. Most people who are important to me regularly engage in leisure-time exercise.  
 Completely true 1      2      3      4      5      6      7 Completely false
20. I am determined to regularly engaging in leisure-time exercise in the next month.  
 Strongly disagree 1      2      3      4      5      6      7      Strongly agree
21. I feel that regularly engaging in regular leisure-time exercise in the next month will be  
 beneficial      1      2      3      4      5      6      7      harmful
22. I plan to regularly engage in leisure-time exercise in the next month.  
 Strongly disagree 1      2      3      4      5      6      7      Strongly agree
23. I feel that regularly engaging in regular leisure-time exercise in the next month will be  
 worthless      1      2      3      4      5      6      7      valuable
24. I feel that regularly engaging in regular leisure-time exercise in the next month will be  
 enjoyable      1      2      3      4      5      6      7      unenjoyable
25. The people in my life whose opinions I value,  
 regularly      1      2      3      4      5      6      7      do not regularly  
 engage in leisure-time exercise.
26. I feel that regularly engaging in regular leisure-time exercise in the next month will be  
 wise      1      2      3      4      5      6      7      foolish
27. I have complete control over whether or not I regularly engage in leisure-time exercise.  
 Strongly disagree 1      2      3      4      5      6      7      Strongly agree
28. I feel that regularly engaging in regular leisure-time exercise in the next month  
 will be  
 satisfying      1      2      3      4      5      6      7      dissatisfying

29. My engaging in regular leisure time exercise in the next month will enable me to experience success.

Unlikely      1      2      3      4      5      6      7      Likely

30. My engaging in regular leisure time exercise in the next month allows me to feel part of a team/club.

Unlikely      1      2      3      4      5      6      7      Likely

31. My engaging in regular leisure time exercise in the next month allows me to socially interact with friends.

Unlikely      1      2      3      4      5      6      7      Likely

32. My engaging in regular leisure time exercise in the next month will enable me to relieve stress.

Unlikely      1      2      3      4      5      6      7      Likely

33. My engaging in regular leisure time exercise in the next month will enable me to improve my appearance.

Unlikely      1      2      3      4      5      6      7      Likely

34. My engaging in regular leisure time exercise in the next month will allow me to improve my health and fitness

Unlikely      1      2      3      4      5      6      7      Likely

35. My engaging in regular leisure time exercise in the next month will allow me to experience a sense of fun and enjoyment.

Unlikely      1      2      3      4      5      6      7      Likely

36. My engaging in regular leisure time exercise in the next month will enable me to feel energised and refreshed.

Unlikely      1      2      3      4      5      6      7      Likely

37. My engaging in regular leisure time exercise in the next month will enable me to feel good about myself.

Unlikely      1      2      3      4      5      6      7      Likely

38. My engaging in regular leisure time exercise in the next month will be very time consuming.
- |          |   |   |   |   |   |   |   |        |
|----------|---|---|---|---|---|---|---|--------|
| Unlikely | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Likely |
|----------|---|---|---|---|---|---|---|--------|
39. My engaging in regular leisure time exercise in the next month will be financially costly.
- |          |   |   |   |   |   |   |   |        |
|----------|---|---|---|---|---|---|---|--------|
| Unlikely | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Likely |
|----------|---|---|---|---|---|---|---|--------|
40. My participation in regular leisure time exercise in the next month would take place in poor weather.
- |          |   |   |   |   |   |   |   |        |
|----------|---|---|---|---|---|---|---|--------|
| Unlikely | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Likely |
|----------|---|---|---|---|---|---|---|--------|
41. My engaging in regular leisure time exercise in the next month would involve the risk of injury.
- |          |   |   |   |   |   |   |   |        |
|----------|---|---|---|---|---|---|---|--------|
| Unlikely | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Likely |
|----------|---|---|---|---|---|---|---|--------|
42. My participation in regular leisure time exercise in the next month would necessitate a lot of dedication.
- |          |   |   |   |   |   |   |   |        |
|----------|---|---|---|---|---|---|---|--------|
| Unlikely | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Likely |
|----------|---|---|---|---|---|---|---|--------|
44. My family members think that
- |              |   |   |   |   |   |   |   |          |
|--------------|---|---|---|---|---|---|---|----------|
| I should not | 1 | 2 | 3 | 4 | 5 | 6 | 7 | I should |
|--------------|---|---|---|---|---|---|---|----------|
- engage in regular leisure time exercise in the next month.
45. My friends think that
- |              |   |   |   |   |   |   |   |          |
|--------------|---|---|---|---|---|---|---|----------|
| I should not | 1 | 2 | 3 | 4 | 5 | 6 | 7 | I should |
|--------------|---|---|---|---|---|---|---|----------|
- engage in regular leisure time exercise in the next month.
46. My coach thinks that
- |              |   |   |   |   |   |   |   |          |
|--------------|---|---|---|---|---|---|---|----------|
| I should not | 1 | 2 | 3 | 4 | 5 | 6 | 7 | I should |
|--------------|---|---|---|---|---|---|---|----------|
- engage in regular leisure time exercise in the next month.
47. My team mates/exercise partners think that
- |              |   |   |   |   |   |   |   |          |
|--------------|---|---|---|---|---|---|---|----------|
| I should not | 1 | 2 | 3 | 4 | 5 | 6 | 7 | I should |
|--------------|---|---|---|---|---|---|---|----------|
- engage in regular leisure time exercise in the next month.

49. I expect that my studies will place high demands on my time in the next month.

Unlikely      1      2      3      4      5      6      7      Likely

50. I expect that other leisure time activities will place high demands on my time in the next month.

51. Unlikely      1      2      3      4      5      6      7      Likely

52. I will find it difficult to afford regular leisure time physical activities in the next month.

Unlikely      1      2      3      4      5      6      7      Likely

53. I expect that I will need to expend a lot of effort to engage in regular leisure-time physical activities in the next month.

Unlikely      1      2      3      4      5      6      7      Likely

54. I will require the help of friends/exercise partners to participate in regular leisure-time exercise in the next month.

Unlikely      1      2      3      4      5      6      7      Likely

55. Being successful at my exercise is

undesirable      1      2      3      4      5      6      7      desirable

56. Feeling part of a team/club is

Undesirable      1      2      3      4      5      6      7      desirable

57. Social interaction with my friends through exercise activities is

Undesirable      1      2      3      4      5      6      7      desirable

58. Relieving stress through exercise activities is

Undesirable      1      2      3      4      5      6      7      desirable

59. Improving my appearance through exercise activities is

Undesirable      1      2      3      4      5      6      7      desirable

60. Improving my health and fitness is

Undesirable      1      2      3      4      5      6      7      desirable

61. Experiencing a sense of fun and enjoyment through exercise is  
 Undesirable 1 2 3 4 5 6 7 desirable
62. Feeling energised and refreshed is  
 Undesirable 1 2 3 4 5 6 7 desirable
63. Feeling good about myself is  
 Undesirable 1 2 3 4 5 6 7 desirable
64. Engaging in time consuming physical activities is  
 Undesirable 1 2 3 4 5 6 7 desirable
65. Engaging in financially costly physical activities is  
 Undesirable 1 2 3 4 5 6 7 desirable
66. Participating in physical activities in poor weather is  
 Undesirable 1 2 3 4 5 6 7 desirable
67. The risk of injury in physical activities is  
 Undesirable 1 2 3 4 5 6 7 desirable
68. Participating in physical activities that require a lot of dedication is  
 Undesirable 1 2 3 4 5 6 7 desirable
69. When it comes to exercising, doing what family members think I should do is important to me.  
 Not at all 1 2 3 4 5 6 7 Very much so
70. When it comes to exercising, doing what my friends think I should do is important to me.  
 Not at all 1 2 3 4 5 6 7 Very much so
71. When it comes to exercising, doing what my coach thinks I should do is important to me.  
 Not at all 1 2 3 4 5 6 7 Very much so

72. When it comes to exercising, doing what team mates/exercise partners think I should do is important to me.  
 Not at all      1      2      3      4      5      6      7      Very much so
73. My studies placing high demands on my time in the next month would make it much more difficult    1      2      3      4      5      6      7      much easier  
 for me to engage in regular leisure time exercise in the next month.
74. Other leisure time activities placing high demands on my time in the next month would make it much more difficult    1      2      3      4      5      6      7      much easier  
 for me to engage in regular leisure time exercise in the next month.
75. The cost of participation would make it much more difficult    1      2      3      4      5      6      7      much easier  
 for me to engage in regular leisure time exercise in the next month.
76. Needing a lot of effort would make it much more difficult    1      2      3      4      5      6      7      much easier  
 for me to engage in regular leisure time exercise in the next month.
77. My requiring the help of friends/exercise partners would make it much more difficult    1      2      3      4      5      6      7      much easier  
 for me to engage in regular leisure time exercise in the next month.

**Many thanks for your help and co-operation in this study.**

#### A.4 Temporal Stability Follow-up Survey

Please assess your feelings on the following statements that relate to your beliefs regarding engaging in Regular Leisure-Time Exercise in the forthcoming month.

The statements should be evaluated by all respondents, both current regular exercisers and individuals that do not engage in regular leisure-time exercise. Please circle the number that best describes your opinion.

\* **Regular Leisure-Time Physical Activity:** This is defined by the WHO (2004) as -  
At least three 20 minute or longer **vigorous physical activity** sessions in your leisure-time per week.  
Or  
At least five 30 minute or longer **moderate physical activity** sessions in your leisure-time per week.

**Moderate Physical Activity:** Exercise that leads to a noticeable increase in breathing  
**Vigorous Physical Activity:** Exercise that leads to heavy breathing and difficulty talking in full sentences

1. My engaging in regular leisure time exercise in the next month will enable me to experience success.  
Unlikely      1      2      3      4      5      6      7      Likely
  
2. My engaging in regular leisure time exercise in the next month allows me to feel part of a team/club.  
Unlikely      1      2      3      4      5      6      7      Likely
  
3. My engaging in regular leisure time exercise in the next month allows me to socially interact with friends.  
Unlikely      1      2      3      4      5      6      7      Likely
  
4. My engaging in regular leisure time exercise in the next month will enable me to relieve stress.  
Unlikely      1      2      3      4      5      6      7      Likely
  
5. My engaging in regular leisure time exercise in the next month will enable me to improve my appearance.  
Unlikely      1      2      3      4      5      6      7      Likely

6. My engaging in regular leisure time exercise in the next month will allow me to improve my health and fitness  
 Unlikely      1      2      3      4      5      6      7      Likely
7. My engaging in regular leisure time exercise in the next month will allow me to experience a sense of fun and enjoyment.  
 Unlikely      1      2      3      4      5      6      7      Likely
8. My engaging in regular leisure time exercise in the next month will enable me to feel energised and refreshed.  
 Unlikely      1      2      3      4      5      6      7      Likely
9. My engaging in regular leisure time exercise in the next month will enable me to feel good about myself.  
 Unlikely      1      2      3      4      5      6      7      Likely
10. My engaging in regular leisure time exercise in the next month will be very time consuming.  
 Unlikely      1      2      3      4      5      6      7      Likely
11. My engaging in regular leisure time exercise in the next month will be financially costly.  
 Unlikely      1      2      3      4      5      6      7      Likely
12. My participation in regular leisure time exercise in the next month would take place in poor weather.  
 Unlikely      1      2      3      4      5      6      7      Likely
13. My engaging in regular leisure time exercise in the next month would involve the risk of injury.  
 Unlikely      1      2      3      4      5      6      7      Likely
14. My participation in regular leisure time exercise in the next month would necessitate a lot of dedication.
15. Unlikely      1      2      3      4      5      6      7      Likely

16. My family members think that

I should not    1       2       3       4       5       6       7       I should  
engage in regular leisure time exercise in the next month.

17. My friends think that

I should not    1       2       3       4       5       6       7       I should  
engage in regular leisure time exercise in the next month.

18. My coach thinks that

I should not    1       2       3       4       5       6       7       I should  
engage in regular leisure time exercise in the next month.

19. My team mates/exercise partners think that

I should not    1       2       3       4       5       6       7       I should  
engage in regular leisure time exercise in the next month.

20. I expect that my studies will place high demands on my time in the next month.

Unlikely       1       2       3       4       5       6       7       Likely

21. I expect that other leisure time activities will place high demands on my time in the next month.

Unlikely       1       2       3       4       5       6       7       Likely

22. I will find it difficult to afford regular leisure time physical activities in the next month.

Unlikely       1       2       3       4       5       6       7       Likely

23. I expect that I will need to expend a lot of effort to engage in regular leisure-time physical activities in the next month.

Unlikely       1       2       3       4       5       6       7       Likely

24. I will require the help of friends/exercise partners to participate in regular leisure-time exercise in the next month.

Unlikely       1       2       3       4       5       6       7       Likely

25. Being successful at my exercise is

Undesirable    1       2       3       4       5       6       7       desirable

26. Feeling part of a team/club is  
 Undesirable 1 2 3 4 5 6 7 desirable
27. Social interaction with my friends through exercise activities is  
 Undesirable 1 2 3 4 5 6 7 desirable
28. Relieving stress through exercise activities is  
 Undesirable 1 2 3 4 5 6 7 desirable
29. Improving my appearance through exercise activities is  
 Undesirable 1 2 3 4 5 6 7 desirable
30. Improving my health and fitness is  
 Undesirable 1 2 3 4 5 6 7 desirable
31. Experiencing a sense of fun and enjoyment through exercise is  
 Undesirable 1 2 3 4 5 6 7 desirable
32. Feeling energised and refreshed is  
 Undesirable 1 2 3 4 5 6 7 desirable
33. Feeling good about myself is  
 Undesirable 1 2 3 4 5 6 7 desirable
34. Engaging in time consuming physical activities is  
 Undesirable 1 2 3 4 5 6 7 desirable
35. Engaging in financially costly physical activities is  
 Undesirable 1 2 3 4 5 6 7 desirable
36. Participating in physical activities in poor weather is  
 Undesirable 1 2 3 4 5 6 7 desirable
37. The risk of injury in physical activities is  
 Undesirable 1 2 3 4 5 6 7 desirable

38. Participating in physical activities that require a lot of dedication is  
 Undesirable 1 2 3 4 5 6 7 desirable
39. When it comes to exercising, doing what family members think I should do is important to me.  
 Not at all 1 2 3 4 5 6 7 Very much so
40. When it comes to exercising, doing what my friends think I should do is important to me.  
 Not at all 1 2 3 4 5 6 7 Very much so
41. When it comes to exercising, doing what my coach thinks I should do is important to me.  
 Not at all 1 2 3 4 5 6 7 Very much so
42. When it comes to exercising, doing what team mates/exercise partners think I should do is important to me.  
 Not at all 1 2 3 4 5 6 7 Very much so
43. My studies placing high demands on my time in the next month would make it much more difficult 1 2 3 4 5 6 7 much easier for me to engage in regular leisure time exercise in the next month.
44. Other leisure time activities placing high demands on my time in the next month would make it much more difficult 1 2 3 4 5 6 7 much easier for me to engage in regular leisure time exercise in the next month.
45. The cost of participation would make it much more difficult 1 2 3 4 5 6 7 much easier for me to engage in regular leisure time exercise in the next month.
46. Needing a lot of effort would make it much more difficult 1 2 3 4 5 6 7 much easier for me to engage in regular leisure time exercise in the next month.

47. My requiring the help of friends/exercise partners would make it  
much more difficult    1       2       3       4       5       6       7    much easier  
for me to engage in regular leisure time exercise in the next month.

**Many thanks for your help and co-operation in this study.**

## A.5 Final Survey Instrument

### Section A

1. Name: \_\_\_\_\_

2. WIT Course and Year: \_\_\_\_\_

3. Student Number: \_\_\_\_\_

4. What age are you? \_\_\_\_\_

5. Gender:  Male  Female

6. Which of the following best describes where you live?

During the school/college year  Urban \*  Rural\*\*

During holiday periods  Urban \*  Rural\*\*

For the purpose of this question the following definitions of urban and rural dwelling apply:

\* Urban, resident in one of the following areas:

- Cities
- Suburbs of cities
- Mixed urban or rural areas bordering on the suburbs of cities
- Towns and their environs with populations of 5,000 or over
- Mixed urban or rural areas bordering on the environs of larger towns.
- Towns and their environs with a population of 1,000 to 5,000

\*\* Rural, resident in one of the following areas:

- Mixed urban or rural areas
- Rural areas

8. Please rate the following items in terms of how accurately they describe your current leisure-time physical activity situation. Tick the appropriate box.

Please read the definition of Regular Leisure-Time Physical Activity in the box below.

**\* Regular Leisure-Time Physical Activity:** This is defined by the WHO (2004) as -  
 At least three 20 minute or longer **vigorous physical activity** sessions in your leisure-time per week.  
 Or  
 At least five 30 minute or longer **moderate physical activity** sessions in your leisure-time per week.

**Moderate Physical Activity:** Exercise that leads to a noticeable increase in breathing  
**Vigorous Physical Activity:** Exercise that leads to heavy breathing and difficulty talking in full sentences

		Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
	1	2	3	4	5	
I currently do not exercise, and I do not intend to start exercising in the next 6 months						
I currently do not exercise, but I am thinking about starting exercising in the next 6 months						
I currently exercise a little, but not regularly.						
I currently exercise regularly, but I have only begun doing so within the last 6 months						
I currently exercise regularly, and have done so for longer than 6 months.						

**If you currently exercise regularly, please address Questions 8-11.**

**If you do not currently exercise regularly, please proceed to Section B of the survey.**

The questionnaire will now focus on what you consider to be your main or most regular form of leisure-time physical activity. Please consider questions/statements in the context of your most regular form of exercise.

8. What is your most regular form of leisure-time physical activity?

---

9. Which of the following best describes the intensity of effort involved when you participate in your favoured form of leisure-time physical activity?

- No Effort (no increase in breathing)
- Light Effort (mild increase in breathing)
- Moderate Effort (noticeable increase in breathing)
- Vigorous Effort (heavy breathing, difficulty talking in full sentences)
- Extremely Vigorous Effort (Gasping for breath, not able to talk at all)

10. Where do you participate in your main leisure-time physical activity?

- Gymnasium/Leisure Centre
- Sports Club
- College or University
- Community Hall
- Public Swimming Pool
- Athletics Track
- At Home
- Public Places\*
- Other \_\_\_\_\_

\* Public places include public roadways, parks, paths etc.

11. Which of the following physical activities have you participated in over the last 6 months? Please tick the appropriate activities in the first column and indicate in one of the five remaining columns how regularly you have participated in each chosen activity in the last 6 months.

Physical Activity		4 or more	2-3 days	2-3 days	1 day	Less Often
		days per week	per week	per month	per month	
Swimming	<input type="checkbox"/>					
Horse Riding	<input type="checkbox"/>					
Rugby Union	<input type="checkbox"/>					
Hockey	<input type="checkbox"/>					
Martial Arts	<input type="checkbox"/>					
Golf	<input type="checkbox"/>					
Aerobics or Gym/Keep Fit	<input type="checkbox"/>					
** Cycling for leisure	<input type="checkbox"/>					
Gaelic Football or Ladies Football	<input type="checkbox"/>					
Tennis	<input type="checkbox"/>					
Jogging	<input type="checkbox"/>					
Hurling or Camogie	<input type="checkbox"/>					
Soccer or 5-a-side football	<input type="checkbox"/>					
Weight Lifting	<input type="checkbox"/>					
Basketball	<input type="checkbox"/>					
*** Vigorous Walking or Hiking	<input type="checkbox"/>					
* Other: _____	<input type="checkbox"/>					
* Other: _____	<input type="checkbox"/>					
* Other: _____	<input type="checkbox"/>					
* Other: _____	<input type="checkbox"/>					

\* If you have participated in leisure time physical activities other than the ones listed below, please include them in the other category/categories in the table.

\*\* If you participate in cycling at a club/competitive level, please include this in the other category in the table.

\*\*\* Vigorous walking is defined for the purpose of this study as the participant expending at least a moderate effort (ie: a noticeable increase in breathing) when engaging in the activity. This doesn't include walking that involves no effort or a light effort (mild increase in breathing). Non-vigorous walking (i.e. walking that involves no effort or a light effort) is not considered a physical activity for the purpose of this study.

Please proceed to Section B of the survey.

## **Section B**

On the following pages are a number of statements concerning the reasons people often give when asked why they exercise. Whether you currently exercise regularly or not, please read each statement carefully and indicate, by circling the appropriate number, whether or not each statement is true for you personally, or would be true for you personally if you did exercise.

If you do not consider a statement to be true for you at all, circle the '0'. If you think that a statement is very true for you indeed, circle the '5'. If you think that a statement is partly true for you, then circle the '1', '2', '3' or '4', according to how strongly you feel that it reflects why you exercise or might exercise.

Remember, we want to know why you personally choose to exercise or might choose to exercise, not whether you think the statements are good reasons for anybody to exercise.

