Chapter 1

Introduction

“Hockey, more than any other game, is etched in the Indian psyche. It is hockey that brings out the magic and mystery, the poetry and prose in Indian sport.”

-R. Sardesai (1992)

The history of the game of hockey has its roots well laid in the world’s early civilizations. One of the oldest known sports, the game is believed to be in existence about 1200 years before the Ancient Games of Olympia. Right from Arabs, Greeks, Romans, Persians to Ethiopians, everyone played a variation of the game. While some played it just for recreation, the others were of the opinion that hockey would make them better warriors. Even though many ancient civilizations played hockey in different variations, the modern game of hockey, the field hockey developed in the British Isles in the 19th century. A popular English school game, hockey was introduced in India by British Army regiments and the game soon found to be of favour among the native Indians. Spreading internationally, the popularity of the game was especially effervescent in India and Pakistan.

Hockey is the only team event in which India has won Olympic Gold Medals - 8 of them. It is considered as the National Game of India. Unmatched excellence and incomparable virtuosity brought India a string of Olympic gold medals. The Golden Era of hockey in India was the period from 1928 - 1956 when India won 6 consecutive gold medals in the Olympics. During this period, India played 24 Olympic matches, won all 24, scored 178 goals (at an average of 7.43 goals per match) and conceded only 7 goals. The Indian stranglehold over the Olympic hockey gold came to an end, when Pakistan defeated India in the final of the 1960 Rome Olympics. However, the record created by India is likely to stand strong through ages, as no other country has ever managed to come close to it. The two other gold medals for India came in the 1964 Tokyo Olympics and the 1980 Moscow Olympics.
What is so peculiar with recent Indian hockey is its inability to handle success. Winning Modern hockey is more psychological than any other factors in elite level. At the elite level, preparation for winning field hockey focuses on the physical aspects of the game. Drills are designed to improve conditioning and physical skills like stick handling, passing, shooting and marking the opposition. Mental skills like focus and emotional control are relatively neglected. Understanding the psychological factors that accompany successful athletic performance is a high priority for applied sport psychology, with a major area of focus being mental links to optimal performance. To advance knowledge in this area, it is important to examine specific psychological constructs with theoretical relevance to optimal performance in order to understand what psychological processes might be contributing to quality of performance.

Sport psychology is a science that utilizes the techniques and principles of psychology specifically in physical activity settings (Cox, 1998). The still evolving field of sport psychology pulls from the research and knowledge of several other areas of psychology, including social psychology and psychophysiology, to help coaches and athletes understand the elements of themselves and those around them pertaining to sport, performance, and exercise.

Currently, the field of sport psychology deals with many different issues that face athletes. Sport psychologists seek to work with athletes in areas such as team dynamics and recovery from injury in order to optimize their abilities. However, trying to understand and solve the issues facing athletes today is an important part of sport psychology. It is the question of why humans participate in sport in the first place that is becoming increasingly important. Participation in sport has been one of the most significant forms of human expression. For centuries, men and women sought to display their power through feats of speed and strength. Ancient athletes would undergo months of strict training in order to prepare for the early athletic games (Csikszentmihalyi, 1990). Following the same tradition, modern athletes also undergo such strict training. It is not uncommon for today’s Olympians or even high school and college athletes to give their time and money over to grueling preparation for an upcoming competition. Athletes risk their bodies and their health daily in order to prepare to be the best in their area of concentration. They undergo daily pain and
sacrifices in the hope that it will all be compensated in one major competition. But the reality is that even though most athletes are willing to sacrifice their minds and their bodies for the gains of competition, most of them will never experience a world renowned win or celebrity status.

The grueling nature of sport begs the question of its purpose. If sport requires tremendous sacrifices for often little gain, why do humans still seek participation? This question is one that fuels current sport psychology research in the area of “flow.” Csikszentmihalyi (1990) hypothesized that all humans seek optimal experience in life, which means that somehow, sport must offer some sort of optimal experience. He later developed a theory that referred to this optimal experience as “flow”. His theory suggests that the reason most athletes continue in participation in sport is because of the flow experience.

The concept of "being in the zone" during an athletic performance fits within Csikszentmihályi's description of the Flow experience. The theories and applications of "being in the zone" and its relationship with athletic competitive advantage are topics studied in the field of sports psychology. The concept of flow has gained increasing attention by researchers of various disciplines, since its introduction by Csikszentmihalyi (1975) The term “the zone” is frequently used in the sport psychology literature, outlining a state of high intensity, strong focus, superior performance (Young, 2000), and peak experience (Murphy & White, 1995), which is indicated by heightened awareness and intrinsic motivation (Frederick-Recasino & Morris, 2004). Tolson (2000) described playing in the zone as “when the body is brought to peak condition and the mind is completely focused, even unaware of what it’s doing, an individual can achieve the extraordinary” (p. 38). Being in the zone is characterized by complete focus and merging of body and mind, which is indicated by optimal information processing reflecting automaticity. The execution of a skilled movement requires little conscious attention and processing which mirrors the state of mind when being in the zone or in flow (Cox, 2002; Csikszentmihalyi, 1990).

Young (2000) employed the terms” zone” and “flow” interchangeably, denoting an optimal experience and performance. Csikszentmihalyi’s (1975) initial concept of flow was illustrated as a corridor in which optimal experience is more
likely to occur. Csikszentmihalyi referred to this zone of optimal experience and arousal as the “flow channel” (p. 51). To enter the flow channel, or the zone, individuals need to perceive a balance of personal skills and situational challenges. Being in this zone was reflected by the absence of anxiety, boredom, or relaxation, and would occur as a function of the challenge-skill balance. Dropping out of the zone is due to either challenge exceeding personal skills (anxiety), or skills surpassing situational challenges (boredom). To re-enter the flow channel would involve strengthening one’s skills or increasing current challenges to regain a match between these two components. Privette (1983) proposed several factors, such as absorption, joy, involvement, spontaneity, awareness, loss of time, and temporality, to be a reflection of communal aspects of peak performance and flow. According to Privette, experiences of flow and peak performance are characterized by active processes, indicating interactivity and responsiveness between athletes and their environments. Similar to Csikszentmihalyi’s (1975) flow experience, Privette(1983) proposed that peak performance manifests in a holistic experience as indicated by a clear focus and a strong awareness of one’s action and one’s self. Sport activities are bounded by a set of rules that promote specific action opportunities within training or competition situations. Both kinds of situation provide an array of intrinsic and extrinsic rewards that may influence flow. Training situations, on the one hand, offer fewer distractions, which could facilitate the experience of flow (Jackson & Csikszentmihalyi, 1999; Young, 2000). Competitions, on the other hand, are characterized as particularly stressful situations, in which athletes experience the pressure of winning or losing. Therefore, athletes’ expectations of future outcomes can interfere with and disrupt the experience of the task at hand.

Csikszentmihalyi (1975) proposed different reward structures for direct or indirect competitions. Basketball and tennis are examples of direct competitions in team and individual sports. These sports are characterized as zero-sum activities, meaning that winning or losing are inherent aspects of the direct competition, producing the same number of losers and winners. The rewards from direct competition are mainly derived from measuring self against others, evaluating personal performance against the opponents’ performance. Sports like dancing or rock climbing represent indirect competitions, in which athletes contend without immediately evaluating their performance against others. In those situations, athletes mainly derive rewards from measuring their performance against their own ideal.
One important difference between the two competition settings is that athletes are able to exert more control over their performance in indirect competitions than in direct competitions. Because of sequential performances there is no immediate influence through the opponent, whereas direct competitions are interactive and athletes’ performance directly depends on the opponents’ performance. Therefore, positive, intrinsic rewards might be more readily available in indirect competitions, which might provide an immediate trigger for flow.

