An exploration of flow experiences in professional jump jockeys

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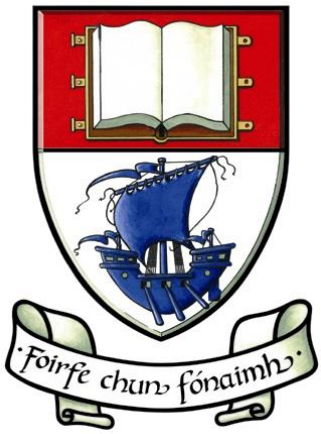

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Abstract

Research has explored the conditions influencing the occurrence of flow in horse racing. However, little is known about the elements characterising the state of flow in equine sports. This study sought to; (a) explore the conditions influencing the occurrence of flow; (b) explore the characteristics of flow; and (c) explore the connections between the conditions and characteristics of flow in jump jockeys. Ten professional jump jockeys (*M* age = 28.1; *SD* = 5.21) participated in semi-structured interviews exploring the occurrence of flow in National Hunt horse racing. Data was analysed through an alternating process between thematic and connecting analyses. Twelve facilitators, ten inhibitors and seven disruptors were identified as being influential to the occurrence of flow. Ten characteristics described the occurrence of flow in jump jockeys, of which the optimal interaction with the horse has not emerged previously. Synchronisation of horse and jockey during flow experiences was characterised by communicatory, physiological and locomotive features. Additionally, 35 links were exhibited between the conditions and characteristics of flow, through which confidence, concentration and the optimal interaction with the horse were most influential for the occurrence of flow. This study made two important contributions by characterising the experience of flow in horse racing and identifying the manner in which the facilitative factors influence the occurrence of flow in jump jockeys. Similar to recent studies, kinaesthetic and cognitive alterations were associated with jockey flow experiences Results are discussed in relation to previous research and recommendations for theoretical and research developments outlined.

Glossary of Terms

Bumper: The former term for a National Hunt Flat race, bumpers are races for National Hunt horses at the start of their careers which do not involve obstacles.

Claim: weight allowance for conditional and apprentice jockeys.

Colt: male horse aged four or under.

Conditional Jockey: National Hunt jockey in the early stages of their career that has not reached the total of 60 winners required to lose their claim.

Filly: female horse aged four or under.

Flat Racing: horse racing on flat courses with no obstacles. Races range from five to twenty furlongs

Furlong: one-eighth of a mile (220 yards)

Gelding: castrated horse

Hurdles: obstacle approximately one-metre in height.

Mare: female aged five or older

National Hunt Racing: horse racing predominantly over steeplechase and hurdle fences, with the exception of Bumpers. Races are between two and four-and-a-half miles.

Point-to-Point Racing: horse racing on private land featuring qualified riders.

Professional Flat Jockey: jockeys move into the professional ranks upon the attainment of their 90th victory or their 25th birthday, whichever comes first.

Professional National Hunt Jockey: jockeys move into the professional ranks upon the attainment of their 60th victory or their 25th birthday, whichever comes first.

Steeplechase fence: obstacle between 137 and 145 centimetres.

Stallion: male horse aged five or over.

Under-rules: races on an official racetrack (excluding point-to-point racing).

Chapter One: Introduction

1.1 Introduction

This chapter contains a brief outline of the rationale, scope, purpose, research objectives and chapter overview pertaining to this dissertation. The overall aim of this research is to explore experiences of flow in National Hunt racing as perceived by professional jockeys.

1.2 Rationale

One of the main reasons underlying sport participation is the level of enjoyment attained from performing in such activities and the desire to repeat those experiences again. However, rather than being conceptualised as a product of sport participation, Kimiecik and Harris (1996) describe this sense of enjoyment as a psychological process experienced *during* task execution. Stemming from his fascination with the sustained and engrossed levels of concentration and task absorption exhibited by painters, artists and chess players in the pursuit of little or no extrinsic rewards, Mihalyi Csikszentmihalyi (1975) outlined:

> "In a world supposedly ruled by the pursuit of money, power, prestige, and pleasure, it is surprising to find certain people who sacrifice all those goals for no apparent reason: people who risk their lives climbing rocks, who devote their lives to art, who spend their energies playing chess" (p. 1).

It was concluded that high levels of enjoyment were attained during task engagement and that this pleasurable feeling subsided upon task completion. As a result of the seemingly endless stream of task-related thoughts associated with such experiences, Csikszentmihalyi (1975) termed this phenomenon 'flow'. Accordingly, this construct is described as an intrinsically rewarding psychological state associated with effortless and enjoyable performances (Jackson & Csikszentmihalyi, 1999).

Flow research in sport has been the subject of increased attention in the last two decades and the works of Kimiecik and Stein (1992) and Jackson (1992) are largely lauded as being the first pieces of published research on flow in sport (Swann, Keegan, Piggott & Crust, 2012). Studies have typically attempted to *describe* the state of flow in sport (e.g. Bernier, Thienot, Codron & Fournier, 2009; Jackson, 1996) and *explore* the conditions that influence flow occurrence (e.g. Jackson, 1995; Sugiyama & Inomata, 2005). Thompson and Nesci (2013) assert that the experience of flow in horse-rider sport differs due to the influence of the horse. Research has indicated that unique conditions influence the occurrence of flow in flat jockeys (Jackman, Van

Hout, Lane & Fitzpatrick, in press). Although novel findings pertaining to the influence of the horse on jockey flow experiences emerged, this research failed to describe the experience of flow in a horse-rider sport. Additionally, the findings of this research may not be generalizable to National Hunt racing where the longer distances, reduced speeds and the added aspect of jumping fences may differentiate the performance experience. Given that jump jockeys frequently allude to the positive experiences of horse racing and that the characteristics of flow in equestrian sports have failed to be previously accounted for, a gap appears to exist in the literature.

1.3 Scope and purpose

The purpose of this research is to describe the experience of flow in National Hunt horse racing and explore the conditions which influence the realisation of this state. Specifically, this involves exploring the conditions that facilitate, inhibit and disrupt the occurrence of flow in jump jockeys. Additionally, this study will also investigate the connections evidenced between the conditions and characteristics of flow.

1.4 Research objectives

A number of research objectives have been formulated to guide the purpose of this study. These objectives include:

1. To explore the characteristics of flow in professional jump jockeys.
2. To explore the conditions which facilitate the occurrence of flow in professional jump jockeys.
3. To explore the conditions which inhibit the occurrence of flow in professional jump jockeys.
4. To explore the conditions which disrupt the occurrence of flow in professional jump jockeys.
5. To explore the connections between the conditions and characteristics of flow in professional jump jockeys.

1.5 Chapter overview

In sum, this dissertation contains a total of six chapters. Chapter two will review the extant literature and outline gaps in the literature which substantiate the rationale for this study. The methodology for the study will be outlined in chapter three and the results emanating from this method described in chapter four. Chapter five will discuss the findings of the study and acknowledge the limitations. Finally, the conclusion and recommendations will account for the sixth and final chapter.

1.6 Conclusion

Little is known about the harmonic combination of horse and rider and the characteristics that encapsulate optimal horse-rider relationships (Wolframm, 2014). Unlike the majority of studies which have examined the experience of flow in traditional sports (Bernier et al., 2009; Chavez, 2008; Jackson, 1992; 1995; 1996; Russell, 2001; Swann, Crust, Keegan, Piggott, & Hemmings, 2015a; Young, 2000), horse rider flow is also dependent on the physical and psychological state of their equine partner (Thompson & Nesci, 2013). Despite the fact that jockeys experience high levels of enjoyment during sport participation, the preponderance of research on this group has focussed on perceptually negative aspects of their sporting careers, such as weight-loss (e.g. Wilson, Drust, Morton, & Close, 2014), mood disturbance (Caulfield & Karageorghis, 2008), eating habits (Dolan et al., 2012) and injury (Forero-Rueda, Halley, & Gilchrist, 2010), though the vast importance of these research areas is undisputed. Although research has previously explored flow in horse racing jockeys (Jackman et al., in press), this focussed solely on flat-racing and failed to describe the experience of flow within this study. Consequently, this study will attempt to build on previous findings in horse racing and answer the call for inductive explorations of flow experiences in sport (Swann et al., 2015a).

Chapter Two: Literature Review

2.1 Defining flow

Flow is an intrinsically fulfilling psychological state accompanied by a heightened sense of consciousness and the unification of body and mind that results in enjoyable and effortless performance experiences (Jackson & Csikszentmihalyi, 1999). In conceptualising flow, Csikszentmihalyi (1975) described the state in his first seminal text:

> "Action follows upon action according to an internal logic that seems to need no conscious intervention by the actor. He experiences it as a unified flowing from one moment to the next, in which he is in control of his actions, and in which there is little distinction between self and environment, between stimulus and response, or between past, present, and future." (p. 36)

During flow episodes, this amplified sense of being derives from the inability to distinguish conscious awareness from the actions being performed and triggers an intensified sense of control over one's performance (Schuler & Brunner, 2009). Additionally, this performance state enhances future motivation to perform that activity again (Swann et al., 2015a; Partington, Partington & Olivier, 2009).

2.2 Flow and similar constructs

Although flow research has emerged as a distinct concept within positive psychology (Nakamura & Csikszentmihalyi, 2011; Seligman & Csikszentmihalyi, 2000), conceptual ambiguity is evident, particularly in the case of peak performance and peak experience (Jackson & Kimiecik, 2008). A single empirical study has attempted to compare peak performance, peak experience and flow (Privette & Bundrick, 1991). However, in asking participants to describe their experience of flow, the concept was defined as "the last time you played a game or sport" (p. 173), which is not only an inaccurate description of the flow state but also appears to be overly presumptuous given that flow is a rare and elusive experience (Jackson, 1992). Likewise, a study on peak performance in golf asked players to describe a performance in which "you were playing to the best of your ability and everything was coming together for you on the golf course" (Cohn, 1991, p. 3), something which arguably resembles the notion of action-awareness merging during flow (Jackson & Csikszentmihalyi, 1999). Consequently, distinguishing flow from other concepts which often resemble characteristics of the flow state is important (Jackson & Eklund, 2012), and examples include peak performance and peak experience.

2.2.1 Flow and peak performance

Peak performance involves the utilisation of an individual's maximum functioning capacity towards any endeavour and concerns superior objective task performance (Berger & Tobar, 2007). Alternatively, flow exclusively encompasses the intrinsically rewarding subjective sensations associated with task mastery (Jackson & Roberts, 1992). Despite the differences between flow and peak performance, it is acknowledged that both flow and peak performance can occur concurrently (Jackson, 1995; Jackson, Thomas, Marsh & Smethhurst, 2001; Jackson & Roberts, 1992; Russell, 2001), although flow displayed no association with superior performance in marathon running (Schuler & Brunner, 2009; Stoll & Lau, 2005). However, samples in both studies were sub-elite athletes, and the decrements in flow reported as the race progressed could be indicative of the utilisation of dissociative strategies employed by runners that 'hit the wall' (Stevinson & Biddle, 1998) and they become consciously aware of their levels of fatigue (St Clair Gibson et al., 2003). In a theoretical comparison of the elements characterising flow and peak performance, Privette (1983) outlined that the transformation of time, a loss of self-consciousness and the autotelic experience differentiated both states. This loss of self-consciousness emanates from the temporary removal of one's ego (Kelly, 2011) which paradoxically permits an intense expression of oneself and one's abilities (Ranpura & Lythgoe, 2010).

2.2.2 Flow and peak experience

Flow is characterised by concentration and immersion in a task, whereas peak experiences are symbolized by joy and happiness (Delle Fave, Massimini, & Bassa, 2011). A peak experience refers to a moment of joy among the greatest in one's life (Maslow, 1968) and can be experienced passively. For example, a peak experience may be felt while listening to music played by another individual as the subject is not actively involved in producing the action creating these superior internal feelings (Maslow, 1971). However, a peak performance could potentially instigate the emotional state associated with the peak experience and trigger feelings of performance satisfaction and ecstasy (Privette & Bundrick, 1997). According to Ravizza (1977), peak experience, in its purest form, is experienced passively and involves minimal task involvement, whereas flow occurs exclusively through task engagement (Figure 1).

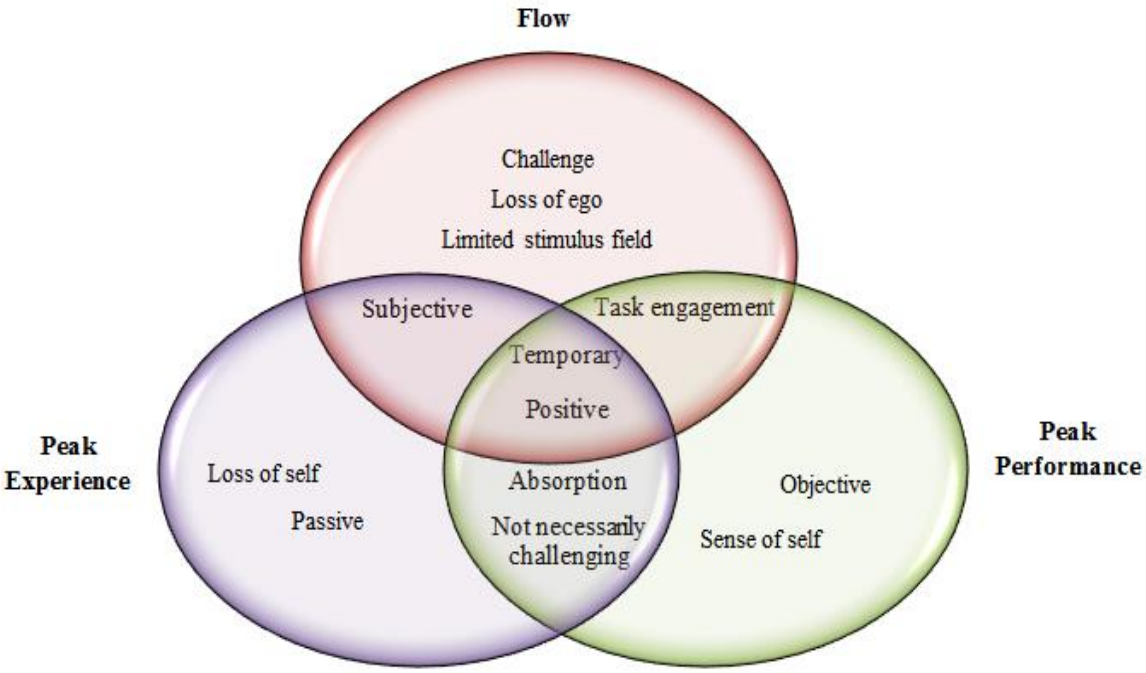

Figure 1: Summary of similarities and differences between flow, peak performance and peak experience

2.3 Characteristics of flow

The generally accepted list of elements characterising the flow experience includes challenge-skill balance, clear goals, unambiguous feedback, concentration on the task at hand, transformation of time, action-awareness merging, loss of self-consciousness, sense of control and an autotelic experience (Csikszentmihalyi, 1990; Jackson & Marsh, 1996), although a recent inductive exploration of flow have suggested that an extension of the nine dimensions is required (Swann et al., 2015a). The term autotelic stems from two Greek words, 'auto' meaning 'self' and 'telos' meaning 'goal'. As a result, the literal translation infers that autotelic experiences derive from the desire to perform a task for the sake of itself (Jackson & Csikszentmihalyi, 1999). Although Csikszentmihalyi (1975) initially used the term autotelic experience to describe this heightened state of consciousness, he modified this to the term 'flow' at a later point in the same text. In justifying this alteration, Csikszentmihalyi (1975) stated that flow can occur in congruence with external goals whereas the autotelic experience is entirely dependent on the presence of internal goals. In a further development of the characterisation of the flow state, Nakamura and Csikszentmihalyi (2002) classified challenge-skill balance, clear goals and unambiguous feedback as proximal conditions of flow, with the remaining six conditions recognised as characteristics of the flow

state. These proximal conditions explicate the motivational derivatives of the perceived interaction between the individual and their environment momentarily during task engagement (Nakamura & Csikszentmihalyi, 2011).

Despite dividing these conditions, little advancement had been made on Csikszentmihalyi's (1975) rather vague proposal that "the various elements of the flow experience are linked together and dependent on each other" (p. 48). Kawabata and Mallett (2011) sought to advance the understanding surrounding the connectivity between the characteristics of flow. Although causality cannot be inferred from these findings, previous categorisations of proximal conditions and characteristics of the flow experience (Nakamura & Csikszentmihalyi, 2002) were supported, whilst pathways between various characteristics were deciphered. In relation to the proximal conditions, clear goals and unambiguous feedback displayed a mutually influential relationship, with both characteristics independently influencing challenge-skill balance. Clear goals demonstrated a link with concentration, which was subsequently linked to a transformation of time, with all three linked to the realisation of an autotelic experience. This link is supported by the affirmation that heightened concentration restricts or prevents the direction of psychological resources towards processes that are extraneous to task execution (Friedman, 1990), such as conceptualising task duration (Conti, 2001). Challenge-skill balance was also linked to a sense of control and the merging of action and awareness, with this fusion of body and mind subsequently correlated with a loss of self-consciousness. Linking these characteristics corroborates with the suggestion that total task concentration prevents the infiltration of unnecessary thoughts and permits the relinquishment of conscious control (Jackson, 1995) which consequently dismisses flow as a dualistic phenomenon (Csikszentmihalyi, Abuhamdeh & Nakamura, 2005).

2.3.1 Extension of flow characteristics

Although deductive analytical approaches have failed to account for the emergence of altered bodily sensations during flow experiences (Jackson, 1996; Sugiyama & Inomata, 2005), recent inductive approaches have acknowledged that altered kinaesthetic perceptions are a feature of the flow experience in elite athletes (Chavez, 2008; Swann et al., 2015a). Based on the significance of kinaesthetic capabilities, motor coordination and dexterity, the psychophysiological aspect of task performance is likely to be more applicable in sporting pursuits than in other domains associated

with flow experiences, such as cognitive tasks (Swann et al., 2012). Despite not being included in the nine dimensions of flow, Csikszentmihalyi (1975) admitted that his initial research with climbers revealed that this group reported augmentations in kinaesthetic sensations and 'a sudden increase in ordinarily unconscious muscular movements' (p. 43). Despite this admission, kinaesthetic alterations failed to be included within the nine dimensions of flow in sport (Jackson & Csikszentmihalyi, 1999). However, in transposing these nine dimensions from Jackson's (1996) study, it is worth pointing out that the author coded 'movements feel great' within the characteristic of the autotelic experience. Therefore, rather than a sudden emergence of kinaesthetic alterations in flow research, the various interpretations of data coding may have contributed to the prior omission of bodily sensations during flow experiences in sport.

Dietrich (2004) proposes that psychophysiological research offers a unique opportunity to gain an enhanced understanding of the outcomes of flow. In an investigation involving piano players, entering a state of flow was positively associated with reduced heart rate, blood pressure and heart rate variability, heightened respiratory depth and increased activation of the zygomaticus muscle, commonly associated with smiling (de Manzano, Harmat, Theorell & Ullén, 2010). Furthermore, neural research employing functional magnetic resonance imaging (fMRI) to investigate the haemodynamic changes that occur during computer game flow states found that flow is associated with heightened outcome probability, enhanced cognitive control, reduced self-referential processing and diminished negative arousal (Ulrich, Keller, Hoenig, Waller & Gron, 2014). By adopting a novel experimental approach and utilising quiz questions as a task, Keller, Bless, Blomann and Kleinbohl (2011) deduced that diminished heart rate variability, associated with demand-skill equilibrium, was indicative of a state of mental workload encompassing 'deep involvement' (p. 852) during 'task engagement' (p. 850). Despite these findings, it is evident that these studies lack any practical application to sport due to the artificial nature of the methods employed.

Buckley (2012) defines rush as the simultaneous experience of flow and thrill, which combines the purely physiological sensations associated with thrill and the psychological state of flow. The author proposes that it is the search for an elusive rush associated with extreme sports rather than an attraction to risk which perpetuates the

experience associated with potentially life-threatening sports. Within a surfing context, individuals alluded to the unique adrenalin rush experienced during flow (Partington, Partington & Olivier, 2009). Buckley (2012) also argues that rush is addictive and that each rush experience augments the scale of the challenge required to elicit such a response. Furthermore, surfers also explicated an addiction to these feelings of euphoria experienced in a big wave, and were often prepared to surf despite injury or the risk of fatality (Partington et al., 2009), although another surfing study has confounded this phenomenon of risky behaviour (Wiersma, 2014).

Although Buckley (2012) provides a seemingly comprehensive rationale for the proposition of rush as a distinct performance experience in adventure sports, it could also be argued that this conceptualisation merely blurs the lines once again between flow and physiological activation, and justifying rush as distinct concept from flow is questionable. Meier (1975) states that sport provides the ideal platform for the unification of body and mind, and substantiates the assertion that the sporting arena provides a highly suitable environment for the physiological aspect to flow based on the importance of kinaesthetic sensations and dexterity of sport (Swann et al., 2012). Therefore, rather than isolating rush as a distinct concept (Buckley, 2012), it is plausible to suggest that the physiological sensations experienced during flow in adventure sports may be more pronounced due to the high level of danger involved and the perceptual magnification of physiological activation during such situations.

2.4 Flow theory

Although several academics have attempted to theorise the occurrence of flow, substantial disagreement still exists concerning flow causation. Initially, Csikszentmihalyi (1975) proposed that flow materialised during situations involving a 'challenge-skill balance' whereby the individual perceived their skills to be in equilibrium with the demands of the task they faced. As a result, this task appraisal is not concerned with the actual level of skill an individual has but the level of skill which they believe they possess (Jackson & Csikszentmihalyi, 1999). Csikszentmihalyi (1975) depicted the flow state as a metaphorical flow channel bisecting the challenge-skill axes. Flow was proposed to emanate from a challenge-skill balance, although a mismatched appraisal instigated two other states, namely anxiety and boredom. Accordingly, the generation of anxiety derived from an individual perceiving the challenge involved in the task to be greater than the skills

possessed, whilst boredom ensued if the challenge involved was subordinate to the skills of the individual.

However, the flow-channel model was later replaced with the quadrant model which proposed that a task capable of inducing flow must be greater than those normally faced by the individual, whilst the appraisal of skills required must subsequently be greater than those typically employed and implies that latent skill potential must be utilised for the attainment of flow (Csikszentmihalyi, 1988). As a result of this 'above-average' hypothesis, the fourth response to the challenge-skill appraisal, labelled apathy, occurs when a task is below both normal skill and challenge levels. A further development of this quadrant flow model was undertaken by Massimini and Carli (1988) to form an octant model, which included four additional elements, namely, relaxation, control, arousal and worry, whilst the general premise depicted in previous models concerning the attainment of flow, boredom, apathy and anxiety did not alter (Figure 2).

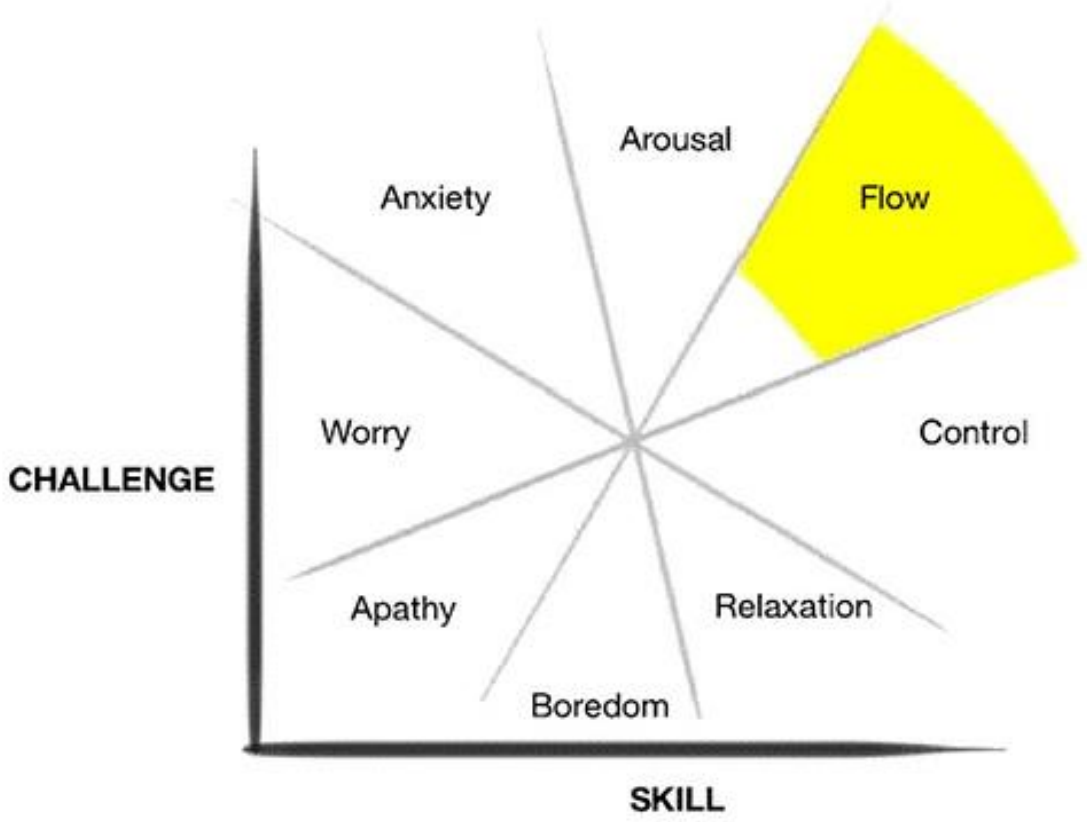

Figure 2: Octant Model (Massimini & Carli, 1988)

2.4.1 Challenge

Locke and Latham (2002) propose that the pursuit of a precise and challenging goal enhances task performance, which is reflected in flow theory (Csikszentmihalyi, 1975). Motivation is represented by the psychological properties which activate, direct and dictate achievement behaviour (Roberts, Treasure & Conroy, 2007) and emerged as a pre-requisite for the occurrence of flow in a number of studies involving elite athletes (Chavez, 2008; Jackson, 1992; 1995; Inomata & Sugiyama, 2005; Swann, Keegan, Piggott & Crust, 2015b; Young, 2000). Central components underpinning the acquisition of optimal motivation include the existence of a challenging situation and the pursuit of clear goals (Csikszentmihalyi, 1975), which are both included as proximal conditions of flow (Nakamura & Csikszentmihalyi (2002). A principal tenet to the understanding of flow is that it is an intrinsically rewarding subjective experience (Jackson and Csikszentmihalyi, 1999). In support of this proposal, positive correlations have been exemplified between task-orientation, intrinsic motivation and flow occurrence (Jackson, Kimiecik, Ford, & Marsh, 1998, Kowal & Fortier, 2000; Moreno, Cervello, & Gonzalez-Cutre, 2010)

Motivation not only differs in intensity but also varies in orientation, and subsists in both intrinsic and extrinsic forms (Ryan & Deci, 2000). Intrinsic motivation stems from the desire to perform an activity for the satisfaction and pleasure experienced during task engagement whereas extrinsic motivation concerns the pursuit of external benefits (Vallerand, Donahue & Lafreniere, 2011). Subsequently, Jackson and Kimiecik (2008) argue that the existence of external rewards in professional sporting contexts, such as monetary gains and trophies, pose a threat to the intrinsic motivation levels of professional athletes. Being intrinsically motivated encompasses a sense of mastery in a challenging situation (Seifert & Hedderson, 2010) and possessing the confidence to execute a task is a central determinant of intrinsic motivation (Burton & Raedeke, 2008). Therefore, based on a combination of these postulations, distinct similarities can be made with the flow model (Csikszentmihalyi, 1997) which states that flow arises as a result of a perceived balance between challenge and skills.

2.4.2 Skill

An inherent property of the flow phenomenon is the assertion that individuals must believe that their skills are equal (Csikszentmihalyi, 1975) or similar (Keller & Landhaußer, 2012) to the demands of a task to induce flow. A positive relationship has

been found between confidence and both state (Koehn, Morris & Watt, 2013) and dispositional (Koehn, Pearce & Morris, 2013) flow states in sport. Elite and international athletes consistently identify confidence as a key mediator of performance (Vealey, 2009). Jackson (1995) states that athletes at the elite level rarely face a sub-ordinate challenge and should actively strive to enhance their belief. Confidence appeared as an influential mediator of the flow state in elite athletes across a number of studies (Chavez, 2008; Jackson, 1992; Jackson, 1995; Sugiyama & Inomata, 2005). Athletes alluded to the facilitative role of confidence, positive thinking and the absence of negative beliefs, whilst the presence of negative thoughts or a lack of confidence inhibited and disrupted flow (Jackson, 1995). In accordance with the integral role played by confidence in the attainment of flow, recognition must also be apportioned to the various sources of confidence and particularly to Vealey's (1986) sport-confidence model. In outlining the elements underpinning confidence in sport, Vealey (1986) proposed the existence of nine sources of confidence, including a demonstration of ability, mastery, social support, vicarious experience, coach leadership, physical and mental preparation, physical self-presentation, environmental comfort and situational favourableness.

Self-efficacy is the degree of belief an individual has in their ability to meet the demands of a specific task (Bandura, 1997). Within a dyadic sport, the tripartite model of relational beliefs (Lent & Lopez, 2002) has particular resonance based on the assertion that self-efficacy interacts with other-efficacy and relation-inferred self-efficacy in the mind of the participant. Other-efficacy refers to the individual's belief in the capabilities of their partner to accomplish a certain task (Lent & Lopez, 2002) whereas relation-inferred self-efficacy is the level of belief that an individual perceives that their partner has in their (the subject) ability to perform a task. Research in dancing found that other-efficacy acted as a stronger predictor of performance than self-efficacy in cooperative interactional contexts, as demonstrated by the fact that dancers possessing augmented confidence in their partner's capabilities exhibited higher levels of performance in comparison to appraisals involving reduced other-efficacy beliefs, irrespective of self-efficacy values (Dunlop, Beatty, & Beauchamp, 2011). Additionally, self-efficacy and other-efficacy have demonstrated a positive association with athlete commitment and satisfaction (Jackson, Beauchamp & Knapp, 2007).

