Team Flow:

The Missing Piece in Performance

Thesis submitted in fulfillment of the

requirements for the degree of

Doctor of Philosophy by Research

College of Sport and Exercise Science

Erez Mosek

Student ID: 3851299

Victoria University

March 2017

Abstract

Attempts have been made to understand the complex dynamic relationships involved in team sports and explain the nature of successful performance. In sports, these components are particularly relevant because athletes often attribute peak performances and outcomes to psychological states such as team flow. This thesis focused on exploring team flow state as an independent construct whose dimensions need to be identified by research. The purpose of this thesis was to conceptualize team flow state and develop an inventory to measure it.

The thesis included four interconnected studies. In Study 1, I used a phenomenological qualitative research design to capture team flow state experiences of athletes, coaches, and sport psychologists. Thematic analysis of the data generated 14 team flow dimensions, seven similar to individual flow and seven new team flow dimensions. In Study 2, I developed the Team Flow State Inventory (56-item TFSI) based on the content of the team flow theoretical model created in Study 1. The analysis of the qualitative data for the dimensions generated 102 raw data statements which were divided between 32 first-order themes, creating a pool of items for the TFSI. Confirmation of the structure, content validity and comprehensibility of the 56 item TFSI was provided by five flow experts, who made suggestions and confirmed the face, content validity, and comprehensibility of the inventory. A pilot study further supported the clarity and comprehensibility of the inventory. In Study 3, I performed CFA which determined the internal structure and psychometric characteristics, as well as the goodness of fit of the TFSI with the hypothesized theoretical model of team flow. A sample of 358 active athletes in various team sports was recruited to complete the 56-item TFSI. Because the 56-item version of the TFSI did not produce a satisfactory fit, item-deleted alphas, and standardized residual covariance were used to improve the model fit by omitting one item from each dimension. Results showed all fit indices of the 42-item TFSI were at least acceptable x^2/sd = 2.31, RMSE = 0.06, TLI = 0.90,

and CFI = 0.92. Internal validity was also satisfactory with Cronbach alpha coefficients that ranged from α =.69 to α =.87. These results confirmed the acceptable construct validity of the TFSI. In study 4, I examined and established significant discriminant validity between the TFSI and measures of individual flow (Flow State Scale-2; FSS-2), team cohesion (Group Environment Questionnaire; GEQ), and collective efficacy (Collective Efficacy Questionnaire for Sports; CEQS), indicating that team flow is a construct that is independent of individual flow and distinct from team cohesion and collective efficacy.

The contributions of this thesis lies in offering a new conceptualisation of team flow in sport as an independent concept, designing the 42-item TFSI, a valid and reliable inventory for measuring experiences of team flow state, the 42-item TFSI, and suggesting future directions for research and practice on team flow in sport.

Doctor of Philosophy Student Declaration

“I, Erez Mosek, declare that the PhD thesis entitled "Team Flow: The Missing Piece in Performance" is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references, and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work”.

Signature

Date

30.03.2017

Acknowledgements

It has been a long road to finally reach this point. Alone I would not have been able to make it. Therefore, I would like to thank the people who contributed their time, thoughts, energy, and concern to assist me in completing my journey.

First of all to my principal supervisor, Professor Tony Morris, who devoted his experience, wisdom and time to ensure that every initiative was properly developed. To my co-supervisor, associate Professor Anthony Watt, who encouraged me to express myself, and motivated me to move forward. I would also like to express my gratitude to all the athletes, coaches, and sport psychologists who were willing to meet with me and share their personal experiences or dedicate time to fill out the inventories which formed the core of these studies.

This project could not have been completed without the assistance of colleagues like: Professor Roni Lidor who shared with me his knowledge and assisted in recruiting participants; Yossi Bonen (Matchas), a friend and a basketball coach who offered warm encouragement and support in locating participants; Associate Professor Daryl Marchant, who was willing to expose his students to my work; Grace Schirripa, a senior officer in the Graduate Research Centre, who provided me with the informative knowledge I needed, and acted behind the scenes to ensure all administrative requirements were met; Professor Mark B. Andersen provided professional guidance in the interviewing process.

I have respect and admiration for Victoria University and especially for the College of Sport and Exercise Science, which enabled me to follow my academic quest to the completion of this thesis. I am also very grateful to the generosity of the Australian government that partly funded this thesis.

I was fortunate to have many friends who encouraged me through this long journey, but I mostly cherish the support of my family who gave me the confidence and love to achieve my goals.

Table of Contents

APENDICES

List of Tables

List of Figures

CHAPTER 1: INTRODUCTION

Team flow is described as a state of optimal experience involving a team's total absorption in a task, as well as a state of consciousness that optimizes performance (Cosma, 1999). Although much has been learned about the terms - team (e.g., Carron, Hausenblas, & Eys, 2005) and flow (e.g., Csikszentmihalyi, 1975, 1990), the combination of the two, creating the term team flow, has typically been neglected. The current research was conducted to better understand the construct of team flow and to develop an inventory to measure team flow. The attainment of these aims should enable the development of specific interventions for facilitating and maintaining team flow.

Flow is identified as a key construct in the field of positive psychology (e.g., Nakamura & Csikszentmihalyi, 2002). Flow has been the focus of a great deal of interest since its inception by Csikszentmihalyi in 1975 and has become the most studied optimal experience in sport (Swann, et al., 2017), thereby gaining worldwide attention (Bonaiuto, et al., 2016). Flow has been described as a state of optimal experience involving total absorption in the task at hand, and the creation of a state of mind where optimal performance is capable of occurring (Csikszentmihalyi, 1990; Russell, 2001).

A state of flow is a valued experience and source of motivation for many individuals undertaking physical activity. This is true whether one is engaged in high-level competitive sport activities or in a fitness endeavor. Flow may also occur in non-sport contexts such as learning, work, surgery, and dancing as long as the necessary skills needed to meet the challenge are present (Egbert, 2003). The ability to attain flow can elevate an experience to high levels of enjoyment and achievement, thereby transforming the experience from the mundane to the optimal (Jackson, 1996; Jackson & Csikszentmihalyi, 1999).

The apparent associations between flow state and peak performance makes understanding flow significant for athletes, coaches, and sport psychologists. Harnessing or

facilitating the optimal experiential state of flow should place performers in the most opportune position to operate at their best (Jackson, 1996). Knowledge of these factors is important in helping athletes reach optimal performances (Russell, 2001).

Many attempts have been made to understand the complex dynamic relationships involved in team sports and explain the nature of successful performance (Harmison, 2006). Positive psychology emphasizes the importance of deepening our understanding of optimal human functioning by exploring themes such as positive subjective experiences and excellence in performance (Seligman & Csikszentmihalyi, 2000). In sport, these themes are particularly relevant since athletes often attribute peak performances and outcomes to psychological states such as flow (Kennedy, Miele, & Metcalfe, 2014). Sport teams are intact, dynamic groups with common identities, goals, and objectives. Individuals who perform in teams are required to collaborate to achieve their common goals (Myers, Payment, &Feltz, 2004). In team sports the outcome is rarely a result of physical differences among competitors (Mugford, 2006); it is more often the emotional and mental aspects that contribute to the biggest differences in performance.

Teamwork behaviours, which facilitate the achievement of collective tasks, require team members to work together to achieve effective team performance (Taggar & Brown, 2001). The collective nature of a team task implies that team members interact and share resources as individual efforts are aligned and coordinated (Vander Vegt & van de Vliert, 2002). Sport leaders, in team sports, stress the need for strong interaction with others using positive reinforcement in their communications (Burnes & O'Donnelle, 2011). The diverse processes or dimensions of teamwork behaviours include communication, coordination, and cooperation. In some cases, these dimensions are ill-defined and difficult to clearly distinguish. Consequently, the lack of agreement on the conceptualisation of team dynamics

impedes the production of valid generalizations about the functioning of teams (Rousseau, 2006).

Interest in team flow is based on the assumption that teams will perform best when they achieve team flow. It is therefore expected that when a team achieves flow the athletes will be more in tune with each other and experience positive emotions, eventually leading to the successful achievement of individual and team goals (Cosma, 1999). Since team sports are characterized by high competitive aspirations, and are consistently striving to outperform opposing teams, understanding and enhancing team flow provides a major contribution to team performance (Burnes & O'Donnelle, 2011).

Over the last 35 years, research in sport psychology has focused mostly on individual flow states. Much qualitative research has described the subjective experience of flow among athletes (e.g., Jackson, 1996; Swann, Crust, Keegan, Piggott, & Hemmings, 2015). Within the sport domain, flow has primarily been studied from the individual point of view (Culbertson, Fullagar, Simmons, & Zhu, 2015; Jackson & Csíkszentmihályi, 2002; Jackson &Kimiecik, 2008), while research on team flow remains scarce. The only researchers, known to date, who developed a specific scale for measuring team flow, are Cosma (1999) and Lazarovitz (2003). Cosma used the Flow State Scale (FSS; Jackson & Marsh, 1996) and Lazarovitz used the Dispositional Flow Scale-2 (DFS-2; Jackson & Eklund, 2002) as the foundation for their team flow scales - the Flow State Scale Teams (FSST) and the Teams Dispositional Flow Scale (TDFS) by modifying the wording of items from individual to team perceptions,but without taking into account the added value and different characteristics of team flow compared to individual flow. Thus, to facilitate research examining the importance of team flow to any team or group, it is necessary to first clarify the conceptualisation of team flow and to develop and evaluate reliable and valid methods with which to measure the construct. Hence, in order to be able to manifest team flow, we must first ask two questions. The initial question is: "Is

team flow controllable?" If it is, then the second question is: "How can teams learn to create and maintain a team flow that will lead to peak team performance?" Most researchers and practitioners would agree that this ideal performance state is not a simple, one-dimensional state, which is easily attained by teams (Hardy, Jones, & Gould, 1996). Therefore, team flow is a worthwhile and valid concept in need of further elaboration. The present thesis is an attempt to move forward in this direction by interviewing athletes, coaches, and sport psychologists from a range of different sports, who are familiar with the phenomena of team flow, and to develop a valid measure with which to evaluate team flow. This measure will enable researchers, coaching staff, and sport psychologists to gather information about teams' situations. Based on this information, specific interventions may be developed to achieve team flow more frequently and at higher levels of intensity.

CHAPTER 2: LITERATURE REVIEW

This literature review constitutes an examination of the research literature on flow and team flow. The review begins with an analysis and appraisal of the existing theory and research in relation to individual flow, which provides the foundation for developing conceptualisations of team flow. I follow the origins of individual flow and describe conceptual distinctions relating to flow, peak experience, and peak performance. I clarify existing descriptions of flow and the nine dimensions of individual flow proposed by Csikszentmihalyi (1975). Then, I describe and critique the research on individual flow, specifying the methods used to explore and measure individual flow. Next, I summarize the research findings on individual flow by identifying the facilitative, preventive, and disruptive factors that may influence flow. Based on the claim that individual flow is controllable, I examine three main intervention modes (imagery, mindfulness, and hypnosis), developed to enhance experiences of flow in sport.

In contrast to the extensive literature on flow, in a thorough literature review, I found that knowledge of team flow is limited. I therefore began by reviewing the relevant descriptive literature on teams, including definitions and characteristics of successful sport teams. By combining these two bodies of research, I trace the developments in the conceptualisation of team flow. Reviewing and critiquing all the previously published studies on team flow in sport and in the workplace enabled me to clarify and describe the current definitions and characteristics of team flow. My final step includes presenting and discussing the similarities and differences between team flow and the related concepts of individual flow, group cohesion, collective efficacy, and team collapse. This review provided me with the foundation for my current research, and led me to clarify the specific focus, goals, and directions of this thesis.

Individual Flow

Origin of Individual Flow

Flow theory and research on flow began with the desire to understand the phenomenon of intrinsic motivation or engaging in activities that are rewarding in and of themselves, regardless of the end product or any external benefits derived from the activity (Nakamura & Csikszentmihalyi, 2002). This area of research has mainly focused upon the subjective experiences of individual athletes (Salanova, Rodríguez-Sánchez, Schaufeli, & Cifre, 2014).

The field of positive psychology shifted the focus of the psychological study of human behavior to the investigation of positive human states, which was in contrast to an earlier dominant focus on psychopathology, weakness, and ill-health (Ryan & Deci, 2011).The goal was to "catalyze a change in the focus of psychology from preoccupation only with repairing the worst things in life to also building positive qualities" (Seligman & Csikszentmihalyi, 2000, p. 5). Since then, sport psychologists have reported further advances and exciting developments in the study of flow experiences in sport. However, according to the current understanding of the concept of flow, several critical issues remain ambiguous. The existing peak performance literature has been criticized for lacking a strong theoretical base along with improperly validated measures, thus limiting its accuracy, usefulness, understandings, and predictive power regarding athletic experience (Jackson & Kimiecik, 2008). In addition, there are a number of conceptual issues and unclear overlaps between peak performance and other concepts, including flow (Krane & Williams, 2006; Swan, Keegan, Piggott, & Crust, 2012). Other concerns relate to definitions : peak performance is considered a state of accomplishment and describes performance outcomes. However, one may perform at peak levels during parts of an event, but not consistently throughout the event. In such circumstances, one may display an excellent performance for most of the event, but fail to achieve peak objective outcomes, such

as winning. Therefore, it is questionable whether the definition of peak performance refers solely to objective outcomes or includes subjective experiences as well (Swann, et al., 2017).

The transition toward positive human states gradually led to further investigations of internal states, including happiness, well-being, optimism, and flow (Buss, 2000; Seligman & Csikszentmihalyi, 2000). With the development of applied sport psychology, considerable attention has been given to ascertain the psychological correlates of optimal performance. The three significant constructs related to this body of research are peak experience, peak performance, and flow (Jackson, 2011). Flow, an intrinsically enjoyable experience, is similar to peak performance and peak experience, since it shares the success of peak performance and the enjoyment or value of peak experience. However, a flow experience does not necessary involve peak performance or optimal joy, although it may involve both or either (Privette & Bundrik, 1983). Thus, in understanding flow, it is important to clarify the conceptual distinctions between flow, peak experience, and peak performance.

Peak Performance and Flow

Peak performance and flow share common characteristics (e.g., Jackson, 1992; Jackson, Kimiecik, Ford & Marsh, 1998; Jackson, Thomas, Marsh, & Smethurst, 2001; Jackson & Roberts, 1992; Mugford, 2006). Kimiecik and Jackson (2002) described peak performance in sport as a "release of latent powers to perform optimally within a specific competition" (p. 503). Flow was considered a highly functional state, which provides intrinsic motivation to engage in more challenging tasks (Engeser & Rheinberg, 2008; Nakamura & Csikszentmihalyi, 2005).

Peak performance was perceived as achievements beyond those of the general expected human potential (Privette, 1981, 1983). Flow was described as an inner experience in which athletes typically achieve outstanding accomplishments, above and beyond their routine levels (Jackson & Roberts, 1992). The difference between peak performance and flow is the focus

on performance outcomes, rather than the experience itself. One might attain a flow state without achieving positive performance outcomes (Stavrou, Jackson, Zervas, & Karteroliotis, 2007). Jackson and Roberts (1992) stipulated that flow might be a precursor or an underlying psychological process of peak performance. However, in the majority of circumstances when athletes experience peak performance, they also appear to be in flow. Therefore, flow experiences constitute a combination of characteristics that typify peak performance (Csikszentmihalyi, 1990), but in regard to flow states, the focus is on the subjective, internal experience.

Peak Experience and Flow

Since the 1950s, researchers have attempted to examine the role peak experiences play in enriching life (Edwards & Edwards, 2012). The conceptualisation of peak experience includes feelings of bliss, great joy, and illumination (McInman & Grove, 1991). Maslow (1962) referred to peak experiences as cosmic, pure psyche, absolute, and even ecstasy-related experiences. He argued that self-actualizing people, "those who have come to a high level of maturation, health, and self-fulfillment" (p. 43), experience peak experiences more often. Leach (1962) described peak experience as follows:

> A highly valued experience which is characterized by such intensity of perception, depth of feeling, or sense of profound significance as to cause it to stand out, in the subject's mind, in more or less permanent contrast to the experiences that surround it in time and space (p. 11).

This exceptional level of experience is pre-eminent; thus, nothing else matters, including performance.

Peak experience, peak performance and flow were found to have similar characteristics. Peak experiences tend to be perceptual, receptive, and passive. This sense of fusion with the world and the subsequent loss of self are also related to peak experience and flow (Privette,

1983). Peak experience and peak performance both focus on a high level of functioning and the achievement of desired outcomes, which closely link them to the goals of elite athletes. This characteristic differentiates them from flow experiences, which can be part of athletes' experiences at most levels, provided the athletes have sufficient skill to meet the necessary challenge (Csikszentmihalyi, 1975).

Peak experiences have a mystic or transpersonal quality that is less clearly defined in peak performance or flow. Another factor that distinguishes peak performance from flow is that while peak performance can be analyzed and achieved only after the results are known, flow can be felt during a break in the competition or at the end of the game. Flow can also be experienced during the competition itself or even during practice sessions. Consequently, flow experiences are often reported retrospectively, after the end of the game or once the task has been achieved. Swann, Keegan, Piggott, & Crust (2012) claimed that the intersection of peak experience and peak performance is the crux of the flow experience - a combination which is extremely relevant in sport activities.

Development of the Concept of Flow

Csikszentmihalyi (1975) was the first researcher to introduce the concept of flow. He described flow as "…an ongoing process which provides rewarding experiences in the present" (p. 9), and as an experience of pure enjoyment and absorption in a task, detached from past or future influences. Globally, millions of people participate in sport for the sheer enjoyment and satisfaction of playing the game. The key factors that motivate people to train and compete in sport activities are the feeling that they are mastering skills as well as doing something they enjoy (Csikszentmihalyi, 2014). Such efforts on the part of athletes can lead to an experience of total absorption and the feeling that they are part of the activity. This produces an autotelic experience, that is, a self-motivating level of enjoyment. Csikszentmihalyi (1975) called this experience flow.

Since sport activities are one of the most facilitative contexts for flow (Jackson, 2011), athletes were chosen to describe situations they believed represented their best performances. Researchers found they used phrases relevant to flow such as: “everything just seemed to click for me”; “time stood still; "I could see everything” (e.g., Jackson & Csikszentmihalyi, 1999). Such statements led to the development of the concept of flow in the sport domain (e.g., Csikszentmihalyi, 1975, 1982, 1990; Jackson, 1992). Experiencing flow is described as being "in the groove" (Jackson & Marsh, 1996), "blinking out", or "having the touch" (Abbott, 2000), and the moment “when everything gelled” (Snyder & Tardy, 2001). The frequency and intensity of experiencing flow can vary, depending on the individual athlete’s characteristics and performance levels. According to Csikszentmihalyi (1997), individuals who frequently experience flow tend to have an autotelic personality:

> Autotelic is a word composed of two Greek roots: auto (self), and telos (goal). An autotelic activity is one we do for its own sake because to experience it is the main goal. Applied to personality, autotelic denotes an individual who generally does things for their own sake, rather than in order to achieve some later external goal (p. 117).

Autotelic personalities tend to initiate, sustain, and enjoy optimal experiences, and therefore experience flow states often (Csikszentmihalyi, Rathunde, & Whalen, 1993; Nakamura & Csikszentmihalyi, 2002). Previous studies that focused on elite sport athletes considered flow to be part of their sport experience; they experienced flow, at least some of the time, during competitions and/or training (Jackson et al,, 1998). Although flow can be experienced on a continuum - ranging from a rare to a daily occurrence (Csikszentmihalyi, 2002) - it is not clear how often flow is experienced by athletes at different levels and in various sport domains (Jackson, 1992).

According to Jackson and Csikszentmihalyi (1999), flow is the simultaneous occurrence of several positive aspects that make the flow experience special. During flow states, one is

totally focused, involved, and absorbed. All other thoughts and emotions are excluded. There is an intrinsic experience of harmonious enjoyment in which mind and body work effortlessly together. Flow typically occurs when individuals perceive a balance between challenges and skills needed to accomplish or meet the demands of the situation (Csikszentmihalyi, 1990). Therefore, flow is a state that can be facilitated through participation and striving toward mastery of an activity (Csikszentmihalyi, 1990). It is rare for flow to be experienced during passive leisure activities. A central element of the flow construct is the need for a perceived challenging situation, one where the challenges of the activity are in balance with the participant's skills (Jackson, 2011). Factors such as repetition, motivation, exploration, satisfaction, spending more time on the task, and taking risks may generate a state of flow and improve performance (Whalen, 1997).

Csikszentmihalyi (1975, 2000) interviewed individuals who mentioned "enjoyment" as the key motivating factor for participating in an activity. He interviewed chess players, rock climbers, dancers, and others. Csikszentmihalyi focused on two different domains: play and work. In play, intrinsic rewards are salient, while in regard to work, specifically surgery, prestige and money are the main motivating forces driving participation. Based on the qualitative data in Csikszentmihalyi's research, characteristics of optimal experience and its proximal conditions were established. Across both domains, the reported phenomenology was remarkably similar. By interviewing elite athletes on their flow experiences, support for the nine flow dimensions proposed by Csikszentmihalyi was established (Jackson, 1996). The following section describes the nine flow dimensions proposed by Csikszentmihalyi.

Dimensions of Individual Flow

Challenge-skill balance. Challenge-skill balance describes the perceived balance between the challenge presented by a situation and one's abilities to meet the challenge (Csikszentmihalyi, 1975, 1990; Jackson, 1996). This balance reinforces task success, which

drives individuals to perform the task again, at a more challenging level, by using the acquired skills to accomplish more challenging tasks. When there is a challenge-skill discrepancy, and the challenges are too high for the perceived skills, worry and anxiety will appear. If, on the other hand, the challenge is too low, boredom will result. Hektner and Csikszentmihalyi (1996) noted that "in order to maintain the enjoyment of flow, people must continually engage in new challenges to match their increasing skills, and they must perfect their skills to meet the challenges" (p. 4). The balance between challenge and skills, referred to as the "flow channel", was suggested by Egbert (2003), and subsequently emerged as one of the most crucial elements of flow theory, as illustrated in Figure 2.1.

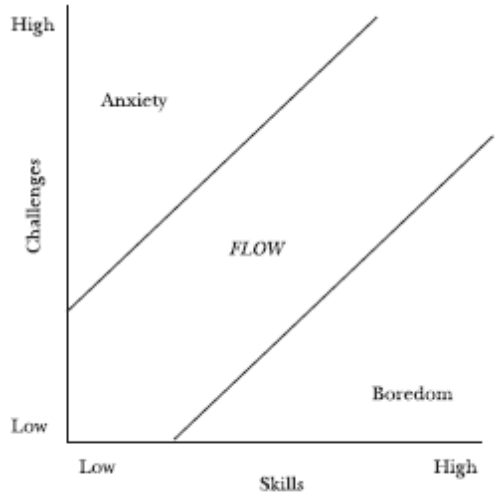

Figure 2.1

The “Flow Channel” Where Skills and Challenge are Balanced (Egbert, 2003).

The skill-challenge balance depicted in Figure 2.1 shows the relationship between the level of challenges and skills, as contributors of flow. When challenges are high and skills are low, anxiety will appear because individuals do not have the necessary skills to meet the challenges. When skills are high and challenges are low, boredom will ensue because the task is not challenging enough to make the situation interesting. An activity that leads to a balance between the perceived skills and challenges will support flow. Eventually, when increased skills are mastered, boredom sets in (depicted as a horizontal line in Figure 2.1). When it is

necessary for individuals to take on greater challenges, anxiety may appear (depicted as a vertical line in Figure 2.1) When challenges and skills are perceived as balanced, people appreciate the challenge and stretch their capabilities to learn new skills. Thus, individuals who experience a challenge-skill balance are most likely to experience flow. An example of a situation in which skills and challenges are in balance occurs when two professional sport performers, with an equal level of skill, compete against each other. On the other hand, when the skills of one player are much greater than those of the other, for example, when a professional player competes with a novice player, the professional player is likely to perceive a low-level challenge and thus will be relaxed or bored. On the other hand, the novice player, who is aware of his/her limited skills, will perceive the challenge as unreachable and will probably feel anxious as a result. The same relationship can be found in team sports. For example, when a team is leading by a big margin and there are only a few minutes left until the end of the game, the losing team is likely to perceive their skills as being insufficient to win. In addition, the losing team will also feel that their skills cannot meet the challenge successfully because they have no hope of winning. Therefore, the players may develop an apathetic attitude, resulting in poor performance (Nakamura & Csikszentmihalyi, 2002). Despite the tendency to view the challenge-skill balance dimension as the most crucial dimension for flow, some researchers have been critical of this tendency (Fong, Zaleski, Leach, 2015). Jackson and Marsh (1996) suggested that a sense of control can be equally important, or even more crucial, to the experience of flow.

Merging of action and awareness. This dimension occurs when deep involvement leads to automaticity and spontaneity -excluding everything else from the individual's awareness (Csikszentmihalyi, 1990; Jackson, 1996). Contrary to our usual behavior, individuals in flow do not begin with a conscious decision-making process that leads to action derived from that decision. Individuals in the midst of the flow process are aware of their

actions, but they are not necessarily aware regarding their decision-making processes. Csikszentmihalyi (1988) argued that "moment awareness is split so as to perceive the activity from 'outside', the flow is interrupted" (p. 151). He also suggested that people can usually maintain the merging of action and awareness for short periods. Flow is broken when individuals question themselves about how they are doing and what should be done differently. Such questions do not reach individuals' awareness during flow experiences.

Clear goals. This dimension refers to setting goals in advance for the short and long term. Setting goals enables one in a flow state to experience a strong sense of what one is going to do. Goals must be stated in a clear way, so that performers know what they are expected to do. Goals should be settled and agreed upon in advance. Individuals in flow have a strong sense of what they are aiming to do, in both the short and the long-term (Csikszentmihalyi, 1990; Jackson, 1996).

Unambiguous feedback. Feedback has been described as information conveyed to athletes about the extent their performance and behaviour corresponding to expectations (Hein & Koka, 2007). Unambiguous feedback refers to the involvement of clear and immediate feedback that helps determine the level of success in reaching goals. The source of feedback can be external, internal or both. For example, sometimes sports players receive immediate feedback about their performance (e.g., in basketball when players succeed in getting the ball into the basket and score points); However, in other situations receiving feedback is delayed and ambiguous, received only at the end of the performance (e.g., when a gymnast performs a floor routine).

Concentration on the task at hand. This is a state in which distracting thoughts are minimized, the mind is focused, and people are totally absorbed and involved in the task (Csikszentmihalyi, 1990; Jackson, 1996). Maslow (1962) described total concentration as a narrowing of the consciousness and a relinquishing of both the past and the future. This sense

of being totally immersed in the present task is a key aspect of the experience of absorption, and is central to the definition and phenomenology of flow.

Sense of control. This dimension refers to a state of feeling calm and confident, and being involved in exercising control without actively trying to be in control. While in flow, people enjoy the sensation of the possibility of control, although people in flow are not necessarily in control per se (Csikszentmihalyi, 1990; Jackson, 1996). In fact, striving to be in control is likely to disrupt the experience of flow. In dangerous and extreme situations, people can facilitate and maintain flow only if they are not consciously thinking and worrying about the situation or the risk of getting injured.

Loss of self-consciousness. During this dimension, concern for the self disappears and feelings of oneness and unity with the activity arise (Csikszentmihalyi, 1990; Jackson, 1996). Loss of self-consciousness may be accompanied by a lack of self-security and concern about what others might be thinking. When worries disappear, self-perceptions may be felt more strongly and in a more positive manner. In such a state, liberating, empowering, and refreshing experiences are possible (Jackson & Csikszentmihalyi, 1999).

Time transformation. During the flow state, an altered or distorted sense of time can occur (Csikszentmihalyi, 1990; Jackson, 1996). At times, individuals may lose their sense of time and feel they have unlimited time for action or they may perceive that time is passing differently from what they normally experience (slower or faster). Time disorientation is a consequence of an altered state of consciousness, which involves a loss of time awareness. This may result from being fully engaged in the activity at hand, so that individuals completely lose track of time. Losing track of time may also occur when individuals are so familiar with a repeated behavior or pattern that they can perform the task with little or no effort. In the field of sport, this shift of consciousness is often described as an optimal state (Chavez, 2008).

Autotelic experience. This dimension relates to the sense that the activity itself is motivating, intrinsically-rewarding, and involves a deep sense of enjoyment (Csikszentmihalyi, 1990; Jackson, 1996). Because of these high enjoyment levels, people are motivated to participate in the activity for its own sake - without taking outcomes into account. Csikszentmihalyi (1990) hypothesized that individuals with an autotelic personality may have an increased likelihood to experience flow. An autotelic personality refers to one's tendency to engage in an activity for its own sake (Csikszentmihalyi, 1975, 1990), and can be described as the propensity to experience the state of flow (e.g., Asakawa, 2004, 2010).

The nine dimensions of flow are interdependent and interconnected. Flow is experienced as a unified experience, "flowing" from moment to moment. These nine flow dimensions have been supported and discussed in prior research (e.g., Jackson, 1995, 1996; Jackson & Marsh, 1996). A critique was raised regarding the necessity of experiencing all nine dimensions, with particular emphasis on certain dimensions. Jackson and Eklund (2002) viewed the nine dimensions of flow as representing the optimal psychological state of flow. However, it may not be necessary for all nine dimensions of flow to occur prior to an individual entering a state of flow. In a purposive sample of eight school leaders, MacNeill and Cavanagh (2013) interviewed each school leader about a memorable flow experience. Data analysis showed that only four of the flow dimensions were mentioned in their in-school experiences, namely challenge-skill balance, clear goals, autotelic experience, and unambiguous feedback. Although this limited identification of flow dimensions could have been related to the small number of participants, it does raise questions regarding the number and type of dimensions that are essential for identifying flow experiences. In the sport domain, Jackson (1996) investigated how many dimensions occur simultaneously. She reported that all athletes mentioned themes that applied to at least three flow dimensions; 93% of the athletes mentioned themes that applied to at least five flow dimensions. Sugiyama and

Inomata (2005) found that 5.8 of the nine flow dimensions matched their athletes' experiences. These studies did not clarify whether consistency existed among the dimensions, such as typical combinations of dimensions that essentially define the quality of the flow experience (Swann et al., 2012).

Even in reference to the perceived balance between challenge and skills - the dimension considered most significant to flow - the necessity of this dimension for experiencing flow has yet to be determined. The challenge-skill balance dimension showed a high correlation with the quality of the flow experience in a sample of recreational athletes (Stein, Kimiecik, Daniels, & Jackson, 1995). However, research evidence shows that the relationship between perceptions of challenge and skills and the experience of flow may be mediated by the personal characteristics of the participants, situational factors, and/or contextual factors related to the type and setting of the activity. For instance, in a sample of elite athletes, Jackson et al., (1998) found only a low correlation between individuals' ratings of the challenge-skill balance dimension and the other dimensions of flow. The result suggests that in competitive sport environments, the perceived challenge-skill balance may not be as important as the perception of one's skills. Moneta and Csikszentmihalyi (1996) found a different relationship pattern between perceived challenge and flow in a study conducted among 208 talented adolescents. The adolescents were male and female high school students in Chicago, whose ages ranged from 14 to 17. From among all the students who volunteered to participate in the study, their teachers nominated those who showed the greatest talent in mathematics, science, music, athletics, and the arts. The results showed positive relationships among ratings of the challenge, concentration, and involvement. Negative relationships were foundamong ratings of the challenge and motivation to take part in the activity and happiness. These variations, regarding the importance of the challenge-skill balance for different participants, types of physical activity and context, require further examination.

Researchers have found the relation between the unambiguous feedback dimension and flow to be related to feedback type. Positive feedback (internal or external) may facilitate flow, while negative feedback may prevent or disrupt flow (Jackson, 1995; Young, 2000). Csikszentmihalyi (1990) did not differentiate between types of feedback when describing unambiguous feedback generated by an activity that provides individuals with information about the progress they are making towards achieving the desired goal. However, Jackson, Thomas, Marsh, and Smethurst (2001) pointed out that negative feedback may contribute to errors and the disruption of flow, as a result of finding a positive correlation between negative feedback and the number of errors made in a game. This may indicate that a focus on errors, rather than the positive aspects of performance, can have an unwanted effect on flow. Evidence for the positive effect of the self-monitoring technique, which focused only on positive feedback, was provided by Kirschenbaum, Owens, and O'Connor (1998). This study found that focusing on positive feedback contributed to improved psychological skills and superior performance in a group of golfers. Further research should be more specific in considering not only the unambiguity of feedback, but also the positive or negative aspects of feedback and how these types of feedback influence flow and performance.

When considering the flow dimension of loss of self-consciousness, one should consider the potential effects of age sport type. A central theme that preoccupies teenagers is self-consciousness, especially in relation to popularity and concerns about self-presentation. At times adolescents may feel they are being watched and judged, even when they are alone (Coleman & Hendrey, 1990). For them, performing in front of a live audience that includes parents and close friends may raise feelings of self-consciousness and disrupt flow. This inhibition may be less pronounced in a team experience, where it may be easier to lose one's self-consciousness, since in a team setting individuals are less concerned about their own representation, and feel more self-confident.

These reservations are in line with emerging evidence showing that the experience of flow is not homogeneous across sports, situations, or participants. Although it appears that some dimensions are more relevant or prevalent than others in the achievement of flow within specific sport contexts (Jackson et al., 1998; Jackson et al., 2001; Jackson, 2011), further systematic research is needed to clarify the patterns of interactive relationships, the relative importance of each dimension, and the interaction between the nine theorized flow dimensions.

Measurement of Individual Flow

The capacity to facilitate flow is contingent on the ability to conceptualize and measure the concept. One of the major challenges facing researchers was "capturing" the flow experience itself (Salanova, Rodrigez-Sa'nchez, Schaufeli, & Cifre, 2014), and discriminating between proximal antecedents and the flow experience. In this section, I described the three main techniques used to measure flow: experience sampling, interviews, and questionnaires. In addition, I identified and explained the main measures of individual flow that have been developed and used in research and practice.

Experience Sampling Method

Through the Experience sampling method (ESM)researchers attempt to understand behavior as it occurs in an ordinary environment (Neisser, 1976). By using ESM it is possible to capture flow experiences related to any activity in a natural environment (Massimini, Csikszentmihalyi, & Carli, 1987) and collect data representative of the with-in-person fluctuations of these experiences (Bolger, Davis, & Rafaeli, 2003). ESM has been used in a number of research projects in the fields of medicine, social sciences, and communication (Kuby, Larson, &Csikszentmihalyi, 2006; Myin-Germeys, et al., 2009; Andrews, Russell-Bennett & Drennan, 2011).

ESM is a validated, structured diary technique, used to assess subjects in their daily living environment. Participants are signaled at random times throughout the day, usually for at least one week. During each signal they are asked to respond to open and closed ended questions regarding their experience (Csikszentmihalyi, & Larson, 1987; Delespaul, 1995). This method can be used for intrapersonal as well as interpersonal comparisons. ESM provides an opportunity to examine links between external context and internal contents of the mind. Over the past 30 years, the technology upon which this research method is based has changed extensively, from pagers to programmable watches, to two-way “personal assistants" (e.g., Kimhy, et al., 2006).

The major contribution of ESM is its access to variations in daily experiences which are often outside the domain of observation. When reasonably accurate, the data collected through such a systematic method is available for analysis, replication, and falsification (Kuby, Larson, & Csikszentmihalyi, 2006). Different questions and divergent interests can be examined with the same data, due to the random sampling of experiences (Hektner, Schmidt, & Csikszentmihalyi, 2007). Accuracy, ecological validity, and the unique opportunity to acquire diurnal patterns of the experience are provided through ESM (Alma, Schaufelib, Salanovaa, Cifrea, & Sonnenscheinb, 2011).

Following the introduction of the ESM, it became possible to measure flow empirically, in respect to everyday life experiences (Csikszentmihalyi et al., 1977; Csikszentmihalyi & Larson 1987). Csikszentmihalyi used ESM in his early work on flow by giving respondents pagers to wear for one week. The participants were paged by electronic signals eight times a day. Participants used the experience sampling form (ESF) to provide their answers. The ESF consists of 29 scaled items and 13 categorical items. The scaled items measure the intensity of subjective feelings and include the following variables: concentration, difficulty in concentrating, feeling good, feeling self-conscious, feeling in control, living up to the

person's expectations, living up to the expectations of others, physical discomfort, activity-related challenges, activity-related skills in the activity, importance of the activity to the person, importance of the activity to others, importance of the activity to the person's overall goals, success in the activity, the wish to be doing something different, and satisfaction. These variables are measured by ten-point scales ranging from zero (not at all or low) to nine (very or high). The remaining thirteen scaled variables are Likert scales, ranging from one to seven, with the following positive poles: alert, happy, cheerful, strong, active, sociable, proud, involved, excited, open, clear, relaxed, and cooperative. The categorical items serve to reconstruct the activity, context, and aspects related to motivation and interest. All of the categorical items are open-ended. After collecting the data, they items should be coded, except for the categorical items, reasons for the activity, and companionship.

Quinn used Thayer's (1986) Activation-Deactivation Adjective Check List (AD ACL) to measure arousal level, and the FSS, after modifying some items designed to fit a cognitive task, rather than a physical task - to measure flow states. The ESM research procedure included monitoring each participant over the course of one week, paging participants at four randomly-selected times each day, and asking them to note, in writing, their activity and their experience during that activity. Results showed that goal clarity, feedback clarity, and balance of challenge and skill were the antecedents of flow, while merging of action and awareness, sense of control, concentration on the task at hand, autotelic experience, loss of self-consciousness, and transformation of time were considered indicators of flow. The contributions of this research were the re-conceptualisation of the inter-relationship among the dimensions of flow. For example, support was provided for the hypothesis that the effect of goal clarity on flow is mediated by feedback clarity. When goals frame the cues a person perceives and responds to, feedback clarity determines the attention devoted to perceiving and responding to those cues which, in turn, creates and sustains the flow experience. These

findings show that flow as an optimal performance phenomenon, transcends different fields of human activity, and that sharing research from different disciplines might be beneficial.

The main disadvantage of ESM is the high demands it places on participants, which contributes to self-selection bias and selective non-response (Csikszentmihalyi, 2014). In addition, the repeated measuring of psychological variables may, in and of itself, cause changes in people's recollection of their experience. Another consideration is the high cost of implementation involved in this procedure. ESM has not been frequently used in sport research on flow, due to reservations voiced by coaching staff and athletes regarding the interferences it causes during a game, or even in practice sessions (Chavez, 2008). In attempting to "catch the moment", these interferences actually disrupt the momentum. This is especially true in regard to flow research, since the disruption may affect the players' flow process, and performance, perhaps even costing them the competition. These limitations led to the exploration of other measurement techniques to examine flow, especially in the sport domain.

Interviews

People are familiar with the interview techniques commonly used in research. In contemporary Western society interviews have become ubiquitous. Interviews are a common method for gaining information on everyday life experiences (Fadyl & Nicholls, 2013). From an empirical positivistic approach, interviews are used to collect information as an evidence base, whereas within the emotionalist approach interviews offer a pathway to capturing participants' authentic subjective experiences (Potter & Hepburn, 2005). In line with the latter approach, interviews are a beneficial tool for conceptualizing both new and controversial concepts. The interview structure may be outlined as follows: (a) unstructured interviews, which resembles naturalistic conversations with informants; (b) semi-structured interviews, which are conducted using a loose structure consisting of open-ended questions that define the

areas of exploration; and (c) in-depth interviews, which are highly focused on a particular subject, whereby the interview questions are the bases for conversation, used by the interviewer to pursue ideas in an in-depth manner (Britten, 1995).

Csikszentmihalyi's (1975) early research, which brought to light the concept of flow, was based on interviewing people regarding their experiences of flow. Interviews were held with respondents from a variety of life domains, such as climbers, dancers, chess players, basketball players, and artists. Jackson (1995), one of the prominent researchers in the area of flow in sport, used interviewing as a major research tool. In her research on flow in sport, Jackson (1992, 1995, 1996) began by examining athletes' descriptions of flow experiences, in order to explore their understanding and the significance attached to their experiences of flow (Jackson, 2011).Elite athletes were chosen as informants because they were expected to be familiar and experienced with states of flow (Jackson, 1996). Jackson (1996) began her research by engaging athletes in in-depth, unstructured face-to-face interviews, during which she shared her understanding of experiences: "My mind isn't wandering, I am not thinking of something else."; "I am totally involved in what I am doing."; "My body feels great."; "I don't seem to hear anything."; "The world seems to be cut off from me."; and "I am less aware of myself and my problems." Following these quotes, she then asked the athletes to describe an experience which for them, "stood out as being better than average… where they were totally absorbed in what they were doing and that was very rewarding" (p.78). Sugiyama and Inomata (2005) conducted semi-structured interviews with 29 university and semi-professional Japanese athletes, who competed in national events. At the beginning of the interview, participants were asked to read a written description of a flow experience followed by a question from the interviewer regarding their recollection of experiencing a mental state during competition which they believed corresponded to this description. If the answer was positive, the athletes were asked to recall details about the competition in which this kind of

experience occurred. After completing this part, interviewees were asked to describe their state during the competition in which they had the flow-like experience, the preparations that led to the experience, and their explanation regarding the type of trigger that initiated the flow-like state. These descriptions were increasingly refined and encouraged based on probing questions led by a semi-structured interview guide. Researchers used logic and content validity in order to conceptualise the phenomena of flow in sport activities, based on the qualitative analysis of data collected through interviews with key informants (Jackson, 1995; Jackson & Eklund, 2002; Jackson & Marsh, 1996; Marsh & Jackson, 1999). Qualitative research on flow has helped to clarify the subjective meaning of the flow experience for athletes, and has been useful in determining the consistency and variation of athletes' description of the flow experience within the context of the dimensional model of flow espoused by Csikszentmihalyi (Jackson, 2011).

The advantage of interviews is the ability to access rich accounts of experiences that are not already reported in other measures (Knapik, 2006). However, due to their subjective nature, the critique of the use of interviews for the purpose of generating original data for research is based on methodological problems related to subjective analysis and data interpretation of data. The idiosyncratic nature of this research method limits the possibility for generalization. Although the methods presented in the previous sections were original at the time they were developed, and they proved to be innovative in generating many insightful and robust findings, they are far from being psychometrically sound. Therefore, researchers set out to develop and validate inventories that can measure flow to the standard requirements by traditional test theory.

Questionnaires

Questionnaires have been the main research tool used to examine flow within the sport domain. However, a prerequisite for the construction of questionnaires is the conceptualisation and operationalisation of relevant theories, models, and concepts. The foundation for the structure of the measures that have been developed to measure flow in sport was Csikszentmihalyi's (1975) nine flow dimensions, which formed the nine subscales. The FSS was the initial sport questionnaire for flow developed by Jackson and Marsh (1996) as a self-report questionnaire designed to measure the state of flow when participating in a specific activity. This questionnaire was designed to be completed immediately or soon after the participant completes an activity. The FSS consists of 36 items with four items measuring each of the nine dimensions of flow. Internal consistency of the nine subscales was sound and confirmatory factor analysis supported the nine-subscale model.

The Dispositional Flow Scale (Jackson, Kimiecik, Ford, & Marsh, 1998) was also a self-report questionnaire designed to measure the frequency with which people experience flow in a target activity, described as their general tendency or disposition to experience flow. This questionnaire should be administered immediately after involvement in the activity (Jackson, 2011). Once again, the DFS comprises 36 items, with four items measuring each of the nine dimensions. As part of the continued development of the measure, slight modifications, including the replacement and rewording of items in order to improve factor structure, were made to these scales, creating the FSS-2 and the DFS-2 (Jackson &Eklund, 2002).

The Flow State Scale-2. This scale was based on the original FSS (Jackson & Marsh, 1996). The FSS-2 consists of nine subscales, with four items for each subscale, based on Csikszentmihalyi's (1990) nine theorized flow dimensions. An example item for each dimension is as follows: Challenge-skill balance: "*I was challenged but I believe my skills will*

allow me to meet the challenge"; Merging of action and awareness: "*I made the correct movements without thinking about trying to do so"*; Clear goals: *"I knew clearly what I wanted to do"*; Unambiguous feedback*: "It was clear to me how my performance was going"*; Concentration on the task at hand: *"My attention was focused entirely on what I was doing"*; Sense of control: *"I had a sense of control over what I was doing"*; Loss of self-consciousness: *"I was not concerned with what others may have been thinking of me"*; Time disorientation: *"Time seemed to alter (either slowed down or speeded up)"*; Autotelic experience: *"I really enjoyed the experience"*; Respondents to the FSS-2 indicate the degree to which they agree with each item on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

A great deal of effort was invested in establishing appropriate levels of reliability and validity for the FSS-2 (Jackson & Eklund, 2002).The internal consistency of each dimension within the flow scale was found to be acceptable with the Cronbach alpha coefficient ranging from α =.80 to α =.92, with a mean of α=.87 (Jackson & Eklund, 2002;Mugford, 2006). High internal consistency indicates that all items in the subscales measure the same underlying construct - individual flow. Construct validity varied from .17 to .72 (median r = .50) (Jackson & Eklund, 2002). Confirmatory factor analyses of an item identification sample and a cross-validation sample demonstrated a good fit and supported the construct validity of the FSS-2 (Jackson, Martin, & Eklund, 2008).

The Dispositional Flow Scale-2. As in the FSS-2the nine subscales are assessed. Each subscale or dimension comprises four items, making a total of 36 items. The wording of the items was changed to the past tense to reflect how often each item was experienced during the activity (Jackson & Eklund, 2002). The directions given to complete the DFS-2 instruct respondents to think about how often they generally experience the characteristics of flow (e.g., ‘‘I know clearly what I want to do") within a particular activity, and to rate their

responses on a 5-point Likert scale, ranging from 1 (never) to 5 (always). Overall, strong support was presented for the DFS-2's construct validity (Jackson & Eklund, 2002). Item loadings on first-order factors ranged from .29 to .86 (mean =.74). Internal consistency estimates for the DFS-2 were reasonable, varying from.70 to .88 (mean = .82). In conclusion, the DFS-2 and FSS-2 instruments each yielded an acceptable factor structure, a good fit, and acceptable reliability (Jackson, Martin, & Eklund, 2008) with a first order model, involving the nine factors, and a higher-order model, reflecting a global flow factor, demonstrating a good fit with regard to the data.

These scales have been used and validated in a variety of sport and physical activity settings (e.g., Martin & Cutler, 2002). Research evidence supports the multi-dimensionality of the flow construct (e.g., Jackson &Marsh, 1996). The validity of self-report studies is contingent on the validity and reliability of the responses. When athletes are asked to retrospectively reflect on their sport experiences, issues may arise in relation to selective memory and recall, social desirability, performance outcomes, and other factors linked to respondents' sport involvement (Jackson, 2011).

Short flow scale and core flow scale. These scales were developed in light of the practical considerations which necessitated a shorter and less time-consuming measure of flow, designed by Jackson et al., (2008) and Martin and Jackson,(2008). The Short flow scales, which are abbreviated versions of their predecessors, the FSS-2 and the DFS-2, both include nine items, with each item representing one of the nine dimensions of flow. Initial psychometric support for the short flow scales was encouraging (Jackson et al., 2008; Martin & Jackson, 2008), but still limited.

The 10-item self-report Core Flow Scale (CFS) has a different purpose. The CFS was designed to capture what it feels like to be in flow during a target activity (state flow) and the general tendency to experience flow(dispositional flow). The scale was developed based on

data previously collected by asking elite athletes to describe their flow experiences (Jackson, 1992, 1995, 1996). A qualitative analysis of their responses comprised the items for the core flow scales. Respondents completing the core scale are directed to think about how often they generally experience the characteristics referred to by flow items (e.g., ‘‘I have total concentration’’) within a particular activity, and to rate their responses on a 5-point Likert scale, ranging from 1 (never) to 5 (always). Model fit and reliability for the core scale were good during the initial research conducted with these scales (Martin & Jackson, 2008) in academic, extra-curricular, and sport settings (Jackson, 2011).

Despite the variety of self-report questionnaires that are available to measure flow, they are all based on the same theoretical model, use similar items, and focus on individual experiences of flow. All of the questionnaires are completed hours, days, weeks, and even months after the behavioral experience, such as a match or sport related performance. This is problematic because these questionnaires require cognitive integration and recalling of past experiences, and are therefore vulnerable to retrospection bias (Peters et al., 2000; Stone, Broderick, Shiffman, & Schwartz, 2004).

Research on Individual Flow

Research on flow has developed continuously over the past four decades (Csikszentmihalyi 1975, 1982, 1990; Jackson, 2011; Kimiecik & Stein 1992; Seligman & Csikszentmihalyi, 2000).Jackson and Roberts (1992) and Jackson (1992) reported their early empirical study of flow states in sport using in-depth interviews. Their main focus was on examining the subjective meaning of flow experiences for athletes, with the intention of ascertaining the relationship of the flow state to positive performance. They also analyzed the degree of consistency between athletes’ narratives of flow and Csikszentmihalyi's (1990) dimensional model of flow. Researchers initially assumed the existence of individual differences in the propensity and ability to experience flow (Csikszentmihalyi 1990).

Csikszentmihalyi (2000) also suggested that flow experiences can be generalized across gender, age, and culture, and that these experiences are universal.

Current research shows that in order to understand the facilitative, preventive, and disruptive factors that influence flow, personal, situational and contextual factors must be identified and examined (Jackson, 2011).

Influence of Personal, Situational, and Contextual Factors on Individual Flow

The examination of flow theory in sports and work domains indicates that flow experiences differ in respect to the individual and situational factors that generate flow (Csikszentmihalyi, 1975; Csikszentmihalyi&Csikszentmihalyi, 1998; Privette & Bundrick, 1991; Ravizza ,1977; Stein et al., 1995). An individual difference was found by Csikszentmihalyi (1990), who coined the term "autotelic personality", defined as individuals who are intrinsically rewarded by their actions. Kimiecik and Stein (1992) were the first to suggest a person-situation interaction approach to the study of flow. They claimed that flow states were almost always experienced, as the result of interaction between the structure of the activity and the individual's ability to experience flow. Moreover, they suggested that "there are many ways in which competitive flow structure may interact with the variety of personal factors or other situation factors to create flow or non-flow experience" (p.154). Figure 2.2 specifies the personal and situational factors which may interact in sport situations to create flow.