### **Personally, I exercise (or might exercise) ...**

		Not at all true for me					Very true for me	
		0	1	2	3	4	5	
1	To stay slim	0	1	2	3	4	5	
2	To avoid ill-health	0	1	2	3	4	5	
3	Because it makes me feel good	0	1	2	3	4	5	
4	To help me look younger	0	1	2	3	4	5	
5	To show my worth to others	0	1	2	3	4	5	
6	To give me space to think	0	1	2	3	4	5	
7	To have a healthy body	0	1	2	3	4	5	
8	To build up my strength	0	1	2	3	4	5	
9	Because I enjoy the feeling of exerting myself	0	1	2	3	4	5	

**Personally, I exercise (or might exercise) ...**

		Not at all true for me					Very true for me	
		0	1	2	3	4	5	
10	To spend time with friends	0	1	2	3	4	5	
11	Because my doctor advised me to exercise	0	1	2	3	4	5	
12	Because I like trying to win in physical activities	0	1	2	3	4	5	
13	To stay/become more agile	0	1	2	3	4	5	
14	To give me goals to work towards	0	1	2	3	4	5	
15	To lose weight	0	1	2	3	4	5	
16	To prevent health problems	0	1	2	3	4	5	
17	Because I find exercise invigorating	0	1	2	3	4	5	
18	To have a good body	0	1	2	3	4	5	
19	To compare my abilities with other peoples'	0	1	2	3	4	5	
20	Because it helps to reduce tension	0	1	2	3	4	5	
21	Because I want to maintain good health	0	1	2	3	4	5	
22	To increase my endurance	0	1	2	3	4	5	
23	Because I find exercising satisfying in and of itself	0	1	2	3	4	5	
24	To enjoy the social aspects of exercising	0	1	2	3	4	5	

**Personally, I exercise (or might exercise) ...**

		Not at all				Very true	
		true for me				for me	
		0	1	2	3	4	5
25	To help prevent an illness that runs in my family	0	1	2	3	4	5
26	Because I enjoy competing	0	1	2	3	4	5
27	To maintain flexibility	0	1	2	3	4	5
28	To give me personal challenges to face	0	1	2	3	4	5
29	To help control my weight	0	1	2	3	4	5
30	To avoid heart disease	0	1	2	3	4	5
31	To recharge my batteries	0	1	2	3	4	5
32	To improve my appearance	0	1	2	3	4	5
33	To gain recognition for my accomplishments	0	1	2	3	4	5
34	To help manage stress	0	1	2	3	4	5
35	To feel more healthy	0	1	2	3	4	5
36	To get stronger	0	1	2	3	4	5
37	For enjoyment of the experience of exercising	0	1	2	3	4	5
38	To have fun being active with other people	0	1	2	3	4	5
39	To help recover from an illness/injury	0	1	2	3	4	5

**Personally, I exercise (or might exercise) ...**

		Not at all				Very true	
		true for me				for me	
		0	1	2	3	4	5
40	Because I enjoy physical competition	0	1	2	3	4	5
41	To stay/become flexible	0	1	2	3	4	5
42	To develop personal skills	0	1	2	3	4	5
43	Because exercise helps me to burn calories	0	1	2	3	4	5
44	To look more attractive	0	1	2	3	4	5
45	To accomplish things that others are incapable of	0	1	2	3	4	5
46	To release tension	0	1	2	3	4	5
47	To develop my muscles	0	1	2	3	4	5
48	Because I feel at my best when exercising	0	1	2	3	4	5
49	To make new friends	0	1	2	3	4	5
50	Because I find physical activities fun, especially when competition is involved	0	1	2	3	4	5
51	To measure myself against personal standards	0	1	2	3	4	5

## Section C

Please assess your feelings on the following statements that relate to your beliefs regarding engaging in Regular Leisure-Time Exercise in the forthcoming month.

The statements should be evaluated by all respondents, both current regular exercisers and individuals that do not engage in regular leisure-time exercise. Please circle the number that best describes your opinion.

**\* Regular Leisure-Time Physical Activity:** This is defined by the WHO (2004) as -

At least three 20 minute or longer **vigorous physical activity** sessions in your leisure-time per week.

Or

At least five 30 minute or longer **moderate physical activity** sessions in your leisure-time per week.

**Moderate Physical Activity:** Exercise that leads to a noticeable increase in breathing

**Vigorous Physical Activity:** Exercise that leads to heavy breathing and difficulty talking in full sentences

1. Most people who are important to me feel that I should regularly engage in leisure-time exercise.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

2. For me to engage in regular leisure-time exercise in the coming month would be

difficult	1	2	3	4	5	6	7	easy
	extremely	quite	slightly	neither	slightly	quite	extremely	

3. I feel that engaging in regular leisure-time exercise in the next month will be

dull	1	2	3	4	5	6	7	interesting
	extremely	quite	slightly	neither	slightly	quite	extremely	

4. The people in my life whose opinions I value would approve of me regularly engaging in leisure-time exercise.

Disapprove	1	2	3	4	5	6	7	Approve
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

5. If I wanted to I could engage in regular leisure-time exercise in the coming month.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

6. I intend regularly engaging in leisure-time exercise in the next month.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

7. I feel that engaging in regular leisure-time exercise in the next month will be

Boring	1	2	3	4	5	6	7	stimulating
	extremely	quite	slightly	neither	slightly	quite	extremely	

8. It is expected of me that I engage in regular leisure-time exercise in the next month.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

9. Many people like me engage in regular leisure-time exercise.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

10. I feel that engaging in regular leisure-time exercise in the next month will be

bad	1	2	3	4	5	6	7	good
	extremely	quite	slightly	neither	slightly	quite	extremely	

11. I am confident that I could regularly engage in leisure-time exercise in the next month.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

12. I will try to regularly engage in leisure-time exercise in the next month.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

13. How much control do you believe you have over engaging in regular leisure-time exercise?

No control	1	2	3	4	5	6	7	Complete control
	Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Moderately agree	Strongly agree	

14. I feel that engaging in regular leisure-time exercise in the next month will be

unhealthy	1	2	3	4	5	6	7	healthy
	extremely	quite	slightly	neither	slightly	quite	extremely	

15. Most people who are important to me regularly engage in leisure-time exercise.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

16. I feel that engaging in regular leisure-time exercise in the next month will be

harmful	1	2	3	4	5	6	7	beneficial
	extremely	quite	slightly	neither	slightly	quite	extremely	

17. It is mostly up to me whether or not I engage in regular leisure-time exercise.

Disagree	1	2	3	4	5	6	7	Agree
	Strongly	moderately	slightly	neither	slightly	moderately	strongly	

18. I plan to regularly engage in leisure-time exercise in the next month.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

19. I feel that engaging in regular leisure-time exercise in the next month will be

worthless	1	2	3	4	5	6	7	valuable
	extremely	quite	slightly	neither	slightly	quite	extremely	

20. I feel that engaging in regular leisure-time exercise in the next month will be

not enjoyable	1	2	3	4	5	6	7	enjoyable
	extremely	quite	slightly	neither	slightly	quite	extremely	

21. The people in my life whose opinions I value regularly engage in leisure-time exercise.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

22. I have complete control over whether or not I regularly engage in leisure-time exercise.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

23. My engaging in regular leisure-time exercise in the next month will enable me to experience success.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

24. My engaging in regular leisure-time exercise in the next month allows me to feel part of a team/club.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

25. My engaging in regular leisure-time exercise in the next month allows me to socially interact with friends.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

26. My engaging in regular leisure-time exercise in the next month will enable me to relieve stress.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

27. My engaging in regular leisure-time exercise in the next month will enable me to improve my appearance.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

28. My engaging in regular leisure-time exercise in the next month will allow me to improve my health and fitness.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

29. My engaging in regular leisure-time exercise in the next month will allow me to experience a sense of fun and enjoyment.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

30. My engaging in regular leisure-time exercise in the next month will enable me to feel energised and refreshed.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

31. My engaging in regular leisure-time exercise in the next month will enable me to feel good about myself.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

32. My engaging in regular leisure-time exercise in the next month will be very time consuming.

Likely	1	2	3	4	5	6	7	Unlikely
	extremely	quite	slightly	neither	slightly	quite	extremely	

33. My engaging in regular leisure-time exercise in the next month will be financially costly.

Likely	1	2	3	4	5	6	7	Unlikely
	extremely	quite	slightly	neither	slightly	quite	extremely	

34. My participation in regular leisure-time exercise in the next month would take place in poor weather.

Likely	1	2	3	4	5	6	7	Unlikely
	extremely	quite	slightly	neither	slightly	quite	extremely	

35. My engaging in regular leisure-time exercise in the next month would involve the risk of injury.

Likely	1	2	3	4	5	6	7	Unlikely
	extremely	quite	slightly	neither	slightly	quite	extremely	

36. My participation in regular leisure-time exercise in the next month would necessitate a lot of dedication.

Likely	1	2	3	4	5	6	7	Unlikely
	extremely	quite	slightly	neither	slightly	quite	extremely	

37. My family thinks that I should engage in regular leisure-time exercise in the next month.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

38. My friends think that I should engage in regular leisure-time exercise in the next month

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

39. My coach thinks that I should engage in regular leisure-time exercise in the next month

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

40. My team mates/exercise partners think that I should engage in regular leisure-time exercise in the next month.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

41. I expect that my studies will impact on my regular leisure-time exercise in the next month.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

42. I expect that other leisure-time activities will impact on my regular leisure-time exercise in the next month.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

43. I will find it difficult to afford regular leisure-time exercise in the next month.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

44. I expect that I will need to expend a lot of effort to engage in regular leisure-time physical activities in the next month.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

45. I will require the help of friends/exercise partners to participate in regular leisure-time exercise in the next month.

Unlikely	1	2	3	4	5	6	7	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

46. Being successful at my exercise is

not desirable	1	2	3	4	5	6	7	desirable
	extremely	quite	slightly	neither	slightly	quite	extremely	

47. Feeling part of a team/club is

not desirable	1	2	3	4	5	6	7	desirable
	extremely	quite	slightly	neither	slightly	quite	extremely	

48. Social interaction with my friends through exercise activities is

not desirable	1	2	3	4	5	6	7	desirable
	extremely	quite	slightly	neither	slightly	quite	extremely	

49. Relieving stress through exercise activities is

not desirable	1	2	3	4	5	6	7	desirable
	extremely	quite	slightly	neither	slightly	quite	extremely	

50. Improving my appearance through exercise activities is

not desirable	1 extremely	2 quite	3 slightly	4 neither	5 slightly	6 quite	7 extremely	desirable
------------------	----------------	------------	---------------	--------------	---------------	------------	----------------	-----------

51. Improving my health and fitness is

not desirable	1 extremely	2 quite	3 slightly	4 neither	5 slightly	6 quite	7 extremely	desirable
------------------	----------------	------------	---------------	--------------	---------------	------------	----------------	-----------

52. Experiencing a sense of fun and enjoyment through exercise is

not desirable	1 extremely	2 quite	3 slightly	4 neither	5 slightly	6 quite	7 extremely	desirable
------------------	----------------	------------	---------------	--------------	---------------	------------	----------------	-----------

53. Feeling energised and refreshed is

not desirable	1 extremely	2 quite	3 slightly	4 neither	5 slightly	6 quite	7 extremely	desirable
------------------	----------------	------------	---------------	--------------	---------------	------------	----------------	-----------

54. Feeling good about myself is

not desirable	1 extremely	2 quite	3 slightly	4 neither	5 slightly	6 quite	7 extremely	desirable
------------------	----------------	------------	---------------	--------------	---------------	------------	----------------	-----------

55. Engaging in time consuming physical activities is

not desirable	1 extremely	2 quite	3 slightly	4 neither	5 slightly	6 quite	7 extremely	desirable
------------------	----------------	------------	---------------	--------------	---------------	------------	----------------	-----------

56. Engaging in financially costly physical activities is

not desirable	1 extremely	2 quite	3 slightly	4 neither	5 slightly	6 quite	7 extremely	desirable
------------------	----------------	------------	---------------	--------------	---------------	------------	----------------	-----------

57. Participating in physical activities in poor weather is

not desirable	1 extremely	2 quite	3 slightly	4 neither	5 slightly	6 quite	7 extremely	desirable
------------------	----------------	------------	---------------	--------------	---------------	------------	----------------	-----------

58. The risk of injury in physical activities is

not desirable	1 extremely	2 quite	3 slightly	4 neither	5 slightly	6 quite	7 extremely	desirable
------------------	----------------	------------	---------------	--------------	---------------	------------	----------------	-----------

59. Participating in physical activities that require a lot of dedication is

not desirable	1 extremely	2 quite	3 slightly	4 neither	5 slightly	6 quite	7 extremely	desirable
------------------	----------------	------------	---------------	--------------	---------------	------------	----------------	-----------

60. When it comes to exercising, doing what family members think I should do is important to me.

Disagree	1 strongly	2 moderately	3 slightly	4 neither	5 slightly	6 moderately	7 strongly	Agree
----------	---------------	-----------------	---------------	--------------	---------------	-----------------	---------------	-------

61. When it comes to exercising, doing what my friends think I should do is important to me.

Disagree	1 strongly	2 moderately	3 slightly	4 neither	5 slightly	6 moderately	7 strongly	Agree
----------	---------------	-----------------	---------------	--------------	---------------	-----------------	---------------	-------

62. When it comes to exercising, doing what my coach/manager thinks I should do is important to me.

Disagree	1 strongly	2 moderately	3 slightly	4 neither	5 slightly	6 moderately	7 strongly	Agree
----------	---------------	-----------------	---------------	--------------	---------------	-----------------	---------------	-------

63. When it comes to exercising, doing what team mates/exercise partners think I should do is important to me.

Disagree	1 strongly	2 moderately	3 slightly	4 neither	5 slightly	6 moderately	7 strongly	Agree
----------	---------------	-----------------	---------------	--------------	---------------	-----------------	---------------	-------

64. If my studies placed high demands on my time in the next month, it would make it more difficult for me to engage in regular leisure-time exercise in the next month.

Disagree	1 strongly	2 moderately	3 slightly	4 neither	5 slightly	6 moderately	7 strongly	Agree
----------	---------------	-----------------	---------------	--------------	---------------	-----------------	---------------	-------

65. If other leisure-time activities placed high demands on my time in the next month, it would make it more difficult for me to engage in regular leisure-time exercise in the next month.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

66. The cost of participation would make it more difficult me to engage in regular leisure-time exercise in the next month.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

67. If it needed a lot of effort, it would make it more difficult for me to engage in regular leisure-time exercise in the next month.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

68. If I required the help of friends/exercise partners, it would make it more difficult for me to engage in regular leisure-time exercise in the next month.

Disagree	1	2	3	4	5	6	7	Agree
	strongly	moderately	slightly	neither	slightly	moderately	strongly	

**Many thanks for your help and co-operation in this study.**

## A.6 Behavioural Follow-up Survey

### Leisure-Time Exercise Questionnaire

Listed overleaf are questions relating to your **leisure-time exercise behaviour** in the last four weeks. The questions ask you to consider your exercise in the last four weeks, outlining the frequency of participation and the types of activity that you engaged in. Please take some time to consider each question.

**NB\*:** Please consider the following definitions of exercise before proceeding any further:

**Moderate Exercise:** Exercise that leads to a noticeable increase in breathing.

**Vigorous Exercise:** Exercise that leads to heavy breathing and difficulty talking in full sentences.

**Name:** \_\_\_\_\_

**WIT Course and Year:** \_\_\_\_\_

**Student Number:** \_\_\_\_\_

## Section A

Please circle what you deem to be most appropriate for your leisure-time exercise behaviour in the past month.

-

1. In the course of the last month, how often have you participated in **vigorous** leisure-time exercise for at least 20 minutes at a time?

1	2	3	4	5	6
Everyday Never	Most Days	On About Half of the Days	A Few Times But Less Than Half	A Few Times	Almost

2. In the course of the last month, how often have you participated in **moderate** leisure-time exercise for at least 30 minutes at a time?

1	2	3	4	5	6
Everyday Never	Most Days	On About Half of the Days	A Few Times But Less Than Half	A Few Times	Almost

3. I engaged in **vigorous** leisure-time exercise for at least 20 minutes at a time in the last month with the following regularity:

1	2	3	4	5	6
Everyday	Most Days	Some Days	Occasionally	Very Seldom	Never

4. I engaged in **moderate** leisure-time exercise for at least 30 minutes at a time in the last month with the following regularity:

1	2	3	4	5	6
Everyday	Most Days	Some Days	Occasionally	Very Seldom	Never

**Section B**

Please answer the following questions:

1. During the last month, how many minutes per week did you spend engaging in moderate or vigorous leisure-time exercise? Please tick the answer that is most appropriate to you.

< 30 minutes \_\_\_\_\_

21-40 minutes \_\_\_\_\_

41-60 minutes \_\_\_\_\_

61-90 minutes \_\_\_\_\_

91-120 minutes \_\_\_\_\_

> 120 minutes \_\_\_\_\_

2. With regard to your leisure-time exercise in the last month, please list the types of activities that you engaged in.

---

---

---

**Thank you again for your time and co-operation in completing  
this study.**

## **Appendix B: Data Normality Analysis for Each Phase of Research**

Data normality tests were tested at a number of junctures in this research. The output of the tests is illustrated in Tables B1 to B4. Issues with data normality arise in three of the four tests, the exception being the tests for the summated TPB beliefs.

**Table B.1: Data Normality Tests for the 51 EMI-2 Variables**

	N	Mean	Std. Deviation	Skew ness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Error	Statistic	Error
Weight Management 1	775	4.16	1.64	-.633	.088	-.713	.175
Ill Health Avoidance 1	775	4.38	1.34	-.745	.088	.031	.175
Revitalisation 1	775	4.94	1.10	-1.109	.088	1.164	.175
Appearance1	774	2.56	1.55	.682	.088	-.585	.176
Social Recognition 1	774	2.50	1.51	.639	.088	-.668	.176
Stress Management 1	774	3.59	1.58	-.231	.088	-1.026	.176
Positive Health 1	774	5.04	1.04	-1.262	.088	1.744	.176
Strength and Endurance	775	4.70	1.33	-1.105	.088	.662	.175
Enjoyment 1	775	4.14	1.48	-.557	.088	-.546	.175
Affiliation 1	775	3.57	1.68	-.191	.088	-1.176	.175
Health Pressures 1	775	1.49	1.08	2.427	.088	5.406	.175
Competition 1	775	3.22	1.93	.147	.088	-1.522	.175
Nimbleness 1	775	3.89	1.55	-.484	.088	-.743	.175
Challenge 1	775	3.70	1.57	-.361	.088	-.917	.175
Weight Management 2	775	3.86	1.89	-.360	.088	-1.351	.175
Ill Health Avoidance 2	774	4.39	1.39	-.839	.088	.086	.176
Revitalisation 2	773	3.97	1.42	-.441	.088	-.432	.176
Appearance2	774	4.71	1.33	-1.063	.088	.591	.176
Social Recognition 2	775	2.86	1.60	.343	.088	-1.077	.175
Stress Management 2	775	3.83	1.52	-.425	.088	-.772	.175
Positive Health 2	775	4.78	1.17	-1.048	.088	1.020	.175
Strength and Endurance	775	4.28	1.40	-.767	.088	-.101	.175
Enjoyment 2	775	4.24	1.42	-.631	.088	-.342	.175
Affiliation 2	775	3.63	1.59	-.223	.088	-.986	.175
Health Pressures 2	775	2.21	1.58	1.083	.088	-.064	.175
Competition 2	775	3.37	1.83	-.011	.088	-1.427	.175
Nimbleness 2	775	3.84	1.43	-.373	.088	-.560	.175
Challenge 2	775	3.51	1.57	-.214	.088	-1.044	.175
Weight Management 3	775	3.99	1.81	-.482	.088	-1.173	.175
Ill Health Avoidance 3	775	3.51	1.71	-.153	.088	-1.231	.175
Revitalisation 3	775	3.37	1.56	-.139	.088	-1.059	.175
Appearance3	775	3.95	1.65	-.526	.088	-.864	.175
Social Recognition 3	775	2.88	1.60	.288	.088	-1.085	.175
Stress Management 3	775	3.68	1.56	-.295	.088	-.951	.175
Positive Health 3	775	4.83	1.08	-1.091	.088	1.423	.175
Strength and Endurance	774	4.53	1.35	-.954	.088	.385	.176
Enjoyment 3	774	4.03	1.48	-.519	.088	-.559	.176
Affiliation 3	775	3.78	1.58	-.365	.088	-.879	.175
Health Pressures 3	775	2.35	1.56	.821	.088	-.575	.175
Competition 3	775	3.35	1.79	.034	.088	-1.353	.175
Nimbleness 3	775	3.80	1.54	-.403	.088	-.805	.175
Challenge 3	775	3.31	1.57	-.093	.088	-1.077	.175
Weight Management 4	775	4.02	1.75	-.508	.088	-1.044	.175
Appearance4	775	3.68	1.75	-.236	.088	-1.241	.175
Social Recognition 4	775	2.70	1.62	.503	.088	-.957	.175
Stress Management 4	775	3.73	1.49	-.345	.088	-.791	.175
Strength and Endurance	774	4.15	1.52	-.680	.088	-.450	.176
Enjoyment 4	774	3.86	1.54	-.359	.088	-.846	.176
Affiliation 4	775	2.95	1.60	.282	.088	-1.062	.175
Competition 4	775	3.46	1.83	-.044	.088	-1.400	.175
Challenge 4	775	3.44	1.66	-.127	.088	-1.140	.175
Valid N (listwise)	765						