2.4.3 Performance automaticity

Given that performances in sport associated with flow have often been referred to as effortless or automatic in nature (Csikszentmihalyi, 1996), it is worth considering theories pertaining to this notion of performance automaticity. Rather than a reduction in physical effort per se (Jackson, 1996), performing a skill automatically places a reduced degree of reliance on attentional resources, particularly those concerning the working memory system (Schmidt & Wrisberg, 2004). The effortless attainment of attention is proposed to be indicative of perceived challenge-skill equilibrium (Csikszentmihalyi & Wong, 1991). Contrary to popular theoretical frameworks which propose that optimal attention is derived from concerted cognitive effort (Dietrich & Stoll, 2010), it is proposed that flow involves the acquisition of optimum attention through minimal conscious effort (Bruya, 2010). However, a concerted effort to attain a sense of effortlessness consequently prevents the occurrence of flow (Wulf & Lewthwaite, 2010) and reflects the assertion that efforts to control attention culminate in a depletion of these limited resources within both body and mind (Schmeichel & Baumeister, 2010). This supposition has been described as the *effort paradox* (Dietrich & Stroll, 2010) and reflects the idea that flow involves the execution of a highly practiced skill which is represented in the knowledge base of the implicit system and is instigated in the absence of interference from the explicit system (Dietrich, 2004).

Augmented movement efficiency is connected with an enhanced feeling of effortlessness (Lay, Sparrow, Hughes, & O'Dwyer, 2002) and is shaped by an individual's focus of attention (Wulf & Lewthwaite, 2010). Nideffer and Segal (2006) propose the existence of a two-dimensional framework, including attention direction and attention type as the axes. This resulted in the generation of four attention styles, namely broad-internal, broad-external, narrow-internal and narrow-external, all of which may be utilised during sporting performance (Table 1). A broad-internal focus concerns one's capacity to develop a performance plan, whilst a broad-external strategy is used to quickly assess and respond to multiple cues. In contrast, a narrow-external focus involves athletes focussing on one or two external cues, whereas a narrow-internal focus is directed towards internal thoughts and feelings. From the previous evaluations of both attention scope and type, it is plausible to suggest that the most suitable attention style conducive to the occurrence of flow is narrow-external.

Table 1: Example attentional styles

External	Awareness of several external performance cues	Awareness of multiple external performance cues
Internal	Direct attention towards internal sensations	Develop pre-race strategy
	Narrow	**Broad**

According to the dual process theory, optimal skill execution is determined by two interdependent systems, known as the implicit and explicit systems (Smith & DeCoster, 2000). The implicit system operates automatically, largely external to conscious control and without heavy working memory resources, whereas the explicit system requires the effortful acquisition of attention and high utilisation of working memory resources. Under this dual system hypothesis, Dietrich and Stroll (2010) propose that the optimal attention levels for task performance in expert performers must be acquired through minimal effort in order to induce flow. Notably, this is similar to the description of skill which Knapp (1963) defined as "the learned ability to bring about pre-determined results, with maximum certainty, often with the minimum outlay of time or energy or both" (p. 4). Although individuals at the highest level are said to have achieved high levels of skill proficiency (Debarnot, Sperduti, Di Rienzo, & Guillot, 2014; Swann, Moran, & Piggott, 2015), Gentille (1972) suggests that the difference between expert and novice performers is the performance consistency of experts, adding that novice performers can perform the technique as competently as the expert performer but with less frequency.

Failure on the part of an expert performer to perform a task through the engagement of the implicit system can cause individuals to consciously attend to the sequential elements of the skill itself and instigates a reversion to the disjointed cognitive processes more commonly associated with novice performers (DeCaro & Beilock, 2010). Although traditional skill theories have generally testified to this notion (cf. Wulf, 2013), Toner and Moran (2015) argue that expert performers cannot continue to improve by maintaining an external focus of attention. Subsequently, they support the emerging concept of somaesthetics (Shusterman, 2008; 2011) which suggests that expert performers can only improve by directing attention towards their bodily movements. In supporting their opinion, Toner and Moran (2015) state that athletes

cannot expect to experience further improvement without directing attention towards the components of task execution and propose that elite performers should engage in an iterative process between reflective and unreflective modes of bodily awareness. Consequently, they propose that performers should attempt to utilise an internal focus of attention to identify technical inefficiencies and direct effort towards habituating biomechanical alterations. However, an external focus of attention is subsequently advised in the case of competitive events, which is subsequently more conducive to the occurrence of flow.

Although little advancement has been made on the call by Jackson and Kimiecik (2008) for the increased utilisation of psychophysiological methods to investigate flow in sport, Wolf et al. (2015) recently employed electroencephalographic (EEG) measures in an attempt to understand brain hemispheric activation during imagined shots. Both expert and novice table tennis players were recruited and shown 40 video clips of a table-tennis player serving a ball and were asked to imagine the shot which they would play in response to the respective serves. Whilst undertaking this task, EEG activity was measured and participants rated their experience of flow subsequent to task completion. The results revealed that experts alternated more rapidly from left to right hemispheric activation which was proposed to be indicative of greater psycho-motor efficiency. A study involving highly skilled golfers found that a similar switch from left hemispheric activation to right hemispheric activation prior to task execution predicted fewer errors (Crews & Landers, 1993). Additionally, right-hemisphere activation was also associated with heightened flow as measured by a post-experimental questionnaire (Wolf et al., 2015). This bolsters the proposal that flow is associated with performance automaticity (Dietrich & Stoll, 2010) given that the left-hemisphere is associated with verbal-analytical processes (Hellige, 1990). Despite the promising nature of these novel findings, future studies should seek to use more realistic situations comprising actual rather than imagined movements in order to substantiate the findings of this study.

2.4.4 Anxiety

Anxiety arises as a consequence of the subject appraising their skills to be inferior to the demands of the task (Csikszentmihalyi, 1988), although no further information is given in this model in relation to the process underlying the realisation of either flow or anxiety. According to Moran (2012a), ‘choking’ is a phenomenon which is

contradictory to the experience to flow in sport. Choking is a derogatory term (Clark, Tofler & Lardon, 2005) which insinuates that performances decrease substantially in a pressure situation (Baumeister, 1984). However, Hill, Hanton, Fleming and Matthews (2009) highlighted their dissatisfaction with this definition and asserted that choking is a sporting process which culminates in substantial performance decrements and derives from an unfavourable demand-skill appraisal where the athlete perceives their skill to be inferior to task demands. Interestingly, in line with this definition and allied with the fact that researchers have asserted that anxiety materialises as a result of a negative demand-skill appraisal (Csikszentmihalyi, 1975; Engeser & Rheinberg, 2008), it is plausible to suggest that choking is a consequence of anxiety, an assertion that is reflected in recent definitional developments (Mesagno & Hill, 2013). Therefore, credence can be given to the contrasting virtues of the flow and choking phenomena based on the assertion that flow can act as a precursor to optimal performance (Jackson & Kimiecik, 2008) and an understanding of the processes underpinning the derivation of the extreme phenomena of choking, comprising both distraction and self-focus theories, is merited.

2.4.5.1 Distraction theories

The Process Efficiency Theory (PET; Eysenck & Calvo, 1992) attempts to explain the underlying processes which result in suboptimal performances during periods of anxiety. A central tenet of the PET is that the onset of anxiety in response to task appraisal impairs the storage and processing capacity within the working memory system and results in an increase in the level of effort required to attain an optimal level of attention. Notably, the PET differentiates between two distinct concepts, namely, performance effectiveness, labelled as the quality of a performance, and performance efficiency, which encompasses the level of effort expended to execute a task. Additionally, the authors also state that performance efficiency, rather than performance effectiveness, is most adversely affected by the presence of anxiety. Although criticism had been levelled at the credibility of this theory for its failure to exemplify measurable alterations in mental effort (Graydon, 2002), neural EEG research has demonstrated that anxiety results in the utilisation of compensatory strategies which negate possible working memory impairments (Ansari & Derekshan, 2011). Despite research in golf (Wilson, Smith & Holmes, 2007), rock-climbing (Hardy & Hutchinson, 2007) and driving simulator tasks (Murray & Jannelle, 2007;

Wilson et al., 2006) indicating promise for this theory, the PET fails to explicitly articulate how anxiety impairs the capabilities of the working memory system (Moran, 2012b).

Eysenck, Derekshan, Santos and Calvo (2007) expanded upon the PET by proposing the Attentional Control Theory (ACT) as an explanation for the adverse impact of anxiety on performance. This theory proposed that an individual's attentional resources are diminished in periods of anxiety but extended upon the PET by specifically outlining that attentional inhibition and attentional shifting capacities are compromised by the existence of anxiety. Attentional inhibition refers to the propensity of an individual to prevent the infiltration of unwanted and irrelevant thoughts, whilst attentional shifting comprises the ability to manoeuvre between and alter one's thoughts in response to fluctuating task demands (Moran, 2012b). Eysenck and Derekshan (2011) propose that in the presence of anxiety, performance decrements can result from attentional impairments, whilst significant performance augmentations, although inefficient, can be acquired through effortful processing. However, effortful attention augmentations trigger a psychological cost (Schmeichel, 2007; Schmeichel & Baumeister, 2010), which is in conflict with the effortless attainment of attention associated with flow (Bruya, 2010). Subsequently, the contentions of Eysenck and Derekshan (2011) exemplify a possible explanation of both the resistance of flow to anxiety and the occurrence of choking.

Optimal arousal has regularly been reported as an antecedent influencing the occurrence of flow (Bernier et al., 2009; Chavez, 2008; Jackson, 1992; 1996; Sugiyama & Inomata, 2005). Gould and Krane (1992) describe arousal as a state of activation that is symbolized by physiological, psychological and behavioural means, and ranges on a spectrum of activation from deep sleep to extreme excitement. Fazey and Hardy (1988) proposed Catastrophe theory as a mechanism to explain the severe performance decrements which coincide with augmented cognitive anxiety and over-arousal. Catastrophe theory proposes a curvilinear relationship between arousal and performance but proposes that over-arousal, stemming from heightened cognitive anxiety, causes severe performance decrements (Hardy, 1999). This theory proposes that physiological arousal can be helpful to performance when accompanied with low levels of cognitive anxiety, but that elevated arousal supplemented by high cognitive anxiety results in profound performance decrements. Subsequently, this assertion

contradicts two of the fundamental proposals of flow as the state is achieved in the absence of anxiety (Csikszentmihalyi, 1975) and a reduction in conscious effort (Bruya, 2010).

In an attempt to rationalise the processes contributing to exceptionally poor skill execution during periods of anxiety, Wegner (1994) proposed the Ironic Process Theory (IPT). Through endeavouring to attain a particular psychological state prior to task execution, IPT hypothesises that individuals engage in a simultaneous search for both intentional and ironic processes. Wegner (1994; 1997) posits that periods of anxiety and cognitive overload coincide with the mind inappropriately directing attention towards consciously gaining control. During periods of anxiety, an individual consciously attempts to search for mental content pertaining to successful task execution whilst also attempting to avoid accessing content relating to task failure and thus instigating an unconscious search for this information (Wegner, Erber & Zanakos, 1993). This unconscious retrieval of unwanted and suppressed thoughts stems from conscious efforts to control attention (Moran, 2012b). Similar to the PET (Eysenck & Calvo, 1992) and the ACT (Eysenck et al., 2007), the IPT (Wegner, 1994) highlights the mechanisms underlying unfavourable task execution in periods of anxiety, which corroborates with the fundamental assertion that flow occurs in the absence of apprehension (Csikszentmihalyi, 1975) and that effortful control of attention prevents the occurrence of flow (Bruya, 2010).

2.4.5.2 Self-focus theories

An external focus of attention is more supportive to performance than internal focus (Wulf & Lewthwaite, 2010; Stoate & Wulf, 2011), though the role of bodily awareness in skill development (Toner & Moran, 2015) has been outlined. According to the conscious processing hypothesis (CPH; Masters, 1992), anxiety can force individuals to consciously attend to implicit knowledge which culminates in diminished performance. For expert performers, this can initiate a mode of consciousness more commonly associated with novice performers (DeCaro & Beilock, 2010). Another term used to describe this theory is reinvestment (Masters & Maxwell, 2008), which infers that individuals reinvest their knowledge of task components in an attempt to exercise control over their actions. Although Toner and Moran (2015) assert that this notion of reinvestment, or somaesthetics (Shusterman, 2008; 2011), may be necessary

for performance enhancement and technical adjustments in expert performers, they state that an external focus of attention should be utilised for peak performance.

Another proposal which is similar to the CPH (Masters, 1992) is the Constrained Action Hypothesis which suggests that consciously attending to the individual elements of a movement interferes with automatic processes (McNevin, Shea & Wulf, 2003; Wulf, McNevin & Shea, 2001; Wulf, Shea & Park, 2001). Therefore, it can be conjectured that the de-automaticity acquired through the reinvestment of conscious control is in opposition to the effortless and automatic performance of skills associated with flow (Jackson & Csikszentmihalyi, 1999). Interestingly, in reporting the conditions influencing the occurrence of flow in elite athletes across a range of sports, Jackson (1995) indicated that a release of conscious control facilitated the occurrence of flow. The use of the term 'release' suggests that rather than an uncontrollable and perceptual loss or absence of conscious control, individuals appeared to liberate themselves and accept the situation, which permitted the effortless acquirement of attention and subsequently facilitated an automatic performance.

2.4.5 Reconceptualising flow theory

Although the traditional theories of flow have been outlined, Keller and Landhaußer (2012) propose a reconceptualised flow model which confounds the previous supposition that an exact fit of perceived challenge and skills leads to the occurrence of flow (Csikszentmihalyi, 1975; Csikszentmihalyi, 1988; Massimini & Carli, 1988). Instead, Keller and Landhaußer (2012) argue that the perceived fit of skills and demands[1], ranging on a continuum from low to high, feature as one axis, whilst subjective value inhabits the opposing axis, with the interaction of both dimensions explicating the intensity of flow experiences. Consequently, this suggests that the depth, richness and magnitude of flow experiences can contrast within and between individuals depending on the subjective level of value apportioned to the activity by the individual, with higher levels of subjective value culminating in more intense flow experiences. Although the flow intensity model proposed by Keller and Landhaußer

[1] Keller and Landhaußer (2012) also deem 'demand' rather than 'challenge' as a more appropriate terminological elucidation in their illustration of flow intensity as the term 'challenge' implies that an appraisal between task demands and perceived skills has already taken place (Engeser & Rheinberg, 2008).

(2012) appears encouraging and avoids a global task appraisal (Moneta, 2012), it fails to clearly explicate precisely how flow materialises.

2.5 Flow antecedents

Antecedents of the flow experience are distinct from the characteristics of flow which are described as elements depicting and typifying experiential realisation (Moneta, 2012). In outlining the pertinence of understanding flow in sport, Kimiecik and Stein (1992) called for increased comprehension of the factors influencing the occurrence of flow in sport and proposed that situational and personal factors offered avenues for research. Despite a number of studies examining the manifestation of flow across a range of elite sport athletes (Chavez, 2008; Jackson, 1995; Sugiyama & Inomata, 2005; Young, 2000), an acknowledgement of the facilitative role of partner unity on flow in elite sport has emerged in two studies, one which involved figure-skaters (Jackson, 1992) and the other which involved athletes from a range of team and individual sports (Jackson, 1995). In what was considered to be the first study exploring the manifestation of flow in sport, figure-skaters specified that the attainment of flow was a rare occurrence and that partner unity, perceived as an uncontrollable element, was an interactional quality realised only in the most valued competitions (Jackson, 1992). Based on the unique nature of figure-skating, which comprises the combination of two individuals through a tactile connection, this flow facilitator is more relevant within this sport. Within equestrian sports, performers must also consider the performance capabilities of their horse in pre-competitive appraisals (Wolframm & Micklewright, 2010a). Consequently, it is plausible to suggest that the relationship between horse and rider may influence perceptions of flow in horse racing jockeys, although the antecedents, characteristics and outcomes of partner unity could differ as a result of the interspecies nature of horse-rider dyads (Thompson & Nesci, 2013).

2.6 Horse racing in Ireland

Thoroughbred horses are the fastest horses in the world over distances greater than a quarter of a mile, and the breed can be traced back to the importation of three Arabian stallions to England in the 17th century. These stallions were bred with native mares to produce the athletic thoroughbred horse, which combined the speed and endurance of the Arabian horse with the strength of the native breed (Cassidy, 2002). The horse racing industry contributes over one billion euros to the Irish economy and is responsible for the direct employment of over 14,000 individuals (Irish Thoroughbred

Breeders Association, 2013). Horse Racing Ireland is the commercial, semi-state body responsible for the development and promotion of horseracing in Ireland. The Turf Club, which also incorporates the Irish National Hunt Steeplechase Committee, is the regulator of the horseracing, overseeing all matters concerning the rules and integrity of racing in Ireland. Thoroughbred racing features two types of racing, Flat and National Hunt, both of which take place in Ireland. In 2013, there were a total 125 Flat meetings, 178 National Hunt meetings and 46 mixed cards, which resulted in a total attendance of 1.2 million people at the 349 meetings in Ireland during the calendar year (Horse Racing Ireland, 2014).

2.6.1 National Hunt racing

National Hunt (NH) or 'jump' racing occurs throughout the year, with the season commencing at the beginning of May and concluding at the end of April, although the most prestigious races are typically staged between October and April. The majority of races in National Hunt racing, with the exception of Irish National Hunt Flat Races, involve jumping over obstacles, and are generally longer in length than flat races, with race distances ranging from two-miles to four-and-a-half miles, and jockey weights varying from 62 kilograms to 76 kilograms (The Turf Club, 2013). The commencement of a NH race differs in comparison to flat-racing, with the field of runners gathering behind a line of tape which is raised by the starter when they are satisfied that all horses are ready to start. Three types of NH racing exist, comprising steeplechase, hurdle and point-to-point races. Hurdle races involve horses jumping over obstacles that are approximately one-metre in height, with horses negotiating no fewer than four hurdles in the initial mile, and a flight of hurdles at every quarter of a mile beyond that point. Steeplechase races require horses to jump over fences which are between 137 centimetres and 145 centimetres in height, although slight adjustments can be made to fence elevation, with a minimum fence height of 132 centimetres. A minimum of ten fences are jumped in the first mile of a race, whilst at least five fences must be jumped in each subsequent mile.

NH horses mature at a slower rate than flat racehorses and will not typically commence racing until they are aged four due to their physical attributes and genetic make-up (Hill et al., 2010), although some horses may commence their careers in flat-racing before switching to NH racing. Horses are allocated an official rating by the handicapper, ranging from 80 to greater than 170, with horses competing in both

hurdle and steeplechase races attaining a different rating for each format. A range of race classifications exist, including Irish National Hunt (INH) Flat Race[2], Maiden Hurdle, Beginners Steeplechase, Novice Hurdle, Novice Steeplechase, Handicap, Conditions, Listed and Graded races (Table 2).

Table 2: National Hunt Race Categories

Race Type	Conditions
INH Flat Race	Horse has not previously won a NH race
Maiden Hurdle	Horse has not previously won a hurdle race or a steeplechase
Beginner Steeplechase	Horse has not previously won a steeplechase, although may have won a hurdle race, INH flat race or a flat race
Novice Hurdle	Horse did not win a hurdle race prior to the commencement of the season
Novice Steeplechase	Horse did not win a steeplechase race prior to the commencement of the season
Handicap	Races incorporate a range of horses that are allocated an individual handicap depending on their official rating. Horses with higher ratings carrying more weight.
Conditions	Specific conditions, such as one win or two wins, for horses to qualify, with penalties given accordingly
Listed	Horses carry similar weights, although Graded winners are likely to be penalised
Graded	Most prestigious races. Horses carry the same weight

2.6.2 National Hunt Jockeys

Individuals wishing to race competitively in Ireland must hold a jockeys licence issued by The Turf Club (The Turf Club, 2013). Jockeys that acquired their licence in another jurisdiction are permitted to compete in Ireland under the regulations of that licence.

[2] INH Flat Races, commonly termed bumpers, are for horses aged between the ages of four and seven that are beginning NH racing. Bumpers are run over a distance between two and two-and-a-half miles, and are ridden by Qualified Riders. Horses can run in a maximum of six Bumpers, and usually commence hurdling or steeplechasing following their bumper win, as they can only compete in bumpers for winning horses after their first victory.

Individuals can apply for a jockey licence once they are sixteen years old, but must undertake a series of requirements to attain that licence (The Turf Club, 2013). Initially, applicants must submit an application form and medical questionnaire (The Turf Club, 2014a; 2014b; 2014c) to The Turf Club. Subsequent to the acceptance of these documents, applicants will undergo a medical examination by The Turf Club Doctor. A practical assessment ensues and is evaluated by officials from the Racing Academy and Centre of Education (RACE), the educational body within the Irish horse racing industry. Qualities examined during the practical assessment include balance, body position, whip use, style, hand skills and the ability to maintain control over the horse at different speeds and distances. The final phase of the licencing process involves an interview with the licencing committee who make the ultimate decision on the approval of a jockey licence. Five types of jockey licences can be issued to applicants, namely flat-professional, NH professional, flat-apprentice, NH conditional and qualified rider.

Individuals are entitled to apply for a conditional licence to the Irish National Hunt Steeplechase (INHS) Committee, a sub-committee of The Turf Club, provided that they have not acquired more than sixty victories under the Rules of Racing, which includes flat-racing. Conditionals jockeys are permitted to ride in most steeplechases, hurdle races and INH Flat races and are permitted to claim a weight allowance in respect of the number of victories they have acquired in the majority of races (Table 3), although they are unable to utilise this weight allowance in Listed or Graded races. Additionally, conditional jockeys are not allowed to ride in Beginner or Novice Steeplechases unless they have ridden in a minimum of three Handicap Steeplechases. Conditional jockeys lose their claim upon winning their 60^{th} race win or upon the occasion of their 25^{th} birthday. Subsequent to the loss of their claim, individuals wishing to continue in their careers as a jockey will apply for their professional NH licence, which involves an interview with the INHS Committee (The Turf Club, 2013). Jockeys are permitted to hold both professional flat and professional NH licences simultaneously and these individuals are generally referred to as dual-purpose jockeys.

Table 3: Weight allowance for conditional jockeys

Number of Wins	Claiming Allowance
0-20	7 lbs
21-40	5 lbs
41-60	3 lbs

2.6.4 Research on jockeys

Research in a range of aspects pertaining to jockey performance has been expansive in scope internationally and has placed an emphasis on a spectrum of matters including injuries (Balendra, Turner, & McCrory, 2008; Forero-Rueda et al., 2010; Hitchens et al., 2010; 2011; Tomkinson et al., 2012; Turner et al., 2012; Yim et al., 2007), the use of the whip (McGreevy, Hawson, Salvin & McLean, 2013; McGreevy & Oddie, 2011; McGreevy & Ralston, 2012; McGreevy et al., 2013), gender inequality (Butler, 2013; Roberts & MacLean, 2012), riding style (Maeda et al., 2012; Pfau et al., 2009) and eating habits (Dolan et al., 2012; Dolan et al., 2011; O'Loughlin et al., 2013; Wilson et al., 2012; Warrington et al., 2009). Despite the substantial level of research featuring jockeys, an exceptional dearth of research has concentrated on psychological aspects of racing performance, with the existence of two studies on sport psychology in jockeys to date (Callow & Waters, 2005; Jackman et al., in press), although studies have examined the psychological effects of rapid weight-loss (e.g. Caulfield & Karageorghis, 2008).

2.7 Equine partnerships

Psychological research within equestrian sports is rather scarce and little is known about the harmonisation of human and horse (Hausberger, Roche, Henry & Visser, 2008; Wolframm, 2014). Equestrian sports involve the creation of a shared, cyclical and dynamic communication process, with both horse and human contributing equally to goal orientation (Brandt, 2004). Equine partnerships differ greatly in comparison to traditional partner based sporting pursuits due to the elusive and largely incontrollable demeanour and performance of the horse on any given day (Keaveney, 2008). In a study exploring the relationship between humans and their equine companions, shared flow featured among the five themes concerning the horse-human experience, with physicality and intimacy, partnership, bonding through adversity and spirituality comprising the remaining themes (Keaveney, 2008). In describing flow, participants

referred to a sense of being ‘at one’ with the horse in both a physical and spiritual sense which created a rare and remarkable experience for riders. Thompson and Nesci (2013) suggest that the feeling of ‘being at one’ with the horse produces a unique ontological rush.

In a bid to uncover the onset of this unique experience, the theory of edgework (Lyng, 1990) can be utilised to comprehend the flow experience within horse-rider combinations. Edgework theorises about the motives underlying voluntary engagement in risky behaviours. The purest conceptualisation of edgework concerns the extent to which individuals are prepared to risk death whilst consequently escaping alive (Lyng, 1990). Within a horse racing context, a number of ‘edges’ can be proposed to exist which may contribute to the experiential sensations during a performance. Thompson and Nesci (2013) suggest that the rider experiencing flow traverses the inter-species border and embodies the metaphorical image of the centaur. An integral facet of the edgework theory is that individuals acquire control over a situation which many may perceive to be uncontrollable. In the case of horse racing, this could refer to the propensity of riders to gain control over a flight animal weighing over 500 kilograms and capable of running up to 40 miles-per-hour. In line with the concept of shared flow (Keaveney, 2008), the harmonisation of horse and rider may reflect the paradox of control within flow experiences. Interviewed eventing riders made a comparison between horse riding and skiing as riders must form a de-differentiated attachment with a non-human partner (Thompson & Nesci, 2013). However, in contrast to the material nature of skis, a horse has a mind and temperament of its own that contributes to this dynamical relationship (Maurstad et al., 2013).

2.7.1 Temperament

Equine performance is dependent on both physical abilities and temperament (Visser et al., 2001). Temperament is a term used interchangeably with personality in animal research (Réale, Reader, Sol, McDougall, & Dingemanse, 2007) and refers to the dispositional traits of animals (Gosling, 2001) that are subsequently expressed through their behaviours (Hausberger, Bruderer, Le Scolan, & Pierre, 2004). Breeders and riders generally place greater emphasis on temperament in comparison to structural configuration and gait attributes when searching for a champion horse (Graf, Konig von Borstel & Gauly, 2013). Temperament assessments (Peeters, Verwilghen, Serteyn & Vandenheede, 2012; Lloyd et al., 2007) and ridden behaviour tests (Hall et al.,

2013) can be utilised to objectively assess horses. However, arguments are made that a combination of both behavioural observation and temperament tests are required to create a composite depiction of horse constitution (Konig von Borstel, Pirsich, Gauly, Bruns, 2012), temperament and predicted behaviours (Konig von Borstel, Pasing & Gauly, 2011).

2.7.1.1 Thoroughbred horses

In comparison to the temperamental characteristics of other breeds, thoroughbreds display a higher degree of anxiousness, excitability, sociability and inquisitiveness (Lloyd et al., 2008). An equines resting heart rate ranges from 30-40 beats per minute and peak exercise induces a maximal heart rate in the thoroughbred horse of 225 to 240 beats per minute (DeFilippis, 2006). Although horse racing involves a lower level of task complexity than show-jumping and dressage (McBride & Mills, 2012), over-arousal, as often exhibited by sweating in the parade ring, can adversely impact on racing performance (Hutson & Haskell, 1997). In response to perceptually threatening stimuli in the environment, augmented arousal can instigate evasive behaviour (Bridgeman, Pretty & Terry, 2011; Kathalijne Visser et al., 2008) which is associated with hormonal secretion (Alexander & Irvine, 1998). Whereas cortisol release is associated with show-jumping and dressage horses (Becker-Birck et al., 2013; Cavado et al., 2006; Peetars, Closson, Beckers, & Vandenheede, 2013), catecholamine hormones, comprising epinephrine and non-epinephrine, are more prevalent in racehorses (Jimenez et al., 1998; Mostl & Palme, 2002) and are released in response to exercise (Kurosawa et al., 1998).

The perceptible nature of arousal augmentations in racehorses is associated with the release of epinephrine, which subsequently stimulates a contraction of the equine spleen (Satué, Hernandez, & Munoz, 2012). The equine spleen plays a significant role in the circulatory system during exercise (Kilne & Foreman, 1991) by increasing the number of circulating red blood cells by approximately 50% (Thomas & Fregin, 1981) which subsequently permits a higher maximal oxygen carrying capacity (Kearns, McKeever, John-Alder, Abe, & Brechue, 2002). Therefore, the optimal secretion of epinephrine and adrenal axis functioning (Alexander & Irvine, 1998) ensures that the delivery of energy is more efficient, as indicated by the discussed link between over-arousal and energy wastage. A six-fold increase in catecholamine levels were demonstrated in racehorses subsequent to a race, whereas cortisol levels elevated by

25% (Martinez et al., 1988). In congruence with the assertion that an optimum level of arousal in horses positively influences performance, favourable hormonal secretion in response to brief, novel stimuli, such as the parade ring at a racecourse, can contribute to improved racing performance (Hada, Onaka, Takahashi, Hiraga, & Yagi, 2003).

2.7.2 Kinematics

The composition of the horse-rider partnership and acquisition of dyadic harmony is symbiotically reliant on both horse and rider (Peham, Licka, Schobesberger, & Meschan, 2004) and the ensuing unification elicits performances which transcend the proficiencies of both partners (Evans & Franklin, 2010). An embedded feature associated with the relationship between horse and rider is the paradoxical notion that riders must move with the motion of the horse whilst concurrently attempting to gain control over their equine partner (Lagarde, Peham, Licka & Kelso, 2005). During the performance of horse riding movements, riders move upwards, downwards, forwards and backwards depending on the gait, direction and level of riding skill (Munz, Eckardt, & Witte, 2014). Rather than anticipate the locomotive actions of their equine partner, riders must continually adapt their movements with those of the horse during motion (Wolframm, Bosga, & Meulenbroek, 2013) and consider the biomechanical properties of equine mobility (Greve & Dyson, 2013). In a study evaluating factors affecting speed in thoroughbred horses, Fonseca, Kenny, Hill and Katz (2010) found that the jockey influenced galloping speed, which highlighted the importance of the jockey to racing performance as well the propensity for more experienced and skilful jockeys to elicit more favourable performance responses with negligible interference on the horses balance.