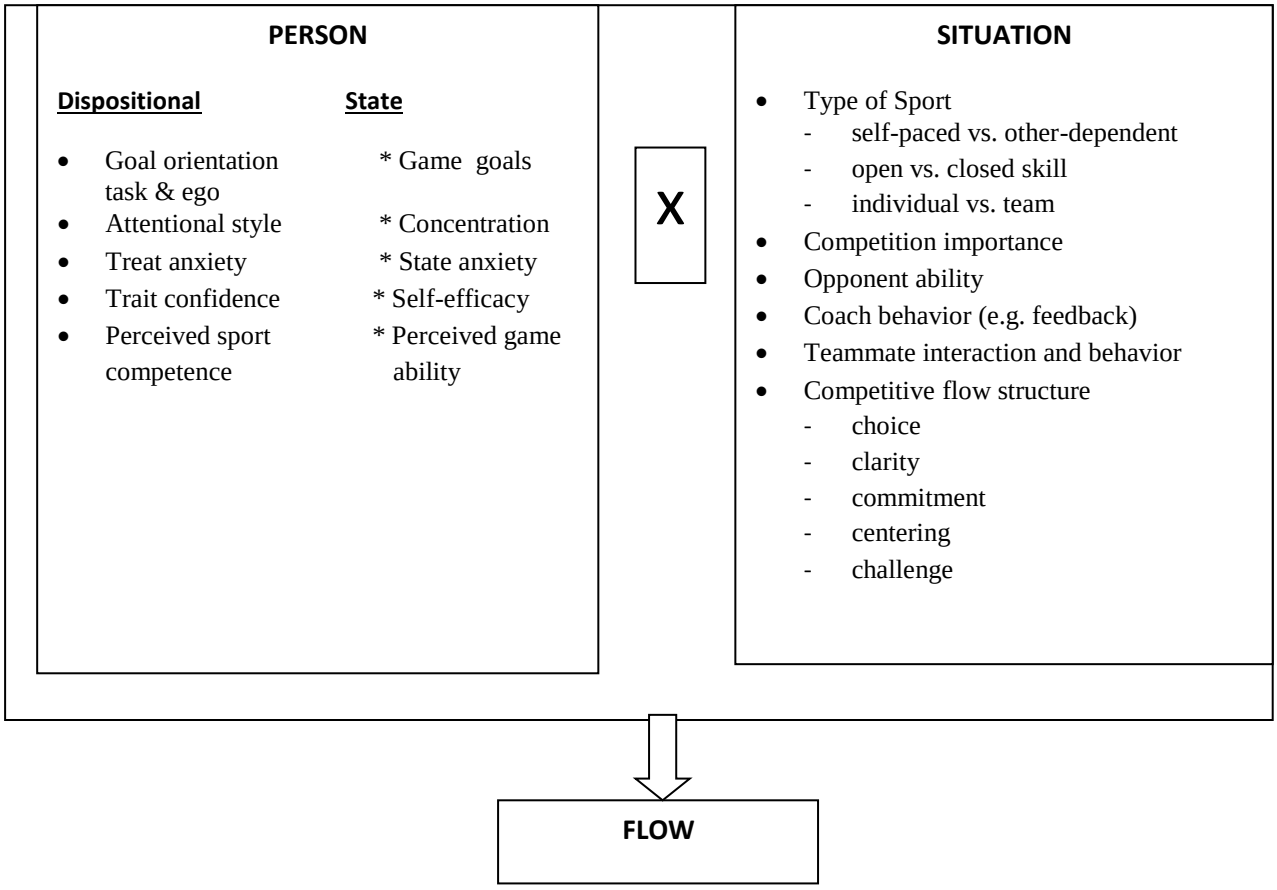

Figure 2.2.

Personal and Situation Factors (disposition and state) Underlying the Flow Experience in Sport (Kimiecik& Stein, 1992, p.151).

Kimiecik and Stein (1992) identified the dispositional personal factors of goal orientation, task and ego, as having impact on the achievement of personal state factors of game goals, attentional style, anxiety, confidence, self-efficacy, and perceived game ability. Situational factors were related to sport type, importance of the competition, opponent's ability, coach's behavior, teamwork inter-action, and structure of the competitive flow. The interaction between personal and situational factors determined the flow outcome. Kimiecik and Stein (1992) believed that the next step in understanding the impact of these relationships on flow involves asking questions, such as, "how, when, where, and what personal factors interact with situation factors to produce flow, boredom, anxiety, and apathy among athletes?" (p. 149).

Quinn (2003) examined experiences of flow in the workplace. The purpose of his research was to separate antecedents of flow from flow indicators in order to better

understand the role of arousal within the flow experience. Data collection included interviews with 13 engineers and scientists from a nuclear power plant. In these interviews, Quinn introduced indicators of flow (concentration, merging of action and awareness, sense of control, autotelic experience, loss of self-consciousness, and time transformation), and asked the interviewees to critique these indicators based on their personal experience. Quinn also asked the participants how often they achieved flow and what factors they believed were responsible for achieving flow. The results showed that most of the proposed relationships between flow antecedents and flow indicators appeared to be significant at the collective level, as well as the individual level.

More recently, it has become evident to researchers that, although flow is experienced by individuals, it does not occur in isolation (Jackson, 2011). Csikszentmihalyi discovered that people experienced flow while conversing with each other. At work, conversation with others is one of the most flow-inducing activities, especially for managers (Sawyer, 2015). Current flow researchers have recognized that flow depends on individual characteristics, situational factors, and contextual variables. Significant progress in flow research is reflected in identifying factors that have an impact to enhancing, preventing, and disrupting flow (Jackson, 1992). Therefore, it is now appropriate to describe the research which attempted to identify these factors.

Factors Facilitating, Preventing, and Disrupting Flow

The systematic research on athletes' optimal experiences of flow included considering the factors that influence flow. A current literature search extracted six studies (Chavez, 2008; Jackson, 1992, 1995; Russell, 2001; Sugiyama &Inomata, 2005;Young, 2000) exploring the factors that have an influence on the experience of flow. Factors related to the prevention of flow, precede flow, while facilitating factors are present during the flow experience. Disrupting

factors also occur during flow, but function to interfere or diminish the intensity of the flow experience (Swann, et al., 2012).

Jackson (1995) explored the perceptions of16 elite figure skaters about the important factors influencing flow. Five general factors were noted to facilitate flow: positive mental attitude, positive pre-competitive and competitive affect, maintaining appropriate focus, physical readiness, and unity with a partner. The positive mental attitude factor, mentioned by 69% of the skaters, included three sub-themes: confidence, positive thinking, and high motivation to do well. Four general factors were found to prevent flow. Physical problems/mistakes were the most influential factors mentioned by 56% of the skaters. The other three factors were: inability to maintain focus, negative mental attitude, and lack of audience response.

Russell (2001) used inductive content analysis to identify factors purported to facilitate, prevent, and disrupt flow. His data was based on interviews with 42 college athletes involved in team sports (i.e., football, baseball, volleyball, softball, and basketball) and 14 college athletes involved in individual sports (i.e., swimming, track, wrestling, and triathlon). His findings showed that the most significant factor for facilitating flow was optimal pre-competitive preparation plan, mentioned by 52.4% of the athletes. The frequent themes mentioned in this respect were positively phrased and included being prepared mentally and physically, engaging in a game plan rehearsal, and being alone before a competition. The most significant factor for preventing flow was non-optimal physical preparation and readiness, mentioned by 48% of the athletes. The additional frequent themes mentioned in this respect were negatively phrased and included not feeling good physically, poor nutrition, and fatigue. The most significant factor for disrupting flow was a non-optimal environment and situational influences, mentioned by 40% of the athletes. Other frequent themes were also negatively phrased and included mechanical failure, negative feedback from the coach,

negative referee decisions, opponents' behaviuor, stoppage in play, and environmental distractions. Facilitating and preventing factors both highlighted the importance of personal characteristics having an impact on pre-competition preparation, as influential factors in generating flow. These included: preparation plans, arousal level before a competition, performance motivation, the athletes' confidence and positive thinking, physical preparation, and focus. Disruptive factors were attributed to situational variables such as coach and team interaction, performance, and environmental conditions.

Sugiyama and Inomata (2005) explored the psychological states leading to flow experiences. Semi-structured interviews were conducted among 29 Japanese athletes regarding their flow experiences. These researchers asked the participants to recall a past experience of being in flow, without specifying a time limit. They questioned participants' experiences in general, without focusing on specific moments of flow. The psychological states mentioned as leading up to flow states were divided into six categories: relaxed, self-confident, highly motivated, completely focused, lack of negative thoughts and feelings, and being extremely positive. The responses received address only general personal psychological states.

Chavez (2008) evaluated the variables associated with facilitating flow, as well as those that prevent and disrupt flow in collegiate athletes. The participants were comprised of 16 NCAA Division I college athletes, from both genders, who participated in soccer, volleyball, tennis (doubles), and individual-sport athletes involved in swimming, tennis (singles), skiing, and golf. Chavez interviewed the participants twice. The first interview was comprised of structured questions on the meaning of flow. The follow-up interview was conducted two weeks after the first interview, and was designed to clarify information from the first interview. The most salient characteristic of flow state in this study was the merging of action and awareness. The merging of action and awareness and having limited or no cognitive

thought represented a combined 42% of all of the raw data. The most cited themes facilitating flow were positive thinking, mental preparation, and task orientation. Chavez (2008) concluded: "In order to achieve the flow state, it is essential that the athlete eliminates any extraneous thoughts, thereby allowing him or her to be fully absorbed in the performance, thereby allowing the performance to feel effortless or automatic" (p.75).

The most commonly cited themes preventing flow were negative thinking, non-optimal arousal level, and not being physically prepared. The most cited themes disrupting flow included non-optimal environment and situation-based factors, focusing on outcomes and performances errors. These findings were consistent with findings in other studies, (e.g. Jackson, 1992; 1995), which indicated that the salient theme of negative thinking has a debilitating effect on the achievement of flow. These results suggested a link between performance and personal preparation. Nine general themes emerged as disrupting the flow state. The most common themes were: non-optimal environmental and situational factors (70%) and focusing on outcomes (44%). The environmental and situational factors identified by Chavez (2008) as relevant to the disruption of flow were consistent with Russell's (2001) conclusions that "non-optimal environmental conditions had the largest impact on disrupting flow and were the single largest element in disrupting flow" (p. 104).

Swann et al. (2012) in a meta-analysis indicated ten factors which were consistently reported to facilitate, prevent, and disrupt flow across a range of sport domains. These factors included focus, preparation, motivation, arousal, thoughts and emotions, confidence, environmental and situational conditions, feedback, performance, and team play and interaction. The influence of these factors was contingent upon their type and stage of influence. When positive, these factors facilitated flow; when absent or inappropriate they prevented flow; and when they were negative they disrupted flow. Jackson (2012)

summarized situational variables, such as sport settings and organizational factors, as having the potential to influence individual flow.

Gaining more knowledge about what facilitates, prevents, disrupts, and retains flow in specific sports is a worthy goal for further research. Despite over 30 years of research, flow is still considered elusive and unpredictable by researchers and athletes (Chavez, 2008), and it remains one of the least understood phenomena in sport (Jackson & Csikszentmihalyi, 1999). Some of the questions which still remain open are as follows: How often does flow occur? Is flow more frequent during training or competition? Are certain types of athletes more prone to experiencing flow than others? It seems that the answers to these questions require a person-situation interaction approach to the study of flow.

Research on Individual Flow and Performance

Since the late 20thcentury and into the 21st century, flow has been one of the most attractive topics in sport psychology research. Early researchers focused on understanding the phenomena of flow by defining its dimensions, identifying antecedent indicators, and investigating its psychological components (Jackson, 2011).The popularity of flow, within the burgeoning development of positive psychology, has gone beyond its appeal as an enjoyable, fun, and autotelic experience, into investigating its possible contribution towards achieving optimal performance (Jackson, 2011). Researchers viewed this possibility as an opportunity to examine the relationship between enhancing flow and performance. Once this association was substantiated, coaches and sport psychologists became interested in developing interventions that could not only identify flow experiences, but also enhance them (Swann, et al., 2012)

With clarification of the flow concept, interest grew in recognizing its impact and influence on the mental, emotional, and cognitive aspects of performance. Increased performance and flow have often been associated, although individuals in the flow state focus on the positive experience of the moment, rather than the outcome (Jackson & Wrigley,

2004). When analysing the nine dimensions in Csikszentmihalyi's(1990) model of flow, the idea that characteristics of flow can be learned, taught, or improved may be controversial, but not unrealistic. The realisation that flow is controllable (Jackson, 1995; Russell, 2001) was important, especially in the context of team sports and elite sport performance, since winning is rarely a result of physical differences among elite competitors (Mugford, 2006).These interventions were particularly relevant for elite athletes competing at the highest levels, under intense pressure, with the greatest rewards at stake. In their struggle to optimise their performance, even a slight improvement could have a dramatic impact on success (Nicholls, Holt, & Polman, 2005). In fact, frequently emotional, cognitive, and mental aspects produced the greatest fluctuations in performance. Acknowledging the effects flow had on performance and outcomes further encouraged research of flow in sport (Jackson & Csikszentmihalyi, 1999; Jackson & Wrigley, 2004). Early data collected using qualitative methods showed a strong connection between flow experiences and performance outcomes in collegiate sports (Jackson & Roberts, 1992) and this lead to further research on aspects of flow related to the issue of increasing its frequency of occurrence and enhancing the intensity of flow experienced.

Is flow controllable? Five studies (Chavez, 2008; Jackson, 1992, 1995; Russell, 2011; Sugiyama & Inomata, 2005) have explored the controllability of flow states as perceived by elite athletes. These researchers asked their informants whether they perceived flow to be controllable, and, if so, how they perceived control over the factors found to influence flow occurrence.

Jackson (1995) found that 79% of the elite athletes in her study perceived flow as controllable. This was confirmed by Russell (2001), who found similar results for 64% of the elite athletes who participated in his study. Thus, it seemed that increasing the intensity and frequency of the occurrence of flow could have a positive impact on performance. The

proposed direct relationship between flow and performance (e.g., Jackson, 1992, 1999; Jackson & Roberts, 1992; Jackson et al., 2001) was later challenged by Schüler and Brunner (2009). In an interesting study focused on marathon runners, they speculated that the potentially performance-enhancing flow characteristics, deemed responsible for the direct link between flow and performance, would not determine performance in a marathon race as strongly as in other sports. For example, high concentration and a high sense of control (the flow dimensions correlated with performance) may not enhance running speed in long distance runners to the same degree as they enhance performance in sports in which decision-making under pressure is necessary (e.g., choosing a player to pass the ball to in soccer). Results of the study by Schüler and Brunner confirmed the hypothesis showing that flow during a marathon race was related to future running motivation, but was not directly linked to race performance. An essential assumption in the attempt to enhance flow is the belief that flow is controllable. Flow theory has acknowledged that some people are more likely to experience flow than others (Csikszentmihalyi, 1975, 2000).Interviews with athletes indicated that 66% of them reported that flow was controllable (Jackson, 1995). Although athletes' perceptions have provided a useful indication of the potential to control and enhance flow states, existing knowledge still lacks sufficient indications regarding the foundation of these perceptions and concrete evidence to what extent control of flow can be achieved.

Interventions to enhance flow. Since sport psychology is a practical science, many researchers have focused on techniques for enhancing and controlling performance. This tendency was evident in the study of flow as an optimal phenomenon, when researchers examined the development of a range of interventions geared to enhance flow. Enhancing flow had many potential benefits. The idyllic mindset in flow states enables the body to function automatically with little conscious effort. In this optimal state, complex tasks appear to be accomplished effortlessly (Alla & Ajibua, 2012). Therefore, researchers have considered

achieving a flow state to be germane to attaining higher performance in sports. Interventions to enhance flow have typically focused on manipulating the antecedents of flow (challenge-skill balance, clear goals, unambiguous feedback, concentration on the task, and sense of control), as well as generating the positive type of thinking that creates flow states. Nakamura and Csikszentmihalyi (2002) suggested that some flow dimensions are crucial for getting into flow. In their opinion, challenge-skill balance, clear goals, and unambiguous feedback are proximal conditions of flow. Jackson et al. (2001) identified challenge-skill balance, clear goals, concentration on the task, and sense of control as antecedents of flow, a claim supported by Stavrou and Zervas (2004). Further research concerning biases in reporting, as well as using different flow scales and cross checking of data based on other measures of flow and performance are needed to determine whether the suggested dimensions are truly more influential or merely more frequently reported. Some of these issues may be clarified by using intervention research.

Three main psychological techniques have been applied in interventions to enhance flow. These are imagery, mindfulness, and hypnosis. I present a description of each intervention technique, along with a review of the studies conducted in each domain, findings and implications for enhancing flow and performance, and a critique related to the methods and significance of the findings.

Imagery. Mental imagery is the processing of perceptual information in the absence of external stimuli (White & Hardy, 1998). Imagery has been defined as follows:

> Creation or re-creation of an experience generated from memorial information, involving quasi-sensorial, quasi-perceptual, and quasi-affective characteristics, that is under the volitional control of the imager, and which may occur in the absence of the real stimulus antecedents normally associated with the actual experience (Morris, Spittle, & Watt, 2005, p. 19).

During imagery, individuals create an experience in their mind and imagine what they would hear, smell, taste, feel, and see. In addition, they experience the physiological, behavioural, and emotional responses that might occur during the imagined scenario (Holmes & Collins, 2001; Wright & Smith 2009).

Examining the relationship between imagery and flow serves two functions. The first is to investigate the relationship between flow and imagery, as two related phenomena. Morris, et al. (2005) reported that imagery interventions played a vital role in creating positive psychological states of mind that can have important implications for flow. Theoretically, it has been hypothesized that the use of imagery can be helpful in enhancing the experience of specific flow dimensions, such as clear goals (Jackson & Csikszentmihalyi, 1999) and concentration on the task (Munroe, Giacobbi, Hall, & Weinberg, 2000). Koehn et al. (2013) assessed the potential correlates underlying the experience of flow in tennis competitions. A total of 261 junior tennis players participated in this research. The measures relevant to imagery and flow used in this study were the Sport Imagery Questionnaire (SIQ), DFS-2, and FSS-2. Using a cross-sectional design, moderate-to-strong correlations were found between flow (dispositional and state) and imagery (r disp = .58; r state = .32).

Koehn, Stavrou, Young, and Morris (2016) examined imagery ability as a moderator between imagery type and flow frequency. A total of 367 undergraduate student athletes between the ages of 17 and 32 from various sports participated in the study. The measures used in this research were the Sport Imagery Questionnaire (SIQ; Hall, Mack, Paivio, & Hausenblas, 1998), Sport Imagery Ability Questionnaire (SIAQ; Williams & Cumming, 2011), and DFS-2 (Jackson & Eklund, 2002). The study employed a correlational, cross-sectional design, using imagery ability, imagery use, and dispositional flow as main variables. The relationships between flow and imagery variables were moderate-to-strong (imagery ability $r = 0.57$, $p < 0.001$; imagery use $r = 0.53$, $p < 0.001$). The results showed that

imagery use was a significant predictor of imagery ability, and that imagery ability significantly predicted flow. Therefore, imagery ability partly mediated the relationship between imagery use and flow.

The second research function was designed to assess the potential of imagery as an intervention method, which can be used as a vehicle to increase flow. Since researchers found substantial empirical links between imagery and flow, imagery interventions that included cognitive and motivational functions of imagery, have been examined to determine the extent to which they enhance flow and improve performance among competitive athletes. A comprehensive literature search was conducted for peer reviewed articles on imagery interventions used to facilitate flow. Based on accessibility and relevance to the topic area, the data bases that came up were: SPORTDiscus, PsycINFO, and SAGE journals accessed online by the Victoria University Depository, using all four keywords, flow, sport, imagery and intervention, and not including blood flow, optic flow, expiratory flow or ventile flow. This search yielded five studies. The studies were conducted by Nicholls, Polman, and Holt (2005), Pain, Harwood, and Anderson (2011), two studies by the same research team (Koehn, Morris, & Watt, 2006, 2012), and the most recent study was conducted by Koehn & Díaz-Ocejo (2016). The studies are summarized in Table 2.1, followed by a brief description of each study, and a critique.

Table 2.1

Imagery Interventions Enhancing Flow and Performance

Study	Participants	Design	Dependent Variables	Procedure	Results
Nicholls, Polman & Holt (2005)	Four male high - performance golfers	Single - Subject ABA Design	Flow State (FSS-2) Dispositional Flow State (DFS-2) Performance	Personalized Imagery Script	Mean global flow, and performance, during and after intervention increased
Koehn, Morris, & Watt (2006)	One junior tennis player	Single Case Study	Flow State (FSS-2) Performance	Imagery Script	Mean flow score from baseline to post-intervention increased
Pain, Harwood & Anderson (2011)	Five male soccer players	Single - Subject ABA Design	Flow State (FSS-2) Perceived Performance	Personalized imagery; Self-selected music	Performance increased, especially in the case of combined imagery and music
Koehn, Morris, & Watt (2014)	Four male junior tennis players	Single-Case AB Design	Flow State (FSS-2) Performance	Imagery script	Mean flow and performance from baseline to post-intervention increased
Koehn &Díaz-Ocejo (2016)	Three elite middle-distance runners	Single-Case, AB Design	Flow State (FSS-2 short form) Performance	Imagery script	Mean increase in flow state for all participants

Nicholls, Polman, and Holt (2005) investigated the effects of an imagery intervention on the intensity and frequency of flow states and golf performance. Participants in this single-case, multiple-baseline A-B design study were four high-performance golfers, representing their country for at least one year. None of the participants had prior formal experience in the use of imagery. Individualized imagery interventions were delivered over a 12-week period. After the completion of baseline phase the imagery training took place. The intervention was administrated to each participant separately at their house for a period of around eight and a half minutes. The imagery script included motivational general mastery (MG-M) images. The performance element of each imagery script was developed to each participant specific performance concerns. The live session was recorded and participants were asked to listen to the tap at least five times a week throughout the intervention phase. Golf performance was

assessed by a participant-selected golf skill. Flow was measured using the FSS-2 and the DFS-2 (Jackson & Eklund, 2002). In comparison to base-line, all participants increased their mean global flow frequency and performance during the intervention and post intervention. Three of the four participants also increased their mean global flow intensity.

Koehn, Morris, and Watt (2006) investigated the effectiveness of an imagery intervention for enhancing the experience of flow state and performance. The participant was one male junior tennis player who was followed during 11 competition tennis matches. The intervention included a tailored, tennis-specific imagery script. The imagery script included relaxation, imagery of service performance, and imagery of groundstroke performance. The participant was instructed during the interview session to imagine vividly him-self being successful in the actual competition situation and external imagery, experiencing situations as outside of the body. The participant was encouraged to use all his senses (visual, auditory, gustatory, olfactory, and kinesthetic). Results showed an increase in flow and performance from the beginning of the intervention to the end. During the post-intervention phase, performance was more stable and the athlete experienced a higher level of confidence.

Pain, Harwood, and Anderson (2011) worked with competitive soccer players to develop and enhance understanding of the effectiveness of pre-performance music and imagery scripts in improving performance and facilitating flow. Five male soccer players, from a university in central England, took part in the study. Following a pre-intervention phase, participants undertook the intervention during their pre-match warm-up. A facilitative effect on perceived performance and flow was indicated when asynchronous music and MG-M imagery were combined. This finding was in line with the suggestion of Morris et al. (2005) that using imagery, directed specifically towards the antecedents in a particular sport context, is most likely to facilitate and maintain flow.

Koehn, Morris, & Watt (2014), examined the effects of an imagery intervention based on the cognitive and motivational functions of imagery that most strongly correlated with dimensions of flow in an earlier study (Koehn et al., 2013). The imagery functions were cognitive specific (CS) and MG-M and the critical flow dimensions were challenge-skill balance, clear goals, concentration on the task, and sense of control. Participants in this Single Case, multiple baseline AB design study, were four male junior tennis players. Following a six-week baseline phase involving the monitoring of flow state and performance, and a subsequent six-week intervention phase that incorporated relaxation in conjunction with imagery techniques, three participants showed a sustained increase in flow experiences. Furthermore, all four participants improved their service performance, ground stroke performance, and they enhanced their national junior ranking-list position.

Koehn and Díaz-Ocejo (2016) examined the effect of an imagery intervention on flow state with three elite junior middle-distance runners with at least three years of experience in training and competition. The study consisted of a non-concurrent, single-case, multiple-baseline A-B design. Participants worked with individualised tailored imagery scripts during a four-week intervention phase. Performance was measured through 60m sprint. Flow was measured by administrating the Flow State Scale-2 Short Form (FSS-2 SF; Jackson et al., 2008) immediately after the 60 m sprint. The FSS-2 SF consists of nine items, each item measuring one subscale of the flow model (Jackson & Csikszentmihalyi, 1999).For this study the FSS-2 SF was translated to Arabic. The results of the post-intervention phase showed a mean increase in flow state for all participants.

These five imagery studies were similar in relation to goals, research design, use of imagery techniques, and findings. Their common goal was to investigate the efficacy of an imagery technique used to enhance flow and performance. Participants in the different studies included soccer players, junior tennis players, and elite golfers. All studies were based on a

small number of participants, from one to five athletes. During the intervention, all of the studies used an imagery script, which in three studies were personalized and adapted to individual players (Pain, Harwood, & Anderson, 2011).

These studies contribute to the understanding of flow by suggesting ways of increasing the frequency and intensity of flow through imagery. Across the four studies, imagery interventions showed a sustained increase in flow experiences in most of the participants, along with improved performance. Imagery can be especially helpful for enhancing the experience of specific flow dimensions, such as clear goals (Jackson & Csikszentmihalyi, 1999) and concentration on the task (Munroe, Giacobbi, Hall, & Weinberg, 2000).

There are a number of limitations in this research, regarding sample characteristics and size, performance indicators, retrospective self-reporting, and the possible influence of situational and contextual factors. These studies were based on a relatively small number of participants, representing only soccer, golf, and tennis, with mainly male participants, and only one female participant. Assessment of the dependent variable of performance was questionable in all of the studies. The frequent use of the ABA design in most of the studies required an assessment of stable baseline performance of flow or a trend in the opposite direction (Kazdin, 2010). Pain, Harwood, and Anderson (2011) and Nicholls, Polman and Holt (2005) had a relatively short baseline period. This reduced the likelihood of attaining a stable level to accurately assess the overall efficacy of the intervention.

In the Nicholls, Polman, and Holt (2005) study, there was another limitation in measurement of performance. The golfers' performance was only based on one skill-performance indicator. Targeting only one performance indicator can create a situation in which a golfer performs relatively well on one skill indicator, but plays poorly in other

domains. Future studies should consider multiple aspects of performance as dependent variables.

Another limitation concerns the assessment of improved performance. Since the players in Koehn, Morris and Watt's (2006, 2014) studies were junior tennis players - adolescents known as less stable performers in contrast to adult elite athletes - it is expected that their performance would improve over time, regardless of the imagery intervention. To control for this alternative explanation, a comparison between an experimental and a control condition is advised. An additional threat to reliability is social desirability. All of these imagery intervention studies used retrospective self-reports as a measure of flow. When using retrospective self-reports, participants are aware of the research goals and performance outcomes, which tends to influence their response by inflating their desire to achieve these goals (Jackson, 2000). Due to the close attention given by the researchers to the small number of participants, the influence of social desirability on reporting flow experiences should be considered.

All of the studies measured flow and performance in competitive environments. This approach is compatible with research in ecologically valid settings, which has the potential to add to both the literature and the applied work of sport psychology practitioners. Future evaluative studies, employing a range of methodological approaches (including group-based designs), would be useful in further developing the applied knowledge underpinning sport psychology interventions. In natural situations, it is impossible to control extraneous variables such as the opponents' characteristics, weather conditions, and audience behavior. These variables may have had an impact on the difficulties of investigating the flow experience in real-life competitive sport settings. The competitive situations themselves could also have affected the flow experiences and performance (Koehn et al., 2014).

The goal of these studies was to investigate the influence of imagery interventions on enhancing flow and performance experiences. This statement suggests a causal relationship between the two. However, until researchers clarify how this may be achieved and until mediating variables have been duly considered, there is no way of knowing whether the relationship between flow and performance is reflected by causality or reciprocity - or whether there is a lack of consistency between the two, since each variable changes independently (Koehn et al., 2014). Further research is required involving larger samples from different sport domains, and with the inclusion of men and women participants, in order to refine the methodological concerns raised in relation to these studies.

Mindfulness. Mindfulness involves being aware of thoughts and sensations, and paying attention to one's body and actions in the moment (Neale, 2007). According to Kabat-Zinn (2005), mindfulness involves "an openhearted, moment-to-moment, non-judgmental awareness" (p. 24) of oneself and the world. Mindfulness training includes body-centered exercises, such as focused breathing (Arch & Craske, 2006), in order to cultivate a quality of consciousness characterized by a nonjudgmental, moment-to-moment attentiveness to experiences, thoughts, and emotions (Grossman, Niemann, Schmidt, & Walach, 2004; Ludwig, & Kabat-Zinn, 2008).

A close theoretical relationship has previously been suggested between the concepts of flow and mindfulness, with an emphasis on present-moment focus (Gardner & Moore, 2004; Kee & Wang, 2008; Salmon, Hanneman, & Harwood, 2010). Both mindfulness and flow conceptualisations emphasize that individuals' present-moment conscious experience is regulated by their focus of attention and awareness, and the importance of nonjudgmental awareness (Cayoun, 2011; Scott-Hamilton & Schutte, 2016). Mindfulness was considered a foundation for the flow experience (Aherne, Moran, & Lonsdale, 2011; Briegel-Jones, Knowles, Eubank, Giannoulatos, & Elliot, 2013; Kaufman, Glass, & Arnkoff, 2009). Flow

and mindfulness involve being present, actively engaged, and attentive. Mindfulness and flow have implications regarding how participation can influence well-being, as a way of being present in the world. Flow and mindfulness embody a sense of presence or attunement during modes of participation. During everyday modes of engagement, most individuals engage in occupations; there exist more opportunities to experience presence to the requirements of the task, the outcomes, the body, and the immediate and social environment through conscious awareness.

While research on flow and mindfulness is limited by methodological and conceptual issues, it is expected that clarification of the relationship between the two concepts will lead to a clearer understanding of both concepts. A growing body of literature indicates that mindfulness can enhance flow and performance in sport settings (Cathcart, McGregor, & Groundwater, 2014). Mindfulness may facilitate flow directly and also impact flow by decreasing sport anxiety and pessimistic, sports-related thoughts (Scott-Hamilton & Schutte, 2016). Some sport researchers have identified correlations between elements of flow and facets of mindfulness (e.g., Aheme, Moran, & Lonsdale, 2011; Cathcart, et al., 2014; Kee & Wang, 2008; Moore, 2013). Among athletes, high mindfulness is associated with a greater frequency of the key flow dimensions of challenge-skill balance, clear goals, concentration, merging of action and awareness, and loss of self-consciousness (Kee & Wang, 2008).

Cathcartet al. (2014) examined the relationship between mindfulness and flow among elite athletes. Participants comprised 92 athletes from the South Australian Sports Institute (SASI) and the Australian Institute of Sport (AIS). Participants included 56 males and 36 females; the sample contained athletes from baseball, water polo, swimming, cycling, athletics, netball, soccer, kayak, rowing, hockey, basketball, and rifle shooting. The measures administered were a sociodemographic and sport questionnaire, to report sociodemographic, medical, and sports participation information; the Five Facet Mindfulness Questionnaire

(FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006); and the Dispositional Flow Scale-2 (DFS-2; Jackson & Eklund, 2002). Data collection involved administering the battery of questionnaires to all participants. Correlations between mindfulness and flow were stronger among athletes from individual and pacing sports (cycling, swimming, rowing, and kayak) compared to team-based and non-pacing sports (rifle shooting, athletics (there were no pacing events in the athletics sample), football, basketball, baseball, water polo, netball, and hockey.) Mindfulness correlated more with different facets of flow in males than in females. The results support the use of the FFMQ in elite athletes, suggesting that the relationship between mindfulness and flow may vary according to gender and sport type among elite athletes.

A comprehensive literature search was conducted for peer reviewed articles on mindfulness interventions used to facilitate flow. Based on accessibility and relevance to the topic area, the data bases that came up were: SPORTDiscus, PsycINFO, and Sage journals accessed online by the Victoria University Depository, using all four keywords: flow, sport, mindfulness, and intervention, and not including blood flow, optic flow, expiratory flow, or ventile flow. This search yielded four studies. The studies were conducted by Kaufman, Glass, and Arnkoff (2009), Aherne, Moran, and Lonsdale (2011), and two studies by similar research teams, Scott-Hamilton and Schutte (2016) and Scott-Hamilton, Schutte, and Brown (2016). These studies are summarized in Table 2.2 followed by a brief description of each study, and a critique.

Table 2.2

Mindfulness Interventions Enhancing Flow and Performance

Study	Participants	Design	Dependent Variables	Procedure	Results
Kaufman, Glass, & Arnkoff (2009)	32 athletes; 11 archers 21 golfers	Experimental between-groups design	Flow State (FSS-2) Dispositional Flow State (DFS-2) Kentucky Inventory of Mindfulness Skills (KIMS)	Mindfulness Sport Performance Enhancement (MSPE) Four-week program	Global flow and unambiguous feedback increased
Ahere, Moran, & Lonsdale (2011)	13 elite athletes; 7 intervention 6 control	Experimental between-groups design	Flow State (FSS-2) Cognitive & Affective Mindfulness Scale - revised (CAMS-R)	Self-initiated mindfulness training guide Six-week program	Global flow, clear goals, and sense of control increased
Scote-Hamilton, Schuttle, & Brown (2016)	47 competitive cyclists; 27 intervention 20 control	Experimental between-groups design	Dispositional Flow State (DFS-2) Mindfulness Questionnaire (FFMQ)	Mindfulness workshop, (MiCBT), home mediation, Mindful spin-bike training Eight-week program	Mindfulness and flow increased
Scote-Hamilton & Schutte (2016)	12 competitive road cyclists; 6 high adherence 6 low adherence	Experimental between-groups design	Dispositional Flow State (DFS-2) Mindfulness Questionnaire (FFMQ)	Mindfulness workshop, (MiCBT), Intervention log workbook Eight-week program	Athletes high in adherence mindfulness and flow increased

Kaufman, Glass, and Arnkoff (2009) explored how a Mindful Sport Performance Enhancement (MSPE) workshop could impact flow states and performance. The workshops were held four times in a period of a month with sessions lasting between two and half to three hours. The participants were recreational athletes, 11 archers and 22 golfers. The chosen measures relevant to mindfulness and flow were the FSS-2, DFS-2, and Toronto Mindfulness Scale (TMS; Lau et al., 2006). Pre- to post-workshop measures indicated significant changes

in the level of overall state flow, specifically in unambiguous feedback. No significant changes were observed for dispositional flow. The archers' overall trait mindfulness increased significantly. The golfers' ability to describe observed phenomena (an aspect of mindfulness) also significantly increased.

Aherne, Moran, and Lonsdale (2011) investigated the effect of a mindfulness training program on athletes' flow experiences during competitive sport training. Participants comprised 13 university athletes from a "High Performance Centre". Participants were assigned to either an experimental or control condition. The FSS-2 and the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R), developed by Feldman, Hayes, Kumar, Greeson and Laurenceau (2007), were administered. After completion of the FSS-2 and the CAMS-R, the intervention condition received an information sheet explaining the nature and characteristics of mindfulness, the ways mindfulness training can be applied to sport, and a CD entitled "Guided Meditation Practices", which they were instructed to use as a guide for practicing mindfulness for six weeks during their sport training. Athletes in the control condition were not provided with any additional instruction and received no further attention. Results showed no significant differences between the mindfulness and control conditions at baseline, but at follow-up the mindfulness group's scores were significantly higher than the control condition's scores with reference to global flow, and the subscales of clear goals, sense of control, and unambiguous feedback.

Scott-Hamilton, Schutte, and Brown (2016) investigated the impact of a mindfulness-based intervention on mindfulness, flow, sport-anxiety, and sport-related pessimistic attributions among competitive cyclists. The recruited Australian cyclists were at least 16 years old and actively competing in mountain biking or road cycling at the club level. Scott-Hamilton et al. included a total of 47 competitive cyclists in the final analyses, 27 in the mindfulness intervention condition and 20 in the wait-list control condition. The mindfulness

intervention included an 8-week mindfulness workshop, home-meditation based on the modified mindfulness-integrated cognitive behavior therapy program (MiCBT) (Cayoun, 2011) material, and mindful spin-bike training sessions. Control condition members did not receive any further contact. Participants completed baseline and post-test measures. Results showed that cyclists participating in the mindfulness intervention program displayed significant moderate-to-large increases in mindfulness and flow, in contrast to the control condition participants, whose mindfulness and flow did not change significantly. These findings were consistent with previous findings regarding the ability to narrowly focus attention in order to facilitate the fulfilment of preconditions of flow, and the ability to sustain attention to remain in a flow state (Nakamura & Csikszentmihalyi, 2005).

Scott-Hamilton and Schutte (2016) continued their previous research by examining how mindfulness influences flow, and how adherence to mindfulness practice may facilitate this process. The competitive cyclists who participated in this study were 12 competitive road cyclists from Australia. Participants completed the following measures which are relevant to mindfulness and flow: DFS-2, Sport Anxiety Scale 2 (SAS-2; Smith, Smoll, Cumming, & Grossbard, 2006), and FFMQ. The measures were completed at baseline and again after eight weeks of mindfulness training. The athletes participated as a group in an eight-week mindfulness training program, consisting of regular weekly mindfulness workshop sessions, home meditation training, and group mindfulness focus on movement exercises. Participants were identified as either “high adherence” or “low adherence” with mindfulness-training, based on a composite score of logbook practice records and workshop attendance. Global flow and frequency of flow characteristics experienced by the high adherence group increased substantially but not significantly. The low adherence group decreased in the frequency of flow characteristics but not significantly. The correlations showed that increase in mindfulness was associated with increase in frequency of global flow and the factors of flow

characteristics Increases in dispositional flow were associated with decreases in somatic anxiety and pessimism.

The research on mindfulness and flow confirmed the possibility of using mindfulness interventions to enhance flow experiences. However, both flow and mindfulness are still in need of further conceptualisation. As Jackson and Marsh (1996) and Csikszentmihalyi (1992) have pointed out, the subjective experience of flow can be quite difficult to assess. Mindfulness can also be conceptualised and assessed in different ways, including approaches based primarily on Buddhist phenomenology and approaches grounded in recent Western societies (Grossman & Nicholas, 2011). Scott-Hamilton, Schutte, and Brown (2016) wrote, "It seems that although valid and reliable measures of mindfulness and flow were used in this study, they may not have adequately captured the ephemeral experience of flow entirely." A related issue concerns the difference between measuring state and dispositional flow and mindfulness. It is still unclear whether mindfulness can be considered a trait, a set of skills, or a state (Giluk, 2009). This uncertainty has led some researchers to measure the dependent variable of flow as state flow (Aherne, Moran, & Lonsdale, 2011), dispositional flow (Scott-Hamilton, & Schutte, 2016; Scott-Hamilton, Schutte, & Brown, 2016) or as both state and dispositional flow (Kaufman, Glass, & Arnkoff, 2009). These uncertainties require further research attention in order to better understand the link between mindfulness and flow.

Since these mindfulness studies all focused on investigating the benefits of using mindfulness interventions to enhance flow, they employed causal research designs. In these studies, the experimental conditions that received training in mindfulness were compared to control conditions that did not receive the interventions. The primary goal of an experimental design is to establish a causal connection between the variables. All of the mindfulness and flow research studies used two group pre-intervention and post-intervention experimental designs (Kirk, 2013). Two studies used an intervention and a control condition (Aherne,

Moran, & Lonsdale, 2011; Scott-Hamilton, Schutte, & Brown, 2016). Two other studies compared two groups, one representing self-paced, closed-skill, and objectively scored sports (archers and golfers), while the other condition differentiated between high and low adherence to implementing a mindfulness intervention. The absence of differences between the mindfulness and control condition and between the two comparable conditions at baseline, were compared with differences found between them after the intervention, and the researchers interpreted that as showing that changes were related to the intervention methods. Assessing the internal validity of a study is related to the degree to which the experimental treatment causes change in the specific experimental settings (Kirk, 2013). These concerns address whether the procedures actually worked correctly and whether the measurement adequately represents what the researchers set out to measure (Leik, 2013). There were a number of limitations concerning the internal validity of the studies, which I now consider.

The first concern relates to sample size. In two studies (Aherne, Moran, & Lonsdale, 2011; Scott-Hamilton, & Schutte, 2016), the sample included 13 and 12 athletes, divided into two conditions. In these small samples, statistical analysis using ANCOVA and t-tests increased the chance of Type II error, which involves not identifying actual differences or associations due to a lack of power. Scott-Hamilton and Schutte (2016) considered the small sample size as being responsible for not identifying significant effects of mindfulness training on the subscales of challenge-skill balance, concentration, and loss of self-consciousness.

The second concern relates to the Hawthorne effect, wherein reactivity to interventions, other than the reaction that was intended, alters the subjects' response (Leik, 2013). The fact that mindfulness training provided participants with attention not received by members of the control condition might be an alternative explanation for the increase in the dependent variable after the intervention. To minimize the impact of this preferential treatment, a

distractor task could have been given to athletes in the control condition (Aherne, Moran & Lonsdale, 2011).

The third concern related to internal validity was the subjects' reactivity to measurement, as a result of knowing the researchers' goal (Leik, 2013). An example of the possible impact of participant-researchers expectation can be found in the work of Kaufman, Glass, and Arnkoff (2009). In their attempt to explain the unexpected finding that significant changes in dimensions of dispositional mindfulness did not entail significant changes in dispositional flow, they wrote,

> One should also consider that the demand characteristic of wanting to answer questions correctly after completing a mindfulness training program might have led to a change in mindfulness scores, while flow was not directly trained, flow scores did not significantly change. This possibility calls into question whether real change in mindfulness occurred, since it would be expected that mindfulness and flow should change simultaneously. (p. 348)

A fourth concern relates to substantiating the impact of an intervention that requires implementation of a sufficient strength and compliance level. Performing interventions that don't meet threshold effects would not cause mindfulness intervention to influence flow experiences (Leik, 2013). The duration of the mindfulness intervention in the above-mentioned studies ranged from four to eight weeks (one session held weekly), with varied inputs from giving the athletes an information sheet and a CD as guides for implementing the intervention, to a mixture of mindfulness workshops, home-meditation (MiCBT) and mindful spin-bike training. These variations signify a need to determine the required threshold effect, concerning the necessary time and means needed to achieve the expected effect.

In a fifth concern, I address the procedure used to administer the intervention and the measures used to verify this. Although most studies provided clear descriptions of the

intervention, the research manipulation check was designed to assess the efficacy of the intervention program (i.e., mindfulness training), rather than the degree to which participants actually adhered to the practice of mindfulness training. Scott-Hamilton, Schutte, and Brown (2016) acknowledged this limitation and addressed it in their next research project (Scott-Hamilton & Schutte, 2016). In the Scott-Hamilton and Schutte study, they used participants' entries in logbooks, documenting their frequency and duration of mindfulness practice to identify participants as either "high adherence" or "low adherence". In this study, the low adherence participants served as a pseudo-control group, as they were provided with an equal opportunity for training and practice over the course of the eight weeks. Results confirmed that athletes high in adherence showed significantly greater increases in mindfulness and aspects of flow.

Results of the mindfulness and flow studies reported in this section suggest that mindfulness training may increase athletes' flow experience, which in other research was also related to performance and well-being (Csikszentmihalyi, 1990; Nakamura & Csikszentmihalyi, 2005). A more precise conceptual and empirical definition of the concepts involved will enable further research into their shared and unique characteristics and contributions. Future studies should investigate how, when and for whom mindfulness interventions are most effective, and determine the precise mechanisms underlying the effects of mindfulness training on flow, in particular, and athletic performance, in general (Aherne, Moran & Lansdale, 2011).

Hypnosis. Hypnosis is a state of human consciousness involving focused attention and reduced peripheral awareness, together with an enhanced capacity for response. The American Psychological Association (APA) describes hypnosis ability as the ability "to experience suggested alterations in physiology, sensations, emotions, thoughts, or behavior during hypnosis" (Elkins, Barabasz, Council, & Spiegel, 2015, p. 6). Hypnosis-related

suggestions are proposed to facilitate a process of dissociation between executive control and monitoring functions within the brain, whereby the non-conscious part of the cognitive control structure responds to the given suggestions and images without engaging potentially critical conscious awareness (Hilgard, 2013). Hypnosis involves suggestions geared to alter thoughts, feelings, perceptions, and sensations, thereby facilitating long-term changes in behavior (Heap & Aravind, 2002).

Unestahl (1983) interviewed elite athletes after experiencing flow and found that flow states and hypnotic states share many of the same qualities and elements. The shared qualities included changes in thinking (less paralysis caused by over-analysis), memory (amnesia), perception (slow motion and enlargement of objects), dissociation (pain detachment), and information processing (parallel processing). The shared elements include dissociation/detachment from one's surroundings, absorption, feelings of control, and perceptual distortions, such as altered perceptions of time (Kihlstrom, 1985; Pates & Maynard, 2000). During athletic performance, individuals scoring high on hypnotic susceptibility tests have been found to be predisposed to experiencing flow-like states, possibly because they possess traits consistent with an autotelic personality (Csikszentmihalyi, 1990). Both states (hypnosis and flow) theoretically suggest hemispheric shifts to a desired state ideal for sport performance (Pates & Maynard, 2000; Unestahl, 1986). Edgette and Rowan (2003) proposed that athletes who become adept at entering hypnotic states find it easier to access flow-like states associated with peak performance. Although the mechanism by which hypnotic interventions increase performance and the experience of flow are not known, it is possible that hypnosis facilitates a shift from an analytical to a holistic style of thinking, thereby enabling access to processes that are important for athletic performance (Crawford & Gruzelier, 1992).

Interventions using hypnosis have been found to enhance performance in different sports, such as football, cricket, martial arts (Barker & Jones, 2005, 2006), badminton (Pates & Palmi, 2002), cycling (Lindsay, Maynard & Thomas, 2005), golf (Pates & Maynard, 2000; Pates, Oliver & Maynard, 2001), and basketball (Pates, Cummings, & Maynard, 2002.) Although there are a number of controlled studies indicating that hypnotic interventions have a significant positive effect on flow among different athletic populations, hypnosis-based interventions are rarely used in the field of applied sport psychology to enhance performance (Pates & Cohen, 2013).

A comprehensive literature search was conducted for peer reviewed articles on hypnosis interventions used to facilitate flow. Based on accessibility and relevance to the topic area, the data bases that came up were: SPORTDiscus, PsycINFO, and SAGE journals accessed online by the Victoria University Depository, using all four keywords, flow, sport, hypnosis, and intervention, and not including blood flow, optic flow, expiratory flow, or ventile flow. This search yielded five studies. The studies conducted by Pates and Maynard (2000); Pates, Oliver, and Maynard (2001); Pates, Cummings, and Maynard, (2002); Lindsay, Maynard, and Thomas (2005); and Pates and Cowen, (2013) are summarized in Table 2.3 followed by a brief description of each study, and a critique.

Table 2.3

Hypnosis Interventions Enhancing Flow and Performance

Study	Participants	Design	Dependent Variables	Procedure	Results
Pates & Maynard (2000)	Three male disabled golfers; ages 18-24	Single Subject ABA design	Flow State (FSS) Performance – golf-chipping accuracy	Relaxation, hypnotic, induction, imagery, & self-selected music as trigger control	Two participants increased mean flow, and all improved performance
Pates, Oliver, & Maynard (2001)	Five male disabled golfers; ages 11-24	Single Subject ABA Design	Flow State (FSS) Performance – golf-putting accuracy	Relaxation, hypnotic, induction, imagery, & self-selected music as trigger control	All participants increased mean flow and improved performance
Pates &Palmi (2002)	Four female competitive badminton players	Single-Subject ABA Design	Flow State (FSS) Badminton Serve	Hypnotic induction and regression, & trigger control	Three participants increased mean flow, and all improved performance
Pates, Cummings, & Maynard (2002)	Five male college basketball players	Single Subject ABA Design	Flow State (FSS) Basketball three point shoot	Relaxation, hypnotic, induction, imagery, & trigger control	All increased mean flow and performance
Lindsay, Maynard & Thomas (2005)	Two male and one female elite cyclists	Single Subject ABA Design	Flow State (FSS) Cyclist race performance	Relaxation, hypnotic, induction, imagery, & trigger control	All increased mean flow; two increased and one decreased performance
Pates, & Cowen (2013)	One male professional golfer	Single Subject ABA Design	Flow State (FSS-2) Performance – average stroke	Hypnotic training, self-practice in stroke & trigger control	Immediate performance improvement and flow effect

Pates and Maynard (2000) examined the effects of a hypnotic intervention on flow states and golf-chipping performance. Three male disabled golfers, ranging from 18-24 years of age, participated in this study. The study utilized an ideographic ABA single-subject design. The intervention involved relaxation, imagery, hypnotic induction, hypnotic

regression, and trigger control procedures. A competition was held among the participants in 12 chipping shots. Performance was measured by assessing the average distance the ball stopped from the hole. This procedure was conducted before and after the intervention. Flow was measured by the FSS immediately after the putting competition. The intervention increased performance accuracy for all participants. During the intervention, two of the three participants showed increases in flow. These results support the hypothesis that a hypnotic intervention can improve golf-chipping performance and increase feelings and cognitions associated with flow.

Pates, Oliver, and Maynard (2001) examined the effects of a hypnosis intervention on flow states and golf putting performances. The participants included five male disabled golfers, ranging from 11-24 years of age. In this research, a single-subject, multiple baseline across-subjects design was chosen. The intervention included three stages: hypnotic induction, hypnotic regression, and trigger control. After the training, participants committed themselves to practice the techniques every day, over a seven-day interval between the first baseline and intervention phase of the study. A competition was held among the participants in 10 putting shots. Performance was measured by assessing the average distance the ball stopped from the hole. This procedure was conducted before and after the intervention. Flow was measured by the FSS immediately after the putting competition. The results suggest that the hypnosis intervention consistently improved golf putting performance accuracy and flow intensity. The results of the study also indicated that hypnosis intervention may be an effective way to prepare professional golfers for significant competitions.

Pates and Palmi (2002) investigated the effects of hypnosis on flow states among four female competitive badminton players, using a single-subject, multiple baseline across-subjects design. The intervention included hypnotic induction, hypnotic regression, and trigger control procedures. Performance was measured during competition in badminton short

serve. Each participant served 11 times aiming as close as possible to a target, all the serves were observed by two independent observes which documented the distance of the serve from the target. The same procedure was done before the intervention and after. Flow was assessed by the FSS. All four participants increased their performance from baseline to intervention; three of them also increased their mean flow scores.

