PERCEIVED MOTIVATIONAL CLIMATE, NEED SATISFACTION, MOTIVATIONAL REGULATION AND PSYCHOLOGICAL WELL-BEING IN ELITE HURLERS

Mark Quinlan

Master's Thesis in Sport and Exercise Psychology
Autumn 2010
Department of Sport Sciences
University of Jyväskylä

ACKNOWLEDGEMENTS

I would like to first of all thank my thesis supervisor, Dr. Montse Ruiz for all her assistance, support and encouragement throughout the process. I would also like to thank Professor Taru Lintunen for her advice and words of wisdom.

I would also like to thank my fellow classmates from the 2008 Sport and Exercise Psychology Masters programme at the University of Jyväskylä for their invaluable help, support and feedback.

A special thanks to Salla for giving me the inspiration to pursue this project. Your constant support, encouragement and faith allowed me to reach the finish line. Thanks also to my family and friends for their support and assistance.

Finally, I want to say a big thank you to all the hurling players that participated in the study and the members of the coaching staff of the three teams that took part. Without your co-operation and willingness to be involved this study would not have been possible.

ABSTRACT

Quinlan Mark, 2010. Perceived Motivational Climate, Need Satisfaction, Motivational Regulation, and Psychological Well-Being in Elite Hurlers: Master's Thesis in Sport and Exercise Psychology, Department of Sport Sciences. University of Jyväskylä. 96 p.

The principal aim of the study was to explore the perceived motivational climate, need satisfaction, motivational regulation and psychological well-being in elite hurlers using the framework of Self-Determination Theory (SDT; Deci & Ryan, 1985, 1991 & 2000). Secondary aims included examining the relationship between perceived motivational climate, need satisfaction, motivational regulation, and psychological well-being. Additional aims included investigating if there were differences between the three teams.

Participants were 60 current elite hurlers representing three different inter-county hurling teams. The respondents age ranged from 19 to 34 years with a mean age of 24.2 (SD=3.86). Competitive experience with their team ranged from 5 months to 15 years with a mean of 4.1 years (SD=3.6). Coaches were contacted via telephone and e-mail to gain access to the respondents. The data was collected by self-administered questionnaires. Perceptions of their motivational climate were measured using the Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Newton, Duda & Yin, 2000), the competence dimension of the Intrinsic Motivation Inventory (IMI; Duncan, Tammen & McAuley, 1989), the autonomy dimension of the Need Satisfaction at Work Scale (Deci et al., 2001), and the Need for Relatedness Scale (NFRS; Richer & Vallerand, 1997) were used to measure competence, autonomy and relatedness respectively. The Sport Motivational Scale (SMS; Pelletier, Fortier, Vallerand, Tucson, Briére & Blaise, 1995) measured the motivational profiles and the Competitive Anxiety in Sport Inventory-2 (CSAI-2; Martens, Vealey & Burton, 1990) was used to measure cognitive anxiety, somatic anxiety and self-confidence.

Results revealed that the elite hurlers in the sample perceived their motivational climate as being more task-oriented than ego-oriented, and had high perceptions of competence, autonomy and relatedness. The elite hurlers also appear to be highly motivated and have positive psychological well-being. A perceived task climate was positively correlated with perceived competence, perceived autonomy, and perceived relatedness. Task climate was also positively associated with intrinsic motivation to accomplish, intrinsic motivation to experience stimulation and state self-confidence, and negatively related to amotivation. An ego climate was positively related with intrinsic motivation to know and state cognitive anxiety and negatively correlated with perceived relatedness and state self-confidence. Task climate positively predicted the three basic psychological needs, all forms of IM and self-confidence. An ego climate positively predicted IM to accomplish, IM to experience stimulation, and state cognitive anxiety. Perceived autonomy was the only positive predictor of IM. Both perceived competence and perceived relatedness positively predicted state-self confidence. IM to experience stimulation positively predicted state cognitive and somatic anxiety while IM to accomplish negatively predicted state somatic anxiety.

Keywords: Motivational Climate, Intrinsic Motivation, Self-Determination Theory, Psychological well-being.

TABLE OF CONTENTS

1 INTRODUCTION

Understanding motivation has become a popular focus of study, especially in the field of sport psychology. In fact, studies on motivation account for one third of the research currently being conducted. Investigating the reasons why individuals behave in a particular way and the factors that can alter their behavior has important scientific and practical implications. The motivational climate is a critical factor that effects the motivation of individuals and is the definition of success and failure stressed in a social environment, such as a classroom or an athletic team (Ames, 1992). It is logical to surmise that one of the key factors that could influence the motivation of hurlers is their environment and how they perceive it. Clearly, in a sport where external rewards are not prevalent the athletes need to be intrinsically motivated. Thus, it might be assumed that positive emotions such as enjoyment, satisfaction, and pleasure from participation augment their desire to maintain their involvement. The type of climate created by the coach and significant others such as teammates can be crucial in fostering intrinsic motivation. In hurling, a climate that encourages learning and development, allows for the input of the athletes, focuses on the performance of the individuals, and where all contributions are valued is more likely to enhance intrinsic motivation than a climate that focuses on competitive results, discourages athletes input, punishes mistakes and encourages comparisons between teammates. Given the significance of intrinsic motivation in hurlers and the importance of the perceived motivational climate, it is quite alarming to find that there have been no previous attempts to investigate this.

Developing an awareness of the motivational processes of athletes in the sport of hurling especially at the elite level is fundamentally important due to the unique characteristics of the sport. Hurling, particularly inter-county level, is extremely demanding and for many involved the opportunities for success are limited. Involvement at elite level requires high commitment to training and optimal preparation while balancing this with work and family life. For all hurlers who maintain participation this is their reality so the question needs to be asked about what exactly drives the hurlers' motivation to continue in a very demanding sport that offers virtually no material rewards and very little recognition. In fact, hurling is without doubt one of the most malnourished sports in terms of its psychological research.

While hurling coaches have received some attention (McCormack, 2007), the players have been neglected altogether. In addition, an environment that will facilitate the hurler's intrinsic motivation is expected to impact positively on aspects of their psychological well-being such as lowering anxiety, raising self-confidence and self-esteem as they experience positive emotions like enjoyment. By contrast, an environment that is detrimental to the hurler's IM is likely to have negative effects such as increasing anxiety, reducing self-confidence and self-esteem due to negative emotions such as displeasure.

The idea for the research topic derived from a passionate interest in the sport and the overwhelming lack of psychological research that has been conducted in hurling. Moreover, there has been a limited amount of studies that have examined the perceived motivational climate of elite athletes in team sports and its impact upon their motivational state and psychological well-being. This is also the first attempt to explore these psychological dimensions in hurling which could have important practical and scientific implications. Consequently, coaches could have greater insight into the possible reasons why hurlers renew their interest in competing or why some no longer participate. It will hopefully encourage coaches to formulate strategies that could develop an environment that can foster the player's intrinsic motivation and psychological well-being, which could subsequently lead to an improvement in performance. Thus, the principal aim of this study was to fill the void that exists in the research by examining the perceived motivational climate, motivational regulation and well-being in elite hurlers.

The main theoretical framework that will govern the approach to this study is the Self-Determination Theory (SDT; Deci & Ryan, 1985, 1991, & 2000) which combines a social cognitive and needs theory of motivation. SDT is a macro theory of human motivation and distinguishes itself from other theories by possessing the capacity to explain sporadic intrinsic motivation and the factors that can facilitate or debilitate it. The social cognitive aspect of SDT is concerned with the extent to which human behaviors are volitional or self-determined (i.e. the degree to which individuals engage in an activity with a sense of choice). Moreover, SDT postulates that an autonomous social environment supports intrinsic motivation and psychological growth whereas a controlling environment impedes

IM and psychological growth. The needs aspect of SDT posits that there are basic psychological needs which are universal for all human health and well-being. Continuous satisfaction of these needs will permit healthy functioning and well-being, however, deprivation of these needs will result in ill-functioning and poor well-being.

The primary aim of this study was to determine how hurlers perceive their motivational climate and if this predicts the satisfaction of their basic psychological needs, motivational regulation, and psychological well-being using the theoretical framework of Self-Determination. An auxiliary aim of this study was to determine which of the basic psychological needs was the strongest indicator of intrinsic motivation in elite hurlers.

2 PERCEIVED MOTIVATIONAL CLIMATE

An individual's motivational climate can be perceived as either a task or mastery climate or as an ego or performance climate (Ames, 1992; Ames and Archer, 1988). The construct of perceived motivational climate originates from Achievement Goal Theory (AGT; Ames & Archer, 1988; Elliot & Dweck, 1988; Maehr & Nicholls, 1980, Nicholls, 1984). According to AGT, individuals have two principal goal perspectives: task and ego orientation. These vistas refer to how individuals interpret their level of competence and define success in achievement settings (Nicholls, 1989). When individuals are task-oriented they feel successful when they invest a lot of effort and make improvements in a task. They experience competence through personal improvement and mastery of the task by effort. By contrast, individuals who are ego-oriented feel successful if their performance compares favorably to others or they perform well with minimal effort as the emphasis is on demonstrating competence. Ego-oriented individuals measure their own success through the medium of social comparisons with others. Furthermore, the tendency to embrace a task or an ego goal orientation when involved in an achievement activity is proposed to be a consequence of the individual's degree of task- or ego-orientation (dispositional) and the attributes of the achievement setting (situational).

The motivational climate created by significant others such as parents, teachers, and coaches is a situational goal structure through which success and failure is judged in a social environment (Ames, 1992). Two predominant motivational climate perspectives have been identified: a task (mastery) and an ego (performance) climate. A task or mastery climate refers to an environment where learning and development is encouraged, success can be measured beyond competitive results, individuals are concerned with their own performance and do not make comparisons with others, and all contributions are valued. By contrast, an ego or performance climate is characterized by a discouragement of learning and development, focusing primarily on competitive results rather than performance, input of individuals is prohibited and comparisons are frequently made with others (Maehr & Nicholls, 1984). This has been the traditional approach to examining the motivational climate, however, Newton, Duda and Yin (2000) expanded this by specifying dimensions within the mastery and performance climates and developed the Perceived Motivational

Climate in Sport Questionnaire 2 (PMSCQ-2; Newton, Duda, & Yin, 2000) as a tool to measure these. A mastery climate consists of *cooperative learning*, *effort and improvement*, and *important role* and a performance climate contains *intra-team rivalry*, *unequal recognition*, and *punishment for mistakes*.

Quested and Duda (2010) reported evidence to support the assertion that more socially and autonomy-supportive environments cultivate perceptions of competence, autonomy, and relatedness in a study of contemporary and ballet dancers. The results showed that perceptions of a task-involving climate positively predicted feelings of competence, autonomy, and relatedness and that an ego-involving climate was negatively related to competence and relatedness. Quested and Duda (2009) also examined the perceptions of motivational climate, needs satisfaction, and well-being in 59 British hip-hop dancers. The results illustrated a climate viewed by the dancers as mastery-oriented was positively associated with perceived competence, relatedness, and autonomy. A perceived ego-oriented climate was negatively associated with perceptions of competence, relatedness, and autonomy. Competence also emerged as a significant mediator of the relationship between perceptions of a task-involving climate and positive and negative affective states.

Similar results have been elicited in sport settings such as Reinboth and Duda (2004) who investigated the relationship between perceptions of the motivational climate, perceived ability and physical and psychological well-being in 265 British adolescent cricket and football players. They reported that those who perceived their environment as highly task-involving had high self-esteem regardless of their perceptions of competence. However, those who perceived their ability as low and a highly ego-involving environment had lower self-esteem. Contingent self-esteem was also found to be positively predicted by perceptions of an ego-involving climate. Moreover, Reinboth and Duda (2006) examined the perceived motivational climate, need satisfaction and indices of well-being in team sports through a longitudinal study in 128 British university athletes. The results showed that increases in perceptions of a task-involving climate positively predicted increases in perceptions of competence, autonomy and relatedness. Thus, it would seem evident that creating a task-involving environment is likely to foster athletes' growth and development

by enhancing feelings of competence, autonomy and relatedness, and impacts positively on their motivation and psychological well-being.

The relationship between perceived motivational climate and motivation has been examined in a multitude of domains, and in particular intrinsic motivation. For instance, in sport, Kavassanu and Roberts (1996) studied the relationship between perceived motivational climate and intrinsic motivation in 285 male and female college tennis athletes. The results indicated that those students that had a mastery perception of their motivational climate were more likely to experience feelings of competence, enjoyment, and self-efficacy while perception of a performance climate were associated with high tension and increased pressure. Most importantly, a perceived mastery climate and dispositional goal orientation emerged as equally important predictors of intrinsic motivation among the male students. By contrast, perceived performance climate was the strongest and a negative predictor of intrinsic motivation among the female athletes. Thus, it appears that a perceived performance climate can have a more detrimental effect on female's intrinsic motivation than males IM.

Similarly, Amorose and Dawn-Butcher (2007) examined whether perceived competence, autonomy, and relatedness mediated the relationship between perceived autonomy-supportive coaching and athlete's motivational orientation in 581 male and female high school and college athletes. Using structural equation modeling (SEM), support was found for the meditational effect. Specifically, the results showed that the degree to which athletes perceived their coaches to be autonomy-supportive significantly predicted the athletes' feelings of competence, autonomy, and relatedness, which, in turn, predicted their motivational orientation. In the physical education environment, Ntoumanis (2001) tested the motivational sequences proposed by Vallerand (1997) of social factors (cooperative learning, self-referenced learning, and choice of tasks), psychological mediators (perceived competence, autonomy, and relatedness), types of motivation (intrinsic motivation, identified, introjected, external regulation, and amotivation), and consequences (boredom, effort, and future intention to exercise) in 424 British students aged 14-16. The results

showed that perceived competence was the most significant psychological mediator and that the three basic psychological needs were positively associated with cooperation, improvement and choice. Perceived competence was found to be the strongest predictor of intrinsic motivation and was negatively associated with amotivation.

The majority of current studies on perceived motivational climate in team sports have tended to focus on athletes at an intermediate or junior level (Reinboth, Duda & Ntoumanis, 2004, Gagne, Ryan & Bargmann, 2003) and very few have examined the context of an elite athlete (Pensgaard & Roberts, 2001, Chantal, Guay, Dobreva-Martinova, & Vallerand, 1996). Perhaps one of the reasons for this is because their environment is highly volatile and sensitive, due to the fact that they have a tendency to be high in both task and ego-orientation, and they are much more prone to drastic changes in their perceptions of ability and performance. Furthermore, many studies on perceptions of the motivational climate have predominantly examined classroom settings in physical education (Papaioannou & Kouli, 1999; Boyce, Gano-Overway & Love Campbell, 2009) due to the relative ease of access to the population and the difficulties in gaining access to elite level athletes that currently exist. It would be logical to assume that this would have greater implications for the well-being of an athlete; however, while some areas such as subjective vitality and physical symptoms have received attention, the effects on self-esteem, anxiety, and self-confidence would appear to have received limited recognition.