Similar to the views of Csikszentmihalyi (1975), Deci and Ryan (1985) argued that direct and indirect competitions provide different sources of rewards and feedback. Depending on the competitors’ interpretation, rewards and feedback can be perceived as either controlling or informational. Controlling feedback becomes more important when the competition is undertaken for instrumental reasons, such as winning or aiming for recognition. Informational feedback in competition focuses on the athletes’ effectiveness and competence. Deci and Ryan concluded that an increase in perceiving controlling feedback in any situation would debilitate intrinsic motivation, whereas an increase in the perception of informational feedback would facilitate intrinsic motivation. This argument also appears to be valid for the experience of flow. Interpreting feedback as instrumental and controlling by focusing on the achievement of a specific performance outcome would tend to prevent flow, because athletes are less likely to get immersed in the here and now. Their thoughts are revolve around some future result, such as winning, and rewards that are associated with the future result. Informational feedback, on the other hand, would constructively contribute to athletes assessing the performance at hand, which would be valuable information regarding athletes’ competence and ability, adding to current experiences, such as flow. Consequently, the way athletes’ derive rewards appears to have an impact on flow and performance. The characteristics of the reward structure of the competition setting, as well as athletes’ interpretation of feedback within the setting, seem to be important factors influencing the intensity of flow state.

Csikszentmihalyi (1990) argued that there are particular activities that are more likely to produce flow, and personal traits that help people achieve flow more easily. A critical qualification of this state is that flow is not dependent upon the objective nature of challenges or the objective level of one's skills, but that flow is
entirely dependent on one's perception of the challenges and their skill (Csikzentmihalyi, 1975). Flow ranges from repetitive, almost automatic behaviour that provides a small increment of enjoyment to a very complex behaviour. Micro flow, for example, may be as inconsequential as chewing gum, whereas deep flow or macro flow has a full range and depth of potential, which may be accompanied by an ecstasy which describes this as the end result of being in flow, a feeling of doing something for its own sake, with no expectation of future reward or benefit. Jackson (1996) found support for these dimensions in a qualitative analysis of elite athletes’ flow descriptions. Jackson & Marsh (1996) further argued that a multi method approach is needed to understand flow, incorporating both qualitative and quantitative research. In particular, they urged the importance of establishing the validity of the various constructs said to underlie the flow experience and relating these dimensions to other psychological states.

An important aspect of the experience of flow in an activity or a competition is the perception of personal performance. Csikszentmihalyi (1975, 1993) reported a positive connection between flow and performance. Researchers have given little attention to a possible cause and effect relationship between flow and performance. One of the few studies on this topic was conducted by Massimini, Csikszentmihalyi, and Fave (1988), who examined individuals with different backgrounds, such as dancers, white collar workers, and students, to identify what marks the onset of their flow experience. The most frequent answer, given by over 40% of the respondents, was the activity itself. Massimini et al. concluded that “the performance of the activity was enough to trigger the experience”. Jackson and Csikszentmihalyi (1999) supported this finding, outlining that “familiar stimuli often do facilitate immersion in the activity and help to bring about flow”. Based on these research findings and theoretical discussions on flow and performance, there appears to be a causal relationship in which performance influences flow. In addition, flow also seems to have an influence on performance. With regard to swimming, Csikszentmihalyi (1993) argued that students, who reported flow in a learning situation, made better progress than students who did not report flow. In addition, Jackson and Csikszentmihalyi (1999) argued that the preparation for a sport event, which culminates in physical and mental readiness, is important for the experience of flow. These theoretical propositions and research findings indicate that flow has the
potential to positively influence performances. Therefore, the relationship between flow and performance appears to be reciprocal, in which flow influences performance and vice versa. At this point, the results are too vague to draw conclusions on whether there is a one directional connection between flow and performance or between performance and flow. More research is needed to untangle the relationship between flow and performance and to further examine directional or reciprocal links. Even though there is no strong evidence on the directional effects between flow and performance, aiming to increase both flow and performance would be preferable, so that one or both variables further enhances the other. Even if flow does not have a direct effect on performance, it would be worthwhile to enhance flow, because of the benefits of flow for intrinsic motivation and, hence, effort and persistence, which would have a mediating effect on performance.

Previous researchers have examined possible associations between flow state and athletic performance (Jackson, Kimiecik, Ford, & Marsh, 1998; Jackson, 1992, 1993, 1995; Jackson & Roberts, 1992; Stein, Kimiecik, Daniels, & Jackson, 1995). The apparent association between flow state and peak performance (Jackson, 1992, 1993; Jackson & Roberts, 1992; Privette & Bundrick, 1991) makes understanding flow tantamount to the athlete, coach, and sports psychologist. Csikszentmihalyi’s (1990) research on flow has identified nine interlinking dimensions that characterize the flow state. Research in the sport context has confirmed the validity of these nine dimensions (Jackson & Eklund, 2004): (1) a balance between challenges and skills; (2) a merging of action and awareness; (3) clear goals; (4) unambiguous feedback; (5) total concentration on the task at hand; (6) sense of control; (7) loss of self-consciousness; (8) transcendence of time; and (9) autotelic experience. Knowledge gained of these factors is important in helping athletes to prepare for optimal performance. Flow is a construct that both excites and mystifies those seeking to understand and experience it, because it represents those moments when everything “come together” for the performer, it is a much sought-after state, it is not, however, an easy state to achieve for most people; thus it can be perceived as being out of reach and somewhat mysterious. Nonetheless, even though flow cannot be controlled and produced on demand, it can be understood and is attainable for most people. Csikszentmihalyi (1990) argues that after a flow experience, the self becomes more complex through the processes of differentiation and integration. Briefly,
“differentiation” refers to increase in distinctiveness, and “integration” to growth in communication and cohesiveness. Differentiation occurs through the seeking out of new challenges, while integration is linked to an increase in skills to meet those challenges. Complexity stems from the optimal development of both differentiation and integration. Flow leads to personal growth and growth in complexity, and provides a rewarding and inspiring process to get there.

The measurement of flow comprises both qualitative and quantitative approaches. Csikszentmihalyi (1975) developed the concept of flow on the basis of results from in-depth interviews with surgeons, music composers, and athletes. To overcome limitations of conventional data collection, Csikszentmihalyi developed the Experience Sampling Method to assess flow at any time during various activities. Equipped with pagers and a sampling form, participants were beeped at different times and filled out a short questionnaire regarding their experience at that time. Based on qualitative findings on flow in general life, Jackson (1992, 1995, 1996) examined the flow experience in sport, using in-depth interviews. In addition, Sparkes and Partington (2003) assessed flow through narrative practice and story telling. Using quantitative measures, flow in sport has been examined on a state and a dispositional level. The Flow State Scale (FSS; Jackson & Marsh, 1996) was established to assess flow state, that is, the experience of flow on a specific occasion, whereas the Trait Flow Scale (TFS; Marsh & Jackson, 1999) measures the extent to which a person generally experiences flow in a specific context, such as training or competition situations. Based on item modifications to improve measurement of flow factors, the FSS and TFS were revised, producing the Flow State Scale-2 (FSS-2; Jackson & Eklund, 2002) and the Dispositional Flow Scale-2 (DFS-2; Jackson & Eklund, 2002).