Horse-rider command receptiveness is determined by the quality and type of relationship in existence between both parties (Saslow, 2002). Riders apply force on the horse through the reins, stirrups and saddle (van Beek, de Cocq, Timmerman & Muller, 2012) and utilise aids or cues to transmit commands to the horse through the appliance of pressure through the reins, legs and saddle (Gorecka-Brudza et al., 2013). Possessing the capability to communicate accurately and consistently with the horse is an integral facet of horse riding performance which places importance on the sensitive ‘feel’ between horse and rider (Lagarde et al., 2005). This reflects the fact that horses are highly sensitive animals (Lansade, Pichard & Leconte, 2008) and that harmonious partnerships are characterised by minimal movement, demonstrative of augmented

tactile sensitivity (Konig von Borstel, Euent, Graf, Konig, & Gauly, 2011). Brandt (2004) reported that participants admitted to being hyperaware of their physiological sensations on horseback in comparison to their contact with humans, although this was an unconsciously attuned attentiveness. As riders develop their skills they become progressively more attuned with the sensations of the horse and learn to transmit commands with increasingly subtle aids (Maurstad et al., 2013; Wolframm et al., 2013). This feature is more overtly apparent in the equestrian sport of dressage where horse-rider synchrony is qualified by the performance of various movements in response to seemingly invisible cueing (Peham et al., 2001).

2.7.3 Tactile sensitivity

Notwithstanding the critical mechanical and instructional role employed by the tactile connection between horse and rider, this medium also permits the transmittance of emotional signals (Tenenbaum, Lloyd, Pretty & Hanin, 2002) which are expressed simultaneously by both horse and rider (Bridgeman, Pretty & Terry, 2011). Rider heart rate augmentations in response to threat anticipation subsequently increase the heart rate of the horse (Keeling, Jonare & Lanneborn, 2009; von Borstel, Duncan & Keeling, 2005), which, it could be argued, represents the reciprocal effect of a negative challenge appraisal (Csikszentmihalyi, 1975) and the adverse impact anxiety can have on horse-rider combinations. Novice dressage riders displayed higher levels of uncertainty than their expert counterparts and suggests the potential existence of augmented task orientation capabilities in elite performers (Wolframm, Shearman & Micklewright, 2010). Similarly, a reduction in somatic anxiety in dressage, show-jumping and cross-country riders enhanced performance, culminated in concentration augmentations and increased task orientation (Wolframm & Micklewright, 2008), although an certain heart rate elevations are still associated with elite riders (Von Lewinski et al., 2013).

Horses are capable of differentiating between genuine and stimulated muscular tension, with the latter failing to elicit heart rate alterations despite the expression of similar behaviours (Von Borstel & Konig, 2008), which supports the contention that humans should attend to the emotional rather than behavioural sensations of horses (Hockenhull & Creighton, 2013). Therefore, it is reasonable to suggest that a reciprocal relationship exists at all times between horse and rider whereby the physiological and psychological state of one partner is mirrored in the other partner,

and that optimum relationships are characterised by the simultaneous manifestation of the ideal performance state in both horse and rider. Matching or suitable horse-rider combinations are demonstrated not only by favourable horse behaviours but also by the existence of similar heart rates (Munsters, Visser, van den Broek & van Oldruitenborgh-Oosterbaan, 2012). Subsequently, it could be argued that this objective and observed data detailing symmetry between horse and rider is indicative of edgework (Lyng, 1990) and the harmonisation of horse and rider (Keaveney, 2008). The discernible physiological link evidenced between horse and rider supports the assertion that being 'at one' with a horse does not exclusively concern a physical congruence. Alternatively, it suggests that the realisation of positive emotive and affective responses (Wolframm & Micklewright, 2010b) transcend performance experiences and elicit a unique flow state (Keaveney, 2008; Thompson & Nesci, 2013).

Chapter Three: Methodology

3.1 Purpose of the study

The purpose of this study was to explore the conditions influencing the occurrence of flow in jump jockeys. The horse-human dyad in equine sports differs greatly in comparison to the partnerships involved in traditional (human-human) dyadic pursuits based on the elusive and largely incontrollable demeanour and performance of the horse on any given day (Keaveney, 2008). Little is known about the harmonisation of human and horse (Wolframm, 2014). Horse-riders have reported a sudden unity or synchrony between horse and human during rare, treasured moments whilst horse riding (Maurstad et al., 2013). Thompson and Nesci (2013) suggest that these moments of feeling 'at one' with their equine partner in an inter-species sport may contribute to superior and distinct flow experiences, although the elements that characterise and contribute to these experiences were not investigated. An exploration of this relationship could uncover the constituent parts characterising an optimal relationship between horse and jockey. The purpose of the present study was to explore professional National Hunt jockeys' experiences and perceptions of; (a) characteristics describing the occurrence of flow in National Hunt racing; (b) conditions influencing the occurrence of flow in National Hunt racing; and (c) the connection between conditions influencing the occurrence of flow in horse racing.

3.2 Research questions

Based on the outlined purposes of the study, five research questions were formulated:

1. What elements characterise the experience of flow in horse racing?
2. What conditions facilitate the occurrence of flow in national hunt jockeys?
3. What conditions inhibit the occurrence of flow in national hunt jockeys?
4. What conditions disrupt the occurrence of flow in national hunt jockeys?
5. What connections are purported to exist between the conditions and characteristics of flow in national hunt jockeys?

3.3 Research design

A qualitative approach was utilised to explore the experience of flow in jump jockeys. Qualitative research encourages conceptual understanding of social experiences (Ritchie & Ormston, 2014) in order to explore the actions and experiences of people in their lives (Sparkes & Smith, 2013). In recognition of the inherently subjective nature of flow, Kimieick and Stein (1992) question the appropriateness of utilising objective, quantitative measures. Additionally, the richness of data pertaining to these optimal

experiences could also be compromised and lost through efforts to quantify the experience. Similar to previous research on flow in elite sport (Chavez, 2008; Jackson, 1992; 1995; Sugiyama & Inomata, 2005), a semi-structured interview was employed to develop an understanding of flow by recalling as accurately as possible the circumstances associated with the occurrence of the phenomenon within the situation in which it took place. Semi-structured interviews involve a certain amount of pre-determined questions whilst also permitting the researcher with the flexibility to probe new areas for inquiry if they spontaneously emerge during the course of an interview (Banister et al., 2011).

3.4 Participants

A sample of 10 male professional jump jockeys participated in the study. The gender bias was attributed to the fact that there are currently no female professional licence holders in Ireland or England and reflects the fact that female jockeys are rare worldwide, despite the fact that horse racing is one of the few sporting arenas where men and women compete equally (Grimes & Ray, 1995). The mean age of the sample was 28.1 years, ranging from 20 to 38 (*SD* ± 5.21). All participants held professional National Hunt licences and had ridden in the 2014-2015 season. The mean career length was 11.6 years (*SD* ± 5.06 years). All participants had ridden at Graded level; five jockeys had ridden at Grade One level; seven jockeys had ridden at Grade Two level; and nine jockeys had ridden at Grade Three level.

3.5 Concepts

In accordance with the research questions, five concepts for inquiry were formed to direct the formulation of the interview guide (Figure 3).

1. *Characteristics of flow:* factors that characterise and describe the flow state.
2. *Conditions facilitating flow*: factors contributing to the state of flow.
3. *Conditions inhibiting flow*: factors preventing the state of flow.
4. *Conditions disrupting flow*: factors that trigger a cessation of a flow experience.
5. *Connections between the facilitative conditions and the characteristics of flow*: links between and within the facilitative conditions and characteristics of flow.

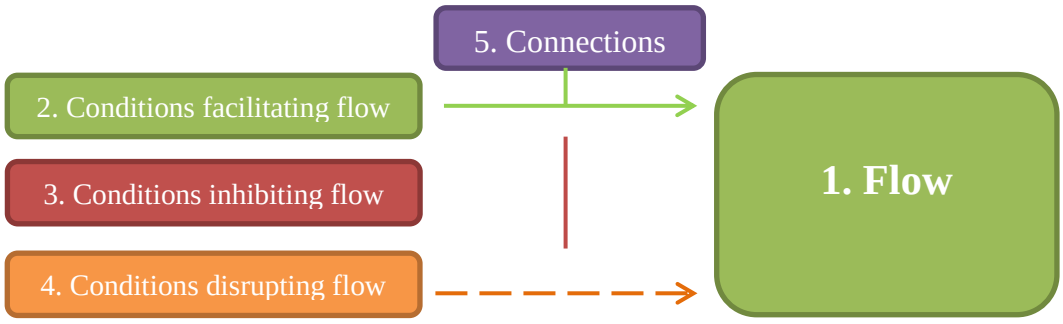

Figure 3: Research concepts

3.6 Interview guide

A semi-structured interview guide was developed (Appendix A) to facilitate the interview process. Although a certain degree of structure was apparent, question sequencing varied depending on the direction of participant responses, which maintained the natural flow of conversation. Each semi-structured interview comprised five distinct sections: (a) background and career history, (b) description of flow, (c) flow facilitation, (d) flow inhibition and (e) flow disruption. Prior to commencing the interview, the researcher explained the topic of flow and the rationale and purpose for study. In order to establish a rapport with the interviewee, the early phase of the interviewed featured fundamental questions about their career and horse racing background. Although the topic of flow was discussed prior to commencing the interview, participants initially described what they believed flow to be in horse racing. The interviewer progressed towards the facilitation of flow upon satisfaction with the participants understanding of the concept. In relation to the inhibition of flow, participants were asked to discuss factors that prevented the occurrence of flow. In the final interview section, participants were asked to think about a performance in which they experienced the flow state, identify the point at which this state stopped and describe the elements which contributed to this cessation. Supplementary to the broad interview sections, participants were asked specific questions in relation to their experiences of flow. Probe (e.g. Can you describe a performance which was optimal and extremely enjoyable?) and elaboration questions (e.g. can you elaborate on that?) were posed to jockeys under the broad interview sections. Pilot interviews were conducted with two conditional jockeys, which allowed the researcher to establish familiarity with NH racing, clarified terminology and ensured that all questions and explanations were understandable.

3.7 Procedures

A non-probability convenience sampling method was used to recruit individual participants. Following approval from the Institute Ethics Committee, information letters (Appendix B) were sent to individuals who held and utilised their jockeys licence in 2014. Recipients were then informed that their contact details were acquired through The Turf Club website and that they would be contacted by phone. The researcher discussed the requirements for the project and an interview time was arranged at a location and time for interested participants. Prior to commencing the interview, jockeys were given the opportunity to ask further questions prior to signing a consent form (Appendix C) and commencing the interview. All interviews were digitally recorded and transcribed verbatim in preparation for data analysis.

3.8 Data analysis

Thematic analysis

The data analysis process was undertaken in accordance with the seven-step framework provided by Colaizzi (1978) and followed a similar method to that employed in previous research on flow in sport (Jackson, 1995; Partington et al., 2009; Russell, 2001) to answer the first four research questions. Initially, the researcher immersed themselves in the content by reading and re-reading each individual transcript. Subsequently, pertinent themes which emerged were extracted to form raw-data themes. Three-by-five index cards were used to facilitate this process, with the phrases or paraphrases obtained from the transcription featuring on one side of the card, and the relevant raw-data theme code written on the opposite side. At this point, raw-data-themes were read by two independent individuals who were familiar with qualitative data analysis. The objective of this was to improve reliability and ensure that accurate raw-data themes were apportioned to each code. Agreement was reached on 99.3% of raw-data themes and 100% agreement was attained through discussion between the researcher and the reviewers.

Subsequently, an inductive content analysis of raw-data themes was undertaken which involved the merging of similar raw-data themes into higher-order themes. A higher-order theme was written on the front of one index card, and raw-data theme index cards pertinent to that higher-order theme were stapled to the higher-order index card. Subsequently, a further inductive content analysis of higher-order themes was undertaken to create categories that represented the highest level of thematic

integration. All raw-data themes, higher-order themes and general dimensions were subsequently depicted in a three-column table representing the research concepts and were validated by an independent reviewer. A final check was then undertaken which assessed the suitability of labels apportioned to higher-order and general dimensions and the reliability of the inductive content analyses. A unanimous consensus was reached on 97.4% of the inductively analysed themes and discussion between the researcher and the reviewer resulted in 100% agreement.

Connecting analysis

A further connecting analysis (Maxwell, 2012) was then carried out on the data to search for links between the characteristics of flow and conditions influencing flow. Connecting analysis focuses on the mechanisms which trigger a phenomena and this approach allowed the researcher to create a more composite conceptualisation of flow in horse racing. The connecting analysis followed procedures outlined by Maxwell (2012). Initially, the researcher searched for quotes within the transcriptions which described the ways in which general dimensions influenced one another. This was undertaken separately to the inductive content analysis. Emphasis was placed on the clarity and richness of the description between themes rather than on the number of participants that discussed the links. This decision was taken based on the assertion that more represented quotations do not necessarily infer the importance of a link (Braun & Clarke, 2006) and that enhancing the clarity of the link was more important than quantifying the importance of a factor in order to maximise trustworthiness. Repetitively moving between thematic and connecting analysis augmented the level of sensitivity that the researcher had with the context underlying each theme and permitted a greater level of contextual understanding in relation to the mechanisms connecting each of the factors.

3.9 Ethical considerations

The main ethical consideration for this study was the recruitment and protection of professional athletes. Approval for conducting this research was sought and granted by the Institute Ethics Committee. A database of Irish jockeys was provided by The Turf Club. Participants had the right to participate and could withdraw at any stage, without question. Participants who agreed to take part in this study were asked to sign a consent form (Appendix C) permitting the audio recording of the interview. Audio recordings and interview transcriptions were saved on a password protected computer

file. Given the high profile nature of these athletes, confidentiality and anonymity was imperative in this study. At no stage were subjects referred to by name, whilst demographic descriptions relating to personal characteristics which could potentially reveal the subjects were excluded. In order to maintain complete anonymity, potential revelatory details mentioned during the interviews, such as the names of individuals or horses, were omitted from the thematic analysis and replaced with a pseudonym.

Chapter Four: Results

4.1 Introduction

This chapter is divided into five sections comprising: a) characteristics of flow and connecting analysis; b) flow facilitation; c) connecting analysis between the conditions facilitating flow; d) flow inhibition; and e) flow disruption. Each of the conditions and characteristics of flow are outlined and quotes representative of the emerging themes utilised to allow the voice of the participants to be conveyed (Creswell, 2007). In order to maximise the level of synergy between the content and connecting analyses, the description of the characteristics of flow and the pertinent connecting analysis will be combined. As well as attempting to illuminate the conditions influencing the occurrence of flow in jump jockeys, the study also sought to ascertain a description of flow within the sport and extrapolate connections between the conditions and characteristics of flow in jockeys. Within the tables, the full list of general dimensions and higher-order themes is outlined and the figure in parenthesis outlines the number of jockeys citing each general dimension and higher-theme. Example raw-data themes are included within the tables and a complete breakdown of the raw-data themes is available in the appendices.

4.2 Characteristics of flow and connecting analysis

A total of 10 characteristics describing flow in jump jockeys emerged, accounting for 38 higher-order themes and 149 raw-data themes (Table 4; Appendix D). The flow state was characterised by confidence, automaticity, enhanced performance, a sense of control, an optimal interaction with the horse, intrinsic rewards, kinaesthetic alterations, concentration, altered cognitive perceptions and the suppression of negative thoughts.

Table 4: Inductive thematic analysis of the characteristics describing experiences of flow in jump jockeys

General dimension	Higher-order theme	Example raw-data theme
Confidence (10)	Feeling of confidence	You have an air of confidence about you
	Performing confidently	Supreme confidence in myself
		Your confidence is up
	Feeling positive	You ride with confidence
		Have a positive edge
		You are a bit more positive.
Automaticity (10)	Effortlessness	Things are happening easier
	Performing instinctively	You are able to make decisions quickly
		You don't have to think
	Automaticity	Doing things without even realising
	Things happen naturally	It's just automatic
		Things just happen a lot more naturally
		Everything happens naturally
Enhanced performance (10)	Everything is well	Everything is going perfect
	Performance unfolds favourably	Being in the right place at the right time
	Everything coming together	Everything just happened as it should
		It just clicks
Optimal interaction with the horse (10)	Confident	Confident partnership
		Exchange of confidence
	Relaxed	Relaxed
	Jumping in sync	Jumping together
	Galloping harmony	Balanced partnership
		In rhythm together
	Enhancement in tactile sensitivity	Minimal cueing generates response
		Soft contact on reins
	Merging as one	At one with the horse
Intrinsic rewards (10)	Enjoyment	It's more enjoyable
	Fun	It's so much fun
	Unforgettable experience	Unforgettable experience
	Enhanced future motivation	Just want to keep winning
Kinaesthetic alterations (10)	Heightening of senses	Heightens your senses
	Feeling of alertness	Makes you more alert/awake
	Relaxed	Feeling relaxed
	Feeling of lightness	Weight lifted
	Altered kinaesthetic perceptions	Distinct 'feel' from interaction with the horse
Concentration (8)	Concentration	Total concentration
		Get in the zone
	Relaxed in your mind	Totally relaxed in your mind
		Not-over thinking

(Continued)

Table 4 ***(continued)***

General dimension	Higher-order theme	Example raw-data theme
Altered cognitive perceptions (7)	Loss of memory	Can't remember anything
	Reduction in conscious processing	Mind-blank
	Heightened awareness	You just aren't aware of it until it's over
	Altered sense of being	More aware than normal of environment
	Time slows down	I was in a bit of a trance really
		You just kind of escape from it all
		Time slows down
Sense of control (6)	Sense of control over performance	Know you are going to win
		Know it was going to happen
	Sense of control in horse-jockey dyad	Sense of control in relationship
Suppression of negative thoughts (6)	Suppression of pressure	Feel under no pressure
	Suppression of worry	Don't question anything
	Suppression of negative thoughts	You don't look at any negatives

Figure 4 illustrates the conditions and characteristics of flow and the links that emerged within the collected data. Arrows are directed *away* from the influencing condition of characteristic and *towards* the influenced characteristic. Arrows matching the colour of a characteristic or condition illustrate the characteristics influenced by this condition or characteristic. As 12 facilitative conditions of flow and 10 characteristics of flow emerged within the inductive content analyses, searches were made within the data to find links between a total of 22 themes, which yielded 21 connections. Four conditions of flow were found to directly influence the characteristics of the flow state, though three of these conditions (confidence, arousal and the characteristics, demeanour and performance of the horse) were linked through the relationship between horse and jockey. As this section was solely concerned with direct connections on the state of flow, the connections between the conditions influencing the occurrence of flow are presented at a later point. A full version of the connecting analysis is available in Appendix E. Each ***characteristic of flow*** is described and the *higher-order themes* outlined. The links emanting from the connecting analysis will be outlined and quotes substantiating the link between the **influencing condition or characteristic** and the ***characteristics*** included.

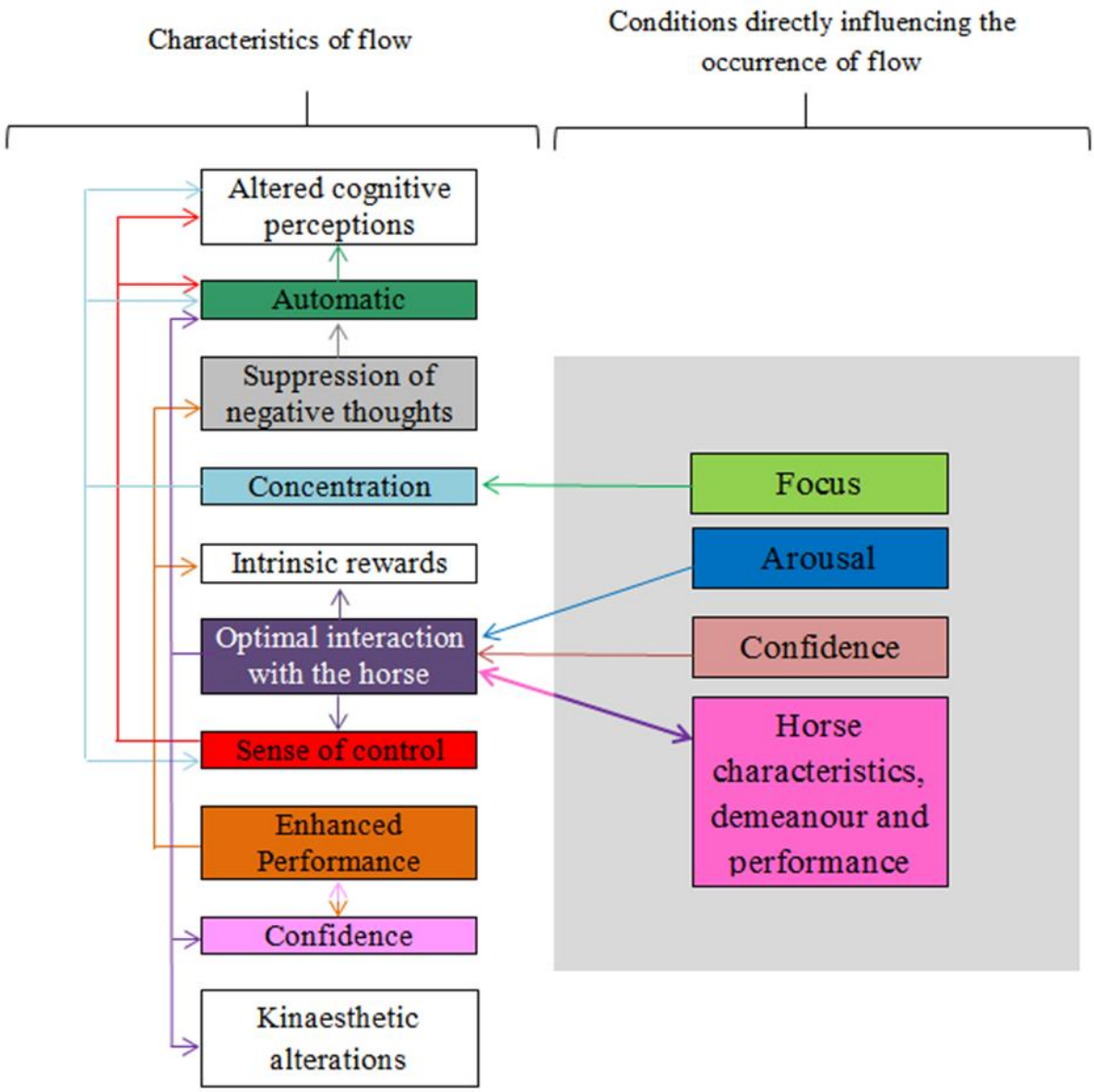

Figure 4: Connections between conditions and characteristics of flow in jump jockeys

Optimal interaction with the horse. A favourable relationship between horse and jockey was indicative of flow for all jockeys. *Merging as one* and an *enhancement in tactile sensitivity* characterised the elusive synchrony of horse and jockey during flow experiences and participants typically reflected the fact that "you and the horse are one" (Jockey 5). In describing the sensation of partnering a **superior horse**, Jockey 2 delineated that "there is very little interaction with the horse…everything just comes so easily to them; you only have to make very gentle touches and they'll automatically

give you every reaction that you want." *Jumping in synchrony* was symptomatic of the jockey partnering with a superior horse that elicited a unique feeling and the sense that "you can enjoy it when you are on a good enough horse and he's jumping" (Jockey 10):

> A horse running right for you, a horse running well…just the minute you get up on the horse you are in the groove then straight away and you have to go with the horse after that. You are just in rhythm with them the whole way through and when you are just coming into a hurdle, they have the class and they just jump it better than most…it just happens easier. (Jockey 5)

Galloping harmony entailed the galloping synchrony of horse and rider. A horse possessing a superior level of balance had a subsequent effect on the equilibrium of the rider and enhanced the capacity to maximise their synergy during the race:

> If the horse is perfectly balanced, they are in control of everything in that moment; so you are sitting on it and having to do very little work really, if the horse is balanced in itself; it's very easy to look stylish and look neat and tidy on top of it…and you have a nice contact on the reins. (Jockey 2)

A reciprocal relationship was reported to exist between horse and jockey and was characterised by a favourable congruence between the **confidence** and **optimal arousal** levels of the jockey and the **characteristics, demeanour and performance of the horse**. A *confident* and *relaxed* relationship incorporated the exchange of positive sensations within the horse-rider dyad. Jockey 1 detailed how the transmission of a "positive vibe" can be interpreted by the horse such that "when you are more relaxed, the horse is more relaxed and trusts in you more" (Jockey 6) which means "they have nothing to worry about" (Jockey 2). The propensity for confidence to be transmitted subsequently from the jockey to the horse as a result of flow was also discussed:

> You have more confidence in yourself and I think you can ride better after that… And is if you have confidence in yourself it seems to come out in your riding and in the horse as well. (Jockey 6)

Confidence. Flow was described by all participants as being a period of augmented confidence and typically referred to a *feeling of confidence, performing confidently* and *feeling positive.* Jockeys spoke at length about the impact of riding winners and

acknowledged that periods of flow were initiated by and synonymous with successful spells during their careers:

> There was a brief time when I was riding absolutely loads of winners… but I knew it (flow) was going on more than everyone else knew that it was going on. It was probably a bit of rubbish really. If I was going out to ride a horse in a race I'd probably ride it as well now as I would have done then. But I would think I was definitely more confident…that comes from riding winners, getting winners every day (Jockey 2).

Jockey 8 commented on a discernible difference in his riding during these periods:

> I definitely ride better. I don't know whether people can pick up on it when they are watching but I know I can certainly feel it when I'm riding with confidence than when I'm not riding with confidence and it definitely affects me anyway.

A reciprocal feeling of confidence when partnering a superior horse was also recognised as an important factor characterising an **optimal interaction with the horse** and the confidence levels of the jockey, as articulated by Jockey 9:

> It's just so much easier to ride a good horse. You don't have to (pause)…nothing is an effort. You don't have to try and do anything, everything you ask the horse to do it will do it for you and you automatically gain confidence from that and from sitting on a better horse, from him giving you more confidence you'll will give him confidence as well and it just makes everything easier… the horse has the same mentality really and they run better for it. Maybe that's in my head but I think horses run better for me when I'm confident.

Concentration. *Concentration* and being *relaxed in your mind* emerged as themes which embodied the level of concentration associated with flow for four-fifths of the interviewed jockeys. A variety of phrases were used to describe concentration and included "one-track mind" (Jockey 6) and "tunnel vision" (Jockey 4). Although flow was viewed as being a state of complete concentration, jockeys also alluded to being *relaxed in their mind*: "you are completely relaxed in your mind…you are just so switched off and relaxed" (Jockey 9). The intense levels of concentration experienced during flow involved an absence of reflection and an absolute focus on the present such that "you don't look at anything, you just carry on, keep doing what you are doing" (Jockey 10). This state was viewed as being the product of the attainment of **optimal focus** and was associated with the symbolic moment of mounting the horse:

"you are totally focussed on what you have to do…once you are on that horse that is all you are thinking about, you aren't thinking about anything else" (Jockey 1).

Enhanced performance. Flow was associated with periods during which all participants felt that their performances were better than usual. A belief that *everything is going well* and that a *performance unfolds favourably* were prevailing features of flow during individual races, as Jockey 7 outlined from his experience: "everything just happened and I was in the right place at the right time, the whole way through the race; But I can't really explain what it was…everything just happened as it should have done." *Riding winners* was also mentioned as a characteristic of flow which both catalysed and sustained general periods of flow: "during that period I got on a few winners and got on a roll and I suppose it's like, for want of a better word, it just snowballs" (Jockey 9). Participants also stated that *everything coming together* epitomised the state of flow: "When everything is going perfect, that would have to be tactically, physically, mentally, everything clicking together" (Jockey 2). A reciprocal relationship was exhibited with **confidence** and centred on the assertion that "jockeys need confidence because the more confidence you have the better you ride" (Jockey 9):

> When things are going your way just those little split second decisions seem to either go your way or you make the right call it's one or the other probably but when things are going the right way you make the right call. When things are going are going well, those split decisions seem to go your way…and that's probably because of your confidence that you're are making the right call rather than the wrong one; they are split-second decisions and you have no time to make them, but when things are going your way they seem to go your way. (Jockey 8)

Automaticity. A sense of *automaticity* during performances was a feature of the flow experience for all jockeys. Participants reported a sense of *effortlessness* during flow and a belief that *everything happens naturally*. Closely linked to the notion of *acting instinctively*, a perceived reduction in decision-making effort was evidenced during periods of flow:

> You don't have to try and do anything. You go out with your idea of what you want do and it just flows. You are just doing everything off instinct. And it just comes natural, everything you think about doing, you do. (Jockey 9)

Allied with this sense of instinctiveness, *automaticity* was also referred to by phrases such as: "you are almost in autopilot really" (Jockey 6) and "you are doing things without even realising them" (Jockey 7). Performance automaticity was associated with **concentration** and allowing performances to unfold instinctively: "Sometimes you aren't trying as hard…not trying as hard to make it happen; you just let it happen more naturally" (Jockey 3). Automaticity was also associated with the **suppression of negative thoughts** as Jockey 7 outlined: "it makes a big difference when you riding without any pressure, things just happen a lot smoother and you aren't forcing things too much." Partnering good horses permitted a **sense of control** and an **optimal interaction with the horse** that allowed participants to perform automatically: "you have such a good relationship with it that you nearly know what's going to happen before it happens" (Jockey 2):

> You are just so in rhythm with the horse that without even trying the horse is listening to you. You don't have to force anything or make any drastic moves; nothing is difficult… it just happens, it just flows. (Jockey 9)

Sense of control. A perceptible feeling of control was referred to as a characteristic of the state of flow by six jockeys and encompassed a *sense of control in the horse-jockey dyad* and a *sense of control over the performance.* It should be noted that rather than having control *over* the horse per se, jockeys referred to the sense of control *in* their relationship with the horse and that control *characterised* the optimal interaction between horse and jockey. Partnering a superior horse indirectly affected the sense of control jockeys had during flow experiences through the **optimal interaction with the horse**. The feeling of balance between horse and rider contributed to an enhanced sense of control in the horse-jockey dyad which subsequently heightened perceived performance control: "if everything is in a balanced situation, it's going to feel nicer, it feels better and you are going to feel more in control" (Jockey 2). Additionally, superior horses also enriched the *sense of control over performance* and permitted an optimal level of **concentration** as "you are always where you want to be on them because it doesn't matter where you want to go…the horse will take you there; so nothing is really a problem then" (Jockey 9). Feeling this *sense of control over performance* also stemmed from **confidence**.