**Table B.2: Data Normality Tests for the Reduced 9 Construct EMI-2 Motives**

	N	Mean	Std. Deviation	Skew ness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Aesthetic	775	3.94	1.45	-.361	.088	-.855	.175
Stress Management	775	3.64	1.23	-.238	.088	-.686	.175
Health Enhancement	775	4.59	1.07	-.681	.088	-.004	.175
Stength	775	4.46	1.23	-.811	.088	.069	.175
Social	775	3.48	1.40	-.197	.088	-.851	.175
Enjoyment	775	3.99	1.20	-.396	.088	-.511	.175
Health Pressures	775	2.02	1.07	1.019	.088	.621	.175
Flexibility	775	3.82	1.40	-.353	.088	-.642	.175
Interpersonal	775	3.09	1.36	.092	.088	-1.068	.175
Valid N (listwise)	775						

**Table B.3: Data Normality Tests for the Elicited TPB Beliefs**

	N	Mean	Std. Deviation	Skew ness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Success	766	30.16	12.25	-.352	.088	-.553	.176
Affiliation	766	23.80	15.89	.179	.088	-1.223	.176
Social Interaction	765	25.99	14.47	-.080	.088	-1.046	.177
Stress Relief	762	30.60	12.58	-.414	.089	-.412	.177
Appearance	764	28.02	13.29	-.217	.088	-.778	.177
Health and Fitness	761	38.04	9.99	-.915	.089	.766	.177
Fun and Enjoyment	763	32.93	11.38	-.466	.089	-.266	.177
Energised	764	36.01	10.21	-.608	.088	.187	.177
Feeling Good	758	36.85	9.91	-.788	.089	.625	.177
Time Consuming	756	25.53	11.31	.036	.089	-.626	.178
Costly	754	11.21	10.00	1.258	.089	1.362	.178
Poor Weather	758	15.54	11.75	.847	.089	.111	.177
Injury Risk	757	11.23	10.44	1.436	.089	1.778	.177
Dedication	759	25.05	12.45	.114	.089	-.794	.177
Family	757	18.32	12.43	.573	.089	-.422	.177
Friends	755	16.35	11.47	.597	.089	-.323	.178
Coach	755	18.27	14.84	.593	.089	-.773	.178
Exercise Partners	760	18.62	13.30	.501	.089	-.622	.177
Studies	760	31.42	13.86	-.365	.089	-.883	.177
Other Leisure	758	22.18	12.21	.283	.089	-.546	.177
Affordability	758	16.48	13.34	.821	.089	-.217	.177
Effort	756	22.48	12.79	.319	.089	-.816	.178
Friend Co-operation	755	15.34	11.17	.821	.089	.104	.178
Valid N (listwise)	723						

**Table B.4: Data Normality Tests for the Summated TPB Constructs**

	N	Mean	Std. Deviation	Skew ness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Summated Behavioural Beliefs	479	26.69	6.69	-.111	.112	.252	.223
Summated Normative Beliefs	470	18.33	10.86	.417	.113	-.382	.225
Summated Control Beliefs	472	21.31	8.51	.437	.112	.066	.224
Reported Behaviour	480	3.56	1.28	.163	.111	-.892	.222
Valid N (listwise)	470						

## **Appendix C: Analysis of Direct TPB Measures**

### **C.1 Introduction**

Global or direct measures of the Theory of Planned Behaviour are included in the main survey instrument. They are not directly included in the segment identification or profiling process, rather they are used to test the criterion validity of the segment outcome (see Section 8.2). Prior to including these measures in the main survey, a larger set of measures of attitude, subjective norm, perceived behavioural control, and behavioural intention are included in the pilot study. The outcome of the pilot study facilitates the reduction of the measures to a smaller quantity of items that are most relevant to the target population. The reduced quantity of measures are then included in the final survey. This appendix outlines the process of identifying and reducing the global TPB measures.

### **C.2 Analysis for the Direct Measures of Attitude**

The twelve bipolar adjectives used to directly measure Attitude are a measure of the evaluative factor of Osgood's Semantic Differential Scale. They also reflect both the instrumental evaluation (six adjectives) and experiential evaluation (five adjectives) of the behaviour, as well as the good-bad scales which tend to capture overall evaluation very well, as recommended by Ajzen (2002). The first step in the analysis is to ascertain if the twelve bipolar adjectives can be categorised as envisaged. A factor analysis is used to establish this (see Table C.1):

**Table C.1: Initial Factor Analysis for Direct Measures of Attitude**

Component		Attitude Statements	
1	2		
.347	.512	DA1	Engaging in exercise will be important/unimportant
.396	.759	DA2	Engaging in exercise will be dull/interesting.
.361	.806	DA3	Engaging in exercise will be boring/stimulating.
-.119	.793	DA4	Engaging in exercise will be pleasant/unpleasant.
.661	.453	DA5	Engaging in exercise will be bad/good
.578	.402	DA6	Engaging in exercise will be useless/useful
.835	.073	DA7	Engaging in exercise will be unhealthy/healthy
.718	.184	DA8	Engaging in exercise will be beneficial/harmful
.779	.302	DA9	Engaging in exercise will be worthless/valuable
.367	.724	DA10	Engaging in exercise will be enjoyable/unenjoyable
.740	.125	DA11	Engaging in exercise will be wise/foolish
.778	.397	DA12	Engaging in exercise will be satisfying/dissatisfying

Two components emerged that are relatively representative of the instrumental evaluation and experiential evaluation aspects of the attitude measures. These are as follows:

Component 1: Represents instrumental evaluation quite well. The measures DA6, DA7, DA8, DA9 and DA11 were designed to reflect instrumental evaluation and have satisfactory scores ( $>.5$ ). However DA1 has an unsatisfactory loading of .347. The intended overall evaluation measure DA5 loads particularly well with this component .661.

Component 2: Represents experiential evaluation quite well. The measures DA2, DA3, DA4, and DA10 were designed to reflect experiential evaluation and have satisfactory scores ( $>.5$ ). However DA12 has an unsatisfactory loading of .397.

Another intention of this phase is to reduce the number of variables being examined, so the two problematic variables DA1 and DA12 were excluded and then variables with the lowest loadings were eliminated sequentially, with a new rotation taking place after the elimination of each item. The following variables were excluded in sequence: DA1; DA12; DA6; DA8; DA2; DA11. The process was halted at this stage, as DA10 would have been next item to be removed. However, this would have left only one measure of experiential evaluation, and the intention has been to have at least two measures of both experiential and instrumental evaluation in the final questionnaire. The rotated

component matrix for the variables to be included in the final questionnaire can be seen in Table C.2:

**Table C.2: Final Factor Analysis for Direct Measures of Attitude**

Component		Attitude Statements	
1	2		
.474	.725	DA3	Engaging in exercise will be boring/stimulating
-.053	.880	DA4	Engaging in exercise will be pleasant/unpleasant.
.784	.360	DA5	Engaging in exercise will be bad/good
.893	-.004	DA7	Engaging in exercise will be unhealthy/healthy
.812	.262	DA9	Engaging in exercise will be worthless/valuable
.446	.706	DA10	Engaging in exercise will be enjoyable/unenjoyable

There are three measures of experiential evaluation DA3, DA4 and DA10; two measures of instrumental evaluation DA7 and DA9; as well as the overall evaluation measure DA5. The analysis then proceeded to examine the reliability of the variables that remained after the factor/data reduction analysis. The Cronbach's Alpha score for the three remaining experiential variables DA3, DA4 and DA10 is a satisfactory .764. The reliability of the two measures of instrumental evaluation DA7 and DA9 is also satisfactory at .765, while integrating the overall evaluation measure DA5 with these two variables increases the reliability to .826. The Cronbach Alpha for all six variables combined is a strong .822.

### **C.3 Analysis for the Direct Measures of Subjective Norm**

Ajzen (2002) contends that measures for subjective norm should have both injunctive and descriptive questions. Six variables were designed to capture both the injunctive and descriptive aspects of subjective norm, three for each aspect. The first step in the analysis is to ascertain if the six measures can be categorised as envisaged. A factor analysis is used to establish this, as illustrated in Table C.3.

**Table C.3: Initial Factor Analysis for Direct Measures of Subjective Norm**

Component		Subjective Norm Statements	
1	2		
.635	-.052	DSN1	People who are important to me feel that I should exercise
.791	-.075	DSN2	People in my life whose opinions I value would approve of me exercising
.662	.042	DSN3	It is expected of me that I exercise
.675	.266	DSN4	Many people like me regularly exercise
.170	.872	DSN5	People who are important to me regularly exercise
-.115	.895	DSN6	The people in my life whose opinions I value regularly exercise

Two components emerged that reflect the injunctive and descriptive aspects of the subjective norms measures.

Component 1: Represents injunctive norms very well. The measures DSN1, DSN2, and DSN3 were designed to reflect injunctive norms and have satisfactory scores (> .5).

Component 2: Represents descriptive norms quite well. The measures DSN5 and DSN6 were designed to reflect descriptive norms and have satisfactory scores (> .5). However DSN4 has an unsatisfactory loading of .266.

A process was then initiated to eliminate measures with unsatisfactory loadings and then further reduce the data, by eliminating the measures with the lowest loading in sequence. The following variables were excluded in sequence: DSN4 and DSN3.

At this stage the exclusion process finished, as DSN2 would have been next item to be removed. However, this would have left only one measure of injunctive norms, and the intention is to have at least two measures of both descriptive and injunctive norms in the final survey. The rotated component matrix for the variables to be included in the final questionnaire can be seen in Table C.4:

**Table C.4: Final Factor Analysis for Direct Measures of Subjective Norms**

Component		Subjective Norm Statements	
1	2		
.042	.844	DSN1	People who are important to me feel that I should exercise
-.035	.824	DSN2	People in my life whose opinions I value would approve of me exercising
.893	.135	DSN4	People who are important to me regularly exercise
.891	-.127	DSN6	The people in my life whose opinions I value regularly exercise

There are two measures of injunctive norms DSN1 and DSN2, and two measures of descriptive norms DSN5 and DSN6. The reliability of the variables that remained after the factor/data reduction analysis is then analysed. The Cronbach's Alpha score for the two injunctive norm variables DSN1 and DSN2 is a moderate .673. The reliability of the two measures of descriptive norm DSN5 and DSN6 is satisfactory at .744. The Cronbach's Alpha for all four variables combined is again moderate at .654.

#### C.4 Analysis for the Direct Measures of Perceived Behavioural Control

Ajzen (2002) contends that measures for perceived behavioural control should include both the individual's perceived capability and their control beliefs. Three measures of individuals' perceived capability are included, as well as three measures to assess people's beliefs that they have control over the behaviour. The first step in the analysis is to ascertain if the six measures can be categorised as envisaged. A factor analysis is used to establish this and the initial rotated component matrix for all direct perceived behavioural control measures is illustrated in Table C.5:

**Table C.5: Initial Factor Analysis for Direct Measures of Perceived Behavioural Control**

Component		Perceived Behavioural Control Statements	
1	2		
.788	.154	DBC1	For me to exercise regularly would be difficult
.679	.042	DBC2	If I wanted to I could exercise regularly
.853	.158	DBC3	I am confident that I could exercise regularly
.750	.430	DBC4	How much control do you believe you have over regularly exercising?
.007	.927	DBC5	It is mostly up to me whether or not I regularly exercise
.404	.788	DBC6	I have complete control over whether or not I regularly exercise.

Two components emerged that reflect the injunctive and descriptive aspects of the perceived behavioural control measures.

Component 1: Represents the individual's perceived capability to exercise very well. The measures DBC1, DBC2 and DBC3 all illustrate satisfactory scores (> .5).

Component 2: Represents the strength of the control beliefs quite well. The measures DBC5 and DBC6 have satisfactory scores (> .5). However DBC4 has an unsatisfactory loading of .430.

A process was then initiated to eliminate measures with unsatisfactory loadings and then further reduce the data, by eliminating the measures with the lowest loading in sequence. The following variables were excluded in sequence: DBC4 and DBC2. At this stage the exclusion process finished, as DBC6 would have been next item to be removed. However, this would have left only one measure of control belief strength, and the intention has been to have at least two measures of both perceived capability and control belief strength in the final survey. The rotated component matrix for the variables to be included in the final questionnaire can be seen in Table C.6:

**Table C.6: Final Factor Analysis for Direct Measures of Perceived Behavioural Control**

Component		Perceived Behavioural Control Statements	
1	2		
.876	.122	DBC1	For me to exercise regularly would be difficult
.870	.140	DBC3	I am confident that I could exercise regularly
-.008	.945	DBC5	It is mostly up to me whether or not I regularly exercise
.461	.771	DBC6	I have complete control over whether or not I regularly exercise.

There are two measures of perceived capability DBC1 and DBC3, and two measures of descriptive norms DBC5 and DBC6. The reliability of the variables that remained after the factor/data reduction analysis is then analysed. The Cronbach's Alpha score for the two perceived capability variables DBC1 and DBC3 is a satisfactory .740. The reliability of the two measures of control belief strength DBC5 and DBC6 is satisfactory at .736. The Cronbach's Alpha for all four variables combined is again satisfactory at .715.

### **C.5 Analysis for Direct Measure of Behavioural Intention**

Four measures are used to directly assess behavioural intention. There is nothing in previous work to indicate that more than one factor/component will emerge in a factor analysis of these measures. The results of the factor analysis that was conducted for the direct measures of behavioural intention are illustrated in Table C.7:

**Table C.7: Initial Factor Analysis for Direct Measures of Behavioural Intention**

<b>Component 1</b>	<b>Behavioural Intention Statements</b>	
.838	BI1	I intend regularly exercising in the next month
.837	BI2	I will try to regularly exercise in the next month
.753	BI3	I am determined to regularly exercise in the next month
.932	BI4	I plan to regularly exercise in the next month

As expected only one component emerged and all measures have satisfactory loadings within the component matrix. A process was then initiated to reduce the data, by eliminating the measures with the lowest loading in sequence. BI3 was excluded before the process was halted, as the researcher wants to maintain three measures of behavioural intention for the final study. The factor analysis for the variables to be included in the final questionnaire can be seen in Table C.8:

**Table C.8: Final Factor Analysis for Direct Measures of Behavioural Intention**

<b>Component 1</b>	<b>Behavioural Intention Statements</b>	
.874	BI1	I intend regularly exercising in the next month
.865	BI2	I will try to regularly exercise in the next month
.932	BI4	I plan to regularly exercise in the next month

There are three measures of behavioural intention chosen for inclusion in the final survey BI1, BI2 and BI4. The reliability of these variables is satisfactory with a Cronbach's Alpha of .863.

The outcome of this analysis is that six measures of attitude, four measures of subjective norm, four measures of perceived behavioural control, and three measures of behavioural intention are selected for inclusion in the final survey instrument.

## **Appendix D: Additional Segment Profiling**

### **D.1 Introduction**

The author conducted a number of other tests examining within-segment differences in the TPB beliefs, based on age category, gender, and recent exercise status. These tests revealed some significant differences within segments that could enhance segment profiling. However, the extent of these differences is not substantial and the author elected not to include these analyses in the main body of the thesis.

### **D.2 Testing Research Proposition ARP1**

The pertinence of age as a correlate of exercise behaviour is well-established (e.g., Quindry *et al.*, 2011). Earlier propositions contended that the segments would illustrate varying age profiles. Additionally, it is anticipated that younger and older members of each segment will exhibit differentiated motivational profiles. It is postulated that a similar situation exists for the underlying TPB beliefs. Rhodes, Blanchard, and Blacklock (2008) illustrate that people of varying ages have significantly different strengths of behavioural, normative, and control beliefs relating to exercise behaviour and this leads to the creation of Research Proposition ARP1

**Research Proposition ARP1: Age will serve as a differentiator in elicited TPB beliefs.**

The proposition is evaluated by testing three hypotheses. They examine significant differences in beliefs for younger and older respondents for the overall sample and across segments.

**Hypothesis AH1a:** Significant differences in behavioural beliefs will emerge between age groups across the identified segments.

**Hypothesis AH1b:** Significant differences in normative beliefs will emerge between age groups across the identified segments.

**Hypothesis AH1c:** Significant differences in control beliefs will emerge between age groups across the identified segments.

A series of independent sample t-tests were conducted to compare beliefs between the two age groups across segments. The respondents were categorised into two age groups, those aged 25 or more and those aged between 18-24 years.

**Hypothesis AH1a:** Significant differences in behavioural beliefs will emerge between age groups across the identified segments.

The findings of the t-test relating to this hypothesis are illustrated in Table D.1 below.

**Table D.1: Within-Segment Comparisons in Elicited Behavioural Beliefs by Age Group**

Group Statistics							Equality of Variance		Independent Samples t-test		
Segment	Belief	Age Category	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Affiliation	18-24	167	30.28	15.079	1.167	.159	.690	3.069	.002	7.857
		25 or Over	43	22.42	14.536	2.217					
	Social Interaction	18-24	167	32.13	13.283	1.028	.477	.491	4.873	.000	11.064
		25 or Over	44	21.07	13.832	2.085					
	Time Consuming	18-24	164	29.83	11.385	.889	.009	.923	2.977	.003	5.738
		25 or Over	44	24.09	11.231	1.693					
Dedication	18-24	165	30.40	12.312	.959	1.414	.236	2.363	.019	4.809	
	25 or Over	44	25.59	10.710	1.615						
Social Competitor	Success	18-24	156	34.51	11.074	.887	2.507	.115	3.986	.000	13.513
		25 or Over	12	21.00	14.296	4.127					
	Affiliation	18-24	156	34.92	13.408	1.073	1.287	.258	4.185	.000	17.167
		25 or Over	12	17.75	17.205	4.967					
	Social Interaction	18-24	155	34.77	11.701	.940	2.586	.110	4.396	.000	15.768
		25 or Over	12	19.00	15.267	4.407					
Dedication	18-24	152	30.01	12.490	1.013	.089	.766	2.030	.044	7.680	
	25 or Over	12	22.33	14.253	4.115						
Healthy Looker	Affiliation	18-24	174	18.35	13.309	1.009	6.761	.010	2.715	.007	5.351
		25 or Over	54	13.00	10.209	1.389					
	Social Interaction	18-24	174	22.75	12.183	.924	.441	.507	4.069	.000	7.599
		25 or Over	54	15.15	11.336	1.543					
Reluctant Exerciser	Appearance	18-24	111	26.30	13.778	1.308	.010	.921	2.921	.004	8.874
		25 or Over	26	17.42	14.665	2.876					

A number of significant differences in behavioural beliefs exist between the age groupings within The Enthusiast segment. The younger group exhibit a significantly more positive attitude concerning the affiliation and social interaction benefits of exercise. Additionally, younger members of this segment are significantly less constrained by potentially negative beliefs concerning time needed to exercise and the dedication required for regular exercise.

The differences are even more pronounced for members of the Social Competitor cluster, with younger members exhibiting a significantly more positive attitude to exercise across a number of beliefs. In this instance, success, affiliation, and social interaction, are the differentiating beliefs. Additionally, younger members are significantly less restrained by the beliefs relating to the dedication required for regular exercise.

Lesser differentiation prevails for the Healthy Looker and Reluctant Exerciser segments. Younger members of the Healthy Looker group illustrate a significantly more positive attitude to the affiliation and social interaction benefits of exercise, while appearance is the sole significant differentiator for the Reluctant Exerciser cluster, with younger members again having a more positive attitude in this regard.

**Hypothesis AH1b:** Significant differences in normative beliefs will emerge between age groups across the identified segments.

Differences in normative beliefs between age groups are evident for three of the four segments, as illustrated in Table D.2.

**Table D.2: Within-Segment Comparisons in Elicited Normative Beliefs by Age Group**

Group Statistics							Equality of Variance		Independent Samples t-test		
Segment	Belief	Age Category	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Coaches	18-24	164	25.52	16.241	1.268	4.804	.030	3.806	.000	10.239
		25 or Over	43	15.28	13.399	2.043					
	Exercise Partners	18-24	165	24.10	14.039	1.093	.828	.364	3.571	.000	8.324
		25 or Over	44	15.77	12.532	1.889					
Social Competitor	Family	18-24	152	21.84	12.449	1.010	.653	.420	2.806	.006	10.336
		25 or Over	12	11.50	9.765	2.819					
	Friends	18-24	152	20.08	12.139	.985	1.153	.285	2.892	.004	10.412
		25 or Over	12	9.67	10.012	2.890					
	Coaches	18-24	152	26.68	14.477	1.174	1550	.215	3.749	.000	16.101
		25 or Over	12	10.58	11.973	3.456					
	Exercise Partners	18-24	153	25.35	12.972	1.049	1766	.186	3.554	.000	13.596
		25 or Over	12	11.75	9.372	2.706					
Healthy Looker	Family	18-24	173	18.80	12.238	.930	4.142	.043	2.119	.035	3.930
		25 or Over	53	14.87	10.271	1.411					
	Friends	18-24	171	16.07	10.756	.823	1081	.300	2.085	.038	3.391
		25 or Over	53	12.68	8.862	1.217					
	Coaches	18-24	172	13.84	11.503	.877	6.178	.014	2.694	.008	4.612
		25 or Over	52	9.23	8.109	1.124					
	Exercise Partners	18-24	173	15.89	11.538	.877	3.098	.080	2.395	.017	4.098
		25 or Over	53	11.79	8.452	1.161					

Within The Enthusiast segment, significant differences occur for the normative beliefs relating to the influence of the coach and exercise partners, with the younger group attributing considerably more importance to this.

The Social Competitor cluster exhibits significant differences for all four normative beliefs, with the younger group quite emphatic in their evaluation of the importance of all of the normative supports. The Healthy Looker group has the same differentiating beliefs, although to a lesser extent, while the Reluctant Exercisers exhibit no significant differentiation between the age groups.

**Hypothesis AH1c:** Significant differences in control beliefs will emerge between age groups across the identified segments.