Pates, Cummings, and Maynard (2002) examined the effects of hypnosis on flow states. The intervention involved relaxation, imagery, hypnotic induction, hypnotic regression, and trigger-control procedures. Performance was measured by three-point shooting scores among five collegiate basketball players. Each participant had 10 attempts, with the score determined by the quality of the shot. Flow was measured by completing the FSS immediately after performance. From baseline to intervention, all participants increased both their mean flow score and mean three-point performance. All participants indicated that the intervention had been beneficial, helping them to remain calm, relaxed, and confident. The results support the proposition that hypnosis can increase cognitions and feelings associated with state flow.

Lindsay, Maynard, and Thomas (2005) examined the efficacy of a hypnotic intervention on flow state and competitive cycling performance. Participants were three elite cyclists, two men and one woman. The intervention involved relaxation, imagery, hypnotic induction, hypnotic regression, and the conditioning of an unconscious trigger associated with the emotions of past peak performance. A single-subject AB design was used. Ecologically valid performance measures were collected from British Cycling Federation (BCF) races, and the intensity of flow was assessed as soon as possible to the performance using the FSS. Results indicated that the number of BCF points gained per race was positively influenced by the intervention for one participant, sporadically influenced for the second participant, and not influenced for the third participant. FSS scores during the intervention phase increased for one

participant. These findings suggest that hypnotic interventions may improve elite competitive cycling performance and increase the feelings and cognitions associated with flow.

Pates and Cowen (2013) examined the effects of a hypnosis intervention on the performance and flow state experiences of a 22-years-old male professional golfer during a European Tour. The research method used was a single-subject AB design. After the first session, used as a baseline, the intervention followed in three stages. In the first intervention stage, the participant was encouraged to sit comfortably and focus on his breathing, while being introduced to a 15-minute session involving progressive muscular relaxation (PMR). In the second stage, an Ericksonian hypnosis technique known as a "staircase induction" (Hammond, 1990) was applied. In the third stage, suggestions were made to help the participant regress and remember a multisensory experience of his best competitive performance. The experimental effect was assessed during 11 competitive golf events. In this research, overall performance was measured by stroke average, taken from two, three, or four rounds of stroke golf play. Flow was measured using the FSS-2. Performance and flow data were analysed using a single-subject design combined with qualitative data used to monitor the golfer's internal experience (Wollman, 1986). The qualitative data revealed that hypnosis may help golfers self-regulate on the golf course during competition. Data analysis showed that the participant improved his performance and increased his flow experiences from baseline to intervention. The results showed that hypnosis intervention may be an effective way to prepare professional golfers for significant competitions.

All of the published studies on the effects of hypnosis on flow states were conducted by affiliated researchers, working together in different configurations, using a similar research strategy, while focusing on different sport domains. From 2000 to 2002, four studies were published, with Pates as the leading author, joined by Maynard, Oliver, and Palmi (Pates & Maynard, 2000; Pates & Maynard, 2001; Pates, Oliver, & Maynard, 2001; Pates & Palmi,

2002; Pates, Commings, & Maynard, 2002). Two additional studies were then published, the first in 2005 (Lindsay, Maynard, & Thomas) and the second in 2013 (Pates & Cowen). All of the above-mentioned studies used a single-subject AB or an ABA research design (baseline behavioral measure, introduction of independent variable, and removal of independent variable), with a procedure that monitored the participants' internal experience (Wollman, 1986). The researchers' study population included athletes representing the sports of golf, badminton, basketball, and cycling. The number of participants ranged from one to five. The intervention methods in all studies included relaxation, imagery, hypnotic induction, hypnotic regression, and trigger control procedures. The results for all studies were similar, supporting the effects that hypnosis intervention can have on improving performance, and increasing the feelings and cognition associated with flow.

This body of research highlights the advantage of using a single-subject design in an exploratory study within a still unrecognized field of practice, such as hypnosis and sport (Pates & Cowen, 2013). In single-subject designs, it is easier to follow links between the intervention and the dependent variables, which enable the detection of successful effects for certain individual subjects, who otherwise might have their success masked in a group design that does not reach significance. In working with skilled athletes who do not improve much from their pre-training level, small but consistent changes may be noticed in single-subject designs. Using a single-subject design also enables tailoring specific hypnotic interventions for individuals who are engaged in real sports competition (Wollman, 1986).

Although a certain increase in performance and flow intensity were demonstrated in all of the studies, athletes' motivation should be assessed more closely. Since the studies included a sequence of sessions, in every consecutive session the athlete is motivated to top the last session's achievements. This self-induced competition may highlight the dimensions of challenge-skill balance, clear goals, and feedback, which may influence additional dimensions

and lead to a significant increase in flow intensity. This dynamic development was not reported in this body of research. On the contrary, qualitative data collected from the players highlighted that hypnosis may help athletes regulate their emotions, for instance by suppressing negative emotions, such as anger, and elevating positive emotions such as confidence, optimism, enjoyment and fun, and positive thinking related to winning. Unfortunately, the mechanism by which hypnotic interventions increase performance and the experience of flow is not known (Pates, & Cowen, 2013).

It is also possible that the improvements in both performance and flow scores are merely an artifact of subject and experimenter bias. Indeed, in these studies, neither the subjects nor the experimenters were blind to the outcome of the research; therefore, it could be argued that experimenter expectations or the demand characteristics of the experiment could have influenced the results. There also remains the issue of a possible Hawthorne effect, which indicates that a reaction to intervention, other than the intended reaction, alters the subjects' response (Leik, 2013). This effect refers to participants' change in performance, resulting from simply participating in the experiment or study. The scrutiny and attention subjects receive in a small research study, comprising 1 to 5 athletes, has the potential to increase their response in accordance with the researcher's expectations.

Although the research on hypnosis, flow, and performance generally found positive intervention effects on flow, this approach is methodologically problematic, because none of the studies evaluated the quality of participants' reports of their best performance experiences as being identical with or akin to the flow state. Therefore, the trigger could be attributed to a state that was substantially different from, or merely resembled, flow. Future intervention studies need to carefully choose and measure dependent variables. Ideally, theory or research findings should inform researchers' decisions on the targeted outcome variables.

The results of the hypnosis and flow research are relevant to sport psychology practitioners, because they suggest that hypnotic training might increase personal control over flow and the performance of fine motor skills. This finding supports the work of Unestahl (1983, 1986), who explicitly indicated that high levels of performance and positive emotions like flow states could be initiated through hypnotic regression and trigger control techniques. A countless number of elite athletes report flow as being the crucial factor separating winners from losers (Unestahl, 1983). These findings imply that elite athletic populations may have the most to gain by adopting and integrating hypnotic interventions into their mental training regimens (Pates & Cowen, 2013).

Research on personal, situational, and contextual factors associated with flow outcomes has contributed to understanding the flow phenomena and its unique characteristics. Research on the occurrence of flow suggests the interaction of internal states (e.g., focus, arousal, motivation, confidence, thoughts and emotions), external factors (e.g., environmental and situational conditions, i.e., weather, or a course that suited the athlete), and behavioral factors (e.g., preparation) (Swann et al., 2012). However, identifying influential flow factors does not provide knowledge about the development process of flow, or the causal links which underlie the flow mechanisms.

Despite the abundant research on flow in sport, the nature of flow remains elusive, because researchers have focused more on identifying the factors that influence flow based on association (Aherne, Moran, & Lonsdale, 2011; Chavez, 2008; Jackson, 1995; Russell, 2001), rather than on investigating how each influencing factor affects flow (Swann et al., 2015).

There is on-going evidence showing that flow experiences are not homogeneous across sports, situations, or participants. However, it appears that some dimensions are more relevant or prevalent than others in the achievement of flow within specific sport contexts (Jackson et al., 1998; Jackson et al., 2001, Jackson, 2013). The uniformity of the flow experience across

sport domains is questionable. Differences regarding the prevalence with which some dimensions may be experienced or reported in some sports compared to others, can be a characteristic of flow (Swann et al., 2012). Elbe, Strahler, Krustrup, Wikman, and Stelter (2010) found that female runners experienced significantly more flow experiences than female football players. The impact of gender differences is also debatable. Researchers did not find meaningful gender differences inflow among college athletes (Martin & Cutler, 2002; Russell, 2001) and adolescent athletes (Moreno Murcia, Cervelló Gimeno, & González-Cutre Coll, 2008).

A clearer understanding of flow occurrence in context requires greater differentiation between sport domains concerning performance standards. In line with the suggestion of Swann et al. (2015), studying athletes from a single setting (i.e., one standard of athletes from one sport) could help researchers make clearer comparisons and explore possible differences. A different approach is evident in the presented research concerning the effect of intervention strategies of imagery, mindfulness, and hypnosis on the frequency of flow and performance. In this body of research, the studies that focus on how each intervention affects flow uncover the mechanisms and interactions that may underlie the occurrence of flow. Applying these guidelines is likely to provide clearer understanding of flow occurrence in context, and include more relevant and specific information for athletes, coaches, and practitioners.

Difficulties in measuring targeted behavioural indicators arose during most of the studies. Single-case research design methods could be based on more relevant indicators of the performance in question than those selected. Rather than exclusively examining performance outcomes, it is important to take into account performance subcomponents (Thelwell, Greenlees, & Weston, 2006). Thus, in golf, technical and tactical subcomponents should be considered.

In most of the studies, the number of participants was smaller than 10. The variety of the sport covered was very limited. Testing was conducted under laboratory conditions, rather than in a competitive environment - the context being studied and reported on. Moreover, some of the measures that were chosen in these studies are not specifically designed for sport settings, which made many of the questions irrelevant.

However, while the intervention studies included in this review do not add conclusive evidence per se, they are perhaps promising in that they suggest interventions that could potentially increase the experience of flow in elite sports. Furthermore, the interventions all involved psychological concepts that have previously not been strongly linked with the experience or occurrence of flow (i.e., hypnosis, imagery, mindfulness, and music)

The considerations reviewed in this chapter regarding individual flow are relevant to understanding the experience and the components of flow. The phenomena of team flow demands a look at the bigger picture. Bakker, Oerlemans, Demerouti, Bruins, and Karamat (2011) claimed that flow occurs at the team level. Players within the team serve as a catalyst for others; when the "catalyst" enters the flow state, other teammates may follow. This may produce exceptional team performances, and could present an interesting area for further exploration, e.g., by conducting interviews or focus groups with teams to discuss and understand how flow experiences start, whether team members share flow experiences, and to explore the relationship between leadership and flow in sport. In the next part of the literature review, I concentrate on the concept of team flow.

Team Flow

In contrast to the extensive research on individual flow, team flow is a concept that was first introduced by Cosma in 1999, and which has continued to develop slowly. Based on my conviction that teams, as a unit, can experience team flow, I began my research by exploring the characteristics of team flow as an independent concept, and its relationship with relevant

concepts related to team dynamics. In the current section, I begin by reviewing the relevant literature on teams; I continue by presenting available research material on team flow; and I conclude with a discussion of similarities and differences between team flow and the related concepts of group cohesion, collective efficacy, and team collapse. This literature review helped me choose the specific goals reflected in my thesis.

Characteristics of Teams

There are several definitions for the term team. Barczak, Lassk, and Mulki (2010) presented a definition that includes many elements found in most of the definitions: "a group of individuals where talent, energy and skills are integrated . . . and this collective capacity to innovate becomes greater than the sum of individual contributions" (p. 332). As early as 1933, Elton Mayo observed that effective collaborative work groups, characterized by high motivation, co-ordination, and unity of purpose, demonstrated a vitality and inventiveness level that were higher than those of their individual members (Spencer & Pruss, 1992). A range of sport activities are based on groups whose members function as teams.

Traditional research in social psychology assumed that people act, think, and feel differently as part of a group than as individuals (Walker, 2010). Consequently, flow in a social context may be a qualitatively different phenomenon than flow experienced in isolation. The tendency of groups to work together in a way that facilitates group flow experiences was identified as social or collective flow (Quinn, 2005; Walker, 2010); in sport contexts the equivalent experience was termed team flow (Cosma, 1999). In the mere presence of other people and in some co-active social situations, individual flow seems to be more frequent than social flow. However, when the unit of performance is a group, especially a team working on mutual tasks, interdependence and cooperation are required, and social flow is more likely. Steiner (1978) proposed that social flow was more frequent among elite athletes who usually face challenging tasks that require group members to act congruously

together. Hackman, Wageman, Ruddy, and Ray (2000) reported that social, collective, and team flow occur in highly cohesive teams in which there is concurrence on goals, procedures, roles, and patterns of interpersonal relations, and in which the competency of team members is consistently high. However, in contrast to social and collective flow, team flow, the term usually preferred in sport, requires a significant perceived team-level challenge for its members to experience flow (Sawyer, 2007). Because research related to these three concepts is still limited, it is difficult to assess the extent of their similarities and differences. Parts of their distinctive characteristics may be linked to flow experiences as a function of activity type and context. Further research is required to better understand the conceptual and operational differences among these terms.

Successful sport teams show unity and team spirit, which Syer (1986) indicated were described by four group resources: morale, cohesion, confluence, and synergy. Cohesion, from a team perspective, was described as "a dynamic process that is reflected in the tendency for a group to stick together and remain united in pursuit of its instrumental objectives and/or for the satisfaction of members' affective needs" (Carron, Brawley & Widmeyer, 1998, p. 213). Team morale is an emotive term that alludes to the happiness of the group, or the collective task attitudes shared by team members (He, 2012). Confluence, a Gestalt concept (Perls, 1976), was portrayed as a state in which limits of self-awareness vanish and there is a feeling of unity with oneself and the aggregate environment. Confluence was also described as cooperative energy or a feeling of extra vitality, strength, or creative ability, which is accessible when teams work amicably and accomplish performance that exceeds expectations. In the coaching literature, synergy refers to the rhythmic and coordinated movements of players as a team, in order to support team cohesion and outperform opponents (Silva, et al., 2016).

Traditional group work researchers, similar to other psychological and social researchers, have tended to focus on deficits, rather than strengths in teams and teamwork research (Kerr & Tindale, 2004). This attitude can be found in relation to coordination gains defined as individual commitments to team collaboration. As a result of this approach, a consensus definition of coordination gains is still unavailable and a research tradition devoted to the demonstration and explanation of coordination gains has not developed (Hüffmeier & Hertel, 2011). Consequences of this approach arise when individuals working as part of a team feel their efforts are not identified or valued by others; therefore, their motivation to complete the task is significantly reduced (Karau & Williams, 1993). This devaluation is also true when individuals feel others are trying to exploit their good will (Kerr, 1983).

Concept of Team Flow

Cosma (1999) described team flow as a state of optimal experience, in which the team is totally absorbed in the task and in a state of consciousness that enhances performance. During team flow, individuals feel they are moving together toward shared or complementary objectives, continuously adjusting to each other's expectations, needs, and contributions. In this state, team members consider how others operate and search for beneficial ways to interact effectively together. Achieving team flow requires individuals to develop shared or reciprocal objectives that exceed their personal agendas. It also requires the sensitivity and vigilance to keep up together with the unique unfolding circumstances of the situation. From a qualitative study on the conceptualization of team flow, Cosma (1999) reported that typical comments team sport athletes used to describe team flow included: "we just clicked", "we gelled", "we were in the zone", and "there was chemistry among us". It appears that, when athletes talk about team flow, they typically refer to a collective experience by using the pronouns "we" and "us".

Sawyer (2003) used interaction analysis, which consists of in-depth observations and the classification of participants' gestures, conversations, and body language to study group flow. Sawyer examined more than 10 years' of observations of several performing groups, and concluded that group flow requires members to develop a feeling of mutual trust and empathy, culminating in a collective mental state in which individual intentions harmonize with those of the group (Gaggioli, Mazzoni, Milani, & Riva, 2015). According to Sawyer, group flow "cannot be reduced to psychological studies of the mental states or the subjective experiences of the individual members of the group" (2003, p. 46). In other words, group flow cannot be accurately reflected by assessing and summing only the work of individuals. This phenomenon rather emerges from the interactions occurring within a group and is able to positively influence overall performance.

In the realm of competitive sports, winning is unquestionably an important goal that individuals and teams aim to achieve. The coaching approach may be an influential factor in encouraging individual versus team flow. In the case of win-lose (WL)-oriented coaches, each player is exposed to the prominent goal of winning, which requires focusing on his/her best performance. As a result, the players become self-centered (Burton & Raedeke, 2008). Within such a team atmosphere, teammates may be perceived as rival competitors, thereby discouraging mutual concern and support for one another. Having a win-oriented approach in a team will tend to encourage individual flow. In the case of a successful result (SR)-oriented coach, athletes help each other and create synergetic effects by coordinating their efforts. Guided by this approach, they willingly promote active teamwork, which is likely to achieve successful results. When a team is in the midst of experiencing a team flow state, it focuses on doing everything to amplify the utilization of everyone's potential capacity, in order to accomplish effective outcomes that can lead to a team victory. Although this coaching style,

similar to a team with a win-centered coach, also pursues victory, the team's actions are not driven by winning, but by maximizing their team effort (Tsutomu, 2012).

Developments in the Conceptualisation of Team Flow

Although those who examined team flow have proposed that analogue processes occur in individual and team flow, it is also likely that some exceptional social qualities are also related to team flow (Salanova, Rodroguez-Sanchez, Schaufeli, & Cifre, 2014). One of those qualities is empathic crossover, based on the Emotional Contagion Theory (ECT; Bavelas, Black, Lemery, &Mullett, 1987; Hatfield, Cacioppo, & Rapson, 1993), an unconscious automatic mechanism whereby athletes who work together experience common emotions, that is, share an affective-motivational state (Salanova, et al., 2014). According to ECT, individuals have the natural, inner tendency to mimic facial expressions, postures, and emotions, consequently synchronizing with each other physically and emotionally. In these situations, while interacting with members of their team, athletes are able to recall a similar situation with a similar effect (Westman, 2001). In this way, flow experiences can spread from one member of a team to "infect" other members, so that flow becomes a collective social experience. Moreover, in highly interdependent and interactive situations, such as team sports and working groups, people who experience empathic crossover serve as "agents of flow" for one another (Salanova, et al., 2014).

Quinn's (2003) interest in collective flow in the workplace began by asking whether a combination of individual flow attributes could be generalized to the team context. An alternate point of view was taken by Sawyer (2003), who claimed that certain teams demonstrate a disposition for team flow, which is greater than the accumulation of individual flow experiences. Bandura (1997) proposed that this tendency might be a function of a dynamic process occurring at the team level, which may be related to group efficacy. Employees frequently work in teams, and people are the common denominator in every team

(Guzzo & Shea, 1992). The competencies needed in teamwork increase the need for knowledge, skills, and abilities (Ramirez, 2013). Therefore, misalignment is problematic between organizational contexts, such as team-based organizations and performance appraisal research, which continues to focus on individual jobs that are disengaged from each other (Latham, Skarlicki, Irvine, & Siegel, 1993).

The current literature lacks a consensual definition of team flow. The main issue requiring clarification is whether individual flow and team flow are the same phenomenon operating on different levels, or whether team flow is a distinct phenomenon with unique dimensions that emerge from the experience of functioning as a team. These questions highlight the need to define team flow. Alternative ways to clarify what constitutes team flow are to conceptualize team flow in terms of individual flow, or to take a fresh look at team flow as an independent concept and explore its relationships with related concepts. In order to clarify these issues, it is important to explore team flow as an independent concept.

Research on Team Flow

I conducted a comprehensive literature search for peer reviewed articles, books, and dissertations on team flow in sport. Based on accessibility and relevance to the topic area, the data bases that came up were: SPORTDiscus, PsycINFO, and SAGE journals accessed online by the Victoria University Depository, using four keywords: flow, sport, team, and group, and not including: blood flow, optic flow, expiratory flow, or ventile flow. This body of research literature did not yield any academic published studies on team flow in sport, although I did locate three unpublished dissertations in the sport domain (Cosma, 1999; Mosek, 2009; Tsutomu, 2012), and a study of collective flow in the workplace conducted by Quinn (2003).

Cosma (1999) was the first researcher to study flow states in teams. His goals were to examine whether soccer players experienced team flow, and if so, whether these experiences were similar or different than individual flow experiences reported by elite athletes. The study

participants came from five soccer teams (*N* = 104 players). All participating athletes received a packet containing a letter of explanation, a consent form, the FSS, and the FSST. The participants were asked to fill out the questionnaires with reference to an experience that emerged as being superior to normal, which they had encountered during a soccer match in the previous season. Once the forms had been completed, players were asked to return the package to the researcher by mail. In order to measure team flow, Cosma designed the FSST, an amended version of the FSS used to measure individual flow. Modification of the scale included only a change of pronouns for each item from "I" to "we" and from "me" to "us". For example, whereas one item in the individual flow state scale was, “I was challenged, but I believed my skills would allow me to meet the challenge”, the corresponding FSST item was "We were challenged, but we believed the skills of the team would allow us to meet the challenge”. The data was then analyzed by Confirmatory Factor Analysis (CFA). Reliability and goodness of fit assessment of the FSST’s structure matrix showed that the team players in this study experienced all nine dimensions of flow, but the results did not support all nine factors to the same degree. Four factors emerged as being most important in capturing the characteristics of team flow. The four-factor model and its relationship to flow, optimal experience, and optimal performance are shown in Figure 2.3.

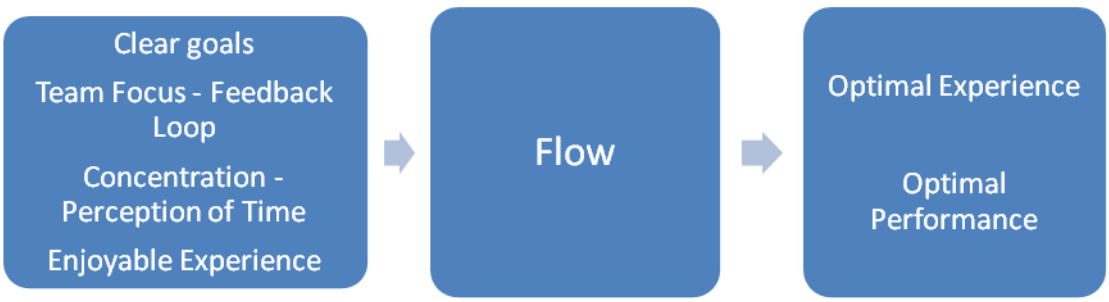

Figure 2.3

Proposed Model of Flow in Teams (Cosma, 1999)

As shown in Figure 2.3, the four factors deemed most influential for team flow were: clear goals, team focus and feedback loop, concentration and perception of time, and enjoyable experience. Cosma (1999) claimed that for a team to be successful it must have clear goals, players must be focused on the mutual giving and receiving of feedback, the team as a collective unit must retain its concentration, and perceive time as their ally. Finally, teams must enjoy the experience. The existence of all these four factors may lead to team flow. Cosma's important contribution was twofold; first, in considering team flow as an independent concept worth examining and, second, in developing a specific measure for team flow.

As the first research on team flow, Cosma's (1999) study had some flaws. The first concern is the proposed causal relationship suggested by the four-factor model between flow and performance. Because Cosma did not examine team flow as a predictor variable for performance, this claim could not be substantiated. The second concern is the specificity of the sample. Cosma's participants were all North American elite male soccer players, limiting generalization of the findings to other populations and sport areas. Team flow, as a general concept, requires broad exploration across genders, sport areas, and cultures. The third concern is related to the use of a retrospective measurement of flow. Cosma's data was based on self-reports collected from the athletes at the end of the season. Therefore, incomplete recall and retrospective distortion seem inevitable, as well as biases due to the players' knowledge regarding their performance throughout the season. Flow should be measured as close as possible to the time of the assessed experience. When flow is measured a substantial amount of time after the event, measurement issues, including incomplete recall and retrospective distortion, may influence the data (Jackson & Roberts, 1992; Privette & Bundrick, 1991). The fourth and most troubling concern, in my opinion, is creating a team flow state scale that is a replica of the individual flow state scale, by modifying pronouns

from singular to plural. This approach assumes that the dimensions of team flow are identical to the dimension of individual flow. In other words, although the experience is occurring with team mates, this has no effect on team flow. There is no consideration of team member communication, team member support, and other crucial and influential factors which, by the definition of team sport, occur, do not occur in individual sports. Sirotnik (1980) contended that researchers too often make the error of analyzing data at the individual level, accordingly overlooking the impact of group characteristics.

Mosek's (2009) unpublished master's thesis was motivated by Mosek's interest in enhancing the current understanding of the team flow experience. This was achieved by comparing team flow and the related concepts of individual flow, team cohesion, and investigating hypothesized relationships between team flow, group cohesion and performance. The participants were 14 teenage male players from a junior basketball team in Israel. The instruments used in this study were: the Group Environment Questionnaire (Carron, Widmeyer, & Brawley, 1985) to measure group cohesion, the FSS-2 to measure individual flow state, the FSST to measure team state flow, and a coach questionnaire designed for the study in order to capture the coach's assessment of players' performance. Mosek administered the inventories before the beginning of the season, to acquire baseline data, and after completing each game, during a series of six games. The GEQ was completed twice, during the first data collection session and during the last session, following six games. Mosek examined the differences between team flow measurements following each of the six games using repeated measures analysis of variance (ANOVA). Significant differences were found between the means of team flow for only two dimensions: team concentration and team autotelic experience. A Chi-Square test of independence was conducted to determine whether team flow and individual flow were independent or correlated experiences. No significant relationship was found (x^2 (1) = .770,p = 0.38);team flow and individual flow appear to be

independent events. A comparative ranking of the mean scores of the nine dimensions of team flow and individual flow showed a close similarity, except for the dimension of loss of self-consciousness, which was ranked second place in individual flow and seventh place for team flow. Comparing means of flow experiences showed that in 23 cases (37%), the players who reported experiencing individual flow ranked highest on the dimensions of challenge-skill balance and autotelic experience; in in 20 cases (33%), the players who experienced team flow ranked highest on the autotelic experience dimension. A Spearman rho coefficient was used to establish the possible relationships between the four dimensions of group cohesion and the dimensions of team flow, at the beginning and the end of the six games. However, no significant correlations were found. The results demonstrated that experiencing individual and team flow were frequent experiences for these basketball players. The occurrence of individual flow and team flow were found to be influenced by individual attributes such as self-confidence and motivation, as well as contextual factors including level of challenge, the coach's support, unambiguous feedback, and culture.

Because the data was based on one basketball team with a limited number of players (14), this can be considered an exploratory study, which can serve as an initial investigation for possible relationships. Mosek's findings were not conclusive in determining whether team flow and individual flow are similar or different phenomena. Because Mosek used Cosma's FSST, objections to the scale's validity are also relevant to the results of Mosek's master's study. The perceived similarity may be attributed to the similar scales used to measure both individual and team flow.

Tsutomu (2012) also examined team flow in the sport domain. The aim of this unpublished doctoral research was to explore the role of the coach in promoting team flow. Study participants were members of a baseball team in a Japanese university and their coach. The researcher was a mental health advisor and a member of the same organization. This case

study was carried out by scheduling narrative interviews with the coach over a period of four years. First, a life story interview was conducted, followed by in-depth interviews, in which the coach was asked to note what he perceived were the characteristics of team flow states experienced by the players, and to describe how he guided the team toward achieving team flow and successful results. This form of inquiry followed the constructionist method. This method examined the ways in which events, realities, meanings, and experiences are the effect of a range of discourses operating within society (Braun & Clark, 2006). Analysis of the qualitative data in Tsutomu's study was based on interpretative phenomenological analysis (IPA). The IPA seeks to explore the participant's view of the world and to adopt, as far as possible, an "'insider's perspective" of the phenomenon under study. At the same time, IPA recognizes that the research exercise includes the researcher's own conceptions, which involve making sense of "that other personal world" through a process of interpretative activity (Brocki & Wearden, 2006).What became clear during the first life story interview with the coach was the difference between his coaching style with the present team and his experiences with previous teams. The difference was evident in the coach's philosophy, which moved from a win-lose (WL) approach to a successful result (SR) approach. In the analysis of the coach's interviews, along with the researcher's field notes, Tsutomu identified four themes that emerged as being characteristics of teams in flow: understanding successful results; performing with a feeling of ease in a self-directed manner; understanding what needs to be done; and a trusting bond between players and coach. The contribution of this research was its in-depth investigation, which was closely tied to a specific locality and thereby embedded with explicit social and cultural values.

The research was mostly based on the researcher's interpretation of the data, which was collected from only one informant, the coach of one baseball team, for an extended period of four years. This research approach may have offered an in-depth understanding, but very

limited possibilities for generalization. Recall and distortion could be expected in light of the fact that the interviews with the coach were conducted between one-and-a-half years to five-and-a-half years after the games were played. Capturing the players' understanding of their experiences and their interpretations could have contributed to a better understanding of the concept of team flow. In light of the researcher's major role as the interpreter of the data, the researcher's neglect to mention any possible limitations of the present study raises some concern.

Another unpublished doctoral dissertation related to team flow was presented by Quinn (2003), who examined collective flow in the workplace. Similar to previous flow researchers in sport, Quinn's (2003) interest in team flow began by asking whether the tendency toward individual flow could be recreated in teams, in such a way that a combination of individual flow characteristics would be generalized to the team context. Since Quinn's research was conducted in the field of work rather than sport, he used a different terminology for team flow, namely collective flow. Quinn defined collective flow as follows:

"a collective experience in which, each person who has a role to play in a collective not only plays that role to the best of his or her ability, but also plays that role at such a performance level that others in the collective are pushed to perform at their maximum level, but not above that level" (p. 122).

Quinn described collective flow as a collective experience whereby each team member performs to the best of his/her ability, and drives teammates to do the same.

The purpose of Quinn's research was to develop a model of collective flow that could account for the differences between individual and collective flow, including their antecedent factors and social nature. The contexts for this study were informal story-planning meetings held on newsroom floors. Quinn defined informal story planning as: "conversations in which an editor asks two to four other newsroom employees to discuss the discovery, angle, and

execution of a story for their newspaper." (p. 98). He chose newsrooms as the sites for his collective flow research, since newspapers' publishing organizations are considered to have relatively clear and challenging goals, they are staffed by skilled professionals, and the process of creating a newspaper involves a high degree of task interdependence. The data sample was based on 27 informal story-planning meetings. Quinn used an ESM to collect the data. Every editor was assigned a random date, in which he was asked to distribute the surveys to the participants at the end of the meeting. The measures used for the survey consisted primarily of the FSS and the Activation-Deactivation Adjective Check List (ADACL, Thayer, 1986). The ADACL is a multidimensional self-rating test developed and validated for measurements of momentary activation or arousal states. It focuses on two dimensions -energetic arousal and tense arousal (Thayer, 1986). Quinn modified the scales by changing the pronouns in all scale items from singular to plural, from "I" to "we" and from "my" to "our".

The results showed that interactions during newsroom meetings provided sufficient variance in team flow indicators and antecedents. Most of the proposed relationships between flow antecedents and flow indicators appeared to be significant at the collective level as well as the individual level. Based on these findings, Quinn proposed a model of the collective flow experience, which is illustrated in Figure 2.4.

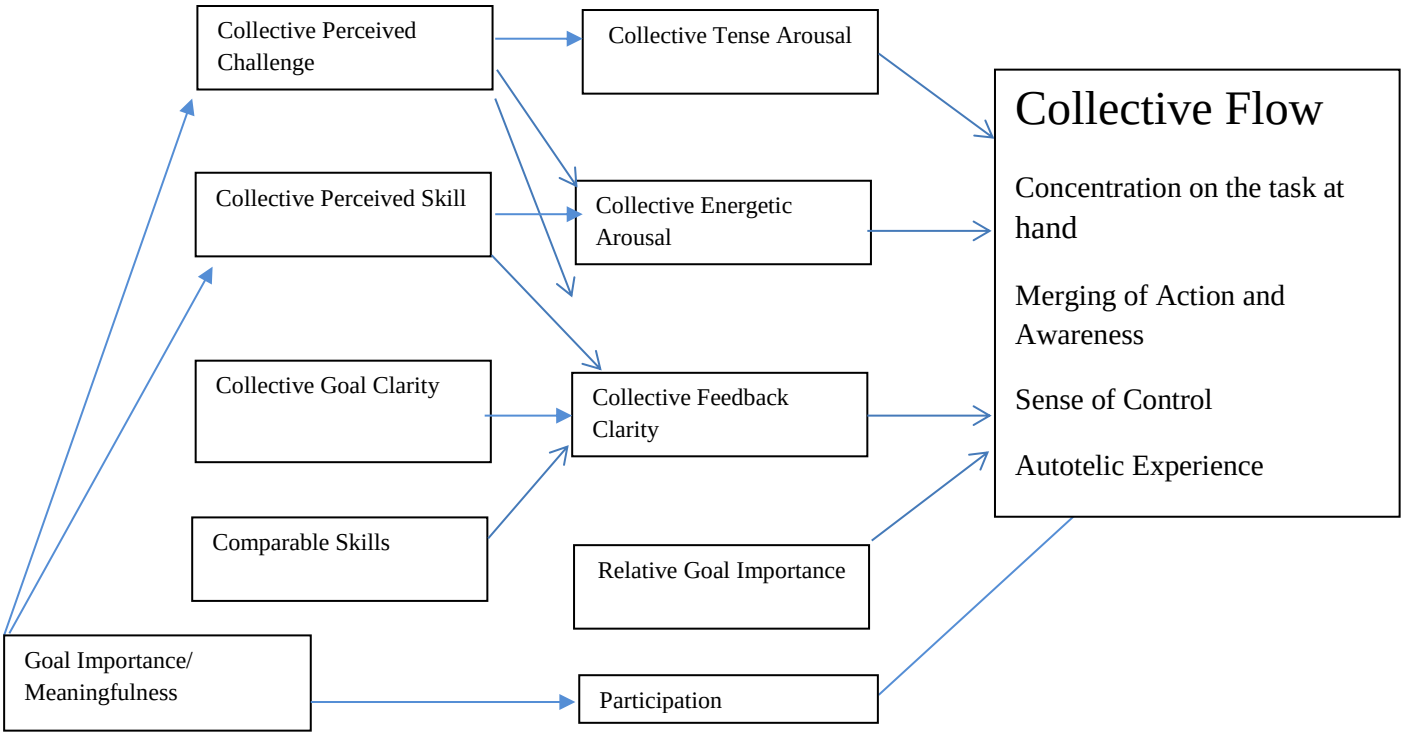

Figure 2.4

Antecedents and Indicators of the Collective Flow Experience (Quinn, 2003)

Figure 2.4 shows that collective flow in the workplace was defined by four dimensions: concentration on the task at hand, merging of action and awareness, sense of control, and autotelic experience. Ten antecedent indicators of collective flow were mentioned, along with their suggested interactions. Goal importance/meaningfulness was suggested to have an impact on participation, and on collective perceived challenge and skills, with the latter impacting collective tense arousal, energetic arousal, and feedback clarity. Collective goal clarity and comparable skills were both linked to collective feedback clarity. Relative goal importance was directly tied to collective flow. Quinn's model identifies several of the dimensions of team flow, including challenge-skill balance, clear goals, concentration, and unambiguous feedback as antecedent dimensions of collective flow.

Energetic arousal and tense arousal serve as cues to the team members, making affective convergence and subtle forms of coordination possible. Through affective cues, people

coordinate by signaling social information relevant to the activities that provide incentives and disincentives, and evoke emotional responses in others (Keltner & Kring, 1998). Collective energetic arousal or collective tense arousal and unconscious processes, such as emotional contagion and vicarious affect are used by people to coordinate and converse with each other (Bandura, 1986). In a follow-up study, Quinn (2005) used the term collective flow to describe flow in the workplace, describing it as one's perception of group members simultaneously experiencing flow, such that the experience is seen on the group level. Quinn claimed that for flow to be collective, people's awareness of the situation should be similar or at least complementary. Quinn's significant contribution to the conceptualisation of collective flow was in investigating the unique antecedents important to experiencing collective flow, in contrast to those related to individual flow. Quinn's contribution to team flow in sport is founded on the similarities and differences between collective flow in the workplace and team flow in sport. The three key characteristics of teamwork that were found to be related to collective flow - coordination of activities between members of the collective through both cognitive and affective processes; collective goals that take precedence over other elements of the collective structure; and a need for comparable levels of skill among team members - are all pertinent to team flow in sport, but they do not represent a comprehensive list of the indicators of team flow in sports. Limitations found in research on team flow were also present in Quinn's (2003) research on collective flow. However, Quinn's model of the antecedents and indicators of a collective flow experience requires further empirical support and refinement, as sufficient evidence of the internal and external validity of the subjective experiences of collective flow has not been shown. In addition, the goal of integrating flow with performance, shared by many researchers who hoped to apply flow interventions in practice, needs more rigorous manipulation and measurement scales in order to solidify causal relationships.

Concepts Related to Team Flow

The literature review confirmed that the concept of team flow has been acknowledged and examined by only a small number of researchers. Furthermore, studies that have been conducted reflect limited thought and debate about the precision and elaboration of the current conceptualisation of team flow. The research methodology was often questionable, due to the use of the established individual flow state scale, with slight modifications, as the measurement scale for team flow. However, a number of widely supported constructs appear to share common ground with the concept of team flow. Aside from individual flow, which has been closely examined in the preceding sections, these include group cohesion, collective efficacy, and team collapse. To further refine the theoretical conceptualisation of team flow, I chose to include in the following section a discussion of the relationship between team flow and the related concepts of group cohesion, collective efficacy, and team collapse.

Group cohesion. The term "cohesion" derives from the Latin word "cohaesus", which means to cleave or stick together (Paskevich, Estabrooks, Brawley, & Carron, 2001). Carron, Brawley, and Widmeyer (1998) defined group cohesion as, "a dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of members' affective needs" (p. 213). A noted characteristic of group cohesion is the group members' tendency to develop a sense of belonging and attraction to the group (Brawley, Widmeyer, & Carron, 1987).

Team flow and group cohesion have multiple components that contribute to the creation and maintenance of team togetherness. Lazarovitz (2003) studied the connection between group cohesion and flow, in relation to dispositional and state flow. Dispositional flow, as the tendency or ability to enter flow, was perceived to be as important as state flow which is the actual flow experience. The participants were 114 elite female hockey players and their head coaches. Dispositional flow data was collected using DFS-2 and Team Dispositional Flow

Scale (Lazarovitz, 2003) during training, and state flow data was collected using FSS-2 and the TFSS after competition. Data on group cohesion was based on the GEQ and performance was measured by two instruments developed for the study, an athlete self-report measure (SRPS) of performance and a coach rating of team performance (CRPS). Lazarovitz (2003) claimed that group cohesion sets the context for flow to occur. He proposed that the ability to experience individual flow might contribute to team flow (or vice versa). His second claim was that high team cohesion might function as a buffer for team flow, by providing a solid ground for the development of antecedents of team flow. It should be noted that in these speculations, Lazarovitz seems to be referring to individual flow in a team context and team flow as interchangeable concepts, rather than considering their unique characteristics, and acknowledging team flow as an independent concept.

A major limitation of Lazarovitz's (2003) study was the presumed directionality of the relationship between team state flow and performance. Lazarovitz (2003) assumed that the intensity of flow influences performance. This assumption was not challenged even though team state flow was measured at the end of the game together with performance. Therefore, players may have been influenced by their performance outcome when indicating retrospectively whether the team had been in flow. Furthermore, correlating a self-report measure of individual flow with a self-report measure of performance has a tendency to inflate correlations because they are both based on the perceptions of the same person. In congruence with the modification of the TFSS, Lazarovitz also designed The TDFS, by changing all items from the personal "I" to the plural "we". Because these team flow scales were only accepted at face value, and were never validated, it has not been demonstrated that they actually reflect and measure accurately the concept of team flow. Cohesion and flow are presumed to share common characteristics. Group cohesion and flow are multidimensional and dynamic in nature (Jackson & Csikszentmihalyi, 1999). Two dimensions of team flow,

clear goals and autotelic experience, also exist in group cohesion. Both concepts are based on working together toward a common goal driven by intrinsic motivation to experience positive affect.

Collective efficacy. The concept of collective efficacy reflects the proposition that the control that individuals and groups exercise through collective actions are influenced by the strength of their efficacy perceptions. Bandura (1986) proposed the use of social cognitive theory as a unified theory of behavioral change. In social cognitive theory, self-efficacy is defined as the belief people have in their capability to perform specific tasks. Efficacy-shaping beliefs may be obtained through mastery and vicarious experiences, social persuasion, and affective states (Bandura, 1997). Collective efficacy refers to a, "group's shared belief in its conjoint capability to organize and execute the courses of action required producing given levels of attainment" (Bandura, 1997, p. 477). Although self and collective efficacy both function as cognitive mediators of performance (Bandura, 2001), self-efficacy is considered an individual level phenomenon, whereas collective efficacy operates on the team level (Bandura, 1997). Collective efficacy beliefs depict a team's shared confidence in the team's ability to generate collective action and successfully complete a desired sport task.

Team collapse. In contrast to the concepts mentioned above, group cohesion and collective efficacy, which may be perceived as antecedents of team flow, team collapse indicates disruptive factors. Collective collapse is described as a crisis that occurs when a majority of the players in a team suddenly perform below expected level in a match of great, often decisive, importance (Apitzsch, 2009). In team collapse, similar to team flow, all or most of the players are involved, resulting in a social phenomenon that is characterized by mutual dependency. The influential factors include: inter - personal relationships that exist between players, coaching staff and team supporters, as well as contextual factors such as game characteristics and situation, game status, team goals, and psychological and physical

characteristics of the team (Kimiecik & Stein, 1992; Snyder & Tardy, 2001; Yukelson, 1997). Team flow and team collapse were both found to be influenced by psychological momentum, which also involves critical moments marked by physical behaviour of choking and slumps and cognitive errors and mistakes (Taylor & Demick, 1994). The difference between team flow and team collapse was most evident in preserving the trend of the game. When a team maintains team flow, an interruption in the game, such as, time-out or substitution, disrupts the flow, theoretically assisting the opposition. When a team maintains team collapse, an interruption in the game, such as, time-out or substitution, disrupts the team collapse assisting the team. Researchers, sport psychologists, and sport experts are still working on explaining the phenomena of team flow and team collapse adequately, as well as identifying the preventive, facilitating, and disruptive factors involved in optimal performance (Carlstedt, 2004).

Current theory and research supported some similarity in relations and process between team and individual concepts. Theoretically, the same relationships, or processes, coined as isomorphism (Moritz & Watson, 1998) can be used to represent a construct at more than one level. Such examples were found in a meta-analysis done by Moritz, Feltz, and Mack, (2000) who found a significant relationship between self-efficacy and individual performance, or the moderate relationship found between collective efficacy and self-efficacy (e.g., Feltz & Lirgg, 1998; Watson, Chemers, & Preiser, 2001). Prussia and Kinicki (1996) also conferred that the relationships found for self-efficacy and goals, prior performance, vicarious experience (i.e., modeling), and persuasion were operative for collective efficacy as well, supporting some similarity, but not correspondence, between individual and team level variables. Since there is virtually no evidence considering whether team flow is distinguishable from relevant group concepts such as group cohesion and team collapse, it is essential for research to be done to test the relationship between team flow and these concepts.

The Present Thesis

The basic assumption underlying this doctoral thesis is that individual flow and team flow share common characteristics, since they both address the phenomena of flow. However, due to the dynamic nature of teams, team flow has unique characteristics, which specify different and additional dimensions not found in individual flow. Despite the wide research and practical interest in the phenomena of flow, there is a great deal that is not fully understood about the concept of flow, particularly in a team setting. Since Csikszentmihalyi (1975) coined the term flow within the sport context, most of the research has focused on individual flow rather than on team flow. Individual flow has been studied among athletes participating in individual sports and athletes participating in team sports. Even research on the phenomena of team flow, has been studied by examining individual athletes who participated in team sports, not taking into account the unique characteristics of teams, such as team communication and coordination. This might be explained by the complexity of studying flow, especially team flow, and the lack of clarity and consensus among researchers about what are the main preventers, facilitators, and disrupters of flow.

In order to achieve my goal of capturing the experience of team flow in sport, I needed to deal with two obstacles which may have jeopardized the findings of previous studies on team flow. The first was a methodological issue which validates the fact that responders to the TFSI were using a team perspective, guided by the pronoun "we", rather than an individual perspective. Due to the complexity and subjectivity of team flow, capturing team flow experiences are mostly based on self-report questionnaires. The second concern was the fact that all team flow scales used by researchers to measure team flow were not based on theory and conceptualisation of team flow as an independent concept. They were basically an amendment of the individual flow scales without referring to the unique and dynamic aspects that characterize teams compared to individuals. These scales were based on individual flow

dimensions without having justified evidence or challenging the possibility that team flow may include unique dimensions particular to team flow. I therefore choose to take a fresh look at team flow, by performing a qualitative study geared to identify team flow themes that would form the dimensions for team flow. Based on this fresh conceptualisation, I developed and operationalized a theoretical model of team flow as the basis for development of an appropriate measurement tool for team flow.

The goals of this thesis were to conceptualize team flow and develop a new inventory to measure team flow state, which are grounded in theory and supported by research. Thus the aims were:

1. Capturing athletes', coaches', and sport psychologists' descriptions of their team flow experiences, in a variety of sport fields through in-depth interviews.
2. Conceptualising the model of team flow and its dimensions based on the themes that emerge from analysis of the interviews.
3. Operationalising of the TFSI.
4. Determining the initial validity and reliability of the TFSI.

CHAPTER 3: CONCEPTUALISATION OF TEAM FLOW (STUDY 1)

In this chapter, I describe the development of the conceptualization of team flow, a concept that was previously recognized, but not explicitly understood or elaborated. In this thesis, I focus on exploring team flow as an independent construct, the dimensions of which need to be identified by empirical research. To date, most of the research on team flow has been based on flow state at the individual level, disregarding the unique contributions of team processes and outcomes. The unique and differentiating qualities of performing as a team have been bypassed by limiting the measurement of team flow to summarizing the dimensions identified as individual flow experiences, instead of searching for the unique characteristics typical to teams, beyond those related to individual flow.

As described in the team flow section of the literature review (Chapter 2), I began the conceptualization process by conducting a search of relevant concepts within two domains, flow and teams. I searched for all theoretical and research work that addressed team flow from any perspective. Since the literature on team flow in the sport domain was limited, I extended the search to include the work domain. The key words used for this search were: flow, flow in sport, team, collective flow, shared flow, group flow, social flow, individual flow, and team flow. Attention was given to peer reviewed research articles, books, and dissertations that presented knowledge and research findings based on qualitative and quantitative methods, which used existing measures of flow, such as the FSS-2, DFS-2, Flow FSST, and TDFS. The current literature review reinforced my conviction that the concept of team flow has not yet been fully recognized by the academic community, nor conceptualised or measured in a way that gives credence to the complexity of the phenomenon of team flow. The major reason for this is that researchers who recognized the concept of team flow have given only limited consideration to the unique characteristics of teams compared to individuals. Hooker and Csikszentmihalyi (2003) claimed that “although flow is a subjective

phenomenon, it is often triggered and sustained by interpersonal interaction" (p. 221). Teams have characteristics that individuals do not possess, such as team communication and team support. Although some of the dimensions of individual flow are similar to components of team flow, the meaning of team flow is greater than the sum of the dimensions of individual flow.

Published research on team flow is limited (Heyne, Pavlas, & Salas, 2011).To date, I did not find any published academic work on the development of a designated inventory to measure team flow state. However, I was able to locate three unpublished doctoral dissertations written on team flow in the sport domain. The first study was conducted by Cosma (1999) who examined team flow in a soccer team and developed the FSST. The FSST was a replication of the FSS, transformed to a team flow scale by changing the wording for all items from singular "I" and "my" to plural "we" and "our" pronouns. Because Cosma did not acknowledge team flow as a new concept, he did not suggest the need for further conceptualization nor consider the possibility of adding or omitting specific dimensions unique to team flow. The second researcher to examine team flow was Lazarovitz (2003), who studied team flow and group cohesion among female ice hockey players. He transformed a dispositional individual flow scale to a team dispositional flow scale by rewording all items. The third researcher was Tsutomu (2012), who used a qualitative research design to focus on understanding the development of team flow, in a Japanese university baseball team. Despite adopting a qualitative research design, Tsutomu did not explore what participants considered to constitute team flow. These dissertations were previously described in the literature review.Thus, I found no research that has explored the experience of team flow with team sport players to determine whether there are elements of team flow that are not addressed by the nine individual flow dimensions. My aim was to explore team flow empirically through the experiences of team athletes.

Conceptualisation of Team Flow

I began my research on team flow by embarking on a conceptualization process the purpose of which was to clarify and develop the theory of team flow. The first stage was intended to familiarize myself with the presumed concept of team flow. I realized that team flow was an unexplored concept that needed to be examined and investigated from a qualitative perspective. I therefore recruited athletes and experts, in the sport domain, who had direct knowledge and familiarity with experiences of team flow and were able to verbalize and describe their knowledge and perspectives. I asked them to tell me what team flow is. Personal interviews with these informants generated a large amount of data that portrayed the ways in which team sport athletes, coaches, and sport psychologists, in a variety of team sport domains, understand and describe the experience of team flow. I employed an inductive content analysis to extract the dimensions of team flow from the raw data (Braun & Clark, 2006), which served as the foundation for the proposed new theoretical structure of team flow.

Conceptualization refers to a process of development and clarification of concepts. It describes a mental process whereby initially fuzzy and imprecise concepts are made more specific and precise (Babbie, 2015). It entails clarifying one's concepts with words, providing examples, and arriving at precise verbal definitions. Since team flow is a highly abstract concept, it requires decomposing into less abstract components. Clear conceptualizations generated indicators that reflected concrete attributes, which led to operationalization of the concept of team flow (Babbie, 2015). Following conceptual clarification I explored the concept of team flow by interviewing athletes', coaches', and sport psychologists' experienced in team sports, at high levels, regarding their experiences of team flow state. The aim of Study 1 was to qualitatively examine these narratives in order to construct a new conceptualization that would capture the unique characteristics of team flow.

Method

In order to discern the common and unique experiences that characterized the participants' conceptualization of the phenomenon of team flow, I chose a phenomenological qualitative research design (Johnson & Christensen, 2008). A phenomenological epistemology (Smith & Osborn, 2003) leans on participants' experiences and captures their understanding of these experiences in order to comprehend the phenomena in question, in this case team flow state (Tesch, 2013).