> You just have full belief in yourself and in your horse and you don't actually have to worry about anything else and you just go out knowing you are going to win, without being cocky about it, you just know. You are just so fully sure that it's going to happen that you just don't worry about anything else. (Jockey 9)

Intrinsic rewards. This category was reported by all participants and was associated with the internal rewards during flow experiences and the intrinsic feelings associated with the consequences of flow. The sense of *enjoyment* and *fun* that was associated with flow permitted the highest level of enjoyment in the professional career of Jockey 9:

> It's just so much fun throughout the race. I can go around with a smile on my face the whole time when it happens. And you get to enjoy the game and the sport so much more when things are going well like that… you just get to see all the good sides of it.

Such *unforgettable experiences* had a subsequent effect on jockeys for a period of time: "I was on a high for a couple of weeks after" (Jockey 7). This feeling served to *enhance future motivation* and bolstered the assertion that "you just want to get back into it again…fuel the fire sort of way" (Jockey 6). A superior horse created a heightened sense of enjoyment because "you are able to go wherever you want and it makes life a lot easier…and it's definitely more enjoyable too" (Jockey 5). Riding good horses also enhanced the **relationship between horse and jockey** and enhanced the feeling of jumping in particular, as described by Jockey 10:

> You can enjoy it when you are on a good enough horse and he's jumping because he is good enough and you know everything happens just so much easier. So you are kind of going around and in a way you are enjoying the spin.

Altered kinaesthetic perceptions. This category encompassed themes associated with physiological alterations during performances and was described as an element of the flow state by nine participants. A *feeling of lightness* characterised the state of flow for some participants, as Jockey 6 suggested: "it's like a weight is lifted and you have clear air and a clear mind." Other themes included a *heightening of the senses*, *a feeling of alertness* and *altered kinaesthetic perceptions.* Partnering a superior horse and attaining an **optimal interaction with the horse** contributed to a differentiated

kinaesthetic 'feel' which was indicative of flow: "It's very hard to describe really (pause)…just the feel they give you, the way they move to the start, the way they carry you" (Jockey 9). However, it was also acknowledged that this kinaesthetic feeling was rare.

> It's very rare that you'd be on a horse that nice…You probably feel like you are performing better than you are. You can almost feel that he is carrying you and you feel so much better (Jockey 2).

Altered cognitive perceptions. Seven participants stated that the experience of flow was juxtaposed by a perceptual change in their cognitive perceptions. Themes included *a loss of memory,* a *reduction in conscious processing* and a perception that *time slows down* such that "everything just seems to happen slower" (Jockey 2). Several jockeys also stated a heightening of their awareness and being "more aware than on a normal day" (Jockey 7):

> I think you can feel it in most races but you probably have a more of a sense of awareness in the big races, everything is a bit heightened…Let's say you're in Cheltenham and there are 50,000 people there and there is a big atmosphere, it probably makes you more aware on those days. (Jockey 2)

Some performances were also described as being to akin to "being in a trance" (Jockey 7) which was indicative of an *altered sense of being* and derived from a **sense of control** emanating from the **optimal interaction between horse and jockey***:*

> You nearly see everything else going on because you are just not thinking about what you and your horse are doing because everything has just clicked. It's not so much of an outer body experience but you just kind of escape from it all. (Jockey 9)

Optimal **concentration** and **automaticity** did share links with the perceived *reduction in conscious processing* and *distortion of time*:

> So when things are going your way, you are a little bit more relaxed and probably maybe mentally things are happening a little bit slower in your mind than when you are more tense and there is more pressure you are trying to make things happen quicker. When you are relaxed possibly and things are going your way you probably think that things are happening a little bit slower. (Jockey 8)

This perception of mental relaxation was also derived from the level of calmness exhibited by the horse and the optimal interaction between horse and jockey which created a **sense of control**:

> At the time when it's going perfectly, the horse will be calm, and will want to go the same pace as everyone else. Everything seems to slow down in your own mind as a result. (Jockey 8)

Suppression of negative thoughts. Six jockeys expressed that a perceptual suppression of negative thoughts was a feature of the flow state and accounted for themes such as a *suppression of worry* and *suppression of negative thoughts*. During periods of flow, participants stated that "you don't worry or question anything" (Jockey 9) and "you don't look at any negatives… you just think about the positives" (Jockey 10). Flow was described as being a state devoid of pressure, as Jockey 6 outlined: "you just feel totally as though you are under no pressure." Periods of flow were associated with **enhanced performance** and were synonymous with a shift away from negativity, as outlined by Jockey 3: "I was riding plenty of winners…you feel like you can do nothing wrong."

4.3 Conditions facilitating the occurrence of flow

Professional jump jockeys identified 12 factors that positively influenced the occurrence of flow. In sum, 116 facilitative raw-data themes emerged from the ten transcriptions which were collated and summarised to form 42 higher-order themes. Further merging of the higher-order themes within the second inductive content analysis led to the creation of 12 facilitative factors. Table 5 presents a hierarchal depiction of the number of jockeys that cited raw-data themes within each general dimension.

Table 5: General dimension percentages for conditions facilitating the occurrence of flow in jump jockeys

General dimension	Percentage of participants citing
Favourable horse demeanour, characteristics and performance	100% (N=10)
Confidence	100% (N=10)
High-quality performance	100% (N=10)
Focus	80% (N=8)
Optimal situational conditions	80% (N=8)
Preparation	70% (N=7)
Optimal motivation	70% (N=7)
Optimal arousal	70% (N=7)
Psychological strategies	50% (N=5)
Experience	50% (N=5)
Optimal environmental conditions	50% (N=5)
Physical and mental well-being	30% (N=3)

An illustration of the emerging categories, higher-order themes and example raw-data themes is contained within Table 6. A full breakdown of facilitative raw-data themes is contained in Appendix F.

Table 6: Inductive analysis of conditions facilitating the occurrence of flow in jump jockeys

General dimensions	Higher-order theme	Example raw-data theme
Favourable horse characteristics, demeanour and performance (10)	Greater ability (7)	Better horse More ability
	Good jumper (6)	Set themselves up to jump Better jumper
	Galloping ease (6)	Travel (gallop) easier In rhythm
	Confident (5)	Gains confidence Confident horse
	Horse performing well (5)	Horse travelling within itself Jumping well
	Balanced (3)	Good balance On an even keel
	Relaxed (3)	Calm Composed
	Determined (2)	Tries hard Horse feels "up for it"
Confidence (10)	Having confidence (6)	Feeling confident Belief in yourself
	Believe you can win (6)	Belief that you can win
	Confidence in horse (6)	Belief in the horse
High quality performance (10)	Winning races (8)	Riding winners Winning races
	Race going well (6)	Everything is going right
	Riding well (4)	Riding well Horses running well for you
	Start well (4)	You feel it from early on You are where you want to be
Optimal situational conditions (8)	Riding good horses (7)	Riding good horses Good opportunities
	Demanding schedule (1)	Busy schedule
	Positive relationship with trainer/owner (2)	Confidence in jockey Right amount of instruction
Focus (8)	Relinquish control (6)	Let it happen more naturally Just let it happen
	Instantaneous concentration (6)	Concentration upon mounting Tunnel vision
Race preparation (7)	Tactical preparation (6)	Study the form Having a plan
	Knowledge of the horse (5)	Knowledge of horse's capabilities Rapport developed with horse
	Pre-performance routine (4)	Worked and schooled horse Using pre-performance routine

(Continued)

Table 6 ***(continued)***

General dimensions	Higher-order theme	Example raw-data theme
High motivation (7)	Important races (5)	Important festivals
		Big races
	Clear goals (4)	Try to do your best
		Aim to enjoy it
		Desire to win
	High motivation (2)	Looking forward to it
	Demanding situation (4)	Horse is an outsider
		Pressure situations
		Big races
Arousal (7)	Relaxed (6)	Completely relaxed
		Calm
	Positive energy (4)	Excitement
		Positive vibe
Psychological strategies (5)	Coping with pressure (4)	Staying level-headed
		Coping with the pressure
		Keeping a lid on emotions
	Mental imagery (1)	Visualise the race
	Mindfulness (3)	Staying in the present
		Re-focus on present
Experience (5)	Developed as a rider (3)	Developed decision making
		Developed technical proficiency
	Having experience (3)	Having experience
	Horsemanship (3)	Horsemanship
		Confident around horses
Environmental conditions (5)	Positive atmosphere (5)	Good atmosphere at the track
		Good atmosphere in the weigh-room
	Optimal ground (1)	Horse gets its preferred ground
	Comfortable amongst peers (1)	Comfortable amongst peers
Physical and mental well-being (3)	Content in riding weight (1)	Content in riding weight
	Physical readiness (3)	Optimising training regime
		Feeling fit
		Warming up
	Hydrated	Hydrated
	Feeling good (2)	Mentally well
		Feeling well in yourself

(Continued)

Favourable horse characteristics, demeanour and performance. All participants reported that having a capable equine partner was a key determinant of flow in jump racing. This was reflected across eight higher-order themes: *greater ability (70%), good jumper (60%), galloping ease (60%), confident (50%), horse performing well*

(50%), balanced (30%), relaxed (30%) and *determined (20%)*. The attainment of flow in horse racing was described as being highly contingent on the horse and typically referred to phrases such as "90% of the time it's dependant on the horse in terms of how you get on" (Jockey 3); and "as a jockey we can't actually do an awful lot…a lot of the time you just have to be on the right horse as well" (Jockey 7). Jockeys specified the importance of a number of qualities which included both the general quality of the horse and the performance of the horse on race-day. Partnering horses with *greater ability* facilitated flow as "good horses will just do a little bit more for you because they will travel through a race better and they just have much more ability" (Jockey 8). Jockeys described a discernible difference in partnering good horses and discussed the impact on flow:

> To be honest it's only when you sit on a nice one that you realise how average most horses are. It's not until you sit on a really good horse, and the buzz you get off that is completely different to just riding horses in run of the mill races. (Jockey 9)

A *horse performing well* also impacted positively on flow during races and was reflected by statements such as "you can sometimes feel it when a horse is going forward, maybe they jump a hurdle very well and they are nearly heartbroken when you pull them in again" (Jockey 5). Jockey 1 described the differentiated kinaesthetic feeling associated with realising that a horse was a *good jumper* and possessed the quality to jump with great ease:

> In racing, and especially in jump racing, you definitely feel it, they just jump brilliantly…there are some horses, they just do it very easily; they can pick a stride, and set themselves up very well.

Being *balanced* concerned the capacity of the horse to possess exceptional levels of equilibrium in their galloping and jumping actions. Jockey 2 compared this quality with a runner to illustrate the visual signs of a balanced horse, as well as indicating the *relaxation* and *galloping ease* of such horses.

> A good horse running is really the same as a nice runner, they are very controlled, their body is perfectly balanced and they are perfectly composed, and they always seem relaxed and as though they are running within themselves…it's a massive saver of energy when they are able to control their own balance.

Participants also commented on the temperament of their horse and the belief that "horses are very intelligent creatures" (Jockey 9) and "every horse has their own characteristics…they all have minds of their own" (Jockey 6). Recognition was given to the influence of distinct psychological capacities and participants established a preference for riding *confident* and *determined* horses. An interpretation of these assets in the horse was described as a kinaesthetic feeling upon mounting and was reflected by phrases such as "you know they are fresh and well in themselves" (Jockey 5) and "you might think - this horse is up for it" (Jockey 4). Participants also spoke about the fact that "you need a horse that tries for you" (Jockey 7) and these admirable qualities were emphasised by Jockey 3:

> You could have one with all the ability in the world but it doesn't try very hard for you. And then you can have the opposite where you have one with not much ability but it will die for you.

High quality performance. Appraising a race or a period of races in a positive manner contributed to the occurrence of flow for all jockeys and was accounted for by four higher-order themes: *winning races (80%), race going well (60%), riding well (40%)* and *starting well (40%)*. A *race going well* was synonymous with flow in jockeys, as described by Jockey 2:

> I remember going by the winning post with a circuit to go thinking that this couldn't possibly be going any better. I wouldn't change the position of any horse for my own position or the speed or anything, and it just couldn't possibly have been going any better.

Riding winners created a positive momentum that was conducive to flow as Jockey 9 described: "I got on a few winners and got on a roll and I suppose it's like, for want of a better word, it just snowballs and things just get easier very quickly." During these successful periods of their careers, jockeys acknowledged the simultaneous click of numerous general dimensions contributed to a jockey *riding well*. Frequenting the winner's enclosure more regularly meant that "you are riding with confidence so things probably just happen and you ride a bit better" (Jockey 8). *Starting well* also led to the initiation of the flow state early in the race and the importance of settling early in a race was outlined by a Grade-One winning jockey:

> Let's say you start off in a race and you are going into it feeling well in yourself you will be feeling quite happy, and you get off in a nice position,

> you have room for yourself and you are where you want to be tactically, you're quite happy…if you're in a nice position, everything is going right, you probably feel it (flow) from very early on, going along thinking 'this is lovely'. It is probably a day where everything is going right, you will know that very early in a race. (Jockey 1)

Confidence. Confidence was integral to the occurrence of flow for all jockeys and themes pertaining to confidence included: *having confidence (60%), confidence in the horse (60%)* and *believing you can win (60%).* Statements testifying to the importance of *having confidence* included "confidence is huge in this game" (Jockey 1) and "confidence is key" (Jockey 10). An inherent feature of confidence was the notion of *believing in the horse,* as summed up by Jockey 9:

> Most of it is knowing that you are on the best horse. You know as long as you are on the best horse and you know you are riding winners, your confidence in yourself is up, you do not doubt yourself in any way.

This jockey also elaborated on the sense of confidence derived from *believing you can win* by adding that: 'when you get up on a horse (prior to flow)...you are literally just convinced that it's going to happen; you are going to win" (Jockey 9).

Optimal situational conditions. Themes within this dimension encompassed the various aspects of a jockey's professional career and the different antecedents that impacted on the occurrence of flow. Representing the views of four-fifths of participants, three higher-order themes were formed: *riding good horses (70%), positive relationship with trainer/owner (20%)* and *demanding schedule (10%).* Jockeys are dependent on getting booked to ride horses at race meetings by trainers and owners and being in the position of *riding good horses* was mentioned by the majority of jockeys. In reflecting on a period of flow during his career, Jockey 2 acknowledged that "that was a time when I felt things were going brilliantly and that was also a time that I was riding good horses as well." A similar theme was echoed by Jockey 9 who stated that the experience of flow resulted from the increased opportunities afforded to him when he was periodically promoted to the number one jockey in the yard:

> It was about two or three years ago, the number one jockey got injured and I started getting a lot more rides, a lot more opportunities. And we just happened to have a nice bunch of horses at the time.

The potential impact of the trainers and the owners was evident and impacted positively on some jockeys as "trainers, owners and people around you try to give you confidence as well which is a big help" (Jockey 7). Jockey 8 acknowledged the impact of the *demanding schedule* imposed on jockeys in comparison to other athletes and the effect that it has on his thinking:

> Racing is different to any other sport I think as jockeys… because footballers or anything else, they prepare for one day. Whereas, we are racing seven days a week. Normally, we race today and race tomorrow. So you are almost planning the night before for the races tomorrow. So even from the night before, you are already looking into your race tomorrow, looking into how the competitors are going on, tactics say, what they are going to do and so you are almost in the zone the night before…so in comparison to other sports we differ because we are at it every day of the week, whereas other sports they train for one day.

Focus. Attaining an optimal level of focus was recognised as a facilitative antecedent of flow for eight jockeys and accounted for two higher-order themes: *relinquish control (60%)* and *instantaneous concentration upon mounting (60%).* The need to *relinquish control* was viewed as a key component for entering flow and was symbolised by statements such as "you just have to allow it to happen" (Jockey 6) and "you can't make it happen, you just have to let it happen naturally" (Jockey 3). Participants also acknowledged the significant alteration in their levels of concentration in the parade ring. This *instantaneous concentration on the horse* was communicated as being an escape from the 'build-up' of big races that acted as a trigger for flow:

> I think when you get the leg-up and you get out on the track and get down to the start you almost start to relax into it and you almost think "right we are here now (Grade One race), we are doing it". Whereas before you actually get on the horse the whole thing is just build-up and you are still talking to people and people want to talk about it and all you want to do is get on and do it. It's only when you are on the horse and you are away on your own that you sort of get into your own bubble. (Jockey 8)

Optimal arousal. This theme was mentioned as a facilitative factor by seven jockeys and encompassed two higher-order themes: *relaxed (60%)* and *positive energy (40%).* Participants indicated the importance of accepting enhanced arousal as a "positive vibe" (Jockey 6) and explicated it as an indicator of the onset of flow. Although

acknowledging the "buzz" of the Cheltenham Festival, Jockey 7 also stated that being *relaxed* was a key contributor to his experience of flow and that being on an outsider meant that "I didn't really have that much pressure on him having to run well…I was just riding it to run well and have a good time so I'd say that probably helped as well; and that helped me to relax."

Preparation. Preparing effectively was indicated as being facilitative to the occurrence of flow by seven jockeys, comprising three higher-order themes: *tactical preparation (60%), knowledge of the horse (50%)* and *pre-performance routine (40%).* Participants signified the importance of developing a race strategy and deriving tactical plans from the form of the runners in a race and other race variables:

> I suppose really with racing its more tactical preparation…if you have a good chance or it's an important race, or a big runner-field, say one with 25 runners, you kind of say to yourself, you look at what people will do; you know someone will go a certain speed. Whereas in a smaller runner field it's much more about what your horse is going to do, so you look up the horse's history, so you want to come up with your tactical solution with the trainer beforehand. (Jockey 2)

Developing *knowledge of the horse* that jockeys are due to ride was also outlined as a key component of preparation and involved "watching re-runs of their races" (Jockey 1) and was allied with the fact that "most horses you will have sat on before so you will have an idea of what they are going to do" (Jockey 3). Developing this rapport with the horse through "riding work" (morning exercise) and "schooling" (jumping obstacles) was also mentioned by Jockey 5. In surmising the preparation involved in racing, Jockey 7 also indicated that his immersion in preparing the horses for the racecourse allowed him to enhance his knowledge by talking to people that work in the yard:

> I ride out for a few different trainers during the week so I'm in there and doing three or four lots and riding lots of different horses so especially riding out with the lads you can say "oh how's that going?....what's he like?"…and they are usually those lads have a good relationship with the horse because they are with them every day. So stable lads in the yard can give you a lot of help as well.

As discussed within focus, the *pre-performance routine* of mounting the horse in the parade ring was indicative of performance initiation and cantering down to the starting point of a race was considered to be a routine that enhanced concentration.

High motivation. Being motivated to perform was facilitative to the occurrence of flow for seven jockeys and encompassed four higher-order themes: *important races (50%), clear goals (40%), demanding situation (40%)* and *high motivation (20%).* The desire to win formed the *clear goals* of jockeys and its significance was reflected by statements such as "totally zoned in on winning" (Jockey 4) and "racing is definitely about winning, from a jockeys perspective certainly anyway" (Jockey 2). Flow was also associated with *important races* and festivals and that "the bigger races are better…it's the festivals where you get the most buzz" (Jockey 10). This was elaborated upon by Jockey 7 and discussed in relation to the *high motivation* associated with a flow experience at the Cheltenham Festival:

> I think that race was different because it was a Cheltenham Festival winner that day and it was a good race. It was on the first day as well so especially as a young lad the buzz of riding at Cheltenham alone is very good. At mid-week racing, you are riding well and you are doing your best but you don't quite get that buzz like at the big meetings such as Cheltenham and Aintree.

In describing a flow experience during a Grade One victory, Jockey 8 outlined the *demanding situation* that faced him:

> It's all about the big day, it's a big event, plenty of pressure on and it's a great horse. It has to be a great horse to win those races. It's just such a big race, it's such a big build-up. It's the build-up more so than anything that gets you so buzzed for it. Those big events are talked about for weeks in advance, it's such a big build-up to them that when it does come off it's like you can't believe it's happened. After all these weeks of talking about it, it's actually happened and we have done it and that's a big part of it.

Psychological strategies. Five jockeys outlined that psychological strategies were used to achieve and maintain an optimal psychological state and included three higher-order themes: *coping with pressure (40%), mindfulness (30%)* and *mental imagery (10%).* Jockey 5 declared the role of psychology in racing and "that the mental side of things is absolutely massive really in racing…in racing, to make it, you just have to be

mentally strong and focussed and keep everything right." *Coping with pressure* and having emotional control played a role in the attainment of optimal concentration. In demonstrating the role of coping, Jockey 2 outlined that this quality had both stable and experientially developed qualities and distinguishes top jockeys:

> You have to be able to deal with that pressure big time…the top jockeys…you never see that with them they arrive at the right time and the occasion never seems to get to them…It's definitely a learning process. And it also comes down to character as well. You see people in all sports and there are some people who can't cope with the big stage whereas there are other people who are capable from the very word go.

Jockeys also emphasised the importance of *mindfulness* and being able to alter their focus quickly to the next race after both triumphs and defeats: "you just move onto the next race" (Jockey 4). From a jockey's perspective, horse racing was likened to "a rollercoaster" (Jockey 6) and recognition was apportioned to the fact that "you know there will be good times and times but you just have to ride the wave" (Jockey 9). Being able to deal with setbacks during prominent periods was also viewed upon as being facilitative to the occurrence of flow:

> Obviously sometimes you are disappointed when horses get beaten but I don't really let it get to my head, tomorrow is another day. Unless I have personally done something wrong I don't really let it get to my head.

Mental imagery was also mentioned as a psychological strategy that was utilised by Jockey 8 prior to important races:

> In those sort of races, it's such a build-up you have done so much talking about it that obviously you think about the race and you try to ride the race in your mind as to where certain horses will be in the race and where you want to be and you almost run the race through in your head, all the different scenarios.

Experience. Acquiring experience was viewed as facilitative to the occurrence of flow for five jockeys and incorporated three higher-order themes: *having experience (30%), developed as a rider (30%)* and *horsemanship (30%).* In acknowledging the role of *horsemanship* skills on race-day, Jockey 7 discussed the impact of these skills on his ability to interpret the horse's personality:

> Horsemanship plays a key part. I like to think that when I get on a horse in the parade ring and by the time I get down to the start I have a rough idea of what kind of personality the horse has.

Becoming *developed as a rider* and "mature as a jockey" (Jockey 9) through racing experience was viewed as a key element that enhanced their performance capabilities and the ability to perform instinctively:

> I'm at the stage of my career now where I'm a professional and I'm doing It every day, so as soon as you get on the horse it's almost like a routine where you do the same thing; obviously some horses have to be ridden differently but you just do things in a race that you don't even think about doing because it's just instinct. (Jockey 7)

Having experience was also associated with an enhanced ability to deal with pressure situations and big races:

> I think as you get older you learn to realise that you can't make it happen, you still have to treat it the same, and try and keep a lid on it. Even though it's a big race and there is more pressure, more expectation, you have to try and keep a lid on it and try and ride the race as level as you can. And that's probably a thing that comes with experience. (Jockey 8)

Optimal environmental conditions. Performing in favourable environmental conditions was mentioned by half of the interviewed jockeys and constituted three higher-order themes*: positive atmosphere (50%), comfortable amongst peers (10%)* and *optimal ground (10%).* Jockeys referred to the influence of big races and significant racing festivals, as Jockey 7 outlined that "at the Cheltenham Festival it's always a big hype. You know it going to the races. There are massive crowds there you are just buzzing off the atmosphere." A different atmosphere in the weigh-room on such occasions was also conducive to flow as "it's more of a buzz, more of an atmosphere. Definitely inside in the weigh-room the lads are a lot more tense…but yet at the same time they are in the zone and its good because its tense" (Jockey 10).

Physical and mental well-being. Accounting for the opinions of three jockeys, raw-data themes pertaining to physical and mental well-being were encompassed within four data themes: *physical readiness (30%), feeling good (20%), hydrated (10%)* and *content in riding weight (10%).* As some jockeys alluded to the link between their physical and mental state, primarily due to weight-management strategies, both entities

were combined within this general dimension. Jockey 2 indicated that "you need to be right physically and mentally" and that finding the optimum methods to reach his optimal physical state had benefited his experience during races: **"**lately I've done less work with horses and done more gym work and I'm feeling better. So lately I've definitely felt better in myself through races than I would have when I was struggling." Others also commented that being "fit from the start" (Jockey 4), "being warmed-up" (Jockey 6) and that "making sure that I'm not too dehydrated" (Jockey 1) benefited their performances.

4.4 Connecting analysis between the conditions of flow

A search was made within the data for links between the 12 facilitative conditions of flow. Figure 5 demonstrates the connections that emerged between the conditions influencing the occurrence of flow. A total of 14 connections were evidenced between the conditions facilitating the occurrence of flow. Colour coding has been used to indicate the connected derivatives of confidence (red), arousal (blue) and focus (green). The shaded area represents psychological antecedents of flow in jockeys.

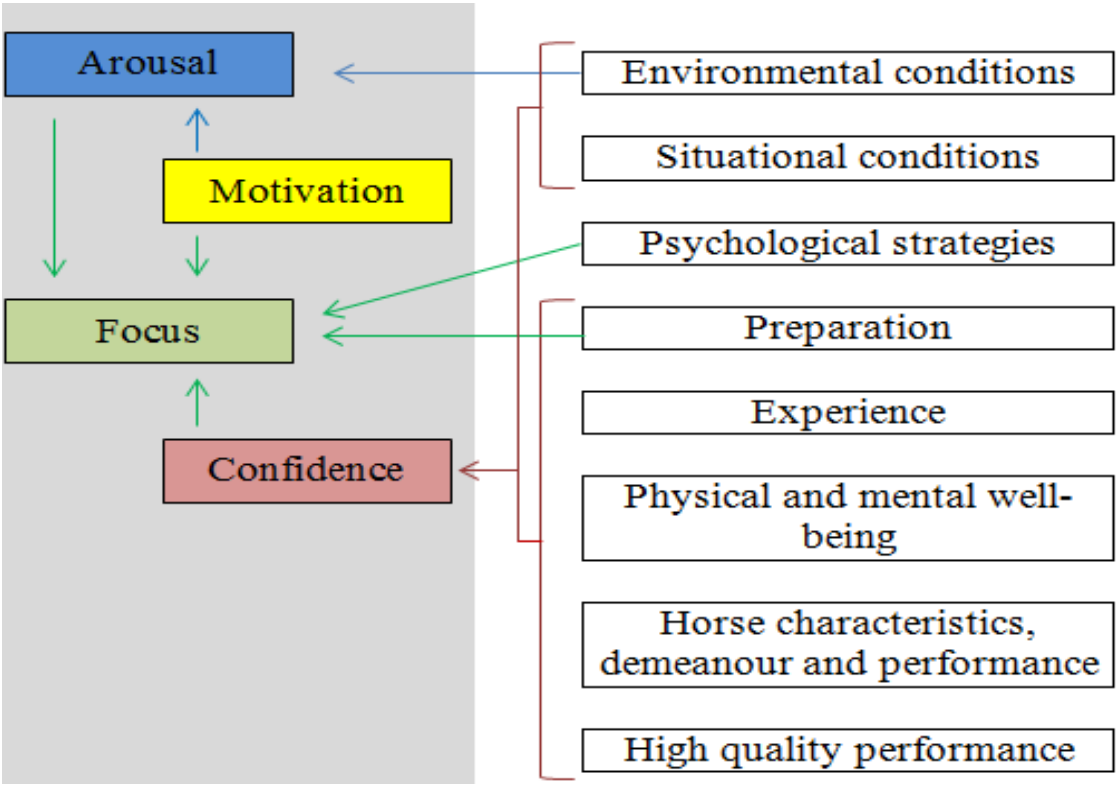

Figure 5: Connecting analysis between conditions facilitating flow

Confidence. Recognised as both an antecedent and characteristic of flow, seven sources of confidence were identified. **Optimal situational conditions** generally coincided with partnering a **superior horse** and instilled a sense of belief in participants such that "they just give you a feeling inside you and you just suddenly get this belief inside and know that everything works" (Jockey 5). In acknowledging the positive impact of **preparation** and **high quality performance** on confidence, Jockey 1 outlined that "confidence is absolutely huge and obviously the more prepared you are in every sense, the better results you will get and the more confidence you will get; everything has a knock-on effect." A feeling of **physical and mental well-being** was also associated with augmented confidence. In referring to a number of sources of confidence, Jockey 2 outlined that although flow is not guaranteed during periods of augmented well-being and is contingent on other factors, such as the quality of the horse, being in the optimal physical and psychological state significantly increases the potential for flow to occur:

> If you are over a period of time feeling very well in yourself, physically and mentally and you are winning a lot of races and are riding with lots of confidence, you will in general feel better and feel more confident in races, you will do a good job on the horse. Now you mightn't have this blissful flow experience in every race but you might be riding with more confidence and riding better and things will feel better and then on the odd occasion you will ride a very nice horse where things just go perfectly and you just think in that moment "this couldn't be going any better".