It would appear from the literature that creating a mastery climate is more advantageous in enhancing individual's self-determination and autonomous forms of motivation. For example, a study by Mallett (2005) that examined the effects of a coach-initiated autonomy supportive environment on the 4x100m and 4x400m Australian male swimming relay teams that competed in the 2004 Olympic Games in Athens. Mallet as coach of the two teams reported that creating a task-oriented environment fostered feelings of competence, autonomy, and relatedness among the athletes and the members of the coaching and backroom staff. Consequently, the teams were quite successful in terms of achieving their performance goals. The 4x100m team reached their performance target and finished 6th in

the final and the 4x400m team also met their performance target and claimed the silver medal in the final.

3 SELF-DETERMINATION THEORY

Deci and Ryan's (1985, 1991, & 2000) Self-Determination Theory (SDT) has become a salient motivational theory in recent years and has received an enormous amount of research attention. Self-determination refers to "an autonomous, flexible capacity to choose, among several courses of action, that action that will bring desired consequences" (Chantal, Guay, Dobreva-Martinova, & Vallerand, 1996). It is composed of four mini-theories of Cognitive Evaluation Theory (CET, Deci, 1975), Causality Orientation Theory (COT, Deci & Ryan, 1985), Organismic Integration Theory (OIT, Deci & Ryan, 1985), and Basic Needs Theory (BNT, Deci & Ryan, 2000). SDT (Deci & Ryan, 1985, 2000) focuses on the extent to which human behavior is self-determined or volitional.

3.1 Origins

Early theories of motivation were characterized by a tendency to be mechanical in nature and theorist's perceived man as machine like and whose behavior was driven to satisfy basic needs. This perception remained the status quo throughout the 1940's and 1950's until Robert White's groundbreaking paper in 1959 who began to view the concept of motivation in a multidimensional fashion and challenged the dominance of the drive perspective. White suggested that the orthodox drive theories were appealing due to their simplistic features but lacked some vital ingredients to explain the behavior of individuals that is not governed by drives or instincts.

According to White (1959) human beings can also derive motivation from competence or what he referred to as "an organism's capacity to interact effectively with its environment" (p. 297). He argued that competence is not an attribute that is prevalent at birth and is attained throughout the gradual process of learning from interacting with the various elements in the environment. Moreover, White suggested that interest in performing a behavior is contingent on the production of a change or an effect in the environment. De Charms (1968) expanded the developing branch of motivational thinking through his concept of personal causation. Personal causation refers to "the initiation by an individual of behavior intended to produce a change in his environment" (p. 6). De Charms (1968) postulated that man desires to be the causal agent or the origin of his own behavior and that

achievement of this can lead to feelings of greater personal satisfaction. He argued that this desire to be the master of one's own fate is the principal catalyst for intrinsically motivated behavior. However, the fulfillment of this desire to be in control of behavior does not guarantee self-determination. Not all individuals seek to have control of their own destiny and may want others to assume that responsibility but need to have a belief that they have a choice in this regard.

Following the significant contributions of White (1959) and De Charms (1968), motivation was examined in terms of intrinsic and extrinsic rewards. Initially, it was determined that both intrinsic and extrinsic rewards had a positive effect on motivation but Edward L. Deci (1971) concluded that there is a cognitive aspect to motivation and that rewards in the form of verbal reinforcement and positive feedback resulted in higher levels of intrinsic motivation. This led to the formulation of cognitive evaluation theory (Deci & Ryan, 1985) and was the foundation for Self-Determination Theory (Deci & Ryan, 1985, 2000).

3.2 Cognitive Evaluation Theory

This sub-theory examines the concept of intrinsic motivation and the influence that the introduction of external rewards can have on the propensity to be intrinsically motivated to engage in a particular behavior. It proposes that if individuals perceive themselves as having an internal locus of causality and competence it will results in greater levels of intrinsic motivation. If an individual perceives themselves as having an external locus of causality and incompetence then their level of intrinsic motivation declines. For example, a girl who does ballet dancing because she enjoys it suddenly begins to receive a reward of money for practicing this will have an enhancing, detrimental or no effect on the girl's intrinsic motivation.

Intrinsic motivation (IM) refers to doing an activity for the pleasure and enjoyment derived from it, and it is the most self-determined form of motivation. Although initially viewed as unidimensional in its nature, attempts to expand the construct have been made. Vallerand and colleagues (1992, 1993) have identified three types of intrinsic motivation: intrinsic motivation towards knowledge, intrinsic motivation toward accomplishment, and intrinsic

motivation to experience stimulation. Intrinsic motivation towards knowledge refers to doing an activity in order to learn new skills or techniques. An example of intrinsic motivation toward knowledge would be when a hurler plays "for the satisfaction from learning new skills". An athlete trying to outperform a previous best or striving to achieve specific individual goals demonstrates intrinsic motivation towards accomplishment. An example of this would be a hurler setting a target of improving on last season's goals tally. Finally, intrinsic motivation to experience stimulation involves the pleasure experienced by specific movements within the sport. For instance, a hurler that expresses delight at the emotions they experience while executing technically difficult skills during a match.

Studies have shown that people engage in activities for both intrinsic and extrinsic reasons, however, intrinsic motives are likely to be more advantageous in the long-term as people are inclined to persist and work hard when there are no external rewards available (Vallerand & Losier, 1999, Vallerand & Rousseau, 2001). Deci (1971) demonstrated that in a study that involved rewarding a group of participants with money and giving no reward to another group to complete a mechanical puzzle called SOMA. Those that had received the money spent significantly less time on a subsequent task than those who had not. The results showed that doing an interesting activity to acquire extrinsic rewards leads to a reduction in the level of intrinsic motivation for that same activity. Research has shown that external rewards and constraints can have a reductionist effect on an individual's level of self-determination. Vallerand and Reid (1984) examined the effects of both positive and negative feedback on the intrinsic motivation of college students. They found that there were increases after positive feedback and decreases after negative feedback was given. Moreover, they reported that perceived competence had also increases following the positive feedback and decreased after negative appraisal.

3.3 Organismic Integration Theory

Organismic Integration Theory is a mini-theory of SDT (Deci & Ryan, 1985, 2000) that developed as a method of categorizing the different types of extrinsic motivation in terms of how they are internalized. According to OIT (Deci & Ryan, 1985) human beings are active organisms that act on internal and external environments to be effective and satisfy

all their needs. Internalization refers to the process to actively transform an extrinsic motive into personally endorsed values and thus assimilate behavior regulations that were previously external (Ryan, 1995). The different types of external motivation are placed along a continuum and positioned according to their level of autonomy. The more autonomous in nature that the external motivation is the greater the degree of internalization. The various types of motivation have been categorized along a continuum of self-determined behavior (Deci & Ryan, 1985, 2000). These range from, amotivation (AM), which is doing something with a lack of purpose behind the activity, to extrinsic types of motivation (EM), which involve doing activities for tangible rewards such as trophies and wealth, and to intrinsic motivation (IM), which is the most self-determined form of motivation.

Within extrinsic motivation there are four types including external regulation, introjected regulation, identified regulation, and integrated regulation. External regulation refers to someone performing an activity coerced by either a possible reward or to avoid punishment. For example, a hurler who is involved in the sport due to pressure from significant others such as parents or who plays to win a league or championship medal. Introjected regulation is"an incomplete internalization of a regulation that was previously external", (Vallerand & Losier, 1999, p.154). In other words, it is participation in a task borne out of pressure applied by the self. An example of this would be a hurler that says,"I must lift these weights to get stronger". Identified regulation refers to when an athlete decides willfully to engage in activity for the personal benefits to be attained from it, rather than the pleasure derived from doing so. For instance, a hurler who practices sprinting outside of scheduled training. The player may not have any interest in running very fast but does so as this may improve an aspect of his game deemed to be deficient. Finally, integrated regulation is when the regulation has been completely internalized, and is the most self-determined form of external motivation. Thus, participation is based on both interest in the activity and outcomes for the person. Although similar to intrinsic motivation, it remains within the domain of external motivation due to the fact that participation is contingent on the outcome, as opposed to merely the enjoyment from being involved in the activity. For example, a hurler who lifts weights because he is interested as

it will increase his upper body strength, which may lead to better long range point scoring. To date, no instrument has been developed to measure this type of extrinsic motivation. The tendency has been to examine these constructs together, however, it is argued that, ”each of the five forms is qualitatively different from each other and that lumping them together does not allow us to examine their respective contributions over time” (Pelletier, Fortier, Vallerand & Briére, 2001, p.285). This suggests that exploring the five forms as separate entities would generate more fruitful results, and one of the aims of this study would be to examine the continuum in this manner.

3.4 Causality Orientations Theory

Causality Orientations Theory proposes that individuals are primed to orient or move toward environments that support their self-determination and looks at individual differences in self-determined behavior. There are three different types of causality orientations; *autonomy* orientation, *control* orientation, and *impersonal* orientation. COT hypothesizes that all human beings are to some degree autonomy oriented, control oriented, and impersonally oriented. Autonomy orientations refers to the propensity for behavior to be initiated and regulated by events internal to one’s sense of self and occurrences in the environment deemed to be informational. This encompasses the satisfaction of all three basic psychological needs and there is a perceived internal locus of causality.

Control orientations describe the disposition for behavior to be commenced due to events in the person that are external to one’s integrated sense of self and situations in the environment perceived as controlling. The needs of competence and relatedness are satisfied but, autonomy is not and there is a perceived external locus of causality. Consequently, this leads to stringent functioning and a reduction in well-being. Impersonal orientations are the presumptions that behavior and outcomes are independent and that forces are uncontrollable, and manifests themselves in experiences of incompetence. It refers to an individual’s inability to cope with the challenges of life where none of the basic psychological needs are fulfilled; functioning is erratic and has a detrimental effect on well-being.

3.5 Basic Needs Theory

BNT (Deci & Ryan, 2000) proposes that humans function and develop effectively as a result of the social environment and its capacity to fulfill basic need satisfaction. According to BNT, we all have three basic psychological needs of autonomy, competence, and relatedness and satisfaction of these will lead to self-determined motivation. Autonomy refers to the belief that one has some level of control over whether they choose to participate in a given activity; competence refers to the belief that a person possesses sufficient ability to cope in a specific situation; and, relatedness is how connected a person feels to those around them such as work colleagues, and team mates. Satisfaction of these basic psychological needs is assumed to result in the enhancement of physical and psychological well-being.

It is apparent that an athlete has to endure and overcome many obstacles in the pursuit of excellence; therefore, it is fundamental for both the coach and athlete to underscore the importance of motivation. Therefore, the environment created by the coach and how the athlete perceives this can have a profound effect on the motivation of the athlete (Vallerand, Deci, & Ryan, 1987). Moreover, when the social environment is autonomy-supportive it serves to enhance self-determined motivation and when it is controlling, the climate has an undermining effect. Research in both sport psychology (Reinboth & Duda, 2004; Vallerand, 1983; Amorose & Horn, 2002; Cervello, Santos Rosa, Garcia Calvo, Jimenez, & Iglesias, 2005; Kipp & Amorose, 2008, Hollembeak & Amorose, 2005) and exercise psychology (Markland, 1999) has demonstrated this. Moreover, studies in educational psychology (Cox & Williams, 2008) have highlighted the significance of perceived teacher support, mastery climate, and relatedness in physical education. Sarrazin, Guillet, and Cury (2001) conducted a longitudinal study among 236 French female handball players to determine the effects of coach created task and ego climates have on the player's competence, autonomy and relatedness. The players completed questionnaires at the beginning and the end of the season and the coaches' perception of their motivational competence was evaluated in the middle. The results indicated that a task-oriented climate positively predicted feelings of competence, autonomy, and relatedness and an ego-oriented climate negatively predicted these outcomes. However, while many studies have

demonstrated the positive mediating effects of autonomy, and competence, (Pelletier et al., 2001), there have been few studies that have emphasized relatedness in this regard. This is surprising given that it has been proven that relatedness has been shown to be a stronger predictor of intrinsic motivation than autonomy (Adie, Duda & Ntoumanis, 2008). Indeed, Pensgaard & Roberts (2001), in a study on elite Norwegian skiers concluded that the role of teammates has thus far been underestimated in its significance and that "this leads to an obvious call to investigate the role of team members in creating the perceived motivational climate for elite athletes" (p.58). Moreover, competence has been found to be a lesser source of self-determined motivation than relatedness in physical education settings (Cox & Williams, 2008). Furthermore, the satisfaction of relatedness can be a positive indicator of well-being (Sheldon & Bettencourt, 2002). Despite the fact that some studies have contradicted this conclusion (Reinboth, Duda & Ntoumanis, 2004) it would appear that the satisfaction of this need is contingent on the specific context of the environment and the nature of the activity in which the athlete is engaged (Reinboth, Duda & Ntoumanis, 2004). This study will examine each of the three needs, particularly focusing on the aspect of relatedness to determine if this is a stronger indicator of high intrinsic motivation.

SDT (Deci & Ryan, 1985, 2000) posits that an environment that is more autonomy-supportive will foster higher levels of intrinsic motivation and enhance feelings of well-being. A significant association has been established between SDT (Deci & Ryan, 1985, 2000) and perceptions of the motivational climate in sport (Kipp & Amorose, 2008) and exercise psychology (Goudas & Biddle, 1994). For example, Gagné, Ryan & Bargmann (2003) investigated the autonomy support and needs satisfaction in the motivation and well-being of 45 United States female gymnasts. All the participants completed a questionnaire and 33 filled in a diary before and after practice that detailed their motivation for gymnastics over a 4 week period. They reported that the more autonomous support received from the coaches and parents the more autonomously motivated the gymnasts were. In addition, the results showed that daily needs satisfaction during practice led to increased well-being.

Hollembeak and Amorose (2005) studied whether perceived competence, autonomy and relatedness mediated the relationship between perceived coaching behaviors and the intrinsic motivation of 280 male and female college athletes from a US university. The athletes completed questionnaires that assessed their perception of their coaches' behavior such as positive feedback, social support, and autocratic and democratic behavior, as well as their IM, and perceived competence, autonomy, and relatedness. The results showed that all coaching behaviors except social support significantly predicted perceived competence, autonomy, and/or relatedness and subsequently IM. Moreover, coaching behaviors deemed autonomy-supportive such as democratic had a positive effect on autonomy, competence, relatedness and IM compared to autocratic behavior that had a negative impact. Similar findings have been derived in studies in the field of education. Cox and Williams (2008) found that a perceived mastery climate had a significantly positive relationship with perceived autonomy, competence, and relatedness.