Participants

Before commencing recruitment of participants, the Human Research Ethics Committee at Victoria University, reviewed and provided approval for this research project. The participants in the conceptualization stage of the study comprised two different groups. The first group included seven elite team-sport athletes, who were active in competition. There were four men and three women, residing in Australia, whose age ranged from 19 to 32 years. I recruited two participants from basketball, two from Australian football and one participant each from handball, netball, and volleyball. The participants in the second group were five expert coaches, three men and two women, and two male sport psychologists. The coaches worked in the fields of soccer, cricket, and lacrosse. The sport psychologists both worked in several sport domains. The first sport psychologist that I interviewed was 34 years old, with 9 years of experience. The second sport psychologist was 46 years old, with 17 years of experience. The mean age of the 12 participants was 28.5 years (SD = 10.85 years) and their skill level ranged from Junior National - 2, National - 4, International - 6.

Measures

I collected demographic information and conducted semi-structured interviews with athletes, coaches, and sport psychologists, regarding their perceptions of their team flow experiences.

Demographic form (Appendix A)**.** I developed a demographic form for this research in order to obtain information regarding participants' age, gender, seniority, and sport domain. I asked active athletes about their role in the team. I asked coaches and sport psychologists about their level of experience in coaching or consulting.

Interview guide (Appendix B)**.** In order to obtain rich, in-depth information about the experience of team flow and the perceived factors associated with its development and outcome, I developed a semi-structured interview guide, with open-ended questions for the current research. Developing the semi-structured interview guide supported the trustworthiness of this qualitative research and contributed to the credibility, confirmability, and dependability, of team flow, making the research process as transparent as possible, and making the interview guide available for further researchers (Kallio, Pietila, Johnson, & Kangasniemi, 2016). The semi-structured interview guide was based on the following questions: (a) Based on your experience, what were the essential elements of team flow? (b) What were the thoughts, feelings, and behaviours involved? (c) Can you describe how this team flow experience developed? (d) What were the consequences of this team flow experience? (e) What do you believe can be done to achieve team flow? (f) Do you believe team flow is an important concept for you as an (athlete/expert)? (g) Do you believe there are different kinds of team flow? (h) Is there anything else you would like to add about team flow? (i) Do you feel we captured the meaning of team flow in this interview I followed unclear responses with clarification probes of the form "Please can you tell me what you meant by…?" and responses that seemed incomplete by elaboration probes of the form "Please can you tell me more about…?" I conducted a pilot test of the interview guide by interviewing an athlete and a coach, who were not involved in the main study, in order to confirm the coverage and relevance of the content, as well as identifying and clarifying unclear questions (Chenail, 2011).

Procedure

The athletes who participated in this stage of the research represented a convenience sample. They were recruited based on personal acquaintance with their coaches, who recommended them for participation in the study after securing their agreement to consider participation. I subsequently made an initial contact by e-mail or phone with each candidate, explained the goal of the research, insured privacy and confidentiality of their personal information, and described the demand of time involved (about an hour). Upon their consent, I scheduled an interview according to their availability, convenience, and preferred location. Recruiting coaches and sport psychologists was facilitated by an initial contact from my supervisor. If they expressed willingness to participate, I contacted them via e-mail or phone, and then I followed a similar procedure to that used with the athletes. I interviewed each participant separately at a time and place convenient to them. In all interviews, I requested and was granted permission to record the interview on audiotape. All interviews were conducted in a quiet place chosen by the participants and easily accessible by them.

I began each interview by introducing myself as a doctoral student majoring in sport psychology at Victoria University, interested in understanding the concept of team flow. I gave all participants an information statement about the goals of the research and encouraged them to ask questions. In addition, I notified participants that they could skip any question, if they felt uncomfortable, and ask to terminate the interview if they wished. I then verified their consent to participate and assured them of guarding their privacy and maintaining confidentiality. I recorded the interviews on a digital audio recorder with participants' prior consent. All participants confirmed their willingness to participate, and signed an informed consent form (Appendix C). None of the participants withdrew during the interview.

At the commencement of each interview session, I helped the participant to complete the Demographic Form (Appendix A). I began the interview by asking for a brief description

of participants' professional sport history, in order to help them feel comfortable, and to encourage sharing sincere thoughts and feelings. Once I felt a rapport was developed, we progressed to the core topics of the interview. My first question was: Can you recall and describe a team flow experience that occurred during the past three months? This question was designed to invite participants to describe a recent team flow experience in their own words. I followed this general description by asking participants to respond to the series of questions prompted by the semi-structured interview guide (Appendix B). In most interviews, the conversation was free flowing and cooperative. When needed I used follow-up questions to maintain the flow of the interview, to focus on the question, and gain accurate information.

Throughout the interview, I used non-verbal probing, such as remaining silent, which allowed the participant to think aloud, and verbal responses, such as repeating the participants' point, expressing interest, and verbal agreement (Kallio et al., 2016). When I felt a participant was able to provide more detailed information in responding to a question, I encouraged the participant to elaborate by asking more specific follow-up questions, such as "Can you tell me some more about… [aspect of their previous response]?" I also made sure each participant covered the experience in reference to structured time periods, before, during, and after the team flow experience. When a participant provided a response that was not clear to me, I probed for specific clarification by asking follow-up questions, such as "Can you explain what you meant by… [specific aspect]?" Once I felt we captured participants' full experience of team flow, I asked them to recall one more recent experience when they perceived the team was in flow. The conversation around the second team flow experience proceeded according to the same format. I concluded the interview by verifying that participants had an opportunity to fully share with me all pertinent information about their experience and perception of team flow. I thanked participants and acknowledged their contribution to the study. Interviews

ranged from 45 to 74 minutes. The average interview time was 63 minutes. The data collected in these interviews amounted to 12 hours and 32 minutes of recorded content.

Data Analysis

Thematic analysis principles were used for data analysis. Upon completing each interview with team-sport athletes, coaches, and sport psychologists, I transcribed the recorded audios verbatim and added my own comments and reflections. This material provided the data for analysis. Once I reached data saturation, when further informants experiences were repetitive and no new concepts emerged, I decided to advance to the data analysis stage. I wanted to immerse myself in the data in order to grasp the whole picture as well as creating awareness of similarity and differences between experiences. I therefore I engaged in reading and rereading the verbatim transcripts until I was very familiar with the content.

The first step in the analysis was open coding, an inductive method designed to organize the raw data into conceptual categories. Open coding was done by me. I scrutinizing each interview transcript, covering each word, sentence, and paragraph, in search of terms, feelings, thoughts, and actions used by the respondents to describe their team flow experiences. For each raw data item, I assigned units of meaning in the form of descriptive or inferential information that was related to the concept of team flow state. Going through this process resulted in additions and combining of themes as needed (Merriam & Tisdell, 2015). Open coding of the entire data corpus was a tedious job, but it resulted in the emergence of a set of raw data statements with name tags related to the characteristics and dimensions of team flow. Before choosing the items for the TFSI, my supervisor and I verified that: (a) the specific raw data statements were under the correct theme; (b) the title of each theme was appropriate; (c) together we assessed the accuracy of the analysis, in relation to its validity (the extent to which each statement accurately reflects team flow); mutually exclusivity (each

theme fits only one dimension); distinction (separating each category from other categories without overlap); and exhaustivity (assuring that all relevant data fitted into a code).

Consequently, I worked together with my supervisors to compare and contrasted the 14 team flow dimensions with the nine dimensions of individual flow in Csikszentmihalyi's (1990) model. This comparison was in line with Glaser's (1978) perception for the use of Grounded Theory, "we do not have to discover all new categories nor ignore all categories in the literature that may apply in order to generate a grounded theory" (p. 148). The result of this Grounded Theory analysis allowed for comparison of the present findings with pre-existing theory, in our case the raw data statements and first order themes that represented the current understanding of team flow, with items measured by the FSS-2. As a result of this comparison seven dimensions of team similar to Csikszentmihalyi's (1990) model of individual flow were included in the current team flow model. Two dimensions from Csikszentmihalyi's (1990) model of individual flow, sense of control and loss of consciousness were not included in the team flow model, because they were not consistent with the qualitative data.

The value of the analysis was assessed in relation to its validity (the extent to which each statement accurately reflects team flow state); mutual exclusivity (each theme fits only one dimension); distinction (separating each category from other categories without overlap); and exhaustivity (assuring that all relevant data fitted into a code). The richness of the collected and analyzed data formed the foundation for presentation of the results.

Results and Discussion

The purpose of this study was to explore team-sport athletes', coaches', and psychologists' understanding of the experience of team flow state, as the basis for conceptualizing team flow. Recent literature reviews on flow, corroborate the value of a more precise understanding of the role of flow in teams (Engeser & Schiepe-Tiska, 2012). My

initial assumption was that team flow is a qualitatively different concept from individual flow. I therefore decided to embark on a fresh examination of the concept of team flow as it was perceived, experienced, and described by athletes, coaches, and sport psychologists. Fourteen dimensions comprised the theoretical model of team flow. Because reporting on each team flow dimension and the first-order themes resulting from the inductive thematic analysis generated by the raw data statements is discursive, I include here a description and discussion of each dimension to enhance the flow and clarity of this account.

Team Flow Dimensions and Themes

Seven dimensions of team flow were similar to seven dimensions of individual flow and seven dimensions were new to team flow. In describing the findings, I first present the seven team flow dimensions that are similar to individual flow dimensions, followed by the seven new team flow dimensions, which together form my proposal for a new conceptualization of team flow. I identifying each team flow dimension, calculated the percentage of response to each dimension by dividing the number of respondents who mentioned a raw data statement by 12 (the total number of participants) x 100. If all participants mentioned a raw data statement the percentage was 100%. If only 11 the percentage was 91% and so on. I then included the relevant themes as well as raw data statements as exemplars that I chose based on their relevance and representativeness. Seven of the nine dimensions that were included in Csikszentmihalyi's (1990) model of individual flow were described by participants in the current study. The first dimension, reported by all participants, was team challenge-skill balance**.** When noting this dimension, participants referred to a specific game or game situation in which players perceived that the challenge faced by the team was especially high, yet the team possessed and displayed the skills to meet that challenge. This dimension included two themes: (a) special tournament challenge and (b) challenging opposition. One kind of challenging situation was described as a special tournament. In the words of one

athlete, "We had to win all our games to qualify". Awareness of the necessity to win all the remaining games left in the tournament highlighted the meaning of the challenge for the team. Challenging opposition was another kind of situation faced by the team and when the team displayed the skill to meet this challenge this reflected a dimension of team flow. This theme emphasized the tendency of the participants to evaluate the teams skills in reference to their perception of their opponents' team skill level, which they rated as very skillful. An athlete said, "The opposition was better than us," and "It would have been quite sensational to beat them." A coach said, "They were rated top four in that time in the world." A sport psychologist said, "The girls are enjoying the challenge of being out there and playing against the best in the competition." Perception of a balance between team challenge and skills, as a team, rather than an individual, dimension, highlights the participants' concern about the balance between their own skills and those of their opponents. This consideration was stronger when there was a special challenging occasion.

The second general dimension of team flow, team merging of action and awareness was referred to by 66% of the participants. Chavez (2008) suggested that deep absorption experienced by athletes may shut off the ability of the conscious mind to detect physical effort, thereby initiating a feeling that performance is automatic or effortless. In describing team merging of action and awareness as a characteristic of team flow, participants referred to an ecstatic state experienced by all or most of the team players. Participants felt completely immersed in the activity in such a way that team performance seemed to just happen by itself. Athletes described this experience as, "It was like the less we thought about it, the results just kind of happened," or "We did not need to think about it because we just did it," and "that match we just did it and it just worked." This theme was characterized as doing without thinking. This refers to the ability to perform with very little conscious attention. Doing without thinking was described by the participants, in this research, as if their actions

succeeded without intention, awareness, effort, or control (Bargh, Schwader, Hailey, Dyer, & Boothby, 2012). The participants, in this research, also emphasized the inevitability of their behavior that led directly to exceptional results, without the mediation of cognitive processes. They stressed their bewilderment that their action overpowered their thinking (Bargh et al., 2012).

The third dimension of team flow was team clear goals, which was reported by 75% of the participants. The dimension of team clear goals refers to a clear understanding by all or most of the team players of the desired game outcome. By setting clear goals in advance, the team has a strong sense of what it is going to do both for the short and long term (Csikszentmihalyi, 1990; Jackson, 1996). This dimension included two themes: a) clear expectations and b) clear goals. The participants' expectations from the team as a whole, and from each player, seemed to have a direct effect on the clarity of the team goals. In the words of one athlete, "Before that match we knew what stats we were supposed to achieve," a coach said, "Each player knew what was expected from him," and a sport psychologist said, "We had the number one team from Victoria and we were expected to medal." Athletes, coaches, and sport psychologists indicated that clear expectations were important when exceptionally high achievements were expected. Having clear goals was considered essential for team flow, as mentioned by a coach, "We had clear goals for the long run and for each game." A unique characteristic that differentiates teams from individuals is the fact that teams have shared and common clear goals and expectations.

The fourth dimension of team flow was team unambiguous feedback, which was reported by 83% of participants. Team unambiguous feedback refers to the availability of clear feedback from the game itself, or from coaching staff and/or players, regarding how well the team is performing in order to meet the team goals. Positive feedback, conveying information about athletes' competence, was considered one of the most crucial coaching

behaviours (Horn, Glenn, & Wentzell, 1993). Providing frequent positive and information-based feedback in response to players' successes and failures should translate into desirable outcomes, such as increased perceived competence, whereas criticizing athletes or ignoring their performances would have the opposite effect (Amorose & Nolan-Sellers, 2016). Positive and constructive feedbacks were the two themes used by the participants to describe their perception of the contribution of team unambiguous feedback to their experience of team flow. Participants mentioned receiving positive feedback from the coaching staff as well as from their perception of the game situation. In the words of an athlete, "We were receiving reinforcing feedback," or "We knew we were doing well." A coach said, "They got feedback that they were doing well, in the line and as a group". A sport psychologist remarked, "The coaching staff was encouraging the players on each good move they were doing," Constructive feedback was received from the coaching staff. In the words of an athlete, "We received more constructive comments rather than just criticism." A sport psychologist said, "The "q's" of the information given were very technical, you could see the guys, it was sort of making sense in their heads." Unambiguous feedback received from the coaching staff, the players and sport psychologists, as well as cues from the game situation, and the opponent team, were perceived by the participants as helpful. Although clear and immediate feedback was found to encourage continuous involvement of players in action (Csikszentmihalyi, 1990; Jackson, 1996), the impact of feedback directed to the team as a unit deserves further exploration.

The fifth dimension of team flow was team concentration on the task at hand, which was reported by 92% of the participants. The team concentration on the task at hand dimension refers to the team's total concentration on the task with no extraneous thoughts. Concentration on the task and concentration on positive actions were the two themes used by the participants to describe team's concentration on the task at hand. Participants described the

teams complete concentration on the task at hand, by focusing on what the team was doing well, eliminating all other distractions. Athletes described concentration on the task as, "We were just worried about what we were doing and not about what they were doing," or "At this one particular moment everyone's thoughts were focused on this game," and "We had complete concentration." Coaches said, "That day they seemed a lot more focused on the task at hand," or "The boys were very well focused on what they are supposed to do" and "Everything else was blocked out and they (players) were really focused." Sport psychologists said, "The group was very focused on the task instead of on being personally worried about being dragged from the court or not being part of the action on the court," and "I think it really takes thinking about other things away." Concentration on positive actions was described by an athlete, as "We were concentrating on positive things," and by a coach as, "I got all the players to concentrate on what they were doing well." In a state of team's concentration on the task at hand, there is a decrease of thoughts distracting team members from the task on hand, and the majority of the team members are involved in performing well.

The sixth dimension of team flow was team autotelic experience, which was reported by 92% of the participants. Team autotelic experience is so enjoyable that people want to engage in the specified activity for its own sake, without worrying about the outcome. Nakamura and Csikszentmihalyi (2002) proposed that experiencing team flow includes intrinsic rewards that inspire the replication of flow experience. In the present study, enjoyment and intrinsic motivation were the two themes used by participants to describe team autotelic experience. Athletes said, "We were happy and excited," and "We had a desire to play." A coach said, "There was a feeling of an enjoyable experience (among members of the team)." A sport psychologist said, "That was a really good experience." A coach described the players' intrinsic motivation by saying, "The players never asked anything in return after the game." Participants emphasized the connection between being happy, enjoying the activity, viewing

the activity itself as worthwhile, and having an autotelic experience. Csikszentmihalyi (1990) viewed the goal directedness of autotelic people as a key characteristic that led them to experience flow states. It seems that on a team level, autotelic characteristics unite the team players and staff around a joyful mood, focused on enjoying the game, and appreciating the experience for its own sake.

The seventh dimension of team flow was team time transformation, which was commented on by 67% of the participants. The dimension of team time transformation refers to loss of a sense of the real passage of time, so that time seems to pass either very quickly or very slowly, causing a distortion of time perception. The perception of time can make hours seem like minutes, minutes seem like seconds, or in the other direction minutes seem like hours, and seconds seem like minutes. Losing a sense of time was the theme used by participants to describe the team time transformation dimension. In the words of athletes, "Time was passing faster than normal for us," or "It (team flow) does kind of speed up time, we were so excited." A coach said, "Time seemed like slowing down in that game." From a team perspective, the free flowing pace that is generated in team flow may result in athletes losing track of time and having more frequent experiences of time transformation.

Seven new dimensions, which were not included in Csikszentmihalyi's (1990) model of individual flow, emerged from the data provided by participants to describe their perception of the unique characteristics of team flow. The first new team flow dimension was game plan, which was reported by 67% of the participants. The game plan, as a dimension of team flow, refers to having a clear game plan, which is understood and followed by the players. For the team to follow the game plan, it is necessary for team players to acquire and share both individual task-specific knowledge (i.e., idiosyncratic knowledge held by individual team members) and team-related knowledge (i.e., collective understanding of team procedures, strategies, and contingency plans). Both of these abilities are required in order to facilitate

team coordination and performance (Filho, Gershgoren, Basevitch, Schinke, & Tenenbaum, 2014; Klimoski & Mohammed, 1994; Mohammed, Ferzandi, & Hamilton, 2010). Executing a game plan requires preparation on behalf of the coaching staff for each specific game. This includes setting a game plan for the match and being aware of the goals, skills, abilities, and conditions of the opposing team (Rive & Williams, 2015).Having a clear game plan and following the game plan were the two themes used by the participants to describe this dimension. Having a clear game plan was mentioned by athletes as, "Letting us know what we had to do… that clarity was what we needed to finish off the extra time," or "We knew what we wanted to do," and "We were so clear about what we had to do to beat the opposition."Coaches said, "I managed to overcome all that with my players by focusing them on my instructions," or "Everybody knew the role they would be playing, their drills etc. " A sport psychologist remarked, "It was a good experience knowing that everyone was really clear on what they needed to do and just went out there and performed." However, having a game plan is not enough; team members need to follow the game plan. An athlete said, "We know how to play this game plan so we sort of stuck to that." A coach articulated, "They (players) were following the game plan very well". Although it is possible to perform without a game plan, research indicates that teams that had a clear game plan and followed it were more likely to achieve successful and high level performances and outcomes (Eccles & Tenenbaum, 2004). Having and following a game plan can only be considered as a dimension of team flow because it requires collective action performed by all or at least most of the team members. The extent to which the players understood the game plan, acknowledged it, and were willing to follow it were decisive for team flow.

The second new team flow dimension was, team optimal arousal, which was reported by 92% of the participants. Optimal arousal was described by the participants as presence of positive emotions and high energy levels that contribute to reaching an optimal point of

arousal. Team optimal arousal refers to a situation in which all or most of the players are at their optimal arousal point. Arousal may be experienced physiologically (e.g., increase in heart rate and adrenaline levels) and psychologically (e.g., feelings of apprehension, tension, and worry). The quality of arousal level can range from a highly energized state to a very relaxed state (Hardy, 1996). Feeling good, having high energy levels, and being at an optimal point were the three themes described by the participants related to the team arousal dimension. Feeling good was described by an athlete as," It is just a good feeling inside, and you feel warm, awesome." In reference to the team, an athlete said, "We had a good feeling during the game." A coach noted, "It was a good feeling around the group." A sport psychologist remarked, "There was a comfortable and relaxed mood in the team." High energy levels were noted by the athletes, "We were full of positive energy," or "We could not get hyper enough," and "Our moods were boosted by special plays." A coach commented in regard to reaching the optimal arousal point, "Everyone was at their optimal point." Although the team optimal arousal dimension may overlap with other dimensions that involve emotions and feelings that contribute to athletes' ability to reach an optimal arousal point, in team flow it specifically refers to unique aspects that are associated with the communal factors of feeling capable, generating positive energy, and experiencing arousal.

The third team flow dimension was the coaching style dimension mentioned by 67% of the participants. The coach-athlete relationship has been found to be particularly crucial in terms of creating a positive or negative outcome for athletes (Jowett & Cockerill, 2002; Lyle, 1999). Coaches play an important role in preparing the team with skills required for the challenges they face. From a team flow perspective, the team as an entity relates to the coaching style. Researchers have reported that coaching style affects athletes' satisfaction, performances, self-esteem, confidence, and anxiety (Chelladurai, 1993; Jowett & Cockerill, 2002; Jowett & Ntoumanis, 2004; Olympiou, Jowett, & Duda, 2008).To this end, they need to

address physical, technical, tactical, and psychological aspects of preparation, as well as the dynamic social interactions with athletes, parents, assistant coaches, and other team personnel (Moen & Federici, 2013). The coaching style found in this research to manifest team flow the most was flat coaching system in which the coaching staff are involved but sitting back, trusting the team and letting them do their thing. The coaching style dimension was described by two themes: a laid back coach and a flat coaching system. The participants indicated that their flow experiences were supported by coaches who were not highly involved in the game, were trusting of the players, and enabled them to "do their thing". Athletes designated the role of a laid back coach as, "The coach was sitting back," or "I remember the coaching staff just taking a step back, you are fine sort of thing." Players explained how the team interpreted this perception of their coaches, "There was a feeling that they (coaching staff) have done their part, now it is our (players) time," and it sent the message that, "We had all the information needed and we pretty much did not need to be coached because we knew how we needed to do the job." Another athlete explained the coach's position based on his confidence in the players, "He (the coach) knew we were playing good and all he had to do is just kind of sit back and let us do our thing." A sport psychologist said, "Not really saying too much. He (the coach) knew it was up to the players to win. When you are rolling in that momentum, you almost do not want to speak to the coach," or "The coach did not need to say much."

Players indicated that, as a team, they preferred a flat coaching system in which everyone had an opportunity to express their thoughts and to influence team strategies. Athletes mentioned having a flat coaching system, "We had a flat coaching system," and "Basically he (coach) came in and made the system flat. There is no hierarchy, your say is important as everybody," and "You did not feel that anyone was better than someone else." The participants' perception of the coaching style dimension supported their understanding of a successful result (SR) oriented coaching style. While a team with a win-oriented approach

(WL) will tend to encourage individual flow, a successful result (SR) oriented coach trains athletes in helping each other to create synergetic effects by coordinating their efforts (Tsutomu, 2012). Guided by this approach, players willingly promote active teamwork, which is likely to achieve successful results. When a team is involved in a team flow state, the team focuses on doing everything to amplify utilization of everyone's potential capacity in order to accomplish effective outcomes that can lead to a team victory (Tsutomu, 2012). By supporting the role of a laid back coach and a flat coaching system, the participants were acknowledging the important role of team as a whole in boasting team flow.

The fourth team flow dimension was team communication, which was reported by 75% of the participants. Team communication as a dimension of team flow reflects the experience that all or most team members and the coaching staff are communicating clearly and effectively regarding performance-related issues. Effective verbal and nonverbal communications have long been considered crucial to athletic performance (Connelly & Rotella, 1991). Effective communication was the theme highlighted by participants, who stressed the significance of clear, open, and direct communication, as a pre-requisite for team flow. Athletes noted, "We were communicating well with each other," or "We had open communication." A sport psychologist remarked, "His (coach) communication was very clear and direct." These statements imply that as part of a flow experience, the team players understood each other and were able to develop an effective way to communicate with each other. The critical importance of communication as a factor in team performance was emphasized by examining communication during team competition (Cannon-Bowers & Bowers, 2006). Team communication that occurs via both verbal and nonverbal channels was proposed to be a central component in coordinating performance (Fiore, Salas, & Cannon-Bowers, 2001). Sport teams operate in highly demanding environments that require them to share a great deal of information within a limited time period. Teams typically respond to this

need by utilizing a variety of verbal communication behaviours, such as asking questions, stating facts, and giving commands. In complex or time-pressured activities, such as team sport competitions, density of communications can make it difficult to follow the thread of communication. Therefore, questions may remain unanswered or team members may fail to carry out critical commands simply because they were not heard and/or understood (Cannon-Bowers & Bowers, 2006). Thus, participants in the present study reported that strong team communication is a key dimension of team flow. Team communication as a flow dimension is distinguished from other communication processes taking place in team sports, because of the phenomenal experience of it reported by team members. There is no individual equivalent to the team flow communication dimension because the individual experience of flow is intrapersonal, it does not involve others. Experts and players consider team communication is essential for team flow (Fiore et al., 2001).

The fifth dimension of team flow was team confidence, which was reported by 92% of the participants. Team confidence refers to the belief that, when the team is experiencing team flow, all or most of the players feel confident in the team's ability to perform well. The participants in the current research described confidence as an experience in which the team was gaining momentum, rolling, and absorbed by a feeling of being unstoppable. Confidence in winning, inevitability and confidence in the team were the three themes described by participants as characteristics of the team confidence dimension. Confidence in winning was expressed by athletes saying, ″We believed we were going to win," or "We had a sense of real belief in winning." A coach shared the players' belief by saying, "We had confidence that we were going to win the game." A sport psychologist noted, "Both players and the coach had confidence in their team's support structure. They felt they can take on any situation and still come through wining," Inevitability captured participants sense that winning would be impossible to avoid. This was generated by athletes who said, "We were on a roll," or "We

knew it is going our way." A coach was also completely confident in the team ability to win, saying, "They cannot stop us," Further support was gained by being confident in the team. An athlete said, "We had a lot of confidence in the team," or "The confidence we had as a group was very good." The athletes confidence in the team was shared by the coaching staff, "They (coaching staff) had enough confidence in us collectively as a group," A coach noted the use of game strategy to substantiate the team's confidence "In our defense just by skinning more turn overs we gave our attack more confidence." Empirical research demonstrated that athletes who are more confident in their team's abilities set more challenging goals (Silver & Bufanio, 1996), put in more effort (Greenlees, Graydon, & Maynard, 1999), and perform better (Stajkovic, Lee, & Nyberg, 2009). This confirmed the role played by the team confidence dimension as part of the team flow experience (Pineau, 2014).

The sixth team flow dimension was team external factors, which was described by 83% of the participants. The dimension of team external factors was used to capture the influence of the game context on team flow, by introducing two themes, the specific game situation and special occasions. During games considered as special occasions, such as finals and games with a historic rival, teams are expected to have additional motivation to reach their optimal performance, and, therefore, to be more likely to experience team flow. External factors were addressed by athletes as, "They are our biggest rivals" or "We had history with this opponent." Winning these competitions, led an athlete to excitedly say, "We were making history." Coaches explained the meaning of external factors by saying, "We played in higher levels than usual," or "It was the finals of the tournament." Sport psychologists explained: "It was an especially important match." and "This is a type of game that you remember." The importance of the audience for flow and team performance was previously suggested by Jackson (1996). Participants defined special audiences by the size of the audience and the athletes' relationships with the audience. Special audience as a theme was emphasized by a

coach saying, "We performed before a special audience (e.g., full stadium, family, recruiters, etc.)" and by a sport psychologist, "Fifty of the one hundred thousand people were there celebrating with us, and I think there must be some kind of effect going on." Although there is growing evidence that a home team crowd supports the home team's advantage, there is still no consensus on what constitutes the nature of this support (Goumas, 2014). One mechanism through home advantage might work is the affect the audience has on team flow and the affect team flow has on performance.

The seventh team flow dimension was team support, which was reported by 92% of the participants. The team support dimension refers to the support the team was receiving from their teammates, coaching staff, and audience. When coping with high challenges, social support is very important because personal skills may not meet up with the task on hand. In these situations social support can serve as an additional resource to keep players engaged, so they have a positive experience (Bakker & Demerouti, 2007). In a correlational study with music teachers and students, Bakker (2005) found that perceived social support was positively associated with teachers' work enjoyment. This finding serves as preliminary evidence that social support may promote enjoyment and flow when the perceived challenges are high (Tse, Fung, Nakamura, & Csikszentmihalyi, 2016). The three themes that emerged from the data were physical and verbal support, team unity, and brushing off mistakes. The first form of support included physical cues, including we were all giving high fives, being close to each other, and patting and hugging, as well as verbal support, including all the team members were smiling, encouraging, cheering, and shouting. Athletes said, "We got a lot of positive vibes from the bench," or "We got a lot of physical and verbal support from the team" and "at time out we were smiling at each other" and "Giving high fives it kind of feeds you, getting close to each other, patting on the back; Everyone came around me, everyone hugged up…" A coach noted, "They were cheering each other on," and another coach remarked: "When

people made a mistake you just brushed it off, it did not worry anybody." A sport psychologist mentioned, "They hugged each other, and shouted, they would get around each other." The supporting atmosphere that surrounded the game generated a flow of positive energy in the team. The second form of team support highlighted the unity of the team as demonstrated by functioning as a team, feeling good towards each other, and working together asa team. Unity as a theme was noted by athletes as, "Everyone was out there for the team," or "They got your back," and "We were doing tasks as a team." The participants emphasized the importance of togetherness in describing team flow. They described team unity in terms of the players' total commitment to the team, their protection of each other and working together to achieve the tasks as a team. The third form of team support was being permissive towards each other, brushing off mistakes, and taking care of each other. Unconditional team support was assured when the coaching staff and the team players were willing to ignore and dismiss mistakes made by players during team flow. Participants in the present study recognized the importance of team support as a unique characteristic and a foundation for team flow. Researchers have reported that receiving social support that was perceived by athletes as beneficial, contributed to the athletes' success in preventing burnout, enhanced their self-confidence, and improved their performance (Bianco & Eklund, 2001; Holt & Hoar, 2006).

The Team Flow Model

The team flow model generated by this research included 14 dimensions that belong to two main general dimensions. The first main general dimension includes the seven dimensions of team flow that are similar to individual flow, but focus on similar flow characteristics from a team perspective. The second main general dimension includes the seven unique team flow dimensions identified by the current study as game plan, team optimal arousal, coaching style, team communication, team confidence, external factors, and

team support. In the current model, two individual dimensions from Csikszentmihalyi's (1975, 1990) flow model were not included as team flow dimensions, namely loss of self-consciousness and sense of control. Exclusion of loss of self-consciousness was unexpected and warrants discussion. Csikszentmihalyi (1990) and Jackson (1996) explained that loss of self-consciousness occurs when concern for the self disappears and the person feels at one or united with the activity. This can be coupled with loss of adherence to self-security, when people are no longer concerned with what others might be thinking about them. The absence of such preoccupation with self can be an empowering characteristic. As worries are relinquished, perception of self can become stronger and more positive, conveying a liberating and refreshing experience (Jackson & Csikszentmihalyi, 1999). Mosek (2009) found that similarity between the dimensions of team flow and individual flow was pronounced except for loss of self-consciousness. When considering this finding, it is important to take into account that the participants in Mosek's study were adolescent basketball players, an age where teenagers are usually pre-occupied with self-consciousness around their popularity and appearance. Occasionally adolescents feel like they are being exposed to a crowd even when they are alone (Coleman & Hendrey, 1990). Mosek's study adopted a quantitative design, so his reflections on loss of self-consciousness were based on Likert scale responses to pre-determined items deemed to reflect team loss of self-consciousness. The present results were derived from the analysis of qualitative interview responses to general questions about what constituted team flow. The absence of a loss of self-consciousness dimension in the transcripts generated by the interviews provides support for the proposition that the dimension of loss of self-consciousness has a more central role in the conceptualization of individual flow than team flow.

The exclusion of sense of control as a dimension in team flow also deserves comment. Sense of control was included in Csikszentmihalyi's (1990) nine dimensions of flow, and was

further defined by Jackson (1996) as: "it is not being in control per se, but the possibility of control that is enjoyable to people in flow" (p. 82). This paradox of control describes one's feelings of being in control without having to think about trying to be in control. The resulting perceptions are ones of power, confidence, and being calm. Jackson (1996) categorized control as: "positive thoughts, feeling unbeatable, feel like can do anything-no fear, feel like nothing can go wrong, total composure, and totally relaxed" (p. 82), These statements correspond with statements extracted from the verbatim interview transcripts in the current research, as participants mentioned: "we were … feeling unbeatable", "we are on a roll", and "we are unstoppable". In the current study, these verbatim statements by respondents were categorized within the team confidence dimension. Participants referred to confidence within a team context as an alternative to control, when they said: "We had confidence that we were going to win the game" and "We had a lot of confidence in the team." These descriptions are in line with researchers' support of a direct positive link between confidence and flow (e.g., Jackson, 1995; Jackson et al., 1998; Koehn et al., 2013; Stavrou et al., 2007).

Limitations

The sample for this study included athletes, coaches, and sport psychologists who had inside knowledge of team flow and were willing to share their experiences with me. I considered them to be eligible based on meeting the criteria of the study, in particular, experience in high-level team sport, including acknowledged experience of team flow. In this sense, they were a purposive sample, selected because they were expected to provide rich data on the topic of interest, namely team flow. At the same time, they were a sample of convenience recruited through individuals personally acquainted to my supervisor or myself. However, I was not personally acquainted with the participants; the links with them were through third parties. A limiting characteristic of this sample was its cultural homogeneity. The participants in this study lived in Australia, a modern western culture. Thus, caution

should be exercised with respect to generalization of the current conceptualization to other societies and cultures.

The data collection for this study was based on face-to-face interviews conducted by me. The participants were cooperative, reflective, and thoughtful. They acknowledged that sharing their retrospective team flow experiences with me, was pleasant and exciting for them. However, issues related to my personal bias in regard to how information was solicited, recorded, or interpreted should be considered (Davis, Couper, Janz, Caldwell, & Resnicow, 2009). The fact that all interviews were conducted by one person, may have led to a degree of consistency and stability in carrying out and interpreting the interviews. This can be considered as strength, but also as a limitation. Therefore, I was involved in a series of meetings dedicated to preparing and discussing my interview skills and the significance I attached to the results with my supervisor. These meetings gave me an opportunity to reflect and critique my work. An example of such a process was evident when upon reflecting on my interviews, I became aware of my tendency to encourage participants to detail experiences characteristic of individual flow, instead of maintaining the focus on team flow. Once aware of this tendency, I made an effort to ask open questions that allowed participants to share their team flow experience without probing for inclusion of individual flow characteristics. My supervisor and I performed independent data analysis and our results were compared, discussed, and verified, so we arrived at consensus. This increased the trustworthiness of the data. Nevertheless, it would have been beneficial to involve an independent researcher who was not familiar with the concepts of individual flow and team flow, and who was not involved or invested in the process of developing the conceptualization of team flow.

Further Research

I am not certain that the data collected from the participants covered all possible dimensions of team flow. It is possible that there are other dimensions that participants did not

mention because they were not consciously aware of their role, not willing to share, or did not remember, other aspects could have had a significant role in their experience of team flow. It is noteworthy that the experts who were asked to consider the face and content validity of the TFSI did not propose additional dimensions. Nonetheless, it would be beneficial to examine the dimensions of team flow through additional methods. For example, team flow sport participants could be asked to rank the role of a bank of suggested dimensions of team flow, which might confirm or introduce other dimensions. In addition, researchers should also explore the possibility that specific sport domains might have unique dimensions of team flow that are not relevant for other sports. The comprehensively and exhaustivity of the new conceptualization of team flow should be further examined in different types of sport and among various cultural groups

Conclusion

In this study, I assumed that team flow and individual flow were two different experiences, requiring separate conceptualization. The ability of athletes and sport experts to describe team flow situations from a team perspective convinced me of the value of team flow as an independent concept. Although current research into team flow was limited and controversial, building on athletes' and sport experts' first-hand descriptions of their experiences of team flow confirmed my proposition that there is richness and meaningfulness in conceptualizing team flow. Based on the interviews I conducted and analyzed, team flow can be described as an optimal psychological state that teams strive to reach and maintain. In a state of team flow, teams will concentrate on following the game plan and obtaining their goals. Members of teams will perceive the team as confident, having skills that match the high challenge embedded in the situation, perform without over thinking, communicate effectively, support each other, and provide and receive constructive and positive feedback. The experience will be autotelic and will be accompanied by time transformation. This optimal

state is more likely to occur on special occasions, when team members are at their optimal point of performance. The coaching staff will be supportive and involved, but will not interfere with the experience of the players, allowing them to express their creativity and take responsibility for completing the team's tasks. Since practical implementation of a concept requires it to be measured, the next step in my research was focused on operationalizing team flow in the form of a paper-and-pencil inventory, based on my current conceptualisation.

CHAPTER 4: DEVELOPMENT AND FACE AND CONTENT VALIDATION OF THE TEAM FLOW STATE INVENTORY (STUDY 2)

To further examine the new conceptualisation of team flow that emerged from the qualitative study (Chapter 3), I considered that the new team flow model should be operationalized in the form of a quantitative measure reflecting the 14 dimensions. The creation of a measure would permit the model to be psychometrically tested. Therefore, I designed Study 2, whose goals were first, to create a questionnaire to measure the dimensions of team flow, which I called the TFSI, then to examine face and content validity of the TFSI, and, finally, to pilot the TFSI for clarity and comprehensibility with team athletes similar to those who would complete it in research and practice in the future.

Method

Content Development of the Team Flow State Inventory

The TFSI was based on the qualitative analysis of elite team-sport athletes', coaches', and sport psychologists' experiences of team flow state, which were shared and analyzed in Study 1. The team flow model generated by this research included 14 conceptual dimensions. A total of 102 raw-data statements emerged from the data. In agreement with my supervisor, I divided the raw data statements into 32 first-order themes, creating a pool of items for the TFSI (see Appendix D). Before choosing the items for the TFSI, my supervisor and I discussed and verified that: (a) the specific raw data statements were under the correct theme; (b) the title of each theme was appropriate; (c) together with my supervisor we assessed the accuracy of the analysis, in relation to its validity (the extent to which each statement accurately reflects team flow); mutually exclusivity (each theme fits only one dimension); distinction (separating each category from other categories without overlap); and exhaustivity (assuring that all relevant data fitted into a code).

The team flow model comprised two general dimensions. The first dimension included the seven conceptual dimensions of team flow that are similar to individual flow, which focus

on similar flow characteristics from a team perspective, namely challenge-skill balance, merging of action and awareness, clear goals, unambiguous feedback, concentration on the task at hand, time transformation, and autotelic experience. In Study 1 the participants' narratives of their team flow experiences closely mimicked the wording of items on the similar individual flow dimensions as described by the FSS-2. I therefore decided to retain the FSS-2 items and to modify them to reflect a team experience. This was done by changing the pronouns "I", “me”, and “my” (an individual) to "we", “us”, and “our” (the team). For example, I modified the FSS-2 item: "I was challenged, but I believed my skills would allow me to meet the challenge" to "We were challenged, but we believed the skills of the team would allow us to meet the challenge". This modification was similar to the process administered by Cosma (1999) when developing the FSST. Beside the difference in the process of generating the items, there are two other differences that should be noted between the FSST and the TFSI. Cosma relied on the FSS, while I used a more current version for individual flow, the FSS-2. This resulted in difference in wording of seven items between the FSST and the TFSI. The FSST included all nine individual flow dimensions. I did not include in the TFSI, the dimensions of loss of self-consciousness and sense of control because they were not mentioned by my interviewees. I included in the TFSI seven new dimensions for team flow that emerged from the inductive thematic analysis. Table 4.1 shows the connection between the interviewees' statements and team flow items that formed the similar individual flow dimensions included in the TFSI.

Table 4.1

Raw data statements, 1st order themes, 2nd order themes, and team flow items corresponding to individual flow items

Raw data statement	1st order theme	2nd order theme	Team flow item
The opposition was better than us but we had the skills	Challenge and skills	Challenge-skill balance	We were challenged but we believed the skills of the team would allow us to meet the challenge.
It would have been quite sensational to beat them, but we had what it takes to win			Our abilities matched the high challenge of the situation.
We had to win all our games to qualify	Challenging situation		We felt we were competent enough to meet the high demands of the situation.
They were rated top four in that time in the world	Challenging opposition		We felt the challenge and our skills were at an equally high level.
It was like the less we thought about it, the results just kind of happened	Performing without over thinking	Merging of action and awareness	We made the correct movements without having to think about them.
We did not need to think about it because we just did it			Things just seemed to be happening automatically for us.
Things happened automatically	Automatically		We performed automatically.
That match we just did and it just worked	Spontaneously		We did things spontaneously and automatically without having to think.
We had clear goals for the long run and for each game	Clear goals	Clear goals	Our goals were clearly defined.
Each player knew what was expected from him			We were clear about what we wanted to do.
Before that match we knew what stats we were supposed to achieve			We had a strong sense of what we wanted to do.
We had the number one team from Victoria and we were expected to medal	Expected goals		We knew what we wanted to achieve.
The coaching staff was encouraging the players on each good move they were doing	Positive feedback	Unambiguous feedback	We had a good idea while we were performing about how well we were doing.
They got feedback that they were doing well, in the line and as a group			We could tell by the way we were performing how well we were doing.

(continued)

Table 4.1 (continued)

Raw data statement	1st order theme	2nd order theme	Team flow item
We knew we were doing well	Positive feedback	Unambiguous feedback	It was really clear to us that we were doing well
We were receiving reinforcing feedback			We were aware of how well we were performing.
The boys were very well focused on what they are supposed to do	Total focus	Concentration on the task at hand	Our attention was focused entirely on what we were doing.
At this one particular moment everyone's thought were focused on this game	Concentrated thoughts		It was no effort to keep our mind on what was happening.
We had complete concentration	Total concentration		We had total concentration.
The group was very focused on the task instead of on being personally worried about being dragged from the court or not being part of the action on the court	Focus on task		We were completely focused on the task at hand.
Time was passing faster than normal for us	Pacing of time	Time transformation	At times, it almost seemed to us like things were happening in slow or fast motion.
It (team flow) does kind of speeds up time, we were so excited			Time seemed to alter for us (either slowed down or speeded up).
It did not feel like it is going on for long (time) in that match	Distorted sense of time		The way time passed seemed to us to be different from normal.
Time seemed liked slowing down in that game.			It felt like time stopped in specific moments of the game.
That was a really good experience	Good experience	Autotelic experience	We really enjoyed the experience.
We were happy and excited	Enjoyable experience		We loved the experience and want to capture it again.
There was a feeling of an enjoyable experience (among members of the team)			The experience left us feeling great.
The players never asked anything in return after the game	Intrinsic reward		We found the experience extremely rewarding

The second stage in the development of the TFSI concerned the second general dimension of team flow that emerged from Study 1. The seven new team flow dimensions identified were game plan, team optimal arousal, coaching style, team communication, team confidence, external factors, and team support. In order to identify the TFSI items that would be included in the seven new team flow dimensions, a combined inductive and deductive thinking process, defined as axial coding. Axial coding, as an attempt to construct a framework of generic relationship (Strauss & Corbin, 1998) assisted me in combining and contrasting raw data statements, first order themes, and the suggested new dimensions of team flow.

In attributing raw data statements to first-order themes, I had to make fine distinctions. Sometimes, one raw data statement could reasonably be assigned to several first-order themes. For example, the raw-data statement: "we gave each other supporting feedback" could be related to team unambiguous feedback, team support, and team communication. Classification decisions regarding the first order themes were made using a peer validation process that compared my supervisor's independent coding of first and second themes with mine. We discussed all discrepancies and when not in agreement, we eliminated the data. I continued this process of comparing and contrasting until all data was accounted for (Morrow & Smith, 2005). After initial positioning of the data, I worked with my supervisors to validate this categorization, by exploring additional questions: (a) Is it possible to combine certain codes together under a more general code? (b) Is it possible to organize codes sequentially (for instance, does constructive feedback occur following positive feedback)? (c) Is it possible to identify a causal relationship between several first-order themes? We discussed these issues until we felt satisfied with our exploration and agreement was reached regarding the final positioning of each raw

data statement, first-order theme, second-order theme, and TFSI item for the seven team flow dimensions as shown in Table 4.2.

Table 4.2

Raw data statements, 1st order themes, 2nd order themes, and new team flow items

Raw data statement	1st order theme	2nd order theme	New team flow item
Letting us know what we had to do… that clarity was what we needed to finish off the extra time	Clear game plan	Game plan	We were clear about the game plan to be executed
We knew what we wanted to do			We knew what we wanted to do
It was clear to us what was needed to be done			The game plan was clear to us
They (players) were following the game plan very well	Following game plan		We followed the game plan
We had a good feeling during the game	Feeling good	Optimal arousal	We felt good during the performance
It was a good feeling around the group			There was a good feeling in the team during the performance
We were full of positive energy	High energy level		We had a lot of positive energy
Everyone was at their optimal point	Optimal arousal point		We were at our optimal level during the performance
The coach was sitting back	Coach laid back	Coaching style	We perceived the coach was sitting back
He (the coach) knew we were playing good and all he had to do is just kind of sit back and let us do our thing.			The sitting back coaching style fitted our team needs
The coach did not need to say much			The coach was supporting our team but still letting us do our thing
We had a flat coaching system I remember the coaching staff just taking a step back, you are fine sort of thing	Flat coaching		The coach was with the team but not interfering
His (coach) communication was very clear and direct	Good communication	Communication	We frankly shared ideas and thoughts
We were communicating well with each other			We communicated clearly with each other
We understood each other			We understood each other
We had open communication			We had open communication with each other
We had a sense of real belief in winning	Inevitability	Confidence	We believed we were going to win
We knew it is going our way			We knew it is going our way
We had a lot of confidence in the team	Confidence in the team		We were confident in our team
			We were confident in our performance
It was the finals of the tournament	Special game	Special occasion	It was a special game for us
It was an especially important match			The excitement about the game helped us
We performed before a special audience (full stadium, family, recruiters, etc.)	Special occasion		We sensed it was special occasion
It was the finals of the tournament			The occasion was special for us

(Continued)

Table 4.2 (continued)

Raw data statement	1st order theme	2nd order theme	New team flow item
We were doing tasks as a team	Team unity	Team Support	We were sharing team responsibilities
They got your back	Taking care of each other		We watched each other's back
We got a lot of physical and verbal support			We were supporting each other
When people made a mistake you just brushed it off, it did not worry anybody	Brushing mistakes		We brushed off mistakes that were made

Table 4.2 demonstrates the relationship between the raw data statements, first-order themes, second-order themes, and the items generated for each new team flow dimension. In summarizing the contents of these dimensions, I proposed that (a) having a clear game plan, enables teams to know what they want to do and how to follow the game plan; (b) reaching optimal arousal creates good feelings within the group and a high level of positive energy; (c) the team positively responded to a coaching style in which the coach was laid back, supporting the team, but letting the players do their thing, without interfering; (d) good communication includes having open clear communication, being frank, sharing ideas, and understanding each other; (e) team confidence includes confidence in the team, its performance, and therefore the perception that winning is inevitable; (f) external factors that enhance team flow represent special games and special audience that generate excitement; (k) team support is conveyed both physically and verbally, as team players share team responsibilities, watch each other's back, and brush off mistakes.

After completing the items for the TFSI, I looked at the "big picture". Consideration was given to the relevance of first order themes to team flow in terms of its antecedents, specific characteristics, actions, and interaction strategies that define it, and the consequences of these strategies. This process involved another thorough reading of the raw data statements in search of cases that illustrated or explained similar team flow state themes, making sure that all confirmatory, as well as contradictory data was included. The results of this meticulous process, was a table of all raw data statements, first-order themes, and second-order themes which were designated as the proposed 14 dimensions of team flow (Appendix D).

Face and Content Validity of the Team Flow State Inventory

Following agreement between my supervisor and I that the items generated were accurate reflections of the dimensions that they represented, I conducted an examination of

face and content validity of the 56-item TFSI by inviting experts in the field of flow to determine item content-relevance, and to identify any items needing changes. In the process of scale development, examination of face and content validity is conducted once a draft scale has been constructed to ensure that the scale appears to experts to be a suitable measure of the construct it has been designed to measure. Face validity of a scale refers to whether the wording of the items reflects the construct that the item is intended to measure (Holden, 2010). For example, an item intended to measure team goals should include in its wording terms that indicate that it refers to team perceptions and that it refers to the goals that members of the team share. Content validity of a scale refers to whether the content of the scale reflects the universe of aspects of the construct measured by the scale in a balanced way (Clark & Watson, 1995). For example, a 20-item scale intended to measure arithmetic ability would have poor content validity if 17 items were about addition and one item each was about subtraction, multiplication, and division.

In order to explore the face and content validity of the TFSI, I contacted seven international sport experts. Five experts consented to participate in the study. The experts were four men and a woman. All experts were senior lectures and researchers in academic institutions with work experience and involvement in different sport fields. Three were from Australia, one from Greece, and one from Israel. Their interest and expertise were in exercise and sport psychology, coaching, positive psychology, flow, physical education, and motor skills.

An introductory letter and the proposed items for each dimension were sent to the five flow experts (Appendix E). This letter included background, definition and critical issues related to team flow, as well as description of Study 1; conceptualisation of team flow. The panel of experts was asked to review the relevance of proposed team flow dimensions, and to consider the content, clarity, comprehensibility and fitness of each in relation to the proposed

team flow dimension. Confirmation of the structure and content of the 56-item TFSI was provided by the five flow experts, who made suggestions and confirmed the face and content validity of the inventory. Experts provided some qualitative feedback. One expert suggested changing the label for one dimension "external factors" to "special occasion". In response to the qualitative feedback, the aforementioned dimension was relabeled. All the experts indicated that in some dimensions there were repetitive items, suggesting that the content of those dimensions could be reduced to three items. Decisions regarding the number of items for each dimension were postponed until I had considered the results of the following study, in which I examined the psychometric characteristics of the TFSI. Fit of the model to the data collected in that study and internal consistency of the 14 subscales (dimensions) would provide valuable information pertinent to this question.