Experience assisted participants in staying confident and dealing with pressure and was identified as a source of confidence during the progression of a jockey's career:

> When you start off, you are only an apprentice at your trade so you are learning until you become a professional and you have obviously learned your trade at that stage. So that will definitely build up your confidence. (Jockey 6)

Horsemanship also contributed to being confident on the horse as surmised by Jockey 2: 'I'd have a lot of horse experience growing up and I grew up with horses and ponies so I got confident with them.' A feeling of comfort in the **environmental conditions** of the weigh-room and pre-race procedures also perpetuated feelings of confidence for Jockey 5:

> You are just comfortable with everything around you, people in the weigh-room… even just simple things of weighing out; in the first few rides you are always worried that you will be ready too early but then after a while you get into a groove and you do everything right then.

Focus. Jockeys commented on the positive relationship between goal-driven **optimal motivation** and focus by stating that "you are totally zoned in on winning" (Jockey 4), whilst clear goals also permitted the relinquishment of conscious control: "you go out there with your idea of what you want to do and it just flows" (Jockey 9). Feeling *relaxed* and having **optimal arousal** was also remarked upon as a quality of flow, as outlined:

> The horse I was on was a bit of an outsider really, bottom of the weights. So I was just going there to have a good time really. So I didn't really have that much pressure on him having to run well. So I wasn't thinking, oh I have to be here or I have to be there as you would be on a good horse. I was just riding it to run well and have a good time so I'd say that probably helped as well and that helped me to relax and get into the zone. (Jockey 7)

The pre-performance routine forms part of the **preparation** for races and acts as a symbolic moment of performance initiation: "from leaving the ground to sitting in the saddle you are almost getting in that zone right then… It's almost a routine from standing to starting" (Jockey 7). These preparatory efforts and focus were also augmented for races in which jockeys had heightened **confidence:**

> Probably the better the horse the more focussed I would be to be honest. The more fancied the horse the more focussed you would be…obviously you would be thinking about it a lot more. If you are on an outsider you mightn't give it as much in-depth thought. So if you are riding a really, really fancied one you don't want to miss anything and you are totally focussed on what you have to do and what everybody else is going to be doing and making sure that you are going out there and you have every corner covered. (Jockey 1)

Optimal arousal. Remarking upon the simultaneous influence of **optimal motivation** and **confidence**, Jockey 1 outlined the heightened sense of arousal accompanying situations involving a favourable task appraisal and viewed this feeling as a welcome sensation in the build-up to a race: "once I have a chance, I get the butterflies. You know then. If you can't get butterflies then there is no point doing it. I like having butterflies; it means I have a chance. It gets me excited, gets me going." The

attainment of optimal arousal was also associated with the **optimal environmental conditions** at important racing festivals, as evidenced by this excerpt:

> I suppose you're alive to the situation, you're more awake, it definitely makes you more alert, the atmosphere definitely affects how you will react. It's difficult to put into words but definitely you feel more awake and it probably heightens your senses as well. (Jockey 2)

4.5 Conditions inhibiting the occurrence of flow

Ten factors were categorised as preventative to the occurrence of flow in jump jockeys. A total of 78 inhibitory raw-data themes emerged from interview transcriptions. Thirty-four higher-order themes were subsequently formed and a further inductive analysis yielded 10 general dimensions (Table 7).

Table 7: General dimension percentages for conditions facilitating the occurrence of flow in jump jockeys

General dimension	Percentage of participants citing
Lack of confidence	100% (N=10)
Negative performance feedback	100% (N=10)
Non-optimal horse demeanour, characteristics and performance	100% (N=10)
Non-optimal relationship between horse and jockey	70% (N=7)
Compromised focus	50% (N=5)
Non-optimal situational conditions	50% (N=5)
Non-optimal arousal	40% (N=4)
Non-optimal physical and mental well-being	40% (N=4)
Lack of experience	30% (N=3)
Non-optimal motivation	30% (N=3)

Table 8 displays the general dimensions, higher-order themes and example raw-data themes pertaining to the inhibition of flow in jump jockeys. A full outline of the raw-data themes that inhibited the occurrence of flow is outlined in Appendix G.

Table 8: Inductive analysis of conditions inhibiting the occurrence of flow in jump jockeys

General dimensions	Higher-order themes	Example raw-data themes
Non-optimal horse demeanour, temperament and performance (10)	Lesser ability (6)	Less ability
		Horse is not good enough
		Moderate horses
	Travelling poorly (6)	Under pressure to gallop
		Going quicker than would like
	Jumping poorly (5)	Poor jumper
		Jumping poorly
	Over-energized (2)	Keen
	Poor balance (2)	Poor balance
	Not determined (2)	Doesn't try hard
	Difficult horse to ride (1)	Difficult to ride
Lack of confidence (10)	Not riding with confidence (4)	Not riding with confidence
	Low confidence (6)	Not having confidence
		Negative attitude
	Doubt (6)	Doubt
		Worry
	Lack confidence in horse (3)	Lack of confidence in the horse
Negative performance feedback (10)	Race not going well (7)	Things are not working
	Not riding winners (6)	Not riding winners
		Going through a bad spell
	Making mistakes (5)	Making mistakes
	Poor start (3)	Start poorly
		Not in an ideal position
Compromised focus (7)	Compromised focus (3)	Concentrating on what the horse is doing wrong
		Have to help the horse more
	Over-thinking (4)	Over-analysing things
		Creating problems in mind
	Slow decision-making (2)	Slow decision making
	Focus on the negatives (2)	Focus on the negatives
	Forcing things to happen (5)	Trying too hard
		Try to force things to happen
Non-optimal relationship between horse and jockey (5)	Lack of harmony (3)	Horse not responding
		More effortful
	Unbalanced partnership (2)	Unbalanced partnership
		Out of balance
	Lack of confidence (2)	Lack of confidence
		Lack of trust
	Over-energized (2)	Over-energized
Non-optimal situational conditions (5)	Riding poor horses (4)	Riding poor horses
	Non-optimal interaction with the trainer/owner (2)	Too much instruction
		Lack of autonomy
		Feeling compelled to carry out a plan

(Continued)

Table 8 ***(continued)***

General dimensions	Higher-order themes	Example raw-data themes
Impaired physical and mental well-being (3)	Not totally fit (3)	Injured Riding in pain
	Not feeling well (1)	Not feeling well
Non-optimal arousal (4)	Anxiety (4)	Not relaxed Uptight
	Negative vibe (2)	Transmit negative vibe
Lack of experience (3)	Lack of experience (3)	Not having experience Panicking under pressure
Non-optimal motivation (3)	Unrealistic goals (3)	Non-optimal motivation (3)

Non-favourable horse demeanour and performance. All jockeys pointed to the negative influence of their horse on flow and encompassed seven higher-order themes: *lesser ability (60%), travelling poorly (60%), jumping poorly (50%), not determined (20%), poor balance (20%), over-energized (20%)* and *difficult horse to ride (10%).* The idiosyncrasy of flow in equine sports in comparison to traditional sports was discussed and indicated by the statements such as "horses are different from other sports and make it (flow) different" (Jockey 1) and "without a good horse you definitely can't do it" (Jockey 10). Partnering horses with *lesser ability* was articulated as being a crucial factor that inhibited flow and that "on your average horse, that's when it's hard work" (Jockey 6). In discussing the negative impact of inferior horses on flow, Jockey 2 also highlighted the fact that horses ultimately determine the level of success that is attained:

> It's not that you are riding that badly when you are on a bad horse, whereas riding the bad one you know they won't respond in the right way. And then you can feel as though you aren't riding well but it mightn't be your fault at all. There were two weeks actually I rode at a track. The first day I left and didn't think I was riding that well. And then the second week, I left and felt I was riding well. But then I was thinking back to it and I wasn't riding that badly the week before, I was just on bad horses last week and I was on nice horses this week. Racing probably gives you that feeling a lot more because the horse is dictating a lot.

Jumping poorly was also cited as a preventative factor for flow and that on the occasion of riding a "poor jumper" (Jockey 4) "you might have to yank the reins going down to the jump and give it a big kick to get it to go" (Jockey 1). Another negative influence was a horse that was *travelling poorly* and was indicated by statements such

as being "behind the bridle" (Jockey 5) and "they are pulling and dragging out of you which means they aren't doing anything right" (Jockey 2). Jockey 10 commented on the impact of this on their performance and stated that "being under pressure to gallop puts even more pressure on when you are jumping." Jockey 2 also commented on the over-arousal of the horse prior to a race and that "some days you can go out to the parade ring and a horse is sweating up mad and is anxious there is probably not a whole pile of good you can do for it." Likewise, a horse being *over-energized* during the race can result in them exhibiting their natural flight tendencies which results in them being keen and failing to settle into a suitable rhythm in the race:

> If a horse is too keen with you in the first half of the race then he has no chance of making it in the last half. You are just using up too much energy the whole way through and you just have no chance of making it home. (Jockey 5)

The inhibitory impact of riding horses with *poor balance* was also expressed: "when they aren't nice horses, they aren't well-balanced horses and you are never going to feel it (flow) when you are on them" (Jockey 2). Additionally, knowing that a horse is not as *determined* as one would like alters the race appraisal such that "there are some horses that don't try as hard as others…so you think - right I'm going to have to try pretty hard to get going on this one" (Jockey 7).

Negative performance feedback. Acquiring negative feedback about one's performance was cited as a preventative factor inhibiting the occurrence of flow for all participants and was encapsulated within four higher-order themes: *race not going well (70%), not riding winners (60%), making mistakes (50%)* and *poor start (30%)*. Jockey 7 discussed the negative impact of a *race not going well* and the impact this had on *making mistakes* as the performance unfolded:

> Some horses just can't physically keep up during the race so when a horse is flat to the boards early on in a race, and then it goes and makes a mistakes, it's just a vicious cycle really; you end up dropping further back and then you are trying to make up that position again.

Not riding winners "makes it a lot harder" (Jockey 3) and "makes you feel as though things are going against you no matter what you do" (Jockey 8). This reduction in winning races also has a subsequent knock-on effect onto other general dimensions that inhibit the flow state:

> If you go a few weeks and you are not having many winners then you start to question yourself and see what you are doing wrong. That's when you try to start to change things and that's when they don't need to be changed. (Jockey 7)

A *poor start* in a race prevented the materialisation of the preferred race plan which subsequently prevented the occurrence of flow, as outlined by Jockey 2:

> I think you will either have it in a race or you won't…If you jump off and someone is in the position you want to be in, you're never going to feel as though everything is going lovely in that race. It's not going to really happen where the first half a race is awful and then suddenly click into gear and everything will go right, and even if you do click into gear and everything goes right, you will still think you have wasted a load of energy in the first half of the race.

The negative impact of starting poorly on the remainder of the performance was also discussed by Jockey 7: "if you jump off and don't get a handy position, you almost have to sit and suffer and just wait for the horse to get back on an even keel again."

Lack of confidence. A lack of confidence was an integral inhibitor of flow for all jockeys and incorporated four higher-order themes: *low confidence (60%), doubt (60%), not riding with confidence (40%)* and *lack of confidence in the horse (30%)*. *Low confidence* prevented the occurrence of flow and was also associated with inferior performances: *"*If you don't believe in yourself you have no chance really. If you don't believe in yourself you are just worrying and making stupid mistakes" (Jockey 5). In line with this suggested link between confidence and performance, a lack of confidence was linked to spells when jockeys failed to record winners, which consequently led to heightened levels of *doubt* during subsequent performances: **"**When you are going through bad periods your confidence might be down. You might be a bit apprehensive because your performances aren't going well…you are nearly afraid to do things" (Jockey 2). These periods also led participants to acknowledge that they were *not riding with confidence,* something that was identified by Jockey 8: "when I'm not riding with confidence, I can feel that I'm not riding with confidence." As a result, this participant also stated that taking action in an attempt to rectify this issue was necessary to enhance performance:

> I think now I've learned now to look back on it and think how I've been doing and think why am I not riding as well as I should be…and then go back to trying; maybe do a little bit more homework on whatever I'm

> riding, work a bit harder on it and try to be a bit more relaxed when I go out to ride. (Jockey 8)

Ultimately the inferior quality of their equine partners resulted in a *lack of confidence in the horse* that impaired their overall level of confidence, as detailed: "if you are riding bad horses every day, it is going to get to you; you think you are riding poorly then as well" (Jockey 1). This lack of confidence in the horse impacted on rider confidence and their general attitude approaching as race, as described by Jockey 10: "I didn't have any chance; you are probably half-thinking a little bit negatively as a result, because you think it has no chance."

Non-optimal relationship between horse and jockey. A failure to attain a favourable relationship with their equine partner had an inhibitive influence on the occurrence of flow for five participants. Four higher-order themes emerged: *lack of harmony (30%), unbalanced partnership (20%), lack of confidence (20%)* and *over-energized (20%).* Jockeys alluded to the effect that a *lack of harmony* with their horse had on their performance and that this subsequently hindered their capacity to experience flow, as outlined by Jockey 2: "if they aren't doing things right then you won't be able to do things right on top of them... So you wouldn't be getting into flow if you aren't riding nice horses." Similarly, an *unbalanced partnership,* deriving from the poor balance of the horse, forced jockeys to adjust their position on the horse to a less favourable locomotive position and culminated in the misuse of energy in the relationship between horse and jockey: "if a horse is unbalanced…this causes you then to have to try and counter-balance them, so there is a massive waste of energy in that system (Jockey 2). Reference was also made to the belief that a negative attitude can be interpreted by and transferred to the horse and typical phrases included: "they get a sense of what you are thinking and if you are thinking negatively or you are not sure about certain things, then you put a doubt in the horses mind as well" (Jockey 9); and "you will find with some horses that if you aren't as confident that they mightn't run as well as they could" (Jockey 3).

Compromised focus. Accounting for the thoughts of seven participants, a compromised focus was encapsulated by five higher-order themes: *forcing things to happen (50%), over-thinking (40%), compromised focus (30%), focus on negatives (20%)* and *slow decision making (10%).* Emanating from a reduction in confidence and winning races, *trying too hard* was associated with times when "you are trying to make

things happen, you are trying to rush things" (Jockey 10) and "you are going to try and force the horse to go at some stage rather than allowing it to happen" (Jockey 3). Participants acknowledged that the absence of instinctive decisions was evidenced by *over-thinking* and *slow decision-making* and was synonymous with the absence of flow, as Jockey 9 detailed:

> Over-thinking things just creates problems in your head that aren't there. And you know you just get worried about stupid things, like will I kick on before two (fences) out or after two out? It doesn't probably matter because if it's good enough it's going to go on and win.

A *focus on the negatives* was a product of a lack of winning and included phrases such as "when you are not riding winners and you get beat you are trying to pick out things you did wrong" (Jockey 3). Participants also stated that riding inferior horses led to a *compromised focus* which saw them "concentrating on what they are doing wrong" (Jockey 2) and having to "help them out a lot more" (Jockey 5).

Non-optimal motivation. Representing the thoughts of three jockeys, non-optimal motivation comprised three higher-order themes: *unrealistic goals (10%), lack of challenge (10%)* and *compromised task orientation (10%).* Lacking confidence in their performances and in the horse resulted in jockeys perceiving mismatched appraisals between their ability to succeed and the challenge of the task. Such periods were also associated with a *compromised task orientation* where "you are trying to prove a point on horses that just aren't good enough" (Jockey 3). Subsequently this led to the creation of *unrealistic goals* during races, which was exemplified by "trying to get horses to do things that they physically can't" (Jockey 7). Alternatively, a *lack of challenge* was also outlined as being inhibitive to the occurrence of flow by Jockey 8, who outlined the reasons for this viewpoint:

> On other horses you expect them to win so that's fine. You get a bit of a buzz but you half-expected it to win anyway. Or you would have been disappointed if it had got beaten. Sometimes it's the challenge of it, when you think 'there is no way this can win today' or the ground is gone against it, and then it goes on and wins, that gives you a bit of a lift ye.

Non-optimal situational conditions. Being positioned in non-optimal situational conditions was inhibitive to the occurrence of flow for five jockeys and included three themes: *riding poor horses (40%), situational change (20%)* and *non-optimal interaction with trainer/owner (20%). Riding poor horses* or having a "lack of good

horses" (Jockey 9) in their employment arrangements negatively impacted on the participant's capacity to achieve success and experience flow, as Jockey 2 described: "I'm not in a good job at the moment so I haven't been riding many winners." Likewise, a *change in circumstances* signified a jockey experiencing an alteration in their job circumstances which coincided with riding inferior horses, as Jockey 9 outlined "the first jockey came back and that was it (inhibition of flow)". Feeling imposed to carry out instructions due to a *non-optimal interaction with trainer/owner* also had the potential to negatively impact on jockeys during a race as outlined:

> I think if you ride for someone and they give you loads of instructions and you know they are putting a bit of pressure on you then you can end up riding worse than if you just went out to ride the race that you wanted to. (Jockey 7)

Impaired physical and mental well-being. Representing the views of three participants, two higher-order themes exemplified the inhibitive effect of a non-optimal physical and state in jockeys: *not totally fit (30%)* and *not feeling well (10%)*. In referring to the higher-order theme of *not feeling well*, Jockey 2 referenced that "you aren't always going to be physically well in yourself or mentally well in yourself" The fact that jockeys are willing and capable of riding when they are *not totally fit* was indicated by a number of jockeys and it was articulated that "riding in pain…that definitely impacts on your confidence" (Jockey 8). Jockey 2 used a comparison with other athletes to indicate the fact that jockeys regularly return from injury quicker than expected or continue whilst injured:

> If there is something bothering you physically, jockeys probably get away with more than most physically, other sports you may have an injury, say in comparison to a runner it could knock five seconds off your time in a mile race, ruin your performance, so if a small injury does that to them then they won't compete. Whereas a jockey the standard of injury you can compete with is probably a lot higher.

However, this jockey also acknowledged that although he may ride winners during periods in which he was not totally fit, the level of pleasure garnered from riding during these periods prevented flow:

> If you're in a race a carrying a bit of an injury which you can get away with, you're not going to feel as well because you are going to be compensating in some way, and you won't be riding at the best of your

> ability or feeling the best. So you aren't going to be in flow in that case. (Jockey 2)

Jockey 6 also commented on the influence of a return from injury and the lack of full fitness during that period:

> If you have a fall, you are going to be off for a certain amount of time so then you have to come back you have to get fit and you are obviously going to have to get back into the swing of things again.

Lack of experience. A *lack of experience* was cited as being inhibitive to the occurrence of flow for three jockeys and contained one higher-order theme with the same name as the general dimension. Jockey 5 commented on how "in the first few races you wouldn't have a clue what's going on around you. My first ten, fifteen rides I had no idea what was happening." Participants also stated that "when I was younger I probably tried too hard to make it happen" (Jockey 8) and linked their lack of experience to "making silly mistakes" and "not being sure of what I was doing" (Jockey 9).

Non-optimal arousal. Four jockeys acknowledged the negative influence of non-optimal arousal and represented two higher-order themes: *anxiety* and *negative vibe*. Jockey 1 identified *anxiety* during a period in which "I knew if I was more relaxed, things would work out better." Jockey 6 also surmised the impact of anxiety and a *negative vibe* on the horse and their performance: "if you are uptight and you are worrying in a race and you are moving, you are rushing things a little bit, everything gets out of balance, and things aren't working so."

4.6 Conditions disrupting the occurrence of flow

Seven general dimensions were formed to represent the conditions that disrupted the experience of flow in jump jockeys. A total of 24 raw-data themes were generated and further categorisation of these raw-data themes led to the creation of 11 higher-order themes and seven general dimensions (Table 9).

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Table 9: General dimension percentages for conditions disrupting the occurrence of flow in jump jockeys

General dimension	Percentage of participants citing
Horse performance disrupted	60% (N=6)
Loss of confidence	50% (N=5)
Impeded competitors	50% (N=5)
Performance problems	50% (N=5)
Non-optimal relationship between horse and jockey	30% (N=3)
Over-thinking	30% (N=3)
Physical Problems	20% (N=2)

Themes emerging within this dimension concerned antecedents that disrupted the experience of flow in jump racing. The general dimensions, higher-order themes and raw-data themes which emerged are presented in Table 10 and a full breakdown is available in Appendix H.

Table 10: Inductive analysis of conditions disrupting the occurrence of flow in jump jockeys

General dimensions	Higher-order themes	Raw-data themes
Horse performance disrupted (6)	Poor jump (5)	Missed a jump
	Loss of rhythm (2)	Loss of rhythm
Loss of confidence (5)	Loss of confidence (4)	Knowing you cannot win
		Loss of confidence in ability
		Realise that other horses are going better
	Doubt (2)	Doubt
		Worrying
Performance problems (5)	Fall (3)	Fall
		Hitting the ground
	Stop riding winners (3)	Stop riding winners
	Performance problems (3)	Things start going wrong
		Make an error
Non-optimal environmental conditions (5)	Impeded by competitor (5)	Competitors takes your ground
		Getting hampered by a horse
		Get into trouble in running
		Getting a bump
Loss of optimal relationship between horse and jockey (3)	Loss of harmony (3)	Loss of rhythm
		Changed rhythm
Over-thinking (3)	Over-thinking (3)	Over-thinking during a race
Physical problems (2)	Getting injured (2)	Getting injured

Horse performance disrupted. Relating solely to the performance feedback of the horse during a race, six jockeys attributed a problem in the horse's performance as being disruptive to flow. Raw-data themes pertaining to this general dimension were contained within two higher-order themes: *poor jump (50%)* and *loss of rhythm (20%).* Participants spoke about the adverse impact of a *poor jump* and a *loss of rhythm,* during a race and the negative effect it had on flow:

> Things are going well and you feel that your confidence is up but then he makes one or two mistakes; gets shuffled back; things don't happen; you have to rush it up when normally you wouldn't rush a horse but you have to because you want to keep him in the race. (Jockey 10)

Loss of confidence. This general dimension was mentioned as being disruptive to flow by five jockeys and accounted for two higher-order themes: *loss of confidence (40%)* and *doubt (20%).* Jockey 2 stated that despite feeling good in his performance, *a loss of confidence* during the race in respect of performance feedback could cause a disruption to flow as "you think you are going alright but then you see someone else is going better so that might take it away from you a little bit." *Doubt* was exhibited by "second-guessing yourself" (Jockey 9) and was closely linked to over-analysis during and between races.

Performance problems. Accounting for the views of five jockeys, encountering difficulties during performances was disruptive to the state of flow and was expressed within three higher-order themes: *falling (30%), stop riding winners (30%)* and *performance problems (30%).* Accepted as being "part of the sport" (Jockey 6), *falling* during a race triggered a cessation in flow for Jockey 5, though he also opinionated that little can be done to avoid falls on the majority of occasions:

> Hitting the ground at speed is one thing (that disrupts it)…especially when you are going very well, that's happened me twice now, and you are just absolutely heartbroken…but then most of the time you can't do anything about it.

Participants commented on the propensity of *performance problems* to adversely impact on flow, as Jockey 2 described "you are going perfectly well and then the next minute, he misses a jump or suddenly you come under pressure and you lose that feeling." In acknowledging the disruptive effect that the *end of a winning roll* had on flow, Jockey 3 also detailed the discernible difference having exited the flow state and

that “it’s not until you come out of that state (flow) that you actually realise how well things were going.”

Non-optimal environmental conditions. Half of the participants stated that flow could be disrupted by their competitors and was accounted for by one higher-order theme: *impeded by a competitor (50%)*. Being *impeded by a competitor* included phrases such as “one can take your ground” (Jockey 2) or “you get into trouble in running” (Jockey 5). Jockey 7 outlined the impact that interference during a race would have on his thought-processing and the necessity to get back into rhythm again.

> If you are trying to get yourself in a rhythm in a race and you get badly bumped into. Then you kind of have to say “that’s happened”. I need to try and figure out now what’s the best way to give my horse the best possible chance of making up that ground without yahooing it and trying to make up the lengths really quickly. You almost just want to get them back into a rhythm again. So if you do get knocked out of that flow, you have to try to get back into that rhythm again.

***Over-thinking*.** Representing the views of three jockeys, an augmentation in thought-processing was disruptive to the occurrence of flow and contained one higher-order theme with the same name as the general dimension. *Over-thinking* not only triggered a cessation in flow but could also have an adverse impact for a period of time afterwards if they were incapable of managing the situation:

> Half-way through a race you would be sure of what you are doing and how you are going, but then you might think, oh will he stay going if I kick on. Rather than just letting things happen you start creating problems by worrying about things that might happen. That’s it (flow disruption). When things are going well it snowballs, and if things are going bad and you are over-thinking things and you haven’t got the mentality to control it and switch off and let it be, it will snowball and things will get an awful lot worse an awful lot quicker. (Jockey 9)

***Loss of optimal relationship between horse and jockey*.** An impairment of the relationship between horse and jockey as a result of an unforeseen performance problem was mentioned by three jockeys as being disruptive to the occurrence of flow and included one higher-order theme: *loss of harmony*. Losing rhythm was symbolic of a changed galloping action and reduced movement efficiency, which was triggered by a performance error during the race. A lost galloping action caused a sudden cessation

of flow as outlined by Jockey 7: “you just get in a rhythm in a race and if a horse makes a bad mistake, it’s (flow) gone.”

***Physical problems*.** Encountering physical difficulties subsequent to a fall was mentioned as a factor that curtailed the occurrence of flow for two jockeys and comprised one higher-order theme: *getting injured (20%).* Suffering a fall disrupted flow as Jockey 10 outlined: “you might get a fall and you might be sore”.

Chapter Five: Discussion

5.1 Introduction

The purpose of the study was to explore the experiences of flow in professional National Hunt horse racing jockeys. Firstly, 29 antecedents of flow in jump jockeys emerged, comprising 12 facilitative conditions, 10 inhibitive conditions and seven disruptive conditions. Although similarities existed between the findings and previous explorations of flow within elite athletes in traditional sports (e.g. Jackson, 1992; Jackson, 1995; Young, 2000; Sugiyama & Inomata, 2005; Chavez, 2008), the influence of the horse on jockey flow experiences emerged in a similar manner to previous horse racing research (Jackman et al., in press). In addressing the second aim of the study, ten characteristics described the experience of flow in horse racing. The optimal interaction of horse and jockey or the notion of horse and rider being 'at one' emerged as a unique characteristic within this population. Although research has mooted the possibility of unique experiences of flow in horse-rider sports (Thompson & Nesci, 2013), no previous published work had attempted to describe the experience of flow in a horse-rider combination. This study also corroborates with the assertion that an extension of flow categories may be warranted (Swann et al., 2015a), particularly in the context of horse-rider sports. Finally, the connecting analysis led to the emergence of 35 connections between the conditions and characteristics of flow. This provided a unique method to understanding the mechanisms underpinning flow in horse racing and assisted in enhancing the level of cohesion between both concepts, something which has been advocated previously (Swann et al., 2015b). In discussing the findings of this study, this chapter will be divided into two sections; 1) the characteristics of flow; and 2) the conditions influencing the occurrence of flow. Connections between the conditions and characteristics of flow are discussed where deemed most appropriate.

5.2 Characteristics of flow

One purpose of the study was to qualitatively explore the characteristics of the flow state in professional jump jockeys. This section will discuss the findings of this study in relation to the nine deductively[3] attained dimensions of flow in sport (Jackson, 1996) and more recent inductive explorations of the flow state in athletes (Chavez, 2008; Swann et al., 2015a). In total, ten characteristics embodied the flow state in jump jockeys and included; concentration, sense of control, optimal relationship between horse and jockey, altered cognitive perceptions, altered kinaesthetic perceptions, automaticity, intrinsic rewards, confidence, enhanced performance and the suppression of negativity. Although overlaps were largely evident between the findings of this study and the extant literature (Jackson, 1996; Swann et al., 2015a), an optimal interaction with the horse emerged as a novel characteristic. Therefore, it is evident that the composition of the flow state in horse racing extends upon previous research. Additionally, the connecting analysis enhances the understanding of flow and coherently integrates the conditions and characteristics of flow.

5.2.1 Concentration

Concentration and a state of mental relaxation were described as being fundamental characteristics of flow. This state of concentration associated with flow was attained through the optimal level of focus and was optimised through the relinquishment of conscious control. Given that flow is described as an intense state of concentration (Moran, 2012a) and that concentration has displayed links with other characteristics of flow in previous quantitative research (Kawabata & Mallett, 2011), it was unsurprising that concentration shared links with a sense of control, automaticity, the suppression of negativity and altered cognitive perceptions in the connecting analysis, all of which will be discussed within these characteristics. Although the distinction between the condition of focus and the characteristic of concentration may seem somewhat confusing, the state of concentration was considered to be a product of optimal focus. Subsequently, the speculated threshold between these two entities may be indicative of the passage into flow.

[3] Jackson (1996) used Csikszentmihalyi's (1996) flow dimensions to deductively analyse the flow experience in sport.

Evidence within this study suggested that jockeys required a degree of focus at all times but that the concentration associated with flow was distinct from their typically high levels of focus. In particular, references were made to the relaxed and calm state of mind which juxtaposed their intense levels of concentration and optimal levels of arousal. This echoes previous findings in elite athletes where flow was also described as being an innate state of relaxation (Chavez, 2008), which will be discussed more deeply in relation to the alteration of cognitive perceptions. Participants explicated the belief that the ability to be mindful aided the attainment of optimal arousal and permitted an intensification of concentration. Research has supported the potential role of mindfulness as an adjunct to the flow experience in elite swimmers (Bernier et al., 2009). Although it is difficult to imply causality between mindfulness and flow based on cross-sectional research (Kee & Wang, 2008), it would be interesting to explore the impacts of mindfulness training on flow in a longitudinal study, given that an a six-week intervention study demonstrated a positive link between mindfulness training and flow augmentations (Aherne, Moran, & Lonsdale, 2011).

5.2.2 Confidence

Similar to inductive research in elite athletes (Chavez, 2008; Swann et al., 2015a), being in the state of flow was referred to as being a feeling of confidence. Although confidence also emerged as a condition within this study, the feeling of confidence during flow was distinct to the perception of confidence that was complicit with the task appraisal. Although it could be argued that both entities are the same, the feeling of confidence derived from the flow state was influenced by the perception of being at one with the horse as distinct from explicitly deriving from the appraisal of the task, though a reciprocal relationship was exhibited between confidence and enhanced performance during flow experiences. Although Nakamura and Csikszentmihalyi (2002) state that unambiguous feedback and a challenge-skill balance are proximal conditions of the flow state, they do imply that both of these two entities are continuously integrated within the experience of flow. Therefore, the inductive approach used within this study as distinct from the deductive approach used by Jackson (1996) may have contributed to the emergence of confidence as a characteristic of flow.