4 PSYCHOLOGICAL WELL BEING

4.1 Anxiety

The conceptualization of anxiety has been somewhat problematic and has led to ambiguity over its precise definition. Terms such as stress and arousal are often associated with anxiety but there is a need to make a distinction between them. Anxiety refers to an emotional reaction or state characterized by: a) varying intensity, b) variation over time, c) the presence of recognizable unpleasant feelings of preoccupation, worry and apprehension, and d) a simultaneous pronounced activation of the autonomic nervous system (Hanin, 1978). Arousal refers merely to the physiological activation of behavior and has only one dimension. Stress, according to McGrath (1970) can be defined as an imbalance between the perceived environmental demands and the perceived response capability. Furthermore, some confusion existed surrounded the quantification of a general proneness to experiencing anxiety and a current state of anxiousness. The distinction was made between trait and state anxiety in Spielberger's State-Trait Anxiety Theory (Spielberger, 1966). State anxiety refers to subjective feelings of worry, tension, nervousness and apprehension accompanied by an arousal of the autonomic nervous system (Spielberger, Gorsuch & Lushene, 1970). Trait anxiety is a tendency to perceive certain situations as threatening and to react to these with fluctuating degrees of state anxiety. Attempts to conceptualize anxiety as a more complex process resulted in the formulation of the Multidimensional Anxiety Theory (MAT; Martens, Vealey, & Burton, 1990).

According to MAT (Martens et al, 1990), anxiety is multidimensional and has two components; cognitive and somatic that can impact on performance in different ways. State anxiety is an existing or current emotional state such as fear and tension. Cognitive anxiety is the psychological element of anxiety and is a consequence of negative evaluation or negative expectations of success. Somatic anxiety is the physiological component that results from the arousal of the autonomic system and can be manifested in a rapid heart rate, increased perspiration, tense muscles, clammy hands, and shortness of breath. The Competitive Sport Anxiety Inventory 2 (CSAI-2; Martens et al, 1990) was initially developed to measure both cognitive and somatic state anxiety. However, factor analysis of state cognitive anxiety revealed a third component of state self-confidence.

However, there has been a limited amount of studies that have examined SDT (Deci & Ryan, 1985, 2000) and its relationship with anxiety. Some exceptions include studies on physical activity (Brunet & Sabiston, 2009). According to SDT (Deci & Ryan, 1985, 2000) environments that are more autonomous in nature result in more positive effects on psychological well-being and that controlling environments have negative impacts.

Recent studies have illustrated a relationship between the perception of the motivational climate and anxiety. Cecchini, González, Carmona, Arruza, Escarti, & Balagué (2001) examined the influence of physical education teachers on intrinsic motivation, self-confidence, anxiety, and pre- and post- competition moods in 115 Spanish school children. The students were trained in a 12 week athletics course before taking part in a competition. The results showed that children who perceived a mastery climate experienced more enjoyment, invested more effort in the PE classes, had higher pre-competitive somatic anxiety but more post-competitive vigor and lower anxiety. Children who viewed the climate as ego-oriented had higher pre-competitive self-confidence, less somatic anxiety but more post-competitive stress. The experience was more satisfactory for those in the mastery climate than in the performance climate.

In a further study in educational psychology, Papaioannou and Kouli (1999) investigated the effect of task structure, perceived motivational climate and goal orientations on students' task involvement and anxiety among 92 Greek junior high school students. The students participated in 4 task-involving tasks and 3 ego-involving tasks and concentration, autotelic experience, loss of self-consciousness; anxiety and perceived motivational climate were all assessed. The findings showed that in the task-involving tasks students had higher self-confidence, lower somatic anxiety, and perceived a higher task-involving than ego-involving climate than in the ego-involving tasks. The mediating effects of the perceived motivational climate on anxiety have also been elicited in sport psychology (Abrahamsen, Roberts & Pensgaard, 2008).

Smith, Smoll, and Cummings (2007) studied the effects of a motivational climate intervention for coaches on young athletes' sport performance anxiety. Thirty-seven

coaches and 216 male and female basketball players in Western United States were divided into an experimental group where coaches were trained in mastery climate techniques and a control group that received no intervention. The results of the intervention were tested on the motivational climate and alterations in cognitive and somatic performance anxiety over the course of the season. Athletes in the intervention group perceived their coaches as more mastery-oriented than those in the control group and athletes who played for the trained coaches exhibited marked reductions in total anxiety from pre-season to the end of the season. By contrast, those in the non-intervention group displayed increases in anxiety throughout the season.

4.2 Self-Esteem

Self-esteem is defined as "a self-reflexive attitude that is the product of viewing the self as an object of evaluation" (Campbell & Lavallee, 1993, p. 4). In other words, it is an individual's overall appraisal of their own self worth and there can be trait, state, implicit, and explicit types. Trait self-esteem is a persistent characteristic of an individual's personality that remains relatively rigid whereas in state self esteem or short-term variations can be evident. Implicit self-esteem refers to an individual's tendency to appraise themselves either positively or negatively spontaneously whereas explicit self-esteem is more deliberate and consists of deeper and more conscious reflection. According to SDT (Deci & Ryan, 1985, 1991 & 2000), a strong sense of self derives from autonomous action and is associated with high levels of self-esteem. Behavior that is deemed to be controlled will lead to lower levels of self-esteem.

Self-esteem is a fundamental aspect of psychological well-being and a relationship with self-determination has been established through research in various disciplines in psychology. For example, Vello and Haggard (2006) investigated the global self-esteem, goal achievement orientations, and self-determined behavioral regulations in physical education settings among 634 Estonian school children. The results indicated that autonomous motives mediated the effect of goal orientations on global self-esteem. This was consistent with the studies by Wilson and Rogers (2002) that showed that autonomous motives of female exercise participants had a positive effect on physical self-esteem.

Thøgersen-Ntoumani and Fox (2007) studied the role of autonomy for exercise and its relationship with mental well-being in 769 non-academic employees at a UK university. The findings revealed an association between feeling self-determined to exercise and high levels of mental well-being compared to feeling that exercise behavior is controlled. In accordance with SDT, the less autonomous types of extrinsic motivation, (i.e. external and introjected regulation) emerged as a negative predictor of well-being. Identified regulation was found to be more positively associated with physical well-being than psychological and intrinsic motivation was significantly positively associated with all the variables of well-being. Thus, individuals who participate in exercise because they enjoy and derive pleasure from doing so are more likely to feel good about themselves both mentally and physically.

Furthermore, in a study of 126 male and female undergraduate students by Kernis, Paradise, Whitaker, Wheatman, and Goldman (2000) that examined the extent to which self-esteem stability relates to self-regulatory styles, self-concept clarity and goal-related effect. The results showed that unstable self-esteem was strongly associated with lower levels of self-determination compared to stable self-esteem. Most strikingly, the analysis concluded that self-esteem was negatively correlated with external and introjected regulation but positively correlated with identified regulation, intrinsic regulation and self-determination index. However, self-esteem stability was positively correlated with external and introjected regulation and negatively correlated with identified regulation, intrinsic regulation and self-determination index. This indicated that those who have low levels of self-esteem and instability are more likely to have higher external and introjected regulations and lower identified regulation, intrinsic regulation and self-determination.

SDT (Deci & Ryan, 1985, 2000) posits that stable self-esteem stems directly from the satisfaction of the basic psychological needs of competence, relatedness and autonomy and may be a consequence of the process of internalizing autonomy-supportive environments and relationships. Coatsworth and Conroy (2009) examined the effect of autonomy-supportive coaching, needs satisfaction, and self-perceptions on initiative and identity in 119 youth swimmers over a 7 week period. The results indicated that coaches' autonomy

support predicted youth competence need satisfaction and relatedness need satisfaction in the coaching relationship and led to a progressively higher level of self-esteem among the participants over the course of the 7 weeks. Quested and Duda (2009) reported that an environment perceived as socially supportive had a positive influence on contemporary and ballet dancer's self-perceptions, i.e. self-esteem.

In summary, it is evident from the review of the literature that a climate perceived as a task/mastery climate (learning and development, co-operative) is more autonomy-supportive and contributes significantly to the fulfillment of perceived competence, perceived autonomy, and perceived relatedness. Previous research has demonstrated that such an autonomous environment is congruent with more self-determined forms of motivation. Furthermore, satisfaction of the basic needs and more autonomous types of motivation has been shown to be positively associated with psychological well-being. The literature has also conjured up support that a perceived ego/performance climate (punishment for mistakes, unequal recognition) is more controlling and less autonomy-supportive and is pernicious to the attainment of the basic needs. Moreover, it would seem that a more controlling environment is compatible with less autonomous forms of motivation and is associated with psychological ill-being.

Deci and Ryan's (SDT; 1985, 1991, & 2000) Self-Determination Theory has been explored and examined in a variety of differing approaches such as the perceived motivational climate, the self-determined motivation continuum, needs satisfaction, and their subsequent impact on both physiological and psychological well-being. However, there is a need to research a number of key variables within these constructs such as separate evaluation of the different types of self-determined motivation, and the need for relatedness, although there is sufficient evidence to add credence to the belief in its' level of importance. Limited research has been conducted on the climate of elite athletes in team sports and what impact the motivational climate created by significant others such as coaches and teammates can have on their motivation regulation, and how in turn this can affect facets of their psychological well-being such as self-esteem and anxiety. While each of these constructs

has been scrutinized in many other contexts they have never been examined in the sport of hurling, thus this study will attempt to fill this vacancy.

5 HURLING

5.1 Historical Background

The sport of hurling is a traditional Irish field game and is a hybrid between lacrosse and field hockey although potentially more dynamic. The game of hurling, although relatively unknown outside of Ireland, has a long and rich history. It is considered by many to be the father of all stick and ball games and its routes may be traced back as early as 2000 years ago in ancient Egypt (Reilly & Collins, 2008). Furthermore, there is evidence from the book of Leinster that refers to a game of hurling being played at the battle of Moytura in 1272 B.C. (de Burca, 1980). Those who follow the game with passion and pride consider it to be the fastest field sport in the world. The Gaelic Athletic Association (GAA) was set up in 1884 to act as the governing body of hurling and other sports like Gaelic football, court handball, and road bowls under the umbrella of Gaelic games. The organization was established in response to the socio-political climate that existed in Ireland in the late 19th century that was characterized by British occupation and a decline in the Irish language and much of its sovereignty. The main purpose of the GAA was to try to revive the Gaelic games that were considered to be uniquely Irish and promote aspects of Irish culture that were clearly distinguished.

A limited amount of knowledge about the game is known beyond the Irish Sea but the many millions of Irish emigrants who have settled elsewhere have established a vast amount of local clubs who compete amongst each other. For example, in Argentina “the first ‘official’ hurling match between two formally constituted clubs was played on 15 July 1900 between Almagro and Palermo, two districts in the city of Buenos Aires” (King & Darby, 2007).

6.2 Competition

Hurling at the elite level is played on an inter-county basis with most of the 32 counties of Ireland competing in the All-Ireland Championships. There are competitions played at club senior, intermediate, under-21, junior, and minor (under-18) levels, and there are also juvenile championships held at under-age beginning as low as age six. Inter-county is the elite level of hurling in which all 32 counties compete in a National League competition that begins in February and concludes in May. However, eligibility for the All-Ireland Championships is based on a ranking system in which the top twelve counties can participate. The competition begins after a short intermission of two weeks in which there are provincial Championships played in the provinces of Munster, Leinster and Ulster. However, there is no provincial Championship in Connaught as Galway is currently the only inter-county team. They have been recently amalgamated into the Leinster Championships along with Antrim from Ulster. An Ulster Championship was played last season but it did not lead to qualification into the All-Ireland series. The competition is played on a knock-out basis with the winners of the provincial Championships in Munster and Leinster qualifying for the All-Ireland semi-finals. The losing teams are drafted into a qualifying series in which the two successful teams face the runner's up from the Leinster and Munster Championship finals in the quarter-finals. The winner's qualify for the semi-final and the final is played on the 1st Sunday of September. The most dominant teams hail from the provinces of Munster and Leinster with the so-called 'big three' of Tipperary, Cork and Kilkenny having won 86 Championships between them.

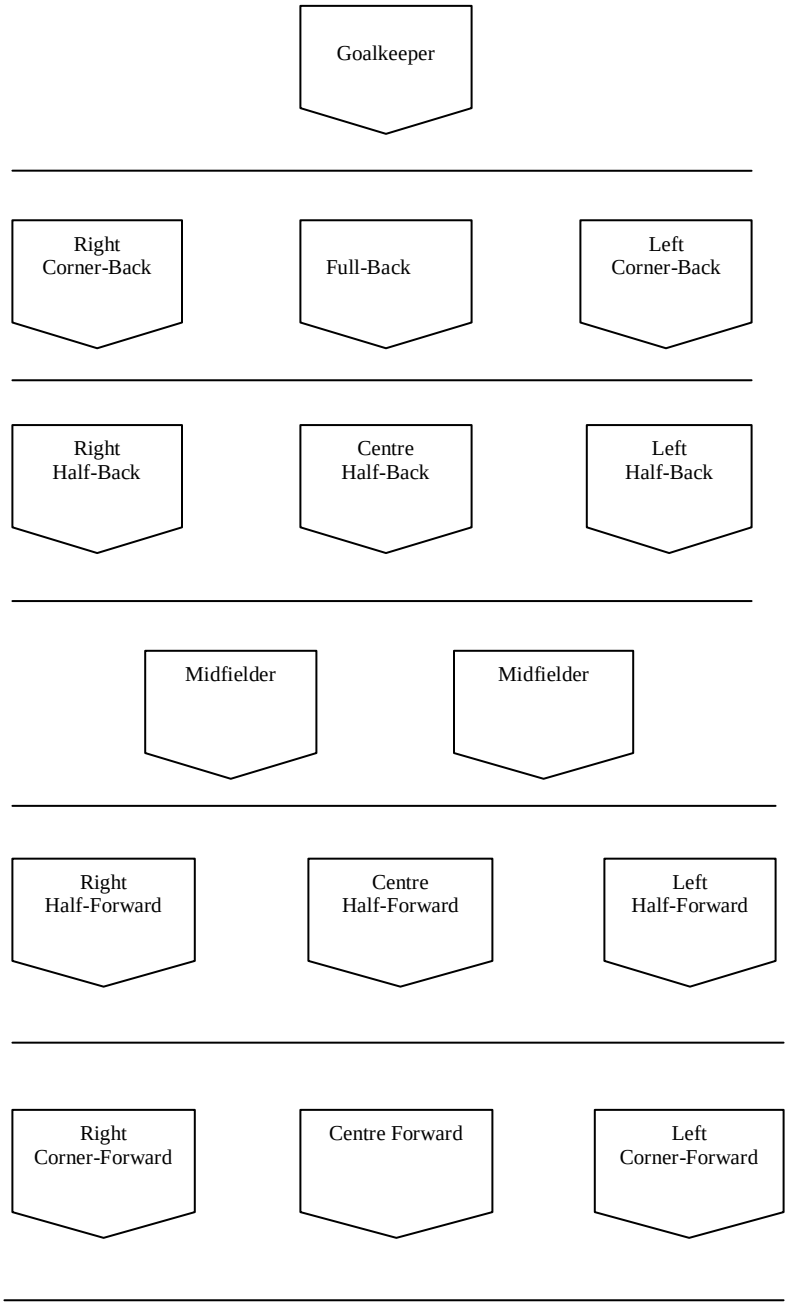
6.3 Characteristics of Hurling

A team in hurling consists of 15 players with the possibility of replacing those with up to five of the nominated substitutes. The consistent line-up comprises of a goalkeeper, two defensive lines of three full-backs and three half-backs, two midfielders, and two offensive lines of three half-forwards and three full-forwards (see Figure 1 below). Man to man marking is prevalent throughout the games. At inter-county level each match lasts 70 minutes with two halves of 35 minutes each. The pitch is approximately 130-165m long and is wider and around 40% bigger than a football pitch. The goalposts at either end

consist of two vertical posts with a horizontal crossbar 2.5m high. A single point is scored by striking the ball above the crossbar and between the posts and a goal which is equivalent to three points by striking the ball below the bar and between the posts. The aim is to score more points than the opposition.