Comprehensibility of the Team Flow State Inventory

The next step in developing the TFSI was to assure its comprehensibility. To examine comprehensibility I conducted a pilot study. Participants in the pilot trial were 13 team-sport athletes who volunteered to complete the TFSI by email using Qualtrics, an internet survey software package. Athletes were asked to verify that all items were clear, comprehensible, and unambiguous. Chosen participants received an invitation email with a link. Upon clicking on the link, participants were directed to the internet website where the inventories were located. The aim of this pilot trial was to verify the utility of the on line procedure for the collection of data, to assure that the survey software was user friendly and operates as it was intended to, that instructions were clear and understood, and participants were able to follow directions in order to produce valid responses. After completing the inventories, I asked the athletes, who participated in the pilot study to record their comments regarding the TFSI and the on line delivery process. I encouraged them to mention any problems they may have encountered in completing this questionnaire. All 13 participants found the procedure user friendly. They

rated all items as clear and comprehensible, beside item 24 which was not fully understood by six of the participants. This item was later deleted. The pilot confirmed the dependability of this administration method and the clarity of the TFSI.

Discussion

Study 2 was initiated to further develop the new conceptualisation of team flow,and to create the TFSI, to measure team flow state. The team flow model generated by Study 1 included 14 conceptual dimensions, equally divided between two general dimension, one similar to individual flow and the other new to team flow. In light of my previous critic of researchers, such as Cosma (1999) who relied on individual flow dimension as the foundation for the team flow inventory, I choose to take a fresh look at the conceptualisation of team flow, by generated the items for the TFSI based on the findings from Study 1. Thematic analysis of the data highlighted the similarity between the content of seven out of nine team and individual flow dimensions. I therefore choose to rely on the FSS-2 items related to these seven dimensions, and modify personal to group pronouns in order to assure that respondents are taking a team perspective. The second general dimension included the seven new team flow dimensions identified by the current study as game plan, team optimal arousal, coaching style, team communication, team confidence, special occasion, and team support. Axial coding was performed in order to combine and contrast raw data statements, first order themes, and the suggested new dimensions of team flow, as a pool of items for the new team flow dimensions of the TFSI.

Further development of the TFSI required establishing its face and content validity. For this purpose five distinguished academic researchers and sport experts were contacted. Confirmation of the structure and content validity of the 56-item TFSI as well as useful suggestions were provided by the five flow experts. The aims of the pilot study were to investigate the clarity and comprehensibility of administering the TFSI using an internet

based method to team athletes similar to those who would complete it in research and practice in the future. Satisfaction with these results led me to proceed towards my next research goal, to refine the inventory by exploring and improving its psychometric characteristics.

CHAPTER 5: INITIAL PSYCHOMETRIC ANALYSIS OF THE TEAM FLOW STATE INVENTORY (STUDY 3)

After completing Study 1 and Study 2, within which the goal was to develop a new conceptualisation and measurement of team flow, I created the 56-item TFSI. This inventory was based on the qualitative analysis of elite team-sport athletes', coaches', and sport psychologists' experiences of team flow. Confirmation of the structure and content of the 56-item TFSI was provided by five flow experts, who made suggestions and confirmed the face and content validity of the inventory and a pilot study confirmed the TFSI clarity and comprehensiveness. The TFSI model generated by the qualitative data included 14 dimensions containing four items in each dimension. The goal of the next research stage was to refine the inventory by exploring and improving its psychometric characteristics.

The foundation of structural equation modeling (SEM) is CFA because all latent variable analyses rely on a sound measurement model (Brown, 2015). Today, CFA is often subsumed under the more general umbrella of SEM. When a CFA is conducted, researchers use a hypothesized model to estimate a population covariance matrix that is compared with the observed covariance matrix. Technically, the researchers aim to minimize the differences between the estimated and observed matrixes (Schreiber, Nora, Stage, Barlow, & King, 2006). CFA is useful when researchers have clear (or competing) hypotheses about an inventory, regarding the number of factors or dimensions underlying its items, the links between specific items and specific factors, and the association between factors. Because CFA is theory driven, before performing CFA, the number of factors in the model is hypothesized and researchers make predictions about which variables are expected to load onto which factor (Hoyle, 2000). By performing a CFA, researchers can broaden their study of construct validity by allowing investigation of the underlying factors. Factor analysis also

contributes to the assessment of the reliability and validity of measurement scales (Jackson, Gillaspy & Purc-Stephenson, 2009; Luhtanen & Crocker, 1992).

CFA can support researchers in evaluating the degree to which their measurement hypotheses are consistent with the pattern of responses, produced by respondents that used the inventory. This is determined by examining three key sets of results: parameter estimates, fit indices, and potential-modification indices (MIs). This process begins by formally testing measurement hypotheses and then modifying hypotheses in order to be more consistent with the actual structure of participants' responses to the inventory. Researchers often examine multiple measurement hypotheses to identify the model's consistency with participants' responses. In these ways, CFA facilitates theory-testing, theory-comparison, and theory-development in a measurement context (Hoyle, 2000).

Factor Analysis Procedures for Inventory Development

The most common analytic technique for examining the internal structure of an instrument was factor analysis. Fabrigar and Wegener (2011) stated that: "factor analysis refers to a set of statistical procedures designed to determine the number of distinct constructs needed to account for the pattern of correlations among a set of measures" (p. 3). The use of factor analysis enables researchers to study behavioral phenomena of great complexity, diversity, and to meld the findings into scientific theories (Brown, 2015; Rummel, 1988).

My choice of CFA was based on my intention to explore the team flow theoretical model developed in Study 1. Using CFA allowed me to specify a priori linkage between dimensions and items by determining the items that will be loaded on each team flow dimension according to the proposed model, and then test if the data fits the model (Kline, 2015). Following this procedure allowed me to assess how well the empirical data conformed to the TFSI model. An additional advantage of using CFA was the possibility to empirically compare a number of competing models (McCoach, Gable, & Madura, 2013).

The Theoretical Model of Team Flow

My proposed theoretical model for team flow included seven dimensions that were consistent with seven of the nine dimensions in Csiksentmihyli's (1975, 1990) individual flow model. These dimensions were: team challenge-skill balance, team merging of action and awareness, team clear goals, team unambiguous feedback, team concentration on the task at hand, team time transformation, and team autotelic experience. The titles of these dimensions emphasized their team reference, and included items that captured team flow experiences. The proposed theoretical model also included seven new dimensions of team flow. These team dimensions were: game plan, team optimal arousal, coaching style, team communication, team confidence, special occasion, and team support. The latent structure of the TFSI is shown in Figure 5.1.

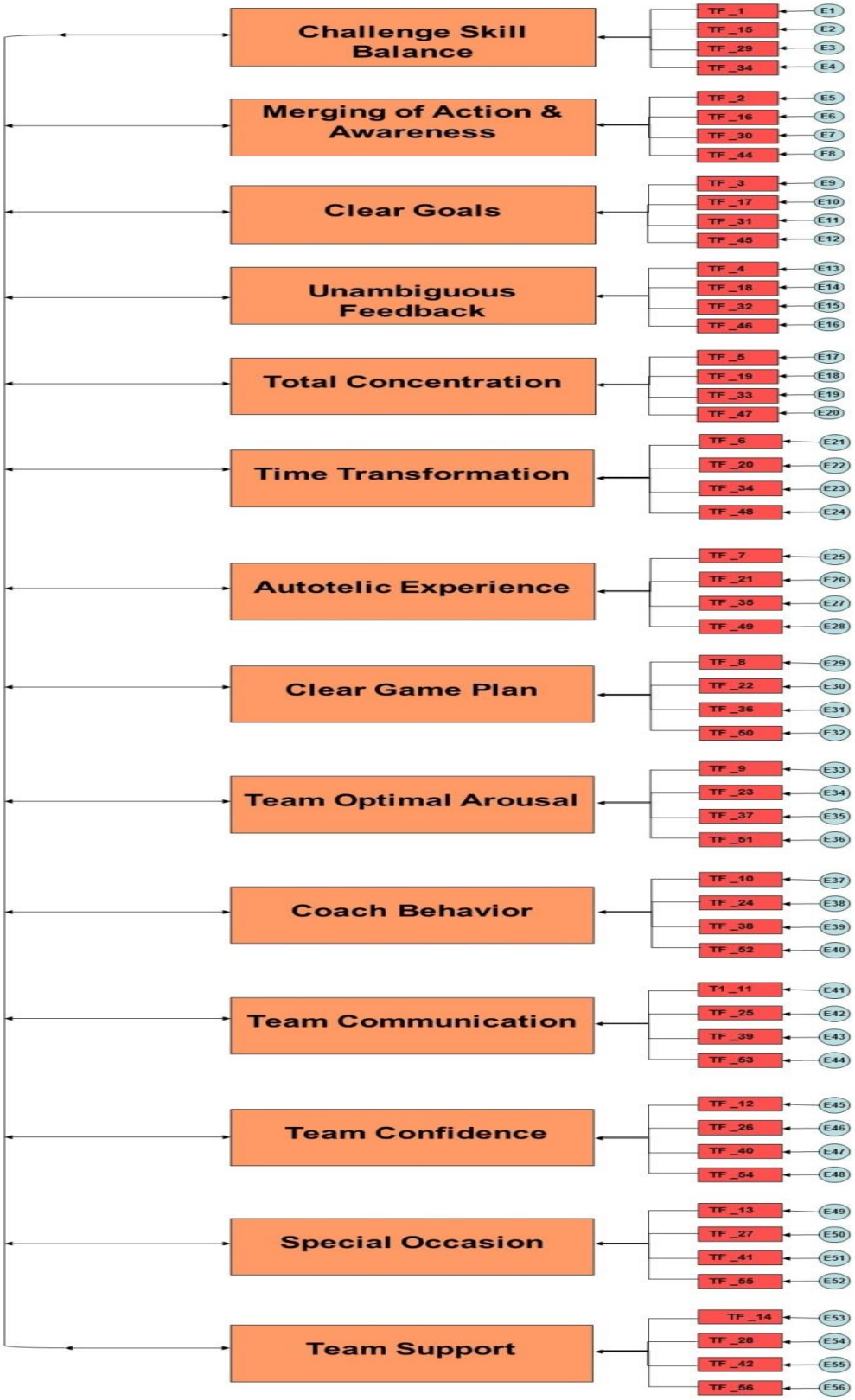

Figure 5.1

Proposed Model of Dimensions, Items, and Errors of Team Flow

In Figure 5.1, the large rectangles represent latent concepts (dimensions) and the small rectangles represent observed variables (items). Single-headed arrows are used to imply a direction of assumed causal influence, and double-headed arrows are used to represent covariance between two latent variables. Figure 5.1 demonstrates the exploration of latent structure of the TFSI by using CFA. The 14 dimensions of team flow, the latent variables, represent common factors with paths pointing to four observed variables (the items included in each dimension of team flow). The circles incorporate measurement error. The assumption embedded in this procedure is that the latent variables "cause" the observed variables, as shown by the single-headed arrows pointing away from the circles and towards the manifest variables. In CFA, the specification of correlated errors is justified on the basis of method effects that reflect additional indicator covariation that result from the assessment methods (e.g., inventories), reversed or similarly-worded test items, or differential susceptibility to other influences, such as response set, demand characteristics, acquiescence, reading difficulty, or social desirability (Brown, 2015; Marsh, 1996).

Confirmatory Factor Analysis of Team Flow State Inventory

My primary goal for Study 3 was to create a valid and reliable inventory to measure team flow. Achieving this goal required initiating a research project designed to engage team-sport athletes in responding to the proposed 56 item TFSI. The data collected formed the basis for conducting CFA to assess and refine the psychometric characteristics of the 56 item TFSI.

Method

Participants

Choosing the size of the sample for this research was guided by two categories of requirement proposed by psychometric specialists. The first requirement, based on the absolute number of cases (N), recommended a range of at least 100 to 300 participants. Gorsuch (1983), Kline (1979), and MacCallum, Widaman, Zhang, and Hong (1999)

recommended at least 100 participants. Hutcheson and Sofroniou (1999) recommended at least 150 - 300 participants (Garson, 2008). Cattell (1978) suggested a minimum sample of 250 participants (MacCallum et al., 1999). The second requirement was based on subject-to-variable ratio (p). Lawley and Maxwell (1971) suggested having 51 more cases than the number of variables, in order to support Chi-Square testing (Garson, 2008). Hair, Anderson, Tatham, and Black (1995) suggested a 20 to one ratio. Because the TFSI consists of 14 dimensions the decision was made to recruit at least 280 participants in order to implement an accepted approach that satisfies the range of both the absolute sample size and the cases to variables ratio recommendations.

The final sample included 358 athletes all active in various team sports. The similarity between the participants was based on the criteria for participation in the study that required at least one training hour a week with a certified coach and competing in a competitive league. The two main groups were Australian academic students of sport psychology and Israeli team sport athletes. Since Australian universities include international students, such as me, a range of national origins were represented in this sample. The sample was composed of 266 men and 92 women. Their age ranged from 18 to 53 years (M = 23.81, SD = 5.85). The minimum requirement for participation in the study was at least one training hour a week with a certified coach, and participation in a team sport within a competitive league. The average weekly training hours for these athletes was 7.37 (SD = 4.46 hours). The largest group of 180 athletes was recruited from Israel, and the second largest group of 115 athletes was from Australia. The origin of the remaining 63 athletes was from 23 different countries. The total sample constituted players from a diverse set of team sport domains as shown in Table 5.1.

Table 5.1

Distribution of Participants by Sport Domain

Sport Domain	Frequency	Percentage
Basketball	122	34.1
Soccer	69	19.3
Volleyball	45	12.6
ARF*	44	12.3
Handball	27	7.5
Netball	17	4.7
Cricket	13	3.6
Rugby	6	1.8
Ice-hockey	6	1.8
Tennis (doubles)	3	.8
Field-hockey	2	.6
Kayaking (doubles)	1	.3
Canoe polo	1	.3
Rowing (team)	1	.3
Futsal	1	.3
Total	358	100

*ARF – Australian Rules Football

The range of team sports included in the study demonstrated an unequal level of representation. The largest group of participants was 122 basketball players, who comprised a third of the research sample. About half of the sample, 185 participants, was athletes from the sport domains of soccer, volleyball, ARF, and handball. Twenty-three athletes were from netball and cricket. The remaining sport domains were represented by one to six team-sport athletes.

Measures

The tools used for this study were a demographic form and the TFSI.

Demographic form (Appendix B). The Demographic form was developed for this research in order to gather information relevant to this particular study. Using the form, I collected non-identifiable personal data and information regarding the type and extent of participants' involvement in a team sport. Participants were asked to enter information on gender, age, nationality, type of sport, number of coaches, weekly hours of training, and level of competition.

Team Flow State Inventory (Appendix H)**.** The TFSI was developed in the current research in order to measure team flow state. The TFSI began with a brief definition of the concept of team flow followed by a request for participants to recall a specific game in which they experienced team flow. Participants were encouraged to close their eyes, recall, and reflect upon an optimal experience that occurred during a particular game. Once they were able to connect to such an experience, they were asked to report, on a visual analogue grading scale from 0 to 100, the degree to which they perceived each item in the TFSI as a genuine description of their team flow experience. Since the administration of the TFSI was intended to be via Qualtrics, I decided to use the VAS. Visual analogue grading scales are simple, quick to administer, and lend themselves to self-completion. The VAS is preferred for mail surveys and self-administered paper-and pencil exercises. Visual analogue scales (VAS) have been used in the psychological, social and behavioural sciences to measure a variety of subjective phenomena (Bushanik, T., 2011). The TFSI included 56 items, four items for each of the 14 team flow dimensions. Table 5.2 introduces the 14 team flow dimensions with an example of a descriptive item for each dimension.

Table 5.2

Dimensions and Examples of Items of the Team Flow State Inventory

Team Flow Dimension	Item
Challenge-skill balance	We were challenged but we believed the skills of our team would allow us to meet the challenge.
Merging of action and awareness	We made the correct movements without thinking about trying to do so.
Team clear goals	Our goals were clearly defined.
Team unambiguous feedback	We had a good idea while we were performing about how well we were doing.
Concentration on the task at hand	We had total concentration.
Time transformation	At times, it almost seemed to us like things were happening in slow/fast motion.
Autotelic experience	We really enjoyed the experience.
Game plan	We were clear about the game plan to be executed.
Optimal arousal	We felt emotionally right during the performance.
Coaching style	The coach was supporting our team and letting us do our thing.
Confidence	We were confident in our performance.
Special occasion	We sensed it was a special occasion.
Communication	We communicated clearly with each other.
Support	We watched each other's back.

Procedure

The 56-item TFSI was written and distributed in English. Because a major part of data collection was done in Israel, and most of the participants' native language was Hebrew, and English for them was an additional language, the TFSI was translated and distributed in Israel in Hebrew. The translation was done by a professional translator, who translated the inventory from English to Hebrew, and I verified it by conducting a back translation from Hebrew to English. I addressed accuracy, precision, and clarification of discrepancies. I conducted a pilot study with five athletes, who were not part of the research sample, to assure the

comprehensibility of the Hebrew TFSI. There were no problems in the instructions or the items of the TFSI so I moved on to recruitments of participants.

Recruitment of participants began by utilizing personal and professional connections, and access to social and sport networks. Messages were sent out to athletes with an invitation to complete the online survey using Qualtrics software. This strategy brought limited success. Only 23 participants (6.4% of the total sample) completed the internet survey. I therefore decided to go back from Australia to my homeland, Israel, and use my native networks and connections for recruitment. The most successful approach was making direct contact with the individual responsible for a specific team. During an initial telephone conversation, I introduced myself and my work, shared the research goals and elaborated on the expected contribution of the research to understanding the phenomenon of team flow. I also stressed the practical implications of validating the TFSI. I informed my contacts of the criteria for participation and the expectations of involvement in the project for the athletes. Following general agreement to participate, we discussed a possible place and date for meeting with that coach's team at their training facility before their training session, in order to fill out consent forms and complete the TFSI. My presence enabled me to encourage participation, without coercion, and assist in the administration and completion process. I followed the same administration procedure with all teams. I arrived at the scheduled time and waited for all participants to be seated comfortably. Then I introduced myself, and asked for their help and cooperation. I gave the participants a brief description of the goal of the research and what would be required of them. I assured them of confidentiality and privacy. I then asked if they had any questions and once these were answered I asked them to complete the consent form if they were willing to volunteer. I distributed the research kit, which included a writing board and a pen as well as the TFSI. I instructed participants to begin by completing relevant demographic information, and to read the introduction page before they responded to the

TFSI. Upon completing the task, I provided a detailed explanation of team flow, its effects on team performance, and the expected contribution of this study to the development of the concept and measurement of team flow. Finally, I thanked the contact person and the athletes for their participation. A total of 180 athletes competing in Israel (50% of the total sample) completed the TFSI. The last recruitment site was academic classes for sport psychology students at Victoria University in Australia. My doctoral supervisor or my associate supervisor was present during these sessions. They followed a similar procedure to the one I employed. They gave the participants a brief description of the goal of the research and what would be required of them, and assured them of confidentiality and privacy. If they were willing to participate they were given the research kit which included a consent form, a demographic form, and the TFSI. One of my supervisors was also present to answer any questions or resolve problems that occurred, and assisted in administrating and collecting the responses. A total of 115 Australian students (30% of the total sample) completed the TFSI. A total of 358 participants comprised the research sample.

Data Analysis

The next stage of the research involved conducting CFA in order to examine whether the internal structure of the TFSI is consistent with my hypothesized theoretical model of team flow. I used CFA to evaluate the acceptability of the TFSI model with reference to its overall goodness of fit, presence of localized areas of strain in the solution (e.g., specific point of ill-fit), and the interpretability size and statistical significance of estimates of the model's dimensions. I recorded and analyzed data using the Statistical Package for the Social Sciences 21 (SPSS), and tested CFA models using robust maximum likelihood estimation with AMOS version 20. Due to the availability of software packages to facilitate calculations related to CFA, the technique functions as an accessible method of inventory development and psychometric evaluation (Brown, 2006). I started this analysis with the proposed model of the

errors, items, and dimensions of team flow previously displayed in Figure 5.1.Upon identifying the structure of variables and errors in the CFA model, the next step was to assess how well the theoretical model matched the observed data. Goodness of fit pertains to how well the parameter estimates of CFA solutions were able to reproduce the relationships that were observed in the sample data. A variety of goodness of fit statistics can provide a global descriptive summary of the ability of the model to reproduce the input covariance matrix. The goodness of fit indices I chose for this study were Chi-Square/df index, root mean square error of approximation (RMSEA), Tucker-Lewis Index (TLI) and comparative fit index (CFI). I used the Chi-Square/df indices as an indicator of differences in fit between the hypothesized theoretical model and the data, with non-significant *p*-values indicating a good fit (Schumacker & Lomax, 2004).The RMSEA is also a test for goodness of fit that incorporates parsimony as a criterion that can be used to evaluate the more realistic hypothesis of close fit. I used CFI and TLI to evaluate the improvement of the proposed TFSI model relative to a more restricted, nested, theoretical baseline model. TLI evaluated the improvement in fit of the k-factor model over the zero-factor model. CFI presented the ratio between the discrepancies of the target model to the discrepancy of the independence model (Brown, 2015).

Close scrutiny of the results indicated the capacity for improving the proposed TFSI reliability and psychometric values by constructing a revised 42-item TFSI (Appendix H), which included three items in each dimension. The decision to omit items was theoretically supported by the sport experts who reviewed the TFSI in Study 1 and found repetitive items, in several TFSI dimensions. Several criteria guided the considerations that lead to omitting one item from each dimension. The first criterion was logic related to the lack of clarity and misinterpretation identified in participants' responses. For example, logical screening prompted omission of item 24, the second item in the dimension of coaching style, which was

removed because of use of the phrase "hands off approach", which may not have been fully understood by certain participants, especially those for whom English was not their native language. The second criterion was statistical, based on data retrieved from standardized residual covariance of the CFA and item-deleted alpha values. Standardized residual covariance reflects the difference between the observed sample value and model-implied estimate for each indicator variance and covariance (Hoyle, 2000). These values can be conceptually considered as the number of standard deviations that the residuals differ from the zero-value residuals that would be associated with a perfectly fitting model. For instance, a standardized residual at a value of 1.96 or higher would indicate that there exists significant additional covariance between a pair of indicators that was not reproduced by the model's parameter estimates. In most cases, the item that was proposed to be removed in the item-deleted alpha analysis was the same item that was identified for removal by the residual covariance values. When a difference was found regarding the proposed item for removal, between the item-deleted alpha and standardized residual covariance, I chose to omit the item that improved the standardized residual covariance, resulting in improvement of model fit and improvement of fit indices. The evidence based on logical and statistical consideration, supported my decision to shorten the TFSI to 42-items from the original large set of 56 items.

An additional function of CFA is to determine estimates of the model's parameters, e.g., factor loadings, variance and covariance of factors, and residual error variances of observable variables (Brown, 2015). These processes support the aim of evaluating the fit of the model, for example, to assess whether the model itself provides a reliable fit to the data. Little (1997) proposed three criteria for comparing nested models: (a) the overall model fit is acceptable, (b) indexes of local misfit (e.g., specific MIs, fitted residuals) are uniformly and unsystematically distributed for the restricted parameters, and (c) the restricted model is substantively more meaningful and parsimonious (having fewer variables or items) than the

unrestricted model. The most vital step in model evaluation is generation of test statistics regarding the model's goodness of fit (Brown, 2015; McCoach et al., 2013).

The procedure used to construct the revised 42-item TFSI, by omitting an item from each dimension required further development of the CFA model. Fitting a model involves iterative processes that begin with an initial fit, test how well the model fits, adjust the model, test the fit again, and so forth, until the model converges or fits well enough. I used modification indices (MI) to identify specific areas of misfit and indications of change that would probably result in a significant improvement in model fit (Harrington, 2009). MIs can be computed for each fixed parameter, for example, parameters that are fixed to zero, such as indicator cross-loadings and error covariance, and for each constrained parameter in the model, for example, parameter estimates that are constrained to the same value. The MIs reflect an approximation of how much the fit will decrease if the fixed or constrained parameter is freely estimated. Based on the MIs report generated by AMOS, I considered the rationale for each possible omission based on available theoretical and empirical knowledge. Anderson and Gerbing (1988) and Hipp and Bollen (2003) concluded that deleting an indicator from the model is the preferred procedure for improving the model fit.

Results

My goal in running CFA was to test whether the team flow model fitted the data and to compare results for the 56-item and the 42-item TFSI. In order to fulfil this goal, I used a maximum likelihood (ML) estimation method commonly used to find the parameter values that make the observed data most likely (Brown, 2015).

The 56-item Team Flow State Inventory. Figure 5.2 presents the CFA model of errors, items, and dimensions of the 56-item TFSI used to evaluate its model fit.

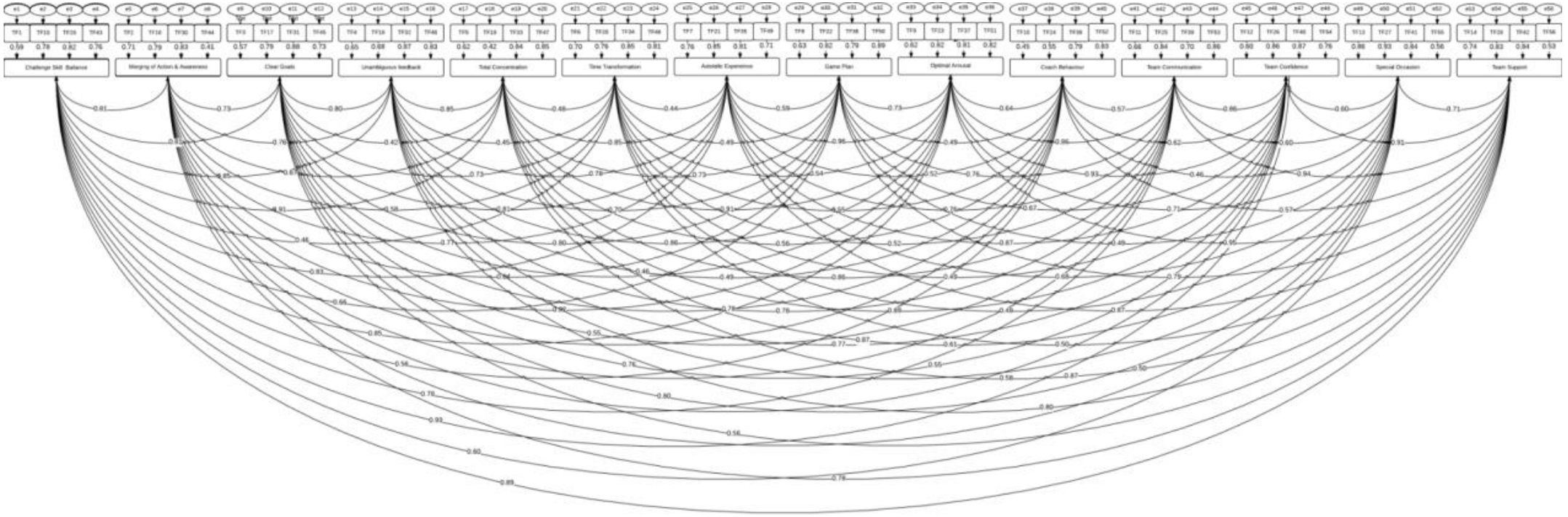

Figure 5.2

CFA Model of Dimensions, Items, and Errors, of the 56-Item Team Flow State Inventory

In Figure 5.2 the 14 dimensions of team flow (i.e., latent variables) represent common factors, with paths pointing to the observed variables (the items included in each dimension of team flow). The circles incorporate the measurement error. The small rectangles represent observed variables and the large rectangles represent the latent concepts. Additionally, single-headed arrows are used to imply a direction of assumed causal influence and double-headed arrows are used to represent covariance between two latent variables. Assessment of the model fit were based on factor loading for each item of the 56-item TFSI, by dimension, as shown in Table 5.3

Table 5.3

Dimensions, Factor Loadings, and Itemsof the 56-Item Team Flow State Inventory

Team dimension	Factor loading	Item
Challenge-skill balance	.59	We were challenged but we believed the skills of the team would allow us to meet the challenge.
	.78	Our abilities matched the high challenge of the situation.
	.82	We felt we were competent enough to meet with the high demands of the situation.
	.76	We felt the challenge and our skills were at an equally high level.
Merging of action and awareness	.71	We made the correct movements without thinking about trying to do so.
	.79	Things just seemed to be happening automatically for us.
	.83	We performed automatically.
	.41	We did things spontaneously and automatically without having to think.
Clear goals	.57	Our goals were clearly defined.
	.79	We were clear about what we wanted to do.
	.68	We had a strong sense of what we wanted to do.
	.73	We knew what we wanted to achieve.
Unambiguous feedback	.65	We had a good idea while we were performing about how well we were doing.
	.68	We could tell by the way we were performing how well we were doing.
	.87	It was really clear to us that we were doing well.
	.83	We were aware of how well we were performing.
Concentration on the task at hand	.62	Our attention was focused entirely in what we were doing.
	.42	It was no effort to keep our mind on what was happening.
	.54	We had total concentration.
	.85	We were completely focused on the task at hand.
Time transformation	.70	At times, it almost seemed to us like things were happening in slow motion.
	.76	Time seemed to alter for us (either slowed down or speeded up).
	.85	The way time passes seemed to us to be different from normal.
	.81	It felt like time stopped when we were performing.
Autotelic experience	.76	We really enjoyed the experience.
	.85	We loved the experience and want to capture it again.
	.81	The experience left us feeling great.
	.71	We found the experience extremely rewarding.
Game plan	.63	We knew what we needed to do.
	.82	The game plan was clear to us.
	.79	We followed the game plan.
	.89	We were clear about the game plan to be executed.
Optimal arousal	.62	We felt good during the performance.
	.82	We were at our optimal level during the performance.
	.81	We had a lot of positive energy.
	.82	There was a good feeling in the team during the performance.
Coaching style	.45	We perceived the coach was sitting back.
	.55	The sitting back coaching style fitted our team needs.
	.79	The coach was supporting our team but still letting us do our thing.
	.83	The coach was with the team but not interfering.

(continued)

Table 5.3 (continued)

Dimensions, Factor Loadings, and Items of the 56-Item Team Flow State Inventory

Team dimension	Factor loading	Item
Communication	.64	We had open communication with each other.
	.64	We understood each other.
	.70	We frankly shared ideas and thoughts.
	.56	We communicated clearly with each other.
Confidence	.60	We believed we were going to win.
	.86	We were confident in our performance.
	.87	We had confidence in our team.
	.76	We knew the game was going our way.
Special occasion	.86	We sensed it was a special occasion.
	.93	The occasion was special for us.
	.84	It was a special game for us.
	.56	The excitement about the game helped us.
Support	.74	We were supporting each other.
	.83	We were sharing team responsibilities.
	.84	We watched each other's back.
	.53	We brushed off mistakes that were made.

Range of factor loadings of the 56-item TFSI was .41 - .93. Two of the 56 items had factor loadings less than .50. Twenty two of the 56 items had factor loadings higher than .80. The average factor loading was .73. Items associated with the special occasion dimension exhibited the highest loadings. Items associated with the concentration on the task at hand dimension exhibited the lowest loadings. Table 5.4 demonstrates the inter-correlations of the latent variables of the 56-item TFSI.

Table 5.4

Inter-Correlations among Dimensions of the 56-Item Team Flow State Inventory

Dimension	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	1.00													
2	.81	1.00												
3	.81	.74	1.00											
4	.85	.76	.76	1.00										
5	.91	.87	.80	.85	1.00									
6	.46	.58	.42	.45	.48	1.00								
7	.83	.77	.73	.78	.85	.44	1.00							
8	.67	.64	.81	.70	.73	.49	.59	1.00						
9	.86	.82	.80	.86	.91	.54	.96	.73	1.00					
10	.55	.55	.46	.49	.56	.55	.52	.49	.64	1.00				
11	.78	.76	.80	.79	.86	.53	.76	.76	.86	.57	1.00			
12	.93	.80	.80	.87	.89	.49	.87	.67	.93	.61	.86	1.00		
13	.60	.56	.55	.57	.61	.50	.68	.49	.71	.46	.60	.60	1.00	
14	.89	.78	.82	.80	.87	.50	.87	.79	.95	.57	.94	.91	.91	1.00

Note. Dimensions of the 56-item TFSI: 1. challenge-skill balance; 2. merging of action and awareness; 3. clear goals; 4. unambiguous feedback; 5. concentration on the task at hand; 6. time transformation; 7. autotelic experience; 8. game plan; 9. optimal arousal; 10. coaching style; 11. communication; 12. confidence; 13. special occasion; 14. support.

The independence of the 14 dimensions was further evaluated via examination of the inter-correlations between the latent variables (i.e., dimensions) (curved double ended arrows). The inter-correlations ranged from .42 to .96 with an average of .71. The dimensions with the lowest set of inter-correlations were time transformation (average of .49), coaching style (average of .54), and special occasion (.60). The dimensions with the highest set of inter-correlations were support (average of .82), optimal arousal (average of .81), and confidence (average of .79). The lowest paired inter-correlations were between time transformation and challenge skill balance (.42), time transformation and autotelic experience (.44), and time transformation and unambiguous feedback (.45). The highest paired inter-correlations were between autotelic experience and optimal arousal (.97), optimal arousal and support (.95), and communication and support (.94).

The 42-item Team Flow State Inventory. Figure 5.3 presents the CFA model of errors, items, and dimensions of the 42-item TFSI used to evaluate model fit.

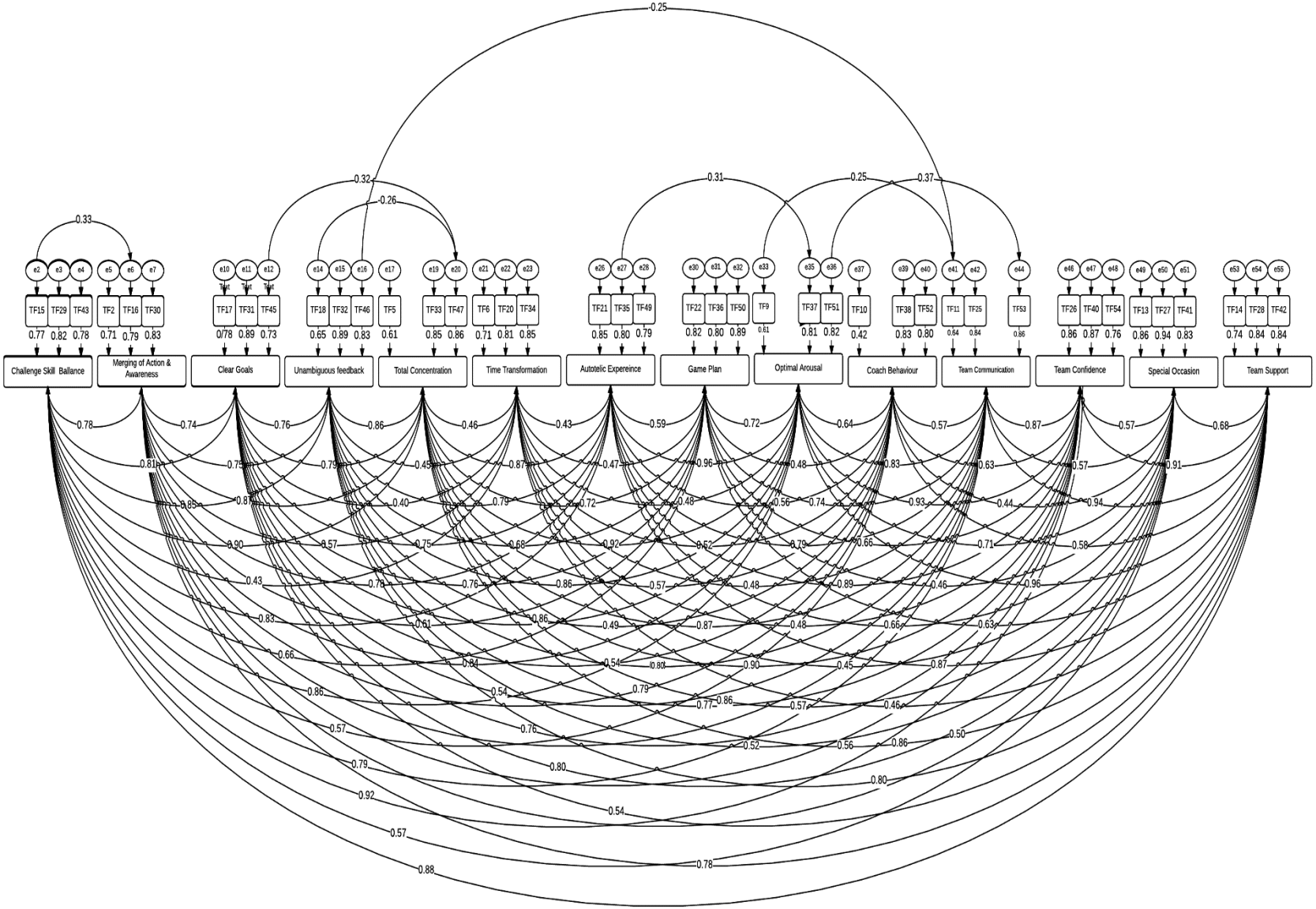

Figure 5.3

CFA Model of Dimensions, Items, and Errors of the 42-itemTeam Flow State Inventory

The 14 dimensions of team flow (i.e., latent variables) represent common factors, with paths pointing to the observed variables (the items included in each dimension of team flow). The circles incorporate the measurement error. The small rectangles represent observed variables and the large rectangles represent the latent concepts. Additionally, single-headed arrows are used to imply a direction of assumed causal influence and double-headed arrows are used to represent covariance between two latent variables. Error in the measurement of e2, e12, e14, e16, e27, e33, and e36 were expected to correlate to some extent with measurement error for e6, e20, e20, e41, e35, e41, and e44 correspondingly, because these were theoretically connected to the same latent factors.Table 5.5 demonstrates the dimensions, factor loadings, and items of the 42-item TFSI.

Table 5.5

Dimensions, Factor Loadings, and Itemsof the 42-Item Team Flow State Inventory

Team dimension	Factor loading	Item
Challenge-skill balance	.77	Our abilities matched the high challenge of the situation.
	.82	We felt we were competent enough to meet with the high demands of the situation.
	.78	We felt the challenge and our skills were at an equally high level.
Merging of action and awareness	.71	We made the correct movements without thinking about trying to do so.
	.79	Things just seemed to be happening automatically for us.
	.83	We performed automatically.
Clear goals	.78	We were clear about what we wanted to do.
	.89	We had a strong sense of what we wanted to do.
	.73	We knew what we wanted to achieve.
Unambiguous Feedback	.65	We could tell by the way we were performing how well we were doing.
	.89	It was really clear to us that we were doing well.
	.83	We were aware of how well we were performing.

(continued)

Table 5.5 (continued)

Team dimension	Factor loading	Item
Concentration on the task at hand	.61	Our attention was focused entirely in what we were doing.
	.85	We had total concentration.
	.86	We were completely focused on the task at hand.
Time transformation	.71	At times, it almost seemed to us like things were happening in slow motion.
	.81	Time seemed to alter for us (either slowed down or speeded up).
	.85	The way time passes seemed to us to be different from normal.
Autotelic experience	.85	We loved the experience and want to capture it again.
	.80	The experience left us feeling great.
	.79	We found the experience extremely rewarding.
Game plan	.82	The game plan was clear to us.
	.80	We followed the game plan.
	.89	We were clear about the game plan to be executed.
Optimal arousal	.61	We were at our optimal level during the performance.
	.81	We had a lot of positive energy.
	.82	There was a good feeling in the team during the performance
Coaching style	.42	We perceived the coach was sitting back.
	.83	The coach was supporting our team but still letting us do our thing.
	.80	The coach was with the team but not interfering.
Communication	.64	We had open communication with each other.
	.84	We understood each other.
	.86	We communicated clearly with each other.
Confidence	.86	We were confident in our performance.
	.87	We had confidence in our team.
	.76	We knew the game was going our way.
Special occasion	.86	We sensed it was a special occasion.
	.94	The occasion was special for us.
	.83	It was a special game for us.
Support	.74	We were supporting each other.
	.84	We were sharing team responsibilities.
	.84	We watched each other's back.

The range of the factor loading of the 42-item TFSI was .42 - .94. There was one item with factor loading less than .50 (We perceived the coach was sitting back). Twenty three of the 42 items had factor loadings higher than .80. The average factor loading was .79. Items

associated with the special occasion dimension exhibited the highest loadings. Items associated with the coaching style dimension exhibited the lowest loading. Table 5.6 demonstrates the inter-correlations of the dimensions of the 42-item TFSI.

Table 5.6

Inter-Correlations among Dimension of the 42-Item Team Flow State Inventory

Dimension	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	1.00													
2	.82	1.00												
3	.81	.74	1.00											
4	.86	.75	.76	1.00										
5	.91	.87	.79	.86	1.00									
6	.45	.57	.40	.45	.46	1.00								
7	.85	.78	.75	.79	.87	.44	1.00							
8	.65	.61	.76	.68	.72	.47	.59	1.00						
9	.87	.83	.81	.86	.93	.48	.97	.72	1.00					
10	.58	.54	.47	.50	.57	.52	.56	.48	.63	1.00				
11	.80	.78	.79	.80	.87	.48	.79	.74	.83	.57	1.00			
12	.92	.80	.78	.86	.90	.48	.89	.66	.68	.63	.87	1.00		
13	.58	.54	.53	.56	.57	.45	.67	.50	.67	.44	.57	.57	1.00	
14	.89	.78	.84	.80	.86	.46	.87	.78	.96	.58	.94	.91	.68	1.00

Note. Dimensions of the 42-item TFSI: 1. challenge-skill balance; 2. merging of action and awareness; 3. clear goals; 4. unambiguous feedback; 5. concentration on the task at hand; 6. time transformation; 7. autotelic experience; 8. game plan; 9. optimal arousal; 10. coaching style; 11. communication; 12. confidence; 13. special occasion; 14. support.

The independence of the 14 dimensions was further evaluated via examination of the correlations among the latent variables (i.e. dimensions) (curved double ended arrows). These inter-correlations ranged from .40 to .97 with an average of .70. The dimensions with the lowest set of inter-correlations were time transformation (average of .47), coach style (average of .54), and special occasion (.56). The dimensions with the highest set of inter-correlations were support (average of .80), optimal arousal (average of .79), and total concentration (average of .78). The lowest paired inter-correlations were between time transformation and clear goals (.40), coaching style and special occasion (.44), and time transformation and autotelic experience (.44). The highest paired inter-correlations were between autotelic experience and optimal arousal (.97), optimal arousal and support (.96), and communication and support (.94).

Model Fit for the 56-item and 42-item Team Flow State Inventory

In CFA, the null hypothesis is that the population covariance of observed variables equals the covariance matrix implied by the proposed model. In order to test the null hypothesis that 'the specified model reproduces the population covariance matrix of observed variables', a Chi-Square test statistic was used (Brown, 2015). In order to assess the goodness of fit between the theoretical model and the observed data, the fit indices of the 14-factor hierarchical model of the 42-item TFSI were evaluated and compared with those of the 56 item TFSI. The fit indices used for model fit were Chi-Square/df, RMSEA, and for model comparison CFI and TLI. Table 5.7 presents the acceptable values for good fit suggested by Hu and Bentler (1999), along with model fit values of the 56-item TFSI, and the 42-item TFSI.

Table 5.7

CFA Fit Indices: 56-Item Team Flow State Inventory and 42-Item Team Flow State Inventory Model Fit Values

Fit indices	Perfect fit	Acceptable fit	56 item TFSI	42-item TFSI
x^2/sd	$x^2/sd < 3$	$3 < x^2/sd < 5$	2.60	2.31
RMSEA	$0 <$ RMSEA < 0.05	$0.05 <$ RMSEA < 0.08	0.06	0.06
TLI	$0.95 \leq$ TLI < 1	$0.90 \leq$ TLI < 0.95	0.86	0.90
CFI	$0.95 \leq$ CFI < 1	$0.90 \leq$ TLI < 0.95	0.90	0.92

As a result of undertaking the re-specification analyses, after removing one item from each of the 14 dimensions of team flow, the fit indices were improved and reached acceptable fit levels. Values for model fit followed guidelines suggested by Brown (2006).

Reliability of the 42-Item TFSI

Internal consistency was assessed by calculating the internal consistencies (Cronbach's alpha coefficients) of the 14 dimensions of the 42-item TFSI. The results for each of the 14 dimensions are shown in Table 5.8.

Table 5.8
Internal Consistency Coefficients for the 42-ItemTeam Flow State Inventory(N = 358)

Team Dimension	Internal Consistency (Cronbach's α coefficient)
Challenge-skill balance	.83
Merging of action and awareness	.82
Clear goals	.84
Unambiguous feedback	.83
Concentration on the task at hand	.80
Time transformation	.83
Autotelic experience	.85
Game plan	.87
Optimal arousal	.79
Coaching style	.69
Communication	.83
Confidence	.78
Special occasion	.77
Support	.84

Table 5.8 shows that the internal consistency reliability of the 14 dimensions of the 42-item TFSI, based on Cronbach alpha coefficients ranged from α =.69 to α =.87. According to George and Mallery's (2010) recommendations for good and acceptable goodness of fit, Cronbach alpha coefficients for 10 dimensions in Table 4.8 are between α =.80 and α =.89, indicating good internal consistency; Cronbach alpha coefficients for three dimensions are between α =.70 and α =.79 indicating acceptable internal consistency; and the remaining dimension of coaching style, with a Cronbach alpha coefficient of α =.69, is acceptable given the small number of items forming each factor (3 items)(Hair, Anderson, Tatham, & Black, 1998; Nunnally & Bernstein, 1994).

Discussion

In Study 3, I explored the congruence between the proposed theoretical model developed in Study 1 and 2, with the structure and dimensions of the 56-item TFSI and the 42-item TFSI. Since the fit was not acceptable for the 56-item TFSI, the 42-item TFSI was created. One item from each dimension of the 56 item TFSI was removed based on logic, item-deleted alpha analysis, and residual covariance values. Conducting the CFA for the 42-

item TFSI, based on the available data set of responses verified the predicted structure of the team model as comprising 14 dimensions. The clusters of three items used to measure each dimension represented a single unidimensional construct (McCoach, 2013). Goodness of fit indices provided evidence for the validity of the theoretical structure for team flow. Three fit indices, Chi-Square/sd, TLI and CFI, met perfect fit criteria, and the fourth indicator, RMSEA was well within acceptable fit criteria (Thompson, 2004).

The 42-item TFSI showed acceptable internal consistency reliability, as Cronbach alpha coefficients for all dimensions were above $\alpha = .70$, except for coaching style, which was marginally below at $\alpha = .69$. The 42-item TFSI demonstrated improvement in the factor loadings of 13 dimensions in comparison to the 56-item TFSI. Only the factor loading of optimal arousal was higher in the 56-item version. This pattern of results indicates that the construct of team flow state as indexed by the TFSI total score is typically representative of a multifaceted construct (Carver, 1989), having 14 underlying facets. Since all the dimensions were developed to measure the aspects of team flow state, it should be expected that the magnitude of the relationships indicates that most factors share a common variance. In both the 42-item and 56-item TFSI the lowest inter-correlated dimensions were time transformation, coaching style, and special occasion. One possible explanation is that time transformation although important for team flow state is ephemeral. Researchers have claimed that flow states are difficult to measure, especially because some dimensions of flow, are more ephemeral by nature than others (Jackson, 2000; Jackson & Eklund, 2002). Coaching style refers to how the coach behaved during the event and is not about how the players themselves perceived the experience. Special occasion is about the context of the experience and not about the meaning attached by team players to their experience. The different focus embedded in these dimensions may contribute to the relatively low inter-correlations. Overall, because the common variance between subscales was typically less than

70 percent, it seems plausible that the team flow state dimensions tap into relatively unique aspects of the team flow experience.

Reliability and item analysis data presented for the 42-items TFSI were satisfactory for a psychological self-report measure in the early stages of development. It was also found to be relatively consistent with reliability findings reported for other multiple-subscale measures (Clark & Watson, 1995; Hooper, Coughlan, & Mullen, 2008).

Limitations

A number of limitations should be acknowledged. The research sample in this study was based on convenience and opportunity, and therefore cannot be considered representative of athletes who could be drawn from across the full spectrum of team sports. Although the size of the sample, which included 358 participants, was large enough to support variability and complied with statistical requirements for validity, the current findings should be regarded as exploratory, and in need of further investigation and replication.

The current study was executed in two countries, Australia and Israel. The TFSI was drafted initially in English, and translated to Hebrew for the benefit of Israeli athletes. This accommodation was appreciated and productive. Recognizing the importance of language in assuring valid understanding and response, several researchers have translated the individual flow scales for non-English-speaking samples. For example Doganis, Iosifidou, and Vlachopoulos, (2000) translated and confirmed its validity in Greek; Fournier et al., (2007) did so to French; Kawabata, Jackson, and Mallett, (2005) did so to Japanese. All these studies supported the fit between their inventories and results obtained with the original version of the FSS-2, providing support for the robustness of the scale across samples from different cultures, responding in different languages. In the current research, data analysis was done on a sample which included the TFSI in English and Hebrew. The reliability and validity of the

TFSI should therefore be further explored based on two separate samples in the two languages large enough to do separate analyses with each sample.

A possible limitation of the present research is related to the use of three different modes of data collection. My first intention was to recruit participants from available sport listings, in order to engage them in completing the TFSI on the internet, using Qualtrics software. Due to limited response, I moved back to my homeland in Israel were I was able to rely on personal connections and available networks to gain access to team managers and sport coaches. Being successful in enlisting their interest led to their willingness to cooperate in helping me schedule meetings with team-sport athletesat their home facility before a training session. Most of the participants from Australia filled participated during an academic class at their university, at the initiative and guidance of my doctoral supervisors. When comparing the three methods of administering the TFSI, I realized that electronic communications did not generate enough motivation for starting and completing the research task. Face-to-face encounters using traditional paper-and-pencil interview (PAPI) material used in Israel and Australia were efficient. However, in Israel some athletes were eager to begin their training and therefore impatient to complete the task. The group of Australian students, who completed the research task during a class session with the support of professors, was highly motivated to contribute to the research and had the necessary time and concentration to do so consistently. The various approaches administration in the three locations may have contributed to differences in response rate (e.g., the number of completed interviews divided by the total number of eligible sample units); presence of social desirability bias; item response (inversely proportional to the number of missing responses in the questionnaire); amount of information; and similarity of response distributions (de Leeuw, 1992). It is likely that the differences in distributing and collecting the data had effects on the quality of the data collected (Bowing, 2005).