History is full of examples of talented teams that failed to live up to expectations or less talented teams that performed far above expectations. There is more to success than the individual skills of the members of a team. The well established principle that a group of individuals working together is far more effective than the same individuals working independently of one another. Need for team members to work together (teamwork) as well as need to like each other and enjoy playing together is crucial for team success. That is when individual roles of team
members are important. Cohesiveness enable the team to function together more smoothly and effectively.

There are many group dynamics that take place within a sporting team. One of the most important is cohesion. One always hears about how important it is for a team to "gel" or "bond" or "have good chemistry." Cohesive teams can achieve dramatic and awesome things. The way players interact has a tremendous impact on the way a team performs. As Hall (1960) put it, "The fittest to survive and succeed are those able to find their strength in cooperation, able to build teams based upon mutual helpfulness, and responsibility for one’s fellow teammates."

The level of sports team cohesion within and outside of athletic activity is impacted by several factors. Carron et al. (1982) suggests that environmental, personal, leadership and team factors all play a role in determining the cohesiveness of a group or team. Environmental factors include factors which influence the team setting, such as the type of sport (Carron, 1982). For example, a soccer team is much more collectivistic in nature, with eleven players working together to achieve the same goal, than more individualistic sports such as track. Track teams are typically highly individualistic with few team aspects, making it harder to unite towards a common goal. The differences in the nature of the sport, in this example collectivistic versus individualistic nature, ultimately change the dynamics of the group environment affecting cohesion amongst team members. On the other hand, personal factors include individuals’ beliefs towards how they relate to the team, and what role they personally feel they play within the team setting (Prapavessis & Carron, 1997).

Another personal factor that contributes to team cohesion is seen when an athlete shows loyalty and commitment through a sacrifice for the success of the team (Prapavessis & Carron, 1997). Spink (1998) noted that leadership factors are also important precursors of cohesion. When poor leadership is in place, the team may have a difficult time finding a common goal to work towards, thus making it more difficult to unite and become cohesive as a group. Without a leader to direct a team towards a common goal, a team can become disjointed. Team factors also influence the perceived cohesiveness of a team, and include maintaining membership and the
team’s engagement in pro-social behaviours (Prapavessis & Carron, 1997). How well team members get along and how much effort they may put into the team as a whole can influence the perceived cohesiveness of a team. To establish cohesion, everyone needs to be on the same page when it comes to team goals. If everyone is striving towards the same thing this will help cohesion develop. Productivity must be established by setting challenging and specific goals. Making sure that the members know what the individual goals are, for themselves and their teammates, is very important. If one knows what his teammates are striving for, one can always aid them in their endeavour, which will lead to a more cohesive relationship. There can be no hidden agendas by any of the members, their goals must coincide with team goals. What is good for the team has to be good for the individual and vice-versa. There is no substitute for the player’s own perception of what is going on not only for him, but also for the team that he is playing on. How a player views the interworkings on the team is a very valuable information when evaluating the level of team cohesion.

The central focus on what teams have to do—their task—is the key factor that distinguishes a social-psychological perspective on the study of teams, in which the task is merely a means to prompt interpersonal interaction, from an organizational perspective, in which the task is the source of goals, roles, and task-based exchanges. For the latter, interpersonal interaction is relevant, but it is in the background rather than the foreground. The team task determines two critical issues. First, it sets minimum requirements for the resource pool—the constellation of team-member individual differences and capabilities—that is available across team members. If members collectively lack necessary knowledge, skills, abilities, or resources to resolve the team task, the team cannot be effective. Second, the team task determines the primary focus of team-member activities. Our focus is on teams that primarily do things and that, in the process of striving toward and accomplishing goals, also have to make decisions and create, invent, and adapt solutions to resolve task-driven problems.

Sports psychologists have largely adopted the group dynamics literature in describing the process by which teams strive to become united and purposive in pursuit of collective goals (Festinger, Schacter, & Back, 1950; Gross & Martin,
As noted by Brawley (1990), team cohesion represents one of the few research topics about which mainstream psychology has acknowledged the potential contribution of sport-related findings in advancing the overall knowledge base of the field. Recently, however, criticism has been raised concerning the theoretical approach and lack of cultural perspective of investigations into the determinants and consequences of group process in sport (Weinberg Grove, & Jackson, 1992; Widmeyer, Carron, & Brawley, 1992). Although basic research has addressed the measurement of team cohesion and the cohesion-performance relationship, applied efforts have lagged in providing empirical evidence to support proposed behavioural approaches to team management, such as cohesion strategies (Brawley, Carron, & Widmeyer, 1987; Carron, 1988; Widmeyer, 1994). A review of group dynamics research reveals that what actually contributes toward building an effective group may run contrary to what intuition would suggest. Sport coaches naturally assume that a generic, positive approach to coaching maximizes team spirit, producing greater team success as a consequence (Kremer & Scully, 1994). More accurately, team cohesion represents a multidimensional process involving specific coaching behaviours as well as the interactions among coaches, teams, individual team members, and overall sport context (Carron, 1982, 1984). Various personal and situational factors have been shown to mediate how a coach affects his or her team. The most frequently investigated aspects include the coach's attributes (Vealey, Udry, Zimmerman, & Soliday, 1992; Weiss & Friedrichs, 1986), team gender (Black & Weiss, 1992; Chelladurai & Arnott, 1985), sport type (Ruder & Gill, 1982; Williams & Hacker, 1982; Williams & Widmeyer, 1991), importance of team goals (Carron, 1984), and athletes' satisfaction (Ball & Carron, 1976; Robinson & Carron, 1982). In particular, Widmeyer and Williams (1991) provided initial evidence that certain coaching strategies may be used to increase task or social cohesion among members of sport teams. However, less is known concerning the subcultural influence of the sporting environment.

Allison (1988) proposed several directions for comparative sport research, each of which may be applied to sports coaching, and more specifically, to team cohesion coaching strategies. First, the process of sport team development must be compared across sport cultures, a process that requires an assessment of the meaning, role, and value ascribed to cohesion within the particular team setting. Second, the
international nature of sport suggests that coaches, athletes, and teams represent a variety of cultural influences and experiences. Hence, it would be important to identify the cross-cultural factors that alter team cohesion. Various group dynamics research reveals that what actually contributes toward building an effective group may run contrary to what intuition would suggest. Sport coaches naturally assume that a generic, positive approach to coaching maximizes team spirit, producing greater team success as a consequence (Kremer & Scully, 1994). More accurately, team cohesion represents a multidimensional process involving specific coaching behaviors as well as the interactions among coaches, teams, individual team members, and overall sport context (Carron, 1982, 1984).

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Common sense would dictate that highly cohesive teams are likely to be highly successful teams. This is traditional sporting wisdom, and it certainly seems logical to expect that a highly cohesive team would be likely to achieve more than a team rife with discontent, conflict and disruption. However, it is altogether unreasonable to assume that all successful teams are also highly cohesive in nature, there is and will always be glaring exceptions to this rule. The reality of sport is that nobody can win all the time. The occasional losing streak plagues even the best of teams, and when times get tough, cohesion is quite literally the glue that holds a team together. Cohesion, in the context of teams, is all about the joining together of individuals to form a united and cooperative whole. Cohesion is an overall measure of group togetherness, and is based on three key factors: interpersonal attraction, defined as the tendency of one person to evaluate another person in a consistently positive manner; individual commitment, towards the collective and its objectives/goals; and feelings of personal satisfaction and pride, based upon the perceived achievements and/or opportunities derived from membership. If all three of these factors are found to be abundant within the majority of team members, the said team can therefore be considered relatively cohesive.
Statement of the Problem

The purpose of this study is to analyze the flow states and team cohesion in male field hockey players.