Minimal significant differentiation exists in control beliefs between the age groups within each segment, as illustrated in Table D.3.

**Table D.3: Within-Segment Comparisons in Elicited Control Beliefs by Age Group**

Group Statistics							Equality of Variance		Independent Samples t-test		
Segment	Belief	Age Category	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Other Leisure Activities	18-24	165	25.72	11.865	.924	.237	.627	2.231	.027	4.517
		25 or Over	44	21.20	12.193	1.838					

### D.3 Evaluating Research Proposition ARP2

The proposition is partially upheld. The level of differentiation in beliefs held by the two age groupings within-segments is moderate, although where differentiation does occur it largely upholds the findings of extant literature.

Strong interpersonal oriented behavioural beliefs (success, affiliation, social interaction) characterise the younger cohort in the overall sample, traits that are also evident in three of the four segments. The Enthusiast, Social Competitor, and Healthy Looker segments all illustrate differentiation for affiliation and social interaction beliefs, with younger respondents more positive in this regard. Studies by Biddle, (1993) and Markland and Ingledew (1997) indicate that affiliation with their team/club is a driving factor for many younger participants, although Strong *et al.* (2006) found no differentiation between age groups in this regard. Support for the social interaction finding comes from a study by Kilpatrick, Hebert, and Bartholomew (2005), who found that young females consistently cite interaction with friends as an antecedent of their exercise engagement. Younger members of the Social Competitor segment are differentiated by their more favourable attitude relating to the potential success oriented benefits of exercising. This finding is consistent with the outcomes of numerous studies in the area that highlight competitive factors as a key driver of the exercise behaviour of many younger participants, in particular young males (e.g., Quindry *et al.*, 2011). Several potential disadvantages of exercising are also evaluated as being significantly less inhibiting for younger respondents. The time required and dedication required to regularly exercise are prominent amongst these and receive varying degrees of support in the literature. Older exercisers have regularly been found to cite time constraints as a negative consideration for their exercise engagement (Beck *et al.*, 2010). However, a number of studies have also found that older exercisers are more equipped with the requisite levels

of dedication to participate regularly, illustrating the willpower and organisation to give time to their exercise activities.

Normative beliefs present a quite differentiated outcome, younger members of the overall sample exhibiting more positive beliefs relating to the role of significant others in their exercise behaviour. A similar situation pertains within the segments. All four normative reference groups assume greater importance for the Healthy Looker and Social Competitor groups, the significance of their role being particularly pronounced for the younger Social Competitors. The findings are congruent with the research of Ntoumanis and Biddle (1999) who established the importance of significant others in their study of young adult exercisers. Additionally, Horn and Amorose (1998) found that as individuals move through the family life cycle, the supportive role of family toward exercise lessens and in some respects becomes a barrier to regular engagement. However, these findings must be considered in the context of the very low proportion of older members within the Social Competitor cluster. The younger Enthusiast segment members also ascribe significant value to the support of coaches and exercise partners. The lack of differentiation between age groups illustrated within the Reluctant Exerciser group is perhaps reflective of a cohort that generally receives little social support for their exercising or do not perceive the support that they do get as being important.

Control beliefs exhibit some differentiation between age groups for the overall sample, with studies exhibiting a greater controlling influence on the exercise engagement of the older grouping, while the activities of the younger cohort are affected significantly more by the need for friends' co-operation in their exercising. No evidence of a significantly greater controlling effect of studies on older groupings has been found in the literature, the bulk of the work in the area having addressed younger audiences (e.g., Kilpatrick, Hebert, and Bartholomew, 2005). It might be reasonable to postulate that this group are more mature in their approach to their college studies and as such it may occupy a more prominent position in their priorities than may be the case for younger groups. The co-operation of friends has been cited as a significant pre-requisite of exercising for younger audiences in a number of studies (e.g., Rhodes, Blanchard, and Blacklock, 2008), with the consensus being that when the co-operation is not forthcoming, there are negative consequences on behaviour. However, this differentiation does not translate into within-segment diversity in behavioural beliefs between the age groupings.

#### **D.4 Testing Research Proposition ARP2**

Gender also consistently emerges as a correlate of exercise behaviour in the literature (Trost *et al.*, 2002). As with age, an earlier proposition contended that the segments would illustrate varying gender profiles. It is also surmised that males and females in each segment will exhibit differentiated motivational profiles. Gender differentials in TPB beliefs have been illustrated in a study by Rhodes, Blanchard, and Blacklock (2008). Consequently, it is proposed that males and females will exhibit considerable differentiation in TPB beliefs in the domain of this study.

**Research Proposition ARP2: Gender will serve as a differentiator in elicited TPB beliefs.**

Three hypotheses evaluating significant differences in beliefs for males and females across segments test this hypothesis.

**Hypothesis AH2a:** Significant differences in behavioural beliefs will emerge between males and females across the identified segments.

**Hypothesis AH2b:** Significant differences in normative beliefs will emerge between males and females across the identified segments.

**Hypothesis AH2c:** Significant differences in control beliefs will emerge between males and females across the identified segments.

A series of independent sample t-tests are conducted to compare beliefs between males and females and across segments.

**Hypothesis AH2a:** Significant differences in behavioural beliefs will emerge between males and females across the identified segments.

The differences in behavioural beliefs between genders are less pronounced within-segments than for the overall sample – see Table D.4.

**Table D.4: Within-segment Comparisons in Elicited Behavioural Beliefs by Gender**

Group Statistics							Equality of Variance		Independent Samples t-test		
Segment	Belief	Gender	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Affiliation	Male	12	30.86	14.505	1.371	1.358	.245	2.244	.026	4.694
		Female	98	26.16	15.803	1.596					
	Feeling Good	Male	111	40.16	8.561	.813	2.418	.121	-2.344	.020	-2.603
		Female	98	42.77	7.337	.741					
	Poor Weather	Male	111	19.46	12.768	1.212	15.18	.219	2.668	.008	4.551
		Female	98	14.91	11.760	1.188					
Social Competitor	Appearance	Male	134	22.80	12.084	1.044	.307	.580	2.177	.031	5.080
		Female	32	17.72	10.843	1.917					
	Feeling Energised	Male	134	34.92	8.843	.764	.002	.969	-3.063	.003	-5.207
		Female	32	40.13	7.716	1.364					
Healthy Looker	Affiliation	Male	101	19.16	12.052	1.199	1.369	.243	2.197	.029	3.725
		Female	127	15.43	13.226	1.174					
	Appearance	Male	100	27.93	11.277	1.128	.965	.327	-3.448	.001	-5.398
		Female	128	33.33	12.075	1.067					
	Health & Fitness	Male	98	37.60	9.231	.932	.169	.681	-1.983	.049	-2.335
		Female	128	39.94	8.407	.743					
	Feeling Good	Male	99	34.48	9.059	.910	.333	.564	-3.341	.001	-4.043
		Female	127	38.53	8.999	.799					
	Poor Weather	Male	99	15.95	10.274	1.033	.118	.732	3.476	.001	4.737
		Female	127	11.21	10.080	.894					
	Injury Risk	Male	99	12.24	8.888	.893	1.270	.261	3.393	.001	4.022
		Female	127	8.22	8.803	.781					
Dedication	Male	99	25.65	9.052	.910	1.031	.311	4.150	.000	5.402	
	Female	127	20.24	10.191	.904						
Reluctant Exerciser	Affiliation	Male	56	19.71	14.805	1.978	3.251	.074	2.577	.011	5.946
		Female	82	13.77	12.191	1.346					
	Appearance	Male	55	21.65	13.354	1.801	2.290	.133	-2.001	.047	-4.943
		Female	82	26.60	14.691	1.622					
	Health & Fitness	Male	55	29.89	10.947	1.476	.046	.831	-2.474	.015	-4.682
		Female	82	34.57	10.798	1.192					
	Poor Weather	Male	55	13.80	9.427	1.271	3.792	.054	2.571	.011	3.849
		Female	82	9.95	7.980	.881					

The Enthusiast segment exhibits some significant differences. The male cohort has significantly stronger beliefs relating to the affiliate benefits of regular exercise, while females' perceptions that exercise can facilitate feeling good are considerably stronger. Additionally, males have significantly more positive evaluation of the impact of poor weather on exercise participation. Within the Social Competitor segment, males are significantly more positive about the appearance benefits of exercising. For the female cohort, the feeling of being energised by exercise is considerably stronger than that of their male counterparts. The females in the Healthy Looker cluster illustrate significantly more positive beliefs concerning the appearance, health and fitness, and feeling the good benefits of exercising. The males rate the affiliation gains of exercising as significantly more important, while they also appear significantly less inhibited by

beliefs relating to poor weather, injury risk, and dedication need to exercise. A similar situation pertains within the Reluctant Exerciser group. Female members have significantly more assured beliefs relating to the appearance, and health and fitness benefits of exercising, while males again rate the affiliation gains of exercising as significantly more important. Additionally, males in this segment are once again significantly less constrained by beliefs concerning poor weather and exercise.

**Hypothesis AH2b:** Significant differences in normative beliefs will emerge between males and females across the identified segments.

As with behavioural beliefs, the differences in normative beliefs between genders are less evident within-segments than for the overall sample – see Table D.5.

**Table D.5: Within-segment Comparisons in Elicited Normative Beliefs by Gender**

Group Statistics							Equality of Variance		Independent Samples t-test		
Segment	Belief	Gender	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Coaches	Male	110	26.02	16.829	1.60457	5.331	.022	2.515	.03	5.606
		Female	97	20.41	15.007	1.52371					
Healthy Looker	Friends	Male	97	17.16	9.814	.99642	.311	.578	2.407	.07	3.346
		Female	127	13.82	10.674	.94720					
	Coaches	Male	98	14.60	10.935	1.10464	.108	.743	2.221	.027	3.253
		Female	126	11.35	10.824	.96427					
	Exercise Partners	Male	99	16.98	10.634	1.06875	.653	.420	2.500	.03	3.649
		Female	127	13.33	11.081	.98324					
Reluctant Exerciser	Friends	Male	97	17.16	9.814	.99642	.311	.578	2.407	.07	3.346
		Female	127	13.82	10.674	.94720					
	Coaches	Male	98	14.60	10.935	1.10464	.108	.743	2.221	.027	3.253
		Female	126	11.35	10.824	.96427					
	Exercise Partners	Male	99	16.98	10.634	1.06875	.653	.420	2.500	.03	3.649
		Female	127	13.33	11.081	.98324					

Within The Enthusiast segment, the only significant difference is for the normative belief relating to the influence of the coach, with males ascribing considerably more importance to this. No significant differences exist between genders within the Social Competitor group. The Healthy Looker grouping is more differentiated, with males attributing significantly greater importance to the impact of friends, coaches, and exercise partners on their exercise behaviour. The only significant normative belief for the Reluctant Exercisers is that relating to the role of exercise partners, which males attribute greater importance to.

**Hypothesis AH2c:** Significant differences in control beliefs will emerge between males and females across the identified segments.

As with the other two sets of beliefs, control beliefs are less differentiated between genders within the segments, as illustrated in Table D.6.

**Table D.6: Within-Segment Comparisons in Elicited Control Beliefs by Gender**

Group Statistics							Equality of Variance		Independent Samples t-test		
Segment	Belief	Gender	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Effort	Male	109	19.67	12.678	1.21	.027	.869	-3.214	.002	-5.862
		Female	96	25.53	13.416	1.37					
Healthy Looker	Studies	Male	99	30.69	12.381	1.24	.551	.459	-2.596	.010	-4.455
		Female	127	35.14	13.114	1.16					
	Effort	Male	98	21.16	10.975	1.11	12.17	.271	-3.246	.001	-5.089
		Female	127	26.25	12.458	1.08					

The only significant difference within The Enthusiast segment is for the effort required to exercise, with females seemingly more constrained by this belief. No gender based differentiation exists within both the Social Competitor and Reluctant Exerciser clusters. Within the Healthy Looker segment considerable differences emerge for the studies and effort beliefs, with females again more controlled by these issues.

### D.5 Evaluating Research Proposition ARP2

Research Proposition ARP2 is largely upheld. Differences in beliefs held by the males and females within-segments are substantial and find a good degree of support from previous research.

Females in the overall sample exhibit significantly stronger wellness type behavioural beliefs (stress relief, appearance, feeling good, feeling refreshed). Interpersonal (success, affiliation, social interaction) and enjoyment oriented beliefs distinguish the male respondents in a manner that positively affects their attitudes toward exercising. Males also have distinctly more optimistic assessments regarding the majority of potential disadvantages of exercising, reducing the impact of these on their attitude toward exercise when compared to females. These findings are consistent with much previous academic research. Female cohorts in studies by Markland and Ingledew

(1997) and Kelinske, Mayer, and Chen (2001) indicate that benefits such as looking and feeling good, and stress relief are key drivers of their behaviour. Similarly, previous studies confirm the competitive orientation of many male exercisers (Rhodes, Blanchard, and Blacklock, 2008), while a sense of affiliation with a team or club is a commonly cited amongst male participants in organised team sports (Murcia Gimeno, and Camacho 2007). Similar outcomes are evident within-segments, particularly the Healthy Looker and Reluctant Exerciser groups, females exhibiting stronger beliefs relating to the wellness gains of regular exercise and males distinguished by positive assessments of affiliation gains and less restricted by potential disadvantages of exercising. The Enthusiast and Social Competitor groups exhibit similar trends, but across a lesser range of behavioural beliefs.

Normative beliefs present a quite differentiated outcome. Male members of the overall sample exhibit significantly more positive beliefs relating to the role of normative referents in their exercise behaviour. The findings do not correspond with the outcome Vallerand's (2001) research. He established the importance of social support from significant others, but found no significant gender differential in this regard. The within-segment analysis exhibits a similar outcome, with males always ascribing greater importance to the role of significant others. This is particularly the case within the Healthy Looker and Reluctant Exerciser groups where males have a significantly more positive assessment of the role that coaches, friends, and exercise partners play in their exercise engagement. Gender differentiation within The Enthusiast segment only occurs for the normative belief relating to coaches. Smith and Smoll (1996) and Weiss (2000) illustrate that coaches play a key role in many organised and competitive exercise contexts and the higher level of male competitive exercise engagement within this segment is consistent with this finding. Surprisingly no differentiation is exhibited within the Social Competitor group. This is perhaps a reflection of the lower proportion of females in this group. In summary, males are quite differentiated in the strength of their normative beliefs, particularly the influential role of the coach. Lack of social support may well be a correlate of the lower exercise adherence rates of females in this study.

Control beliefs exhibit some significant differentiation between genders for the overall sample, with studies and effort required exhibiting a greater controlling influence on the

exercise engagement of the female cohort. Previous research (e.g., Kilpatrick, Hebert, and Bartholomew, 2005) has highlighted the heightened reluctance of female groupings to expend the necessary effort to regularly exercise. Literature examining the gender impact of studies on exercise behaviour is not prevalent, although some backing from the findings emerges in an examination of the general literature which indicates that females illustrate a more conscientious outlook to their studies in tertiary education (Ellis, 2001). Similar findings emerge in a few cases in the within-segment analysis. The effort required for regular exercise emerges as a significantly greater controlling factor for females in The Enthusiast and Healthy Looker segments, while the controlling influence of studies is substantially greater for females in The Enthusiast cluster.

#### **D.6 Testing Research Proposition ARP3**

The literature illustrates the importance of previous exercise behaviour, particularly proximal exercise behaviour, on individual's exercise motivation and adherence (e.g., Boyette *et al.*, 2002). As with age and gender, earlier hypotheses (RP4) suggested that the segments would illustrate varying recent exercise profiles. Differing motivational profiles between regular and non-regular exercisers in each segment are thought likely. A number of TPB studies highlight the key role of past behaviour, with some going as far as integrating a measure of past behaviour in the TPB model (Norman, Conner, and Bell, 2000; Rhodes and Courneya, 2003). It is reasoned that considerable differentiation in TPB beliefs will emerge when examining them in the context of the recent exercise status of respondents.

**Research Proposition ARP3: Recent exercise status will serve as a differentiator in elicited TPB beliefs.**

Evaluation takes place through three hypotheses that evaluate significant differences in beliefs for regular and non-regular exercisers across segments.

**Hypothesis AH3a:** Significant differences in behavioural beliefs will emerge between regular and non-regular exercisers across the identified segments.

**Hypothesis AH3b:** Significant differences in normative beliefs will emerge between regular and non-regular exercisers across the identified segments.

**Hypothesis AH3c:** Significant differences in control beliefs will emerge between regular and non-regular exercisers across the identified segments.

A series of independent sample t-tests conducted to compare beliefs between regular and non-regular exercisers across segments.

**Hypothesis AH3a:** Significant differences in behavioural beliefs will emerge between regular and non-regular exercisers across the identified segments.

The differences in behavioural beliefs between genders within-segments are illustrated in Table D.7.

**Table D.7: Within-Segment Comparisons in Elicited Behavioural Beliefs by Recent Exercise Status**

Group Statistics							Equality of Variance		Independent Samples t-test		
Segment	Belief	Current Exercise Status	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Success	Non-Regular	74	31.88	9.664	1.23	.024	.877	-4.148	.000	-5.879
		Regular	136	37.76	9.892	.848					
	Affiliation	Non-Regular	74	23.72	12.014	1.397	14.562	.000	-3.561	.000	-7.644
		Regular	136	31.36	16.191	1.388					
	Stress Relief	Non-Regular	74	34.80	10.710	1.245	.008	.927	-2.970	.003	-4.218
		Regular	135	39.01	9.294	.800					
	Health & Fitness	Non-Regular	74	40.46	8.290	.964	1.443	.231	-2.364	.019	-2.688
		Regular	136	43.15	7.633	.655					
	Fun & Enjoyment	Non-Regular	75	36.04	9.546	1.102	.191	.662	-2.743	.007	-3.730
		Regular	135	39.77	9.387	.808					
	Feeling Energised	Non-Regular	75	39.00	8.447	.975	1.311	.254	-2.382	.018	-2.750
		Regular	136	41.75	7.787	.668					
	Time Consuming	Non-Regular	72	25.08	10.662	1.257	.592	.442	-3.279	.001	-5.402
		Regular	136	30.49	11.627	.997					
Poor Weather	Non-Regular	73	12.29	10.951	1.282	2.160	.143	-4.464	.000	-7.742	
	Regular	136	20.03	12.455	1.068						
Dedication	Non-Regular	73	22.81	10.500	1.229	.610	.436	-6.249	.000	-10.111	
	Regular	136	32.92	11.484	.985						
Social Competitor	Success	Non-Regular	48	26.92	13.245	1.912	6.941	.009	-4.911	.000	-9.283
		Regular	120	36.20	10.080	.920					
	Affiliation	Non-Regular	48	27.08	14.704	2.122	1.825	.179	-3.934	.000	-9.250
		Regular	120	36.33	13.381	1.222					
	Social Interaction	Non-Regular	47	30.13	13.333	1.945	1.889	.171	-2.277	.024	-4.881
		Regular	120	35.01	12.104	1.105					
	Health & Fitness	Non-Regular	48	34.04	9.435	1.362	.015	.902	-2.497	.014	-3.916
		Regular	118	37.96	9.049	.833					
	Time Consuming	Non-Regular	47	22.64	9.794	1.429	1.533	.217	-3.585	.000	-6.883
		Regular	117	29.52	11.599	1.072					
	Poor Weather	Non-Regular	47	16.68	11.664	1.701	.230	.632	-2.013	.046	-4.182
		Regular	117	20.86	12.175	1.126					
	Dedication	Non-Regular	47	24.09	13.266	1.935	1.551	.215	-3.538	.001	-7.522
		Regular	117	31.61	11.910	1.101					

**Table D.7 continued: Within-Segment Comparisons in Elicited Behavioural Beliefs by Recent Exercise Status**

Group Statistics							Equality of Variance		Independent Samples t-test		
Segment	Belief	Current Exercise Status	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
Healthy Looker	Success	Non-Regular	135	25.43	10.912	.939	1279	.259	-3.683	.000	-5.205
		Regular	93	30.63	9.834	1.020					
	Affiliation	Non-Regular	135	15.36	10.953	.943	17.009	.000	-2.467	.014	-4.218
		Regular	93	19.58	14.851	1.540					
	Stress Relief	Non-Regular	134	29.34	10.952	.946	1288	.258	-2.177	.031	-3.260
		Regular	94	32.60	11.386	1.174					
	Health & Fitness	Non-Regular	133	37.83	9.369	.812	3.886	.050	-2.255	.025	-2.668
		Regular	93	40.49	7.779	.807					
	Fun & Enjoyment	Non-Regular	134	27.93	9.557	.826	.001	.976	-4.023	.000	-5.184
		Regular	94	33.12	9.607	.991					
	Feeling Energised	Non-Regular	134	34.35	10.129	.875	1.733	.189	-2.428	.016	-3.160
		Regular	94	37.51	8.981	.926					
	Time Consuming	Non-Regular	133	22.27	9.575	.830	.064	.801	-2.258	.025	-3.001
		Regular	92	25.27	10.119	1.055					
Costly	Non-Regular	132	11.56	8.785	.765	.395	.530	2.395	.017	2.754	
	Regular	93	8.81	8.059	.836						
Dedication	Non-Regular	133	21.47	9.486	.823	1.327	.251	-2.048	.042	-2.763	
	Regular	93	24.24	10.655	1.105						
Reluctant Exerciser	Success	Non-Regular	90	19.51	12.251	1.291	.759	.385	-3.729	.000	-7.906
		Regular	48	27.42	11.085	1.600					
	Affiliation	Non-Regular	90	14.24	12.708	1.340	1.255	.265	-2.331	.021	-5.568
		Regular	48	19.81	14.533	2.098					
	Health & Fitness	Non-Regular	89	30.85	11.935	1.265	6.667	.011	-2.712	.008	-5.250
		Regular	48	36.10	8.306	1.199					
	Fun & Enjoyment	Non-Regular	89	23.40	11.478	1.217	.031	.860	-2.566	.011	-5.158
		Regular	48	28.56	10.733	1.549					
	Feeling Energised	Non-Regular	89	28.25	10.974	1.163	.628	.430	-2.175	.031	-4.107
		Regular	48	32.35	9.692	1.399					
	Time Consuming	Non-Regular	89	20.10	10.199	1.081	.053	.818	-2.343	.021	-4.253
		Regular	48	24.35	10.016	1.446					
	Dedication	Non-Regular	89	15.98	10.304	1.092	1.535	.218	-2.270	.025	-4.308
		Regular	49	20.29	11.312	1.616					

Many significant differences in behavioural beliefs exist between regular and non-regular exercisers within The Enthusiast segment. The regular group exhibit a significantly more positive attitude for the success, affiliation, stress relief, health and fitness, fun and enjoyment, and feeling energised beliefs. No significant differences exist for the social interaction, appearance, and feeling good beliefs. Additionally, regular exercisers are significantly less constrained by potentially negative beliefs concerning time needed to exercise, poor weather, and dedication required for regular exercise.