5.2.3 Enhanced performance

One of the noted features of flow was the perception that performances were enhanced as a result of the feeling of confidence associated with the state. Specific references were made to the fact that performances unfolded favourably and that everything seemed to go to plan. Although these assertions could be justified as being consequences of self-efficacy prior to performance, one could also argue that race outcome and retrospective bias may have influenced such perceptions. However, another argument could also be made that the feeling of confidence derived from the optimal interaction with the horse may have proliferated feelings of enhanced performance, as evidenced by the impact of the horse on racing performance. This confidence-performance link played a key role in both the conditions of flow and the characteristics of flow. Positive performance enhanced feelings of confidence whilst these feelings of confidence were also linked to performance enhancements. Although Csikszentmihalyi (1975) states that flow can be experienced when "the human organism is functioning at its fullest capacity" (p.55), there is a dearth of quantifiable objective performance data to support this contention. Although clear similarities exist between the psychological components of peak performance (Andersen, Hanrahan, & Mallett, 2014) and the characteristics of flow (Swann et al., 2015a), future research could attempt to implement employ the experience sampling method (Massimini, Csikszentmihalyi, & Carli, 1987) or neurophysiological methods (Jackson & Kimiecik, 2008) to illuminate the relationship between flow and performance.

5.2.4 Optimal interaction between horse and jockey

The attainment of an optimal relationship with the horse emerged as a novel characteristic of flow within this sport. Previous research has indicated that cyclists and rowers felt a feeling of oneness with their bikes and boats respectively during flow experiences (Jackson, 1996). However, unlike the material nature of these objects, horse sports involve an interspecies partner that has its own temperament and performance characteristics (Maurstad et al., 2013). The relationship between horse and jockey was considered to be a description of the elements epitomising the optimal unity between horse and rider. As indicated with the conditions influencing the occurrence of flow, the demeanour, characteristics and performance of the horse played a key role in the attainment of the optimal relationship between horse and jockey and also influenced the psychological correlates of flow within jump jockeys. As a result, this signifies the fact that horse-rider harmony is simultaneously reliant on

both horse and rider (Peham et al., 2004). This is the first study to describe the occurrence of flow within an interspecies dyad and uses a connecting analysis to illustrate the impact of this forged relationship on the occurrence of flow and situate it within the context of this unique performance experience.

In attempting to synthesise the range of themes that emerged within this characteristic of flow, three elements emerged as being integral to the realisation of the optimal dyadic state. Firstly, an optimal relationship was characterised by a perceived reduction in the level of communication between horse and rider as a consequence of the reduced need for instruction. Jockeys outlined that horses with greater ability necessitated less instruction and were more capable of performing with minimal command. McBride and Mills (2012) state that the use of the legs, whip and bridle represent negative feedback commands. This is based on the suggestion that racehorses are engaged in an operant conditioning learning system whereby they respond to negative reinforcement. However, jockeys stated that the optimal relationship between horse and rider is characterised by minimal interaction between horse and jockey which therefore implies that the horse is performing as the jockey would wish. Therefore, this resonates with idea that being at one with the horse permits a narrow-external focus of attention (Nideffer & Segal, 2006) and rider automaticity.

Secondly, locomotive harmony comprised the joint motion of horse and jockey and referred to galloping and jumping synchronisation. In discussing the conditions influencing the occurrence of flow, balance, galloping motion and jumping ability were considered to be the important movement features associated with preferred partners. As the travelling speed of horses increase, their reliance on their balance or their dynamic equilibrium is increased (Pilliner, Elmhurst & Davies, 2002). During motion, a horse maintains its balance as its body falls forward towards the centre of gravity by placing another leg on the ground, which takes the horses weight and propels it forward (Pilliner et al., 2002). Given that flow was regularly associated with high-quality horses and that succeeding in racing is dependent on defeating other competitors, it is plausible to say that the feeling of balance is not only conducive to flow but is also indicative of performance efficiency. Jockeys also commented on the perceived effortlessness of jumping when partnering horses with greater ability. In comparison to previous research on flat-jockeys (Jackman et al., in press), the novelty of jumping in horse racing resulted in a greater emphasis being placed on dyadic

motion. Given that jumping is considered to be a skill of motor co-ordination in racehorses (McBride & Mills, 2012), the emerging impact of partnering superior horses enhances the perception that flow experiences and automaticity are more readily experienced when partnering more proficient horses.

Finally, a sense of confidence and relaxation characterised the relationship between horse and jockey and entailed that both horse and rider forged a reciprocally optimal physiological state that served to transmit positive kinaesthetic sensations to their partner. Some jockeys stated a capacity to detect confidence in their horse, whilst others testified that confidence was a communicable sensation that could be positively interpreted by the horse. Experienced horse riders reported a similar recognition of their horse's positive emotional state which served to enhance their own feelings of confidence (Brandt, 2006). Similarly, dyadic relaxation was also influenced independently by both horse and jockey and findings reflected the previously deciphered notion of physiological reciprocity in horse-rider relationships (Von Borstel & Konig, 2008). On this basis, it is suggestive that the attainment of an optimal relationship between horse and jockey results in the horse becoming a psychological expression of the human-self during flow experiences. Subsequently, given that minimal communication, locomotive harmony and positive psychological correlates characterise the optimal relationship between horse and jockey, these findings support the contention that being 'at one' with an equine partner does not solely concern physical harmony but also refers more broadly to positive affective and physiological sensations (Wipper, 2000; Wolframm & Micklewright, 2010b).

5.2.5 Suppression of negative thoughts

Experiences of flow were described as being periods of freedom from worry and negativity and were subsequently linked to performance automaticity. The suppression of pressure was derived from having a relaxed mind and was associated with a lack of concern for the outcome of races or the potential consequences of racing manoeuvres. In comparison to the nine dimensions of flow in sport (Jackson, 1996), this characteristic appears to mirror the loss of self-consciousness, which is described as the lack of concern for the self and negative thoughts. Notably, this general dimension differed terminologically in comparison to the *absence* of negative thoughts reported in elite golf (Swann et al., 2015a). The results revealed that feelings of negativity were quelled and concealed during the state of flow. However, it was interpreted that flow

was associated with the gravitation of attention away from negatively construed thoughts rather than their absolute abolishment. In supporting this view, the IPT (Wegner, 1994) can be utilised to support this terminological difference. Given that the IPT suggests that concurrent searches for preferred and ironic mental content occur during task performance, it is implied that negative content is still present and can be activated in the case of the emergence of a disruptor, as was indicated by the results concerning the disruption of flow. Likewise, in considering the theoretical proposals of the ACT (Eysenck et al., 2007) it could also be argued that the absence of anxiety associated with flow (Csikszentmihalyi, 1975) maintains the integrity of the attentional inhibition capacity which contributes to this perceived absence of negative thoughts. As a result, the use of the term *suppression* rather than *absence* of negativity in this study is supportive of the contention that the state of flow centres on the inference that "there is simply no attention left over to worry" (Jackson & Csikszentmihalyi, 1999, p. 27).

5.2.6 Sense of control

Unlike other sports, the level of control jockeys have over their performance is reduced due to the influence of the horse. A sense of control encompassed both perceptions of control over the performance and a feeling of control in the relationship between horse and jockey. In applying the theory of edgework (Lyng, 1990) to the relationship between horse and rider, it appeared that the fusion of horse and rider supported the proposal (Thompson & Nesci, 2013) that flow is associated with the metaphorical image of the centaur whereby horse and rider act 'as one'. Lagarde et al. (2005) asserted that horse riders face a somewhat paradoxical situation by having to move with the horse whilst simultaneously attempting to gain control over their equine partner. However, rather than having a feeling over control over their horse, flow was associated with a sense of control in the horse-jockey dyad. Notably, this also comprised the degree of control the horse had over their movement and equilibrium during the race which enhanced this feeling of locomotive control. As a result of the optimal interaction, jockeys outlined that this sense of control transferred to their performance and encouraged performance automaticity, which subsequently distinguishes the sense of control pertaining to equestrian sports.

5.2.7 Automaticity

Automaticity was reflected by a sense of effortlessness and the belief that everything happens naturally during such performances. Rather than the absence of effort per se, this perceived effortlessness was associated with a reduction in the level of felt effort and is indicative of the merging of action and awareness (Jackson & Csikszentmihalyi, 1999). Particular associations were made between the relinquishment of conscious control and the ability to perform instinctively during flow. This echoes the assertion that optimal attention is ascertained through minimal effort during flow experiences (Dietrich & Stoll, 2010). Additionally, this may also be reflective of EEG research which found that expert table-tennis players displayed more rapid shifts from activation of the verbal-analytical left-hemispheric region of the brain to the more efficient right-hemispheric region (Wolf et al., 2015). Jockeys also alluded to the fact that being relaxed in their mind permitted the execution of instinctive movements and that decision making appeared to be enhanced during such periods.

In contrast, jockeys associated periods of inhibited flow with anxiety and over-thinking, which is suggestive of the infiltration of unwanted thoughts as proposed by the ACT (Eysenck et al., 2007). Decision-making was emphasised as being slower and more effortful during periods of low-confidence and anxiety. Research in basketball has shown a positive link between self-efficacy and 'taking the first option' in decision-making scenarios, with the first options in these trials also being more effective than later options (Hepler & Feltz, 2012). In applying these findings to the absence of flow and the ACT (Eysenck & Calvo, 2007), the permeation of unwanted thoughts as a consequence of the onset of anxiety may increase the perceived scope of attention. Given that self-efficacy is associated with 'taking the first option' (Hepler & Feltz, 2012), a lack of self-efficacy may result in the individual failing to take the first option or taking more time to sift through alternative options before taking the right option. Although it is difficult to prove these assertions, the fact that compromised focus was associated with slow decision-making and the absence of automaticity amongst this sample, and that taking the first option is an important element of pressurised performance (Hepler & Feltz, 2012), there does appear to be some merit in these arguments.

In accordance with the dual process theory (Smith & DeCoster, 2000), the sense of automaticity, effortless and ease during flow epitomised the utilisation of the implicit

system. Jackson and Csikszentmihalyi (1999) clarify that the automaticity associated with sporting performance does not imply that athletes become robotic but that movements and decisions are carried out instinctively (Jackson, 1996; Singer, 2002). The outlined association between concentration and automaticity perpetuates the notion that minimal effort is required to attain the optimal level of attention conducive to flow (Dietrich & Stoll, 2010). Despite the perceived link between flow and automaticity, Toner and Moran (2014) assert that constant skill improvements in elite athletes are highly contingent on the performer's capacity to engage reflective modes of bodily awareness. On first glance, this may appear to be in conflict with the postulation that flow is solely associated with an external focus of attention (Wulf & Lewthwaite, 2010). However, in contextualising the opinion of Toner and Moran (2014), Jackson and Csikszentmihalyi (1999) differentiate self-consciousness from the self-awareness during flow. The authors assert that self-consciousness is disruptive to the flow state as it involves the splitting of attention between the action being performed and the apparent observation of that action. Alternatively, being self-aware merely involves the processing of information concerning the subtle nuances of their movement and could support the finding that golfers were aware of the flow state (Swann et al., 2015a) as opposed to being self-conscious.

Automaticity was also influenced by the perceptions of control in the horse-jockey dyad and the relationship between horse and jockey. Although previous research (Chavez, 2008; Jackson, 1996; Sugiyama & Inomata, 2005; Swann et al., 2015a) indicated action-awareness merging or automaticity as being indicative of the flow state, none of these studies involved subjects whose ability to perform in a given task was influenced by an animal. Consequently, the fact that a reduction in the level of negative reinforcement coincided with heightened automaticity amongst this sample is a novel finding. Furthermore, attaining an optimal relationship with the horse permitted a narrow-external focus of attention, as attention was not directed towards the attainment of this relationship. As a result, flow is characterised by automaticity within horse racing but, unlike traditional sports, is not solely dependent on the actions of the subject and is highly dependent on the horse and perceptions of the relationship between horse and jockey.

5.2.8 Intrinsic rewards

Flow experiences were described as being intrinsically rewarding by the majority of participants and referred to the level of enjoyment associated with the state of flow. In comparison to the nine dimensions of flow in sport (Jackson, 1996), this characteristic resembles the autotelic experience (Csikszentmihalyi, 1975). Some jockeys referred to the fact that experiences of flow and performance success were among the moments of greatest enjoyment in horse racing. Typically, the feeling of enjoyment was derived from the attainment of an optimal relationship with a superior horse and created a perception of effortlessness that permitted a sense of enjoyment and a feeling of fun during the performance. Given that jockeys referred to the enjoyment associated with flow and their desire to repeat the experience again, this reflects the suggestion that the autotelic experience incorporates both an experiential and a motivational element (Landhaußer & Keller, 2012).

In an effort to disentangle this notion of enjoyment during flow, Kimieick and Harris (1996) assert that enjoyment is considered to be the *process* of flow as distinct from the affective *product* of the experience, but they state that flow "is likely to lead to or be associated with positive affective experiences" (p. 259). A prime example of this distinction between flow and post-performance affect was reported in chess (Abuhamdeh & Csikszentmihalyi, 2012). A curvilinear relationship was demonstrated between enjoyment and performance such that enjoyment levels were maximised during games in which the players were level or when the subject was only marginally (one pawn) ahead of their opponent. Players attained the greatest levels of enjoyment competing against superior opponents, and, in the case of this study, playing games during which there was only a 20% chance of victory. Players reported higher levels of enjoyment during defeats to superior opponents than wins against inferior opponents. However, by replacing post-game affect as the outcome variable, post-game affect was greater for defeats over inferior opponents than losses against superior opponents. However, jockeys stated that the feelings of competence associated with winning were greater than those derived from losing races. Therefore, this implies that the enjoyment associated with flow differs from the consequential affective response and that prudent efforts should be made in flow research to differentiate these two entities.

5.2.9 Kinaesthetic alterations

The state of flow was associated with altered physiological and kinaesthetic perceptions in the entire sample of jump jockeys. Jockeys made reference to a heightening of their senses, an energetic feeling of alertness and a sense of lightness and relaxation during the state of flow. Similar to findings in the work of Chavez (2008), jockeys reported a heightening of their senses during the flow experience, whilst the perception of relaxation and weightlessness reported by golfers (Swann et al., 2015a) was also evident within this study. Similarly, the feeling of riding a high quality horse and being at one with the horse resulted in a distinct 'feel' being experienced that was symptomatic of experiences of flow in jump jockeys. This perpetuates the assertion that a feeling of oneness with a horse produces a unique ontological experience coinciding with flow (Thompson & Nesci, 2013).

In attempting to illuminate the theoretical underpinnings of altered bodily sensations during flow experiences, the biopsychosocial model (Blascovich & Mendes, 2000) can be utilised. In summarising the literature pertaining to challenge and threat states, both challenge and threat states activate the release of adrenalin which triggers heart-rate accelerations (Seery, 2013). However, a challenge state permits the optimum delivery of blood to the body through reduced peripheral resistance whereas the threat state is associated with artery constriction and the release of cortisol. On this basis, it could be argued that the kinaesthetic alterations associated with flow in this and other studies (Bernier et al., 2009; Chavez, 2008; Swann et al., 2015a) are derived from the maximal utilisation of an individual's physiological functioning capacities. In that case, rather than being conceptualised as an 'alteration' per se, it may be more appropriate to refer to these kinaesthetic perceptions as expressions of maximal physiological innervation. In support of this suggestion, Dienstbier (1989) affirms that cardiovascular reactivity during a challenge state in indicative of a proficient physiological stress response. Heightened arousal in anticipation of a challenge permits the optimal release of energy which is transported effectively to the brain and muscles through a reduction in vascular resistance. Furthermore, this would also weaken the assertion that rush comprises a distinct combination of flow and thrill (Buckley, 2012) and supports the view that that physiological activation is a feature of the flow experience which may necessitate an extension of the flow dimensions (Swann et al., 2015a). However, until physiological or psychophysiological studies examining alterations during flow in sport are undertaken, theoretical associations can only be inferred.

5.2.10 Altered cognitive perceptions

An alternation in cognitive perceptions was indicated as being a characteristic of the flow experience by six participants and was associated with concentration and a sense of control in the connecting analysis. A feeling of psychological relaxation contributed to a perceived alteration in time for some jockeys, something which was also derived from the sense of control in the relationship between horse and jockey. This perception of time transformation has previously been included in isolation in the nine dimensions of flow (Jackson & Csikszentmihalyi, 1999), though it is the least cited characteristics of flow in qualitative research (Swann et al., 2012). Friedman (1990) suggests that the perceptual distortion of time is derived from the intensification of concentration on task relevance cues and the lack of awareness for processes that are extraneous to task performance, such as time recognition.

Arguably, this distortion of cognitive perception may also be associated with the loss of memory in one participant, a characteristic that concurs with flow experiences in elite golf (Swann et al., 2015a), though this could also be a product of performance automaticity (Unestahl, 1979) as indicated in the connecting analysis. Another salient theme was the notion that an altered sense of being could accompany flow experiences, and reverberated with previous accounts of trance-like and detached states of consciousness during flow (Jackson, 1996). Although stating that it was not an outer body experience in the truest sense of the word, one participant alluded to the fact that some experiences of flow made him feel as though he was watching the race from an altered viewpoint and a created a feeling of detachment from the race. This feeling of objectivity gives the athlete the opportunity to step outside of the situation and allows the individual to adopt the perspective of an external observer, distancing themselves from negative feelings and emotions (Ellis, 1996). Overall, the emergence of altered cognitive perceptions as a characteristic of the flow state gives credence to the assertion that a relaxed and calm state of mind is indicative of flow (Chavez, 2008) and supports the viewpoint that future research could attempt to attain a greater understanding of brain-wave activation during such experiences (Jackson & Kimiecik, 2008) as recently attempted by Wolf et al. (2015).

5.3 Conditions influencing the occurrence of flow

In comparing the conditions that influenced the occurrence of flow in jump jockeys with previous research in elite athletes (Jackson, 1992; 1995; Swann et al., 2015a), it is

clear that similar themes have emerged, although novel findings pertaining to the idiosyncrasy of NH racing are also evident. By merging similar thematic categories that facilitate, inhibit and disrupt the occurrence of flow, 13 conditions are presented and discussed in relation to their influence on the occurrence of flow including; environmental conditions, situational conditions, physical and mental well-being, horse characteristics, demeanour and performance, high quality performance, confidence, arousal, motivation, focus, psychological strategies, preparation, experience and the non-optimal relationship between horse and jockey.

5.3.1 Environmental conditions

This factor referred to aspects within the environment on race-day that impacted on the psychological states of jockeys and their performance. From a facilitative point of view, an atmospheric environment heightened the level of excitement and encouraged optimal arousal. Some jockeys also spoke about a palpable sense of tension in the weigh-room on such occasions that contributed to heightened focus. In a race situation, being impeded by competitors had the potential to disrupt a horse's performance and trigger a cessation in the flow experience. Given that horses typically travel at speeds close to 40 miles per hour, jockeys must always be prepared for such scenarios. However, the impact of competitors is something which is largely uncontrollable for a jockey, particularly in situations when horses behave unpredictably. Therefore, although research in traditional sports had outlined that participants can be impeded by competitors (Jackson, 1995; Chavez, 2008), the unique nature of horse racing entails that a somewhat unpredictable animal could impact on their experience of flow. Consequently, jockeys reported that responding to the interruption involved efforts to regain the rhythm between horse and jockey. Therefore, the implementation of coping mechanisms in response to the breakage of flow and horse-jockey rhythm would appear to be warranted in order to maximise performance and attempt to regain flow.

5.3.2 Physical and mental well-being

In accordance with the suggestion that the type of sport and the physical demands involved dictate the elements contributing to physical readiness (Jackson, 1995), the idiosyncratic nature of the physical requirements imposed on jockeys contributed to a number of novel findings. Although failing to emerge as a significant factor, jump jockeys referred to the influence of their physical and mental state on flow and encompassed three key facets. Firstly, unlike flat-jockeys (Jackman et al., in press),

jump jockeys alluded to the negative influence of injuries on performance. Research has indicated that jump jockeys are 14 times more likely to suffer a fall during a race than flat-jockeys and are five times more likely to suffer an injury whilst riding (Forero-Rueda et al., 2010). Subsequently, the impact of injury is exacerbated in jump racing and probably contributed to the emergence of this factor. Similar to other elite athletes (Jackson, 1992; 1995; Chavez, 2008), injury emerged as an inhibitor to the occurrence of flow. In acknowledging that jockeys are capable of performing whilst injured, it was evident that this negatively impacted on their level of comfort and their ability to enter flow.

Secondly, the importance of being hydrated and content in their riding weight were reported as being facilitative to the occurrence of flow. Unlike other athletes who have to make weight restrictions on an intermittent basis, jockeys face a daily battle for the entirety of their careers to maintain their weight. Jockeys use a range of methods to induce weight-loss, including saunas, hot baths and food restrictions (Leydon & Wall, 2002), and typically consume just over two meals per day (Wilson et al., 2012). Making weight was also discussed in relation to mental well-being, the third element within this condition, and the inextricable link expressed resulted in the merging of both entities. Although mental well-being was only mentioned by a small number of participants, it has failed to previously be indicated as an influencer on the occurrence of flow. Rapid weight-loss is associated with impaired mental health and well-being in jockeys (Wilson et al., 2014) and has demonstrated a positive relationship with mood disturbance (Caulfield & Karageorghis, 2008). Although rapid weight-loss has demonstrated a negative performance with physical performance (Wilson et al., 2014; Dolan, Cullen, McGoldrick & Warrington, 2013), jockeys failed to show any signs of impaired motor response or decision making in either study. These findings would suggest that although the cognitive effects of rapid weight-loss are limited in this population, these methods adversely impact psychological well-being, which subsequently prevents flow. Consequently, maintaining weight in a manner that fails to elicit these negative effects is recommended for the occurrence of flow amongst this population.

5.3.3 Situational conditions

Situational conditions had a facilitative, inhibitive and disruptive influence on flow and themes pertained to the employment circumstances of jockeys and the interaction with

trainers and owners. The majority of jockeys stated that being in a favourable position and riding good horses enhanced their capacity to achieve performance goals and subsequently attain flow. Alternatively, the absence or sudden diminishing of optimal situational conditions contributed to the inhibition of flow. Additionally, although not as strongly evidenced, some jockeys also stated that receiving the right amount of riding instruction from the owner or trainer served to enhance their capacity to achieve flow. Alternatively, placing too much pressure on the jockey to carry out a specific race-plan or achieve unrealistic goals had an adverse impact on the occurrence of flow. Previous research has combined the environmental and situational conditions of flow (Jackson, 1995; Chavez, 2008; Swann et al., 2015b), though no studies explicated the importance of employment circumstances. However, as a clear distinction was evident between situational and environmental conditions in this sample, the separation of both elements permitted a greater level of understanding into the unique circumstances faced by jockeys.

5.3.4 Optimal motivation

Being motivated to perform emerged as both a facilitative and inhibitive condition to the occurrence of flow, though it did not emerge as a significant inhibitor. A deductive approach to describing flow in elite athletes (Jackson, 1996) concurred with the original notion that a challenge-skill balance was necessitated to attain flow (Csikszentmihalyi, 1975). However, given that a deductive approach limits the scope of thematic analysis at the highest level of abstraction, it is arguable that this approach may have limited the findings. In this study, no jockey alluded explicitly to a 'challenge-skill balance' and participants spoke about the two factors independently as confidence and motivation rather than complicity. Recent research in golf has employed a similar inductive method which also led to the separation of this union (Swann et al., 2015a). Nonetheless, this is not to say that a challenge-skill appraisal does not exist. On the contrary, it is just likely that the inductive method led to the independent emergence of these two conditions.

In an inductive exploration (Swann et al., 2015a) and connecting analysis (Swann et al., 2015b) of flow states in golf, a challenging task was considered to be both a condition and characteristic of flow. However, in this study the perception of challenge was viewed upon as a corollary to the state of flow. Additionally, Nakamura and Csikszentmihalyi (2002) describe the challenge-skill balance as being proximal

conditions for flow rather than a characteristic of the state. In relation to the determinants of motivation, jockeys stated that competing in important races or festivals enhanced their capacity to achieve flow, which echoes findings in professional golf (Swann et al., 2015a). Although Jackson and Kimiecik (2008) suggest that professional athletes may be influenced by extrinsic rewards, no jockey spoke of the monetary gain associated with such races and spoke entirely about the level of subjective value placed on such occasions. In his earliest seminal text, Csikszentmihalyi (1975) differentiated between the fundamental conceptualisations of the flow state and the autotelic experience on the basis that the state of flow can occur in the presence of external goals and rewards whereas the autotelic experience cannot. Given that flow is proposed to intensify depending on the level of subjective value an individual places on a task (Keller & Landhaußer, 2012), this appears to be the case in this study. The importance of certain races and meetings links to the second salient theme within this condition which refers to the level of challenge perceived by an individual. Flow was associated with optimally challenging situations when the skills and demands of the task were at a similar level. On the other hand, flow was inhibited when the challenge faced was not difficult enough or when the challenge greatly exceeded the capabilities of the horse. As a result, this corroborates with the flow model which states that boredom results from an individual's skill exceeding task demands, whilst anxiety materialises from the an appraisal in which demands outweigh the subjective perception of skill.

Flow was also influenced both positively and negatively by the formation of goals, one of the proximal conditions of flow (Nakamura & Csikszentmihalyi, 2002). Although only one jockey commented on the negative impact of unrealistic goals, this finding does concur with the belief that unrealistic goals can drive individuals to take risky options (Denrell, 2003), though this link did not explicitly emerge in this case. Nonetheless, this finding asserts that individuals should aim to create "just-manageable" challenge goals (Nakamura & Csikszentmihalyi, 2002, p. 90). Goals can be set prior to performance or emerge spontaneously during a performance in response to performance feedback (Jackson & Csikszentmihalyi, 1999) and are positioned on the edge of consciousness as an orientation aid (Locke & Latham, 2006). The attainment of optimal concentration was linked to having three types of goals. Firstly, some jockeys spoke of their intense desire to win, which was earmarked as the

benchmark for performance success amongst this population. Alternatively, although sparse in sample representation, one jockey stated that a reduction in task-orientation in association with impaired confidence prevented the occurrence of flow. Secondly, striving to achieve the best possible result for a horse also emerged as being facilitative to the occurrence of flow, although participants still stated that winning was more preferable than finishing second. Finally, flow was also facilitated by the intention to enjoy oneself during a performance and consequently supports the literal interpretation of the autotelic experience (Csikszentmihalyi, 1975).

In reference to the first two types of goal, achievement goal theory postulates the existence of two goal orientations, task and ego (Roberts, 2001). Task-orientation refers to an emphasis on self-referenced growth during goal progression, whereas an ego-orientation is associated with the attainment of supremacy over others. In applying this theory to the results of this study, it appears that jockeys describe the relevance of both task-orientation and ego-orientation based on their explication to both maximising the position of the horse and attempting to be victorious. Similarly, professional golfers have also described both task and ego orientation goals as being facilitative to the state of flow (Swann et al., 2015a). Interestingly, research has previously indicated that a high-ego/high-task orientation cluster is associated with superior confidence (Vosloo, Ostrow, & Watson, 2009). Consequently, it would seem that the simultaneous existence of high task-orientation and high ego-orientation goals is not only a reality in competitive sport but may also be positively linked to confidence in jockeys and other elite athletes.

5.3.5 Experience

Experience influenced the occurrence of flow in jump jockeys and was purported to be facilitative and inhibitive to the occurrence of flow. Only one study in elite athletes has previously indicated the role of experience in relation to flow (Jackson, 1995). One reason for the emergence of this theme within horse racing may be attributed to the fact that jockeys commence their careers at 16 and can be immediately pitted against jockeys with decades of experience. As a result, conditional and apprentice jockeys are allocated a weight-allowance which they can use to reduce the amount of weight a horse carries in a race. This measure is in place in an effort to provide trainers with an incentive to utilise inexperienced jockeys and consequently give younger jockeys an opportunity to learn and develop their trade. Therefore, although jockeys are assigned

to a trainer who acts as their Master, it is clear that their skills will develop quite organically through racing experience and an immersion within their social environment. Additionally, given that jockeys experience sequential progression as they lose their claim, the challenges they face gradually increase as they become more competent. Specifically, jockeys spoke about the development of racing skills and the importance of horsemanship in their horse-rider relations. By gaining experience, jockeys discussed the development of their technical proficiency, particularly during their time as conditional jockeys prior to losing their weight-allowance claim. Some jockeys also stated that the development of horsemanship enhanced their ability to interact optimally with the horse and stated that having less experience may cause jockeys to adversely influence their horse, particularly in situations when the horse is already displaying signs of anxiety. This finding is supported by previous equestrian research which demonstrated that expert riders demonstrate less somatic anxiety than novice riders (Wolframm, Shearman, & Micklewright, 2010).

In addition to greater technical proficiency, experience was purported to enhance the coping capabilities of jockeys during challenging situations, such as important races or meetings. A salient trend which emerged was that experience coincided with an enhanced ability to cope with both positive and negatively construed circumstances and that this quality was experientially developed over time. In addition, reference was made to the belief that the ability to cope was perceived as possessing trait-like qualities, though this quality could be enhanced through experiential learning. As a result, this finding is suggestive of the existence of individual differences that influence the occurrence of flow in jockeys and is suggestive of the autotelic personality (Csikszentmihalyi, 1975), an individual difference which is associated with a higher propensity to attain and sustain experiences of flow (Baumann, 2012). Despite being proposed as an avenue for research in sport over two decades ago (Kimiecik & Stein, 1992), little progress has been made in defining and conceptualising the autotelic personality within flow research on sport (Swann et al., 2012).