The subordinate purpose of the study was to assess:

The nine dimensions in flow scale, that are challenge-skill balance, merging of action and awareness, clear goals, unambiguous feedback, concentration on the task at hand, sense of control, loss of self consciousness, transformation of time, autotelic experience.

In team cohesion, four measures of cohesiveness are assessed: individual attraction to group - task; individual attraction to group –social; group integration – task and group integration –social.

Limitations

1. Questionnaire research has its limitations, any bias that may enter into the subject on this account may be considered as a limitation to this study.
2. Life style of the subject is beyond the control of researcher. Though effort will be put to control the groups, any other factor that may bring an influence is another limitation in the study.

Delimitation

1. This study was delimited to the 91 South Indian Universities and professional clubs.

2. It was also delimited to selected questionnaire in assessing the flow states of the hockey players

Hypothesis

On the basis of the literature gone through, research finding and the scholar’s understandings of the problem, the following hypothesis is formulated.
**Ho1**: Flow states of various teams would have a different pattern.

**Ho2**: There would be significant difference in the Group Cohesion of various teams in,

a) Individual attraction to group-task (ATG-T): It is a composite measure of individual team members’ feeling about their personal involvement with the group task, productivity, and goals and objectives.

b) Individual attraction to group-social (ATG-S): It is a composite measure of individual team members’ feelings about personal involvement, desire to be accepted and social interaction with the group.

c) Group integration task (GI-T): It is a measure of individual team members’ feelings about the similarity, closeness, and bonding within the team as a whole around the group’s task

d) Group integration –social (GI-S): It is measure of the individual team members’ feelings about the similarity, closeness, and bonding within the team as whole around the group as social unit.

**Definition and explanation of terms**

**Flow**

Mihaly Csikszentmihalyi was the first to use the flow-concept in Western psychology (Csikszentmihalyi, 1977). In his first book on the topic *Beyond Boredom and Anxiety* (Csikszentmihalyi, 1977) he describes flow as “the holistic sensation that people feel when they act with total involvement”. Flow was first described as an autotelic experience. The word autotelic comes from the Greek word *auto* which means self, and *telos* which means goal or purpose, and refers to an activity that is rewarding for its own sake (Csikszentmihalyi, 1977). An autotelic experience happens when a person does something that is intrinsically motivating. Deci & Ryan (1985) proposed that flow can signify a purer instance of intrinsic motivation. Csikszentmihalyi (1991) has suggested that when experiencing the state of flow in an activity several times, a person will perform that activity for its own sake; thus the activity becomes intrinsically motivated.
Within a sport context, Jackson (1992) defined flow as a “psychological process involving a state of total absorption into an activity and with experiential characteristics that make the experience so intrinsically rewarding that the experience of flow becomes a goal in itself”. Introducing a sport-specific model of flow, Kimiecik and Stein (1992) adopted a definition from Csikszentmihalyi (1990), defining flow as “autotelic experience (performed for its own sake) accompanied by above average feeling states that begins when perceived challenges and skills are above average, and are in balance”. Previous definitions of flow have incorporated and highlighted dimensions of flow and processes underlying the generation of the flow state. In addition, the definitions have emphasized the connection between personal and situational aspects and flow. A working definition that includes the essential characteristics of the definitions stated in this section could be thus summarized: Flow in sport is affected by personal and situational interactions, including a match between personal skills and current challenges in a structured activity that is important to the self, and which positively influences cognitive and motivational processes, being exclusively directed on the task at hand and leading to a holistic state characterized by absorption and positive affect, such as an autotelic experience. This definition is not original, but it reflects key aspects of previous flow definitions.

Flow is important to athletes, because it facilitates peak performance. When inflow, athletes can be pushed to the limits of their performance (Jackson & Csikszentmihalyi, 1999). Flow is also important to athletes because the experience of flow is rewarding for its own sake, i.e. autotelic or intrinsically motivated. Without flow one might lose the feeling of enjoyment in doing sports (Jackson & Csikszentmihalyi, 1999). According to Jackson and Csikszentmihalyi (1999) there are nine essential elements of the flow state that make athletic activities intrinsically interesting in relation to sports. Jackson and Eklund (2004) developed a scale, the Dispositional Flow Scale (DFS) based on these elements, or dimensions, which are thought to constitute the optimal psychological state of flow (Jackson & Csikszentmihalyi, 1999; Jackson & Eklund, 2004).
1) **Challenge-skill balance**: The first dimension of the flow state is based on Csikszentmihalyi’s Challenge-Skill Ratio (CSR), which is the most important part of the definition of flow (Csikszentmihalyi, 1991). In the Model of the Flow State, later to be known as CSR, Csikszentmihalyi (1977) explains two criteria for an optimal experience of flow: a) The perceived challenge in an activity has to be in balance with an individual’s perceived capabilities and skills, and b) perceived challenge and perceived skills needs to be high. If the perceived challenge is high and the perceived skills are low, one could experience anxiety. If the opposite is true, the perceived challenge is lacking and the perceived skills are high; one could experience boredom or relaxation. If both the perceived challenge and skills are low, apathy will result, which leads to a feeling of low energy levels, boredom and a lack of attention (Csikszentmihalyi, 1977; 1991). Flow is experienced when perceived capabilities match the perceived challenges (Csikszentmihalyi, 1991). It is important to remember that it is the subjective perception that predicts flow; what the person thinks his or her capacities are, and what available opportunities the person has to meet the challenges. The belief of what one can do, rather than actual abilities, will determine the experience (Jackson & Csikszentmihalyi, 1999). Examples of challenges one might meet in sports are physical, mental and technical.

2) **Merging of action and awareness**: This dimension refers to an awareness of ones actions, but one is ignorant of this awareness. It is like mind and body fusing into one. The person is feeling as one with his or her natural and spontaneous movements, and is totally absorbed in the activity. There is a feeling of effortless movement, like being on automatic pilot, even when pushed to the limits of ones capacity (Jackson & Csikszentmihalyi, 1999). Athletes often call this “being in the zone” (Jackson & Eklund, 2004). To reach this merging of action and awareness, the skills need to match the challenges, which make this dimension closely aligned to the challenge-skill balance (Jackson & Eklund, 2004).

3) **Clear goals**: The goals need to be so clear that the athlete knows exactly what to do, which will lead to greater concentration and attention (Jackson & Eklund, 2004). The clarity of purpose occurs on a moment-to-moment basis, which leads the performer to be fully concentrated on the task (Jackson & Csikszentmihalyi, 1999).
4) **Unambiguous feedback**: This dimension of the state of flow refers to knowledge about how one is performing, which allows continuity in the persuasion of goals (Jackson & Csikszentmihalyi, 1999). The feedback can be on kinaesthetic awareness, or on the quality of one’s performance (Jackson & Eklund, 2004).

5) **Concentration on the task at hand**: The task at hand is the focus of attention, on “here and now”, and other thoughts are not present. Crowds, noise and distractions are not registered, or not influencing, when totally concentrated. Athletes are focused on doing their job, or focused on their movements. It should be noted that focus on components or team mates can also be important in some sports, for example football (Jackson & Csikszentmihalyi, 1999).

6) **Sense of control**: There are no worries about not having control. This dimension reflects the capability of doing whatever challenges one might encounter, without having fear of not being able to make it (Jackson & Csikszentmihalyi, 1999). The task is doable; the person can do no wrong, and feelings of power and confidence result. One is unbeatable and has all the skills one needs. However, too much control might get a person out of flow, and too little control can lead to anxiety (Jackson & Eklund, 2004).