A similar situation prevails for the Social Competitor grouping, with regular exercisers exhibiting a significantly more positive attitude to exercise across a number of beliefs. In this instance, success, affiliation, social interaction, and health and fitness are the differentiating beliefs. Additionally, regulars are significantly less restrained by the beliefs relating to time needed to exercise, poor weather, and dedication required for regular exercise.

The regulars in the Healthy Looker segment exhibit a significantly more positive attitude for the success, affiliation, stress relief, health and fitness, fun and enjoyment, and feeling energised beliefs. No significant differences exist for the social interaction, appearance, and feeling good beliefs. Regulars are also significantly less restricted by the beliefs relating to the amount of time and dedication needed for exercise. Interestingly, for this segment non-regulars are less restricted by the potential cost of exercising.

Regulars within the Reluctant Exerciser cluster success, affiliation, health and fitness, fun and enjoyment, and feeling energised beliefs. No significant differences exist for the social interaction, stress relief, appearance, and feeling good beliefs. Regulars are also significantly less restricted by the beliefs relating to the amount of time and dedication needed for exercise.

**Hypothesis AH3b:** Significant differences in normative beliefs will emerge between regular and non-regular exercisers across the identified segments.

The differences in normative beliefs between regular and non-regular exercisers are less evident within-segments than for the overall sample, as illustrated in Table D.8.

**Table D.8: Within-Segment Comparisons in Elicited Normative Beliefs by Recent Exercise Status**

Group Statistics							Equality of Variance		Independent Samples t-test		
Segment	Belief	Current Exercise Status	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Coaches	Non-Regular	72	17.13	13.031	1536	13.401	.000	-4.225	.000	-9.608
		Regular	135	26.73	16.777	1444					
	Exercise Partners	Non-Regular	198	36.34	20.524	1352	13.401	.000	-4.225	.000	-9.608
		Regular	261	45.95	24.271	1261					
Social Competitor	Coaches	Non-Regular	324	55.56	28.017	1169	13.401	.000	-4.225	.000	-9.608
		Regular	387	65.17	31.764	1077					
	Exercise Partners	Non-Regular	450	74.78	35.510	.985	13.401	.000	-4.225	.000	-9.608
		Regular	513	84.38	39.257	.894					
Healthy Looker	Coaches	Non-Regular	576	93.99	43.004	.802	13.401	.000	-4.225	.000	-9.608
		Regular	639	103.60	46.750	.710					
	Exercise Partners	Non-Regular	702	113.21	50.497	.618	13.401	.000	-4.225	.000	-9.608
		Regular	765	122.82	54.243	.527					

Within The Enthusiast segment, significant differences occur for the normative beliefs relating to the influence of the coach and exercise partners, with regular exercisers ascribing considerably more importance to this. A similar situation exists for the Social Competitor cluster, with regulars even more emphatic in their evaluation of the importance of coaches and exercise partners/team mates. The Healthy Looker group has the same differentiating beliefs, although to a lesser extent, while the Reluctant Exercisers exhibit no significant differentiation between regular and non-regular participants.

**Hypothesis AH3c:** Significant differences in control beliefs will emerge between regular and non-regular exercisers across the identified segments.

There are a number of control beliefs that are significantly differentiated between regulars and non-regulars within the segments. Regular exercisers are significantly less controlled by beliefs relating to affordability, effort, and friends co-operation within The Enthusiast segment. The Healthy Looker and Reluctant Exerciser segments both illustrate identical trends to The Enthusiasts, while the Social Competitor group is characterised by regular exercisers being significantly less controlled by the affordability and effort beliefs – see Table D.9.

**Table D.9: Within-Segment Comparisons in Elicited Control Beliefs by Recent Exercise Status**

Group Statistics							Equality of Variance		Independent Samples t-test		
Segment	Belief	Current Exercise Status	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	Sig. (2-tailed)	Mean Diff.
The Enthusiast	Affordability	Non-Regular	74	19.57	13.907	1.617	1404	.237	2.126	.035	4.005
		Regular	135	15.56	12.512	1.077					
	Effort	Non-Regular	73	26.78	11.278	1.320	5.687	.018	3.590	.000	6.781
		Regular	132	20.00	13.784	1.200					
	Friends Co-operation	Non-Regular	73	20.15	12.300	1.440	1815	.179	3.766	.000	6.272
		Regular	132	13.88	10.903	.949					
Social Competitor	Affordability	Non-Regular	47	18.96	14.142	2.063	.584	.446	2.572	.011	5.811
		Regular	116	13.15	12.610	1.171					
	Effort	Non-Regular	46	23.43	11.035	1.627	2.384	.125	2.244	.026	4.710
		Regular	120	18.73	12.483	1.140					
Healthy Looker	Affordability	Non-Regular	133	21.58	13.599	1.179	8.875	.003	5.441	.000	9.127
		Regular	93	12.45	10.474	1.086					
	Effort	Non-Regular	133	27.41	11.434	.991	.357	.551	5.421	.000	8.243
		Regular	92	19.16	10.887	1.135					
	Friends Co-operation	Non-Regular	133	17.06	11.311	.981	2.757	.098	3.038	.003	4.386
		Regular	92	12.67	9.599	1.001					
Reluctant Exerciser	Affordability	Non-Regular	89	18.82	14.511	1.538	1901	.170	2.364	.019	5.902
		Regular	49	12.92	13.111	1.873					
	Effort	Non-Regular	90	28.57	12.673	1.336	3.675	.057	6.467	.000	13.608
		Regular	48	14.96	9.846	1.421					
	Friends Co-operation	Non-Regular	90	15.63	11.308	1.182	5.049	.026	2.715	.007	4.988
		Regular	48	10.65	7.975	1.151					

### D.7 Evaluating Research Proposition ARP3

The proposition is predominately upheld. The level of differentiation in beliefs held by regular and non-regular exercisers is substantial and generally tallies with the findings of previous studies, as can be evidenced from the following discussion.

Regular exercisers exhibit significantly more positive behavioural beliefs for the majority of the perceived advantages of regular exercise, while also ascribing significantly more positive assessments to most of the potential disadvantages of exercising. This is obviously reflective of a cohort with a very positive attitude toward exercise engagement. The literature has consistently illustrated that individuals' with positive attitudes toward exercising engage more regularly (Hagger, Chatzisarantis, and Biddle, 2002). It also suggests that males in the population generally possess more positive attitudes toward exercising (Downs and Hausenblas, 2005) and this is reflected in the higher proportion of male regular exercisers. All four segments exhibit substantial

within-segment differentiation in behavioural beliefs between regular and non-regular exercisers. This suggests a clear divide in attitude toward exercising within all the segments, and that this may have a direct consequence on segment member exercise behaviour.

Some notable within-segment outcomes emerge. All four segments are characterised by the greater evaluation of the potential for success and affiliation benefits of regular exercisers. Some support in the literature emerges for these findings. The desire for success and winning in their exercise and sporting activities is an oft cited amongst regular male exercisers in particular (e.g., Markland and Ingledew, 1997). Affiliation with a team or exercise group also emerges as sought after benefit of exercising, particularly among male exercisers (e.g., Gill and Overdorf, 1994). So a potential male/female divide in beliefs may be evident among regular exercisers within the segments. Stronger health and fitness beliefs also distinguish regular exercisers across the groups. There may be some link to self-efficacy in this finding. Previous research has demonstrated that people who perceive that they have the competence, skills, and physical capability to derive health benefits, are much more likely to engage in exercise than people with competence or efficacy issues in this regard (Rovniak, Anderson, and Winett, 2002; Von Ah *et al.*, 2004) . Fun and enjoyment beliefs distinguish regular exercisers in three of the four segments and enjoyment from and the link between perceived enjoyment of an activity and behaviour is well-established (Weiss and Williams, 2004). The attitude of non-regular exercisers across segments is noticeably affected by some of the potential disadvantages of regularly exercising, particularly the time required, weather restrictions, and dedication needed. The differential between regulars and non-regulars in these potentially negative beliefs is greatest in The Enthusiast and Social Competitor segments, evidence of regular exercisers that are not off-put by difficulties associated with their activity. The regular cohort in the Healthy Looker and Reluctant Exerciser segments also hold significantly more positive beliefs in this regard, but the differences in beliefs between them and non-regulars are much less pronounced. This may be indicative of groupings that while they regularly exercise, do not possess the same strength of positive attitude and feeling toward their activity. Normative beliefs present a quite differentiated outcome, regular exercisers in the overall sample exhibiting more positive beliefs relating to the role of significant others in their exercise behaviour. A similar situation emerges in the within-segment analysis,

although the roles of family and friends do not exhibit significant differentiation between regular and non-regular exercisers. Coaches and exercise partners are perceived to provide significantly greater support and facilitation of exercise for regular exercisers. This is an understandable situation given that non-regulars would have little or no interaction with coaches in particular. Some evidence emerged in the discussion groups about over-zealous coaches and team-mates representing a de-motivating factor for lapsed exercisers and a finding that is supported in the work of Weinberg and Gould (1995) on exercise disengagement. The importance of coaches and team mates/exercise partners in facilitating exercise and motivating regular exercisers is again apparent, reinforcing the outcome of many studies in the area (e.g., Smith and Smoll, 1996)

Control beliefs exhibit strong differentiation between regular and non-regular exercisers for the overall sample, with four of the five control beliefs exhibiting a greater controlling influence on the exercise engagement of non-regular exercisers. Evidence of a significantly greater controlling effect of effort required, affordability of the activity, and need for friends co-operation on non-regular exercisers is illustrated within each of the segments. The literature consistently highlights these issues as controllers of or barriers to exercise engagement (e.g., Teixeira *et al.*, 2012; Rhodes and Dean, 2009; Biddle and Mutrie, 2008).

## **D.8 Discussion**

Analyses evaluating beliefs based on age, gender, and recent exercise status present mixed outcomes. Half of the behavioural beliefs exhibit significant differences between age groupings, all the normative beliefs differ, while 40% of the control beliefs vary significantly between age groupings. When within-segment analyses based on age are performed for each of the belief categories, mixed findings again emerge. Some behavioural belief differentiation, minimal control belief differentiation, and extensive normative differentiation in the beliefs held by the two age groupings within-segments is illustrated. As with the age comparisons for the motivational constructs, the outcomes are underwhelming in comparison with the influence of age on exercise that is consistently exhibited in the literature. The same caveats about the proportion of younger and older age group members and the lack of spread in age categories apply when offering a potential explanation for the indifferent profiling capability of age.

The majority of the behavioural beliefs exhibit significant differences between gender, all the normative beliefs differ, while 40% of the control beliefs vary significantly between males and females. The within-segment analyses based on gender illustrate moderate differentiation. Reasonable behavioural belief differentiation, some control belief differentiation, and strong normative differentiation in the beliefs held by males and females within-segments is illustrated. Although not as strong as the gender comparisons for the motivational constructs, the degree of differentiation in beliefs based on gender is reasonable and facilitates enhanced description of the segments. This is consistent with the literature that exhibits the strength of gender correlation with exercise behaviour.

A comparison of beliefs across and within-segments based on recent exercise status, illustrates the strong profiling capability for this measure. The majority of the behavioural beliefs exhibit significant differences between regular and non-regular exercisers, all the normative beliefs differ, while the majority of the control beliefs also vary significantly between regular and non-regular respondents. The within-segment analyses based on recent exercise status illustrate strong variation. Strong behavioural belief differentiation, reasonable normative belief differentiation, and relatively strong control differentiation in the beliefs held by regular and non-regular exercisers characterise these analyses. The degree of differentiation in beliefs based on recent exercise status is strong and enables enhanced description of the segments. This is consistent with both the literature and discussion group findings that highlight the role of proximal exercise behaviour in determining current behaviour.

These analyses have the scope to enhance the profiling of the segments, but the author argues that the tests outlined in the main body of the thesis are more than sufficient in revealing and profiling distinct segments. Further differentiation could reduce the clarity of the outcome derived from the testing of the seven Research Propositions.

## Appendix E: Discussion Group Transcripts

A sample of two of the discussion group transcripts are provided for viewing. The transcripts relate to the Mixed Discussion Group 2 and Mixed Discussion Group 3 interviews. A profile of the discussion group members can be viewed in Table 6.1.

A coded outline of each contributor is included in the transcripts. Each quote is accompanied by an abbreviated identity of the contributor e.g., **G1 M20 Reg** incorporates:

**G1:** Discussion group that respondent is a member of, in this instance Group 1.

**M:** Male or **F:** Female

**20:** Age of Respondent, in this instance 20

**Reg:** Regular Exerciser or **Non Reg:** Non-Regular Exerciser

### Mixed Discussion Group 2

**MOD: Good afternoon everybody, I just want to start with a general question as to why you engage in regular physical activity?**

**F25 REG:** For me it relieves stress and helps me get away from work or college, that is the main reason and obviously for my physical health as well.

**F23 NON-REG:** I would do it for the enjoyment, I love running, I love lots of sports and trying out new sports.

**F43 REG:** I would agree with F25 REG, it is probably more for the health and fitness and also it is a good way of getting rid of stress.

**M22 REG:** For me I have a sports injury and I have to do certain exercises on the recommendation of my physio to get my leg right again.

**MOD: So it is a type of recuperation process?**

**M22 REG:** Yeah.

**MOD: What about when you were playing regularly, what drove your behaviour then?**

**M22 REG:** To reduce stress, and good for socialising and meeting people too.

**M25 NON-REG:** I enjoyed the competitive nature of sports, playing matches and things and also as M22 REG said socialising and meeting people.

**M22 REG:** Just to keep fit, playing a match on a Sunday you need to be fit for it and you look better when you are fit!

**M27 REG:** It is kind of an outlet that once you get used to it, it is very hard to give it up. It does release stress and keeps a healthy mind, healthy body, very true.

**M25 REG:** I play a number of sports, I go to the gym and play rugby and soccer as well. For the gym it is mostly about the health and keeping fitness, for the rugby and soccer its about the fun, meeting up with the lads and having a bit of fun. I know I am 25 now and am never going to be an Olympic or World cup material type, it is just to have fun and a laugh with the lads.

**M31 REG:** Yeah, Health again and stress relief. Usually after a weekend, especially if I have been out, I usually find that I am quite tired on a Monday, whereas if I go to the gym I tend to feel better, as though the badness is gone out of my system.

**MOD: Just another general question, when you took up exercise or sports in the first place, what were the primary driving forces behind your decision?**

**F25 REG:** For me I was about 8 when I took up horse riding and I have been doing it since. It was my mum who did it and other family members who did it too and they influenced me and I really enjoyed it at that age, so I continued doing it.

**F23 NON-REG:** I have done a number of different sports, I did gymnastics mainly for fun, because I like jumping around and trying out different moves, I saw it on the Olympics and wanted to have a go. Then with running, swimming and kick boxing it was something to do and was an outlet at nighttime, because where I am from there was very little to do, so going to those kind of activities was another way of getting out of the house

**F43 REG:** I think one of the reasons why I rejoined the gym was that I had been a member of a gym when I worked for Aer Lingus in London, I just thought I need to this again, it is important for health and fitness and I think you can become very lacklustre and let it slip, so I wanted to get back into building up a fitness regime again.

**M22 REG:** Again, once we started school, the school was big into hurling, so from an early age we were picking up a hurley, that is where it started.

**M25 NON-REG:** It started with me back in school in England when I was 9, in our school the sports were compulsory so we had to play rugby, hockey, cricket, so you had no choice. You were just brought into it and as time went on I started to enjoy playing regularly.

**M22 REG:** The premier reason why I started playing sport was that all my friends were into it, and I loved running around and all my family are into sport, so it was a natural progression kind of thing.

**M27 REG:** The first sport I played was hurling, I would probably have had a hurley in my hand around the house before I was even old enough to go down to

the club, because my father would have been a big fan of it. I would have played a lot of different sports during school, but then hurling was always the one I stuck with and that is the only one I am playing today.

**M25 REG:** Like M25 NON-REG, I went to school in England, so sport was compulsory. I used to be a sprinter in school and I represented England in the EU indoor championships when I was 15. When I came to college there was no time to do training, you know training on other peoples schedules, so I took on the gym then. I just play soccer and rugby in my own time with the lads to have fun.

**M31 REG:** I played sports in school, but I was not really into it, so the first time I decided myself to get fit was to lose weight, because I was quite heavy. This is going back to when I was 16 or so.

**MOD:** The next set of questions are looking at some of the key benefits that have been cited by people as their motivation for physical activity, so we will just run through them and see how applicable they are to you. You do not have to interject if you do not think it is relevant to yourself.

**MOD:** How do you feel about exercise as a means of relieving stress?

**F43 REG:** I think it is like what M31 REG said, when you are tired you can go to the gym and get all the bad stuff out of you, it is almost as if you have been reenergised after you go to the gym. I know you are tired and have to motivate yourself to go there but once you do you feel better.

**F25 REG:** I find that I sleep better as well, because sometimes you have stuff going on in your head that you have been doing all day, but if you go to the gym or go for a run, you come home and feel new or something and then go to bed and have a good night's sleep.

**MOD:** So there is a degree of mental refreshedness that comes from exercise?

General agreement amongst participants.

**M25 REG:** It is kind of addictive, because once you start doing it if you go 2 weeks without going to the gym you do not feel the same. It is like taking a shower in the morning, you feel a lot better after it.

**M25 NON-REG:** I did not really consider the stress aspect when I was going to the gym, especially when I was going regularly in second year, 3 times a week. It was more so just because I enjoyed it and wanted to get fit, it was like a progression to me. It was not as if I felt I am stressed out or having a difficult day, so I am going to go to the gym.

**F23 NON-REG:** You miss it when you cannot exercise, I have a back injury at the moment so I am not able to run, I have to stay off it for about a year and it is horrible when you are not able to do anything. When you are so used to being

able to do something to relieve stress, it is horrible when you cannot do that anymore and have to find new ways of having to relive stress.

**M22 REG:** It depresses you when you cannot exercise, you see others doing and think I wish I could do it.

**MOD: How important is enjoyment of physical activity to you? Would you be willing to participate in exercise if you weren't really enjoying it?**

**M22 REG:** Why would you go to somewhere like the gym if you did not really enjoy it? There has to be at least some element of enjoyment there.

**F43 REG:** I think the problem with the gym is that you can get into a bit of a routine and if you do not change it you can get bored with it. That is what I find that I can get bored easily with it and have to change things to keep enjoying it.

**M27 REG:** I do not like the gym because it does not have the kind of sporting aspect to it. There is no competition, I would always like playing with a ball, whether it was hurling or soccer or rugby and when that is removed I would find it much harder to exercise.

**MOD: What would you say the key contributors to you enjoying your activity are?**

**F23 NON-REG:** Getting better at it. I know when I was doing gymnastics I was terrible at first, but then you get better and better and I got to an All-Ireland. Seeing your progression is great, I could do handstands and back flips and it gives you a sense of achievement being able to say I can do this.

**M25 NON-REG:** That is a good point, even back in England rugby was compulsory, at first I did not like rugby, always got broken up, having aches the next day. Because you had to play it, I ended up playing county level at rugby, hockey and cricket, at the end of the day you ended up enjoying it because you had to play and ended up enjoying by getting better skill levels and fitness.

**M22 REG:** Being part of a team, hurling is a 15 man game, 20 even these days and being part of a team that gets to a county final is a big thing, the rivalry among teams and doing it for your team mates, you kind of feel obliged to do it for and with them.

**M27 REG:** I think with a lot of teams you will find if they stick together that they have goals, sometimes they might not achieve them, but they persist at them.

**MOD: Just to reiterate a point made earlier, would you be willing to continue exercising if you lost the enjoyment for what you are doing?**

**M31 REG:** I play football on Thursday, 5 a side, the same group of 10/15 people show up each week. Back in May a few people could not make it anymore and these other people came in instead and it started to lose its laugh

and fun element, so I dropped out and then a few other people started to drop out, as it lost its fun factor.