Hurling is a highly skilful game requiring extremely accurate hand-eye coordination and players often strike the ball with the camán or hurling stick for distances between 80-90m. The camán is made primarily from ash but more recent models have contained synthetic materials. Hurling sticks are similar in shape to hockey sticks although they are wider and curved at the base. In addition, the camán can be played using both sides to accommodate left-handed or right-handed players. The sliothar or ball has a leather exterior with a padded cork interior. It resembles a cricket ball although is lighter in stature but equally likely to inflict injury. Hurling is a contact sport that is characterized by multiple physical exchanges and therefore players often wear helmets to protect themselves from being struck by the camán of an opposing player. Lifting the ball off the ground using either hand is prohibited and contact must be made with the hurling stick in order to do so.

Figure 1. Typical Formation of a Hurling Team



The sport commands an amateur status in that participation is purely on a voluntary basis and the players do not receive monetary rewards and have limited exposure and notoriety in the mass media. Moreover, the players who compete at the elite level of inter-county are either engaged in full-time employment or studying at various universities and can be required to attend two training sessions and either a club or inter-county match each week during the season. Players who compete at the most elite level (inter-county) are required to possess physical fitness levels that are similar to that of professional athletes. For example, McIntyre (2005) compared the physiological profiles of elite Gaelic footballers, hurlers and soccer players. A physiological assessment was conducted on 29 inter-county Gaelic footballers, 30 inter-county hurlers, and 21 League of Ireland soccer players. The results showed that there were little differences between height, weight, and body size for all three sports and similar levels of speed are required for participation. However, the soccer players had lower body fat, greater aerobic capacity, strength endurance and flexibility than the Gaelic footballers and hurlers. It was suggested that this may be due to specific training and conditioning that soccer players are compelled to undergo.

Despite the absence of many of the tangible rewards that are often derived from professional sport hurling enjoys an unparalleled degree of popularity both in Ireland and among the plethora of Irish communities dispersed around the globe. One of the principal reasons cited is that the parish is the origin of the club system where the majority of clubs derive their name from national patriots or Catholic saints and that every parish has a club. There is a strong association between participation in the sport and a sense of patriotism or National pride. Indeed in the latter part of the Championships stadia are generally packed full to capacity and the final attracts attendances of 82,300 to Croke Park in Dublin, which is the 4th largest stadium in Europe. However, despite the enormous interest from players and supporters and the intuitively appealing nature of the sport there has been an overwhelming dearth of research examining the psychological characteristics of senior inter-county hurlers.

6.4 Psychology of hurling

In a sport that demands a high degree of intensity and fitness there are certain psychological skills required to compliment these demands. Hurlers, particularly at elite level need to be intrinsically motivated as there can be long time lapses between games and because of the multitude of pressures from work and family life. As the game is very skilful and requires excellent hand-eye coordination psychological skills such as concentration and attention are important. Emotions play an enormous role due to the many physical encounters during the game and the strong sense of pride experienced in representing either the player's parish or county. Players can be provoked into feeling emotions such as anger during a game and anxiety before the start of an important match. Elite hurlers need to have the ability to focus on the goal of winning the game and be able to block out detrimental distractions such as the crowd. As the prevalence of injuries is quite high in the sport it is vital for hurlers to have the necessary coping skills that facilitate an efficient rehabilitation process.

To my knowledge there has been virtually no studies examining the psychological aspects of elite level hurlers. Research in hurling has tended to focus on socio-cultural dimensions and issues such as nationalism and identity (Darby & Hassan, 2007). Areas such as physiological profiling (Doran, Donnelly, & Reilly, 2003), injuries (Kiely, Ashraff, O'Grady, Dawson, & O'Beirne, 2003), and post-exercise effects (Lyons, Al-Nakeeb. & Nevill, 2008) have received notable attention. Interestingly, "several recent All-Ireland Championship winning teams have used sport psychologists to assist in their competitive preparation" (MacIntyre, Mahoney, & Moran, p. 507, 1998) which would beg the question why there has not been any studies undertaken to examine the psychology of hurling athletes. This could perhaps be a consequence of some coaches viewing sport psychology with a certain degree of skepticism and suspicion and restricting access to the players and themselves. While there has been considerable neglect for the psychological attributes of hurling players there has been some investigation into the behavior of hurling coaches. McCormack (2007) surveyed 35 inter-county hurling coaches to determine the factors that influence their leadership and behavior. The results indicated the importance of experience in leadership and coaching behavior. This study aims to bridge that gap that exists in the psychological research on hurling and to act as a catalyst for future investigations.

6 PURPOSE AND HYPOTHESES

The primary aim of this study was to explore the perceived motivational climate, basic psychological needs, motivational regulation, and psychological well-being in elite hurlers in response to the lack of previous research in the sport. A secondary aim was to examine the relationship between perceived motivational climate, need satisfaction, motivational regulation and psychological well-being. A third aim was to determine how motivational regulation predicts psychological well-being in hurlers. Auxiliary aims include investigating if relatedness is a stronger indicator of self-determined types of motivation. Based on the literature and previous research this study had four principal aims and examined several hypotheses and these are outlined in detail below.

The specific aims of this study were:

Aim 1

To explore the motivational climate of elite hurlers and to determine if it is perceived as being either task-involving or ego-involving. As there have been no previous psychological studies of elite hurlers the initial aim of the study was to examine how the hurling players perceived their motivational climate using the responses from the self-administered PMCQS-2.

Aim 2

From results in the earlier literature (Quested & Duda, 2010; Chi & Lu, 1995; Cox & Williams, 2008; Sheldon & Bettencourt, 2002) the second aim of the study was to establish if the three basic psychological needs of perceived competence, perceived autonomy, and perceived relatedness as posited by SDT (Deci & Ryan, 1985, 1991 & 2000) were being satisfied amongst the hurlers.:

Aim 3

To investigate the motivational regulation of elite hurlers and elicit their motivational profiles to ascertain if they possess high levels of autonomous motivation and are low in amotivation.

Aim 4

To explore the psychological well-being of hurlers by examining the dimensions of state cognitive and state somatic anxiety, state self-confidence, and global self-esteem to indicate positive or negative psychological well-being.

The study examined relationships between:

- Players' perceptions of motivational climate as task or ego-involving and their perceived basic need satisfaction as stated by SDT (Deci & Ryan, 1985, 1991 & 2000).
- Players' perception of need satisfaction and motivational regulations.
- Players' motivational regulations and psychological well-being in terms of anxiety and self-esteem.

Based on previous studies (Reinboth and Duda, 2004; Reinboth, Duda & Ntoumanis, 2004; Quested & Duda, 2009; Quested & Duda, 2010; Kipp and Amorose, 2008) and upon the tenets of SDT (Deci & Ryan, 1985, 1991, & 2000) it was hypothesized that:

- A motivational climate perceived as a task climate was expected to be positively associated with the three psychological needs of perceived competence, autonomy, and relatedness as posited by SDT (Deci & Ryan, 1985, 2000), and the more autonomous forms of motivation, and positive psychological well-being.
- A motivational climate perceived as an ego climate was expected to be negatively associated with the three psychological needs of perceived competence, autonomy, and relatedness, and positively associated with less autonomous forms of motivation and psychological well-being.
- A motivational climate perceived as a task-involving climate was expected to positively predict the three basic psychological needs, more autonomous forms of motivation and psychological well-being.
- A motivational climate perceived as an ego-involving climate was expected to negatively predict the basic psychological needs, autonomous forms of motivation and psychological well-being.

- The psychological need of perceived relatedness would be a stronger indicator of intrinsic motivation (IM) than perceived competence and autonomy.
- The three basic psychological needs of SDT (Deci & Ryan, 1985, 1991 & 2000) would positively predict psychological well-being
- The more autonomous types of motivation would positively predict psychological well-being.

7 METHOD AND PROCEDURE

7.1 Method

7.1.1 *Participants*

The participants (*N=60*) included male adults with an age ranging from 19 to 34 years (*M*=24.2, *SD*=3.86) from three different Inter-County hurling teams throughout various parts of the Republic of Ireland. The athletes competed in a variety of different positions in the sport ranging from goalkeeper to full forward. The age at which the athletes started playing hurling ranged from 3 to 11 years old (*M*=6, *SD*=2.29), and the length of time they were currently involved with their teams was 5 months to 15 years (*M*=4.1, *SD*=3.6). The average amount of time spent playing hurling, including training and matches, per week was 9.5 hours (*SD*=2.81).

7.1.2 *Measures*

The hurlers completed a battery of questionnaires that consisted of: 1) demographic information, years of experience with their current team, the amount of hours spent on average per week hurling (including training and matches), and their position 2) motivation towards hurling, 3) perceived competence, 4) perceived autonomy, 5) perceived relatedness, 6) perceived motivational climate, 7) competitive sport anxiety, and 8) self-esteem.

7.1.3 *Motivation towards hurling*.

The Sport Motivation Scale (SMS; Pelletier, Fortier, Vallerand, Tucson, Briére, & Blaise, 1995) was used to assess the different types of motivation as proposed by SDT (Deci & Ryan, 1985, 1991 & 2000). The SMS is a 28-item scale that measures intrinsic motivation, extrinsic motivation and amotivation. The participants indicated to what extent each of the items corresponds to a reason why they are currently playing hurling. The hurlers responded to each item on a Likert-type scale ranging from 1 (*does not apply at all*) to 7 (*applies exactly*). The SMS contains seven subscales consisting of 4 items each. Participation motives include the most autonomous forms: intrinsic motivation to know ("for the enjoyment of knowing more about hurling"), intrinsic motivation toward

accomplishment ("because I feel a lot of personal satisfaction while mastering certain difficult skills/techniques"), and intrinsic motivation to experience stimulation ("for the excitement I feel when I am really involved in hurling"). Less autonomous (extrinsic) forms include: identified regulation ("because it is a good way to learn lots of things which could be useful in other areas of my life"), introjected regulation ("because I must participate in hurling to feel good about myself"), and external regulation ("because it allows me to be well thought of by people I know"). The SMS also includes a scale to measure amotivation ("I used to have good reasons for participating in hurling, but now I am asking myself if I should continue doing it"). Acceptable internal consistency was found for all scales with Cronbach alphas ranging from .74 to .80. The identified regulation scale showed moderate internal consistency (α=.63) (Pelletier et al., 1995).

7.1.4 *Perceived Competence*

The 5-item perceived competence subscale of the Intrinsic Motivation Inventory (IMI; McAuley, Duncan & Tammen, 1989) was used to derive how the athletes perceived their ability to hurl. The scale requests the participants to indicate which response is the most appropriate that reflects their competence in their sport. Perceived competence is measured on a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). An example of an item would be, "After practicing a particular skill for a while I feel pretty competent". High internal consistency has been found (α=.85) for the scale in previous research (Ntoumanis, 2001).

7.1.5 *Perceived Autonomy*

The autonomy dimension of the Needs Satisfaction at Work Scale by Deci et al. (2001) was utilized to assess perceived autonomy. The scale consists of 6 items that asks the respondents to select the option that indicates how they currently feel about their autonomy level using a Likert type scale that ranges from 1 (*not true at all*) to 7 (*very true*). For example, "I feel free to express my ideas and opinions". Satisfactory reliability and validity and good internal consistency (α=.83 and α=.89) in two samples have been shown (Deci et al. 2001).

7.1.6 *Relatedness*

The 5-item Need for Relatedness Scale (NFRS; Richer & Vallerand, 1998) assessed the extent to which the hurlers felt connected to their team mates and members of the coaching staff. The inventory elicits the degree of relatedness through a Likert scale starting from 1 (*strongly disagree*) to 7 (*strongly agree*). An example of an item would be, "In this hurling team I feel listened to". High internal consistency (α=.96) of the scale have been demonstrated in the literature by Amorose and Hollembeak (2005).

7.1.7 *Perceived Motivational Climate*

The Perceived Motivational Climate Questionnaire in Sport-2 (PMCSQ-2; Newton, Duda & Yin, 2000) was used to assess the perception the hurlers had of their motivational climate. The 33 item scale contains of 6 subscales that identify the dimensions of task-oriented climate and ego-oriented climate. The task-oriented dimension contains the subscales of co-operative learning ("hurlers help each other learn"), important role ("each hurler contributes in some important way"), and effort and improvement ("hurlers feel good when they try their best"). The ego-oriented dimension contains the subscales of punishment for mistakes ("the coach gets mad when a hurler makes a mistake"), unequal recognition ("only the best hurlers get praise"), and intra-team rivalry ("hurlers are encouraged to outperform the other hurlers"). The participants responded to items on a Likert scale from 1) *strongly disagree* to 7) *strongly agree.* Newton et al. (2000) have provided evidence of adequate consistency and validity with internal consistency of .87 for the Task-involving climate and .89 for the Ego-involving climate subscales of the PMCSQ-2.

7.1.8 *Anxiety*

The Competitive Sport Anxiety Inventory-2 (CSAI-2; Vealey & Martens, 1990) was used to gauge the level of state cognitive and somatic anxiety of the hurlers as well as state self-confidence. CSAI-2 (Martens et al, 1990) is a 27 item inventory with 9 items measuring state cognitive anxiety ("*I am concerned about this competition*"), 9 items measuring state somatic anxiety ("*I feel tense in my stomach*"), and 9 items eliciting the level of state self-confidence ("*I feel at ease*"). This is done through a four point Likert type

scale ranging from 1 (*not at all*) to 4 (*very much so)*. Adequate reliability with a Cronbach alpha score of .70 have been found for the CSAI-2 (Raudsepp & Kais, 2008).