7) **Loss of self-consciousness**: This dimension represents a total loss of consciousness of one's identity, and “feeling as one” with the activity. Worries, self doubt, self concerns and negative thoughts disappear when in flow. There are no worries about how others might perceive the person (Jackson & Eklund, 2004). However, this dimension might differ in importance for different kinds of sports; for example, figure-skating depends on how others are viewing the performance of the skater (Jackson, Ford, Kimiecik, & Marsh, 1998).

8) **Transformation of time**: The perception of time is different, it either feels like it speeds up or it slows down. Hours can seen like minutes, and minutes like seconds. Sometimes minutes can seem like forever, and one has all the time in the world to perform (Jackson & Eklund, 2004).

9) **Autotelic experience**: People seek the experience primarily for its own sake and there are no goals or rewards external to the experience (Jackson & Eklund, 2004).
This dimension appears to be closely aligned to intrinsic motivation (Jackson & Csikszentmihalyi, 1999).

Research has shown that each one of these dimension is part of the definition of flow (Jackson & Csikszentmihalyi, 1999; Jackson & Eklund, 2004; Jackson et al., 1998; Jackson, Thomas, Marsh, & Smethurst, 2001). However, Jackson and Eklund (2004) have proposed that some of these flow dimensions can be more relevant than others, and for different kinds of athletes. The challenge-skill ratio has been an important part of the definition of flow (Csikszentmihalyi, 1991). Thus, the challenge–skill balance, which is based on the challenge-skill ratio, seems to be of special importance. Since Csikszentmihalyi’s (1977) initial research on flow, there have been few studies concerning flow in athletes (Sugiyama & Inomata, 2005) except for the work done by Jackson (Jackson & Csikszentmihalyi, 1999; Jackson & Eklund, 2004; Jackson et al., 1998; Jackson et al., 2001). Jackson and Eklund (2004) developed and revised the dispositional flow scale (DFS-2) to assess athletes’ experience of the nine flow characteristics. The athletes are asked about general experiences of the flow experience in a particular activity the athlete chooses. Another scale developed by the same authors is the flow state scale-2 (FSS-2), which assesses the flow state right after completing an activity. Csikszentmihalyi (1975) attributed the flow to the situation where the person is performing on the edge of his or her abilities. According to this model, flow can occur when the challenge provided by the activity is high enough but the skills of the person can still control the situation (i.e. challenge and skills are balanced and on high enough level (see figure 1).
Figure 1. The four-channel model of flow.

According to this model, flow can occur when both challenges and skills are high. High challenges but low skills result in anxiety, the reverse situation results in boredom. Apathy is a later, and rather controversial, addition. (Adapted from Ellis, Voelkl & Morris, 1994.) The four-channel model was the first and has since been the most used flow model, but concerns about how the concept should be operationalized have emerged. The model does not specify how the challenge and skills should be assessed, how “high” is defined, or what “the balance” means. It has also been reported that people actually enjoy more a situation where skills are greater than challenges, than a situation where both are high (Carli, Delle Fave & Massimini, 1988; Clarke & Haworth, 1994; Ellis et al., 1994). What is immediately distinguishing about almost all commentary on the flow experience is its thoroughgoing metaphorical content. Flow occurs because psychic energy is invested, consciousness is ordered, undreamed states of consciousness are reached, and when we are immersed into activity. Flow doesn't refer to behavioural, neural, or somatic variables, but to other domains of perceptual experience that reflect disembodied levels of experience.
Flow is composed of distinctive rational, perceptual, and emotional domains that follow with each other like the chain of boxes in a flow chart. Thus a demand/skill match is followed by attention that is followed or attended to by 'senses' of playfulness, self control, enjoyment, etc. All of these different domains act as different segmented psychological faculties. These domains represent different psychological phenomena, and are seen as separate but interacting agencies. Flow is distinctive among motivating processes because it is not only signaled by a perception of a matching of skill and demand, but also incorporates other inferred motivating processes such as hypnosis, play, self actualization, and psychic energy (attention). Indeed, the critical element of purely informative or perceptual events such as the matching of skill to demand seem almost incidental when lost in this profuse list of motivational processes which are incorporated into the flow construct. In contrast to the profusion of interpretive or metaphorical characteristics of flow, the physiological correlates to flow have been scarcely investigated and have been only generally or partially described, or in the case of somatic and neural responses, not described at all. Indeed, the neural correlates to flow have been reduced to metaphorical representations of the mind that engage hydraulic or electromechanical models that render the mind with cartoonish simplicity. Thus, flow is depicted as the result of the vaguely defined containment, channeling and alignment of emotions, feedback loops, attentional energies and forces, mental "cool" states, or as the tuning of the arousal and inhibition of neural circuitry (Goleman, 1995). More remarkably, there has been no experimental investigation into the nature of the somatic states that parallel flow. Specifically, the visceral and musculoskeletal concomitants to flow have never been examined. Any scientific theory must be ultimately judged by how well it describes the subject matter it purports to explain. Because it does not account for the physiological correlates of reported feelings of pleasure and absorption, a satisfactory flow theory does not exist. A flow theory must explain and integrate the behavioural, cognitive, and neuro-psychological events that comprise flow experiences. By synthesizing different 'levels' of observations that descend from molar (subjective experience, absorption) to molecular detail (neural processes), fine grain predictions can be made regarding the latency, duration, and scalability of flow, and the underlying physiology of enhanced creativity and reported pleasure.
**Behavioural Measures of Flow**

Flow occurs when the demands of a task match but to not surpass the skill available to complete that task. This perceptual set, or 'flow channel' represents a class of information that that both elicits and it the object of attentional focus. This information may in turn have normative implications that vary from high to low. From self-reports of individuals, flow seems to scale or increase as the implications of behaviour increase. Thus, intense and ecstatic flow experiences are commonly reported among individuals who are absorbed in demanding tasks that have critical implications, such as surgery, mountain climbing, and creative behaviour. In contrast, less intense or no flow experiences are reported among individuals who are engaged in absorbing but less critical tasks such as reading, video game playing etc. Besides scaling with the importance of the task, the emotional concomitants to flow occur when an individual anticipates a task that commands total absorption, and subsequently to flow eliciting behaviour. Finally, higher behavioural efficiency and creativity have been commonly attributed to the influence of the flow state (Canter, Rivers and Storrs, 1985).

**Cognitive Measures of Flow**

In addition to these behavioural indices of flow, cognitive measures of flow have focused on one primary variable, namely cognitive absorption or focused attention. The implicit assumption of a corollary and perhaps causal relationship between focused attention and flow follows the pattern of a stimulus-response mechanism. That is, the occurrence of the stimulus event (attention) is followed by an almost reflexive response (emotion). Nonetheless, whether or not this paradigm may be of any practical validity depends upon the status of attention as a definable stimulus event, and the degree to which specific correlations can be drawn between various levels of attention and emotional states. The important question is whether attention as commonly defined displays the expected attributes of a stimulus event. Certainly, the many definitions that may be given to attention do not provide for a simple answer to this question. For example, Candland (1969) maintains that attention can represent a variety of phenomena, such as general alertness, selective focusing, flexibility in shifting focus, and capacity to sustain focused alertness. In addition, the
concept of attention does not reflect on localized process, but is best viewed as a
taxonomy for a multitude of processes that modulate the afferent signal from a
sensory receptor along its sensory pathway (Hilgard, 1975). Supporting this
perspective, the neurophysiological correlates of attention as revealed by a variety of
researchers (Hernandez-Peon, Spong, Haider, and Lindsley, 1965; Deutsch and
Deutsch, 1963) discredit the implicit judgment that attention represents a stimulus like
event. Rather, attentional processes assume the aspect of a homeostatic mechanism
that allows certain streams of sensory information to be processed to the exclusion of
other incoming information. That is, rather than representing a stream of information
that is transmitted through certain afferent and efferent neural passageways, attention
represents the process that permits such information streams to be enhanced or
diminished.