Caution should be applied regarding the possibility that overall goodness of fit indices were indicative of acceptable fit despite the fact that some relationships among the indicators were not reproduced adequately (Hooper, Coughlan, & Mullen, 2008). A noted limitation of goodness of fit statistics (e.g., RMSEA, CFI) is that these indices provide only a global, descriptive indication of the ability of the model to reproduce the observed relationships as indicators in the input matrix. Although the current data provided an acceptable to perfect fit with the proposed theoretical model of team flow, a strong result from structural equation modelling does not ensure that the model is the only, or even the best, representation of the relationships between the variables (Hox & Bechger, 1998). Considering this limitation, the proposed model can only be regarded as a preliminary version of the relationship that exists between the dimensions of team flow. It is possible that other variables that were not explored in this study also have an influence on team flow. Although the current research has fulfilled its goals, it is only a first step that should be followed by further research.

Further research

Although the results of the CFA for the 42-item TFSI validated the theoretical structure for team flow state, and the hierarchical model demonstrated a good fit, further research needs to replicate the CFA with different samples that will test the robustness of the model and provide information to refine it if necessary. The different samples should include athletes from a wider range of sport fields, genders, ages, and cultures, as well as other domains, such as work and the creative and performance arts, to which the concept of team flow is relevant.

Testing the proposed model against alternative models is a useful suggestion for further research that requires larger samples. Examining and comparing the hypothetical model (14 factor correlated model) will provide further support that the model provides the

best fit. In order to further examine the factor structure of the TFSI testing alternative factor models is needed:

1) 14 factor model uncorrelated
2) One hierarchical factor model (all items loading in one factor)
3) One first order factor model (all factors loading in one second order factor)
4) Two first order factor model (all 7 FSS-2 factors loading in one second order factor and the rest 7 factors in another second order factor). Examining and comparing the hypothetical model (14 factor correlated model) will provide further support that the model provides the best fit.

The 42-item TFSI should be available to the international sport community. In order to achieve this goal, language barriers need to be removed. In the current study, the TFSI was drafted initially in English, and translated to Hebrew for the benefit of Israeli athletes. This accommodation was appreciated and productive. Recognizing the importance of language in assuring valid understanding and response, several researchers have translated the individual flow scales for non-English-speaking samples. For example Doganis, Iosifidou, and Vlachopoulos, (2000) translated and confirmed its validity in Greek; Fournier, et al.,(2007) did so to French; Kawabata, Jackson, and Mallett, (2005) did so to Japanese. All these studies supported the fit between their inventories and results obtained with the original version of the FSS-2, providing support for the robustness of the scale across sample from different cultures, responding in different languages. These results should encourage researchers to translate and administer the 42-item TFSI in athletes' native language, and investigate the congruence of their factor structure with the original inventory.

Conclusion

The findings of this study provide preliminary support for the psychometric properties of the 42-item TFSI. Specifically, CFA demonstrated acceptable model fit for the 42-item

TFSI. Therefore the 42-item TFSI will be the only scale used for all further data analysis. The inventory appears to represent a multi-dimensional construct that is capable of measuring team flow state. In light of the acceptable reliability and validity demonstrated by the findings, the 42-item TFSI warrants further development and psychometric evaluation. In particular, it is important to examine whether the concept of team flow and its constituent dimensions represent independent constructs, as reflected by exploring their convergent and discriminant validity in relation to other conceptually-related concepts, such as individual flow, and other team and group concepts, including group cohesion and collective efficacy.

CHAPTER 6: CRITERION VALIDITY OF THE TEAM FLOW STATE INVENTORY (STUDY 4)

In Study 4, I continued the validation process for the TFSI, which I revised in Study 3 to a 42-item measure with 14 subscales, representing the 14 dimensions of team flow. Each subscale comprises three items. During the first stage, described as Study 1 (Chapter 3), I established conceptualisation of team flow based on data retrieved from face-to-face interviews with team-sport athletes, coaches, and sport psychologists. A qualitative analysis of this data formed the basis for the theoretical model of team flow, which served as the foundation for development of the TFSI. In the second stage, described as Study 2 (Chapter 4), I focused on generating evidence for the face and content validity of the TFSI. I asked sport experts to judge the adequacy with which the inventory dimensions and items reflected the breadth of content in the universe of team flow (content validity) and whether the items looked like they referred to the dimensions to which they were assigned (face validity). In Study 3 (Chapter 5), I examined the reliability and validity of the TFSI. Based on responses of a substantial sample of team athletes to the 56-item TFSI, I performed CFA to explore the structure of the TFSI and its goodness of fit with the proposed theoretical model. Although several fit criteria reached or approached acceptable levels, overall the results did not provide an acceptable fit. Based on psychometric results of the CFA and item-deleted alpha coefficient values, I omitted one item from each TFSI dimension, resulting in improvement in factor structure and internal consistency reliability for the 42-item TFSI. The TFSI represents a multi-dimensional construct, capable of measuring team flow state. The current stage, described as Study 4, continued the validation process by investigating the criterion validity of the TFSI. The aim of this investigation was to explore the discriminant validity between the TFSI and three scales assumed to measure related, but independent, constructs, namely individual flow, group cohesion, and collective efficacy.

Validity was defined as "the degree to which a test measures what it claims, or purports, to be measuring" (Brown, 1996, p. 231). Cronbach and Meehl (1955) coined the term construct validity. They argued that none of the existing specific forms of validity could provide a definitive outcome that a measure was valid. Thus the validity of a measure should be based on the built up of evidence that supports the theoretical construct being measured. Lissitz (2009) stressed that validity refers to the degree to which evidence supports the inferences made from the scores, in accordance with Messick's (1989) definition of validity as "an integrated evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on test scores and other modes of assessment" (p. 13). In a broader understanding of construct validity, Kline (1998 argued that all tests of validity can be considered to reflect construct validity because they all provide evidence that supports or contradicts the validity of the construct, thus, contributing to the building of construct validity. One popular approach to test the validity of a construct is criterion validity, in which existing measures are compared with the scale being validated on the basis of their proposed relationship to the construct being measured in the new scale. There are two main types of criterion validity, namely convergent validity and discriminant validity. Scales that are predicted by the theoretical framework to be related to the scale under examination provide evidence of convergent validity if they show high correlations with the scale being validated. Scales that are predicted by the theoretical framework not to be closely related to the scale under examination provide evidence of discriminant validity if they show low correlations with the scale being validated (Drew& Rosenthal, 2003; McCoach, 2013). Thus, in the broader conception of construct validity, convergent and discriminant validity are methods of establishing construct validity by showing that the scale being validated correlates highly with other scales measuring the same or similar constructs and does not correlate highly with scales measuring constructs that

are independent of the scale under investigation, but could be suggested to have a relationship if the construct underlying the new scale is not unique (Nunnally & Bernstein, 1994).

To assess the criterion validity of the TFSI it would have been beneficial to establish convergent validity with other inventories that were used to measure team flow state. Although there was one other inventory that Cosma (1999) proposed to measure team flow state, namely the FSST, as explained in the literature review that scale was based on Csikzhentmihalyi's (1975) nine-dimension model of individual flow, as reflected in the FFS, without including characteristics possessed by teams. Changing subject of items from singular (I) to plural (we), may have altered the perceptions of the responders, but did not capture the unique experience of team flow that is qualitatively different from the experience of individual flow. Thus, I decided that there was no suitable measure of team flow that could be correlated to the TFSI to test for convergent validity. Thus, I focused the examination of criterion validity on discriminant validity. Here there are two issues that I also addressed in the section the literature review on team flow. First, if team flow is a construct that is independent of individual flow correlations between team flow dimensions should discriminate from individual flow dimensions. Second, if team flow is an independent team construct, dimensions of team flow should discriminate from dimensions of established group and team constructs, specifically from team cohesion and collective efficacy.

Aim of the Study

The aim of this study was to examine the relationships between the TFSI and measures of individual flow (FSS-2), team cohesion (GEQ), and collective efficacy (CEQS),in particular, with reference to discriminant validity. Discriminant validity ensures that the measurement of the construct (TFSI) is empirically unique and represents phenomena of interest that other measures do not capture (Hair, Black, Babin, & Anderson 2010).

Method

Participants

Participants from the sample in Study 3 also participated in Study 4. Thus, the sample included 358 athletes active in various team sports. The sample comprised of 266 males and 92 females. Their age ranged from 18 to 53 years, with the mean age of 23.81years (*SD* = 5.85 years). The minimum requirement for participation in the study was at least one training hour per week with a certified coach and participation in a competitive league. Mean weekly training hours was 7.37 (*SD* = 4.46). Participants mostly represented two nationalities. The largest group of 184 athletes was from Israel, and the second largest group was 142 athletes from Australia. Additional athletes were nine Americans who played in the Israeli Basketball League and 23 athletes from different nationalities studying in Australia. Basketball players formed 34.1% of the participants, 51.7% were from the sport domains of soccer, volleyball, ARF, and handball, and 8.3% of the participants were from netball and cricket. The rest of the sport domains were represented by one to six team-sport athletes.

Measures

Study 4 focused on criterion validation of the TFSI by investigating the correlations between the TFSI and the FSS-2, GEQ, and CEQS. The TFSI and the demographic form were previously described in Chapter 4, so, in this section, I describe the individual flow (FSS-2), group cohesion (GEQ), and collective efficacy (CEQS) measures.

Flow State Scale -2 (Jackson & Eklund, 2002) (Appendix J). The FSS-2 was based on Csikszentmihalyi's (1975, 1990) theoretical model of nine dimensions of individual flow. Participants reflected upon the optimal experiences that surfaced during a recent game and responded to 36 items, describing the degree to which they perceived the existence of flow dimensions. They responded on a 5-point Likert rating scale (from 1 =*Strongly disagree* to

5=*Strongly agree*). Table 6.1 displays the nine dimensions of individual flow and an example of an item representing each dimension.

Table 6.1

Dimensions of the Flow State Scale-2 and Descriptive Items

Dimension of FSS-2	Descriptive Item
Challenge-skill Balance	I was challenged but I believe my skills will allow me to meet the challenge.
Merging of action and awareness	I made the correct movements without thinking about trying to do so.
Clear goals	I knew clearly what I wanted to do.
Unambiguous feedback	It was clear to me how my performance was going.
Concentration on the task at hand	My attention was focused entirely on what I was doing.
Sense of control	I had a sense of control over what I was doing.
Loss of self-consciousness	I was not concerned with what others may have been thinking of me.
Time Disorientation	Time seemed to alter (either slowed down or speeded up).
Autotelic Experience	I really enjoyed the experience.

Due to the challenges of quantitatively measuring an abstract construct, a great deal of effort was invested in establishing appropriate levels of validity and reliability for the FSS-2 (Jackson, Martin, & Eklund, 2008). Logical and content validity were developed through qualitative analysis that investigated the perception of the experience of flow (Jackson, 1995; Jackson & Eklund, 2002; Jackson & Marsh, 1996). In addition, confirmatory factor analyses supported the construct validity of the FSS-2 (Jackson, Martin, & Eklund, 2008). The internal consistency of each dimension within the FSS-2 is acceptable because the Cronbach α coefficients ranged from $\alpha = .80$ to $\alpha = .92$, (Jackson & Eklund, 2002). Research supports the

multi-dimensionality of the flow construct (e.g., Jackson & Marsh, 1996). For the present research, the FSS-2 was professionally translated to Hebrew, back translated to English, and pilot tested for comprehension.

Group Environment Questionnaire (Carron, Widmeyer, & Brawley, 1985). (Appendix J).The GEQ was designed to measure individuals' perception of intra-group relations (or cohesion) for athletes. This multidimensional instrument was based on a conceptually-driven model of cohesiveness that is broken down into four separate dimensions. Group integration - social (GI-S) refers to group members' perception of togetherness and bonding within the group as a whole around the group as a social unit. An example item (reversed) is, "Our team members rarely party together". Individual attraction to the group - social (ATG-S) refers to the desire of group members to stay in the group. An example item (reversed) is, "I am not going to miss the members of this team when the season ends". Group integration - task (GI-T) refers to group members' perception of togetherness and bonding within the group as a whole around the group's task. An example item (reversed) is, "Our team members have conflicting aspirations for the team's performance". Individual attraction to the group - task (ATG-T) refers to individuals' perception about their personal involvement with the group. An example item (reversed) is, "I do not like the style of play on this team". The 18 items included in the questionnaire are responded to on a 9-point Likert-type scale (from 1 = *strongly disagree* to 9 = *strongly agree*). The summation of the four scores comprises individuals' overall perception of group cohesion.

The GEQ is one of the most extensively used multidimensional measures of cohesion in sport and exercise psychology (Eys, Carron, Bray, & Brawley, 2007). Brawley, Widmeyer, and Carron (1987) reported that the GEQ had adequate content, concurrent (criterion-related), predictive and construct validity. Content validity was determined by a panel of judges labeled as experts (Brawley, Widmeyer, & Carron, 1987). Concurrent validity was shown

when the GEQ predicted correspondence with similar measures of cohesion and not with other constructs. Internal consistency, as measured by Cronbach α across the four main dimensions, showed medium reliability: α =.64 (ATG-S), α =.75 (ATG-T), α =.76 (GI-S), and α =.70 (GI-T); (Carron et al., 1998). Although some researchers have calculated similar or larger values (e.g., Carron & Ramsay, 1994; Li, Harmer, Chi, & Vongjaturapat, 1996), variable internal consistencies have also been reported on one or more GEQ subscales in other studies (e.g., Prapavessis & Carron, 1996, 1997; Westre & Weiss, 1991). For example, Westre and Weiss (1991) found moderate Cronbach's alpha values particularly for the social scales: ATG-S and GI-S had low values of α =.54 and α =.44, respectively, whereas ATG-T and GI-T had higher values of α =.68 and α =.66, respectively. Eys et al. (2007) found larger Cronbach's alpha values for three out of four subscales, when using a positively worded version of the GEQ and proposed that the use of items that were positively and negatively worded may have reduced the GEQ's internal consistency. A further explanation for variable internal consistency can be found in the dynamic and multidimensional nature of cohesion. All dimensions may not be salient for a group at a specific point in time, or across different types of groups (Carron et al., 1998). For the present research, the GEQ was professionally translated to Hebrew, back translated to English, and pilot tested for comprehension.

Collective Efficacy Questionnaire for Sports (Short, Sullivan, & Feltz, 2005) (Appendix K). The third inventory used in this research was the CEQS. Collective efficacy refers to a "group's shared belief in its conjoint capability to organize and execute the courses of action required to produce given levels of attainment" (Bandura, 1997, p. 477). In sport, this has also been referred to as team efficacy or team confidence.

The CEQS is a multidimensional measure of collective efficacy used in sport research. The scale includes five interrelated factors: ability, effort, preparation, persistence, and unity. The CEQS consists of 20 items, four items for each of the five factors. All items start with the

prefix: "How confident are you that your team will…" Following is an example for each factor: ability – "outplay the opposing team"; unity – "resolve conflicts"; persistence – "perform under pressure"; preparation – "be ready"; and effort –"demonstrate a strong work ethic". All items are scored on a10-point Likert-type scale (from 0 = *not at all confident* to 9 = *extremely confident*). Factors can be scored separately, or added to yield a total score (Bandura, 2001). Cronbach's alpha internal consistency scores exceeded the recommended level of α=.70 (Nunnally & Bernstein, 1994): with ability recording α=.89, unity α=.87, persistence α=.73, preparation α=.85, and effort α=.86. These values were in line with a validation study by Short et al. (2005). Confirmatory factor analyses supported the construct validity of the CEQS. The goodness of fit indices were acceptable: CFI = .92, NNFI = .90, SRMR = .06, and RMSEA = .10, with a 90% confidence interval ranging from .09 to .12 (Short, Sullivan, &Feltz, 2005). For the present study, the CEQS was also professionally translated to Hebrew, back translated to English, and was pilot tested for comprehension.

Procedure

The original research plan was to ask participants to complete the demographic form, the TFSI, and respond to all three inventories (GEQ, FSS-2, and CEQS). This worked well with respondents who filled the questionnaires through the internet, or during a class session within a university setting. However trying to fulfill this request with groups of athletes in the field before team training sessions was impractical because the administration time was too long and athletes became bored or restless. The athletes, although willing to help in this project, were impatient to begin their sport training and found it demanding to respond to four inventories, which included 137 responses. Therefore, I decided to ask each athlete to fill the demographic form, the TFSI and one of the three inventories (which were equally and randomly assigned to each team member). Data was not considered if inventories did not contain responses to all questions, all items had an identical response, or participants did not

meet the requirements of training at least one hour a week and competing in a league. From a total of 385 completed inventories, 28 were disqualified. The final data base included 357 TFSI, 206 FSS-2, 174 GEQ and 250 CEQS.

Data Analysis

In the data analysis, I assessed the degree to which the evidence supported the inference that the TFSI displayed discriminant validity in relation to the FSS-2, GEQ, and CEQS. The statistical procedure used to examine strength, direction, and probability of these relationships was correlation analysis. Since the data included interval and ratio scales, the Pearson product-moment correlation (r) was used (Kossowski & Hauke, 2011).

The interpretation of validity coefficient values follows that of a correlation index. Coefficient values range from −1 to +1. The magnitude of the relationship is described in terms of strength, such that values near 0 indicate very weak or minimal relations between test and criterion scores, whereas values near +1 or −1 indicate very strong relations. Weak correlation coefficients between the TFSI and the other measures supported discriminant validity of the TFSI. If the correlation coefficients between the measures that theoretically were predicted to be low were high, the discriminant validity was weak. The interpretation of the strength of the correlation as strong, moderate, or weak depends, in part, on the topic of study. When studying complex topics that are difficult to measure, such as sport experiences, it should be expected that the correlation coefficients will be lower than when studying a concrete topic, such as in demographic studies (McCoach, 2013). Cohen (1988) defined effect sizes as small, r = .0 to .2, medium, r= .2 to .5, and large, r =.5 to .8. Correlations tend to increase as sample size increases. With a large sample as in this study, it is possible that correlations were inflated, leading to significance being observed more often than might be expected and effect sizes perhaps being rather generous, that is a medium effect size might not be strong evidence of a powerful association.

Results

Discriminant Validity between Team Flow and Individual Flow

Discriminant validity between team flow and individual flow was examined by correlations between the TFSI and FSS-2. The FSS-2 was based on Csikszentmihalyi's (1975, 1990) theoretical model of nine dimensions of individual flow. The proposed theoretical model for team flow included seven dimensions that were similar to Csiksentmihyli's (1990) individual flow model and seven unique and new dimensions of team flow. The results of a correlation matrix between the 14 dimensions of team flow state and the nine dimensions of individual flow state, as measured by the TFSI and FSS-2 respectively, are shown in Table 6.2.

Table 6.2

Correlations between the Team Flow State Inventory and Flow State Scale-2 (n=206)

Team flow Dimension	1	2	3	4	5	6	7	8	9
Challenge-skill balance	.30**	.29**	.22**	.28**	.22**	.28**	.15*	.17*	.32**
Merging of action and awareness	.19**	.31**	.15*	.18**	.25**	.26**	.10	.21**	.36**
Clear goals	.15*	.21**	.34**	.19**	.17*	.27**	.08	.18**	.23**
Unambiguous feedback	.25**	.26**	.26**	.34**	.23**	.28**	.12	.17*	.33**
Concentration on the task at hand	.33**	.35**	.32**	.29**	.37**	.41**	.18**	.22**	.48**
Time transformation	.12	.27**	.10	.11	.12	.21**	.01	.55**	.22**
Autotelic experience	.22**	.25**	.24**	.23**	.24**	.30**	.11	.22**	.52**
Game plan	.10	.27**	.27**	.16*	.23**	.25**	.02	.29**	.26**
Optimal arousal	.24**	.30**	.25**	.28**	.26**	.36**	.17*	.27**	.46**
Coaching style	.07	.14*	.01	.06	.06	.11	.11	.19**	.22**
Communication	.24**	.32**	.32**	.35**	.31**	.38**	.13	.30**	.42**
Confidence	.23**	.25**	.26**	.30**	.18**	.29**	.13	.12	.34**
Special occasion	.28**	.23**	.17*	.23**	.16*	.28**	.17*	.33**	.40**
Support	.21**	.27**	.30**	.31**	.25**	.32**	.12	.19**	.40**

Notes: Individual Flow Dimensions of the FSS-2: 1. challenge-skill balance; 2. merging of action and awareness; 3. clear goals; 4. Unambiguous feedback; 5.concentration on the task at hand; 6.sense of control; 7.loss of self-consciousness; 8.time transformation; 9. autotelic experience

*p<.05, **p<.01

When I examined the results pertaining to the dimensions of the TFSI and the FSS-2, there were 126 positive paired correlations, 21(17%) were not significant. 19(15%) were small, (*r* =. 15 to r = .17, p >.05; r = .18 to r = .19, *p*< .01); 84(66%) were medium and significant (r = .21 to .48, *p*<.01). Two correlations were large, (r = .52 and r = .55, p > .01). These results infer the adequate discriminant validity of the TFSI with reference to individual flow state. These results confirmed the theoretical hypothesis that the TFSI and FSS-2 measure two distinct and independent phenomena.

When I examined the results pertaining to the seven similar dimensions of individual flow and team flow, I found that correlations between the five dimensions of challenge-skill balance, merging of action and awareness, clear goals, unambiguous feedback, and concentration on the task at hand, were medium *(r* = .30 to r = .37 *p*< .01), inferring adequate discriminant validity. However, these correlations were higher than most correlations with other dimensions. The two dimensions of time transformation and autotelic experience were large*(*between *r* = .52 and *r* =.55; *p*< .01), suggesting that there might be some common basis for these dimensions in team flow and individual flow, but the values still fell below the threshold for considering the dimensions to be measuring the same construct in each case. Thus, the evidence supported discriminant validity between individual and team flow measures.

Only seven of the nine dimensions of individual flow proposed by Csikszentmihalyi's (1975, 1990) were included in the TFSI. The dimensions not included were loss of consciousness and sense of control. When examining the results pertaining to the correlations between loss of consciousness, and the TFSI dimensions, most of them were not significant or small (*r* = .15 to .17, *p*<0.05; *r* =.18 *p*<0.01). The second dimension, sense of control, had a positive medium correlation (*r* = .21 to .41, *p*< .01) with almost all team flow dimensions.

Discriminant Validity between Team Flow and Group Cohesion

Discriminant validity between team flow and group cohesion was examined by correlations between the TFSI and GEQ. The GEQ is a multidimensional instrument based on a conceptually-driven model of cohesiveness divided into two separate domains: individual and group social relations and individual and group task relations, thereby generating four dimensions. Summation of the four score dimensions comprised overall perception of group cohesion. The correlations between the dimensions of the TFSI and the GEQ are shown in Table 6.3.

Table 6.3

Correlations between the Team Flow State Inventory *and* Group Environment Questionnaire *Dimensions (n=174)*

Team Flow Dimensions	Individual Social	Individual Task	Group Social	Group Task
Challenge-skill balance	.26**	.17*	.21**	.27**
Merging action and awareness	.30**	.16*	.28**	.29**
Clear goals	.31**	.16*	.30**	.37**
Unambiguous feedback	.29**	.19**	.24**	.26**
Concentration on the task at hand	.31**	.20**	.25**	.30**
Time transformation	.20**	.09	.25**	.22**
Autotelic experience	.30**	.20**	.19**	.25**
Game plan	.30**	.25**	.32**	.40**
Optimal arousal	.32**	.21**	.21**	.29**
Coaching style	.19**	.17*	.11	.21**
Communication	.29**	.22**	.23**	.34**
Confidence	.29**	.16*	.21**	.30**
Special Occasion	.26**	.20**	.13	.18**
Support	.34**	.22**	.28**	.37**

*p<.05, **p<.01

I examined the results pertaining to the correlations between the 14 TFSI dimensions and the four GEQ dimensions. I found 56positive paired correlations. Three (5%) were not significant; 9(16%) were small (r = .16 to r = .17,p< .05; r = .18 to r = .19,p< .01); 44 (79%) were medium (r = .20 to r = .40, p< .01) No strong correlations were observed between dimensions of the TFSI and the GEQ.

The significant correlations with small to medium effect found between all of the dimensions of the TFSI and GEQ dimensions substantiate the conclusion supporting discriminant validity of the TFSI, inferring that the TFSI measures constructs that are distinct from task and social cohesion.

Discriminant Validity between Team Flow and Collective Efficacy

Discriminant validity between team flow and collective efficacy was examined by correlations between the TFSI and CEQS. The CEQS includes five interrelated factors: ability, effort, preparation, persistence, and unity. Collective efficacy refers to a "group's shared belief in its conjoint capability to organize and execute the courses of action required to produce given levels of attainment" (Bandura, 1997, p. 477). In sport, this has also been referred to as team efficacy or team confidence. Correlations between the dimensions of the TFSI and the CEQS are shown in Table 6.4.

Table 6.4

Correlations between the Team Flow State Inventory and Collective Efficacy Questionnaire for Sport Dimensions (n =250)

Team flow dimension	Effort	Ability	Preparation	Persistency	Unity
Challenge-skill balance	.54**	.56**	.53**	.46**	.43**
Merging action and awareness	.51**	.46**	.47**	.44**	.43**
Clear goals	.52**	.42**	.56**	.40**	.42**
Unambiguous feedback	.43**	.49**	.44**	.38**	.35**
Concentration	.53**	.48**	.48**	.42**	.42**
Time transformation	.31**	.29**	.32**	.26**	.24**
Autotelic experience	.50**	.43**	.42**	.36**	.36**
Game plan	.52**	.41**	.56**	.40**	.40**
Optimal arousal	.53**	.51**	.46**	.39**	.43**
Coaching style	.39**	.35**	.36**	.31**	.31**
Communication	.54**	.46**	.52**	.39**	.47**
Confidence	.59**	.61**	.57**	.49**	.45**
Special occasion	.31**	.28**	.29**	.21**	.24**
Support	.62**	.51**	.56**	.45**	.47**

*p<.05, **p<.01

The results pertaining to the correlations between the 14 TFSI dimensions and the five CEQS dimensions formed 70positive paired correlations. All correlations were positive and significant. There were no small effect size correlations; medium effect size was found for 50

(71.4%) correlations (r = .21 to r = .49, p< .01); large effect size was found for 20 (28.6%) correlations (r = .51 to r = .62, p< .01. The results showed variability in the correlations of the dimensions of the CEQS with the dimensions of the TFSI. Exploring the criterion validity of the TFSI in relation to the FFS-2, GEQ and CEQS, provided evidence supporting discriminant validity for the 14 dimensions of the TFSI from individual flow, team cohesion, and collective efficacy dimensions.

Discussion

This study used criterion validity procedures to assess the discriminant validity of the TFSI in relation to three theoretically-related constructs, namely individual flow, group cohesion, and team collective efficacy. The main goal was to determine whether team flow can be considered as an independent concept, theoretically different than the other three concepts. I used the Pearson's *r* Coefficient to test these relationships, and found that theTFSI showed very clear discriminant validity from the GEQ and FSS-2 and clear, but not as strong, discriminant validity from the CEQS, except for the confidence dimension of the TFSI and the ability dimension of the CEQS. Given that both these measures reflect group confidence, that correlation is not surprising. I observed one other, less obvious, strong correlation between the support dimension of the TFSI and the effort dimension of the CEQS.

Cosma (1999) and Lazarovitz (2003) used the FSS and DFS-2 as the foundation for their team flow scales (FSST and TDFS), by modifying the wording of items from individual to team perceptions. My findings did not support the claim for strong convergent validity between the FSS-2 and the TFSI. On the contrary, most effect sizes were weak, indicating discriminant validity. A closer look at the correlations between the seven similar individual flow and team flow dimensions included in the TFSI, showed discriminant validly for five dimensions, challenge-skill balance, merging of action and awareness, clear goals, unambiguous feedback, and concentration on the task at hand. The effect size of these

correlations was relatively higher than the other correlations, but still weak in absolute terms. The ties between these correlations may be attributed to the similar wording used to describe the content of each item in parallel dimensions by both the FSS-2 and the TFSI.

Exploring the effect size of correlations between the seven unique team flow dimensions of game plan, optimal arousal, coaching style, communication, confidence, special occasion, and support and the nine individual flow dimensions, discriminant validly can be inferred for all dimensions.

The findings of this criterion validity study, which focused on examining discriminant validity in relation to constructs that might be claimed to bear some conceptual similarity to team flow substantiated that team flow, at least in part, is a unique and differentiated concept from individual flow. These results indicated that individual flow measured by the FSS-2 and team flow measured by the TFSI referred to two different theoretical and practical flow models.I suggest that instead of assuming a framework of conceptual and dimensional similarity, further research should clarify the unique and shared relationships between individual flow and team flow.

The GEQ was the inventory that showed the most clear-cut discriminant validity in relation to the TFSI. The highest correlations were found between the dimensions of game plan and team clear goals and the group task dimensions of the GEQ. Medium correlations were found between the dimensions of team flow and individual social cohesion. These findings indicated that the TFSI reflects a team experience that was mostly connected to the task, rather than to social experiences. Unexpectedly, group and individual social dimensions of GEQ were more related to team flow dimensions than the individual task cohesion dimension. This interesting finding might further emphasize the difference between team tasks and the individual tasks that players might have within the team. For example, individuals might not be performing well, but could still indicate that the team is doing well,

or individuals may feel that the team is not in flow, but some individuals might be performing at their best.

The discriminant validity between the TFSI and CEQS was limited to only one third of the correlations. The three dimensions of the TFSI found to be discriminated from the CEQS were time transformation, coaching style, and special occasion. Convergent validity was found between the TFSI dimension of confidence and the CEQS dimension of ability, and the TFSI dimension of support and the CEQS dimension of effort. This finding suggests the presence of a mutual affect that includes collective efficacy and a belief in the team's ability to meet the challenge by investing the effort, as a necessary condition for team flow. Although one of the prerequisites to experiencing flow in teams is performing at the peak of one's abilities, support and confidence of team members, so that they can accomplish the task at hand may be equally important (Salaniva, Rodr'iguez - Sanchez, & Schaufeli, 2014). Team members who share perceptions of their collective efficacy may influence the perception of team challenges, according to team abilities, which can lead the team to experience collective flow (Bandura, 1997, 2001). It is also possible that a team reaching team flow could rely on this achievement as a source of future collective efficacy beliefs (Salaniva et al., 2014).

The medium effect correlations may be explained by measurement issues derived from the relatively similar rating scales used by both the TFSI and the CEQS. The TFSI was scored on a scale from 0 to 100 and the CEQS was scored on a scale from 0 to10. This was in contrast to the FSS-2 scored on a Likert scale from 1 to 7, and the GEQ scored on a Likert scale from 1to 9. Another possible explanation pertaining to the limited discriminant validity between the CEQS and the TFSI may be attributed to the observation that they are both sport specific measures. Although the FSS-2, based on Csikszentmihalyi's (1975)original flow model, was modified to fit athletes and sport contexts, it was not developed specifically for sport. Although the GEQ was designed to measure individuals' perception of intra-group

relations (or cohesion) for athletes, it includes characteristics that are not directly related to performance, such as how often team members party together. Therefore, the CEQS and TFSI were the scales that theoretically tested the most similar dimensions developed specifically for sport contexts.

Limitations

Since this study relied on the same sample used in Study 2, the studies shared common limitations regarding the participants and the context. The first limitation concerned the presence of possible influential variables embedded in the data collection conditions and research settings. Whereas the majority of the Israeli participants completed the questionnaires at their home field before a training session, participants from Australia completed the inventories during an academic class at university, and other participants completed the scales on line. Although all participants volunteered to take part in the study, familiarity with the task, comfort, and especially their motivation may have been different. Athletes completed the inventories using Qualtrics software on the internet, were able to do this in their own time, in the convenience of their computer's private location, with little or no human distractions. The Israeli athletes, who completed the task in their natural sport environment with my presence and encouragement, were interested in completing the task as soon as possible, in order to resume their preferred activity. Although I did my best to simplify the task, I was compelled to limit data collection given to each athlete to the demographic questionnaire, the TFSI and only one additional inventory. The Australian group, who completed the inventories during an academic class in sport psychology, in the presence of one of my supervisors, were more patient, paid more attention, focused on the instructions, had interest in the process, and filled out all the inventories with dedication and concentration. Lack of uniformity in the process of data collection and research settings may

have influenced the estimated effect of the criterion validity of the TFSI in relation to the FSS-2, GEQ, and CEQS.

Further Research

Future studies should examine the independence of team flow from related variables. The measures used in this study should be kept in replications because they are the measures most commonly used in research and practice. At the same time other measures of these variables should be considered and other group variables could be included. In addition future studies may examine whether the dimensions of the FSST correlate more highly than the FSS-2 with the TFSI dimensions.

Conclusion

In Study 4, I evaluated the criterion validity of the TFSI by assessing its discriminant validity compared to three inventories used to measure individual flow, group cohesion, and collective efficacy. The study supported theoretical and research-based predictions that team flow, although sharing worthwhile connections with individual flow, group cohesion, and collective efficacy, represents unique and independent phenomena requiring independent conceptualisation and distinct measurement tools. These initial findings need to be further examined in further research in order to provide a clearer indication of the implications of using the TFSI.

CHAPTER 7: GENERAL DISCUSSION

The main contribution of this thesis is in suggesting a new conceptualisation of team flow state as an independent concept and designing a valid and reliable inventory for measuring experiences of team flow state. The literature review reinforced the perception that the concept of team flow has not yet been fully recognized by the academic community, nor measured in a way that gives credence to team dynamics and specific team characteristics that influence team flow. Therefore, the goal of the first study was to develop a theoretical model of team flow based on narratives shared by team-sport athletes, coaches, and sport psychologists. I employed a phenomenological qualitative research design to collect and analyze interview data. The theoretical model designated team flow as a complex concept describing a collective phenomenon in which team members share the same psychological state, involving not only shared equivalents of individual aspects of flow, but also the confluence of inter-personal relations that are communicated among team members and the coaching staff, within a specific situation. The team flow state model that I proposed from the themes that emerged from the interview data includes 14 dimensions. Seven dimensions are similar to seven dimensions of individual flow from the Csikszentmihalyi (1975, 1990) model of flow, but experienced at a team level, and seven are new team flow dimensions.

In Study 2, I focused on creating the Team Flow State Inventory, based on the qualitative analysis of elite team-sport athletes', coaches', and sport psychologists' experiences of team flow, which were shared and analyzed in Study 1. The 14-dimension team flow model generated by this research included 32 first-order themes and 102 raw-data statements. These statements comprised the pool of items for the TFSI. Choosing the items was performed differently for the team flow dimensions that were similar to individual flow dimensions, and the new team flow dimensions. The wording of items for the seven dimensions that were similar to individual flow dimensions was based on the FSS-2, with

modification of the individual perspective to team perspective. The items for the seven new team flow dimensions were based on the axial coding data analysis used to identify statements that described the dimensions of team flow state. The items used to examine the 14 team flow dimensions were the basis for an inventory that may be used to measure team flow. Content and face validity of the 56-item TFSI was confirmed by five distinguished sport experts with knowledge and experience of flow research and psychometrics. A pilot study with team athletes assured the clarity and comprehensibility of the items and instructions for administration of the TFSI.

I designed the third study to explore the structure of the 56-item TFSI and its goodness of fit with the proposed theoretical model. I administered the TFSI to a large sample of team sport participants and performed a CFA to test the psychometric characteristics of the TFSI, its internal consistency reliability, and its latent structure. The fit of the proposed model was not acceptable. Based on psychometric results of the CFA and item-deleted alpha coefficient values, I omitted one item from each TFSI dimension, resulting in improvement in factor structure and internal consistency reliability for the 42-item TFSI. The TFSI represents a multi-dimensional construct, capable of measuring team flow state.

The goal of the fourth study was to examine the relationships between the TFSI and measures of individual flow (FSS-2), team cohesion (GEQ), and collective efficacy (CEQS), in particular, with reference to discriminant validity. A key issue to be clarified was whether the TFSI measured an independent construct. The results of Pearson's product-moment correlation coefficient (*r*) analyses to test these relationships indicated that the TFSI could be discriminated from the FSS-2, the GEQ, and the CEQS. The study supported theoretical and research-based predictions that team flow, although sharing connections with individual flow, is distinguishable as an experience at the group level. Although team flow shares group perception depicted by group cohesion and collective efficacy, team flow represents unique

and independent phenomena requiring independent conceptualisation and distinct measurement tools. These initial findings need to be further examined in further research in order to provide a clearer indication of the applied implications of administering the TFSI.

In the current thesis, I offer a new conceptualisation of team flow state as an optimal psychological state. In this state, team members perceive and are confident that their combined skills can meet the high challenges presented by intense team sport competitions, by performing without over thinking, while communicating effectively, supporting each other, and receiving constructive and positive feedback from team members and the coaching staff. When experiencing a team flow state, team members are concentrating totally on following the game plan and achieving their goals. This optimal state is more likely to occur on special occasions when team members are at their optimal arousal point. The experience is autotelic, that is, pleasurable for its own sake and, as a consequence, self-motivating, and is accompanied by the experience of time transformation. The coaching staff support and are involved, but do not interfere with the players' autonomy, allowing them to express their creativity and take responsibility for meeting challenges and fulfilling the team's tasks.

An important contribution of this study was describing team flow as an independent factor, with a recognized similarity to individual flow. An in-depth look at the distinctions between individual and team flow can be demonstrated within the challenge-skill balancedimension. Perception of balance between challenge and skills is experienced differently in individual and team flow. In individual flow, challenge-skill balance refers to the perceived balance between the challenge presented by a situation and individuals' ability to meet the challenge (Csikszentmihalyi, 1975, 1990; Jackson, 1996). When considered as a team, challenge-skill balance highlights team members' evaluation of the skills of their opponents as a team in comparison to their team's skills. This comparison leads the team as an entity to judge the level of challenge in the particular match. According to this assessment,

team members weigh their chances for overcoming the opposing team. The experience of team challenge is especially pronounced in matches that reflect a special occasion. These findings suggest that although the team and individual challenge-skills balance dimensions have similar content, when players consider this balance as a team, rather than individual performance, they focus on different attributes. Further exploration into the differential content attributed to team versus individual significance of each of the seven dimensions that are team equivalents of individual flow dimensions will add to the understanding of the similarity and distinction between experiences of individual and team flow.

Theory and Research

Interest in flow has grown substantially in sport psychology, alongside the mainstream development of positive psychology. Although numerous researchers have explored flow experiences in sports and other domains, since Csikszentmihalyi (1975) introduced the concept (e.g., Jackson & Wrigley, 2004; Kimiecik & Jackson, 2002), application of this knowledge to team flow has been limited. In this thesis, I have proposed that the missing piece in this body of research was a lack of differentiation between individual flow and team flow experiences. Synder and Lopez (2012) reflected this conclusion when they indicated that analysis of team flow should identify team flow qualities related to dimensions, dynamics, conditions, functions, and effects. I started to address this gap in conceptualisation and operationalization of the dimensions of team flow by offering a fresh and independent theoretical model of team flow that emerged from a phenomenological qualitative analysis of team flow experiences of athletes, coaches, and sport psychologists, and by developing an inventory to measure team flow state, based on the theoretical model.

Early studies on individual flow demonstrated the difficulties in describing and conceptualising the concept of flow, as with most subjectively experienced states. The research questions posed with reference to individual flow have included "what is the highest

(most fulfilling) experience you ever had in your life?" (Allen, Haupt, & Jones, 1964) or "discuss your greatest moment when participating in sport" (Ravizza, 1977). Jackson (1995) inquired about an exceptional experience, by asking athletes to "describe an experience that stood out as being better than average…where you were totally absorbed in what you were doing and that was very rewarding". Sugiyama and Inomata (2005) probed for a sense of total emersion, by asking athletes to recall "a competition experience in which you were completely absorbed in what you were doing". These investigations were based on the proposal that grasping what constitutes individual flow and describing the characteristics of flow depends on athletes' reports about what they experienced. Fixx (1977) claimed runners believed that non-runners could not imagine the states that runners reach. A degree of vagueness remains in the conceptualisation of individual flow. It is still unclear whether all the nine dimensions of individual flow suggested by Csikszentmihalyi (1975, 1990) need to be experienced to the same degree in order to experience flow, or whether some dimensions are more important than others. Along the same lines, researchers have not examined whether different patterns of intensity of dimensions might be associated with a different phenomenal experience of flow. For example, is a flow experience in which concentration is the dominant dimension subjectively different to one in which merging of action and awareness is most prominent? An additional ambiguity surrounds data on the frequency of flow experiences. Some researchers have suggested that peak moments are experienced once in a lifetime (Panzarella, 1980), whereas others have claimed they can be experienced quite often (Ravizza, 1984). These discrepancies may be a result of the way the research questions have been asked or because researchers have not asked enough of the right questions (Maslow, 1971; Panzarella, 1980; Wuthnow, 1978). The research on optimal experiences still relies mostly on participants' self-reports. Therefore, a major consideration is participants' ability to articulate and precisely describe their internal experiences of these states. Murphy (1977)

noted that: "Relatively few sports people have the language or philosophy to interpret altered states like these." (p. 21). An additional barrier to clarification of flow concepts has been the inconsistent terminology used by researchers in describing similar concepts. For example, some researchers have used the term peak experience interchangeably with the term flow to describe the same optimal experience (Mcinman & Grove, 1991). This lack of clarity hinders conclusions regarding basic questions concerning the essential characteristics of flow and it has been carried over to the conceptualization of team flow. To describe flow in groups or teams, researchers have used a number of different terms, including collective flow (e.g., Quinn, 2005), shared flow (e.g., Csikszentmihalyi & Csikszentmihalyi 1988), social flow (e.g., Walker, 2011), and team flow (Cosma, 1999).

To date, most of the research on team flow has been based on the conceptualization of flow state at the individual level, disregarding the unique contributions of team processes and outcomes. The first study on team flow in a soccer team was conducted by Cosma (1999), who administered the FSST, which was a version of the FSS-2 modified to refer to teams. Although published research on team flow is limited (Heyne, Pavlas, & Salas, 2011), I was able to locate three unpublished doctoral dissertations written on team flow in the sport domain, and a few studies in adjacent fields done by Quinn (2005) in the workplace, by Csikszentmihalyi and Csikszentmihalyi (1988) on shared flow and by Walker (2011) on social flow. In light of this situation, I explored a new conceptualization of team flow states in sport, as an independent construct whose dimensions need to be identified by research.

The Team Flow Model

The TFSI developed in this research includes 14 dimensions that belong to two main general dimensions. The first general dimension includes the seven dimensions of team flow that were similar to individual flow dimensions, that is, these dimensions focus on similar flow characteristics, but from a team perspective. These team flow dimensions were

challenge-skill balance, merging of action and awareness, clear goals, unambiguous feedback, concentration on the task at hand, autotelic experience, and time transformation. The second main general dimension includes seven new team flow dimensions identified in Study 1 as game plan, team optimal arousal, coaching style, team communication, team confidence, special occasion, and team support. In the current model, two individual dimensions from Csikszentmihalyi's (1975, 1990) flow model were not included as team flow dimensions, namely loss of self-consciousness and sense of control. This was because they did not emerge from the qualitative data analysis in Study 1.

Further development of the theoretical model for team flow should focus on identifying the qualitative differences between the dynamics of individual flow and team flow. Van Zomeren, Postmes, and Spears (2008) offered a relatively new perspective for understanding differences between individuals and groups that focuses on investigating social identity in collective action. They proposed that when individuals identify with a group, they are not relating to other members as unique individuals, but as anonymous members of the same social category, who share the prototypical beliefs, practices, and values of the group (Whitehouse & Lanman, 2014). Based on this point of view, social identification may influence individuals' tendency to identify with a collective ego (Ashmore, Deaux, & McLaughlin-Volpe, 2004; Van Bavel & Cunningham, 2012). This leads individuals who are part of a group to share prototypical features that are not essential to their individual personal identities (Gómez, Brooks, Buhrmester, Vázquez, Jetten, & Swann, 2011). This perspective may explain why individuals who are in a team flow state were not focused on loss of self-conciseness or control, but identified with their collective consciousness of being part of a group.

The findings in the current study are a first step in a new conceptualisation of team flow. As such, the findings require further confirmation. For example, despite the substantial

range of dimensions that emerged, it is not certain that participants in Study 1 covered all possible dimensions of team flow. Even though experts supported the content validity of the TFSI, their own conceptualization of the universe of team flow dimensions was limited by the absence of a frame of reference. There was no existing model of team flow outside the nine-dimension individual flow model. Thus, rather than examining whether the team flow model underlying the TFSI covered the universe of team flow dimensions in a balanced way, those experts had to judge whether each dimension proposed seemed to be plausible. The experts could only have speculated about the existence of other dimensions not included in the model. Further research should be performed to substantiate the inclusiveness of the current team flow model. Further research on team flow can also profit from exploring the impact of contradictory concepts that function to disrupt flow. One such concept is "anti-flow", a de-motivational state characterized by tedium, and lack of autonomy and control (Sorrentino, Szeto, Nezlek, Yasunaga, Kouhara, & Ohtsubo, 2008). Another is team collapse described as, "a crisis which occurs when a majority of the players in a team suddenly perform below expected level in a match of great, often decisive, importance" (Apitzsch, 2009, p. 35). In team collapse, similar to team flow, all or most of the players are involved, resulting in a social phenomenon that is characterized by mutual dependency. These disruptive factors can enhance understanding of the impact team dynamics have on the barriers and obstacles associated with team flow states.

Further Development of the Team Flow State Inventory

Although the TFSI has been shown to demonstrate conceptual integrity, good psychometric properties, and an acceptable model fit, the TFSI is in the early stages of development, so continued investigation of the factor structure, reliability, and validity of the measure in a wide variety of team contexts will be beneficial. A major aspect in maintaining and improving the quality of any psychological measure is the developer's commitment to the

process of refinement and re-evaluation (DeVellis, 2003). Refinement of the TFSI may include probing for additional dimensions of team flow. This may be done by the use of Delphi methodology, whereby participants are asked to suggest and rank a bank of dimensions of team flow. Contrasting and comparing these dimensions with the TFSI dimensions would further confirm its content validity. Re-evaluation will also be illuminating to examine usefulness of the TFSI in a variety of populations that engage in a range of team sport domains, with athletes from diverse levels of experience and ability, who belong to distinctive clubs and leagues.

A productive area for further exploration is that some degree of overlap was found between the TFSI and CEQS. Although this may be explained by the relatively similar rating scales used by both measures, it may also reflect mutual beliefs and social cognitions that underlie the two inventories, collective efficacy and team flow state. According to Social Cognitive Theory (Bandura, 1997, 2001), people who share beliefs in their collective power to produce the desired results (collective efficacy beliefs) may influence the way group members perceive challenges, and this may in turn lead people in groups to experience collective flow. Further evidence for this relationship may be found in considering the prerequisites to experience flow in teams and performing at the peak of one's abilities, based on the belief of team members that they can accomplish the task at hand. Salaniva et al. (2014) proposed that attainment of team flow could be a source of future collective efficacy beliefs. Despite this rationale, little is currently known about the role of collective efficacy beliefs in increasing the likelihood of the team flow experience and, in turn, the reciprocal effect, that is the role of collective flow in increasing collective efficacy beliefs over time. Additional studies investigating the correlations, effects, and relationships between these concepts could be beneficial for designing interventions to enhance collective efficacy and team flow.

Further Research

Conceptualization of team flow state warrants further consideration in light of the complex characteristics of the experience of team flow. Flow theory and research has mainly focused upon the subjective internal experiences of individual athletes (Csikszentmihalyi, 1990; Salanova, Rodríguez-Sánchez, Schaufeli, & Cifre, 2014), using qualitative research to access rich accounts of experiences (Knapik, 2006).These reports were useful in determining the consistency and variation of athletes' description of the flow experience within the context of the dimensional model of flow espoused by Csikszentmihalyi (Jackson, 2011). The results of Study 1, confirmed athletes and sport experts ability to describe team flow state situations from a team perspective, by providing rich and meaningful accounts of their team flow experiences. It seems that some dimensions might be easier to feel, express, and recall during team flow than others. The idiosyncratic nature of qualitative research raises concerns regarding the possibility for generalization. Further research should be sensitive to factors that may have an impact on respondents' ability to describe team flow dimensions. For example, athletes remember the challenge of playing against a higher positioned opponent, but may not recall the sense of time transformation they experienced during team flow. Contextual factors may also affect athletes' ability to report accurately on team flow experiences. For example, a player who was a team member, but was not actively participating in the specific match, might provide a significantly different response to the dimensions of team flow than a key player who was active in that specific match. Raising critical questions regarding the selectivity and omitted data during data collection, interpretation, and analysis will further elaborate and contribute to the description of team flow.

Team flow has been described as a state of optimal experience involving a team's total absorption in a task, as well as a state of consciousness that optimizes performance (Cosma, 1999). However the directionality of this relationship has not been determined. This issue was

raised concerning Lazarovitz's (2003) study on the relationship between group cohesion and flow using the TDFS. Lazarovitz assumed that group cohesion sets the context for flow to occur and that high team cohesion might function as a buffer for team flow by the development of antecedents of team flow that intensify flow and enhance performance. The stipulation regarding the relationship between team flow and performance could not be confirmed because team flow state and performance were measured simultaneously at the end of the game. In this situation, players may have been influenced by their performance outcome when indicating retrospectively whether the team had been in flow.

Another challenge related to team flow involves capturing the intensity of the experience. Measures of team flow have been administered retrospectively, often after a substantial period of time. This was also true for Study 1, when participants reported on a team flow experience that occurred up to three months before the interview. Generally, researchers should be cautious when interpreting retrospective measures, due to the lack of clarity about the influence of directionality of the relationship between team flow state and performance. The question that needs to be further explored is the extent to which the retrospective report of team flow experiences captures the multifaceted experience of team flow in its variety and intensity. I suggest that in order to follow the development of team flow experiences, collecting empirical evidence during the team flow experience by pacing physiological parameters, such as heart rate, oxygenation, or endorphin levels, could be compared to athletes results regarding the completion of the TFSI.

Many questions regarding team flow still remain open. For example, how often do teams experience a state of team flow? Is experiencing team flow more frequent during training or competitions? Are certain types of teams more prone to experiencing team flow than others? Does a team need to experience all the team flow dimensions to experience team flow? What is the optimal intensity required for each dimension under various personal and

situational conditions? Do all teams experience team flow in the same way? What interventions are beneficial for experiencing team flow? Is team flow controllable? Is there a particular coaching style that is positively correlated with experiencing team flow? Answers to these and additional questions require empirical studies that will be able to follow the development of team flow, in a variety of sport fields, during competition, practice, and training.