7.1.9 *Self-Esteem*

The 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965) was used to measure global self-esteem. The scale consists of ten items with a four point Likert scale from 1 (*strongly agree*) to 4 (*strongly disagree*). Total scores range from 10 to 40 with higher scores indicating greater global self-esteem. An example of an item that taps into the global self-esteem would be, "*I feel that I am a person of worth, at least on an equal plane with others*". Sufficient levels of internal consistency (r = .92) and re-test reliability (r = .85) have been demonstrated in previous studies (Wylie, 1974).

7.2 Procedure

Each of the 32 inter-county boards were contacted and informed about the study. The coaches of three teams responded positively to participate in the study. A meeting was arranged with one of the coaches following observation of a practice session to outline the study and to make arrangements for the collection of data. Verbal communication by telephone was made with the coaches of the remaining two teams to organize distribution of the questionnaires as it was not possible to attend training sessions. Each of the coaches was given a verbal and written explanation of what the study entailed. The athletes gave their informed consent after the purpose of the study was explained and they were reassured that their responses would be kept anonymous and confidential at all times. Participants were involved on a voluntary basis. The data was collected in early May prior to the start of the championship season so that there would be minimum disruption to the player's preparation.

7.3 Data analysis

The data was statistically analyzed using SPSS version 15.0. Data screening was conducted to investigate if there were any missing values and to determine that the values were within the expected ranges. A small percentage of items contained two responses and a decision was taken to use the mean scores of these. The remaining missing values were replaced by

calculating the means of the series. Correlations between the variables were calculated using the Pearson product moment enter method and standard linear regression analyses were used to make predictions about the relationships between perceptions of the motivational climate, needs satisfaction, motivational regulation and psychological well-being. In addition, a one-way ANOVA test was used to check for differences between the three different teams.

7.4 Literature Search

A systematic literature search was carried out utilizing the following electronic databases: PsychInfo, SportDiscuss, ScienceWeb, Ebsco Host, Google Scholar, ISI Web of Knowledge, Nelli, JYKDOK, and PubMed.

Key Search Terms: Perceived Motivational Climate, Self-Determination Theory, Intrinsic Motivation, Motivation, Needs Satisfaction, Well-being, Anxiety, Self-Esteem, Elite Sport, Hurling.

8 RESULTS

When analyzing the data the decision was taken to separate the three subscales of extrinsic motivation and intrinsic motivation in order to specify the relationship with the self-determined continuum, perceived motivational climate and the aspects of psychological well-being examined in this study.

8.1 Descriptive Statistics

Mean scores and standard deviations were calculated for the three subscales that measure a task climate (co-operative learning, important role, and effort/improvement) and the three subscales that measure an ego climate (punishment for mistakes, unequal recognition, and intra-team rivalry). These are outlined in Table 1. Overall, the hurlers responses indicated that they perceived their motivational climate as being more task-oriented (M=4.27 SD=.59) than ego-oriented (M=2.71 SD=.63). In general, the hurlers reported that the three basic needs were being met (see Table 1). The hurlers reported a high level of relatedness with a mean score of 4.04 and standard deviation of .77 on a 5-point scale followed by a high level of perceived competence (M=5.55 SD=.74) and a moderate degree of perceived autonomy (M=3.50 SD=1.14).

Mean scores and standard deviation scores from the SMS demonstrated that the hurlers scored higher on the most autonomous forms of motivation in comparison to the less autonomous types. Amotivation (AM) was quite low among the hurlers (M=1.70 SD=.99) with external regulation (M=3.37 SD=1.34) and introjected regulation (M=3.43 SD=1.32) scoring slightly higher while identified regulation (M=4.07 SD=1.39) was moderately high. Intrinsic motivation to know (M=4.70 SD=1.34), intrinsic motivation to accomplish (M=5.08 ± 1.04) and intrinsic motivation to experience stimulation (M=5.38±1.08) were quite high among the sample indicating a high level of intrinsic motivation which is the most autonomous form of motivational regulation. Descriptive statistics for all variables are provided in Table 1.

The results (Table 1) would seem to illustrate that the hurlers overall psychological well-being is positive. They reported having a moderate level of state cognitive anxiety (M=2.28 SD=.64) and a low level of state somatic anxiety (M=1.90 SD=.52). In addition, the hurlers seem to have moderately high state self-confidence (M=3.11 SD=.50). The elite hurlers also appear to have moderately high global self-esteem (M=2.39 SD=.30).

Table 1. Descriptive Statistics for all Variables

Variables	Min	Max	M	SD
Task Climate	2.43	5.00	4.28	0.59
Ego Climate	1.00	4.19	2.71	0.63
Perceived Competence	2.80	7.00	5.46	0.86
Perceived Autonomy	1.00	6.33	3.50	1.14
Perceived Relatedness	1.00	5.00	3.99	0.86
Amotivation	1.00	4.50	1.70	0.99
External Regulation	1.00	6.00	3.37	1.34
Introjected Regulation	1.00	6.50	3.43	1.32
Identified Regulation	1.00	7.00	4.07	1.39
IM to know	1.50	7.00	4.70	1.34
IM to accomplish	2.50	7.00	5.08	1.11
IM to exp stim	2.75	7.00	5.38	1.08
Cognitive Anxiety	1.11	3.67	2.28	0.64
Somatic Anxiety	1.22	3.33	1.90	0.52
Self-confidence	1.89	4.00	3.11	0.50
Self-esteem	1.75	3.00	2.39	0.30

Note: Task and Ego Climate and Perceived Relatedness were measured using a 5 point Likert scale; Perceived Competence, Perceived Autonomy, Amotivation, Extrinsic Motivation, and Intrinsic Motivation (IM) were measured using a 7 point Likert scale. While State Cognitive and Somatic Anxiety, State Self-confidence, and global Self-esteem were measured on a 4 point Likert scale.

8.2 Relationship between Perceived Motivational Climate, Needs Satisfaction, Motivation Regulation and Psychological well-being

Bivariate correlations using Pearson product moment co-efficients (see Table 2) were used to establish the relationships between the different variables. A climate perceived as task-oriented was positively associated with all three basic psychological needs as proposed by SDT (Deci & Ryan, 1985, 1991 & 2000). There was a significant positive association with perceived competence (r=.28; $p<0.05$) but perceived autonomy (r=.24) was weakly positively associated. Perceived task climate was very significantly positively associated with perceived relatedness (r=.57; $p<0.01$). Amotivation was significantly negatively associated with a task climate (r=-.37; $p<0.05$) whereas external regulation was weakly negatively related to a perceived task-oriented climate. Both introjected regulation (r=.03) and identified regulation (r=.04) were very weakly correlated with a task climate and intrinsic motivation to know was weakly positively associated (r=.12). Intrinsic motivation to accomplish (r=.30; $p<0.05$) and intrinsic motivation to experience stimulation (r=.29; $p<0.05$) were found to be significantly positively associated with a task climate. State cognitive and state somatic anxiety were weakly negatively associated with a task climate. State self-confidence was very significantly positively associated with a task climate (r=.43; $p<0.01$) and global self-esteem was weakly positively related to a perceived task climate.

Perceived competence, perceived autonomy and, in particular, perceived relatedness were all positively associated with a task-oriented climate. The least autonomous forms of motivation (amotivation and external regulation) were negatively correlated with a perceived task climate while the more autonomous forms (introjected regulation, identified regulation, intrinsic motivation to know, intrinsic motivation to accomplish, and intrinsic motivation to experience stimulation) had positive relationships. Furthermore, the results produce sufficient evidence to support the claim that a perceived task climate is associated with positive psychological well-being as both state cognitive and somatic anxiety were negatively related whereas state self-confidence and global self-esteem were positively associated.

Bivariate correlations were calculated using the Pearson product moment method and the full results can be seen in Table 3 below. An ego-oriented climate was found to be weakly positively related to perceived autonomy while there was a weak negative association with perceived autonomy. There was very significant negative relationship with perceived relatedness ($r=.38$; $p<0.01$) and a perceived ego-oriented climate. Amotivation, external regulation, introjected regulation, identified regulation, intrinsic motivation to accomplish, and intrinsic motivation to experience stimulation all had weak positive associations with a perceived ego climate. However, intrinsic motivation to experience was found to be positively associated with a perceived ego climate ($r=.30$; $p<0.05$). A perceived ego climate was negatively correlated with psychological well-being. State cognitive anxiety had a significantly positive relationship with a perceived ego climate ($r=.32$; $p<0.05$) and state somatic anxiety was positively associated ($r=.13$). By contrast, state self-confidence ($r=-.28$; $p<0.05$) was significantly negatively related and global self-esteem ($r=-.17$) was negatively related to an ego-oriented motivational climate.

Table 2. Bivariate Correlations for all Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Task															
2. Ego	-.39**														
3. Competence	.28*	-.03													
4. Autonomy	.24	.07	.20												
5. Relatedness	.58**	-.38**	.25	.51**											
6. Amotivation	-.37**	.23	-.06	-.09	-.34**										
7. External Reg	-.05	.15	.26*	.26*	.12	.27*									
8. Introjected Reg	.03	.13	.20	.24	.07	.15	.62**								
9. Identified Reg	.04	.10	.24	.21	.15	.18	.66**	.48**							
10. IM to know	.12	.30*	.13	.17	.03	-.02	.37**	.45**	.54**						
11. IM to accomplish	.30*	.11	.16	.21	.14	-.13	.42**	.49**	.53**	.69**					
12. IM to exp stim	.29*	.12	.04	.34**	.22	-.15	.27*	.41**	.46**	.69**	.73**				
13. Cog Anxiety	.00	.32*	.10	.20	.04	.24	.28*	.27*	.26*	.09	.23	.31*			
14. Som Anxiety	-.01	.13	.06	.24	.24	.24	.18	.22	.21	-.01	-.04	.16	.65**		
15. Confidence	.43**	-.28*	.39**	.19	.47**	-.09	.09	-.02	.02	.09	.10	-.01	-.28*	-.20	
16. Self-esteem	.05	-.17	.21	-.06	.16	-.10	.05	-.08	.08	-.08	-.03	-.03	-.04	-.06	.19

*p<0.05 **p<0.01 level of significance

Standard linear regression analyses using the enter method were conducted to test the plausibility of the hypothesis. As expected a perceived task climate emerged as a positive predictor of all three psychological well-being as posited by SDT (Deci & Ryan, 1985, 1991 & 2000). Both perceived competence (F (2,558) β = .31; p=.027) and perceived autonomy (F (2,754) β =.32; p=.026) and accounted for 8% and 9% of the variance respectively. Task climate significantly and positively predicted perceived relatedness (F (16,662) β =.51; p=.000) with 37% of the total variance. Table 4 below presents the results of the standard regression analyses where the three basic psychological needs were regressed on the perceived motivational climate.

Table 3. Standard regression analyses for predicting needs satisfaction from perceived motivational climate

Variable	Predictor	*β*	*T*	R^2	*F*
Perceived Competence					
	Task	0.31*	2.26*	0.08	2,59*
	Ego	0.09	0.68		
Perceived Autonomy					
	Task	0.32*	2.29*	0.09	2,75*
	Ego	0.19	1.37		
Perceived Relatedness					
	Task	0.51**	4.48*	0.37	16,66**
	Ego	-0.18	1.60		

*p<0.05 **p<0.01

Perceptions of a task-oriented climate significantly and negatively predicted amotivation (F (4,901) β=-.34; p=.015) and accounted for 15% of the variance. However, it was not significantly related to external regulation, introjected regulation, and identified regulation (p>.05). A perceived task climate significantly and positively predicted the three dimensions of intrinsic motivation. Intrinsic motivation to know (F (3,111) β=.31; p=.029) accounted for only 10% of the variance with intrinsic motivation to accomplish (F (5,147) β=.31; p=.003) accounting for 15% and intrinsic motivation to experience stimulation (F (5,774) β=.41; p=.003) explaining 17% of the total variance. Therefore, overall a perception of a task climate positively and significantly predicted the more autonomous forms of

motivation (IM to know, IM to accomplish, IM to experience stimulation). Table 5 below outlines the full results of standard linear regression where motivation regulations were regressed on perceived motivational climate.

Standard linear regression analysis indicated that a perceived task climate did not significantly and negatively predict state cognitive anxiety ($p>.05$), however, both task and ego climate together, did predict state cognitive anxiety ($F(3,782)$; $p=.029$). State somatic anxiety was not found to be significantly related to perceptions of a task-oriented climate and a task climate did not predict global self-esteem ($p>.05$). State self-confidence ($F(7,205)$ $\beta=.38$; $p=.004$) was found to be significantly and positively predicted by a perceived task climate and accounted for 20% of the variance. Table 6 contains the full results of the standard linear regression in which psychological well-being is regressed on the perceived motivation climate. Contrary to the hypothesis, in general a motivational climate that was perceived as being task-oriented did not significantly and positively predict psychological well-being among the elite hurlers.

Table 4. Standard regression analyses for predicting motivation from perceived motivational climate

Variable	Predictor	*β*	*T*	R^2	*F*
Amotivation					
	Task	-0.34*	-2.52	0.15	4.90*
	Ego	0.10	0.73		
External Regulation					
	Task	0.13	0.09	0.02	0.62
	Ego	0.15	1.06		
Introjected Regulation					
	Task	0.09	0.63	0.23	0.66
	Ego	0.16	1.13		
Identified Regulation					
	Task	0.09	0.66	0.02	0.48
	Ego	0.13	0.93		
IM to know					
	Task	0.31*	2.25	0.10	3.11
	Ego	0.26	1.88		
IM to accomplish					
	Task	0.41**	3.09	0.15	5.15**
	Ego	0.27*	2.02		
IM to experience stimulation					
	Task	0.41**	3.12	0.17	5.77*
	Ego	0.32*	2.47		

*p<0.05 **p<0.01

Table 5. Standard linear regression for predicting psychological well-being from perceived motivational climate

Variable	Predictor	*β*	*T*	R^2	*F*
Cognitive Anxiety					
	Task	0.14	1.07	0.12	3.78*
	Ego	0.37**	2.75		
Somatic Anxiety					
	Task	0.05	0.37	0.02	0.54
	Ego	0.15	1,04		
Self-confidence					
	Task	0.38**	2.96	0.20	7.21**
	Ego	-0.13	-1.02		
Self-esteem					
	Task	-0.01	-0.10	0.03	0.83
	Ego	-0.17	-1.22		

*p<0.05 **p<0.01

Standard linear regression analyses demonstrated that perceptions of an ego climate did not significantly and negatively predict perceived competence, perceived autonomy, and perceived relatedness (p>.05). Perceptions of an ego-oriented climate did not emerge as a predictor of amotivation (β=.097; p=.47), external regulation (β=.15; p=.29), introjected regulation (β=.16; p=.26), identified regulation (β=.13; p=.36), and intrinsic motivation to know (β=.26; p=.07). However, contrary to the hypothesis, a perceived ego climate emerged as a significant and positive predictor of intrinsic motivation to accomplish (F (5,147) β=.27; p=.048) and intrinsic motivation to experience stimulation (F (5,774) β=.32; p=.017). IM to accomplish and IM to experience stimulation accounted for 15% and 17% of the overall variance. Therefore, a perceived ego climate did not significantly and negatively predict the more autonomous forms of motivation (see Table 5).