5.3.6 Preparation

Solely deciphered as a facilitative condition, feeling prepared consisted of tactical and behavioural preparation prior to a race. From a tactical point of view, jockeys alluded to the importance of analysing their competitors in a race and developing a race-plan that enhanced their capacity to succeed in a race. Additionally, this race-plan was

developed in consideration of their horses profile and the importance of developing an understanding of the horse emerged as an influencing factor. Previous encounters with the horse in training or in previous races enhanced their level of familiarity with their equine partner and contributed positively to tactical preparation. Similar to elite golfers (Swann et al., 2015b), pre-performance routines also assisted jockeys to attain an optimal level of focus prior to a race. Singer (2002) suggests that the use of pre-performance routines permits performance automaticity and encourages individuals to put themselves into "an optimal emotional, high self-expectant, confident, and focused state immediately prior to execution, and to remain that way during the act" (p. 367). In particular, mounting a horse in the parade ring was viewed as the initiation of pre-race procedures and was the first point at which a jockey came into contact with their horse prior to a race.

5.3.7 Psychological strategies

Similar to other qualitative (Jackson, 1995; Swann et al., 2015b), and quantitative findings (Jackson et al., 2001), jockeys reported that the usage of psychological strategies prior to a race augmented their capacity to reach the optimal psychological state conducive to flow. Directing attention towards the present moment following both positively and negatively assessed performances was considered as being facilitative to the attainment of optimal focus and flow. Although not explicitly referred to in this terminology amongst this population, mindfulness is defined as the present attention of focus (Stratton, Cusimann, Hartmann, & DeBoom, 2005), and has been conceptualised as being; (1) the recognition of internal sensations; (2) the direction of attention towards external stimuli; and (3) the commitment towards athletic actions, which is in agreement with the opinionated description. On a typical racing day, jockeys could ride in as many as seven races at a meeting with 30 minutes generally separating race times. However, when the race time, parade ring discussions and the procedures of weighing-in and weighing-out are considered, the time period afforded to jockeys between races is minimal and possibly compels the need for mindfulness more so than in other sports.

Specifically, jockeys spoke about the heightening of affect after the completion of a race which subsequently needed to be quelled in preparation for their next race. Research has indicated that mindful individuals are less likely to display signs of neuroaffective reactivity in response to positive and rewarding feedback in comparison

to less mindful individuals (Teper & Inzlicht, 2014). In attempting to fill the void within sport psychology for a sport-specific measure of mindfulness, Thienot et al. (2014) created a three-factor questionnaire to measure the three concepts of mindfulness (Gardner & Moore, 2012). In testing the construct validity of this questionnaire in comparison to other external aspects, flow demonstrated a significant positive correlation with an awareness of internal sensations and the refocusing of one's thoughts on upcoming goals. Likewise, Kee and Wang (2008) previously showed that mindfulness capabilities demonstrated a positive relationship with flow and mental skills adoption. Again, it appears that some element resembling the autotelic personality is at play here which is operationalised in situational circumstances.

5.3.8 Horse characteristics, demeanour and performance

All jockeys stated that the horse facilitated the state of flow and is a significant determinant in the relationship between the horse and jockey. A consistent trend was the importance of the horse on performance outcome and the state of flow, which also highlights the possible elusiveness of flow amongst this population. The horse had the capacity to inhibit and disrupt flow through its demeanour, characteristics or performance. In describing this condition, the terms *characteristics, demeanour* and *performance* were used to cluster the emerging themes. The characteristics of horse were considered to be more stable qualities, such as the ability of the horse and their general temperament. On the other hand, the demeanour of the horse encapsulated situational-specific description of the behaviour of the horse prior to and during a race. Finally, performance referred to the functioning of the horse during a race, which was said to be influenced by both the characteristics of the horse and their demeanour.

A common acknowledgement was the fact that all horses possess their own temperamental characteristics that are demonstrated through their behaviours in training and their race-day demeanour. References were made to a perception that some horses try harder and are tougher than others, whilst jockeys also acknowledged that a feeling of confidence transmitted by the horse during a race could also be interpreted. Similarly, relaxation and the attainment of optimal arousal also emerged as being facilitative to the occurrence of flow, whereas being over-energised reduced the horse's energy resources and subsequently impacted on the jockey's interaction with the horse. McBride and Mills (2012) describe horse racing as a low-complexity equine

sport and imply that a heightening of arousal is somewhat of a necessity, as indicated by high catecholamine secretion in racehorses (Jiminez et al., 1998). However, they also state that exceeding an optimal level has detrimental effects on performance. This corroborates with the fact that over-arousal prior to and during a race is indicative of poor performance (Hutson & Haskell, 1997).

The emergence of over-arousal prior to a race was not as pronounced amongst this population in comparison to flat-jockeys (Jackman et al., in press). Three possible explanations can be proposed for this. Firstly, flat horses typically commence their racing careers as two-year-olds and high quality colts and fillies generally retire by the end of their three or four-year old careers. Alternatively, National Hunt horses typically begin their career over obstacles as four-year-olds and some can continue racing until the middle of their teenage years. In a cross-sectional study investigating the stress response in fillies, Noguieira and Barnabe (1997) reported that cortisol levels were highest in yearlings, and lowest in three-year-olds. As a result, it appears that a form of stress tolerance is developed in thoroughbred horses which may be derived from training and race exposure. Secondly, flat-racing constitutes a much shorter and more explosive form of racing than the comparatively longer and slower jump racing. Sprint horses are associated with greater muscular hypertrophy (Hill et al., 2012) whereas NH horses possess larger hearts (Young, 2003). Therefore, based on the important role of the equine spleen in oxygen carrying capacity (Kearns et al., 2002) and the smaller heart size of flat racehorses (Young, 2003), it is arguable that innervation of a flat racehorses musculature requires a significantly higher level of epinephrine, which propagates the prevalence of heightened arousal in flat-racing.

This leads onto the final point with regards to the differing pre-race procedures in both flat and jump racing. Jump racing commences with the horses typically circling in a group at the starting point before an official signals that the race can commerce. However, in flat races, the horses are loaded into the stalls and released simultaneously. It has been reported that the average heart rate of a horse during this loading procedure was 132 beats per minute (Krzywanek, Wittke, Bayer & Borman, 1970), which is greater than half of the maximal heart-rate of the thoroughbred horse. Therefore, horses can commence the race in a highly-aroused state, particularly in the case of horses that are averse to the loading procedure. Some horses fail to load into stalls which results in them being withdrawn from the race whilst others may also

become fractious if they spend too long in the stalls. As a consequence, it could be argued that national hunt horses typically display more relaxed behaviours and that a particular level of relaxation is not as discernible as it would be in flat racehorses.

In terms of performance, jockeys stated that a horse travelling (galloping) comfortably and jumping proficiently throughout a race enhanced performance appraisals which subsequently contributed to flow. Alternatively, a horse struggling to jump and maintain the pace being set during a race resulted in negative performance feedback which subsequently inhibited flow. Finally, a poor jump or a loss of galloping rhythm had the potential to trigger a cessation in flow and disrupted the relationship between horse and jockey, which resulted in the jockey engaging in efforts to regain racing rhythm. Though these performance qualities were looked upon as being race-specific, jockeys also stated that some horses possess greater ability than others. Particularly strong references were made to the effortless galloping rhythm and unique jumping capacities of certain horses. Being balanced played a role in determining both of these qualities, and had particular relevance for jumping, a distinguishing feature of jump racing. Jockeys also stated that some horses were mode adept at finding the correct jumping stride and that their ability to land and continue running was influenced by their ability to regain their balance promptly upon landing. In contrast, a horse that struggled to gallop and jump not only prevented the optimal synergy of horse and rider but also compromised the focus of the jockey. During a race, a negative assessment of the horse's performance forced them to consciously direct attention towards attempting to enhance the performance of the horse. As a result, this exemplifies a narrow-internal type of attention (Nideffer & Segal, 2006) whereby the attention scope is narrow and is directed internally towards the horse. Subsequently, this is in conflict with the assertion that an external focus of attention is conducive to flow (Wulf & Lewthwaite, 2010). Therefore, this substantiates the reasoning behind the inhibition and disruption of flow as a consequence of a horse performing poorly or being disrupted during a race.

5.3.9 Non-optimal relationship between horse and jockey

The absence of this unity between horse and jockey was reported as being an inhibitor and disruptor to flow. It was suggested that a failure to acquire this relationship early in the race would subsequently prevent the occurrence of flow for the remainder of the race due to the negative performance appraisals and energy wastage that occurred

previously. A lack of confidence and being over-energized were viewed as being entities that could be influenced independently by both horse and jockey and which subsequently influenced the other party. In the case of being over-energized, a horse being keen and failing to settle could compromise the task appraisal of the jockey and enhance their level of anxiety. In accordance with the ACT (Eysenck et al., 2007), this could then result in the permeation of unwanted thoughts during a race, as demonstrated by the association that a number of jockeys made between anxiety and over-thinking. In a similar vein, jockeys also stated that having a lack of confidence could also be transmitted to their horse and that this could negatively impact performance as a result. This perpetuates the assertion that a reciprocal and parallel relationship exists between horse and rider and that horses are capable of interpreting the negative physiological sensations expressed by riders (Von Borstel & Konig, 2008; Von Borstel et al., 2005). Whereas being at one with the horse was acknowledged as a characteristic of flow, a lack of harmony and an unbalanced partnership prevented the occurrence of flow. Likewise, an error during the race triggered the cessation of flow by disrupting the level of harmony between horse and rider which subsequently led to a change in focus as the jockey directed attention towards regaining their racing rhythm and position. A poorly balanced horse forced jockeys to alter their riding style and adopt a less favourable position to counter the locomotive deficiencies of their horse, which ultimately resulted in less dyadic efficiency.

5.3.10 Confidence

Confidence was recognised by all jockeys as being facilitative to the occurrence of flow and was strongly represented as a facilitative, inhibitive and disruptive condition. Although confidence also emerged as a characteristic of the state of flow, this section will solely focus on the condition of flow which acted to influence the realisation of the flow state. In assessing the range of higher-order themes pertaining to this condition, it was clear that confidence, self-efficacy and other-efficacy were key factors within this condition. Unlike other research with elite athletes (Jackson, 1992; Jackson, 1995; Chavez, 2008), other-efficacy emerged as being a key factor within jump jockeys. By utilising a connecting analysis, this study travelled a step beyond the aforementioned studies and unhinged the factors that contribute to the realisation of optimal confidence in jump jockeys. Similar to research in golf (Swann et al., 2015b), confidence was influenced by the highest number of other conditions and was

impacted by a total of seven other conditions including experience, situational conditions, preparation, enhanced performance, physical and mental well-being, environmental conditions and the horse characteristics, demeanour and performance.

Significantly, this condition emphasises the benefit of the connecting analysis method in linking independent categories (Maxwell, 2012). Previous studies have merely highlighted the conditions of flow and failed to create any form of synergy between these conditions. For example, previous research (e.g. Chavez, 2008; Jackson, 1992; 1995) has reported each of the sources of confidence identified within this study as being independently influential to the occurrence of flow. However, the connecting analysis within this study evidences that a high proportion of the conditions impact on athlete confidence, which subsequently influences the other psychological correlates, including focus, motivation and arousal. Therefore, it is plausible to argue that rather than directly influencing the state of flow, it may be more appropriate to suggest that these conditions influence flow through psychological variations, as evidenced by the connecting analysis. Although this is merely an observation based on these findings, theoretical (Vealey et al., 1998) and qualitative (Hays et al., 2007) research on the sources of confidence in athletes would support this proposal. Additionally, the sources of sport confidence (Vealey et al., 1986) have demonstrated a positive relationship with flow which was mediated by confidence (Koehn, Pearce & Watt, 2013). Consequently, a reconciliation of flow research with other theories of psychology may be warranted to advance future understanding and integrate flow more coherently within mainstream sport psychology.

A period of confidence coincided with the facilitation of flow, whereas a lack or loss of belief prevented or disrupted the occurrence of flow. In accordance with the sport-confidence model (Vealey, 1986), the higher-order theme of confidence referred to the degree of belief performers had in their ability as jockeys. In recognising the demands of elite sport, Jackson (1995) suggests that increasing confidence is more important to the occurrence of flow in elite athletes due to the rarity of sub-ordinate challenges. Given that the necessity for an increased challenge was rarely mentioned, the emphasis placed on the importance of confidence would support Jackson's (1995) assertion. Additionally, this also supports the importance of *skill* within the challenge-skill proposal (Csikszentmihalyi, 1975). A significant influence on a confidence appraisal was the importance of succeeding and winning races which is indicative of a

demonstration of ability within the sources of sport confidence (Vealey et al., 1998). Winning served to solidify each of the jockey's belief in their ability, with some even stating that a poor performance in a winning race could enhance confidence more substantially than a good performance during defeat.

Reference was also made to the fact that confidence was susceptible to fluctuations in all jockeys and that a win was generally required to regain confidence. Performance feedback played a critical role in perceptions of confidence, with a losing streak contributing to a reduction in confidence, which adversely impacted on performance, arousal and concentration. Some jockeys also stated that, similar to the development momentum in response to winning, a substantial and continual decline in confidence coincided with recurrent losses. During such periods, some jockeys spoke about purposely taking the time to assess their performances and use strategies to boost their confidence. However, it was also added by some jockeys that this reflective intervention was a skill that had improved and been developed as they became more experienced and capable of dealing with reductions in confidence. This period of reflection, during which performers actively attempted to assess problems with their performance and rectify them, could support the role of somaesthetics (Shusterman, 2008; 2011), as advocated by Toner and Moran (2014; 2015). This is boosted by the fact that jockeys willingly acknowledged that periods of low confidence were associated with a failure to allow performances to materialise instinctively.

Bandura (1997) defined self-efficacy as being the degree of belief one has in their ability to succeed in a given task. Given the situational nature of the flow model and the challenge-skill appraisal (Csikszentmihalyi, 1975), it is no surprise that self-efficacy has demonstrated a positive relationship with flow (Pineau, Glass, Kaufman & Bernal, 2014). From a situational point of view, self-efficacy played a critical role in the occurrence of flow and was represented by the level of belief jockeys had in their ability to succeed in a given race. In the case of pressurised situations, the assertion that coping self-efficacy enhances performance (Nicholls, Polman, & Levy, 2010) was indicated in this study. Although it was indicated that a reciprocal relationship existed between self-efficacy and winning, the impact of a high-quality performance appeared to have a greater impact on self-efficacy than self-efficacy had on performance. This echoes previous research which found that the more proficient individuals become in performing skills, the more likely they are to be dependent on performance outcomes

to influence self-efficacy (Feltz, 1982). In concurring with theoretical (Feltz, Short, & Sullivan, 2008) and empirical (Beattie, Lief, Adamoulas, & Oliver, 2011) self-efficacy evidence, performance accomplishments played a key role in the development of efficacious beliefs. The belief that performance enhancements were associated with outcome-derived self-efficacy is supportive of the fact that performance is more likely to be predicted by outcome self-efficacy than performance efficacy (Martin & Gill, 1991). Alternatively, a lack of belief in their capacity to succeed in a race had a negative impact on performance and some jockeys stated that this resulted in a negative attitude before and during performances, something which could subsequently be interpreted by the horse.

Although self-efficacy played an important role in situational flow, other-efficacy emerged as a key element of a race appraisal and accounted for the belief the jockey had in the capabilities of their horse to succeed in a race. Similar to research in the equestrian sport of eventing (Beauchamp & Whinton, 2005), other-efficacy enhanced feelings of self-efficacy and contributed favourably to the challenge-skill appraisal. Given that the majority of racing performance outcome was attributed to the horse in this sample, other-efficacy is undoubtedly a factor that plays a key role in the propensity for flow in jockeys. In comparing the sources of other-efficacy with previous research in elite athletes (Jackson, Knapp & Beauchamp, 2008), jockeys stated three major factors emerged, comprising comparison with similar athletes, comparison with past partners and psychological and physiological aspects of the horse. Based on the findings which emerged in this study, it could be argued that the locomotive capabilities of the horse could be an extended feature of the antecedents of other-efficacy in horse sports. Jockeys stated that other-efficacy enhanced their ability to perform and contributed positively to the relationship between horse and rider. Consequently, this echoes the fact that other-efficacy enhances rider performance in horse-rider sports independently of self-efficacy (Beauchamp & Whinton, 2005).

5.3.11 Focus

Given that flow is proposed to stem from the intensification of concentration (Moran, 2012b), it was unsurprising that focus emerged as being a facilitative, inhibitive and disruptive condition to the occurrence of flow in jump jockeys. Similar to other elite athletes (Jackson, 1995), and in agreement with the assertion that the flow state is associated with effortless attention (Bruya, 2010) and performance automaticity

(Swann et al., 2015a), the ability to allow a performances to materialise instinctively necessitated the relinquishment of conscious control. This contentment to allow the performance to unfold through minimal cognitive effort was in contrast to the effortful nature of performances during the absence of flow. Generally speaking, this deterring feature was derived from a lack of confidence and the absence of positive performance feedback. Alternatively, relinquishing conscious control was associated with increased confidence which highlights the assertion that the crucial threshold for the realisation of flow is the transference from conscious to non-conscious processing (Dietrich, 2004).

As already discussed within arousal and psychological strategies, the instantaneous heightening of concentration coincided with a state of relaxation and the commencement of the pre-performance routine. Specifically, jockeys refereed to being aware of their physical state and the need to convert their heightened arousal into a state of relaxation and positivity whilst also acknowledging that the routine of mounting the horse in the parade ring permitted concentration on their performance and the relinquishment of conscious control. Therefore, given that mindful acceptance is conceptualised as the recognition of internal sensations, direction of attention towards external stimuli and a commitment towards athletic actions (Gardner & Moore, 2012), mindful acceptance, although not explicitly referenced in this terminological form by any participant, appears to influence the occurrence of flow in horse racing. Previous cross-sectional research has reported the existence of a positive correlation between mindfulness and flow (Kee & Wang, 2008; Thienot et al., 2014). Given that a reduction in positive affect is associated with the occurrence of flow (Baumann & Scheffer, 2010) and that mindful acceptance of emotional circumstances is associated with reduced neuroaffective reactivity (Teper & Inzlicht, 2014), theoretical evidence suggests that mindfulness may have a role in the occurrence of flow, though the acceptance of emotion has yet to be integrated within flow theory. Research has also deciphered that mindful acceptance was a strategy exemplified by swimmers as being influential to the occurrence of flow (Bernier et al., 2009). Given that a similar finding emerged within this study, it could be suggested that the highly kinaesthetic and tactile nature of both sports may have made this finding more pronounced within these samples, given that swimmers and jockeys make contact with water and the horse in their respective sports.

Indications were also made that the scope and attentional style of jockeys influenced the occurrence of flow. In outlining the attention styles utilised at various stages, jockeys referred to the use of all four attentional styles proposes by Nideffer and Segal (2006). Prior to a race, a broad-internal style was used to formulate a race plan and assess the potential tactics of the opposition. The adoption of a narrow-external focus of attention was permitted by a positive appraisal of the performance of the horse and contributed to automaticity through the optimal relationship between horse and jockey, as discussed within the characteristics of flow. Alternatively, when a performance was not going to plan and when a non-optimal relationship existed between horse and jockey, an increase in the communication messages being sent to the horse was indicative of a shifting of concentration away from the race and towards the performance of the horse. Therefore, a heightened necessity for these observable reinforcement methods suggests the requirement for a narrow-internal attentional style (Nideffer & Segal, 2006) as the jockey requests a response from the horse. However, a narrow-external focus is proposed as being more conducive to performance automaticity (Wulf & Lewthwaite, 2010), one of the characteristics of flow (Swann et al., 2015a). This assertion is reinforced by the positive link in the connecting analysis exhibited between the optimal interaction between horse and jockey and performance automaticity.

5.3.12 Arousal

Attaining an optimal level of arousal was viewed as being both facilitative and inhibitive to the occurrence of flow amongst jump jockeys. Participants referred to a facilitative increase in arousal prior to races which necessitated the utilisation of psychological strategies and highlighted the importance of coping with augmented arousal. Despite indicating the perceptibility of augmented arousal in pre-race preparation, jockeys also stated that being relaxed was a key component of race performance, which is of particular importance in equine sports due to the hyper-sensitivity of horses and their ability to detect physiological signals (Von Borstel & Konig, 2008; Von Borstel et al., 2005). However, jockeys did state that this heightened arousal could be interpreted as positive energy and transmit a sense of confidence to the horse. Given that coping strategies were indicated as playing a key role in the positive interpretation of pre-performance arousal augmentations, this is indicative of

the temporal arousal fluctuations prior to performance parachute jumpers (Fenz & Epstein, 1967) and the role of suitable coping strategies (Fenz, 1988).

On the other hand, jockeys stated that inexperience and an inability to cope reduced their capacity to deal with heightened arousal which impacted negatively on the horse and their performance. In comparing the utilisation of coping strategies in expert and novice performers, Fenz (1988) found that expert performers were more adept at utilising coping strategies to deal with heightened arousal prior to performance than novices. Jockeys stated that dealing with pressure during important races and racing festivals assisted them in achieving optimal arousal and flow. Based on the fundamental supposition that flow is derived from perceiving the ability to succeed in a challenging situation (Csikszentmihalyi, 1975), parallels can subsequently be observed between coping and the attainment of flow in accordance with the biopsychosocial model of challenge and threat states (Blascovich & Mendes, 2000). This model outlines that a challenge state derives from an individual perceiving their resources to outweigh the demands of the task, whilst a threat state is associated with the demands of a task exceeding the efficacy beliefs of the individual. The temporal physiological alterations reported amongst jump jockeys are in congruence with the suggestion that a challenge-appraisal leads to the adoption of a challenge state (Seery, 2011).

Research has indicated that appraising a situation as a challenge versus a threat state is associated with superior task performance and reduced anxiety (Moore, Wilson, Vine, Coussens, & Freeman, 2013), enhanced physiological performance (Moore, Vine, Wilson & Freeman, 2014), and increased attentional control (Vine, Freeman, Moore, Chandra-Ramanan, & Wilson, 2013). This link between a challenge state and attentional control signifies the relevance of the ACT (Eysenck et al., 2007), although it should be noted that no empirical research to date has explored the relationship between challenge appraisals and flow in sport per se, possibly owing to the elusiveness and unpredictability of flow (Jackson, 1992), although theoretical parallels have been discussed. Anxiety is associated with increased cognitive effort (Eysenck & Calvo, 1992; Nieuwenhuys & Oudejans, 2012) which is in conflict with the effortless attainment of attention during flow (Bruya, 2010). Research in golf reported that elite players acknowledged the utilisation of coping strategies to maintain the state of flow (Swann et al., 2015a). Therefore, the theoretical implication of the coping and challenge-threat literature, in combination with the findings of this study would

suggest that preparatory mechanisms which enhance an individual's capacity to appraise as a challenge state could be utilised to proliferate the potential for flow.

Invariably, the carryover of heightened pre-race arousal to a performance was also associated with reduced self- efficacy and other-efficacy beliefs which resulted in an unfavourable challenge-skill appraisal. Given that anxiety is inferred to occur in such situations within flow theory (Csikszentmihalyi, 1975), the theory of challenge and threat states in athletes (Jones, Meijen, McCarthy & Sheffield, 2009) could also be utilised to enhance understanding of the adverse impact of a negative performance appraisal. In accordance with this theory, a threat state is associated with low self-efficacy and a low sense of control over performance. Given that the horse plays such a crucial role in performance appraisals, a lack of other-efficacy could reduce the level of control that jockeys perceive they have over performance. Additionally, given that somatic anxiety is viewed as being the physiological expression of cognitive anxiety (Martens et al., 1990), the link between anxiety and compromised focus expressed within this study can be substantiated by the ACT (Eysenck et al., 2007).

Although jockeys stated that a heightening of arousal resembling the challenge state (Jones et al., 2009) was experienced prior to a race, a contradictory feeling of relaxation was also experienced during the race. In discussing this alteration, jockeys expressed that mounting their horse in the parade ring was viewed as being a significant moment that relieved them of non-performance related anxiety, such as talking to trainers and owners, and allowed them to focus purely on their performance. As a result, this moment of performance initiation was associated with relaxation and signified the start of a pre-performance routine which involved cantering towards the starting point of the race. This finding reverberates with the proposal that mindful acceptance can act as an adjunct or trigger to the occurrence of flow (Bernier et al., 2009), as demonstrated by the instantaneous concentration and relaxation reported upon mounting.

5.3.13 High-quality performance

Similar to previous research in elite athletes (Jackson, 1995), appraisals concerning performance served to facilitate, inhibit and disrupt the occurrence of flow in NH racing. Notably, the connecting analysis supported the contention that confidence and performance feedback shared a reciprocal relationship. As a result of this finding and

previous research indicating the relationship between challenge-skill balance and unambiguous feedback (Kawabata & Mallett, 2011), mutual links can subsequently be drawn between these two factors. Starting positively was integral to the initiation of flow and bolstered both self-efficacy and other-efficacy in the early stages of a race. On the other hand, a poor start in a race inhibited the occurrence of flow and was largely borne from the horse failing to settle early in the race. As a result, this negative feedback resulted in performance alterations, reduced efficacious beliefs and adverse task appraisals. Moreover, a poor start also compromised focus by forcing jockeys to direct attention towards their bodily actions in altering their position on the horse. Although jockeys stated that an efficient galloping rhythm could be regained later in the race, their awareness of the lasting effects of energy wastage during the early stages of the race adversely impacted the challenge-skill appraisal.

As already stated within confidence, being victorious served to enhance confidence and increase the possibility for flow to occur. On the other hand, failing to ride winners or experiencing a reduction in the number of winners served to inhibit and disrupt flow respectively. As indicated within motivation and confidence, jockeys placed a significant emphasis on winning, something which is probably affected by the professional nature of their sporting involvement. In examining relations between self-determination theory (Deci & Ryan, 1985), motive disposition theory (McClelland, 1985) and the state of flow (Csikszentmihalyi, 1975), Schuler and Brandstatter (2013) found that the satisfaction of psychological needs does not independently predict flow. In sum, individuals with a higher achievement motive are more likely to be influenced by perceptions of competence satisfaction and their experiences of flow are more likely to coincide with feelings of competence. Alternatively, flow experiences in individuals with a lower achievement motive are less likely to be dictated by perceptions of competence. As a result of these findings, Schuler, Brandstatter and Sheldon (2013) have proposed and found evidence for a matching hypothesis which suggests that inter-individual differences in flow experience are determined by both individual motives and needs. Further research has indicated support for the matching hypothesis and also demonstrated that a high achievement motive-competence satisfaction relationship failed to demonstrate a link with positive affect (Schuler, Wegner & Knechtle, 2014). This solidifies the contention that individuals with a high achievement motive are more likely to be stimulated by challenges rather than the

positive affect derived from task completion (McClelland, Koestner, & Weinberger, 1990). Although no quantitative measures of the autotelic personality were assessed in this study, there does appear to be evidence of the matching hypothesis (Schuler et al., 2013) within this research as flow experiences were highly contingent on perceptions of competence.

5.4 Limitations

Although the findings of this study have been presented and discussed with regard to the extant literature, there are limitations. Firstly, as with any qualitative study, the subjective nature of data analysis and interpretation of findings derived may be contrary to the opinion of others. By utilising a peer debrief system, it was hoped that the potential for bias would be minimised as a result. Furthermore, the utilisation of quotes and the number of the jockey ensured that the qualitative data was representative of the sample. Secondly, although the connecting analysis (Maxwell, 2012) presents a novel method to reconciling the conditions and characteristics of flow, it is difficult to understand the conditions under which each of these connections are evidenced and generalise the order in which such connections materialise. On a related point, although the connecting analysis provides a more coherent understanding of flow, it is not possible to determine at the point flow actually begins and the neurological factors that underpin the transfer from regular consciousness to the state of flow. Thirdly, studies have previously stated that participants were unaware of the term flow (e.g. Jackson, 1992). All participants in this study were initially unaware of the term and efforts were subsequently made by the researcher to direct the participants towards an understanding of the flow state without biasing their description (Swann et al., 2015a). Although the researcher failed to proceed to the next stage of the interview until satisfaction with the articulated description flow was achieved, it could be suggested that the obscurity of Csikszentmihalyi's (1975) flow impinges on empirical research efforts. Finally, it could be argued that the sample size is small. However, this size is equal to the sample size in previous single-sport studies of flow in sport (Swann et al., 2015a; Swann et al., 2015b) and due to the recurrence of themes, the sampling of 10 professional jockeys was deemed sufficient for the study.

Chapter Six: Conclusion and Recommendations

6.1 Conclusion

This study explored the conditions that influenced the occurrence of flow in professional jump jockeys and characterised the experience of flow amongst this cohort. Additionally, a connecting analysis (Maxwell, 2012) was utilised to enhance the level of coherency between the conditions and characteristics of flow in jump jockeys and exemplified that flow involves a click of numerous circumstances (Hefferon & Ollis, 2006). Overall, 29 influencing conditions emerged, comprising 12 facilitators, 10 inhibitors and seven disruptors. In comparing the findings to athletes in traditional sports (Chavez, 2008; Jackson, 1992; 1995; Russell, 2001; Sugiyama & Inomata, 2005; Swann et al., 2015b; Young, 2000), the majority of conditions reported within these studies were evident within jump jockeys. A novel finding within this equestrian sport concerned the influential impact of the characteristics, demeanour and performance of the horse on jockey flow experiences. Jump jockeys placed a greater level of emphasis on the motion and motor co-ordinations abilities of the horse and discussed the influence that this had on their capacity to attain an optimal relationship with the horse.