However, the physiological correlates to focused attention may be inferred from a
related experience to flow called meditation. Conditions that elicit focused attention
as well as its unique experiential characteristics are generally shared by and may be
subsumed under the class of 'meditative' experiences that have been studied far more
exhaustively. Pleasant emotional experiences that are characteristic of meditation
have long been associated with strict attentiveness to specific stimuli or stimulus
classes and seen as a byproduct of that attentiveness (Goleman, 1976). Like flow,
meditation has been associated with unique physiological and experiential states
(Goleman, 1976, Brown, 1977; Deikman, 1963), but unlike flow, the
neurophysiological and somatic correlates to meditation have been exhaustively
studied Fenwick(1977), Michaels (1976), Wagstaff (1975), Pagano and Warrenburg
(1983), Holmes (1984, 1988), and have been found to represent no unique neuro-
physiological or somatic state, but are merely relaxation. The fact that meditative
experiences represent no unique physiological state calls into question the validity of
similar claims that flow is elicited from focused attention, but as has been noted, there
are many different varieties of attention. Albeit the matching of demand to skill
demands an absorption in the task at hand, the flow response universally requires the
rapid consideration and choice between many cognitive precepts or events. Thus a
mountain climber, surgeon, or poet would have to rapidly choose between many
variants of each successive behaviour or cognitive precept, each of which if chosen
wrong could result in a bad fall, a dead patient, or the loss of inspiration. Can rapid
attentional set shifting between a cascade of salient cognitive precepts account for flow? Recently, new neuro-psychological evidence has been assembled that suggests that it can.

**Neuro-psychological Measures of Flow**

Like all behavioural responses, flow is instantiated by neural processes. But what candidate processes exist that can explain flow? A common suggestion is that flow reflects a reduction in brain metabolism, as represented by indices of cortical activity, such as the EEG (Goleman, 1995). In actuality, the cerebral cortex is enervated, and no manner of direct stimulation, electrical, physical or otherwise results in sensations that would otherwise be reported as pleasurable or painful. On the other hand, direct stimulation of mid brain organelles such as the thalamus, amygdala, etc. commonly evokes sensations of pleasure or pain. The essence of emotion, if referred to the sensations that are at the core of feeling, must engage the activity of mid brain structures as mediated by neuro-chemical processes. Indeed, the cerebral cortex is largely the recipient of emotional influences rather than the generator of various emotional states (Panksepp, 1998). The facts of experience, as represented by the information we constantly perceive both consciously and unconsciously, continually integrate higher (neo-cortical) and lower (midbrain) neural processes. In a review of recent findings in neuro-psychological Ashby, Isen, and Turkel (1999) concluded that rapid attentional set shifting between salient cognitive precepts does indeed correlate to feelings of elation and satisfaction, and that the neuro-chemical processes that enable this shifting also increase cognitive efficiency and creativity. In a similar vein, the behaviouristic psychologists John Donahoe and David Palmer (1993) identified cognitive set shifting with dopamine release, and in turn with the concept of reinforcement.

On the behavioural level of description, the selection of a particular environmental behaviour relation or cognitive precept can be defined as reinforcement, which on the neural level causes the neurotransmitter dopamine to be liberated in synaptic clefts between coactive pre- and post synaptic neurons (Donahoe and Palmer, 1993). The functional role of dopamine stabilizes active neural representations in the prefrontal cortex (i.e., attention), and thereby protects goal
related delay activity against interfering stimuli, (Durstewitz et al. 1999). Dopamine labels stimuli with appetitive value, and may provide advance reward information before behavior occurs (Schultz, 1999). Dopamine also mediates the cognitive effects of pleasant feelings that may be denoted by self reports of pleasure, happiness, or satisfaction (Ashby, Isen, & Turken, 1999).

In particular, mesolimbic dopamine (DA) activity has been conceptualized as a reward signal that marks the importance of perceptual events (Horvitz, Stewart, and Jacobs 1997), and promotes the effective processing of afferent signals simultaneously arriving at the midbrain. A cascade of multiple salient perceptual events would presumably accentuate DA activity and facilitate the switching among alternative cognitive perspectives, and thus enhances decision making and creative thinking (Ashby, Isen, and Turken, 1999). This neuro-chemical activity would not only facilitate the rapid and efficient focusing of the mind on a wide range of images, but would also be frequently interpreted as highly pleasurable. Preliminary confirmation of this has been provided by neuro-imaging studies that demonstrated the increased release of dopamine during activities (a video game) that required sustained shifting of a cognitive set (Koepp, 1998). Finally, the greater number of stimuli that are associated with a response, the more likely that any given environment will contain some of those stimuli, and hence the response will reoccur or persist. This 'over-expectation' effect, or behavioural momentum (Nevin, 1992) would assign a discriminative function to otherwise neutral stimuli that have been associated with the response. Thus, the continuation of an emotional response long after its proximal causes have ceased, may be attributed to linger in the original environmental setting (office, laboratory) of that response. Hence, as an emotional response, flow would also be predicted to have a behavioural momentum, which subjective reports indicate is the case..

However, this analysis becomes a bit more complicated when situations that elicit the sustained release of dopamine are considered. The positive affect caused by unexpected rewards has been attributed to the release of the neuromodulator dopamine, yet dopamine release continues long after dopamine cells have stopped firing (Ashby, Isen, and Turken, 1999). Although dopamine release has been noted to occur up to thirty minutes after the stimulation of dopaminergic systems, it remains
unclear how emotional memory or behavioural momentum may facilitate or inhibit the degree and persistence of the release of dopamine over time. Because dopaminergic activity derives from midbrain structures, it is not incompatible with other somatic responses that are also activated by perceptual events. For example, if rapid perceptual set shifting is not perceived to be sufficient in itself in achieving an important goal, other somatic responses (e.g., muscle tension) may be signaled that serve as somatic markers that signal other behavioural strategies that may alter how a problem is appraised, but not how rapidly it is appraised. Thus, an individual taking a difficult test would rapidly shift between different perspectives that allow him to resolve test problems, yet may experience mild anxiety that further sharpens or attenuates his focus. Similarly, an individual may experience intermittent feelings of high alertness or high alertness combined with high anxiety, as when one is absorbed in watching an 'exciting' football game. Because dopamine release is not locked in tandem with other somatic responses, and because subjective appraisals map to input from a collection of neural, somatic, and cognitive systems, dopamine alone is highly correlated with but nonetheless cannot be solely responsible for feelings of ecstasy or bliss.