When I completed my initial study of team flow in my Master's thesis (Mosek, 2009), the question I raised for doctoral research was whether team flow affects performance. In my initial discussion with my supervisor, we agreed that it was necessary to refine the definition and measurement of team flow before studying the relationship between team flow and performance. Thus, I focused on the conceptualization and operationalization of team flow in the present thesis. I still consider that a key research direction is to determine whether team flow affects team performance. Once the TFSI has been refined through further studies of its validity and reliability, research that uses the TFSI to examine the relationship between team flow and team performance should be a priority. This should include studies of the use of various kinds of intervention to enhance aspects of team flow. The impact changes in global team flow and specific team flow dimensions has on performance can be examined using structural equation modeling in these intervention studies. Such evidence will be valuable for practitioners, providing directions for sport psychologists to enhance team flow and performance in team sports.

Implications for Practice

This thesis is part of the current trend in psychological research, which signifies a move from illness and problems to positive psychology and strength, by focusing on achievements defined as peak performance, peak experiences, peak moments, and flow (Ryan & Deci, 2011; Seligman & Csikszentmihalyi, 2000).The research findings derived from this thesis

have implications for athletes in team sports, coaches, and sport psychologists interested in enhancing experiences of team flow. Exposure to the new conceptualization offered by this thesis, contributes a new perception of team flow by raising awareness to team flow dimensions that are an integral part of the experience of team flow. The new conceptualisation of team flow has created the opportunity to define, describe, and measure team flow state. This conceptualisation offers sport psychologists, coaches, and athletes a shared understanding and common terminology that can stimulate reflections and conversations of their team flow experiences. These conversations may raise athletes' awareness regarding the important role played by each team flow dimension, and help them clarify their perception of the team's situation to their team members, coaches, and sport psychologists. This might support a better understanding and communication of athletes' needs, which should enable teams to work on the development of specific interventions for enhancing team flow. Acquiring a common language that may be shared by team members, coaches, and sport psychologists may increase the possibility for reaching team flow state.

From a practical point of view, the question of whether team flow may be controllable is a critical issue. Administering the TFSI and examining results before, during, and after an intervention can provide a valuable tool for following and understanding the team's flow experiences over time. Interventions to enhance flow and performance were investigated in relation to individual flow. This body of research focused on concepts of focus, thoughts and/or emotions as facilitators, preventers, and disrupters of flow (Swann, Keegan, Piggott, & Crust, 2012). The findings from Study 4 show that individual and team flow are independent concepts and, therefore, intervention effects for one cannot be generalized to the other. The development of effective interventions for enhancing team flow will require consideration of team dynamics and the new team flow dimensions, as a foundation for shaping effective interventions. For example, if the dimension of following the game plan is low among most or

all of the athletes in the team, the coaching staff should evaluate if the athletes understand the game plan, if they are able to follow it, and if they believe the game plan is valuable to the team. By studying aspects of team flow among team members, perhaps different , more meaningful, and more effective game plans can be developed with consideration of the athletes' opinions and capabilities, leading to greater athlete cooperation with the coach and with each other.

The TFSI can be used by applied sport psychologists to measure team flow, allowing sport psychologist and coaches to know not only what global team flow level their team has, but also what dimensions of team flow are stronger and weaker, so appropriate steps can be taken to enhance team flow. Further, the TFSI can be used to monitor team flow over time by regular administration, so the effects of interventions can be evaluated.

The seven dimensions of team flow that have not been reported before appear to lie at the heart of the concept of team flow and provide athletes and coaches, supported by sport psychologist, to address these dimensions in fresh ways that should enhance team flow and, as a consequence, have an impact on performance.

Interest in enhancing team flow and performance is shared by a large part of the world population that spends its leisure time as spectators and supporters of their team, constantly following its achievements. For some athletes, developing a sport career entails intensive dedication of time and resources in order to achieve recognition. Therefore, enhancing teams' achievements by reaching optimal performance through team flow is a concern for many interested parties including stakeholders. Elite sport organizations must work with stakeholders in the external environment that include media, sponsors, politicians, spectators, club members, coaching staff, and sport psychologists to achieve immediate successful outcomes, often at great cost. A contribution of this thesis toward meeting these expectations is the greater understanding of how teams work and what factors influence effective

functions. Further clarification and elaboration of team flow would be achieved by focusing on two tasks. The first task is sharing the results of the current study with members of the sport research community by publishing and presenting this work in professional journals and conferences. Creating dialogues and offering additional researchers an opportunity to join this quest, will assist in validating the phenomena of team flow as an independent concept with links to individual flow. Sport researchers examining team flow should link up with researchers leading related developments in other spheres of life, such as the workplace and creative sciences, in order to identify the unique characteristics of successful teamwork and its interaction with the phenomena of team flow. The second task is based on acknowledging that sport psychology is essentially an applied field, so, in order to implement the contribution of research findings to practice, practitioners as well as researchers, should be invited to join in exploring the evidence regarding the important role team flow state can play in achieving optimal performance.

Concluding Remarks

In this thesis, I took a fresh look at the concept of team flow, without assuming that team flow comprises the same dimensions as individual flow and without relying only on the available measures of individual flow as the foundation for team flow. This led to the development of a new conceptualisation of team flow state and the initial version of an inventory, the TFSI, for measuring its occurrence and intensity. Further research is required to refine and re-evaluate the TFSI with reference to its validity and reliability. Generalization of the results will be increased by including samples that represent various team sport domains, different skill levels, and diverse social and cultural groups. The TFSI can provide sport psychologists and coaches with a tool for understanding their team's strengths and weaknesses, and the obstacles the team must overcome in reaching and maintaining a high level of team flow state. This recognition may open the way for the development of specific

interventions for enhancing teams' capabilities to reach, maintain, and enhance the occurrence of team flow. I hope that researchers and practitioners will study team flow more vigorously, and that the TFSI, as it is refined, will be a useful instrument in research and applied work. Experiencing team flow may in turn provide athletes with additional motivation and exceptional moments of enjoyment and pleasure.

References

Abbott, J. A. (2000). ‘Blinking out and having the touch’: Two fifth-grade boys talk about flow experiences in writing. *Written Communication, 17*(1), 53–92. https://doi.org/10.1177/0741088300017001003

Aherne, C., Moran, A. P., & Lonsdale, C. (2011). The effect of mindfulness training on athletes’ flow: An initial investigation. *Sport Psychologist, 25*(2), 177-189. https://doi.org/10.1123/tsp.25.2.177

Alla, J. B., & Ajibua, M. A. (2012).Achieving "flow" state in sport through periodization of training programme. *International Journal of Sports Sciences and Fitness, 2*(2), 315-328.

Allen, R. M., Haupt, T. D., & Jones, W. (1964).An analysis of peak experiences reported by college students. *Journal of Clinical Psychology, 20*(2), 207-212. httpho://dx.doi.org/10.1002/1097-4679

Allison, M. T., & Duncan, M. C. (1987). Women, work, and leisure: The days of our lives. *Leisure Sciences, 9*(3), 143-161. https://doi.org/10.1080/01490408709512156

Alma, M. R., Schaufelib, W., Salanovaa, M., Cifrea, E., & Sonnenscheinb, M. (2011). Enjoyment and absorption: An electronic diary study on daily flow patterns. *Work & Stress, 25*(1), 75-92. https://doi.org/10.1080/02678373.2011.565619

Amorose, A. J., & Nolan-Sellers, W. (2016).Testing the moderating effect of the perceived importance of the coach on the relationship between perceived coaching feedback and athletes’ perceptions of competence. *International Journal of Sports Science & Coaching, 11*(6), 789–798. https://doi.org/10.1177/1747954116676105

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411–423. https://doi.org/10.1037/0033-2909.103.3.411

Andrews, L., Russell-Bennett, R., & Drennan, J. (2011).Capturing affective experiences using the SMS Experience Sampling (SMS-ES) method. *International Journal of Market Research, 53*(4), 479-506. https://doi.org/10.2501/IJMR-53-4-479-506

Apitzsch, E. (2009). A case study of collapsing handball team.In S. Jern, & J. Näslund (Eds.).*Dynamics within and outside the lab: Proceedings from the 6th Nordic Conference on Group and Social Psychology*, (pp 35-52). Sweden: Lund University.

Arch, J., & Craske, M. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy, 44*(12), 1849-1858. http://dx.doi.org/10.1016/j.brat.2005.12.007

Asakawa, K. (2004). Flow experience and autotelic personality in Japanese college students: How do they experience challenges in daily life? *Journal of Happiness Studies, 5*(2), 123–154. https://doi.org/10.1023/B:JOHS.0000035915.97836.89

Asakawa, K. (2010). Flow experience, culture, and well-being: How do autotelic Japanese college students feel, behave, and think in their daily lives? *Journal of Happiness Studies, 11*(2), 205–223. https://doi.org/10.1007/s10902-008-9132-3

Ashmore, R. D., Deaux, K., & McLaughlin-Volpe, T. (2004). An organizing framework for collective identity: Articulation and significance of multidimensionality. *Psychological Bulletin, 130*(1), 80–114. https://doi.org/10.1037/0033-2909.130.1.80

Babbie, E. R. (2015). *The practice of social research*. Boston, MA: Cengage Learning.

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006).Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27- 45. https://doi.org/10.1177/1073191105283504

Bakker, A. B. (2005). Flow among music teachers and their students: The crossover of peak experiences. *Journal of Vocational Behavior, 66*(1), 26-44. https://doi.org/10.1016/j.jvb.2003.11.001

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology, 22*(3), 309–328. https://doi.org/10.1108/02683940710733115

Bakker, A. B., Oerlemans, W., Demerouti, E., Slot, B. B., & Karamat, A. D. (2011). Flow and performance: A study among talented Dutch soccer players. *Psychology of Sport and Exercise, 12*(4), 442–450. http://dx.doi.org/10.1016/j.psychsport.2011.02.003

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*(2), 122-147. https://doi.org/10.1037/0003-066X.37.2.122

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Bandura, A. (2001). Guide for constructing self-efficacy scales. In F., Pajares & T., Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307-338). Greenwich, Connecticut: Information Age Publishing.

Barczak, G., Lassk, F., & Mulki, J. (2010). Antecedents of team creativity: An examination of team emotional intelligence, team trust and collaborative culture. *Creativity and Innovation Management, 19*(4), 332-346. https://doi.org/10.1111/j.1467-8691.2010.00574.x

Bargh, J. A, Schwader, K. L, Hailey, S. E., Dyer, R. L., & Boothby, E. J. (2012).Automaticity in social-cognitive processes. *Trends in Cognitive Science*, *16*(12), 593-605. https://doi.org/10.1016/j.tics.2012.10.002

Barker, J. B., & Jones, M. V. (2005). Using hypnosis to increase self-efficacy: A case study in elite judo. *Sport and Exercise Psychology Review, 1*(1), 36-42.

Barker, J. B., & Jones, M. V. (2006). Using hypnosis, technique refinement and self-modeling to enhance self-efficacy: A case study in cricket. *Sport Psychologist, 20*(1), 94-110. http://dx.doi.org/10.1123/tsp.20.1.94

Bavelas, J. B., Black, A., Lemery, C. R., & Mullett, J. (1987). Motor mimicry as primitive empathy. In N. Eisenberg, & J. Strayer (Eds.), *Empathy and its development* (pp. 317-338). New York, NY: Cambridge University Press.

Bianco, T., &Eklund, R. C. (2001). Conceptual considerations for social support research in sport and exercise psychology: The instance of sport injury. *Journal of Sport & Exercise Psychology, 23*(2), 85-107. https://doi.org/10.1123/jsep.23.2.85

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology, 54*(1), 576-616. https://doi.org/10.1146/annurev.psych.54.101601.145030

Bonaiuto, M., Mao, Y., Roberts, S., Psalti, A., Ariccio, S., Cancellieri, U., & Csikszentmihalyi, M. (2016). Optimal experience and personal growth: Flow and the consolidation of place identity. *Frontiers in Psychology, 7*, 1654. https://doi.org/10.3389/fpsyg.2016.01654

Braun, V., & Clarke, V. (2006).Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Brawley, L. R., Widmeyer, W. N., & Carron, A. V. (1987). Exploring the relationship between cohesion and group resistance to disruption. *Journal of Sport and Exercise Psychology, 10*(2), 199-213. http://dx.doi.org/10.1123/jsep.10.2.199

Briegel-Jones, R. M. H., Knowles, Z., Eubank, M. R., Giannoulatos, K., & Elliot, D. (2013).A preliminary investigation into the effect of yoga practice on mindfulness and flow in elite youth swimmers. *Sport Psychologist, 27*(4), 349-360. http://dx.doi.org/10.1123/tsp.27.4.349

Britten, N. (1995). Qualitative interviews in medical research. *British Medical Journal Clinical Research, 311*(6999), 251-253.

Brown, J. D. (1996). *Testing in language programs.* Upper Saddle River, NJ: Prentice Hall Regents.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York, NY: Guilford.

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). New York, NY: Guilford.

Brocki, J. M., & Wearden, A. J. (2006).A critical evaluation of the use of interpretative phenomenological analysis (IPA) in health psychology. *Psychology & Health, 21*(1), 87-108.
https://doi.org/10.1080/14768320500230185

Burnes, B., & O'Donnell, H. (2011). What can business leaders learn from sport? *Sport, Business and Management: An International Journal,1*(1), 12-27.
https://dx.doi.org/10.1108/20426781111107144

Burton, D., & Raedeke, T. D. (2008).*Sport psychology for coaches.* Champaign, IL: Human Kinetics.

Bushanik, T.L. (2011). Visual analog scale. In J. S. Kreuter, J. Deluca, & D., (Eds.), *Encyclopedia of Clinical and Neuropsychology,* (p. 2626). New York, NY: Springer.

Buss, D. M. (2000). The evolution of happiness. *American Psychologist, 55*(1), 15-23.
https://doi.org/10.1037/0003-066X.55.1.15

Cannon-Bowers, J. A., & Bowers, C. (2006). Applying work team results to sports teams: Opportunities and cautions. *International Journal of Sport and Exercise Psychology, 4*(4), 447-462.
https://doi.org/10.1080/1612197X.2006.9671807

Cathcart, S., McGregor, M., & Groundwater, E. (2014). Mindfulness and flow in elite athletes. *Journal of Clinical Sport Psychology, 8*(2), 119-141.
https://doi.org/10.1123/jcsp.2014-0018

Cattell, R. B. (1978). *The scientific use of factor analysis.* New York, NY: Plenum

Carlstedt, R. A. (2004). *Critical moments during competition: A mind-body model of sport performance when it counts the most*. New York, NY: Psychological Press.

Carron, A. V., Brawley, L., & Widmeyer, W. N. (1998). The measurement of cohesiveness in sport groups. In J. Duda, (Ed.), *Advances in sport and exercise psychology measurement* (pp. 213-226). Morgantown, WV: Fitness Information Technology.

Carron, A. V., Hausenblas, H. A., & Eys, M. H. (2005). *Group Dynamics in Sport* (3rd ed.). Morgantown, WV: Fitness Information Technology.

Carron, A. V., & Ramsay, M. C. (1994). Internal consistency of the Group Environment Questionnaire modified for university residence settings. *Perceptual and motor skills*, 79(1), 141-142.

Carron, A. V., Widmeyer, W. N., & Brawley, L. R. (1985). The development of an instrument to assess cohesion in sport teams: The Group Environment Questionnaire. *Journal of Sport Psychology, 7*(3), 244-266. https://doi.org/10.1123/jsp.7.3.244

Carver, C. S. (1989). How should multifaceted constructs be tested? Issues illustrated by self-monitoring, attributional style, and hardiness. *Journal of Personality and Social Psychology, 56*(4), 577-585.

Cayoun, B. A. (2011). *Mindfulness-integrated CBT: Principles and practice*. Malden, MA: Willey-Blackwell.

Chavez, E. J. (2008). Flow in sport: A study of college athletes. *Imagination, Cognition and Personality, 28*(1), 69-91. https://doi.org/10.2190/IC.28.1.f

Chelladurai, P. (1993). Leadership. In R.N. Singer, M. Murphey & L.K. Tennant (Eds.), *Handbook of research on sport psychology* (pp. 647–671). New York, NY: Macmillan.

Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7*(3), 309-319. https://doi.org/10.1037/1040-3590.7.3.309

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates

Coleman, J. C., & Hendry, L. (1990).*The nature of adolescence*. (2nd ed.). New York, NY: Routledge.

Cosma, J. B. (1999). *Flow in teams* (Unpublished doctoral dissertation). Chicago School of Professional Psychology, Chicago, IL.

Crawford, H. J., & Gruzelier, J. H. (1992). A midstream view of the neuropsychophysiology of hypnosis: Recent research and future directions. In W. Fromm & M. R. Nash (Eds.), *Contemporary hypnosis research* (pp. 227-266). Ney York, NY: Guilford Press.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52,* 281-302. https://doi.org/10.1037/h0040957

Chenail, R. J. (2011). Interviewing the investigator: Strategies for addressing instrumentation and researcher bias concerns in qualitative research. *The Qualitative Report, 16*(1), 255–262. Retrieved from http://nsuworks.nova.edu/tqr/vol16/iss1/16

Csikszentmihalyi, M. (1975).*Beyond boredom and anxiety*. San Francisco, CA: Josey Bass.

Csikszentmihalyi, M. (1978). Attention and holistic approach to behavior. In K. S. Pope & J. L. Singer (Eds.), *The stream of consciousness* (pp. 335–358). New York, NY: Plenum.

Csikszentmihalyi, M. (1982).Learning, flow, and happiness.In R. Gross (Ed.), *Invitation to life-long learning* (pp. 167-187). New York, NY: Fowlett.

Csikszentmihalyi, M. (1988). Motivation and creativity: Toward a synthesis of structural and energistic approaches to cognition. *New Ideas in Psychology, 6*(2), 159–176. https://doi.org/10.1016/0732-118X(88)90001-3

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experienc*e. New York, NY: Harper & Row.

Csikszentmihalyi, M. (1992).A response to the Kimiecik & Stein and Jackson papers. *Journal of Applied Sport Psychology,4*(2), 181–183. http://dx.doi.org/10.1080/10413209208406460

Csikzentmihalyi, M. (1997*).*Happiness and creativity: Going with the flow. *Futurist, 31*(5), 8-13.

Csikszentmihalyi, M. (2000).*Beyond boredom and anxiety* (25th Anniversary ed.). San Francisco, CA: Jossey-Bass.

Csikszentmihalyi, M. (2002). *Flow: The psychology of optimal experience* (2nd ed.). New York, NY: Harper & Row.

Csikszentmihalyi, M. (2014). *Applications of flow in human development and education: The collected works of Mihaly Csikszentmihalyi*. Dordrecht, NL: Springer.

Csikszentmihalyi, M., & Csikszentmihalyi, I. (1988). *Optimal experience: Psychological studies of flow in consciousness*. New York, NY: Cambridge University Press. https://doi.org/10.1017/CBO9780511621956

Csikszentmihalyi, M., & Larson, R. (1987). Validity and reliability of the experience sampling method. *The Journal of Nervous and Mental Disease, 175*(9), 526–536. https://doi.org/10.1097/00005053-198709000-00004

Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal Experience in Work and Leisure. *Journal of Personality and Social Psychology*, *56*(5), 815-822. https://doi.org/10.1037/0022-3514.56.5.815

Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1993). *Talented teenagers: The roots of success and failure*. New York, NY: Cambridge University Press.

Culbertson, S. S., Fullagar, C. J., Simmons, M. J., & Zhu, M. (2015). Contagious flow: Antecedents and consequences of optimal experience in the classroom. *Journal of Management Education, 39*(3), 319-349. https://doi.org/10.1177/1052562914545336

Davis, R. E., Couper, M. P., Janz, N. K., Caldwell, C. H., & Resnicow, K. (2010). Interviewer effects in public health surveys. Health Educational Research, 25(1), 14-26. https://doi.org/10.1093/her/cyp046

DeLeeuw, E. D. (1992). *Data quality in mail, telephone and face to face surveys*. Amsterdam, NL: TT-Publikaties.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination theory in human behavior*. New York, NY: Plenum. https://doi.org/10.1007/978-1-4899-2271-7

Delespaul, A. E. G. (1995). *Assessing Schizophrenia in daily life: The experience sampling method*. Maastricht, NL: Maastricht University Press.

DeVellis, R. F. (2003). *Scale development: Theory and applications* (2nd ed.). Thousand Oaks, CA: Sage.

Doganis, G., Iosifidou, P., & Vlachopoulos, S.(2000). Factor structure and internal consistency of the Greek version of the Flow State Scale. *Perceptual and Motor Skills, 91*(3), 1231-1240. https://doi.org/10.2466/pms.2000.91.3f.1231

Drew, W., & Rosenthal, R. (2003). Quantifying construct validity: Two simple measures. *Journal of Personality and Social Psychology, 84*(3), 608-618. https://doi.org/10.1037/0022-3514.84.3.608

Eccles, D. W., & Tenenbaum, G. (2004). Why an expert team is more than a team of experts: A social-cognitive conceptualisation of team coordination and communication in sport. *Journal of Sport and Exercise Psychology, 26*(4), 542-560. https://doi.org/10.1123/jsep.26.4.542

Edgett, J. H., & Rowan, T., (2003). *Wining the mind game: Using hypnosis in sport psychology*. Carmarthen, Wales: Crown House Publishing.

Edwards, C., & Edwards, A. (2012). Peak communication experiences and its relations with positive socio-psychological concepts and communication competence: A factor analysis study. In *International Conference on Communication, Media, Technology and Design*. Istanbul, Turkey.

Egbert, J. (2003). A study of flow theory in the foreign language classroom. *The Modern Language Journal, 87*(4), 499-518. https://doi.org/10.1111/1540-4781.00204

Elbe, A. M., Strahler, K., Krustrup, P., Wikman, J., & Stelter, R. (2010). Experiencing flow in different types of physical activity intervention programs: Three randomized studies. *Scandinavian Journal of Medicine and Science in Sports, 20*(1), *111–117.* https://doi.org/10.1111/j.1600-0838.2010.01112.x

Elkins, G. R., Barabasz, A. F., Council, J. R., & Spiegel, D. (2015).Advancing research and practice: The revised Division 30 definition of hypnosis. *International Journal of Clinical and Experimental Hypnosis, 63*(1), 1–9. https://doi.org/10.1080/00207144.2014.961870

Engeser, S., & Baumann, N. (2016).Fluctuation of flow and affect in everyday life: A second look at the paradox of work. *Journal of Happiness Studies, 17*(1), 105-124. https://doi.org/10.1007/s10902-014-9586-4

Engeser, S., & Rheinberg, F. (2008). Flow, performance and moderators of challenge-skill balance. *Motivation and Emotion, 32*(3), 158–172. https://doi.org/10.1007/s11031-008-9102-4

Engeser, S., & Schiepe-Tiska, A. (2012). Historical lines and an overview of current research on flow. In S. Engeser (Ed.), *Advances in flow research (*pp. 1-22). New York: Springer. https://doi.org/10.1007/978-1-4614-2359-1_1

Eys, M. A., Carron, A. V., Bray, S. R., & Brawley, L. R. (2007). Item wording and internal consistency of a measure of cohesion: The Group Environment Questionnaire. *Journal of Sport and Exercise Psychology, 29*(3), 393-402. https://doi.org/10.1123/jsep.29.3.395

Fabrigar, L. R., & Wegener, D. T. (2011). *Exploratory Factor Analysis*. Oxford : Oxford University Press. https://doi.org/10.1093/acprof:osobl/9780199734177.001.0001

Fadyl, J. K., & Nicholls, D. A. (2013). Foucault, the subject and the research interview: A critique of methods. *Nursing Inquiry, 20*(1), 23-29. https://doi.org/10.1111/nin.12011

Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. P. (2007). Mindfulness and emotion regulation: The development and initial validation of the Cognitive and Affective Mindfulness Scale Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment, 29*(3), 177-190. https://doi.org/10.1007/s10862-006-9035-8

Feltz, D. L., & Lirgg, C. D. (1998). Perceived team and player efficacy in hockey. *Journal of Applied Psychology, 83*(4), 557–564. https://doi.org/10.1037/0021-9010.83.4.557

Filho, E., Gershgoren, L., Basevitch, I., Schinke, R., & Tenenbaum, G. (2014). Peer leadership and shared mental models in a college volleyball team: A season long case study. *Journal of Clinical Sport Psychology, 8*(2), 184-203. https://doi.org/10.1123/jcsp.2014-0021

Fiore, S. M., Salas, E., & Cannon-Bowers, J. A. (2001). Group dynamics and shared mental model development. In M. London, (Ed.), *How People Evaluate Others in Organizations* (309-336). New Jersey, NJ: Lawrence Erlbaum, Mahwah.

Fixx, J.F. (1977). *The complete book of running.* Victoria, Australia: Outward Press.

Fong, C. J., Zaleski, D. J., & Leach, J. K., (2015). The challenge-skill balance and antecedents of flow: A meta-analytic investigation. *The Journal of Positive Psychology, 10*(5), 425-446. https://doi.org/10.1080/17439760.2014.967799

Fournier J., Gaudreau P., Demontrond-Behr P., Visioli J., Forest J., & Jackson S. A. (2007). French translation of the Flow State Scale–2: Factor structure, cross-cultural invariance, and associations with goal attainment. *Psychology of Sport and Exercise, 8*(6), 897–916. http://dx.doi.org/10.1016/j.psychsport.2006.07.007

Gaggioli, A., Mazzoni, E., Milani, L., & Riva, G. (2015). The creative link: Investigating the relationship between social network indices, creative performance and flow in blended teams. *Computers in Human Behavior, 42*(3), 157-166. https://doi.org/10.1016/j.chb.2013.12.003

Gardner, F. L., & Moore, Z. E. (2004). A mindfulness-acceptance-commitment-based approach to athletic performance enhancement: Theoretical considerations. *Behavior Therapy, 35*(4), 707–723. https://doi.org/10.1016/S0005-7894(04)80016-9

Garson, D. G. (2008). *Factor Analysis: Stat notes*. North Carolina State University Public Administration Program. https://www2.chass.ncsu.edu/garson/pa765/factor.htm.

George, D., & Mallery, P. (2010). *SPSS for Windows step by step: A simple study guide and reference*, (18.0 Update). Boston, Mass: Allyn & Bacon.

Giluk, T. L. (2009). Mindfulness, big five personality, and affect: A meta-analysis. *Personality and Individual Differences, 47*(8), 805–811. https://doi.org/10.1016/j.paid.2009.06.026

Glaser, B. G. (1978). *Theoretical Sensitivity: Advances in the methodology of Grounded Theory.* London, UK: Sociology Press.

Gómez, A., Brooks, M. L., Buhrmester, M. D., Vázquez, A., Jetten, J., & Swann, W. B. (2011). On the nature of identity fusion: Insights into the construct and a new measure. *Journal of Personality and Social Psychology, 100*(5), 918–933. https://doi.org/10.1037/a0022642

Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Hillsdale, NJ: Erlbaum.

Goumas, C. (2014). How does crowd support contribute to home advantage in soccer? *Journal of Sport Behavior, 37*(3), 236-250.

Greenlees, I. A., Graydon, J. K., & Maynard, I. W. (1999). The impact of collective efficacy beliefs on effort and persistence in a group task. *Journal of Sports Sciences, 17*(2), 151–158.
http://dx.doi.org/10.1080/026404199366253

Grossman, P., & Nicholas, T. V. D., (2011). Mindfulness, by any other name…: trials and tribulations of *sati* in western psychology and science. *Contemporary Buddhism, 12*(1), 219-239.
https://doi.org/10.1080/14639947.2011.564841

Grossman, P., Niemann, L., Schmidt, S., &Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research, 57*(1), 35-43.
https://doi.org/10.1016/S0022-3999(03)00573-7

Guzzo, R. A., & Shea, G. P. (1992).Group performance and intergroup relations in organizations.In M. D. Dunnette, & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (pp. 269-313). Palo Alto, CA: Consulting Psychologists Press.

Hackman, J. R., Wageman, R., Ruddy, T. M., & Ray, C. R. (2000).Team effectiveness in theory and practice. In C. Cooper, & E. A. Locke (Eds.), *Industrial and organizational psychology: Theory and practice* (pp. 109–129). Oxford, UK: Wiley- Blackwell.

Hair, J. F. J., Anderson, R. E., Tatham, R. L., & Black, W. C. (1995). *Multivariate data analysis* (4th ed.). Saddle River, NJ: Prentice Hall.

Hair, J. F. J., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). Saddle River, NJ: Prentice Hall.

Hair, J. F. J., Black, W. C., Babin, R. E., & Anderson, R. E. (2010).*Multivariate Data Analysis* (7th ed.). Saddle River, NJ: Prentice Hall.

Hall, C. R., Mack, D. E., Paivio, A., & Hausenblas, H. A. (1998). Imagery use by athletes: Development of the Sport Imagery Questionnaire. *International Journal of Sport Psychology, 29*(1), 73–89.
https://doi.org/10.1007/s40279-014-0253-z

Halson, S. L. (2014). Monitoring training load to understand fatigue in athletes. *Sports Medicine, 44*(2), 139-147.
https://doi.org/10.1007/s40279-014-0253-z

Hammond, D. C. (1990). *Handbook of hypnotic suggestions and metaphors.* New York, NY: Norton.

Harackiewicz, J. M., & Elliot, A. J. (1993).Achievement goals and intrinsic motivation. *Journal of Personality and Social Psychology, 65*(5), 904-915. https://doi.org/10.1037/0022-3514.65.5.904

Hardy, L. (1996). Testing the predictions of the Cusp Catastrophe Model of anxiety and performance. *Sport Psychologist, 10*(2), 140-156. https://doi.org/10.1123/tsp.10.2.140

Hardy, L., Jones, G., & Gould, D. (1996).A unifying model of psychological preparation for peak athletic performance. In L., Hardy, G., Jones, & D., Gould, (Eds.), *Understanding psychological preparation for sport: Theory and practice of elite performers* (pp. 239–248). Hoboken, NJ: Wiley. https://doi.org/10.1037/0735-7028.37.3.233

Harmison, R. J. (2006). Peak performance in sport: Identifying ideal performance states and developing athletes' psychological skills. *Professional Psychology: Research and Practice by the American Psychological Association, 37*(3), 233-243. https://doi.org/10.1037/0735-7028.37.3.233

Harrington, D. (2009). *Confirmatory factor analysis*. Oxford Scholarship Online. https://doi.org/10.1093/acprof:oso/9780195339888.003.0004

Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1993). *Emotional contagion*. Cambridge, UK: Cambridge University Press. https://doi.org/10.1017/CBO9781139174138

He, J., (2012). Counteracting Free-Riding with Team Morale - An Experimental Study. *Project Management Journal, 43*(3), 62-75. https://doi.org/10.1002/pmj.21272

Heap, M., & Aravind, K. K. (2002). *Hartland's medical and dental hypnosis*. (4th ed.). London, UK: Churchill Livingston/Harcourt Health Sciences.

Hein, V., & Koka, A. (2007).Perceived feedback and motivation in physical education and physical activity. In M. S. Hagger, & N. L. D. Chatzisarantis (Eds.), *Intrinsic motivation and self-determination in exercise and sport* (pp. 127-140). Champaign, IL: Human Kinetics.

Hektner, J., & Csikszentmihalyi, M. (1996).A longitudinal exploration of flow and intrinsic motivation in adolescents. Paper presented at the annual meeting of the American Educational Research Association, New York, NY.

Hektner, J., Schmidt, J. A., & Csikszentmihalyi, M., (2007). *Experience Sampling Method: Measuring the quality of everyday life.* Thousand Oaks, CA: Sage publications. https://doi.org/10.4135/9781412984201

Heyne, K., Pavlas, D., & Salas, E. (2011).An investigation on the effects of flow state on team process and outcomes. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 55*(1), 475-479. https://doi.org/10.1177/1071181311551098

Hilgard, E. R., (2013). *Hypnosis in the relief of pain.* Hoboken, NJ: Taylor and Francis.

Hipp, J. R., & Bollen, K. A. (2003). Model fit in structural equation models with censored ordinal, and dichotomous variables: Testing vanishing tetrads. *Sociological Methodology, 33*(1), 267-305. https://doi.org/10.1111/j.0081-1750.2003.00133.x

Guzzo, R. A., & Shea, G. P. (1992).Group performance and intergroup relations in organizations. In M. D. Dunnette, & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (pp. 269-313). Palo Alto, CA: Consulting Psychologists Press.

Holden, R. B. (2010). Face validity. In B. I. Weiner, & W. E. Craighead (Eds.), *The Corsini Encyclopaedia of Psychology* (4th ed.) (pp. 637–638). Hoboken, NJ: Wiley.

Holmes, P. S., & Collins, D. J. (2001). The PETTLEP approach to motor imagery: A functional equivalence model for sport psychologists. *Journal of Applied Sport Psychology, 13*(1), 60-83. https://doi.org/10.1080/10413200109339004

Holt, N. L., & Hoar, S. D. (2006).The multidimensional construct of social support. In S. Hanton, & S. D., Mellalieu (Eds.), *Literature Review in Sport Psychology* (pp. 199-225). London, UK: Nova Science Publishers.

Hooker, C., & Csikszentmihalyi, M. (2003). Flow, creativity, and shared leadership: Rethinking the motivation and structuring of knowledge work. In C. L. Pearce, & J. A. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 217-234). Thousand Oaks, CA: Sage Publications. https://doi.org/10.4135/9781452229539.n10

Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural Equation Modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*(1), 53-60.

Hox, J. J. & Bechger, T. M. (1998).An introduction to structural equation modeling. *Family Science Review, 11*(4), 354-373.

Horn, T. S., Glenn, S. D., & Wentzell, A. B. (1993). Sources of information underlying personal ability judgments in high school athletes. *Paediatric Exercise Science, 5*(3), 263-274. https://doi.org/10.1123/pes.5.3.263

Hu, L., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural equation modelling: Concepts, issues and applications* (pp. 76-99). Thousand Oaks, CA: Sage Publications. https://doi.org/10.1080/10705519909540118

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Hüffmeier, J., & Hertel, G. (2011). Many cheers make light the work: How social support triggers process gains in teams. *Journal of Managerial Psychology, 26*(3), 185-204. https://doi.org/10.1108/02683941111112631

Hutcheson, G., & Sofroniou, N. (1999). *The multivariate social scientist: Introductory statistics using generalized linear models*. Thousand Oaks, CA: Sage Publications. https://doi.org/10.4135/9780857028075

Jackson, D. L., Gillaspy, J. A., & Purc-Stephenson, R. P. (2009). Reporting practices in confirmatory factor analysis: An overview and some recommendations. *Psychological Method 14(1),* 6-23. https://doi.org/10.1037/a0014694

Jackson, S. A. (1992). *Elite athletes in flow: The psychology of optimal sport experience*. (Unpublished doctoral dissertation).University of North Carolina, Greensboro, NC.

Jackson, S. A. (1995). Factors influencing the occurrence of flow in elite athletes. *Journal of Applied Sport Psychology*, *7*(2), 138-166. https://doi.org/10.1080/10413209508406962

Jackson, S. A. (1996). Toward a conceptual understanding of the flow experience in elite athletes. *Physical Education, Recreation and Dance, 67*(1), 76-90. https://doi.org/10.1080/02701367.1996.10607928

Jackson, S. A. (2000). Joy, fun, and flow state in sport. In Hanin, Y. (Ed.), *Emotions in sport* (pp. 135-156). Champaign, IL: Human Kinetics.

Jackson, S.A. (2011). Flow. In T. Morris and P. Terry (Eds.), *New sport and exercise psychology companion* (pp. 327-357). Morgantown, WV: Fitness Information Technology.

Jackson, S. A., & Csikszentmihalyi, M. (1999). *Flow in sports: The keys to optimal experiences and performances.* Champaign, IL: Human Kinetics.

Jackson, S. A., & Eklund, R. C. (2002) Assessing flow in physical activity: The Flow State Scale-2 and Dispositional Flow Scale-2. *Journal of Sport and Exercise Psychology, 24*(2), 133-150. https://doi.org/10.1123/jsep.24.2.133

Jackson, S, A., & Eklund, R. C. (2004).*The flow scales manual*. Morgantown, WV: Fitness Information Technology.

Jackson, S., Kimiecik, J., Ford, S., & Marsh, H. (1998). Psychological correlates of flow in sport. *Journal of Sport & Exercise Psychology, 20*(4), 358.

Jackson, S. A., & Kimiecik, J. C. (2008).The flow perspective of optimal experience in sport and physical activity. In T. S. Horn (Ed.), *Advances in sport psychology* (3rd ed.), (pp. 377-399). Champaign, IL: Human Kinetics.

Jackson, S. A., Kimiecik, J. C., Ford, S., & Marsh, H. W. (1998). Psychological correlates of flow in sport. *Journal of Sport and Exercise Psychology, 20*(4), 358-378. https://doi.org/10.1123/jsep.20.4.358

Jackson, S. A., & Marsh, H. W. (1996). Development and validation of a scale to measure optimal experience: The Flow State Scale. *Journal of Sport and Exercise Psychology, 18*(1), 17-35. https://doi.org/10.1123/jsep.18.1.17

Jackson, S. A., Martin, J. A., & Eklund, R. C. (2008). Long and short measures of flow: The construct validity of the FSS-2, DFS-2, and new brief counterparts. *Journal of Sport and Exercise Psychology, 30*(5), 561-587. https://doi.org/10.1123/jsep.30.5.561

Jackson, S. A., & Roberts C. (1992). Positive performance states of athletes: Toward a conceptual understanding of peak performance. *Sport Psychologist, 6*(2), 156–171. https://doi.org/10.1123/tsp.6.2.156

Jackson, S. A., Thomas, P. R., Marsh, H. W., & Smethurst, C. J. (2001). Relationships between flow, self-concept, psychological skills, and performance. *Journal of Applied Sport Psychology, 13*(2), 129-153. https://doi.org/10.1080/104132001753149865

Jackson, S. A., & Wrigley, W. (2004). Optimal experience in sport: Current issues and future directions. In T. Morris, & J. Summers, (Eds.). *Sport psychology: Theories, applications, and issues* (2nd ed.), (pp. 423-451). Milton, QLD: Jacaranda Press.

Johnson, B., & Christensen, L. (2008). *Education research: Quantitative, qualitative and mixed approaches*. Los Angeles, CA: Sage Publications.

Jowett, S., & Cockerill, I. M. (2002).Incompatibility in the coach–athlete relationship. In I. M. Cockerill (Ed.), *Solutions in sport psychology* (pp. 16–31). London, UK: Thomson Learning.

Jowett, S., & Ntoumanis, N. (2004). The Coach–Athlete Relationship Questionnaire (CART-Q): Development and initial validation. *Scandinavian Journal of Medicine and Science in Sports, 14*(4), 245-257. https://doi.org/10.1111/j.1600-0838.2003.00338.x

Kabat-Zinn, J. (2005). Coming to our senses: Healing ourselves and the world through mindfulness. New York, NY: Hyperion.

Kallio, H., Pietila, A. M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing, 72*(12), 2954– 2965. https://doi.org/10.1111/jan.13031

Karau, S. J., & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology*, *65*(4), 681-706. https://doi.org/10.1037/0022-3514.65.4.681

Kaufman, K. A., Glass, C. R., & Arnkoff, D. B. (2009). Evaluation of mindful sport performance enhancement (MSPE): A new approach to promote flow in athletes. *Journal of Clinical Sport Psychology, 3*(4), 334-357. https://doi.org/10.1123/jcsp.3.4.334

Kawabata, M., Jackson, S. A., & Mallett, C. J. (2005).Development and preliminary validation of the Japanese versions of the Flow State Scale-2 and Dispositional Flow Scale-2. In *ISSP 11th World Congress of Sport Psychology: Promoting Health and Performance for Life*. International Society of Sport Psychology (ISSP).World Congress of Sport Psychology. Sydney, Australia.

Kazdin, A. E. (2011). *Single-case research designs: Methods for clinical and applied settings*. Oxford University Press.

Kee, Y. H., & Wang, C. K. J. (2008). Relationships between mindfulness, flow dispositions and mental skills adoption: A cluster analytic approach. *Psychology of Sport and Exercise, 9*(4), 393-411. https://doi.org/10.1016/j.psychsport.2007.07.001

Keltner, D., & Kring, A. M. (1998). Emotion, social function, and psychopathology. *Review of General Psychology, 2*(3), 320-342. https://doi.org/10.1037/1089-2680.2.3.320

Kennedy, P., Miele, D., & Metcalfe, J. (2014).The cognitive antecedents and motivational consequences of the feeling of being in the zone. *Consciousness & Cognition*, *30*(1), 48–61. http://dx.doi.org/10.1016/j.concog.2014.07.007

Kerr, N. L. (1983). Motivational losses in small groups: A social dilemma analysis. *Journal of Personality and Social Psychology, 45*(4), *819-828.* https://doi.org/10.1037/0022-3514.45.4.819

Kerr, N. L., & Tindale, R. S. (2004). Group performance and decision making. *Annual Review Psychology*, *55*(1), 623–655. https://doi.org/10.1146/annurev.psych.55.090902.142009

Kihlstrom, J. F. (1985). Hypnosis. *Annual Review of Psychology, 36*(1), 385–418. https://doi.org/10.1146/annurev.ps.36.020185.002125

Kimiecik, J. C., & Jackson, S. A. (2002). Optimal experience in sport: A flow perspective. In T. Horn (Ed.), *Advances in sport psychology* (pp. 501-527). Champaign, IL: Human Kinetics.

Kimiecik, J. C., & Stein, G. L. (1992*).* Examining flow experiences in sport contexts: Conceptual issues and methodological concerns. *Journal of Applied Psychology, 4*(2), 144-160. https://doi.org/10.1080/10413209208406458

Klimoski, R., & Mohammed, S. (1994). Team mental model: Construct or metaphor? *Journal of Management, 20*(2), 403–437. https://doi.org/10.1177/014920639402000206

Kimhy, D., Delespaul, P., Corcoran, C., Ahn, H., Yale, S., &Malaspina, D. (2006). Computerized experience sampling method (ESMc): Assessing feasibility and validity among individuals with schizophrenia. *Journal of Psychiatric Research, 40*(3), 221–230. https://doi.org/10.1016/j.jpsychires.2005.09.007

Kirk, R. E. (2013). *Experimental design: procedures for the behavioral sciences* (4th ed.). Thousand Oaks, CA: Sage Publications. https://doi.org/10.4135/9781483384733

Kirschenbaum, D. S., Owens, D. D., & O'Connor, E. A. (1998). Smart golf: Preliminary evaluation of a simple, yet comprehensive, approach to improving and scoring the mental game. *Sport Psychologist, 12*(3), 271–282. https://doi.org/10.1123/tsp.12.3.271

Kline, P. (1979). *Psychometrics and psychology*. London, UK: Academic Press.

Kline, P. (1998). *The new psychometrics: Science, psychology, and psychometrics*. London, UK: Routledge.

Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). New York, NY: Guilford Publications.

Koehn, S., &Díaz-Ocejo, J. (2016). Imagery intervention to increase flow state: A single-case study with middle-distance runners in the state of Qatar. *International Journal of Sport and Exercise Psycholog*y, 1-14. doi:10.1080/1612197X.2016.1187653

Koehn, S., Morris, T., & Watt, A. (2006).Efficacy of an imagery intervention to increase flow and performance in tennis competition. *Medicine and Science in Tennis, 11(1)*, 12-14.

Koehn, S., Morris, T., & Watt, A. (2013).Correlates of dispositional and state flow in tennis competition. *Journal of Applied Sport Psychology, 25*(3), 1533-1571. https://doi.org/10.1080/10413200.2012.737403

Koehn, S., Morris, T., & Watt, A. (2014). Imagery intervention to increase flow state and performance in competition. Sport Psychologist, 28(1), 48-59. https://doi.org/10.1123/tsp.2012-0106

Koehn, S., Stavrou, N. A. M., Young, J. A., & Morris, T. (2016). The applied model of imagery use: Examination of moderation and mediation effects. *Scandinavian Journal of Medicine & Sciences in Sports, 26*(8), 975-984. https://doi.org/10.1111/sms.12525

Kossowski, T., & Hauke, J. (2011).Comparison of values of Pearson's and Spearman's Correlation Coefficient on the same sets of data. *QuaestionesGeographicae*, 30(2), 87–93. https://10.2478/v10117-011-0021-1

Krane, V., & Williams, J. M. (2006).Psychological characteristics of peak performance. In J. M. Williams (Ed.), *Applied sport psychology: Personal growth to peak performance* (5th ed.), (pp. 207– 227). New York, NY: McGraw-Hill.

Kuby, R., Larson, R., & Csikszentmihalyi, M. (2006). Experience sampling method applications to communication research questions. *Journal of Communication, 46*(2), 99-120. https://doi.org/10.1111/j.1460-2466.1996.tb01476.x

Knapik, M. (2006). The qualitative research interview: Participants' responsive participation in knowledge making. *International Journal of Qualitative Methods, 5*(3), 77-93.

Larsen, R. J., & Diener, E. (1992). Promises and problems with the circumplex model of emotion. In M. S. Clark (Ed.), *Review of personality and social psychology: Emotion, 13*, (pp. 25-59). Newbury, Park, CA: Sage Publications.

Latham, G. P., Skarlicki, D., Irvine, D., & Siegel, J. P. (1993).The increasing importance of performance appraisals to employee effectiveness in organizational settings in North America. In C. L., Cooper & J. T., Robertson (Eds.), *International review of industrial and organizational psychology* (pp. 87-132). New York, NY: Wiley.

Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., & Carlson, L., et al. (2006). The Toronto Mindfulness Scale: Development and validation. *Journal of Clinical Psychology, 62*(12), 1445–1467. https://doi.org/10.1002/jclp.20326

Lawley, D. N., & Maxwell, A. E. (1971). *Factor analysis as a statistical method* (2nd ed.). London, UK: Butterworth and Company.

Lazarovitz, S. M. (2003). *Team and individual flow in female ice hockey players: The relationships between flow, group cohesion, and athletic performance* (Unpublished doctoral dissertation). University of Calgary, Alberta, Canada.

Leach, D. (1962). *Meaning and correlates of peak experience* (Unpublished doctoral dissertation). University of Florida, FL.

Leik, R. K. (2013). *Experimental design and the analysis of variance*. Thousand Oaks, CA: Sage Publications. https://doi.org/10.4135/9781483348940

Li, F., Harmer, P., Chi, L., & Vongjaturapat, N. (1996).Cross-cultural validation of the Task and Ego Orientation in Sport Questionnaire. *Journal of Sport & Exercise Psychology*, *18* (4), 392-407.
http://dx.doi.org/10.1123/jsep.18.4.392

Little, T. D. (1997). Mean and covariance structures (MACS) analyses of cross-cultural data: Practical and theoretical issues. *Multivariate Behavioral Research, 32*(1), 53–76.
https://doi.org/10.1207/s15327906mbr3201_3

Lindsay, P., Maynard, I. W., & Thomas, O. (2005).Effects of hypnosis on flow states and cycling performance. *Sport Psychologist, 19*(2), 164-178.
https://doi.org/10.1123/tsp.19.2.164

Lissitz, R. W. (2009). *The concept of validity: Revisions, new directions, and applications.* Charlotte, NC: Information Age Publishing.

Ludwig, D. S.,& Kabat-Zinn, J. (2008). Mindfulness in medicine. *Journal of the American Medical Association, 300*(11), 1350-1352.
https://doi.org/10.1001/jama.300.11.1350

Luhtanen, R., & Crocker, J. (1992). A collective self-esteem scale: Self-evaluation of one's social identity. *Personality and Social Psychology Bulletin*, *18*(3), 302-318.
https://doi.org/10.1177/0146167292183006

Lyle, J. (1999). Coaching philosophy and coaching behaviour. In N. Cross & J. Lyle (Eds.), *The coaching process: Principles and practice for sport* (pp. 25–46). Oxford, UK: Butterworth-Heineman.
https://doi.org/10.1177/0892020612459288

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods, 4*(1), 84-99.
https://doi.org/10.1037/1082-989X.4.1.84

Macneill, N., & Cavanagh, R. (2013).The possible misfit of Csikszentmihalyi's dimensions of flow in the contemporary roles of school leaders. *Management in Education, 27*(1,) 7–13.
https://doi.org/10.1177/0892020612459288

Marsh, H. W., & Jackson, S. A. (1999). Flow experience in sport: Construct validation of multidimensional, hierarchical state and trait responses. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(4), 343-371.
https://doi.org/10.1080/10705519909540140

Martin, J. M., & Cutler, K. (2002).An exploratory study of flow and motivation in theater actors. *Journal of Applied Sport Psychology, 14*(4), *344-352.*
https://doi.org/10.1080/10413200290103608

Martin, J. M., & Jackson, S. A. (2008). Brief approaches to assessing task absorption and enhanced subjective experience: Examining 'short' and 'core' flow in diverse performance domains. *Motivation and Emotion, 32*(3), 141-157. https://doi.org/10.1007/s11031-008-9094-0

Massimini, F., Csikszentmihlyi, M., & Carli, M. (1987). The monitoring of optimal experience: A tool for psychiatric rehabilitation. *Journal of Nervous and Mental Disease, 175*(9), 545-549. https://doi.org/10.1097/00005053-198709000-00006

Maslow, A. H. (1962). *Toward a psychology of being*. Princeton, NJ: Van Nostrand.

Maslow, A. H. (1971). *The farther reaches of human nature*. New York, NY: Viking.

Messick, S. (1998). Test validity: A matter of consequence. *Social Indicators Research, 45*(1), 35–44. https://doi.org/10.1023/A:1006964925094

McCoach, D. B., Gable, R. K., & Madura, J. P. (2013). *Instrument development in the affective domain, school and corporate applications* (3rd ed.). New York, NY: Springer-Verlag. https://doi.org/10.1007/978-1-4614-7135-6

McInman, J., & Grove, R. (1991). Peak moments in sport: A literature review. *Quest, 43*(3), 333- 351. https://doi.org/10.1080/00336297.1991.10484035

Merriam, S. B., & Tisdell, E. J. (2015).*Qualitative research: A guide to design and implementation* (4th ed.). San Francisco, CA: Josey-Bass. https://doi.org/10.4018/978-1-4666-7409-7.ch007

Moen, F., &Federici, R. A. (2012). Perceived leadership self-efficacy and coach competence: Assessing a coaching based leadership self-efficacy scale. *International Journal of Evidence Based Coaching and Mentoring, 10*(2), 1-16.