In assessing the wide range of conditions influencing the occurrence of flow in jump jockeys, the connecting analysis has indicated that rather than conceptualising all of the conditions for flow on a singular-level, a more stratified conceptualisation may advance understandings of flow, as evidenced within the results chapter. In reconciling the findings of the connecting analysis, the discussion of conditions integrated a range of theories to substantiate the links evidenced. Particular attention was given to the sources of sport-confidence model (Vealey et al., 1998), the theory of challenge and threat states (Jones et al., 2009) and the attentional control theory (Eysenck et al., 2007). Consequently, by stratifying the conditions influencing the occurrence of flow, this study goes beyond a previous connecting analysis within flow research (Swann et al., 2015b) and advances previous understanding of the flow state in horse racing jockeys (Jackman et al., in press). Researchers had previously alluded to the possibility of a unique flow experience in horse-rider sports (e.g. Maurstad et al., 2013; Thompson & Nesci, 2013). In support of this contention, the optimal relationship between horse and jockey characterised the experiences of flow in jump jockeys. Partnering horses with superior ability permitted the attainment of this optimal relationship which was characterised by locomotive harmony, jumping synchrony,

merging as one, confidence and relaxation. This feeling of oneness permitted an external focus of attention which is conducive to the occurrence of flow (Wulf & Lewthwaite, 2010) and contributed to enhanced kinaesthetic perceptions, something which is not included within the nine established characteristics of flow (Jackson & Csikszentmihalyi, 1999). However, recent inductive explorations of flow (Chavez, 2008; Swann et al., 2015a) have suggested that a refinement of the deductively derived characteristics of flow (Jackson, 1996) may be warranted, particularly in the case of altered kinaesthetic and physiological sensations. Jockeys commented on the unique 'feel' derived from partnering a superior horse and the discernible yet elusive feeling of uniting with such horses.

A salient theme which subtly appeared in this study was the belief that personality characteristics contributed to the occurrence of flow. Although Kimiecik and Stein (1992) proposed that flow is contingent on the interaction between personal and situational factors, the preponderance of research has focused on situational experiences of flow in sport (e.g. Bernier et al., 2009; Chavez, 2008; Jackson, 1992; 1995; Russell, 2001; Sugiyama & Inomata, 2005; Swann et al., 2015a; Young, 2000) and has largely ignored the conceptualisation of an autotelic personality in sport (Swann et al., 2012). Particular references were made to the necessity for coping abilities to deal with race pressure and to prevent the misappropriation of efficacious beliefs during flow experiences, something which was viewed upon as being an experientially developed trait. Jockeys also stated the need to quell feelings of positive affect following race victory in order to re-focus for the next race. As a result, this is the first study on flow in sport to indicate the role of post-performance strategies in order to facilitate upcoming performance, something which is possibly more pronounced in horse racing due to the strenuous scheduling demands imposed on jockeys. Nonetheless, it is still suggestive of the fact that the search for and acceptance of a challenge results in the suppression of positive affect (Baumann & Scheffer, 2010). As a result, these reflective processes appear to echo the notion of mindfulness and supports the assertion that mindfulness facilitates automatic goal-focussed processes (Birrer, Rothlin, & Morgan, 2012) and may act as an adjunct to flow (Bernier et al., 2009). This supposition gains particular credence due to the fact that mindful individuals display reduced neuroaffective response to positive feedback in comparison to less mindful individuals (Teper & Inzlicht, 2014). This notion of

mindfulness and reflection may also be linked to the notion of somaesthetics (Shusterman, 2011) and the belief that skill improvement necessitates the direction of attention towards bodily movement in training (Toner & Moran, 2015). Consequently, it may be the case that autotelic personalities display a higher frequency of flow experiences due to their willingness to actively engage in self-reflection and strive for continuous improvement by downwardly shifting from automatic to conscious-awareness through somaesthetic awareness (Shusterman, 2008) and the purposeful suppression of the ego (Kelly, 2011).

6.2 Recommendations

Based on the findings of this study, a number of applied and research recommendations are advocated.

6.2.1 Research

From the point of view of research in horse racing, jockeys in this study attested to the gradual increase in technical, tactical and psychological skills during the early stage of their career. Due to the unique nature of the conditional and apprentice jockey process in horse racing, an exploratory study into the development of jockeys over the course of this period could yield interesting results. Given that research on flow states in jockeys has concentrated on professional riders, it would also be interesting to assess the materialisation of this state in amateur riders and assess differences and similarities between professional and amateur riders. Additionally, given that horse racing is one of the few sports in which male and female jockeys compete equally and that research to date has focussed solely on male performers, a study evaluating the experiences of female jockeys is necessary.

With regards to the occurrence of flow in equestrian sports, a number of future avenues could be explored. Firstly, horse racing jockeys ride a number of horses on any given day and will typically ride in 300-400 races over the course of a season. Given that the kinaesthetic alterations associated with jockey flow experiences invariably occurred when partnering superior horses, these appraisals were largely derived from a comparison with other horses. However, within equestrian sport, riders will typically partner a smaller number of horses and may have a greater understanding of the horse's personality and be more likely to identify subtle differences in their horse on any given day. Subsequently, it would be interesting to explore flow within equestrian

riders to assess the possibility of intra-equine variance between different performances and assess the prospect of shared flow within this population (Keaveney, 2008). Secondly, given the heightened level of task complexity involved in the equestrian sports of eventing, show-jumping and dressage, an exploration of flow within these sports may also yield subtle differences.

In relation to the potential advancement of flow research in sport, four potential avenues for future are suggested. Firstly, despite the research progression on flow in sport in the last two decades (Swann et al., 2012), there is still a lack of understanding in relation to flow causation and the changes that constitute the passage from normal functioning to the perceived state of flow. Consequently, neurocognitive research into brain functioning during experiences may assist to advance understanding, particularly given the evidence surrounding the potential link between mindfulness and affect reactivity (Teper & Inzlicht, 2014), given that flow is associated with affective alterations (Baumann & Scheffer, 2010). Clarification on the causal mechanisms underpinning flow would also assist to develop understanding on *how* the state can be realised, particularly on the basis that intervention studies, to date, have reported nebulous results (Swann et al., 2012). Secondly, an enhanced understanding of the conceptualisation and influence of the autotelic personality within sport is necessary. For example, cross-sectional research on dispositional flow has demonstrated links with mindfulness (Kee & Wang, 2008) and mental toughness (Crust & Swann, 2013). Subsequently, investigations into the links between these constructs and flow may also assist in situating flow within sport performance. Additionally, jockeys evidenced the role of managing positive affect and utilising strategies to quell emotions prior to, during and after performances. As a result, it could be interesting to assess the role of coping strategies in the occurrence of flow, given that emotion focussed-coping strategies (Bortoli, Bertollo, Hanin, & Robazza, 2012) would appear to share theoretical links with this finding.

Thirdly, the connecting analysis is a novel method which has succeeded in enhancing the coherency between the characteristics and conditions of flow (Swann et al., 2015b). However, quantitative measures should attempt to investigate these connections which could enhance understanding of flow causation. Additionally, given that links were established between multiple characteristics of flow, it would be interesting to assess whether or not flow experiences and the characteristics of flow experiences can differ

depending on situational circumstances or personal characteristics. Finally, although interviews have typically been used to extrapolate information concerning the flow experience (e.g. Jackson, 1992; 1995; 1996; Bernier et al., 2009; Chavez, 2008; Swann et al., 2015a), these accounts of flow could be impacted by retrospective bias and memory recall (Brewer, Van Raalte, Darwyn, & Van Raalte, 1991). As a result, an innovative method could be to adopt a "near-experience" approach, as utilised by Seifert and Hedderson (2010) and attempt to interview athletes that have experienced flow within a specific time period (e.g. in-situ or within one week) after the performance. Although the unpredictability of flow may present a challenge to researchers, this approach could yield alternative and perhaps purer descriptions of the flow experience.

6.2.2 Practice

In applying the findings of this study, jockeys consistently identified the importance of relinquishing conscious control in order to maximise performance and attain the flow state. An appreciation for the adverse impact of over-thinking and a lack of relaxation was highlighted by the sample, with jockeys also stating the importance of identifying such periods and actively attempting to tackle these problems. In dealing with performance problems, jockeys alluded to actively attempting to enhance their confidence, which included sources from the sport-confidence model (Vealey et al., 1998) including preparation and enhancing their physical and mental well-being. As a result, performers should try to develop the capacity to identify periods during which their performances are below-par and understand the controllable mechanisms through which they can attempt to deal with psychological deficiencies. Additionally, given that this study outlines the conditions influencing the occurrence of flow and the connections between the conditions and characteristics of flow, an awareness of these findings may enhance the awareness of psychological processes among jockeys and potentially enhance the frequency of flow experiences.

Given that flow was associated with periods of confidence, enhanced performance and winning, trainers and owners could utilise these markers to book jockeys that are 'in-form' to enhance their chances of performance success. For example, a jockey that has experienced a recent in surge in their wins-to-races ratio is more likely to experience confidence augmentations and perform more effectively during the race. Additionally, a prudent approach towards the psychological development of the jockey would be to

gradually expose the conditional or apprentice jockey to progressively greater challenges, as participants outlined the importance of the learning process. By mastering challenging tasks, individuals are capable of enhancing their skill and competence levels (Csikszentmihalyi, Abuhamdeh, & Nakamura, 2005). Consequentially, by gradually exposing the conditional jockey to increasingly difficult tasks, trainers are more likely to induce the occurrence of flow and enhance rider competencies, something which may be of considerable interest to the Masters of conditional and apprentice jockeys.

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Appendices

Appendix A: Interview Guide

Introduction

Can you tell me how old you are and how long you have been a jockey? What is the highest level at which you have competed?

Introducing Flow

Have you ever heard of the term flow? If no, have you heard of the terms 'in the groove'…perhaps from other sports?

If yes, could you now describe what you think that this experience would be like in racing?

If no, Can you think of a performance that was optimal and extremely enjoyable? Could you describe what that was like?

If content that description is that ok flow, continue.

Characteristics of Flow

Can you think of a personal experience in racing which was similar to this?

Could you describe that experience in as much detail as possible? Thoughts? Feelings?

Conditions Influencing Flow

Can you think of a performance in which you may have experienced something like that? Elaborate? Give me more detail?

Can you think of a performance in which you may have experienced something like that? Elaborate? Give me more detail?

And have you ever been in that state and had that feeling suddenly stop?
Elaborate? Give me more detail?

Appendix B: Qualitative information letter

Postgraduate Area,
WIT Library,
Waterford Institute of Technology,
Cork Road Campus,
Waterford
10/01/14

Dear Sir,

My name is Patricia Jackman and I am a postgraduate researcher in Waterford Institute of Technology. The topic I have chosen for my research is 'An exploration of conditions influencing the occurrence of flow in Irish professional horse racing jockeys'. Although a number of studies have examined various areas relative to your sport, few have examined the psychological aspects involved in racing performance. I am making all jockeys aware of this study and will be contacting you by phone in the coming week to discuss if you would like to participate in this study. Having been in touch with The Turf Club, a website containing the contact details of all riders was utilised to source contact details. Your contribution will be invaluable in assisting the establishment of conditions relating to this 'zone' experience in horse racing.

The study will involve an interview where I will be asking you some questions about your experience of flow during races which should take less than 45 minutes. I intend to audio record interviews in order to accurately gather your thoughts and experiences. Anonymity is guaranteed at all times during the presentation and discussion of the study findings. All data collected will be strictly confidential and used solely for the purpose of this research. Ethical approval has been granted by the Institutes Ethics Committee.

I will be contact with you in the coming days by phone to discuss if you would be willing to participate in this study. You are invited to participate in this study and are free to withdraw your contribution at any time. I would greatly appreciate your involvement in my research, which I believe will be of interest to jockeys and others within the industry. If you have any further questions please do not hesitate to contact me or my supervisors at the contact details listed below.

Thanking you in advance,

_____

Patricia Jackman
Email: pcjackmanresearch@gmail.com
Phone: xxxxxxxxx
Principal Supervisor: Gerry Fitzpatrick (gfitzpatrick@wit.ie)
Co-supervisor: Dr Aoife Lane (alane@wit.ie)

Appendix C: Consent Form

Consent Form

Study Title: An exploration of the flow experience in professional horse racing jockeys.

I _____ certify that I am over 18 years old and am voluntarily giving my consent to participate in research exploring flow in jockeys being conducted by Patricia Jackman in Waterford Institute of Technology. I have read and understood what is involved in this study and recognize that the aim of this research is to gain a better understanding of this experience in horse racing.

Procedures

Participants will be asked to take part in an interview which will last approximately one hour. Participants will be asked about their experience of flow and the conditions which influenced this occurrence. Participation in this study is voluntary and participants are free to withdraw at any stage without question. All information will be treated in a confidential manner and that all results will be reported collectively, with no information used outside of the purpose of this research. If you have any questions please do not hesitate to ask the interviewer.

I voluntarily agree to take part in this study and allow this interview to be audio recorded in the knowledge that all information will be treated confidentially and only summary results will be reported.

Signed: _____ Date: _____

Appendix D: Inductively generated characteristics of the experience of flow in jump jockeys

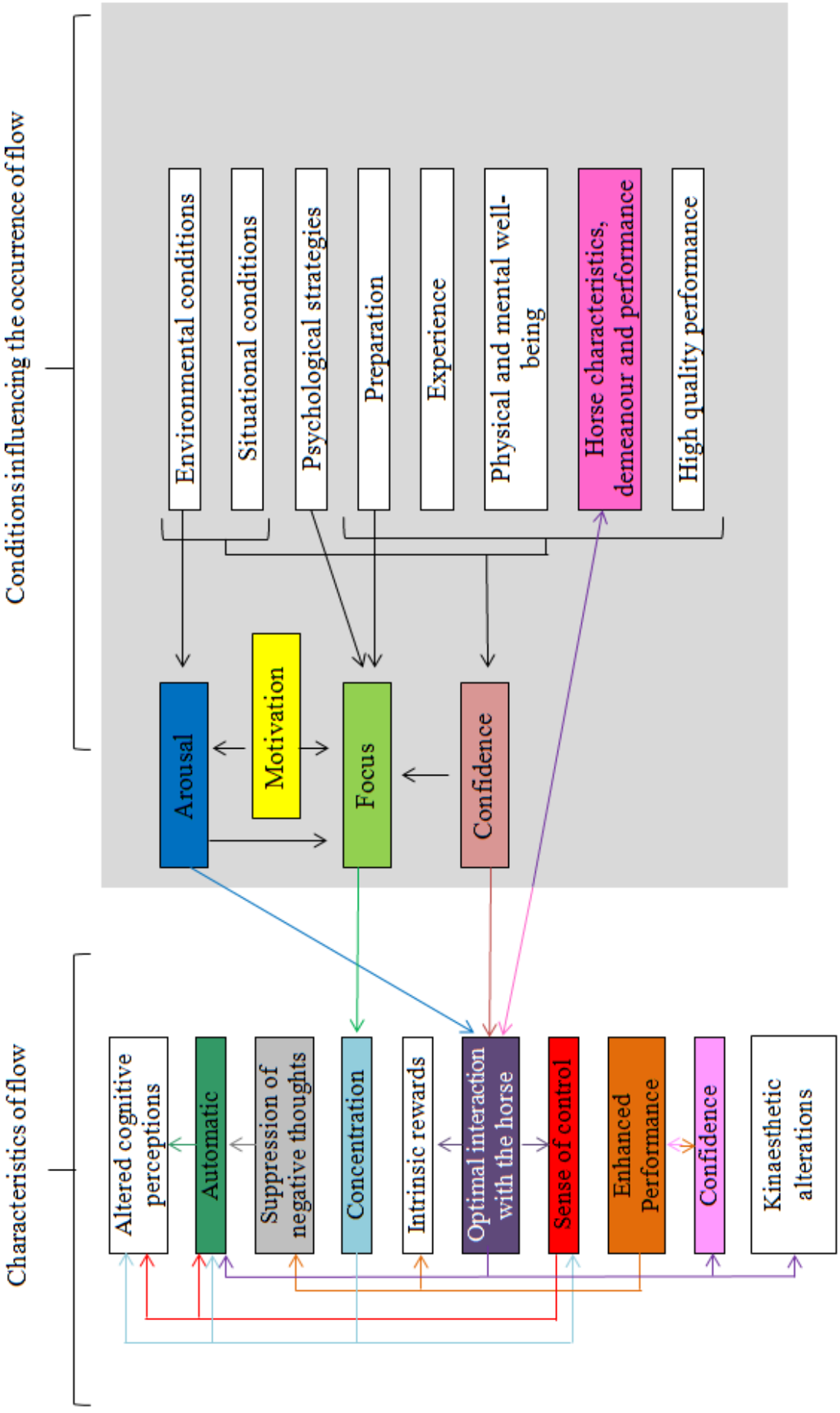
General dimension	Higher-order theme	Raw-data theme
Confidence (10)	Feeling of confidence (8)	You have an air of confidence about you.
		It's just a confidence in myself.
		A confident feeling is a lot of it.
		You get more confidence.
		You are confident
		Supreme confidence in myself
		You have more confidence in yourself
		Just suddenly get this belief inside you
		Your confidence is up
	Performing confidently (5)	Riding with confidence
		The more confidence you have the better you ride
		You feel like you can do nothing wrong
		I can certainly feel it when I'm riding with confidence
	Feeling positive (2)	Have a positive edge
		You are a bit more positive.
Automaticity (10)	Effortlessness (3)	Things are probably happening that little bit easier
		Quick decisions are coming that little bit easier
		You are able to make decisions quickly
	Performing instinctively (7)	Things seem to happen a lot smoother.
		You aren't trying as hard
		Performing on instinct
		You are just doing everything off instinct
		Everything just seems to happen
		You don't have to think
		Doing things without even realising
		Are in almost autopilot really.
	Automaticity (6)	It's just…automatic really
		Just go with the flow of it all
		You are going with it
		Everything is in a flow
		You go out with your idea of what you want

	Things happen naturally (7)	to do and it just flows Let it happen more naturally You just let it sort of happen a little bit more naturally Things just happen a lot more naturally Everything you just do in the race comes naturally to you Everything happened naturally It just comes natural, Everything happens kind of naturally
Enhanced performance (10)	Everything is going well (10)	You feel like you can do nothing wrong When everything is going well. I was in the right place at the right time, the whole way through the race Everything just happened as it should have done Tactically, physically, mentally, everything clicking together It just clicks Feeling very well in yourself Everything going right and easy It's a moment when everything is going right Everything is going perfect
	Performance unfolds favourably (2)	You are just getting the rub of the green and things will go Everything that could have gone right, went right in that particular race
	Everything coming together (2)	It just clicks Things come together
Altered cognitive perceptions (7)	Loss of memory (1)	Half of the race I can't even remember It was as though I had a mind-blank
	Reduction in conscious processing (4)	It was a bit surreal. It takes ten or twenty seconds after the race for it to sink in that you actually did it You just aren't aware of it until it's over You don't look at anything, you just carry on

	Altered sense of being (2)	I was in a bit of a trance really You just kind of escape from it all You nearly see everything else going on You feel as though you know everything that's going to happen before it happens
	Heightened awareness (1)	Heightened awareness
	Time slows down (2)	Things are happening a little bit slower Everything seems to slow down
Kinaesthetic alterations (10)	Heightening of senses (2)	Everything is a bit heightened Heightens your senses as well
	Feeling of alertness (6)	Definitely you feel more awake and it probably More aware Makes you more alert You're more awake You're alive to the situation Increases energy
	Relaxed (4)	It gets me excited Feeling relaxed Totally at ease with yourself You just relax
	Feeling of lightness (3)	It's like a weight is lifted You have clear air and a clear mind You are definitely freer
	Altered kinaesthetic perceptions (6)	Distinct 'feel' from interaction with the horse Difference in how jockeys is carried by horse Just the 'feel' they give you (4)
Sense of control (6)	Sense of control over performance (4) Sense of control in the horse-jockey dyad (4)	Always where you want to be (2) Know you are going to win (2) You feel more in control (3) You know everything that will happen
Intrinsic rewards (10)	Enhanced future motivation (3)	It's what keeps you going It's all about getting back on that winner again Just want to keep winning Don't want to stop winning

	Enjoyment (3)	It's more enjoyable You get to enjoy the sport You are enjoying the spin
	Fun (3)	It's so much fun You're quite happy It's just a happy feeling
	Unforgettable experience (2)	Unforgettable experience I'll never forget it
Optimal relationship with the horse (10)	Confident (3)	Confident partnership Exchange of confidence (2)
	Relaxed (4)	Relaxed (4)
	Jumping in sync (2)	Jumping as one
	Galloping harmony (4)	Balanced partnership In rhythm together (2)
	Enhancement in tactile sensitivity (4)	More efficient movement Minimal cueing generates response Soft contact on reins Respond to command
	Merging as one (4)	Understanding Merging as one (2) At one with the horse
Concentration (8)	Concentration (8)	Total concentration (4) Tunnel vision One-track mind In your own bubble Being in the right frame of mind Get in the zone
	Relaxed in your mind (5)	Totally relaxed in your mind (2) Not-over thinking Mentally calm (2)
Suppression of negative thoughts (6)	Suppression of pressure (2)	Feel under no pressure Don't put pressure on yourself
	Suppression of worry (2)	You don't question anything You don't worry
	Suppression of negative thoughts (3)	You don't look at any negatives You aren't worried about making mistakes If something goes wrong, it doesn't matter, you just keep going

Appendix E: Connecting analysis of the flow experience in jump jockeys



Appendix F: Inductive content analysis of the conditions facilitating the occurrence of flow in professional jumps jockeys

General dimensions	Higher-order theme	Example raw-data theme
Horse temperament, demeanour and performance (10)	Greater ability (7)	Better horses(5)
		More ability (5)
		Touch of class (1)
	Good jumper (6)	Brilliant jumper (2)
		Pick a stride well (1)
		Set themselves up to jump (1)
		Better jumper (6)
	Galloping ease (6)	Travel easier (5)
		Move to the start easily (2)
		Being in rhythm (1)
	Balanced (3)	Good balance (1)
		In control of own equilibrium (1)
		On an even keel (1)
	Relaxed (3)	Calm (1)
		Composed (1)
		Relaxed (1)
	Confident (5)	Gains confidence (3)
		Horse is feeling good in itself (1)
		Has trust in you (1)
		Confident horse (2)
		Feeling fresh and well (1)
	Horse performing well (5)	Horse exceeding expectations (3)
		Horse travelling within itself (2)
		Keeping with the pace (1)
		Jumping well (2)
	Determined (2)	Tries hard (2)
		Horse feels “up for it” (1)
Confidence (10)	Having confidence (6)	Feeling confident (4)
		Belief in yourself (4)
	Believe you can win (6)	Belief that you can win (3)
	Confidence in horse (6)	Belief in the horse (3)
		Believing you are on the best horse (4)

		Confident in horses jumping (2)
High-quality performance(10)	Race going well (6)	Everything seems to be going right (4)
	Start well (4)	Performance couldn't be going better (1) In ideal position (1) Get a nice position (1) You feel it from early on (1)
	Winning races (8)	You are where you want to be tactically (1) Settle in behind a good horse (1) Riding winners (7) Winning races (1)
	Riding well (4)	Riding well (1) Enhance performance of the horse (2) Horses running well for you (1) Make the right decisions (2)
Situational (8)	Riding good horses (7)	Riding good horses good horses (7)
	Demanding schedule (1)	Good opportunities (1)
	Positive relationship with trainer/owner (2)	Busy schedule (1) Trust in jockey (1) Confidence in jockey (1) Right amount of instruction (2)
Preparation (7)	Tactical preparation (6)	Tactical preparation (2) Assessment of race pace (2) Study the form (2) Having a plan (3) Feeling prepared (1)
	Knowledge of the horse (5)	Knowledge of horse capabilities (1) Watch race replays (1) Knowledge of how a horse likes to race (1) Understanding of horse (1) Rapport developed with horse (1)

	Pre-performance routine (4)	Worked and schooled horse (1) Sat on the horse before (1) Having a routine (4)
Focus (7)	Relinquish control (6) Increase concentration on the horse (5)	Letting it happen (4) Just let it happen (2) Instantaneous concentration upon mounting (3) You are in the zone when you get up on him (1) Once you get the up, he is all yours (1)
Psychological strategies (5)	Coping with pressure (4) Mindfulness (3) Mental imagery (1)	Capable of dealing with pressure (4) Staying level-headed (2) Keeping a lid on it (emotion) (1) Forgetting about the past (1) Staying in the present (1) Re-focus on the present (1) Visualise the race (1)
Arousal (7)	Relaxed (6) Positive energy (4)	Relaxed (4) Calm (2) Completely relaxed (1) Positive energy (2) Excitement (3)
Environment (5)	Positive atmosphere (5) Optimal ground (1) Comfortable amongst peers (1)	Good atmosphere at the track (3) Good atmosphere in the weigh-room (1) Big build-up (2) Buzzing atmosphere (2) Horse gets its preferred ground Comfortable amongst peers (1)
Experience (5)	Developed as a rider (3) Having experience (3) Horsemanship (3)	Developed decision making (2) Developed technical proficiency (2) Having experience (3) Horsemanship (3) Confident around horses

		Ability to interpret the horse (2)
Motivation (7)	Important races (5) Clear goals (4) High motivation (2) Challenging situation (4)	Important festivals (4) Big races (3) Not trying to prove anything (1) Try to do your best (2) Aim to enjoy it (2) Desire to win (5) Zoned in on winning (1) Looking forward to it (2) Horse not is an outsider (2) Pressure situations Big races (3)
Physical and mental well-being (3)	Content in riding weight (1) Physical readiness (3) Hydrated (1) Feeling good (2)	Content in riding weight (1) Optimising training regime (1) Feeling fit (3) Warming up (1) Hydrated (1) Mentally well (1) Feeling well in yourself (1)

Appendix G: Inductive content analysis of the conditions inhibiting the occurrence of flow in professional jumps jockeys

General Dimension	Higher-order theme	Raw-Data Theme
Non-optimal horse demeanour, characteristics and performance (10)	Lesser ability (6)	Lesser ability (4)
		Horse is not good enough (2)
		Moderate horses (1)
		Poor balance (1)
	Poor balance (2)	Pull hard (1)
	Travelling poorly (6)	Lazy (1)
		Under pressure to gallop (5)
		Going half a stride quicker than you want to (1)
		Behind the bridle (1)
	Jumping poorly (5)	Poor jumper (4)
		Poor chaser (1)
	Difficult horse to ride (1)	Difficult to ride (1)
	Over-energized (2)	Keen (2)
		Wasted energy early on (2)
		Sweating in the parade ring (1)
	Not determined (2)	Doesn't try hard (2)
Negative performance feedback (10)	Race not going well (7)	Horse not capable of performing actions (2)
		Horse cannot sustain the pace (3)
		Things are not working (1)
		Dropping back (1)
	Not riding winners (6)	Not riding winners (6)
		Going through a bad spell
	Making mistakes (5)	Making mistakes (1)
		Rushing (3)
		Try to change things (1)
		Not giving the horse a chance (1)
	Poor start (3)	Start poorly (2)
		Not in an ideal position (1)
Lack of confidence (10)	Not riding with confidence (4)	Not riding with confidence (4)
		Riding with fear (1)
	Low confidence (6)	Apprehensive (1)

		Not having confidence (4)
		Negative attitude (1)
		Question yourself (1)
	Doubt (6)	Doubt (3)
		Self-critical (2)
		Worry (3)
		Fell on the horse before (1)
	Lack confidence in the horse (3)	Lack of confidence in the horse (3)
		Know that the horse can't win (1)
		Hoping for luck (1)
Non-optimal motivation(3)	Unrealistic goals (1)	Putting too much pressure on the horse (1)
	Compromised task orientation (1)	Trying to prove a point (1)
	Lack of a challenge (1)	Lack of a challenge (1)
Non-optimal relationship between horse and jockey (5)	Lack of harmony (3)	Horse not responding (3)
		More effortful movements (1)
	Unbalanced partnership (2)	Unbalanced partnership (1)
		Out of balance (1)
	Lack of confidence (2)	Lack of confidence (1)
		Lack of trust (1)
	Over-energized (2)	Over-energized (2)
Non-optimal situational circumstances (5)	Riding poor horses (4)	Riding poor horses (4)
	Non-optimal interaction with Trainer/Owner (2)	Too much instruction (1)
		Feeling compelled to carry out plan (1)
		Lack of autonomy (1)
	Changed job circumstances (2)	Riding inferior horses (2)
Compromised focus (7)	Compromised focus (3)	Concentrating on what the horse is doing wrong (2)
		Have to give the horse more help
	Over-thinking (4)	Over-analysing things (3)
		Thinking about trainers instructions
		Creating problems in your head
	Slow decision-making (2)	Second-guess yourself
		Decisions don't happen quickly (2)
	Focus on negatives (2)	Focus on what you are doing wrong
	Forcing things to happen (5)	Trying to hard

		Try to force things to happen
Physical problems (3)	Not totally fit (3) Not feeling well (1)	Injured (2) Riding in pain (1) Not feeling well (1) Feeling down (1)
Lack of experience (3)	Lack of experience (3)	Not having experience in racing (3) Panicking under pressure (1)
Non-optimal arousal (4)	Anxiety (4) Negative vibe (2)	Not relaxed (2) Uptight (1) Putting too much pressure on yourself (4) Transmit negative vibe (2)

Appendix H: Inductive content analysis of the conditions disrupting the occurrence of flow in professional jumps jockeys

General Dimension	Higher-order theme	Raw-Data Theme
Horse performance disrupted (6)	Poor jump (5) Losing rhythm (2)	Missed a jump (5) Loss of rhythm (2)
Loss of confidence (5)	Loss of confidence (4) Doubt (2)	Knowing you cannot win Lack of confidence in ability (3) Loss of confidence (2) Realise that other horses are going better (1) Doubt (1) Worrying (1)
Performance problems (5)	Fall (3) Stop riding winners (3) Performance not going well (3)	Hitting the ground Falls Stop riding winners (3) Things start going wrong (2) Make an error (2)
Non-optimal environmental conditions (5)	Impeded by competitor (5)	Competitors takes your ground (2) Getting hampered by a horse in front (2) Get into trouble in running (1) Getting a bump (1)
Physical problems (2)	Getting injured (2)	Getting injured (2)
Loss of optimal relationship between horse and jockey (3)	Loss of harmony (3)	Loss of rhythm (2) Changed rhythm (1)
Non-optimal challenge (2)	Non-optimal challenge (2)	Challenge too great for the horse (2)
Over-thinking (3)	Over-thinking (3)	Over-thinking during race (3)