Perceptions of an ego climate were found to be a significant and positive predictor of state cognitive anxiety (F (3,728) β=.37; p=.008) but accounted for just 11% of the variance. State somatic anxiety (β=.15; p=.30), state self-confidence (β=-.13; p=.31), and global self-esteem (β=-.17; p=.23) were not predicted by an ego-oriented climate. Thus, a perception of

an ego climate was not a significant and negative predictor of psychological well-being (see Table 6).

Standard linear regression analysis was used to test hypothesis 5 that the basic needs would positively predict the motivational regulation of the hurlers (see Table 7 for full results). Amotivation was not found to be predicted by perceived competence (β=.02; p=.89) and perceived autonomy (β=.11; p=.46), however, it was significantly and negatively predicted by perceived relatedness (F (2,657) β=-.40; p=.009). This accounted for 13% of the variance. External regulation, introjected regulation, and identified regulation were not found to be predicted by any of the basic needs (p>.05). Both intrinsic motivation to know and intrinsic motivation to accomplish were also found not be significantly related to perceived competence, perceived autonomy, or perceived relatedness. Intrinsic motivation to experience stimulation (F (3,257) β=.34; p=.023) did emerge as being significantly and positively predicted by perceived competence with 15% of the variance but was not predicted by either perceived autonomy or perceived relatedness. All three basic needs emerged as non-predictors of intrinsic motivation to know and intrinsic motivation to accomplish (p>.05).

Table 6. Standard linear regression for predicting motivation from needs satisfaction

Variable	Predictor	*β*	*T*	R^2	*F*
Amotivation					
	Perceived Competence	0.02	0.14	0,13	2.66*
	Perceived Autonomy	0.11	0.74		
	Perceived Relatedness	-0.40**	-2.70		
External Regulation					
	Perceived Competence	0.23	1.73	0,11	2.41
	Perceived Autonomy	0.25	1.68		
	Perceived Relatedness	-0.07	-0.44		
Introjected Regulation					
	Perceived Competence	0.18	1.35	0,09	1.82
	Perceived Autonomy	0.25	1.71		
	Perceived Relatedness	-0.11	-0.71		
Identified Regulation					
	Perceived Competence	0.21	1.57	0,09	1.77
	Perceived Autonomy	0.16	1.08		
	Perceived Relatedness	0.01	0.09		
IM to know					
	Perceived Competence	-0.05	-0.37	0,09	1.87
	Perceived Autonomy	0.22	1.48		
	Perceived Relatedness	0.14	0.89		
IM to accomplish					
	Perceived Competence	0.12	0.92	0,06	1.21
	Perceived Autonomy	0.18	1.20		
	Perceived Relatedness	0.01	0.08		
IM to experience stimulation					
	Perceived Competence	0.03	0.21	0,15	3.26*
	Perceived Autonomy	0.34*	2.34		
	Perceived Relatedness	0.07	0.62		

*p<0.05 **p<0.01

Standard linear regression analyses were used to test hypothesis 6 which proposed that the basic needs of SDT (Deci & Ryan, 1985, 1991 & 2000) would positively predict the psychological well-being of hurlers. Table 8 presents the results from the standard linear regression analyses where the dimensions of psychological well-being were regressed on the basic psychological needs. None of the three basic needs emerged as predictors of state cognitive anxiety, state somatic anxiety, and global self-esteem ($p>.05$). However, both perceived competence ($\beta=.30$; $p=.011$) and perceived relatedness ($\beta=.45$; $p=.001$) were found to be significant and positive predictors of state self-confidence. Perceived autonomy was not a predictor of state self-confidence ($p>.05$).

Table 7. Standard linear regression for predicting psychological well-being from needs satisfaction

Variable	Predictor	*β*	*T*	R^2	*F*
Cognitive Anxiety					
	Perceived Competence	0.08	0.60	0.05	1.04
	Perceived Autonomy	0.24	1.57		
	Perceived Relatedness	-0.10	-0.66		
Somatic Anxiety					
	Perceived Competence	-0.02	-0.13	0.07	1.48
	Perceived Autonomy	0.16	1.04		
	Perceived Relatedness	0.16	1.05		
Self-confidence					
	Perceived Competence	0.30*	2.62	0.31	8.42**
	Perceived Autonomy	-0.10	-0.75		
	Perceived Relatedness	0.45**	3.40		
Self-esteem					
	Perceived Competence	0.20	1.52	0.09	1.82
	Perceived Autonomy	-0.21	-1.42		
	Perceived Relatedness	0.21	1.42		

*p<0.05 **p<0.01

Again, standard linear regression analysis was used to test the predictability of psychological well-being from the different types of motivational regulation (Hypothesis 7). The full results are presented in table 9 below. Only intrinsic motivation to experience stimulation was shown to be a significant and positive predictor of state cognitive anxiety (F (2,233), β=.49; p=.021) and accounted for 23% of the variance. Intrinsic motivation to accomplish (β=-.51; p=.017) significantly and negatively predicted state somatic anxiety. By contrast, intrinsic motivation to experience stimulation was a significant positive predictor of somatic anxiety (β=.45; p=.037) while the remaining forms of motivation did not emerge as predictors of psychological well-being (p>.05). All seven types of motivation did not significantly predict state self-confidence or global self-esteem (p>.05).

Table 8. Standard linear regression analyses to predict psychological well-being from motivation

Variable		*β*	*T*	R^2	*F*
Cognitive Anxiety					
	Amotivation	.22	.66	.23	2.23*
	External Regulation	.12	.64		
	Introjected Regulation	.08	.46		
	Identified Regulation	.003	-.02		
	IM to know	-.26	-1.34		
	IM to accomplish	-.01	-.04		
	IM to exp stimulation	.49*	2.38*		
Somatic Anxiety					
	Amotivation	.17	1.22	.21	2.02
	External Regulation	.001	-.01		
	Introjected Regulation	.18	1.05		
	Identified Regulation	.16	.86		
	IM to know	-.02	-.10		
	IM to accomplish	-.51*	-2.74*		
	IM to exp stimulation	.45*	2.14*		
Self-confidence					
	Amotivation	-.08	-.56	.07	.60
	External Regulation	.21	1.01		
	Introjected Regulation	-.17	-.91		
	Identified Regulation	-.10	-.53		
	IM to know	.20	.93		
	IM to accomplish	.20	.87		
	IM to exp stimulation	-.26	-1.15		
Self-esteem					
	Amotivation	-.17	-1.17	.07	.55
	External Regulation	.09	.45		
	Introjected Regulation	-.12	-.63		
	Identified Regulation	.20	1.02		
	IM to know	-.02	-.07		
	IM to accomplish	.02	.10		
	IM to exp stimulation	-.21	-.91		

*p<0.05**p<0.01

8.3 Variations among the different teams

A fourth research aim was to compare the perceived motivational climate, need satisfaction, motivational regulation and psychological well-being among the three elite hurling teams. A one-way ANOVA (Appendix) was conducted on all variables (Task, Ego, Competence, Autonomy, Relatedness, Amotivation, External, Introjected, Identified, IM to know, IM to accomplish, IM to experience stimulation, Cognitive Anxiety, Somatic Anxiety, Self-Confidence and Self-Esteem) to compare differences between the three teams. In addition, a Tamhane 2 post-hoc test was carried out to investigate the specific differences between the teams. The results showed that there were significant differences in the perceived autonomy between Team A and Team C. Team A (M=3.88), $F(2, 57)=3.94$, p=.043 had a higher perception of autonomy in comparison to Team C (M=2.96), $F(2, 57)=3.94$, p=.043. The only other significant difference was found in the level of state somatic anxiety. Team C reported lower state somatic anxiety, (M=1.65), $F(2, 57)=3.31$, p=.019, compared to Team A (M=2.06), $F(2, 57)=3.31$, p=.019.

No other significant differences were found among the remaining variables (p>.05).The participants were then grouped into three groups (Team A N=30, Team B N=17, Team C N=13). There were significant differences found between the teams in their perception of autonomy ($F(2, 57) =3.94$; p=.025), perceived relatedness ($F(2, 57) =4.07$; p=.022), and levels of state somatic anxiety ($F(2, 57) =3.31$; p=.043). No significant differences were found in the teams' perceptions of the motivational climate, perceived competence, motivational regulation, state cognitive anxiety, state self-confidence and global self-esteem. Since only significant differences were found for autonomy, relatedness and state somatic anxiety the teams were treated as a group.

Table 9. Significant differences between the hurling teams

Variable		M (SD)	*t*	df	*p*
Autonomy	Team A	3.88 (1.07)	3.94*	2, 57	.025
	Team B	3.24 (1.16)			
	Team C	2.96 (1.04)			
Relatedness	Team A	4.29 (.61)	4.07*	2, 57	.022
	Team B	3.73 (1.02)			
	Team C	3.65 (.94)			
Somatic Anxiety	Team A	2.06 (.54)	3,31*	2, 57	.043
	Team B	1.82 (.52)			
	Team C	1.65 (.36)			

*p<0.05 level of significance

9 DISCUSSION

The predominant aim of this study was to examine the perceived motivational climate, needs satisfaction, motivational regulation and psychological well-being in elite hurlers. This involved determining whether hurlers viewed themselves as having either a task-involving or ego-involving climate using the PMCSQ-2 (Newton, Duda & Yin, 2000), and eliciting if the hurlers experienced perceptions of competence, autonomy, and relatedness through the IMI (McAuley, Duncan & Tammen, 1989), Need Satisfaction at Work Scale (Deci et al., 2000) and the NFRS (Richer & Vallerand, 1996). In addition, the study explored the motivational regulation of hurlers using the SMS (Pelletier et al., 1995) and tried to establish the degree of hurlers autonomous motivation and investigated their psychological well-being through the CSAI-2 (Martens et.al, 1990) and Rosenberg's Self-Esteem Scale (Rosenberg, 1965). Furthermore, the relationship between each of the variables was also scrutinized. This type of study was the first of its kind in the domain of hurling and generated some rather interesting and fascinating results.

9.1 Perceived Motivational Climate

The current study indicated that elite hurlers perceived their motivational climate as being more task-oriented in comparison to ego-oriented. This suggests that the environment created by hurling coaches and significant others such as teammates is characterized more by an emphasis on co-operative learning where the players are encouraged to learn and develop new skills and to work in tandem with other players to achieve their individual and team goals. Furthermore, it indicates that each hurler feels that they have an important role within the squad and that the emphasis is more on effort and improvement rather than competitive results. The lower perception of an ego-involving climate denotes that the elite hurler's environment is not typified as often by coaches punishing players for making mistakes during practice and matches, diverting the majority of their attention to the high-profile players, and encouraging rivalry and competition among the squad members. The results are in keeping with other studies that have examined the motivational climate of elite athletes such as Pensgaard and Roberts (2002) study on elite Norwegian skiers who were found to perceive their climate as being higher in task-orientation than ego-orientation.

9.2 Needs Satisfaction

The elite hurlers were found to have quite high perceptions of competence, autonomy, and relatedness. Thus, the three basic psychological needs of SDT (Deci & Ryan, 1985, 1991 & 2000) were satisfied. The results illustrate that hurlers have higher perceptions of relatedness than competence and autonomy and is similar to the findings of Cox and Williams (2008). This might be explained by the fact that elite hurlers in general have a very positive relationship with their coach and have a strong bond and sense of unity with the other members of the team regardless of their current status within the squad. Elite hurlers viewed themselves as having sufficient levels of ability to cope with the demands placed on them within their environment and felt self-determined, i.e. a degree of choice with regard to participating in hurling related activities.

9.3 Motivation Regulation

From the results it would seem that elite hurlers are highly motivated. The motivational regulation of elite hurlers was overall highly autonomous in nature and is consistent with the findings of Pelletier et al. (2001). The trend followed a distinctive pattern with amotivation being extremely rare in elite hurlers. There were no significant differences between the external regulation and introjected regulation but were moderately experienced by the hurlers. This suggests that some hurlers may participate in the sport due to external pressure being exerted on them by others or with a view to achieving a particular goal such as maintaining a high level of physical fitness stemming from guilt about non-participation. Another possibility is that hurlers compete for the pride of representing their county in elite competition. Identified regulation was slightly higher than the other two forms of extrinsic motivation (Ntoumanis, 2001) and may be an indication that for some elite hurlers participation is both internalized but they have aspirations for achieving personal goals such as increasing physical strength or winning a championship medal. Despite the presence of less autonomous forms of motivation, the hurlers exhibited much higher levels of the most autonomous types.

In a sport where there are little extrinsic incentives for competing, it would be logical to assume that participation would be predominantly on the basis of enjoyment and pleasure

derived from competing in hurling. As expected, the elite hurlers were found to have high levels of intrinsic motivation (Sarrazin et al., 2002) and contrasts with the findings of Thøgersen-Ntoumani and Ntoumanis (2006) where identified regulation was higher than IM. Intrinsic motivation to know was experienced slightly less than intrinsic motivation to accomplish and intrinsic motivation to experience stimulation. It may well be that for elite hurlers the satisfaction of learning new skills or techniques about striking the ball is less of an antecedent for participation than setting individual targets for improvement in performance such as a back setting a goal of conceding less points or a forward improving their points tally for the next season. Most interestingly, it appears that the key factor that acts as a catalyst for intrinsic motivation among inter-county hurlers is the pleasure that is gained from the types of movements and the execution of technically advanced skills during both practice and during matches. Thus, being able to simply catch a high ball during a game while under extreme pressure or scoring a long-range free from an acute angle is much more likely to enhance satisfaction from participation than developing knowledge on how to rise the ball on the hurling stick or achieving personal goals such as scoring more points in a season.

9.4 Psychological Well-Being

The hurlers playing at inter-county level appear to have positive psychological well-being. State cognitive anxiety was moderate and state somatic anxiety was found to be lower. It could be that hurlers experience higher state cognitive anxiety than state somatic anxiety due to the amount of decisions that need to be made during the match and practice situations while trying to execute technically complex movements and skills. Furthermore, the stressors and demands placed on the hurlers from daily working and family life probably have an enhancing effect. State self-confidence was relatively high among the hurlers suggesting that while they are prone to feelings of cognitive and somatic anxiety they have sufficiently high belief in their own abilities to function effectively within their hurling environment and is consistent with the findings of Cecchini et al. (2001). The global self-esteem of hurlers was moderate and this could perhaps be mediated by external factors such as present job situation, and their current marital and financial status.