Mohammed, S., Ferzandi, L., & Hamilton, K. (2010). Metaphor no more: A 15-year review of the team mental model construct. *Journal of Management, 36*(4), 876–910. https://doi.org/10.1177/0149206309356804

Moneta, G. B., &Csikszentmihalyi, M. (1996).The effect of perceived challenges and skills on the quality of subjective experience. *Journal of Personality, 64*(2), 275-310. https://doi.org/10.1111/j.1467-6494.1996.tb00512.x

Moore, B. A. (2013). Propensity for experiencing flow: The roles of cognitive flexibility and mindfulness. *The Humanistic Psychologist, 41*(4), 319-332. https://doi.org/10.1080/08873267.2013.820954

Moreno Murcia, J. A., CervellóGimeno, E., & González-CutreColl, D. (2008). Relationships among goal orientations, motivational climate and flow in adolescent athletes: Differences by gender. *Spanish Journal of Psychology, 11*(1), 181-191. https://doi.org/10.1017/S1138741600004224

Moritz, S., Feltz, D., Fahrback, K., & Mack, D. (2000). The relation of self-efficacy measures to sport performance: A meta-analytic review. *Research Quarterly For Exercise & Sport, 71*(3), 280-294. http://dx.doi.org/10.1080/02701367.2000.10608908

Moritz, S. E., & Watson, C. B. (1998). Levels of analysis issues in group psychology: Using efficacy as an example of a multilevel model. *Group Dynamics:Theory, Research, and Practice, 2(4),* 285-298. https://doi.org/10.1037/1089-2699.2.4.285

Morris, T., Spittle, M., & Watt, A. P. (2005). *Imagery in sport.* Champaign, IL: Human Kinetics.

Morrow, S. L., & Smith, M. L. (2000).Qualitative research for counseling psychology. In S. D. Brown, & R. W. Lent (Eds.), *Handbook of counseling psychology* (3rd ed.), (pp. 199–230). New York, NY: Wiley.

Mosek, E. (2009). *Exploration of team flow in a competitive youth basketball team***.** (Unpublished master thesis).University of Jyväskylä, Jyväskylä, Finland.

Mugford, A. L. (2006). *Flow in a team sport setting: Does cohesion matter?* (Unpublished doctoral dissertation). University of Kansas, Kansas, USA.

Munroe, K. J., Giacobbi, P. R., Hall, C., & Weinberg, R. (2000). The four Ws of imagery use: Where, when, why, and what. *Sport Psychologist, 14*(2), 119-137. https://doi.org/10.1123/tsp.14.2.119

Murphy, M. (1977).Sport as yoga. *Journal of Humanistic Psychology, 17*(4), 21-33. https://doi.org/10.1177/002216787701700403

Myers, D. G. (2000).The funds, friends, and faith of happy people. *American Psychologist, 55*(1), 56-67. https://dx.doi.org/10.1037/0003-066X.55.1.56

Myers, N. D., Payment, C. A., & Feltz, D. L. (2004.) Reciprocal relationships between collective efficacy and team performance in women's ice hockey. *Group Dynamics-Theory Research and Practice*, *8*(3), 182–195. https://doi.org/10.1037/1089-2699.8.3.182

Myin-Germeys, I., Oorschot, M., Collip, D., Lataster, J., Delespaul, P., & Van Os, J. (2009). Experience sampling research in psychopathology: Opening the black box of daily life. *Psychological Medicine, 39*(9), 1533–1547. https://doi.org/10.1017/S0033291708004947

Nakamura, J., & Csikszentmihalyi, M. (2002*).*The construction of meaning through vital engagement. In C. Keyes & J. Haidt (Eds.), *Flourishing* (pp. 83-104). Washington, DC: American Psychological Association Books.

Nakamura, J., & Csikszentmihalyi, M. (2005).The concept of flow. In C. R. Snyder, & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 89–105). Oxford, UK: University Press.

Neale, M. (2007). Mindfulness meditation: An integration of perspectives from Buddhism, science and clinical psychology. Dissertation Abstracts International: Section B: *The Sciences and Engineering, 67* (10-b), 60-70.

Neisser, U. (1976).*Cognition and reality*. San Francisco, CA: Freeman.

Nicholls, A., Polman, R., & Holt, N. (2005).The effects of individualized imagery interventions on golf performance and flow states. *Athletic Insight, 7(1),* 43-64.

Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric theory (3rd ed.). New York, NY: McGraw-Hill.

Olympiou, A., Jowett, S., & Duda, J. L. (2008). The psychological interface between the coach-created motivational climate and the coach-athlete relationship in team sports. *The Sport Psychologist, 22*(4), 423-438. https://doi.org/1 0.1123/tsp.22.4.423

Pain, M. A., Harwood, C., & Anderson, R. (2011).Pre-competition imagery and music: The impact on flow and performance in competitive soccer. *Sport Psychologist, 25*(2), 212-232. https://doi.org/10.1123/tsp.25.2.212

Paskevich, D., Estabrooks, P., Brawley, L., & Carron, A. (2001).Group cohesion in sport and exercise. In R. Singer, H. Hausenblas, & C. Janelle (Eds.), *Handbook of sport psychology* (2nd ed.). (pp. 472-494). New York, NY: John Wiley

Pates, J. K., & Cowen, A. (2013).The effect of a hypnosis intervention on performance and flow state of an elite golfer: A single subject design. *International Journal of Golf Science, 2*(1), 43-53. https://doi.org/10.1123/ijgs.2.1.43

Pates, J. K., Cummings, A., & Maynard, I. (2002).The effects of hypnosis on flow states and three-point shooting performance in basketball players. *Sport Psychologist, 16*(1), 34-47. https://doi.org/10.1123/tsp.16.1.34

Pates, J. K., Oliver, R., & Maynard, I. (2001).The effects of hypnosis on flow states and golfing putting performance. *Journal of Applied Sport Psychology, 13*(4), 341-354. https://doi.org/10.1080/104132001753226238

Pates, J. K., & Palmi, J. (2002).The effect of hypnosis upon flow states and short serve badminton performance. *Journal of Excellence, 6,* 48-62. http://hdl.handle.net/10545/232979

Pates, J. K., & Maynard, I. (2000).Effects of hypnosis on flow states and golf performance. *Perceptual and Motor Skills, 91*(4), 1057-1075. https://doi.org/10.2466/pms.2000.91.3f.1057

Perls, F. (1976).*The Gestalt Approach.* London, UK: Bantam.

Peters, M. L., Sorbi, M. J., Kruise, D. A., Kerssens, J. J., Verhaak, P. F., & Bensing, J. M. (2000). Electronic diary assessment of pain, disability and psychological adaptation in patients differing in duration of pain. *Pain, 84*(2-3), 181-192. https://doi.org/10.1016/S0304-3959(99)00206-7

Pineau, T. R. (2014). Effects of Mindful Sport Performance Enhancement (MSPE) on running performance and body image: Does self-compassion make a difference? (Unpublished doctoral dissertation).The Catholic University of America, Washington, DC.

Potter, J., & Hepburn.A. (2008). Qualitative interviews in psychology: Problems and possibilities. *Qualitative Research in Psychology, 2(4), 281-307.* https://doi.org/10.1191/1478088705qp045oa

Prapavessis, H., & Carron, A. V. (1996).The effect of group cohesion on competitive state anxiety. *Journal of Sport & Exercise Psychology,* 18 (1), 64-74. https://dx.doi.org/10.1123/jsep.18.1.64

Prapavessis, H., & Carron, A.V. (1997) Sacrifice, cohesion, and conformity to norms in sport teams Group Dynamics: Theory, Research, and Practice, 1(3), 231-240. http://dx.doi.org/10.1037/1089-2699.1.3.231

Privette, G. (1981). Dynamics of peak performance. *Journal of Humanistic Psychology, 21*(1), 57-67. https://doi.org/10.1177/002216788102100106

Privette, G. (1983). Peak experience, peak performance, and flow: A comparative analysis of positive human experiences. *Journal of Personality and Social Psychology, 45*(6), 1361-1368. https://doi.org/10.1037/0022-3514.45.6.1361

Privette, G., & Bundrick, C. M. (1991). Peak experience, peak performance, and flow: Personal descriptions and theoretical constructs. *Journal of Social Behavior and Personality, 6*(5), 169-188.

Prussia, G. F., & Kinicki, A. J. (1996).A motivational investigation of group effectiveness using social-cognitive theory. *Journal of Applied Psychology, 8*(2), 187-198. https://doi.org/10.1037/0021-9010.81.2.187

Quinn, R. W. (2003). *Nuclear weapons and daily deadlines: The energy and tension of flow in knowledge work* (Unpublished doctoral dissertation). University of Michigan, Michigan, USA.

Quinn, R. W. (2005). Flow in knowledge work: High performance experience in the design of national security technology. *Administrative Science Quarterly, 50*(4), 610-641. http://dx.doi.org/10.2189/asqu.50.4.610

Ramirez, C. M. (2013). *Teams a competency-based approach*. Hoboken, NJ: Taylor and Francis.

Ravizza, K. (1977). Peak experiences in sport. *Journal of Humanistic Psychology, 17*(4), 35-40. https://doi.org/10.1177/002216787701700404

Rive, J., & Williams, S. (2015). Establishing a game-plan. *Coaching & Sport Science Review 66(*23), 15-16.

Rheinberg, F., Manig, Y., Kliegl, R., Engeser, S., & Vollmeyer, R. (2007). Flow during work but happiness during leisure time: Goals, flow-experience, and happiness. *Zeitschrift Fur Arbeits-Und Organisationspsychologie, 51*(3), 105-115. https://doi.org/10.1026/0932-4089.51.3.105

Rodr´ıguez-S´anchez, A. M., Salanova, M. Cifre, E., & Schaufeli,W. B. (2011). When good is good: A virtuous circle of self-efficacy and flow at work among teachers. *Revista dePsicolog´ıa Social, 26*(3), 427–441. https://doi.org/10.1174/021347411797361257

Rousseau, D. M. (2006). Is There Such a Thing as "Evidence-Based Management"? *The Academy of Management Review, 31(*2), 256-269. https://doi.org/10.5465/AMR.2006.20208679

Rummel, R. J. (1988). *Applied factor analysis*. Evanston, IL: North western University Press.

Russell, W. D. (2001).An examination of flow state occurrence in college athletes. *Journal of Sport Behavior, 24*(1), 83-107.

Ryan, R. M., & Deci, E. L. (2011).A self-determination theory perspective on social, institutional, cultural, and economic supports for autonomy and their importance for well-being. In V. I., Chirkov, R. M., Ryan & K. M., Sheldon (Eds.), *Human autonomy in cross-cultural context: Perspectives on the psychology of agency, freedom, and well-being* (pp. 45-64). Dordrecht, NL: Springer.

Salanova, M., Rodríguez-Sa'nchez, A. M., & Cifre, E. (2014).Flowing together: A longitudinal study of collective efficacy and collective flow among workgroups. *The Journal of Psychology, 148*(4), 435-455. https://doi.org/10.1080/00223980.2013.806290

Salmon, P., Hanneman, S., & Harwood, B. (2010). Associative/dissociative cognitive strategies in sustained physical activity: Literature review and proposal for a mindfulness-based conceptual model. *Sport Psychologist, 24*(2), 127-156. https://doi.org/10.1123/tsp.24.2.127

Sawyer, K. (2003).*Group creativity: Music, theater, collaboration*. New Jersey, NJ: LEA.

Sawyer, K. (2007).*Group genius: The creative power of collaboration*. Cambridge, MA: Basic Books.

Sawyer, K. (2015).Group flow and group genius. *NAMTA Journal, 40*(3), 29-52.

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modelling and confirmatory factor analysis results: A review. *The Journal of Educational Research, 99*(6), 323-337. https://doi.org/10.3200/JOER.99.6.323-338

Schumacker, R. E., & Lomax, R. G. (2004).*A beginner's guide to structural equation modelling* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

Schüler, J., & Brunner, S. (2009). The rewarding effect of flow experience on performance in a marathon race. *Psychology of Sport and Exercise, 10*(1), 168-174. https://doi.org/10.1016/j.psychsport.2008.07.001

Scott-Hamilton, J., & Schutte, N. S. (2016). The role of adherence in the effects of a mindfulness intervention for competitive athletes: Changes in mindfulness, flow, pessimism, and anxiety. *Journal of Clinical Sport Psychology, 10*(2), 99-117. https://doi.org/10.1123/jcsp.2015-0020

Scott-Hamilton, J., Schutte, N. S, & Brown, R. F. (2016). Effects of a mindfulness intervention on sports-anxiety, pessimism, and flow in competitive cyclists. *Applied Psychology: Health and Well Being, 8*(1), 85-103. https://doi.org/10.1111/aphw.12063

Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*(1), 5-14. http://dx.doi.org/10.1037/0003-066X.55.1.5

Silva, P., Chung, D., Carvalho, T., Cardoso, T., Davis, K., Araujo, D., & Garganta, J. (2016). Practice effects on intra-team synergies in football teams. *Human Movement Science, 46*(1), 39-51. https://doi.org/10.1016/j.humov.2015.11.017

Silver, W. S., & Bufanio, K. M. (1996).The impact of group efficacy and group goals on group task performance. *Small Group Research, 27*(3), 347–359. https://doi.org/10.1177/1046496496273001

Short, S. E., Sullivan, P., & Feltz, D. L. (2005). Development and preliminary validation of the Collective Efficacy Questionnaire for Sports. *Measurement in Physical Education and Exercise Science, 9*(3), 181-202. https://doi.org/10.1207/s15327841mpee0903_3

Sirotnik, K. A. (1980). Psychometric implications of the unit-of-analysis problem (with examples from the measurement of organizational climate). *Journal of Educational Measurement, 17*(4), 245-282. https://doi.org/10.1111/j.1745-3984.1980.tb00831.x

Smith, J. A., & Osborn, M. (2003).Interpretative phenomenological analysis. In J. A. Smith (Ed.), *Qualitative psychology: A practical guide to research methods* (pp. 25-52). London, UK: Sage Publications

Smith, R. E., Smoll, F .L., Cumming, S. P., & Grossbard, J. R. (2006). Measurement of multidimensional sport performance anxiety in children and adults: The Sports Anxiety *Scale-2. Journal of Sport & Exercise Psychology, 28*(4), 479-501.

Sorrentino, R. M., Szeto, A., Nezlek, J., Yasunaga, S. Kouhara, S., & Ohtsubo, Y. (2008). Uncertainty regulation: The master motive? In R. M. Sorrentino & S. Yamaguchi (Eds.) *Handbook of motivation and cognition across cultures* (pp. 49-70). Amsterdam, NL: Elsevier.

Spencer, J.,& Pruss, A. (1992).*Managing your team*. London, UK: Piatkus.

Stajkovic, A. D., Lee, D., & Nyberg, A. J. (2009). Collective efficacy, group potency, and group performance: Meta-analyses of their relationships, and test of a mediation model. *Journal of Applied Psychology, 94*(3), 814–828. https://doi.org/10.1037/a0015659

Stavrou, N. A., Jackson, S. A., Zervas, Y., & Karteroliotis, K. (2007). Flow experience and athletes' performance with reference to the orthogonal model of flow. *Sport Psychologist, 21*(4), 438-457. https://doi.org/10.1123/tsp.21.4.438

Stavrou, N. A., & Zervas, Y. (2004). Confirmatory factor analysis of Flow State Scale in sports. *International Journal of Sport and Exercise Psychology, 2(2),* 161–181. https://doi.org/10.1080/1612197X.2004.9671739

Stein, G. L., Kimiecik, J. C., Daniels, J., & Jackson, S. A. (1995).Psychological antecedents of flow in recreational sport. *Personality and Social Psychology Bulletin, 21(2),* 123-135. https://doi.org/10.1177/0146167295212003

Steiner, E. (1978). *Group processes*. New York, NY: Academic Press.

Stone, A., Broderick, J., Shiffman, S., & Schwartz, J. (2004). Understanding recall of weekly pain from a momentary assessment perspective: Absolute accuracy, between-and within-person consistency, and judged change in weekly pain. *Pain, 107*(1-2), 61-69. https://doi.org/10.1016/j.pain.2003.09.020

Strauss, A., & Corbin, J. (1998).*Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage

Sugiyama, T., & Inomata, K. (2005).Qualitative examination of flow experience among top Japanese athletes. *Perceptual and Motor Skills, 100*(3), 969-982. http://dx.doi.org/10.2466/PMS.100.4.969-982

Swann, C., Crust, L., Keegan, R. J., Piggott, D., & Hemmings, B., (2015). An inductive exploration into the flow experiences of European tour golfers. *Qualitative Research in Sport, Exercise and Health, 7*(2), 210-234. https://doi.org/10.1080/2159676X.2014.926969

Swann, C., Crust, L., Jackman, P., Vella, S. A., Allen, M. S., & Keegan, R. J. (2017). Psychological sates underlying excellent performance in sport: Toward an integrated model of flow and clutch states. *Journal of Applied Sport Psychology*. Advance online publication. https://doi.org/10.1080/10413200.2016.1272650

Swann, C., Keegan, R.J., Piggott, D., & Crust, L., (2012). A systematic review of the experience, occurrence, and controllability of flow states in elite sport. *Psychology of Sport and Exercise 13*(6), 807-819. https://doi.org/10.1016/j.psychsport.2012.05.006

Snyder, B., & Tardy, C. (2001). "That's why I do it": Flow and teachers' values, beliefs, and practices. In *TESOL Annual Convention*. St. Louis, MO.

Synder, C. R., & Lopez, S. J., (2002).*Handbook of positive psychology*. Oxford, UK: University Press.

Taggar, S., & Brown, T. C. (2001). Problem-solving team behaviours: Development and validation of BOS and a hierarchical factor structure. *Small Group Research, 32*(6), 698-726. https://doi.org/10.1177/104649640103200602

Taylor, A. J., & Demick, A. (1994). A multidimensional model of momentum in sports. *Journal of Applied Sport Psychology, 6*(1), 51-60. https://doi.org/10.1080/10413209408406465

Tesch, R. (2013). *Qualitative types: Analysis types*. New York, NY: Routledge.

Thayer, R. E, (1986). Activation-deactivation adjective check list: Current overview and structural analysis. *Psychological Reports, (58)*2, 607-614. https://doi.org/10.2466/pr0.1986.58.2.607

Thelwell, R. C., Greenlees, I. A., & Weston, N. J. V. (2006). Using psychological skills training to develop soccer performance. *Journal of Applied Sport Psychology, 18*(3), 254-270. https://doi.org/10.1080/10413200600830323

Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications.* Washington, DC: American Psychological.

Tse, D. C. K., Fung, H. H., Nakamura, J., & Csikszentmihalyi, M. (2016). Teamwork and flow proneness mitigate the negative effect of excess challenge on flow state. *The Journal of Positive Psychology,* Advanced online publication. http://dx.doi.org/10.1080/17439760.2016.1257059

Tsutomu, F. (2012).*Team flow in a Japanese university baseball team: Narrative study of a university baseball coach* (Unpublished doctoral dissertation). University of North Carolina, Greensboro, USA.

Unestahl, L. E. (1983). *Inner mental training*. Orebro, Sweden: Veje Publications.

Unestahl, L. E. (1986). Self-hypnosis. In J. Williams (Ed.), *Applied sport psychology: Personal growth to peak performance*. Mountain View, CA: Mayfield.

Van Bavel, J., & Cunningham, W. A. (2012). A social identity approach to person memory: Group membership, collective identification, and social role shape attention and memory. *Personality and Social Psychology Bulletin, 38*(12), 1566–1578. https://doi.org/10.1177/0146167212455829

Van Zomeren, M., Postmes, T., & Spears, R. (2008). Toward an integrative social identity model of collective action: A quantitative research synthesis of three socio-psychological perspectives. *Psychological Bulletin, 134*(4), 504–535. https://doi.org/10.1037/0033-2909.134.4.504

Vander Vegt, G., & van de Vliert, E. (2002). Intragroup interdependence and effectiveness: Review and proposed directions for theory and practice. *Journal of Managerial Psychology, 17*(1), 50-67. https://doi.org/10.1108/02683940210415924

Veenhoven, R. (1984). *Conditions of happiness*. NL: Kluwer, Dordrecht.

Walker, C. J., (2010). Experiencing flow: Is doing it together better than doing it alone? *The Journal of Positive Psychology, 5*(1*),* 3-11. https://doi.org/10.1080/17439760903271116

Watson, C. B., Chemers, M. M., &Preiser, N. (2001). Collective efficacy: A multilevel analysis. *Personality and Social Psychology Bulletin, 27*(8), 1057–1068. https://doi.org/10.1177/0146167201278012

Westman, M. (2001).Stress and strain crossover. *Human Relations, 54*(6), 557–591. https://doi.org/10.1177/0018726701546002

Westre, K. R., & Weiss, M. R. (1991).The relationship between perceived coaching behaviors and group cohesion in high school football teams.*The Sport Psychologist*, 5(1), 41-54. https://dx.doi.org/10.1123/tsp.5.1.41

Whalen, S. (1997). *Assessing flow experiences in highly able adolescent learners*. Chicago, IL: American Educational Research Association.

White, A., & Hardy, L. (1998).An in-depth analysis of the uses of imagery by high-level slalom canoeists and artistic gymnasts. *Sport Psychologist, 12*(4), 387-403. https://doi.org/10.1123/tsp.12.4.387

Whitehouse, H., & Lanman, J. A. (2014). The ties that bind us: Ritual, fusion, and identification. *Current Anthropology, 55*(6), 674–695. https://doi.org/10.1086/678698

Wiggins, M. S., & Freeman, P. (2000). Anxiety and flow: An examination of anxiety direction and the flow experience. *International Sport Journal, 4*(2), 78-87.

Williams, S. E., & Cumming, J. (2011). Imagery ability: The Sport Imagery Ability Questionnaire. *Journal of Sport & Exercise Psychology, 33*(3), 416-440. https://doi.org/10.1123/jsep.33.3.416

Wollman, N. (1986). Research on imagery and motor performance: Three methodological suggestions. *Journal of Sport Psychology, 8*(2), 135-138. https://doi.org/10.1123/jsp.8.2.135

Wright, C. J., & Smith, D. (2009).The effect of PETTLEP imagery on strength performance. *International Journal of Sport and Exercise Psychology, 7*(1), 18-31. https://doi.org/10.1080/1612197X.2009.9671890

Wuthnow, R. (1978). Peak Experiences: Some empirical tests. *Journal of Humanistic Psychology, 18*(3), 59-75. https://doi.org/10.1177/002216787801800307

Young, J. A. (2000). Professional tennis players in the zone.In S. J. Haake, & A. Coe (Eds.), *Tennis science and technology* (pp. 417-422*)*. Malden, MA: Blackwell Science.

Yukelson, D. (1997). Principles of effective team building interventions in sport: A direct services approach at Penn State University. *Journal of Applied Sport Psychology, 9*(1), 73-96.

Appendix A

Demographic Form

What is your gender?

What is your age?

Which team sport do you play?

What is your nationality?

Which level do you compete in?

How many coaches do you have in the team?

On average how many hours do you practice each week?

Appendix B

Semi Structured Interview Guide for Team Flow

- Discussion of the interviewees professional history and areas of interest
- What is "team flow" for you?
- How do you feel when you perceive that your team is in flow?
- Can you recall a time when you experienced/noticed team flow? Ifthe answer is yes, can you share detailed stories of previous experiences of team flow (preferably 2)?
- Can you describe the antecedents of these team flow experiences?
- Can you describe the consequences of these team flow experiences?
- What are in your experience the essential elements of team flow?
- What are the thoughts, feelings, and behaviors involved in experiencing team flow?
- What do you believe can be done to achieve team flow?
- What do you believe disrupts team flow?
- Do you believe team flow is an important concept for you as an (athlete, coach, or sport psychologist)?
- In your opinion, are there different kinds of team flow?
- Is there anything else you would like to add about team flow?
- Do you feel we captured the meaning of team flow in this interview?

Appendix C

Informed Consent Form for Team Flow Interview

By signing this consent form you are giving your consent to participate in this research study. Your involvement in this project will include one interview regarding your team flow experiences. Your participation in the research study is completely voluntary and you have a right to stop your participation at any time with no consequences.

All information provided will be confidential. Any mention of your name, names of other people, and other features that could be used to identify you will be removed or coded in the written texts. Data will be secured and only researchers will be able to access it. At no time will your identity be revealed in any published reports.

Additional questions about this study can be directed to Erez Mosek, PhD student of the College of Sport and Exercise Science, Victoria University.
Email: teamflowsportinventories@gmail.com, Phone: (61)0410480011 or to
Prof. Tony Morris, Professor of Sport, Exercise and Health Psychology.

By marking the box below you indicate that you have been informed of the following procedures:

- participation is entirely voluntary;
- all information provided will be confidential;
- coaches will not receive any information about the study in which your individual responses can be identified;
- study results can be used for scientific reporting in a format that prevents the recognition of a single participation;
- you may withdraw consent and terminate participation at any time during the project, and upon request, you can receive a summary of the findings from this study;
- you are an active team sport player, coach, or sport psychologist;

Approval of consent form

Appendix D

Raw Data Statements, First Order Themes and General Dimensions of Team Flow

Raw data statement	**First order theme**	**General Dimension**
The opposition was better than us but we had the skills	Challenge and skills	Challenge skill balance
The girls are enjoying the challenge of being out there and playing against the best in the competition		
It would have been quite sensational to beat them but we had what it takes to win		
We had to win all our games to qualify	Challenging situation	
They were rated top four in that time in the world	Challenging opposition	
It was like the less we thought about it, the results just kind of happened	Performing without over thinking	Merging of action and awareness
Things happened automatically	Automaticity	
We did not need to think about it because we just did it		
That match we just did and it just worked	Spontaneously	
We had clear goals for the long run and for each game	Clear goals	Clear goals
Each player knew what was expected from him	Expectations	
Before that match we knew what stats we were supposed to achieve		
We had the number one team from Victoria and we were expected to medal		
We received more constructive comments rather than just criticism	Constructive feedback	Unambiguous feedback
The "q's" of the information given were very technical, you could see the guys it was, sort of, making sense in their heads		
We were receiving reinforcing feedback	Positive feedback	
We knew we were doing well		
They got feedback that they were doing well, in the line and as a group		
The coaching staff was encouraging the players on each good move they were doing		
We were just worried about what we were doing and not about what they were doing	Concentration on task	Total concentration

Raw data statement	First order theme	General Dimension
That day they seemed a lot more focused on the task at hand	Concentration on task	Total concentration
The boys were very well focused on what they are supposed to do		
The group was very focused on the task instead of on being personally worried about being dragged from the court or not being part of the action on the court		
At this one particular moment everyone's thought were focused on this game		
We had complete concentration		
Everything else was blocked out and they (players) were really focused		
I think it really takes thinking about other things away		
We were concentrating on positive things	Concentrating on positive	
I got all the players to focus on what they were doing well		
Time was passing faster than normal for us	Pacing of time	Time transformation
It (team flow) does kind of speeds up time, we were so excited		
It did not feel like it is going on for long (time) in that match	Distorted sense of time	
Time seemed liked slowing down in that game.		
That was a really good experience	Good experience	Autotelic experience
We were happy and excited	Enjoyable experience	
There was a feeling of an enjoyable experience (among members of the team)		
We had desire to play		
The players never asked anything in return after the game	Intrinsic reward	
Letting us know what we had to do… that clarity was what we needed to finish off the extra time	Clear game plan	Game plan
I managed to overcome all that with my players by focusing them on my instructions.		
It was a good experience knowing that everyone was really clear on what they needed to do and just went out there and performed.		
Everybody knew the role they would be playing, their drills etc.		

Raw data statement	First order theme	General Dimension
We knew what we wanted to do	Clear game plan	Game plan
It was clear to us what was needed to be done		
We were so clear about what we had to do to beat the opposition		
Making sure everybody in the team knew exactly what we are trying to do, everybody knew exactly where to go		
They (players) were following the game plan very well	Following game plan	
We know how to play this game plan so we sort of stuck to that		
We had a good feeling during the game	Feeling good	Optimal arousal
It was a good feeling around the group		
There was a comfortable and relaxed mood in the team		
It is just a good feeling inside, and you feel warm, awesome		
We were full of positive energy	High energy level	
We could not get hyper enough		
Our moods were boosted by special plays		
Everyone was at their optimal point	Optimal arousal point	
The coach was sitting back	Coach laid back	Coaching style
He (the coach) knew we were playing good and all he had to do is just kind of sit back and let us do our thing.		
There was a feeling that they have done their part (coaching staff) now it is our (players) time		
I remember the coaching staff just taking a step back, you are fine sort of thing		
Not really saying too much. He (the coach) knew it was up to the players to win. When you are rolling in that momentum, you almost do not want to speak to the coach		
We had all the information needed and we pretty much did not need to be coached because we knew how we needed to do the job		
The coach did not need to say much		
We had a flat coaching system	Flat coaching system	
Basically he (coach) came in and made the system flat. There is no hierarchy, your say is important as everybody		
You did not feel that anyone was better than someone else		

Raw data statement	First order theme	General Dimension
His (coach) communication was very clear and direct	Good communication	Communication
We were communicating well with each other		
We had open communication		
We believed we were going to win	Confidence in winning	Confidence
We had a sense of real belief in winning		
Both players and the coach had confidence in their team's support structure. They felt they can take on any situation and still come through wining		
We had confidence that we were going to win the game		
They cannot stop us	Inevitability	
We were on a roll		
We knew it is going our way		
The confidence we had as a group was very good		
We had a lot of confidence in the team	Confidence in the team	
They (coaching staff) had enough confidence in us collectively as a group		
In our defence just by skinning more turn overs we gave our attack more confidence		
They are our biggest rivals	Special occasion	Special occasion
We had history with the opponent		
We played in higher levels than usual		
It was the finals of the tournament		
We were making history		
It was an especially important match		
This is a type of game that you remember		
We performed before a special audience (full stadium, family, recruiters, etc.)	Special Audience	
Fifty of the one hundred thousand people were there celebrating with us, and I think there must be some kind of effect going on		
The environment was very noisy		
We were really happy; people were encouraging, cheering even when we walked off at time out we were smiling	Physical and verbal support	Team support
Giving high fives it kind of feeds you, getting close to each other, patting on the back; Everyone came around me, everyone hugged up…		
They hug each other, and shout, they would get around each other		
We got a lot of physical and verbal support		
We had a lot of positive vibes from the bench		
They were cheering each other on		

Raw data statement	First order theme	General Dimension
Positive encouragement when you tackle someone they pick you up	Physical and verbal support	Team support
When people made a mistake you just brushed it off, it did not worry anybody		
We were doing tasks as a team	Team unity	
They got your back	Taking care of each other	
Everyone was out there for the team		
We just all felt good towards each other, we just felt yeah, it just felt right		

Appendix E

Letter to Flow Experts on Team Flow

Background of Team Flow

Although much has been learned about the terms – "team" (e.g. Carron, et al.,2005) and "flow" (e.g., Csikszentmihalyi, 1990), the combination of the two, creating the term "team flow", has been mostly neglected. Interest in "team flow" is based on the assumption that teams will perform best when they achieve "team flow". It is expected that when a team enters flow the athletes will be more in tune with each other, leading to a positive experience, contributing to successful achievement of their team goals (Cosma, 1999).

Definitions of Team Flow:

I. A state of optimal experience involving a team's total absorption in a task and a state of consciousness that optimizes performance (Cosma, 1999).
II. One's perception of other members of the group simultaneously experiencing flow, such that the experience is perceived on the team level (Quinn, 2005).

Critical issues:

The conceptualization of "team flow" has not been thoroughly discussed or agreed. Measurement of "team flow" to date has been based on instruments developed for "individual flow" (FSS-2, DFS-2) which ignore significant team dimensions such as team communication and team support.

Study 1: Conceptualizing Team Flow

Goal: Determining face and content validity for the items of team flow**.**

Participants- 12 (male-10, female-2) from Victoria, Australia; team sport players (n=5), coaches (n=5), and sport psychologists (n=2). Mean age - 34.5 years (SD = 10.85 years) Skill level- Junior National - 2, National - 4, International - 6.

Measures- Participants were recruited according to their field of expertise. A semi-structured interview guide was used in an hour long personal interview. Participants were asked to describe a recent game in which their team had an experience that stood out as being above average in some way; an experience where the participant felt that the team was totally absorbed in what the team was doing; where the team was gelling, and which was very rewarding in and of itself.

Analysis- All interviews were recorded and transcribed. The data was divided into two groups, players, and experts (coaches and sport psychologists). From the data, raw themes, and first order themes were identified and these were classified into general dimensions. Since the data was similar for both groups, the results were combined and the dimensions for "team flow" emerged.

Please be aware that some dimensions are similar to dimensions of individual flow, but it should be clear that the items refer to respondents' perceptions of the team's experiences, not of their individual experiences.

What I would like you to do:
Please read carefully each item, if the item is acceptable as a representative of the dimension give it a tick in the box following the item. If the item is broadly acceptable, but you suggest a minor change of wording to make it clearer or more precise, propose the amendment(s) using track changes. If you consider that the item is problematic please add a comment below the item to indicate the nature of your concern.

Note: In the final version of the measure the order of items will be randomly placed across dimensions, but to facilitate the process of judging their face validity for each dimension they are grouped here together.

Instructions for respondents
To help you contextualize the scale administration process, here are the instructions respondents will be given at the start of the final scale:
We are interested in your experience of team flow during competition. Team flow is the sense you have that all or most of the members of the team are totally focused on the team's performance, acting together in a highly coordinated way, almost without thinking.Can you remember an experience where the **team** stood out as being exceptional in some way, an experience where you felt that the team was totally absorbed in what the team was doing, the team was gelling, and the experience seemed to be very rewarding in itself? An experience where most or all of the teammates were in the "ZONE".

Please answer the following questions in relation to the team's experience. Answer the questions below, using this rating scale:

0 50 100

For each question, mark X on the scale that best matches the team's experience.

Team Challenge Skill Balance

- We were challenged but we believed the skills of the team would allow us to meet the challenge. ☐
- Our abilities matched the high challenge of the situation. ☐
- We felt we were competent enough to meet the high demands of the situation. ☐
- We felt the challenge and our skills were at an equally high level. ☐

Team Merging of Action & Awareness

- We made the correct movements without thinking about trying to do so. ☐
- Things just seemed to be happening automatically for us. ☐
- We performed automatically. ☐
- We did things spontaneously and automatically without having to think. ☐

Team Clear Goals

- Our goals were clearly defined. ☐
- We were clear about what we wanted to do. ☐
- We had a strong sense of what we wanted to do. ☐
- We knew what we wanted to achieve. ☐

Team Unambiguous Feedback

- We had a good idea while we were performing about how well we were doing. ☐
- We could tell by the way we were performing how well we were doing. ☐
- It was really clear to us that we were doing well. ☐
- We were aware of how well we were performing. ☐

Team Total Concentration

- Our attention was focused entirely in what we were doing. ☐
- It was no effort to keep our mind on what was happening. ☐
- We had total concentration. ☐
- We were completely focused on the task at hand. ☐

Team Transformation of Time

- At times, it almost seemed to us like things were happening ☐
- in slow motion. ☐
- Time seemed to alter for us (either slowed down or speeded up). ☐
- The way time passes seemed to us to be different from normal. ☐
- It felt like time stopped when we were performing. ☐

Team Autotelic Experience

- We really enjoyed the experience. ☐
- We loved the experience and want to capture it again. ☐
- The experience left us feeling great. ☐
- We found the experience extremely rewarding. ☐

Game Plan

- We knew what we needed to do. ☐
- The game plan was clear to us. ☐
- We followed the game plan. ☐
- We were clear about the game plan to be executed. ☐

Team Optimal Arousal

- We felt good during the performance. ☐
- We were at our optimal level during the performance. ☐
- We had a lot of positive energy. ☐
- There was a good feeling in the team during the performance. ☐

Team Coaching Style

- We perceived the coach was sitting back. ☐
- The sitting back coaching style fitted our team needs. ☐
- The coach was supporting our team but still letting us do our thing. ☐
- The coach was with the team but not interfering. ☐

Team Communication

- We had open communication with each other. ☐
- We understood each other. ☐
- We frankly shared ideas and thoughts. ☐
- We communicated clearly with each other. ☐

Team Confidence

- We believed we were going to win. ☐
- We were confident in our performance. ☐
- We had confidence in our team. ☐
- We knew the game was going our way. ☐

Team External Factors

- We sensed it was a special occasion. ☐
- The occasion was special for us. ☐
- It was a special game for us. ☐
- The excitement about the game helped us. ☐

Team Support

- We were supporting each other. ☐
- We were sharing team responsibilities. ☐
- We watched each other's back. ☐
- We brushed off mistakes that were made. ☐

Once you have read all the items in all the dimensions, please comment on the extent to which you feel that the items provide a balanced and comprehensive assessment of the dimensions of team flow (content validity).

Comments:
……
……
……
……
……
…….

Your willingness to share your knowledge and contribute to this project is sincerely appreciated.

Best Regards,
Erez Mosek

Appendix F

Informed Consent Form for Team Flow State Inventory

Practical interest in team flow is based on the assumption that teams will perform best when they achieve team flow. Once validated, the Team Flow State Inventory will provide a practical tool for athletes, coaches and sport psychologist working with teams in diverse sport fields. The aim of the TFSI is to assess to what extent the team who is experiencing team flow is functioning on its optimal level of performance and to specify the characteristics related to this optimal level.

By signing this consent form you are giving your consent to participate in this research study. Your involvement in this project will include filling out inventories related to your team and your own personal sport performance. Please refer to the same match for all the inventories. Your participation in the research study in completely voluntary and you have a right to stop your participation at any time with no consequences.

All information provided will be confidential. Any mention of your name, names of other people, and other features that could be used to identify you will be removed or coded in the written texts. Data will be secured and only researchers will be able to access it. At no time will your identity be revealed in any published reports.

Additional questions about this study can be directed to Erez Mosek, PhD student of the College of Sport and Exercise Science, Victoria University.
Email: teamflowsportinventories@gmail.com, Phone: (61)0410480011 or to
Prof. Tony Morris, Professor of Sport, Exercise and Health Psychology.

By marking the box below you indicate that you have been informed of the following procedures;

- participation is entirely voluntary;
- all information provided will be confidential;
- coaches will not receive any information about the study in which your individual responses can be identified;
- study results can be used for scientific reporting in a format that prevents the recognition of a single participation;
- you may withdraw consent and terminate participation at any time during the project, and upon request, you can receive a summary of the findings from this study;
- you are an active team sport player;

Approval of consent form

Appendix G

Team Flow State Inventory (56-itemTFSI) (Mosek, 2015)

We are interested in your experience of team flow during competition.
Team flow is the sense you have that all or most of the members of the team are totally focused on the team's performance, acting together in a highly coordinated way, almost without thinking.
Can you remember an experience where the **team** stood out as being exceptional in some way, an experience were you felt that the team was totally absorbed in what the team was doing, the team was gelling, and the experience seemed to be very rewarding in itself?
An experience where most or all of the teammates were in the "ZONE".

Please take a minute to understand what team flow is, and another minute to recall a specific game that your team was in flow. It might help you to close your eyes and think about the last game your team was in flow. For all scales think about the same game. Answer the following questions in relation to the **team's experience**.

Please mark an "X" at the most suitable place.

1. We were challenged but we believed the skills of the team would allow us to meet the challenge.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

2. We made the correct movements without having to think about them.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

3. Our goals were clearly defined.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

4. We had a good idea while we were performing about how well we were doing.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

5. Our attention was focused entirely on what we were doing.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

6. At times, it almost seemed to us like things were happening in slow or fast motion.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

7. We really enjoyed the experience.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

8. We knew what we needed to do.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

9. We felt emotionally in tune during the performance.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

10. We perceived that the coach was relaxed.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

11. We had open communication with each other.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

12. We believed we were going to win.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

13. We sensed it was a special occasion.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

14. We were supporting each other.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

15. Our abilities matched the high challenge of the situation.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

16. Things just seemed to be happening automatically for us.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

17. We were clear about what we wanted to do.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

18. We could tell by the way we were performing how well we were doing.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

19. It was no effort to keep our mind on what was happening.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

20. Time seemed to alter for us (either slowed down or speeded up).

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

21. We loved the experience and want to capture it again.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

22. The game plan was clear to us.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

23. We were at our optimal emotional level during the performance.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

24. The "hands off" (sitting back) coaching style fitted our needs.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

25. We understood each other.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

26. We were confident in our performance.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

27. We sensed it was a special occasion.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

28. We were sharing team responsibilities.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

29. We felt we were competent enough to meet the high demands of the situation.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

30. We performed automatically.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

31. We had a strong sense of what we wanted to do.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

32. It was really clear to us that we were doing well.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

33. We had total concentration.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

34. The way time passed seemed to us to be different from normal.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

35. The experience left us feeling great.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

36. We followed the game plan.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

37. We had a lot of positive energy.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

38. The coach was supporting out team but still letting us do our thing.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

39. We shared ideas and information frankly.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

40. We had confidence in our team.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

41. It was a special game for us.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

42. We watched each other's back.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

43. We felt the challenge and our skills were at an equally high level.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

44. We did things spontaneously and automatically without having to think.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

45. We knew what we wanted to achieve.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

46. We were aware of how well we were performing.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

47. We were completely focused on the task at hand.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

48. It felt like time stopped in specific moments of the game.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

49. We found the experience extremely rewarding.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

50. We were clear about the game plan to be executed.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

51. There was good feeling in the team during the performance.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

52. The coach was supportive of the team but not interfering.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

53. We communicated clearly with each other.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

54. We knew the game was going our way.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

55. The excitement about the game helped us.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

56. We did not dwell on mistakes that were made.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

Appendix H

Team Flow State Inventory (42-itemTFSI) (Mosek, 2017)

We are interested in your experience of team flow during competition.
Team flow is the sense you have that all or most of the members of the team are totally focused on the team's performance, acting together in a highly coordinated way, almost without thinking.
Can you remember an experience where the **team** stood out as being exceptional in some way, an experience were you felt that the team was totally absorbed in what the team was doing, the team was gelling, and the experience seemed to be very rewarding in itself?
An experience where most or all of the teammates were in the "ZONE".

Please take a minute to understand what team flow is, and another minute to recall a specific game that your team was in flow. It might help you to close your eyes and think about the last game your team was in flow. For all scales think about the same game. Answer the following questions in relation to the **team's experience**.

Please mark an "X" at the most suitable place.

1. We were challenged but we believed the skills of the team would allow us to meet the challenge.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

2. We made the correct movements without having to think about them.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

3. Our attention was focused entirely on what we were doing.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

4. At times, it almost seemed to us like things were happening in slow or fast motion.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

5. We perceived that the coach was relaxed.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

6. We had open communication with each other.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

7. We sensed it was a special occasion.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

8. We were supporting each other.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

9. Our abilities matched the high challenge of the situation.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

10. Things just seemed to be happening automatically for us.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

11. We were clear about what we wanted to do.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

12. We could tell by the way we were performing how well we were doing.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

13. Time seemed to alter for us (either slowed down or speeded up).

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

14. We loved the experience and want to capture it again.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

15. The game plan was clear to us.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

16. We were at our optimal emotional level during the performance.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

17. We understood each other.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

18. We were confident in our performance.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

19. We sensed it was a special occasion.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

20. We were sharing team responsibilities.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

21. We felt we were competent enough to meet the high demands of the situation.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

22. We performed automatically.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

23. We had a strong sense of what we wanted to do.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

24. It was really clear to us that we were doing well.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

25. We had total concentration.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

---

26. The way time passed seemed to us to be different from normal.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

27. The experience left us feeling great.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

28. We followed the game plan.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

29. We had a lot of positive energy.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

30. The coach was supporting our team but still letting us do our thing.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

31. We had confidence in our team.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

32. It was a special game for us.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

33. We watched each other's back.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

34. We felt the challenge and our skills were at an equally high level.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

35. We were aware of how well we were performing.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

36. We were completely focused on the task at hand.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

37. We found the experience extremely rewarding.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

38. We were clear about the game plan to be executed.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

39. There was good feeling in the team during the performance.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

40. The coach was supportive of the team but not interfering.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

41. We communicated clearly with each other.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

42. We knew the game was going our way.

No Agreement Total Agreement

0 10 20 30 40 50 60 70 80 90 100

Appendix I

Flow State Scale 2 (FSS-2) (Jackson & Eklund, 2002)

For the same game, please answer the following questions in relation to your experience. These questions relate to the thoughts and feelings you may have experienced while taking part in the game. There is no right or wrong answer.
Think about how you felt during the event and circle the number that best matches your agreement with the options given to the right of each question.

	Strongly Disagree	Disagree	Neither Agree or disagree	Agree	Strongly Agree
I was challenged, but I believed my skills would allow me to meet the challenge.	1	2	3	4	5
I made the correct movements without thinking about trying to do so.	1	2	3	4	5
I knew clearly what I wanted to do.	1	2	3	4	5
It was really clear to me how my performance was going.	1	2	3	4	5
My attention was focused entirely on what I was doing.	1	2	3	4	5
I had a sense of control over what I was doing.	1	2	3	4	5
I was not concerned with what others may have been thinking of me.	1	2	3	4	5
Time seemed to alter (either slowed down or speeded up).	1	2	3	4	5
I really enjoyed the experience.	1	2	3	4	5
My abilities matched the high challenge of the situation.	1	2	3	4	5
Things just seemed to be happening automatically.	1	2	3	4	5
I had a strong sense of what I wanted to do.	1	2	3	4	5
I was aware of how well I was performing.	1	2	3	4	5
It was no effort to keep my mind on what was happening.	1	2	3	4	5
I felt like I could control what I was doing.	1	2	3	4	5
I was not concerned with how others may have been evaluating me.	1	2	3	4	5

	Strongly Disagree	Disagree	Neither Agree or disagree	Agree	Strongly Agree
The way time passed seemed to be different from normal.	1	2	3	4	5
I loved the feeling of that performance and want to capture it again.	1	2	3	4	5
I felt I was competent enough to meet the high demands of the situation.	1	2	3	4	5
I performed automatically, without thinking to much.	1	2	3	4	5
I knew what I wanted to achieve.	1	2	3	4	5
I had a good idea while I was performing about how well I was doing.	1	2	3	4	5
I had total concentration.	1	2	3	4	5
I had a feeling of total control.	1	2	3	4	5
I was not concerned with how I was presenting myself.	1	2	3	4	5
It felt like time went by quickly.	1	2	3	4	5
The experience left me feeling great.	1	2	3	4	5
The challenge and my skills were at an equally high level.	1	2	3	4	5
I did things spontaneously and automatically without having to think.	1	2	3	4	5
My goals were clearly defined.	1	2	3	4	5
I could tell by the way I was performing how well I was doing.	1	2	3	4	5
I was completely focused on the task at hand.	1	2	3	4	5
I felt in total control of my body.	1	2	3	4	5
I was not worried about what others may have been thinking of me.	1	2	3	4	5
I lost my normal awareness of time.	1	2	3	4	5
I found the experience extremely rewarding.	1	2	3	4	5

Appendix J

Group Environment Questionnaire (GEQ) (Carron, Widmeyer, & Brawley, 1985)

This questionnaire is designed to assess your perception of your team. There is no right or wrong answers so please provide your immediate reaction. The following questions are designed to assess YOUR FEELINGS about YOUR PERSONAL INVOLVMENT with this team. Please CIRCLE a number from 1 to 9 to indicate your level of agreement with each of the statements.

I do not enjoy being a part of the social activities of this team.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

I am not happy with my selection to this current team.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

I am not going to miss the members of this team when the season ends.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

I am unhappy with my team's level of desire to win.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

Some of my best friends are on this team.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

This team does not give me enough opportunities to improve my personal performance.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

I enjoy other parties more than team parties.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

I do not like the style of performance on this team.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

For me this is one of the most important social groups to which I belong.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

The following questions are designed to assess your perceptions of YOUR TEAM AS A WHOLE. Please circle a number from 1 to 9 to indicate your level of agreement with each of the statements.

The team is united in trying to reach its goals for performance.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

Members of our team would rather go out on their own then get together as a team.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

We all take responsibility for any loss or poor performance by our crew.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

Our team members rarely party together.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

Our team members have conflicting aspirations for the team's performance.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

Our team would like to spend time together in the off-season.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

If members of our team have problems in practice, everyone wants to help them so we can get back together again.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

Members of our team do not stick together outside of practices and competition.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

Our team members do not communicate freely about each athlete's responsibilities during competition or practice.

Strongly Disagree								Strongly Agree
1	2	3	4	5	6	7	8	9

Thank you for your cooperation

Appendix K

Collective Efficacy Questionnaire for Sport (CEQS) (Short, Sullivan, & Feltz, 2005)

For the same game, please rate your team's confidence that your team has the ability to…

	Not at All Confident										Extremely Confident
1. Outplay the opposing team	0	1	2	3	4	5	6	7	8	9	10
2. Resolve conflicts	0	1	2	3	4	5	6	7	8	9	10
3. Perform under pressure	0	1	2	3	4	5	6	7	8	9	10
4. Be ready	0	1	2	3	4	5	6	7	8	9	10
5. Show more ability than the other team	0	1	2	3	4	5	6	7	8	9	10
6. Be united	0	1	2	3	4	5	6	7	8	9	10
7. Persist when obstacles are present	0	1	2	3	4	5	6	7	8	9	10
8. Demonstrate a strong work ethic	0	1	2	3	4	5	6	7	8	9	10
9. Stay in the game when it seems like your team is not getting any breaks	0	1	2	3	4	5	6	7	8	9	10
10. Play to its capabilities	0	1	2	3	4	5	6	7	8	9	10
11. Play well without your best player	0	1	2	3	4	5	6	7	8	9	10
12. Mentally prepare for this competition	0	1	2	3	4	5	6	7	8	9	10
13. Keep a positive attitude	0	1	2	3	4	5	6	7	8	9	10
14. Play more skillfully than the opponent	0	1	2	3	4	5	6	7	8	9	10
15. Perform better than the opposing team	0	1	2	3	4	5	6	7	8	9	10
16. Show enthusiasm	0	1	2	3	4	5	6	7	8	9	10
17. Overcome distractions	0	1	2	3	4	5	6	7	8	9	10
18. Physically prepare for this competition	0	1	2	3	4	5	6	7	8	9	10
19. Devise a successful strategy	0	1	2	3	4	5	6	7	8	9	10
20. Maintain effective communication	0	1	2	3	4	5	6	7	8	9	10