**M25 NON-REG:** I think goal setting is also important, it would not directly apply to me but I had some friends who were playing rugby and they were going to the gym to get stronger, even though they were not particularly enjoying it. So even though they weren't enjoying it they felt like they were achieving something.

**MOD: How important is a challenge to you in your physical activity?**

**F25 REG:** Very important. Definitely is for me. When I compete at weekends, there are certain levels that I compete at and if I get a certain point score I can move on to the next level, so it is a big challenge for me because every week I need to gain more points. It is a very individual sport, but at the same time I like the social aspect of it. There is sometimes a team element to it, but mainly it is an individual sport that is challenging for both me and the horse.

**M22 REG:** We play indoor soccer every Sunday night and it is very competitive. It is one of the main reasons why we all go because it is so competitive, we are all killing each other during the match but then afterwards we are still best friends. It is important, that is part of the enjoyment as well, the competitive nature of it.

**M25 REG:** It is the same with rugby as well, sometimes you fight on the pitch, but you finish up shaking hands. It is just that when you are on the pitch you are a different person, you want to win.

**M22 REG:** That is the beauty of sport.

**MOD: What about those of you that exercise casually?**

**F43 REG:** I find that if you are in a gym that if once you have built up your fitness levels you want to challenge yourself more. Things are becoming easier, so obviously you want to set yourself a new challenge and go to a higher level on different machines. You are constantly trying to push yourself.

**MOD: To what extent do you think you have maximised your ability at your chosen form of exercise or is that a particular goal to maximise your ability or skill level at your activity?**

**F23 NON-REG:** I got to the All-Ireland in gymnastics and then I just stopped going. Well I injured myself at the same time. I could have gotten better and gone up a grade, but I got to the All-Ireland, got first and I was happy with that. With the injury I was not willing to push myself to get any better, it is a sport that puts a lot of pressure on your body. Once I got to a certain level I was happy to walk away from it and say I do not want to do this anymore.

**M25 REG:** Same here, I was a sprinter and I had an athletics scholarship with Carlow IT for 3 years. When I was doing my undergraduate studies, I had too

much work to do and I felt that I had to work on somebody else's schedule, so I just had to take a step back. That is why I took up the gym, because I can work it in my own time. At the same time I knew I was getting too old and wasn't going to make an Olympic quality type athlete. I felt like I was good enough for the level I was competing at, but at the same time I knew I wasn't going to make it to the top levels.

**M27 REG:** As part of a team sport it is definitely drilled into you that you are going to be better than you were the year before, usually you will have a coach there driving you on.

**M22 REG:** You are only as good as last game really, there is always room for improvement, you have to push yourself, push yourself, stay going.

**M27 REG:** You have pressure from your team mates, you cannot really go out and play disastrously every week, they won't thank you for it.

**Mod: Related to that I suppose, how important is recognition of others for your activities?**

**M22 REG:** It would give you more confidence if you are on a team, say if you pull off a spectacular save and they all compliment you, it gives you more confidence going into the next game and that.

**M22 REG:** It is good motivation, you can be best friends, but you want to beat him, you push each other on.

**Mod: Outside of your team mates is there anyone else you seek recognition from?**

**M22 REG:** If you are doing weights you want to be as good as the other guys in the gym, if he can do it so can I.

**F25 REG:** For me my cousin trains me, he gives me lessons and stuff, he has showjumped internationally for Ireland, so to get recognition from him is good.

**Mod: Do you like to compare your abilities with other people?**

**M22 REG:** Definitely, that is human nature without a doubt. That is life you have to push yourself and come out of your comfort zone.

**Mod: What about those of you that play on a casual basis?**

**M31 REG:** You would be having a laugh with your pals and people you hang out with and it would get quite competitive, but it stopped being good fun when a couple people who started playing were assholes really, taking it way too seriously and not fitting in with everyone else who were more relaxed about it. You would still play and still impress and that, but at that level it is a bit annoying.

**F23 NON-REG:** That happened to myself and my friend at kickboxing at home. We were at it for about two years and were getting quite good. Then these two lads started and they did not like the fact that me and my friend were better than them, so they started getting us in headlocks and that happened a few times and basically turned us off it.

**Mod: The social aspects of exercise, the interaction with your friends and peers. How important is that to you?**

**M25 REG:** I suppose for myself, most of the lads I went to college with now have jobs and that, we use our game every Wednesday as an excuse to come together and play football.

**M27 REG:** It is a great way to stick together, all the lads that I played hurling with in Tramore, we are all still in touch, whereas the guys that did not play have sort of drifted away. If they moved to Dublin they do not stay in touch, whereas some of the lads that play hurling have moved to Dublin but still come home to play it.

**M22 REG:** You meet people too and kind of interact, in the gym lads that are going regularly like yourself, you get to know them and make more friends. It is an important aspect too.

**Mod: How important is being successful to you?**

General acknowledgement that it is very important.

**Mod: Even for the casual participant?**

**M31 REG:** Maybe not at football, but I did Kung Fu for a couple of years, I was quite good at it, enjoyed the competition and quite liked being successful at it, but overall I do not really have a competitive streak in me when it comes to sports.

**M22 REG:** You would not want to be second best either. You would be going in giving it everything.

**M31 REG:** Ya everyone goes out and gives it their best.

**M22 REG:** You want to win deep down?

**M31 REG:** Oh yeah you do want to win, you keep track of the score through the game.

**F43 REG:** I think as well that you tend to compare yourself to other people, you look at them and think I wish I could do that. So you are kind of egged on by them. I used to do cardio kickboxing and used to think God I really want to be as good as that person. I knew I had to get to a certain level before I could be as good as them, so it meant making sure I did it on a regular basis and build up my fitness. It is the same in the gym as well, you are constantly watching other people.

**M25 NON-REG:** I think also that it is good using other people that are really good to try and motivate you. Back in school there was this really good hockey player and sometimes you see him on his own practicing on the Astroturf and you would be laughing at him. But when you saw him out playing you just went wow! That kind of motivates you to reach that level.

**Mod: Have any of you found lack of success at your activity to be a de-motivator or alienate you from participating?**

**M22 REG:** It is not a de-motivator, it just hurts. The WIT soccer team got to the All-Ireland semi-final and I still think ah God if only we had won that we would have made the final. It could be a motivator as well, push you that extra mile.

**F23 NON-REG:** Like I said earlier what is a de-motivator is when you are getting good at something and other people have a bad influence on that, they make you think I am not bothered with this, if I am going to get that treatment. It is de-motivating if you have to give up something you enjoy because of the actions of others.

**M25 REG:** Same here with my athletics coach, he put a few people off athletics. He was trying to live his dream through other people, he was pushing people too hard. When you know you are good, but not going to be top class, when someone tries to push you too hard or too far you just end up saying look it is not for me, you just end up giving it up.

**M22 REG:** We did that with basketball. We joined up a club in first year, we thought it would be a bit of fun, but when we got there, we weren't near good enough and the coach made sure we never played basketball again!

**Mod: This one is geared towards those of you who are engaging in competitive sports. Would you enjoy non-competitive exercise as much?**

**F25 REG:** Yes definitely, just to go for a run or a walk in the evening is very enjoyable.

**M27 REG:** I do not really I find it frustrating at times. Sometimes I play 5 a-side soccer and I get annoyed easily with no referee and lots of messing going on.

**F25 REG:** You need rules and structure.

**M27 REG:** Yeah the structure and the competition and even something like jerseys. When you do not have them you cannot tell people apart and think this is stupid.

**M25 REG:** It depends on why you are doing it. If you are doing it to relax you do not want to be getting stressed about it or over pushing yourself.

**M25 NON-REG:** I always found when you are playing there are some players that kept making mistakes and I would always be giving out to them, especially with frustration if we were losing. Some people's attitudes would be different, they might tell me to relax and calm down it is just a game and this used to get on my nerves.

**Mod: How important is physical fitness to you?**

**F23 NON-REG:** I hate being unfit. I am unfit at the moment because I cannot participate in sports. When I was active I had a good physique and was really toned and felt fit and now I cannot do this it kills me because I do not have any fitness anymore.

**F43 REG:** If you miss the gym or whatever you get annoyed with yourself. I find that if I do not go at least three times a week, it feels like that week is gone. Time is obviously a big issue for people, the lack of time, people are so much busier these days. I do find I get frustrated with myself if I cannot make it three times a week.

**M25 NON-REG:** I think injury is such a big problem. Before when I was really, really fit I tore my quadricep muscle doing athletics. It was a serious injury, a disaster, I was on crutches for 3 months and had to go to the physio and it was really hard to recover from that. I wasn't the same after it, the leg lost muscle, all the work I had put in before. It was very hard to try get it back.

**M22 REG:** When you're injured you get a bit depressed. You know you cannot do anything and seeing everyone else doing stuff hurts. You do not appreciate your legs and arms until you cannot use them I suppose.

**Mod: The health benefits of exercise have been pretty well documented. Are they a conscious underlying motivator for you or is it something that you do not think a lot about?**

**M22 REG:** I think deep down yes, but we would not say it. Everyone's look is important to them, if you look good you feel good. So if you exercise or do weights and you lose a few pounds, it makes you feel better about yourself and if you feel better life is better I suppose.

**F25 REG:** I have noticed as I have gotten older, I am 29 now, when I was 21 I could have ran 5k, I could not do that now. I am still quite active, but I have to work a lot harder now than 8 years ago, even just to keep it up.

**F23 NON-REG:** That is what I am dreading about going back, because I know if I go back and am not any good, I might just say I will leave it and carry on doing my regular thing and won't get back to the fitness that I had. There's also the fear that once I get over one injury it might trigger another one.

**F43 REG:** I think also we are persuaded to a large extent by the media, because there a lot of issues now around obesity and diabetes and heart disease and there

is a push on people to get involved and to do something about their health and fitness levels

**M22 REG:** Even with hurling there is less of a drink culture. Our trainer used to say ‘one nights drinking is two nights training’.

**M25 REG:** On the health aspect there is also times when I do not usually eat healthy food, going to the canteen eating chips and curry, so I can feel bad about myself and have to go to the gym to work it off.

**Mod: Just in terms of appearance, does an improved appearance matter to you and is exercise a means of achieving this?**

**F25 REG:** Yeah you notice it, you want your clothes to fit better. For girls anyway, not sure if lads put as much emphasis on this.

**F23 NON-REG:** You can also change your shape, I noticed that when I was doing competitive sports I was very lean and when I stopped I went from looking very young to developing more of a womanly figure, it changes your body image.

**M25 NON-REG:** I think when I was younger I wasn’t very conscious of the health benefits of exercise. Obviously now after doing the recreational management course I am very conscious of the health benefits. I also think it depends on the person, some people might have a high metabolism, so they get away with more stuff, they might not be motivated to have to exercise at certain times to lose weight or tone up. That has an effect.

**M25 REG:** The fact that you know yourself that your metabolism changes with age, you know you have to push harder as you grow older.

**Mod: There are a number of other physical benefits that are associated with regular exercise, such as building strength, improving muscle tone, increasing endurance and speed and, improving agility and flexibility. Do you see any of these benefits as being important to yourself?**

**F43 REG:** I think it is very good for your balance, when I went to the gym I used to have to lean against the wall to do my stretches. Now I can just stand and pull up my back leg, I was never able to do that, so it definitely does make a difference to the whole agility and balance thing.

**F23 NON-REG:** I am glad I was so flexible from my gymnastic days, because at the moment I have a bad back. My dad has a bad back too and when it affects him he walks around like a board. I think because I was so flexible before my muscle has a memory and is able to do certain movements despite the fact that I would be in pain, I am still able to do the same physical things.

**M22 REG:** I think especially if you are playing sport agility is very important, especially as I am a goal keeper!

**Mod: What about strength and bulking up being important?**

**M22 REG:** Yeah you would want to. We all hear about obesity, but you never hear about the other end, being skinny. I am like a greyhound and the only way I am going to put on weight is by doing weights to build up the muscles.

**M25 NON-REG:** I was going to the gym regularly, it wasn't even to look macho or anything. They say if you go to the gym regularly 3 times a week, it could take 6 months before you see an increase in muscle mass. For me every week I was doing it I felt stronger and this made me feel better.

**Mod: Just moving on to a couple of benefits that are associated with specific types of sports as opposed to just general exercise. Would you consider yourselves to be risk takers or thrill seekers in your physical activities?**

**M25 REG:** Risk taker yes. Sometimes you can go tackle someone way bigger when you are playing rugby for the risk and buzz of it.

**F25 REG:** Yeah, absolutely for me I might jump 1 metre 30 at home but I would not do it competitively, to do it at home is a challenge. Sometimes at home I would be going along the beach and there are drains and dykes there and I would try jump it, that is definitely a thrill.

**M22 REG:** I used to have horses as well, you keep pushing yourself to jump bigger heights, there's a real buzz with a horse.

**F23 NON-REG:** I injured myself that way. I was showing off, I was able to do back flips perfectly, so I decided to do one off a box. The box moved mid air and I ended up with 6 pulled muscles and a slipped disc in my back!

**M25 NON-REG:** I loved showing off when I was playing sports, when I was doing athletics, the long jump, there would be loads of girls around to show off to, it was a motivating kind of thing.

**Mod: What about the physical and aggressive nature and aspects of some sports, is that in any way appealing to you?**

**M22 REG:** Definitely, hurling is a bit like that though, you can see it with Kilkenny how good and how aggressive they are.

**M27 REG:** That increases it as an outlet I think. I was working in Dublin sitting behind an office desk all day long and you would be dying to get out in the evenings for a good match in training in the evenings. It is a buzz an outlet and you enjoy it.

**Mod: Is anybody turned off by the aggressive nature of some sports?**

**F43 REG:** I did the cardio kick boxing, but I would not do kick boxing because I did not like the aggressive nature of that.

**F23 NON-REG:** I absolutely loved it, I came home every week with a bloody nose and black eyes, but the amount of times I got lads and properly hurt them, it was great. It lost the effect though when people got overly aggressive. That was sparring and was a bit of craic and you would expect a few knocks.

**F43 REG:** Were you never afraid of getting really badly hurt?

**F23 NON-REG:** No, I know my limits and know when someone is too big for me!

**M25 REG:** You know what you are expecting when you play sport, I used to box as well, I broke my jaw twice and fractured my cheekbone, but you still go on and do it, because you know what you are going to get anyway. I do not think that would put you off.

**Mod:** In terms of representing your team or your club, how important is that to you?

**M27 REG:** It is probably the most important thing, it keeps you coming back year after year. The fact that you are part of a team, you get to know the other members of the team very closely, and you are trying to achieve something together. You have set out a goal, you might even have set out the goal 5 years ago and still have not achieved it, but you still come back for more. Often some lad might say I am not coming back this year and then a few lads will call round to his house and talk him round by saying let's go back and give it another year, you know how great it would be if we could all achieve this together. I think the team mates are very important.

**M22 REG:** Sometimes it turns into a little family. I remember a few years ago when I was 13 or 14, we were all best friends on a team and if we lost we were all low together.

**F23 NON-REG:** As M31 REG said earlier if you get a couple of people who aren't in it for the fun, they do ruin it for everyone else. You do not want to go to something where you feel unwilling to go to this tonight, you want to be looking forward to doing it.

**Mod:** Does sports participation engrain any values that you feel you might not acquire elsewhere in life, work, education etc.?

**F23 NON-REG:** Fair play I think.

**M25 REG:** Discipline I think, it teaches you some level of discipline.

**M31 REG:** Teamwork as well I reckon.

**M22 REG:** Socialising. I mean some people might not be good mixers, whereas if they are part of a team they have to push themselves to mix and get out there.

**M25 REG:** When you set yourself a timetable for exercise it goes back to discipline. Sometimes when you are tired you know you have to go and play, you force yourself to do it. It makes you a focused person.

**Mod:** I am going to examine some of the external or other influences that might impact on your exercise activity. Firstly we will look at family and their influence on your patterns and types of exercise behaviour.

**M22 REG:** I think it is huge, because both of my uncles played hurling and my dad played rugby, so sport was just like walking to me when I was younger. Compared maybe to families where nobody played sport, I suppose kids would not be as inclined to take it up I suppose.

**M25 REG:** It depends on the sport, my mother made me give up boxing, she just thought it wasn't a good sport, she did not look at it as a sport, she just saw violence.

**M27 REG:** I think it has a big influence on the sport that you do stick with. I remember when I was young anything that I wanted to do with hurling would have been given without a problem. My mother never wanted me playing rugby so she would not drive me into town for training, so they weren't as supportive of that.

**M22 REG:** It makes you close too as a family. We had horses and we'd be going off to shows together. It helps bond a family too.

**M31 REG:** Myself, my brother and my dad all play sports, but they are different sports and we do not like each other's sports. My dad plays golf and my brother wind surfs and I do not like those at all.

**Mod:** Just leading on from that, family is a big influence in the initial stages of taking up sports as a young person, but at this stage are family still influential on your exercise behaviour?

**F25 REG:** For me as a child family was a massive influence. My parents had to buy the pony and drive the jeep with the horse box, I could not have done any of that. As an individual sport it involved a lot of time and effort from my family. Now I can do all that myself. If I was playing a team sport when I was younger then maybe we could have shared lifts and that, so it might not have been as demanding for my family.

**M25 REG:** I suppose at this age we are kind of self-dependent, if your friends like what you are doing you are going to like it regardless of what your family thinks. That is who you hang around with most of the time these days.

**M25 NON-REG:** It is more peer influence now, some people are not even living with their parents anymore, so they cannot be a direct influence.

**M22 REG:** With hurling when we were younger, my mother would make us go training and drive us there and that. Now she leaves it up to ourselves, we are old enough to make our own minds up what we want to do.

**Mod: Is cost a factor in what you do exercise wise?**

**F25 REG:** It is for me.

**Mod: Does it inhibit you in what you would like to do in any way?**

**F25 REG:** Not really, obviously I would like to buy a horse of a couple of hundred thousand, but that is not realistic. I suppose it does hit me in that way in that I might want a better performer, but otherwise no.

**M25 REG:** I suppose we just have to make do with what we have. If you join a 50 euro gym you just make do with what's there.

**F43 REG:** A lot of gyms have good offers, good deals, pay by direct debit and are making it easier all the time. It is not a huge factor, if you want to do it you will do it.

**M25 NON-REG:** I think more than anything time is the biggest constraint.

**M27 REG:** It might stop you taking up a new sport, I would have a bit of an interest in golf, cost to get started in golf is very expensive. Or even down in Tramore they do a lot of kite surfing it looks cool, I've been told to get all the gear is really expensive. It might put you off a little.

**M25 REG:** With Goldstone they have student rates, membership is way cheaper for students.

**M22 REG:** But you still have to get the gear before you start.

**Mod: Your coach or manager or mentor, assess the role that they play in your activity?**

**M22 REG:** He broke our heart anyway, he would be ringing you day and night. They were a big influence really, it paid off I suppose, we won a lot of underage titles. I suppose looking back he was a positive influence, although at the time we might have negative feelings toward him.

**M25 REG:** Sometimes they can be a negative influence, sometimes you are going for fun and they have to know that. Most coaches know your standards, but some push you outside your limits and that drives you away from your sport.

**M25 NON-REG:** They know your level of ability. I found that if a player is really good they do not compliment you as much you would have to do something really exceptional. Lesser players they give them more encouragement. Yeah they were a positive influence for me.

**M22 REG:** I think we had coaches too that had not made the mark, so they were pushing us to do what they did not do.

**M25 REG:** Kind of living their dream through you.

**F23 NON-REG:** Our coach heaped praise on my sister in gymnastics, even though I was a little bit better than she was and nothing that I did was good enough for her. Even when I got the All-Ireland medal, it was a quick move on to the next competition, there was no congratulations or anything like that. I just said no I could not be bothered.

**Mod: So would you say she turned you off it?**

**F23 NON-REG:** That and the injuries I suppose. You do work hard and you do like recognition, everyone else was saying well done and if the person that trained you hasn't the courtesy to say it you think what's the point.

**M25 REG:** I suppose it is because they know your potential and know you can do better. Sometimes though when you know you are not good enough and he knows you are not good enough and still pushes you, there's no point in doing that.

**M27 REG:** We have a coach that some people do not like him on the team and it has led to a few people giving up the sport, they feel that strongly about it. It can be divisive.

**Mod: We have touched on the social aspects of things, but just to revisit again. Your close friends, what kind of influence do they have on your exercise behaviour?**

A few utterances of none.

**M31 REG:** I have a few close friends that I play football with and when I took up Kung Fu there was a few of them doing it already so they influenced there. With the gym I started myself and am fairly self-motivated about it.

**M25 REG:** For me most of my friends did a Physiology course in Carlow and they were all into the gym, so that is why I took it up.

**F25 REG:** When we were kids me and my friends all did pony club together, but they did not continue it on and I have, so at the moment they would not have much of an influence.

**M22 REG:** I think going to the gym is more individual, whereas playing a sport is more a social kind of thing.

**F43 REG:** For me it was self-motivation as well in relation to the gym. But for the cardio kick boxing it was because a friend said it to me and we said we would give it a try.

**M25 REG:** I could sat out of the gym for two or three weeks and then when you see your friends are after improving, you feel like you want to go back because he looks better than you!

**Mod: Your other leisure activities outside of exercising and sport, how do they impact on what you do with regard to your physical activity?**

**F25 REG:** I found that I used to ride out in the morning and go to the gym after work, that was 2 years ago and my fitness level was far higher than I am now and my legs would have been much stronger than they are now and I felt fantastic. But it is very demanding at the same time, you can only keep it going for so long.