9.5 Relationship between all variables

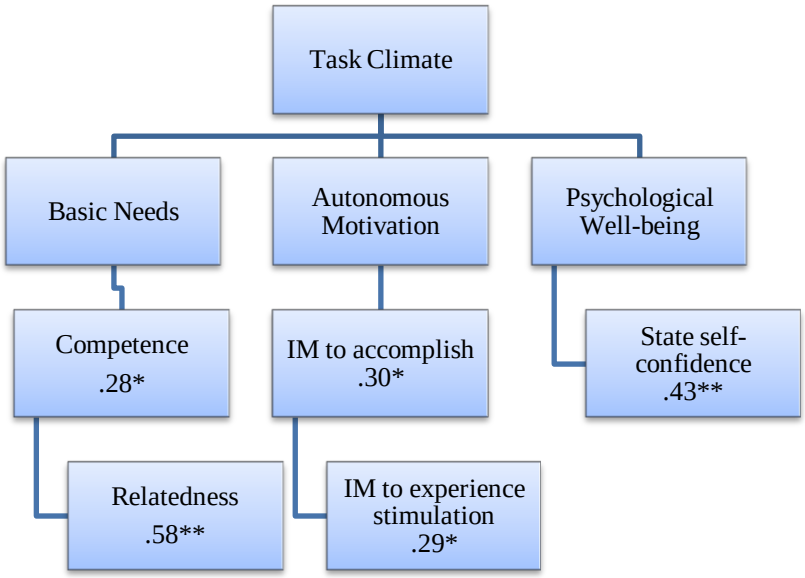
According to SDT (Deci & Ryan, 1985, 1991 & 2000) an environment that is perceived as autonomy-supportive will enhance perceived competence, perceived autonomy, and perceived relatedness. Hypothesis 1 proposed that a motivational climate perceived as task-oriented would be positively associated with the three basic psychological needs, autonomous forms of motivation and psychological well-being. Elite hurlers perceived their motivational climate as being primarily task-involving and a task climate was significantly positively associated with both perceived competence and perceived relatedness. However, no significant relationship emerged between a perception of a task climate and perceived autonomy. Thus, the aggregated results would appear to support the hypothesis that a motivational climate that is perceived as being task-oriented is positively associated with the three basic needs of SDT (Deci & Ryan, 1985, 1991 & 2000). The results support previous findings in sport settings such as Sarrazin et al. (2002) who found that a climate perceived as task involved facilitated feelings of competence, and relatedness in female Canadian handball players. However, contrary to this study perceived autonomy was enhanced by perceptions of a task motivational climate.

Moreover, similar results have been found outside of the domain of sport. For example, Quested and Duda (2009) determined that perceived task motivational climate was positively associated with feelings of competence, autonomy, and relatedness in UK hip-hop dancers. A perceived task involved climate was significantly positively related to the more autonomous forms of motivation (IM to accomplish and IM to experience stimulation). Only intrinsic motivation to know showed an unexpected pattern of association. The results are in keeping with previous studies such as Kipp and Amorose (2008) who found that self-determined forms of motivation were positively related to a perceived task motivational climate. Furthermore, amotivation was shown to be significantly and negatively related to perceptions of a task motivational climate and offers support to SDT's (Deci & Ryan, 1985, 1991 & 2000) claim that intrinsic motivation is fostered in an environment where effort and improvement is strongly emphasized and the basic needs are satisfied. This is in keeping with previous findings such as Vallerand (1983) who showed that when ice-hockey players received positive feedback and experienced

feelings of competence, autonomy and relatedness that their levels of intrinsic motivation were increased.

Contrary to expectations, only self-confidence was found to have an association with a perceived task climate. It would seem that when an environment is created where the focus is on improving and developing new skills that the level of self-confidence is greatly enhanced and is congruent with earlier findings in sport settings such as Cecchini, Gonzalez, Carmona and Contreras (2004) who showed that self-confidence was positively related to a perceived task motivational climate in a sample of tennis players and in a physical education intervention study by Papaioannou and Kouli (1999) that demonstrated that when students perceived their environment as task-oriented they experience higher state self-confidence. However, unlike the present study they also found that students had lower feelings of state cognitive and somatic anxiety. This is in contrast to other findings in physical education where a positive relationship between a task climate and self-confidence did not emerge (Cecchini et al., 2001). Unlike earlier findings, state cognitive anxiety, state somatic anxiety, and global self-esteem had no significant relationship with perceptions of a task motivational climate (Smith, Smoll & Cumming, 2007, Coatsworth & Conroy, 2009). Overall, the hypothesis is supported with the exception of psychological well-being where state self-confidence was the only variable to emerge as having a significantly positive relationship with perceptions of a task motivational climate.

Figure 2. Hypothesis One

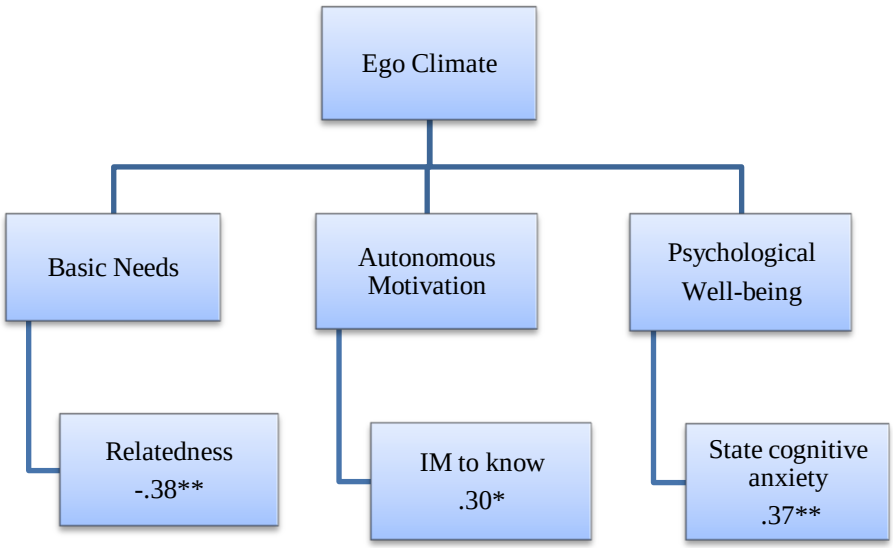


Hypothesis 2 proposed that a motivational climate that is perceived as being ego-oriented would be negatively associated with the three basic needs of SDT (Deci & Ryan, 1985, 1991 & 2000), the more autonomous forms of motivation and psychological well-being. Therefore, the overall results do not fully support the hypothesis. The results did show that a perceived ego climate was negatively associated with the basic psychological needs but only perceived relatedness was statistically significant. This suggests that an environment where mistakes are frequently punished and all contributions of the team are not valued will have a detrimental effect on the potential for members to establish a positive relationship with significant others such as coaches and teammates. This is concurrent with previous studies such as Olympiou, Jowett and Duda (2008) who found that perceptions of an ego-involving climate were associated with a decrease in the level of commitment, closeness and complimentarity between the coach and the athlete in a sample of 591 British athletes.

However, the results in the present study did not demonstrate that an ego-oriented motivational climate is negatively associated with more autonomous forms of motivation as all forms of motivation were shown to be positively associated with a perceived ego climate. This rather unexpected finding suggests that an ego-oriented climate does not

always a negative impact on the motivational states of hurlers. This contradicts the previous findings that have suggested that an elite athlete's prosperity is fostered by a mastery climate to compliment their high levels of task and ego goal orientations (Pensgaard & Roberts, 2002). A rather surprising finding in the study was that a perceived ego climate was significantly and positively associated with intrinsic motivation to know. Perhaps an elite hurlers desire to acquire knowledge about new skills can be enhanced by encouraging rivalry and competition among the players. Having strong competition for starting places and comparing their performance with other players may in some cases act as a catalyst for increasing their motivation to improve. Psychological well-being was demonstrated to be negatively correlated as both state cognitive and state somatic anxiety were positively related and state self-confidence and global self-esteem were negatively related to an ego-oriented climate.

Figure 3. Hypothesis Two

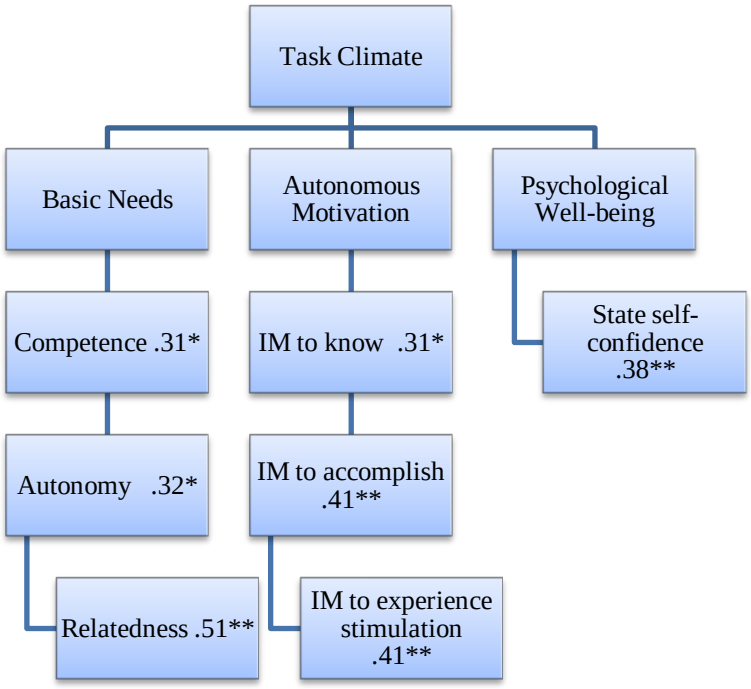


Hypothesis 3 proposed that a perceived task climate would positively predict the satisfaction of the three basic psychological needs of SDT (Deci & Ryan, 1985, 1991 & 2000), more autonomous forms of motivation and psychological well-being. The three basic psychological needs were shown to be positively predicted by perceptions of a task-oriented motivational climate. While perceived competence and perceived autonomy accounted only for 8% and 9% of the variance, perceived relatedness was more strongly predicted and explained 37% of the total variance. Thus, it appears that in the context of elite hurling that when a motivational environment is viewed as task-involving it has a greater influence on the player's feelings of belonging to the group and connectivity with significant others than their feelings of possessing sufficient ability and volition to participate. These findings support the previous results in the domain of sport that have shown that a perceived task motivational climate positively predicts perceived competence, perceived autonomy, and perceived relatedness (Sarrazin, Guillet & Cury, 2001; Adie, Duda & Ntoumanis, 2008).

As expected, perceptions of a task motivational climate significantly and negatively predicted amotivation and also significantly and positively predicted the most autonomous forms of motivation (IM to know, IM to accomplish, IM to experience stimulation). The findings support earlier studies that have illustrated a link between perceptions of a task motivational climate and experiencing intrinsic motivation (Kavussanu and Roberts, 1996). Interestingly, intrinsic motivation to experience stimulation emerged as the strongest predicted type of autonomous motivation. This suggests that while a climate that is preoccupied with promoting learning and development and reduced social comparison is beneficial for all types of intrinsic motivation it has a more profound effect on the degree of enjoyment hurlers derive from performing technically difficult skills. State self-confidence emerged as the only dimension of psychological well-being that was positively and significantly predicted by a perceived task motivational climate. State cognitive and somatic anxiety were not predicted by perceptions of a task climate which is contrary to other findings (Abrahamsen et al., 2006). In addition, global self-esteem was not found to be predicted by a task climate and contradicts with the study by Reinboth and Duda (2004) where a perceived task motivational climate emerged as a positive predictor of global self-

esteem. The results overall (see Table 4), do not fully support the hypothesis as although perceptions of a task climate significantly and positively predicted the three basic psychological needs (perceived competence, perceived autonomy, and perceived relatedness), and the most autonomous forms of motivation (IM to know, IM to accomplish, and IM to experience stimulation), it did not significantly predict psychological well-being.

Figure 4. Hypothesis Three

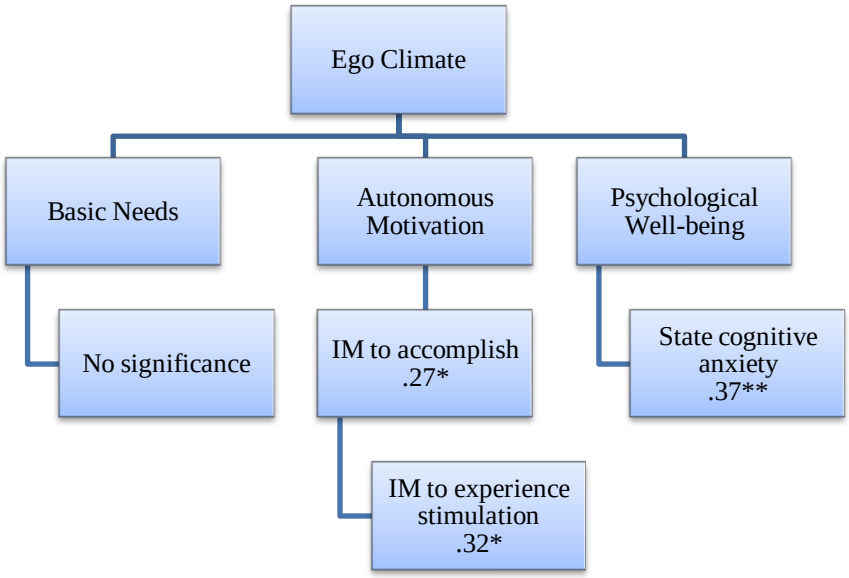


Hypothesis 4 proposed that a perceived ego climate would negatively predict the three basic psychological needs, the more autonomous types of motivation, and psychological well-being. Overall, the results do not support the hypothesis as the results indicate that a perceived ego climate did not negatively predict the three basic psychological needs of SDT (Deci & Ryan, 1985, 1991 & 2000) and does not support the results of prior studies in the context of sport (Sarrazin et al., 2001). However, the findings in this study are in line with the results in Reinboth and Duda (2006) who found that perceived competence and perceived autonomy were not negatively predicted by an ego climate. A possible

explanation for this non-significant finding is that it could be possible that when an ego climate is perceived that some players still have high perceptions of competence in certain contexts (such as when the team is winning) and some of the more high profile players could be afforded a certain amount of autonomy within the team. It could also be that the hindering of good relationships and intra-team rivalry has a galvanizing effect on the players who perceived themselves as being less important.