**Miscellaneous Measures of Flow**

Flow has been linked to reported states of euphoria or pleasure that occur during and after states of prolonged exertion (Jackson and Csikszentmihalyi, 1999). This euphoric state, or 'runners high', is generally attributed to the release of endogenous opioid-peptides, or endorphin that are the body's natural way of toning down specific pain responses at different levels. As a result of physical stress, endorphin release produces euphoria, respiratory depression, reduced gastrointestinal motility, and analgesia (Rang, 1995). However, the mapping of euphoric states to physical stressors rather than perceptual events (demand/skill match) cannot account for any of the well established behavioural and cognitive correlates to the flow response. Like dopamine, endorphins are opioids, and presumably would elicit similar subjective feelings. However, since they are elicited by entirely different classes of environmental factors the relationship between flow and a runner's high, they are linked only by their relationship to the similar neurochemical changes they share.
A Bio-Behavioural Theory of Flow

Flow does not represent a separate or distinctive mental or physiological state, but is rather the subjective or felt aspect of a consistent and high level of neural activation or arousal that is unaccompanied by other activating somatic states (e.g. muscle tension). A bio-behavioural theory of flow explains the latency, duration, and intensity of flow, as well as flow's effect on cognitive efficiency and creativity. In addition, the theory is parsimonious, testable, and integrates the seemingly independent subject matters of phenomenology, learning theory, and cognitive neuro-psychology. Most importantly, a bio-behavioral theory demonstrates that the flow experience cannot be understood through an appeal to phenomenological, cognitive, neurological, or behavioural variables alone, but only through an integration of the respective metaphors that are engaged by these explanatory schemes. Ironically, the systematic integration of these different explanations present a far simpler representation of the flow experience, since different metaphorical and methodological perspectives provide a multivariate perspective on the phenomenon, and correct for conclusions that are skewed by the language itself (Lakoff, 1999).

Practical Implications of a bio-behavioral theory of flow

The flow experience does not represent a separate or distinct neuro-psychological event. Rather, flow represents a neurological event that differs in degree rather than type from other similar events, and is no more distinctive than high anxiety is from low anxiety, or running from walking. Moreover, flow is subject to the same principles of learning that govern other involuntary and voluntary behaviours. That is, the processes that underlie flow display the same lawfulness that governs responses as disparate as salivation, emotion, walking, or talking. The practical implications of a bio-behavioural explanation for flow greatly refine Csikszentmihalyi's own prescriptions for the replication of flow in everyday life, and make those prescriptions much clearer by discarding spurious mental processes such as intrinsic motivation, autotelic personality, and the like. For example, short bursts of absorbing activity (e.g. writing sonnets, creating art) that are paced at separate intervals during the day will elicit a high level of neural arousal will have enough 'momentum' to span those intervals, and create a state of pleasurable alertness that can
be extended all day. Secondly, because flow is a scalable response, lower levels of activation are still desirable, even if they may not produce self-reports of elation or satisfaction. School curricula that are designed to cultivate a child's shifting focus on diverse aspects of a subject matter that may be inherent in or denoted by that subject matter will arouse his attention, and thus seem to be 'intrinsically reinforcing'. Third, by stressing the importance of activating neural processes in environments that require exacting levels of performance (e.g. education, work), learning technologies can be readapted to more accurately fit the facts of behaviour, and with subsequent increases in their effectiveness as well as comprehensibility.

Explanations of the zone or flow state can be gleaned from two psychological theories, flow theory (Csikszentmihalyi, 1975, 1990) and reversal theory (Apter, 1982, 1989). In brief, flow theory denotes the zone as a rare and dynamic state characterised as the experience of self-rewarding and enjoyable involvement. Flow theory states that while the zone can be experienced at varying levels, a phenomenological structure of eight dimensions describes the experience for individuals across occupations, demographic groups and cultures. These dimensions are listed by Csikszentmihalyi (1990). These dimensions are deemed to constitute the conditions necessary for the occurrence and continuation of the zone.

Reversal theory posits an explanation of the zone in terms of metamotivational states (modes or mental states in which an individual's motives are structured, interpreted and organised within experience) and reversals (switches between modes). Specifically, individuals are thought to experience the zone as an optimal relaxing telic (from the Greek word "telos" meaning goal or end) or exciting paratelic ("para" being the Greek word for beside or alongside) metamotivational state. A range of personal and situational factors is conceptualized to influence telic or paratelic zone states.

In order to maintain Flow experience, the activity must balance the inherent challenge of the activity and the player’s ability to address and overcome it. If the challenge is beyond that ability, the activity becomes so overwhelming that it
generates anxiety. If the challenge fails to engage the player, the player quickly loses interest and tends to leave the game. Csikzentmihalyi (1975) indicated that a skill-challenge balance was an essential precursor flow occurrence, and that flow was dependent upon the individual's ability to structure their consciousness so as to make flow possible. The complexities in examining flow relate to the concerns over qualitative and quantitative research approaches (Jackson & Marsh, 1996), yet the ability to effectively incorporate these approaches to the study of flow may have implications for applied sport psychology consultants. By identifying the psychological factors that enhance, inhibit, and disrupt flow, consultants and coaches may be better able to help athletes achieve optimal performance (Kimiecik & Stein, 1992). Jackson, Kimiecik, Ford & Marsh (1998) examined psychological correlates within trait and state flow. Results provided support for the construct of flow in that similar sets of predictor variables explained significant relationships with flow at both the subscale and global level. Specific predictors were perceived ability, anxiety, concentration disruption, anxiety-worry and intrinsic motivation to experience stimulation. Support for construct validity of flow scales was also demonstrated in that the flow trait challenge-skill balance was most highly correlated with the trait measure of perceived ability, and the authors concluded that high perceived ability is crucial to facilitating flow states (Kimiecik et al., 1998). It may be that less-skilled athletes are less likely to experience flow because both their actual and perceived level of skill are lower than elite athletes. Flow, however, an influential and important state that needs to be examined in greater detail to increase understanding in theoretical and applied sports psychology.

**Team Cohesion**

Many researchers acknowledged that team cohesion was a complex concept. In 1999, Ryska, Todd, Yin, Cooley and Ginn claimed that what actually contributes to building a cohesive group may run contrary to what intuition would suggest. The same group also noted that "there is no one way to effectively build team cohesion in sports" (Ryska et al., 1999). For these reasons, 'team' and 'cohesion' were included separately.

**Team**
A team can be defined as (a) two or more individuals who (b) socially interact (face-to-face or, increasingly, virtually); (c) possess one or more common goals; (d) are brought together to perform organizationally relevant tasks; (e) exhibit interdependencies with respect to workflow, goals, and outcomes; (f) have different roles and responsibilities; and (g) are together embedded in an encompassing organizational system, with boundaries and linkages to the broader system context and task environment (Alderfer et al., 1977). Since hockey is one of the most popular team sports around the world, the importance of finding out what exactly a 'team' was, becomes evident. In an article involved with perceptions of group cohesion and mood in sport teams, researchers defined team as "a collection of individuals whose existence as a collection is rewarding to the individuals" (Terry et al., 2000). The 'collection of individuals,' in this particular study's case, represents the hockey teams. For most athletic experiences, athletes are members of groups or teams. These groups have a strong impact on the members of the group. Although this impact can be both positive and negative, an athlete’s involvement in a group is inevitable. Carron, Hausenblaus, and Eys (2005) have defined a sport team (or group) as "a collection of two or more individuals who share a common fate, have structured patterns of communication, and hold common perceptions about group structure."

**Cohesion**

It has been reported (Clavell 1983) that over 2500 years ago a philosophy in the "art of war" was that, to win, soldiers needed to act in a unified manner, be able to focus on tasks without distraction and believe in the objectives of the group. Today this philosophy may be called "cohesion", Cohesion is based on the Latin, "cohaesus" meaning "stick together", and is used today to describe a dynamic process that is reflected in the tendency for a group to remain united in the pursuit of its goals or for the satisfaction of members' emotional needs. The concept of team cohesion was defined by Paul Turman while studying the impact of coaching techniques on cohesion. Turman defined team cohesion as "an individual's sense of belonging to a particular group and his or her feelings of morale associated with
membership in groups" (2003,). According to Turman, team cohesion hinges on two ideas: sense of belonging and feelings of morale (2003).