**M27 REG:** You might have times of the year where you say I am not going out for a few weeks because I have a big match coming up or you are trying to increase your fitness. I might say I will watch what I eat for a month or won't drink for a month and see where I am at then. I find that holidays are massively affected by team sports, you are saying to your girlfriend I cannot go on holidays in August or September because there is a chance that I might be in a final!

**F43 REG:** You are more conscious of things that affect you, you do things like walk to the shop rather than drive, you are all the time thinking about things like your diet and what you are eating.

**Mod: How about access to facilities for participation, is that an issue?**

**F23 NON-REG:** No, especially if you are running you just get out and run.

**F25 REG:** I do not think so, there are so many facilities out there, gyms everywhere and you can walk and run anywhere.

**F23 NON-REG:** It is a nice feeling being outdoors and free and no one can stop you.

**Mod: What about the quality of the facilities that are available, would that be a determinant in what you are doing?**

**F43 REG:** I think that is important, if you know a particular gym has really good facilities you might be prepared to go there rather than one close by that is not as good. Access is not necessarily an issue it is the quality of facilities and equipment that matters.

**M27 REG:** Wintertime is awful. A lot of pitches are playing catch up and the likes of floodlights, we have no floodlights in Tramore. Even with the college we are training in De La Salle underneath theses lampposts, it is not enjoyable when you do not have proper facilities.

**Mod: Do any of you play within a college context?**

A few stated they used to.

**Mod: Was there any obligation on you to participate or do certain things?**

**M22 REG:** No, although when you get on a team there is pressure to perform.

**M25 REG:** For me there was a certain level of pressure because I had a scholarship.

**F23 NON-REG:** I was offered a scholarship, but I turned it down because I wanted to concentrate on my study, rather than be under obligation to my sport. It was either one or the other for me and sports usually won over study, but this time I said no to the scholarship, because I knew it would take away from my studies, despite the fact that I would have liked to represent the college.

**Mod: M25 REG did you say that it inhibited you having to play when you had a scholarship?**

**M25 REG:** They would not force you but you know yourself you have to give back seeing as they are giving you money to pay for your rent, pay for all your college books. If I missed an assignment because I was gone off to Dublin sprinting they would give me the class average or allow me sit it again, so you really had to give back because they were giving you so much.

**Mod: Just a couple final questions lads, I just want to look at how you intend behaving in the next month regarding exercise in the next month. Firstly, are you likely to engage in what we have termed regular exercise in the next month? We can do a sweep around the table on this.**

**F23 NON-REG:** No

**F43 REG:** Iffy

**Mod: Why?**

**F43 REG:** As we said time is a huge constraint, if you are busy and have a lot of things on, they kind of take priority and your sporting activities get put on the backburner a bit. And then there is a huge guilt feeling!

**Mod: M25 REG, you are obviously constrained by injury?**

**M22 REG:** Yeah, hopefully I will because I kind of have to. If I do not do my exercises the longer it will take to get over the injury, so I kind of have to.

**M25 NON-REG:** The same, time is a big constraint, I am not going to lie here, it is also just pure laziness. The last 4 years I have been working part time in AOL, so at least I have an excuse.

**M22 REG:** Yeah definitely, with the time off over Christmas I can make up for time lost kind of thing.

**M27 REG:** Yeah the college team do a good bit of training over Christmas so I will have to do it

**M25 REG:** To be honest with me it is all about discipline so I have to. I set up my timetable so I just have to follow it. If it means giving up something it won't be exercising anyway.

**F23 NON-REG:** Exams!

**M25 REG:** I know myself I study a lot when I am doing projects and that, and then there are times when I am doing nothing, so I go to the gym then.

**M31 REG:** I will try, but I know there will be a week around Christmas and the New Year when I just won't bother. Before it and after I probably will.

**Mod: F25 REG?**

**F25 REG:** I would say I will. Over the next couple of weeks I won't do as much as normal with exams and that, but definitely once the Christmas holidays come up I will be straight back in there.

**Mod: A final question then, are there any additional factors or circumstances that will help or inhibit you from engaging in regular exercise in the next month. I know some of you have mentioned a few inhibiting issues....**

**M31 REG:** I think the exams might help. It would be good to de-stress by taking an hour out of your day.

**Mod: So the exams might be a motivating factor?**

**M31 REG:** In a way yes. I know in the next 2 or 3 weeks I will definitely be in the gym 3 times a week and I will probably play football on a Thursday, just to like take my mind off college stuff.

**Mod: Anyone else?**

**F25 REG:** Yeah I definitely agree with that, even just to go for a walk for half an hour in the evening. It is like the stress relief thing just to get away from the books for a while.

**Mod: Is there anything that would prevent your participation?**

**F25 REG:** For me weather, if it is frosty.

**Mod: Injury obviously for one or two of you?**

**F23 NON-REG:** Yeah.

**F43 REG:** Maybe just time again, but I think it is important, what M31 REG said, obviously the exams are motivators, you want to clear your mind you want

to get out and go to the gym. To a certain extent I will have more time now that all our presentations are finished!

**Mod: Just to round it off are there any other issues with regard to your exercise behaviour that you would like to raise?**

General no.

**Mod: Ok, thank you very much for your co-operation and input, it is very much appreciated.**

### **Mixed Discussion Group 3**

**Mod:** Good afternoon everyone. We are going to have a general discussion about your exercise behaviour and your reasoning for engaging in physical activity. Just to start off the debate can you have a think about why you exercise, why you play sport or engage in physical activity? What are the key reasons behind it? If you could just briefly summarise it

**M21 NON-REG:** To try get some way fit, to be able to play with your friends to be able to get up there and enjoy yourself.

**Mod:** So there is a social aspect and a fitness aspect to it as well, is there?

**M22 REG:** Health.

**F19 NON-REG:** To keep weight down.

**M20 REG:** Also competitiveness as well, amongst friends even when you play 5 aside you want to win.

**Mod:** So you find even in a casual game you want to win?

**M20 REG:** Yes.

**M19 REG:** I think there is a big social aspect to it. On a week day it is something to do with your friends, something to do together, and to talk about when you get back, it is social as well.

**F20 NON-REG:** It can be used for entertainment as well, some people would rather play a game of football than sit down and watch TV.

**Mod:** As a form of leisure?

**F20 NON-REG:** Yeah.

**F21 REG:** It is a hobby for me, sports and stuff.

**Mod:** When you took up sport in the first place what was the key driving factor?

**F20 REG:** An interest in it, the area you would be in, just having a keen interest in it - you watch it on TV and just take it up naturally.

**M22 REG:** Your parents would be a big driver in it, trying to get you so socialise with other children.

**M19 REG:** Your friends as well, when I started I was in primary school, it just seemed like everyone was doing it at the time, plus you are seeing celebrities on TV as well.

**F20 NON-REG:** Sometimes if you watch a film as see Jean Claude van Damme doing karate, you wanted to join karate to be like your role models.

**Mod:** What I want to talk about what you see as the benefits or what gains you seek or that you gain from participation? I would like to see how relevant to yourself. First of all as a means of relieving pressure or relieving stress, do you think exercise is important in doing this for you?

**M22 REG:** It is a good way to take your mind off other things, like when you are out playing football on a pitch, you have your mind on one thing and that is football - what has to be done, so it just relieves you and it takes your mind off any study that has to be done.

**M19 REG:** Definitely it does take your mind off stuff.

**M21 NON-REG:** You have to be able to get a break from what you are doing, go out and enjoy yourself get your mind off other things.

**M20 REG:** Yes it is a release, everyone has that edge that they want to go out and compete as well, well I do anyway.

**Mod:** Again related to that, do you think it is good for your mental freshness and your mental state? Do you think it is good for that as well?

**M19 REG:** It takes your mind off the study and stuff, you know coming up to exams. Even now we are playing at the weekend it takes your mind away from the study, thinking of all the studying we are doing!

**F21 REG:** You always feel really good about yourself after exercise, you might be a bit wrecked, like you would be wrecked after it but there is a buzz about you afterwards, you might have been down about exams before but your refreshed after it.

**Mod:** One of the most cited reasons for playing sport is the enjoyment people get from it, what do you think contributes to your enjoyment of exercise? What are the key factors which you enjoying a particular form of activity?

**M21 NON-REG:** You have fun, even if you are competing you still wanting to have fun at the same time. When you are training there is always a bit of banter going on, when you go to the match it gets serious alright but you'll have fun afterwards.

**M19 REG:** Winning is a big enjoyment, you are on a high after it if you are winning a final or something, you are on a high for a week or two, it puts you in a good mood for a few weeks.

**F20 REG:** Helps motivate me, if I get out and do stuff, it makes me use that in the studies as well. When I am tired it motivates me to study.

**M19 REG:** Yeah, you feel good about yourself afterwards, rather than being lazy.

**Mod: Do any of you find exercise not enjoyable?**

**F20 NON-REG:** I do not like doing it when I am on my own, you know like when you go for a run, I would rather have someone with me so I can have a chat, when I am doing it.

**Mod: And would be will to continue to persist, if you weren't enjoying it what you are doing?**

**F21 REG:** Yes, you do not always like going to the gym, but you know it is good for you.  
I might not want to go, I might be tired or whatever but I know I'll regret it if I cannot fit into my jeans or whatever.

**M22 REG:** I think it gives you energy as well, you might feel wrecked, you could sit around the house all day you are way more tired come the evening time but if you actually go out and do something you'll come back refreshed.

**M19 REG:** The less you do the more lazy you feel.

**Mod: We have probably touched on it already, but how important is a challenge to you in terms of what you are doing?**

**M20 REG:** You need it do not you, if there is no challenge why would you be motivated to do something.

**M19 REG:** Even say you could be sitting at home on a Wednesday night, there could be football on the TV and you have training, you feel a challenge even to go to training, but you would feel better after going.

**F20 NON-REG:** You could get bored just doing the same thing, say you have no matches to play. You could get bored if you just have training you should have matches to play, you get more motivated and it is something to look forward to.

**Mod: To what extent do you think you have maximised your full potential in say your given favourite activity? Do you think you have given the best you can be, or maximised what you could have been?**

**F20 NON-REG:** Well I was in karate and I achieved my black belt and I just stopped then, I have achieved the highest grade there was, so I was like well done.

**M19 REG:** I think for most people that they do not think they ever feel that they have achieved their full potential, if they achieve one thing they just want to go on further, even the best athletics look to the next competition.

**How much effort do you think you have put into your favourite activity? How much do you think you have put into mastering the skills of it, are do you just go along with it?**

**M19 REG:** I think it deteriorates when you go college. When you reach 17 or 18 you decide if you want to take it serious or do not do it at all, especially for the lads that move away to college. It is hard to move to a new team and get to know more people so I think it does deteriorate when you are in college.

**F20 REG:** You do not have as much time when you are in college, like I had to give up the horse riding after 12 years because I did not have enough time, so that puts a stop to it as well, time pressures.

**Mod: How important is it other people recognising your exercise ability or your exercise participation does that matter to you, gaining recognition from other people?**

**M21 NON-REG:** Yes it does give you motivation, say you are name was in the paper after a match and someone says it to you it does motivate you to try and be better the next time, to be on a high the whole time.

**M22 REG:** There is a feel good factor about it,

**M20 REG:** Even say you were going to the gym and someone said you had lost weight that would motivate you to go there a bit more.

**Mod: Do you like to compare your ability with that of your mates, peers friends?**

**M19 REG:** That is natural. If someone is very good you are going to be comparing yourself to them. Maybe if you want to make yourself feel good you would compare yourself to someone not a good so you feel better.

**F21 REG:** Myself and my sister are very competitive, it is never spoken that I am better than you or anything but it would always be in the back of each other's heads, oh crap she is after getting to whatever level and I have to step up my game a bit. I always want to be on a par or a bit better.

**M19 REG:** It is a bit of fun as well, there is always a bit of banter with my brother or friends as to who scored most in a match, there is always a bit of enjoyment, you are trying to outdo each other in a match.

**Mod: Again something you mentioned already in terms of the social interaction, how important is that to you, mixing and mingling with your friends, gaining new friends, is that a key motivator for you?**

**F20 REG:** It makes is easier, I would not go for so much walks if I did not have someone to talk to. It makes it seem shorter, it just feels shorter.

**M20 REG:** It is a big aspect of it especially if you are just doing it casually. I mean it is just to socialise as well while you are doing it, it is not that you are just playing ball it is always with your friends.

**M19 REG:** I do not think you would enjoy it as much if you went out for a casual game with 10 people you did not know, whereas with 10 friends there is a lot more enjoyment.

**Mod: How important is being successful at your chosen sport?**

**M21 NON-REG:** It is not everything, once you are participating is one goal, you are still going to have fun even if you are not winning. Or you are just not going to be as good as the team that winning but you are still going to gain enjoyment from it.

**M22 REG:** When you are younger and growing up, I think personally that it is one of the biggest motivations to become as successful as you can, but as M20 REG said earlier on once you hit 16 or 17 you are introduced to beer and it goes downhill after that.

**F20 REG:** I would agree with the younger thing alright, as even with the horse riding it was very competitive when you are younger, but the minute you go into the horses its just like nobody knows you at all.

**F21 REG:** I would see myself, that there is always going to be somebody better than you, being successful is one thing, but it is very hard to be at the top of your game, you are always going to be looking around to see what people are at, there will always be people who you cannot reach, I still think you cannot let that put you off, you need to keep going for yourself.

**Mod: How many of you would describe yourselves as competitive individuals?**

**M20 REG:** Yes, I would.

**M22 REG:** Yes.

**M19 REG:** Yeah definitely.

**Mod: Do you feel your competitive instincts are satisfied by what you are doing?**

**M19 REG:** Yes I would say so, even as M19 REG said the 5 aside, you are kind of counting the scores, it is a big aspect for us

**M22 REG:** You have the bragging rights for the next week.

**M19 REG:** Even just playing soccer in the club at home, you would, it is very competitive especially when you get to semi-finals or finals winning means everything it would put you on a downer for a couple of weeks if you lost.

**M20 REG:** I even know myself I get stroppy if anything goes against me in 5 aside, what's the point in playing if you do not want to win.

**F20 NON-REG:** Even if you join a gym with a friend, you are always competitive, looking to see who has lost the most weight.

**Mod: What about those of you who are not as competitively driven, do you enjoy competitive sports or activities?**

**F20 REG:** No I do not like people when they get like that I just cannot be around them, I do not know why.

**Mod: Would this turn you of playing?**

**F20 REG:** I would not compete just to satisfy them, I mean I would not try to compete with them, it does turn me off a bit when it is so competitive.

**Mod: And would it put you off participating?**

**F20 REG:** It depends on the activity.

**Mod: Those of you that are competitive, do you enjoy non-competitive exercise as much?**

**M22 REG:** No.

**M20 REG:** No.

**M19 REG:** Most things I do I am competitive, even when we are playing computer games the controls would be flying all over the place. It seems a lot of things that we do are competitive.

**M21 NON-REG:** That is what we have done. We play pro-evolution and we have to turn it into a competition to make it a bit exciting. There would be a prize for the winner.

**M19 REG:** We could not play without some kind of competition involved, we just could not go on playing casual games, it is kind of sad, it is in our nature I suppose.

**Mod: Those of you that are not successful at your activity, does it lead to a sense of alienation toward the activity or would you persist regardless?**

**M19 REG:** I think it would lead to motivation, for me personally anyway.

**F21 REG:** I do not know I have gotten very frustrated in the past, you know you would want to chuck it in, you know getting really, really down on yourself. You would never really chuck it in though, you would consider it especially if you have not succeeded in what you wanted to do, you would feel so frustrated.

**M19 REG:** You do also get your days where you feel is it worth it and that. Same with a lot of things I suppose, studying is the same.

**Mod: How important is physical fitness to you?**

**F19 NON-REG:** I think it is important for girls, Girls are very into their image, keeping fit and that.

**M19 REG:** Not as much now that we are in college, but it still is I suppose. You like to feel fit. You do not like to be going out playing where you feel tired after ten minutes, you would like to be able to keep going for an hour or an hour and a half exercise.

**F20 REG:** I think it is important, but I find it hard to motivate myself to get fit It is not so much to do it, it is to actually keep it going. That is hard.

**M22 REG:** You always get little spurts where you go to the gym every day, you have a big idea to get fit, then the next week you do not go as much, you are not as motivated anymore.

**Mod: What about the health benefits of exercise, they are fairly well documented. Do you feel they are important in driving your behaviour?**

**F20 REG:** You can tell the difference when you are fitter, you can definitely tell, your skin your hair everything. Girls especially.

**Mod: And would those benefits be a driver for you?**

**F20 REG:** Sometimes yeah definitely.

**F21 REG:** It would not really cross my mind to be honest. I do not stop and think I feel healthy like. Fair enough, I would be fit and lose weight and stuff, if you want to consider that as a health benefit, that maybe I would be slimmer. But I would never really say I am doing this to be healthier.

**Mod: Just getting back to appearance and the way you feel and look, how important is that to you?**

**M19 REG:** I think it is. I think more so for girls than fellas, girls are more scrutinized I would say about the appearance, fellas do not really care as much, they would leave themselves go.

**F20 NON-REG:** Say a couple of years ago when you were really fit your clothes fitted you properly. And then when you stop doing the exercise it just kind of gets you down that you won't fit into them jeans anymore or anything like that.

**Mod: So do you all feel you have kind of dropped off in exercise over the years?**

General agreement.

**F21 REG:** I would say I probably do a bit more now.

**Mod:** What would you put that down to?

**F21 REG:** New interests I suppose, I think in school you probably just did not care. Now I would be a lot more self-conscious, you would just want to do a bit more.

**F20 REG:** I think I was a lot fitter in secondary school to be honest. Like you had PE three times a week, you had a certain set of things, your day was planned out completely, whereas with college, you can do whatever you want like, you really can.

**M19 REG:** I think you are trying to juggle when you are in college trying to do a part time job maybe or study or going out a couple of nights. When I was 16 or 17 I would have one thing every night of the week either training or a match. I used to play three, I used to play soccer, hurling and football, you would have something every day of the week, but now you cannot fit in, you kind of have to chose one or the other when you get to a certain age with jobs and stuff.

**F21 REG:** When it came to PE in school, I do not think a week went by when I did not bring in a sick note, I hated it , I used to be begging my mother to write me notes to get me out of doing PE like, you just be why bother with something like that.

**Mod:** And was that because you weren't interested in the activities that they were doing or was it that the physical exertion was turning you off?

**F21 REG:** Aw no I was always fairly fit, it was just the whole sports thing, I just had no interest at all.

**F20 NON-REG:** I used to love PE, we would do something different every week, they would send us off to the gym out in Waterford Glass or they did karate class, they did yoga, any type of exercise they tried us out on everything.

**F21 REG:** We used to get shoved out into the freezing cold wet and rain onto a swamp like pitch, you would sink in it and they would tell us to run around or they would give us a tennis racket to play rounders and you would be sinking in the mud. The facilities were just dreadful, I used to just think let me go upstairs and listen to music or something. I think the outside put me off an awful lot, being out in the rain. That was it, I never minded PE or whatever.

**Mod:** So those of you that have dropped off in your participation, you would put it down to other interests and time pressures and that kind of thing? Is there anything else that would have contributed to that?

**M22 REG:** Moving away from home, moving away from the local team back home or whatever. Just before I came down here I started playing for a new team. I was going to train down here and go back home to Dublin for matches. It was just too much effort

**M21 NON-REG:** Work as well. I played football and rugby up until I started working. Then I just stopped when I started working and I have not taken anything back up since.

**M22 REG:** Once you drop it as well it is very difficult to get back into it.

**F20 REG:** You have different responsibilities as well now, like you are not as carefree anymore, you have to feed yourself, you have to get a part time job, there are too many important things that you have to do, it doesn't seem as important, exercise and stuff.

**Mod:** **Ok we have touched on improved appearance and weight control as being factors. Regular exercise has a number of other additional benefits such as building strength, improving muscle tone, increasing endurance and speed and, improving agility and flexibility. Are any of these issues important to you?**

**M21 NON-REG:** It would depend like, you when you get back in when the GAA starts the difference between the start of the year in people and when the championship is in full flight. People are always going to be weak and unfit at the start, you just see how people progress and get stronger through the year.

**F21 REG:** You really need to be fit and agile for skating. My coach gives me an intense set of stretching moves to do every day to increase my agility.

**Mod:** **Sure. For yourselves when you engage in exercise are they things that are at the back of your mind?**

**F20 NON-REG:** It would depend on what you are doing the exercise for, if you are doing it to lose weight the toning part would be more important to you, whereas if you are doing it for say matches, then you want to be stronger and faster.

**M19 REG:** I think if you are playing competitively then it would be, if you are playing casually then it is not as big a deal to be as fast as can be. When you are playing competitively it is a big deal, even in training you are doing short sprints to improve yourself.

**M20 REG:** I was never the greatest footballer, but I could play a bit, but I think now I am not half as sharp even when I play 5 a sides. You know yourself you do not have the same sharpness or quick thinking or whatever, because you have not been playing regularly.

**M22 REG:** You are going to lose I thought if you do stop playing. It is like anything you are going to get rusty if you aren't playing regularly.