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Prapavessis and Carron (1997) claimed that group cohesion is created because an individual's sacrifice contributes to perceptions of teammates' sacrifice conformity to group norms. This sense can be affected by several different factors, including leadership behaviour, relationship with teammates, and general levels of disclosure among the athletes. Matheson, Mathes & McMurray (1997) defined cohesion as "the total field of forces which act on members to remain in the group". This so-called 'field of forces' can be interpreted to have numerous different meanings. In the boundaries of the current study, however, it was considered within the context of the world of sports.

The four steps of cohesion are (1). **Forming**, is the act of putting the team together. In youth sports this may involve tryouts, a draft, or some other process of evaluating the athletes and placing them on teams. A critical part of this step is making the members feel comfortable with each other, getting to know each other, and beginning to establish lines of communication.

(2.) **Storming**, is also referred to as infighting. It is not unusual to see displays of temper and occasionally even aggression during this stage. This is when the members of the team try to show off their skills for the coaching staff as they jockey for coaching staff as they jockey for status on the team. It is during this stage that coaches assess the strengths and weaknesses of their athletes and begin to decide who will go in which roles: starters, substitutes bit players, and so on.
(3.) **Norming**, is the step in which the coaches pull the team back together. Within the team, we move from competition to cooperation. Each athlete must understand his or her unique role on the team and the contribution each will make to the team. In leagues with younger athletes, we may intentionally rotate the players among the various positions so they can experience the different skills involved in playing the sport.

4.) **Performing**, is the culmination of the team building process. It is when (all the members work together to achieve the common team goals. 1. There should be mutual respect among members. You can’t have a cohesive group on the field if you don’t respect your teammates. You don’t have to necessarily love them off the field, but you better love them on the field and respect them both on and off the field. You are all fighting for a common goal and there is a special closeness that goes along with this. 2. There should be an effective two way communication that is clear and direct. Good communication skills result in an increase in self-esteem, respect, trust, and decision making skills.

Group cohesion has been studied in many areas, such as sport psychology, social psychology, military psychology, etc. In looking at cohesion in sport groups, the generally accepted definition is that cohesion is a dynamic process that is reflected in the tendency of a group to stick together and remain united in the pursuit of its instrumental objectives and or for the satisfaction of member affective needs (Carron, Brawley, & Widmeyer, 1998). This definition has several different aspects that are helpful in understanding the construct. First, cohesion is multidimensional, meaning that any number of factors can influence a group’s cohesiveness, and these factors may vary from group to group (Carron et al 2005). Second, cohesion is dynamic. Any group’s cohesiveness can change over time and factors that affect cohesion at one point in time may not affect it at other points.

The importance of cohesion for sport teams can be seen in the expressed philosophy and management styles of successful coaches. Phil Jackson (Jackson and Delehanty 1995) uses the term "selflessness" to encourage the team to think of others, which he believes can lead to a more cohesive unit. Similarly, Michael Jordan (1994) states, "When a pressure situation presented itself, we were plugged into one
another as a cohesive unit. That's why we were able to come back and win so many close games." Noted researchers Carron and Hausenblas (1998) have suggested that cohesion should be viewed in a multidimensional model involving four interacting factors: leadership, environment, personal factors and team factors. Within their model, all these factors are intertwined. For example, the leadership of the team can affect the personal factors of the players, which in turn affect team cohesion. Unfortunately, much of the world's focus today is on selfish decisions that people make, and the concept of sacrifice behaviour is relatively hard to come by. Within most perennially successful sports teams, however, it is possible to find such behaviour. Aside from the desire to win, researchers suggest that this conformity without regard to reciprocity is due to a need for belonging. Once an athlete is committed to a team, he/she feels a need to belong, which is characterized by two criteria: a need for frequent, pleasant interactions with others, and a temporarily stable framework of concern for one another's welfare (Terry, Carron, Pink, Lane, Jones & Hall, 2000). If other athletes are willing to perform sacrifice behavior to promote team cohesion, the need to belong amongst their teammates will also be satisfied.

Merely being together at workouts and games does not necessarily guarantee that a team will be cohesive and successful, it simply means that they are occupying the same space at the same time. A cohesive team can be distinguished from a noncohesive team by many characteristics. A cohesive team has well-defined roles and group norms, common goals, a positive team identity, a good working relationship, shared responsibility, respect, positive energy, trust, a willingness to cooperate, unity, good communication, pride in membership, and synergy. Another indicator of the amount of cohesiveness in a team is the frequency of statements of "we" and "our", in contrast to statements of "I", "me" and "mine". The "we" is just as important as the "me". Developing cohesion is something that takes time and effort, but it is well worth the investment. The social mixing of a sports club is termed "Social Cohesion" and a group with shared formal goals who are normally successful as a group (e.g. the 8 rowers in a boat race) is referred to as "Task Cohesion". Research tends to support the view that high interaction teams need high task cohesion to be consistently successful, whereas for moderate or low interaction teams cohesion is less important to success. Again, we have social cohesion, the extent to which members of the group get on with one another, and task cohesion, the extent to
which members cooperate to achieve the group's goals. The following factors affect cohesion: **Stability** - Cohesion develops when the longer a group is together with the same members **Similarity**- Cohesion develops when the more similar the group members are in terms of age, sex, skills and attitudes **Size** - Cohesion develops more quickly in small groups **Support** - Cohesive teams tend to have managers and coaches who provide support to team members and encourage them to support one another **Satisfaction**- Cohesion is associated with the extent to which team members are pleased with each others performance, behaviour and conformity to the norms of the team

We have taken a look at what cohesion is and how important it is to develop and nurture it on a team or any team. Only good things can come from bonding with other members of your team good things for everyone, individually and collectively. As stated by Long Beach City College Head Softball Coach Shellie McCall, “Team cohesion is the glue that keeps a team focused and determined to reach its goals.” Research on the cohesion-performance effect typically conceptualizes cohesion as the sum of three key factors: interpersonal attraction, individual commitment and personal pride in group membership. Performance is typically considered to be exhibited only in terms of 'on the field' outcomes. Research leads to several outlooks on the issue, with the majority of academics supporting the existence of a positive correlation between cohesion and performance, the magnitude of which is said reliant on several unstable elements: the level of interaction between group members, the size of the group and the 'reality' of the group. Those involved in the sporting community should facilitate team- cohesion wherever possible, as it can have a significant effect on performance outcomes, and can be valuable source of solace and resolve for team members during prolonged periods of poor performance and/or instability.

**Significance of the study**

Hockey being the national game of India, and the only team event in which India won gold medals in the Olympics, any study related to hockey receives significant attention among the Indian public.
The present study analyses two major positive psychological aspects of the performance of hockey teams in South India. Namely, flow states and team cohesion. These two aspects are essential in enhancing the appeal of modern hockey.

Result of the present study will give a profound insight into the flow state and team cohesion to sports psychologists, coaches and players in South Indian hockey teams. Result of the study will help the players, coaches and sports psychologists to select suitable interventions to improve flow and team cohesion.

The present study will give awareness to the coaches, sports psychologists and players on the importance of team cohesion and flow in the performance of hockey teams.