**Mod:** **Ok I am just going to talk about a couple of things that relate specifically to sport, we have been speaking about general exercise issues up to now. Would you class yourselves as risk takers or thrill seekers in any way and do your activities reflect that in any way?**

**F21 REG:** Yeah. About three years ago I started figure skating with my sister and we are always trying to get better jumps.

**F19 NON-REG:** I do not like risks. I always think of the worst case scenario.

**Mod: Why is that, what do you get from that?**

**F21 REG:** I suppose when you do that you fall an awful lot and get hurt, you would be taking risks and that, I have broken bones doing it.

**Mod: What is the benefit of doing it for you?**

**F21 REG:** The benefit is the feeling when you actually succeed, you can get a double jump or whatever, it is a fantastic feeling, you get a good buzz from it.

**M22 REG:** It is a sense of achievement

**M19 REG:** You do tend to take risks, say if you are injured and someone tells you not to play, you are kind of determined, I do not know is it to prove people wrong. I know when I broke my collar bone, I was told not to play, but you would still go and play games, maybe it was just to prove people wrong and you can play through it.

**M21 NON-REG:** Definitely with cars, I know it would not be physical exercise, at home we'd be messing about all the time with cars, doing drifting hanging out the doors or windows. Just to get a buzz and have a bit of craic!

**Mod: Not sure that comes under the umbrella of what we are speaking about! What about horse riding, is there a risk element entailed?**

**F20 REG:** Some of the things I do I would not see as being risky, but people who do not do it or aren't as advanced maybe, would take it as being risky, whereas we used to jump over fences with no saddle or bridle and we'd be fine. A lot of people would see that as being a risk, but I would not.

**M22 REG:** I find that sort of stuff very risky. My little brother and sister are into horses as well but I would not go near them, I would be terrified.

**F20 NON-REG:** Previously with karate the whole thing is a risk, you are putting yourself in for a fight every time you go up training, you are at a risk of a lot of injuries, especially in competition, it can be very rough in competitions.

**Mod: Relating to that do you enjoy the physical and aggressive aspects of sports?**

**F20 NON-REG:** It is great to take your frustrations out on somebody!

**M19 REG:** It is a way to channel your anger and frustrations. In a way you are angry in a match, you are fired up, it is channelling that anger, not just going out

and hitting someone. The physical side of the game does help leave off a bit of steam. I would enjoy it personally.

**Mod: Does anybody take the opposite viewpoint of that, does the physical nature turn them off the sports or exercise?**

**M19 REG:** It depends on the level, some teams are very physical, you can get bigger teams and you come home and can hardly move after playing them. That would make you think 'ah why did I go through that' but it is worth it in the end.

**Mod: How important is representing your team or club to you? Those of you that are involved in competitive sport in particular.**

**M21 NON-REG:** It is everything when you get to a big level. We got to a county final the year before last and we were a small village playing a big town next to us and when you went back and see the flags everywhere and everyone going mad about it, it is great like because you are representing your club that you have played for all your life.

**M19 REG:** It brings the community together everyone going, everyone has the same goal, even people with no interest in sport go along to see how the team does. Even representing your county is a big honour as well.

**M20 REG:** I think it means more in GAA than in soccer. I played with 2 different teams in schoolboy football and I started playing with the Glass, then I played with Villa, I do not think it means as much. Whereas in GAA I never played it, but I assume it means more.

**M19 REG:** You do not get people changing teams as much, so I think that is why it is bigger in GAA. You live in the area you are playing so everyone has the same goal.

**M21 NON-REG:** And you have played with everyone all the way up so you are all together.

**Mod: Do you feel any bond with the people you play or exercise with regularly?**

**M21 NON-REG:** Oh you would yeah definitely.

**Mod: How important is that to you?**

**M20 REG:** The dressing room banter is always important. A lot of professional footballers, say that is something they do miss about playing football, the banter in the dressing room. I do miss that myself not playing for a team.

**M22 REG:** Professional!?! Laughter

**M19 REG:** Even going for a walk or going to the gym with someone.

**Mod: Yes it can apply casually as well.**

**M19 REG:** Yeah it is something to do with someone, even if you are just going for a walk with someone a couple of times a week.

**Mod: Do you find that you motivate each other as you go along?**

**F20 NON-REG:** Yeah because you could be tired and they'd so come on and we go.

**M19 REG:** You are more likely to if you are with someone, one of ye would want to go, if you are on your own you might think ah I will stay in tonight, whereas if someone is there to say come on and we will go you do.

**M21 NON-REG:** You even see it, we have greyhounds at home, if you had to take them for a walk they would know what would be happening and jump up all over you and almost tell you where they want to go.

**F21 REG:** On the same point, I will always walk further when I have the dog, if I am going for a walk myself and just have the Ipod with me to listen to music, I might walk for an hour. If I had the dog I might go the extra half hour or whatever. You will always put that bit extra into it.

**M21 NON-REG:** Especially when two people are going to benefit from it, yourself and the dog.

**M19 REG:** I think the competitive thing brings a bit of a bond as well, even if it is casually going for a jog, two people going to the gym even, you are kind of in your head competing against them, so I think that brings a bit of a bond as well.

**Mod: Do you think exercise and participation in sports engrain any values that you might not get elsewhere, in your educational life or your working life or family life? Is there anything extra that it brings to you in terms of yourself as a person?**

**M19 REG:** I think it helps you deal with a lot of things that you can relate to life, like with the depression if you lose or the high if you win, you kind of have to deal with say losing a final, you can kind of relate that and the motivation of getting up to go to a match would be the same as getting up to do a bit of study. You can kind of relate it especially to motivating yourself to do things.

**M21 NON-REG:** Like he said if you lose a match there is going to be 14 other fellows that feel the exact same as you. If you lose your job or lose something close to you, it is only you yourself who has lost it, but if you have 14 other people or 30 other people to comfort you if you have lost a match it is easier than if it is just yourself.

**Mod: Any other values that you think it brings?**

**F21 REG:** I think it is a good example of the saying you only get out of things what you put into it. It is true like, say you want to lose weight you are get out of it what you put into it and say you see some results, if you start getting fitter and

stuff like that, it will show you if you relate it back to things like study, you will get out of your study and exams what you put into it. It is a life example.

**M19 REG:** I think it helps your social skills as well, even just going to the gym or you are in a team, you are thinking of other people as well and you are used to working in groups. Even if it is a full team, you are used to working say the defensive work together, you are used to working in teams. When you come to college then you are used to working out problems, I know it is on a different scale, but I think in a little way it does help.

**Mod:** We are just going to have a quick look at some of the influences other than the motivating factors that we have mentioned, some external influences that may influence your participation or exercise. How important is family in driving your exercise behaviour, do your family participate in different sports and may have driven you that way and how important have they been in getting you to take it up in the first place and on your continued participation?

**M20 REG:** I know in the start certainly my father was. I mean he was involved. I played with Waterford Crystal since I was 5 or 6 and he was involved at the time. That is how I started anyway. The fact that he was involved in football, he was never interested in hurling or gaelic or anything, I have never been interested in hurling or gaelic, I have never picked up a hurley in my life. That is where family is vital in what sports you do play and how you become involved and who you become involved with.

**M19 REG:** I think family is massive as well. When everyone is young everyone tends to play, but you see when people get to 13 or 14 people, young fellas that love playing sport do not go because their parents cannot bring them, whereas with me my parents would always bring me to matches, they would always go watch, even my father would be a big clubman. It is great to see the pride on their face if you are playing a big final for the club.

**F20 NON-REG:** It is great you know in karate, when you are going to go up a grade everyone shows up to watch it and then there is a little celebration afterwards and then you are training for the next one knowing you can do it and they are behind you supporting you the whole way.

**Mod:** What about at this age, how important is family in maintaining your participation? Has the influence waned over the years?

**M22 REG:** I think it has, I would be big into football, but no-one in my family ever had any real interest in football, but they always supported me if I needed a lift or anything like that down to where I was playing. Since I have got older it is all down to myself if I want to continue. They would not really be as much of an influence anymore.

**M19 REG:** For me it is the same. When you are living at home it is a lot different, it is a lot harder when you are living away. If I slept out or something on a Sunday morning there would always be someone there to wake me and tell me I had a match. I would not be allowed miss a match even at this age!

Whereas I think if you are living away from home it is a lot harder you kind of have to motivate yourself like.

**M21 NON-REG:** I would be the exact same as M19 REG, my father would be big into the GAA and anytime there would be training on he'd drag out and drive me down.

**F21 REG:** My family have helped an awful lot, I probably would not have been able to do half the things I have done without them. I have to get to Dundalk and go up the North for competitions or training and shows and that and I have never once had to get the bus. I have always had someone getting up really early and because a lot of the time the training sessions would be like at half six in the morning we would be leaving my house in Kildare at half four to get there. It is never a problem to get up that hour of the morning someone will always say 'oh well it has to be done not a problem'. So they have just helped an awful lot.

**M19 REG:** I think you like to think you are doing your family proud. When you see them on the sideline at a match it gives you a little boost. If they come along, it gives you a little boost that you want to make them proud, especially when you are younger like.

**Mod: The financial cost of exercising, is that a factor in what you do?**

General agreement that it is.

**F21 REG:** As a student yes. It is so expensive to do what I do, for my skates alone I think the actual boots were about €750 and the blades were about €400, just even the equipment you need and then the lessons, they can be up to €100 per hour.

**Mod: And do you think the cost inhibited you in any way in what you were doing?**

**F21 REG:** Em, yeah it did. I would probably be a lot further along now if it was cheaper, but like you can find ways around it. It is just so expensive, if you wanted to spend the whole they up there you could easily spend €100 and then you have got to think about the maintenance and the equipment, you have to keep getting your blades sharpened every few weeks and that, petrol money up to Dundalk, it is seriously expensive.

**F20 NON-REG:** Some sports can be expensive, say Irish dancing it costs a fortune. Some sports are very cheap, say like karate it costs €2 a go and then just buy your outfit which will do you until you grow out of it, it is not too bad.

**Mod: Has cost prohibited any of you doing something you want to do in terms of exercise?**

**M19 REG:** I would not think so. It is tough alright, you are trying to find time to get the part time job to work to get the money to pay for the sport, so you are kind of going around in a circle really. You are trying to balance it all. I know there has been weeks where you are even struggling to get the fiver to pay the

match fee. Still for the sports I play it is not a big deal, but F20 NON-REG said different sports have different levels of cost.

**F20 REG:** I think definitely the horse riding is extremely expensive, especially the show jumping side of it. It depends on the horse you get, it could cost a couple of grand, then there's all the equipment, vet costs, farrier costs, entry costs. Like to enter a show, even a really small show would be at least €20 for an entry and there might be no prize fund. It is just the transport costs, stables and everything. Not a lot of people get a chance to do it because of the cost and that is why it is declining in Ireland, because it is just so expensive.

**Mod: Your coaches and mentors and managers, what kind of role have they played in what you do?**

**F20 REG:** It helps you compete with others, because if they have really good trainers they are going to do better than you, because they are better equipped for it. Therefore you are at a disadvantage already if you are not even prepared for it, so I think they do play a big role.

**M19 REG:** I think you always have your ups and downs with coaches, when you are younger you kind of look up to the coaches and have a bit of a bond with them, you become good friends with them, I am friendly with a few of them around the parish just knowing them from the sport. Especially when you are younger you think they are your hero nearly! When you are 7 or 8 growing up they are your earliest memories, when they are in charge of you. They are kind of your father figure or mother figure on the pitch, I think you would build a bit of a bond with someone like that.

**F21 REG:** I know sometimes even with your parents they might tell you to do something, and you might say aw I will do it later, but I know for me what my coach says is gospel like. If my coach said to me do not drink before the competition or take a week off or do not go out, I know I would definitely listen to him.

**Mod: Do you find pressure from your coaches an inhibitor or that it turns you off in any way? Have any of you had that experience?**

General no.

**Mod: All fairly positive experiences then?**

**M21 NON-REG:** There was one fella I fell out with there about 2 years ago. He was, he did not like me being there. He wasn't from the same place and he just picked on a few of us because we were younger and he just did not want us there. Eventually he got told where to go.

**F20 REG:** I suppose like they are really helpful for motivation. I am doing the running at the moment and I am not good at it at all, it is sprinting, I know I am not good at it. But he won't even really help me at all, because I am not one of the top people. Even if he said every now and then 'you are doing well keep

going' it would help me to do it more, it would motivate me a lot more. But he doesn't even bother looking in at me so I do not try as hard.

**Mod: Do any of your close friends exercise or play sport with you and if so, what degree of influence do you think they have over your actual participation?**

**F19 NON-REG:** With walking like, your friends are obviously going to motivate you. As I said earlier if there is someone else with you, you are more inclined to go. They'd encourage you.

**M19 REG:** I think a lot of my close friends have come from sport from an early age. You are with them up through the years so you build a bit of a relationship that way.

**F20 NON-REG:** It is something to talk about as well if they do they same sports as you. If they weren't doing the same sports as you, you would have less topics for conversation.

**M22 REG:** Going through school I never had PE, so I would have gotten a lot of my close friends through football.

**M19 REG:** I think that is what helps you become friends. You have the same interests. All our group are big into soccer and the GAA and it kind of takes up most of your day what you are talking about, what you watch on TV and that. It has a big part to play.

**F21 REG:** None of my friends would be, I do other sports other than skating, but none of my friends are into that. The only person that does that with me is my sister and then the friends that I have made through skating. My actual friends from home have no influence in what I do.

**Mod: Other than sports and exercise, what other activities do you engage in and do they hinder or compliment what you do in an exercise context?**

**M19 REG:** I think it was touched on earlier with college your social life plays a bigger part than you sporting life. At times you kind of, like when you come into college on a Monday the first mention is of 'what you are doing Wednesday night, where you are going?', not 'are we going playing football this week?'. It is just social life, especially when you are in college, is a lot bigger, than the sporting aspects of it.

**Mod: Other than social aspects is there anything else that impinges on your exercise behaviour?**

**F20 REG:** Just work, part-time jobs, definitely and money.

**Mod: In terms of access to what you want to do with regard to exercise, do you have ready access, do you have to travel, is there facilities in your local area or do you have any issues or problems in this regard?**

**M22 REG:** There would have been. I have facilities available back where I live, but I never once played sport close to where I lived. I never had that whole community thing you know with the GAA and all that. I would have always travelled at least 45 minutes or an hour to go training or get up to a match and it would be the same in the evening coming home.

**Mod: And do you think that hindered you or were you happy to do it?**

**M22 REG:** I was happy to do it.

**Mod: Obviously you were similar with the ice skating F21 REG?**

**F21 REG:** I live in Kildare but I travel up to Dundalk, my club is in Dundalk. I only have two options Dundalk or Belfast and Dundalk is the nearer of the two, probably better equipped to.

**Mod: Yeah, that is the other point I was going to touch on, does the quality of the facilities that are available to you affect you decisions or behaviour in any way?**

**M19 REG:** I think when you are growing up it is the facilities that are available close to you. Where I grew up there is a soccer club down the road and a GAA club, you kind of tend just to go to the local club, your parish or whatever, I do not think the facilities seem to matter. I think when you are older you tend to look more at the facilities.

**Mod: What about those of you that use gymnasiums, do you look at the facility as being important to you or is it cost or access?**

**F20 NON-REG:** Now it is cost, whichever offer the best students discounts or whatever, other than that, it would be what's in there.

**F20 REG:** The feel of the gym as well. You would have to have a good feeling about it.

**F20 NON-REG:** With clubs when you are younger I think it is whatever is handy for the parents, you do not really have too much of a choice, it is kind of 'I can only bring you here or only bring you there'.

**F19 NON-REG:** Where I am from they are only after forming a girls football team in the past two years and there was no camogie or anything. So there was no real opportunity for us to play this.

**Mod: In a college context, say within a WIT setting, so you exercise regularly, or is it all done external to the college?**

General: All external

**F21 REG:** The most exercise I get here is just walking in to college.

**F20 NON-REG:** I was in the karate club here and the guy who was teaching it, I was a higher grade than him, so I did not think there was a point in someone at a lower grade than me teaching me what to do, so I stopped going then.

**M19 REG:** I started playing with the college, but I did not think the set up was as good. I do not think you have the same feel about it when it is not your own team. I just did not like the set up so I did not continue with it.

**M21 NON-REG:** They more or less know in the college who is coming in beforehand and that, they focus on the elite people.

**M19 REG:** When you were in first year there were fourth year students over the team so it was very poor, the organization was bad, if they knew someone in their year or the year behind them they put them on the team. It is hard to break into a team like that.

**Mod: So was there any obligation for you to play in college, are you pressured into doing exercise?**

General no.

**Mod: When you were in a school context, did you feel obliged to exercise in the likes of PE classes?**

**F21 REG:** Oh yeah it was never really taken very seriously in our school. It was just another allotment on the timetable. PE, the equipment was fairly good, I just think it was the teachers their attitude and mentality towards it like would put you off it. It wasn't even the getting out and doing it, I would be fairly fit anyway, it is just the monotonous regime, I hated it, I did my best to get out of it every week.

**F20 REG:** There was a huge emphasis in my school, they were big into basketball, they have won a load of trophies, so if they won something they would be running around the school with the trophy, it was a pride thing.

**Mod: Did the obligatory nature have any kind of a negative effect on you, did it turn you off exercise in any way?**

**M19 REG:** It was a positive for me.

**F20 REG:** Positive for me too.

**F21 REG:** I think you had sports stars in school, you had the basketball players, they literally were the stars in the whole school, the basketball, camogie and football girls were really concentrated on their sports. Everyone else was just tagging along for the ride. I do not think there was enough emphasis put on just normal exercise.

**Mod: The final section that I am going to look at is what your behavioural intention for the next month is with regard to regular exercise as we defined it**

**earlier – 3 times a week for at least 20 minutes. What is the likelihood of you exercising at that level in the next month? First off assess the likelihood of you exercising regularly in the next month.**

**M19 REG:** There won't be much done this month I would say with the exams coming up, it will be head in the books.

**F19 NON-REG:** After Christmas everyone always says they are going to start exercising and cut down eating and then it always fades away.

**Mod: What is your current exercise pattern? Do you think you will maintain your current exercise regime over the next month?**

**M19 REG:** Game of ball on Monday for an hour and walk to and from college, about a 20 minute walk each way. Yeah I think I will keep that up.

**F20 REG:** I do two hours of running every week and I cycle to and from college. It will probably stay the same until Christmas and then become less.

**F20 NON-REG:** I do nothing at the moment and it will stay like that. I did join Curves and went for the first month and it was great because I had someone to go with me, but then she stopped going, so I stopped going. Hopefully I will get into it again after Christmas.

**F19 NON-REG:** I do not do any exercise at the moment, but after I pig out over Christmas I will probably start for a few weeks alright.

**F21 REG:** When I am down here, all I get is a walk or a run or whatever, but mostly Saturday and Sunday mornings I would be up there for about half six and spend about three hours or maybe longer and then back home. So twice a week and I'll be keeping that up.

**M19 REG:** I play a game at the weekend and maybe train once a week. Hopefully when the exams or finished I will start going to the gym two or three times a week.

**M22 REG:** A bit of football once a week. I would say when I move back up to Dublin I will look to try get back with one of the old teams that I was with.

**M21 NON-REG:** I have not been doing much lately, I could not for a while there, so I am just easing back into it and will start a bit of GAA and that after Christmas.

**Mod: Are there any additional factors or circumstances that will enable you to engage in regular exercise in the next month, other than what we have mentioned already?**

**M19 REG:** The work experience I think will be a big factor. You won't necessarily be studying every night, which we are now, I think we will have a lot more free time.

**M20 REG:** I think it will help me too. I am moving to Dublin after Christmas, moving up there I only know one or two people, as opposed to knowing everyone here, so in my spare time if I am doing nothing else I could go to the gym a couple of nights a week, so I think it might help me in that respect.

**M19 REG:** You are not having a part time job at the weekend too, gives you more spare time.

**M20 REG:** That is true, weekends off.

**M22 REG:** I think our days will be more structured after Christmas, once we settle down into work it will be 9 to 5 working and evenings free and weekends free, so we will have a bit more time on our hands.

**M19 REG:** You are doing less when you are in college, you could get up late and not go to a class, so you are getting lazy, whereas I think if you are up early and doing stuff you tend to do more then on top of that.

**M22 REG:** You have the whole day ahead of you.

**F21 REG:** I am not doing the work experience, but I am going to study abroad for the flexible semester, I am going to Boston and there is a rink on campus, so I am definitely going to get a lot of use out of that. It will benefit me doing that.

**Mod:** **Is there any factors that will make it difficult or impossible for you to engage in regular activity in the coming month or so?**

**F20 NON-REG:** Exams.

**M19 REG:** Christmas I think, everyone kind of switches off, up to the exams you would be studying, once they are over, you tend to give yourself a break for a week or two, you are looking towards Christmas and then the New Year. You kind of relax until after New Year's.

**F20 REG:** I do not have placement yet, so I will probably end up doing college and community. If I do that I will end up having to get a part-time job and so I won't have as much time as the placement lads. It is going to be harder for me to get into a regular routine I would say.

**Mod:** **Ok guys, that is just about it. Is there anything else that you want to add about your physical activity that we have not touched on yet?**

General no.

**Mod:** **Thank you very much for your co-operation and help.**

## Appendix F: Discussion Group Coding Report

Figure F.1 outlines the coding structure that emerged from the five discussion group interviews. The themes that emerged are discussed in detail in Section 6.8.

**Figure F.1: Discussion Group Coding Report**