Furthermore, a perception of an ego climate failed to negatively predict the more autonomous forms of motivation and contrary to expectations emerged as a significant and positive predictor of two types of intrinsic motivation (IM to accomplish, IM to experience stimulation). This conflicts with the results in Kipp and Amorose (2008) that did not derive a link between perceptions of an ego climate and autonomous motivation. Perhaps, a plausible reason for this unexpected finding is that elite athletes are usually high in both task and ego-orientation and that while it is important to encourage effort and improvement, and foster positive relationships among the team members it might also be beneficial in the sport of hurling for the coaches to include a limited amount of intra-team rivalry and focus on competitive results to raise performance levels and achieve success at the highest level. Moreover, of the four dimensions of psychological well-being examined only state cognitive anxiety was found to be significantly and positively predicted by an ego climate. This finding is in line with earlier results (Abrahamsen, Roberts & Pensgaard, 2008) that have showed that individuals experience greater levels of cognitive anxiety in a climate where their level of ability is compared to others and where personal success is judged in terms of competitive results. State somatic anxiety, state self-confidence, and global self-esteem were not significantly predicted by a perceived ego-oriented motivational climate. This is incongruent with previous studies in sports settings (Reinboth and Duda, 2004).

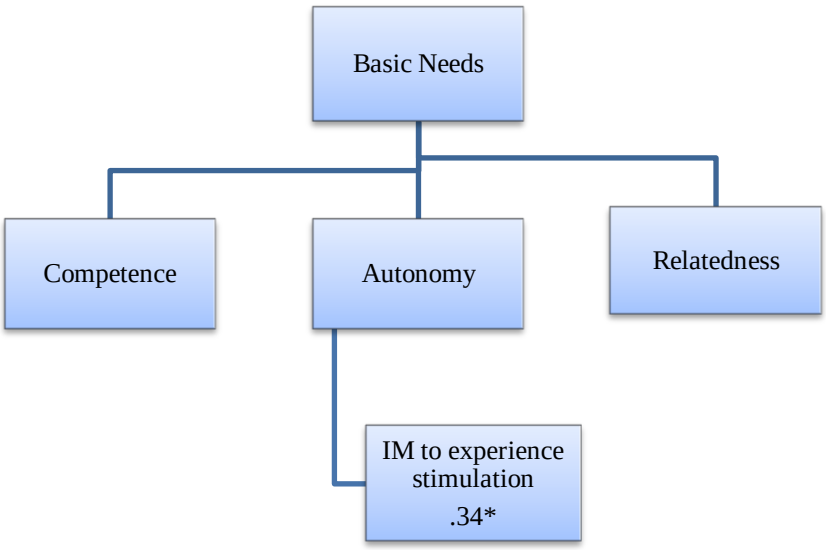
Figure 5. Hypothesis Four



Hypothesis 5 asserted that the basic psychological need of perceived relatedness would be stronger predictor of intrinsic motivation than perceived competence and perceived autonomy. In general, the results are contradictory to the proposed hypothesis. While perceived relatedness significantly and negatively predicted the least autonomous type of motivation (amotivation) it was not found to be related significantly to the three dimensions of intrinsic motivation. Perceived autonomy did not predict amotivation, the three forms of extrinsic motivation, and the three types of intrinsic motivation. Perceived autonomy emerged as the only basic need that significantly and positively predicted intrinsic motivation (IM to experience stimulation). Thus, it may be concluded that in the case of elite hurlers that perceived autonomy is a stronger predictor of intrinsic motivation than perceived relatedness and perceived competence. This contradicts the findings by Gillet, Bernot and Rosnet (2009) who examined the relationship between intrinsic motivation and need satisfaction in 275 male and female French university athletes in two separate studies. The results indicated that perceived autonomy was not a significant predictor of intrinsic motivation in either study, while perceived competence was found to be a significant indicator of intrinsic motivation in the first study. However, by contrast to the results of this study, perceived relatedness was found to be the strongest indicator of intrinsic motivation

in both studies. This is not in line with the assumptions of SDT (Deci & Ryan, 1985, 1991, & 2000) that the satisfaction of the three basic needs will results in more self-determined motivation. It is also inconsistent with previous studies (Standage, Duda & Ntoumanis, 2006) that have shown competence to play a central role in enhancing autonomous forms of motivation.

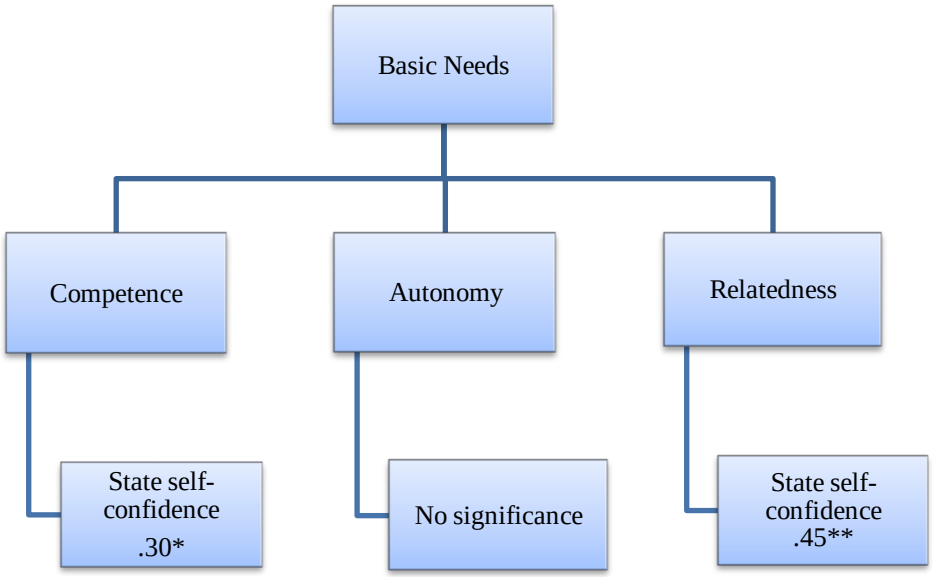
Figure 6. Hypothesis Five



Hypothesis 6 asserted that the three basic psychological needs of SDT (Deci & Ryan, 1985, 1991 & 2000) would positively predict psychological well-being in elite hurlers. Overall, the results partially support the hypothesis that the three basic psychological needs predict positive psychological well-being as only state self-confidence was significantly predicted by perceived competence and perceived relatedness. This is in keeping with previous findings such as Quested and Duda (2010) who studied the impact of the social environment on the need satisfaction, and indicators of ill- and well-being in 392 ballet and contemporary dancers. The results showed that need satisfaction positively predicted well-being among the dancers. According to the tenets of SDT (Deci & Ryan, 1985, 1991 & 2000) the satisfaction of the three basic psychological needs will enhance the psychological well-being of individuals. The current study found that perceived competence and

relatedness strongly and positively predicted state self-confidence but perceived autonomy negatively and weakly predicted state self-confidence which contradicts the propositions of SDT (Deci & Ryan, 1985, 1991 & 2000). Interestingly, perceived relatedness was found to be a stronger predictor of state self-confidence than competence. This implies that in the sport of hurling that when the players feel connected with other members of the group and have good relationships with their coaches and teammates that their level of self-confidence is more likely to be enhanced than when they feel they possess high ability.

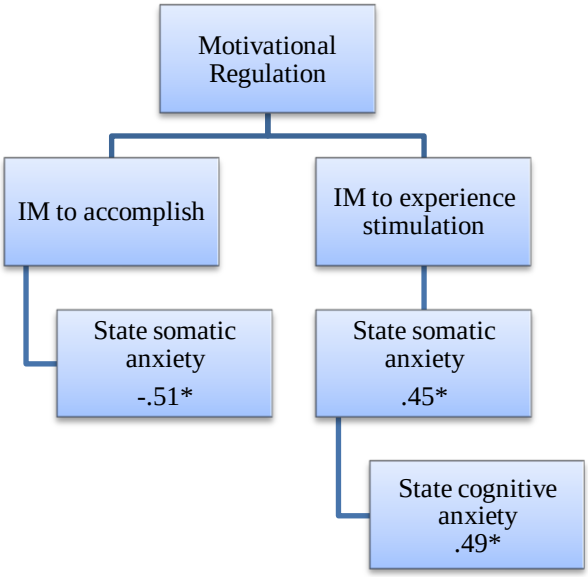
Figure 7. Hypothesis Six



The final hypothesis in the study tested whether the different types of motivational regulation predicted the hurlers' psychological well-being. The results generally displayed only partial support for the hypothesis. Intrinsic motivation to experience stimulation was the only significantly positive predictor of state cognitive anxiety while IM to know and IM to accomplish were negatively but weak predictors. Amotivation, external regulation, introjected regulation, and identified regulation were positive but weak predictors of state cognitive anxiety. IM to accomplish was a strongly negative predictor of state somatic anxiety while IM to experience was a significantly positive indicator. IM to know was a weak negative predictor but amotivation, external regulation, introjected regulation, and

identified were non-significant positive indicators of state somatic anxiety. The results are parallel to findings in earlier studies (Gagné, Ryan & Bargmann, 2003). Both state self-confidence and global self-esteem were not significantly predicted by the various forms of motivational regulation. It appears that when elite hurlers experience intrinsic motivation from the pleasure of performing technically complex skills that this is likely to raise their state cognitive and somatic anxiety. It is logical to expect this to occur since engaging in a complex task requires multiple thought processes and is accompanied by increased physical symptoms such as increased heart rate.

Figure 8. Hypothesis Seven



9.6 Limitations of the study

There were some limitations to this current study. Firstly, there were a number of difficulties with the data collection. For instance, the logistics of collecting the data from another country meant that there was an overreliance on the contacts within the team to administer the battery of questionnaires. There were a small amount of questionnaires that were received that were incomplete and had some discrepancies in the responses given. The drawback as with all self-administered questionnaires is that it was not possible to guarantee that all answers given were completely honest. As these were elite level athletes,

gaining access to the players was as expected extremely difficult. In addition, the data collection was conducted prior to the beginning of the championship season and the coaches were naturally concerned about players losing focus and becoming unnecessarily distracted before the most important competition commenced. It was only possible to arrange and attend one training session and meet with the coach of that team.

Secondly, the approach taken to the study was purely quantitative in the form of a battery of questionnaires. However, without qualitative methods the current study was unable to probe further and elicit the reasons why the type of relationships existed between the different variables. Moreover, the study was unable to derive the antecedents for the elite hurlers' perceptions of a predominantly task-oriented motivational climate, satisfaction of the basic psychological needs, autonomous motivation, and psychological well-being. Further studies should use qualitative methods. Thirdly, there was no follow-up study conducted at the end of the Championship season. From the results it appears that the hurlers are highly motivated and viewed their environment as being more task-involved. It is normally the case that elite athletes' motivation reaches its peak just before the start of a major competition and in this study the data was gathered before the 2009 All-Ireland hurling Championships began. Without further studies it was not feasible to make a comparison of the elite hurlers' perception of the motivational climate, need satisfaction, motivational regulation, and psychological well-being at the beginning and end of the season. Finally, the size of the sample who participated in the study was relatively small and therefore the findings should be taken with caution.

9.7 Practical Implications

It is clear, from the results that elite hurlers perceived their motivational climate as being high in task-orientation, experience feelings of competence, autonomy and relatedness, are intrinsically motivated, and have positive psychological well-being. It is transparent that the environment plays a crucial role in fostering autonomous motivation and positive feelings in elite hurlers and the coaches of elite hurling teams play a hugely significant role in shaping and molding the perceptions of this climate. Coaches should try to establish an environment that fosters the three basic psychological needs of SDT (Deci & Ryan, 1985,

1991 & 2000). Perceived competence could be enhanced by placing more emphasis on learning and development of skills and the importance of effort in training sessions and matches and appropriate and positive feedback should be given rather than punishing players for making punitive mistakes. Thus, helping the players feel that they have sufficient levels of ability. This in turn, will help to increase their motivation to participate and improve self-confidence levels.

Perceived autonomy could be increased if coaches were to involve players more in decision-making on practice routines and during team meetings in order to give them a sense of volition and degree of choice in participating in a hurling related activity. Furthermore, coaches could offer precise explanations as to why certain practice drills are being done and how they are congruent with the hurlers' personal goals. Increased feelings of relatedness could be evoked by coaches adopting a more personal approach with the hurlers. Coaches could try to become better acquainted with individual athletes by conducting one-to-one meetings to discuss motives and aspirations. Consequently, the hurler will feel valued, and respected by the coach (Treasure, Lemyre, Kuczka, & Standage, 2007). Moreover, coaches should avoid preferential treatment of high-profile players and emphasise the valuable contribution of each athlete regardless of their current role. Coaches could arrange social events and team building activities outside of training sessions to establish a strong sense of unity and positive relationships between the players. This is especially important in hurling where participation is on a voluntary basis. If coaches create a more task-involving climate it is likely to enhance intrinsic motivation and psychological well-being whereas an over emphasis on an ego-involving environment will undermine IM and psychological well-being.

In terms of future research on motivation in the sport of hurling, it may be useful to conduct qualitative inquiries to gain further understanding into the elite hurlers' perceptions of the motivational climate, need satisfaction, motivational regulation, and psychological well-being. While the current study examined aspects of elite hurlers' psychological well-being it did not investigate their implications for performance. Furthermore, there is a lack of longitudinal studies on the perceived motivational climate in the context of an elite athlete.

It may be fruitful to investigate perceptions of the motivational climate at the beginning, middle and end of the season in order to establish if these perceptions alter and what are the consequences for the athletes' need satisfaction, motivation and psychological well-being.

REFERENCES

Abrahamsen, F.E., Roberts, G.C., & Pensgaard, A.M. (2008) Achievement goals and gender effects on multidimensional anxiety in national elite sport. *Psychology of Sport and Exercise*, 9, 449-464.

Adie, J.W., Duda, J., & Ntoumanis, N. (2008) Autonomy support, basic need satisfaction and the optimal functioning of adult male and female sport participants: A test of basic needs theory. *Motivation and Emotion*, 32, 189-199.

Al-Nakeeb,Y., Lyons, M., & Nevill, A. (2008) The impact of competition and the presence of others on performance', *The 55th Annual Meeting of The American College of Sports Medicine*. Indianapolis – Indiana, USA.

Ames, C. (1992) Achievement goals, and adaptive motivation patterns: the role of the environment. In Roberts, G.C., (Ed) *Motivation in sport and exercise* (pp. 161-176). Champaign, IL: Human Kinetics.

Ames, C., & Archer, J. (1988) Achievement goals in the classroom: students' learning strategies and motivational processes. *Journal of Educational Psychology*, 80, 260-267.

Amorose, A., & Horn, T.S. (2000) Intrinsic motivation: relationships with collegiate athletes' gender, scholarship status, and perceptions of their coaches' behaviour. *Journal of Sport & Exercise Psychology*, 22, 63-84.

Amorose, A.J., & Anderson-Butcher, D. (2007) Autonomy-supportive coaching and self-determined motivation in high school and college athletes: a test of self-determination theory. *Psychology of Sport and Exercise*, 8, 654-670.

Boyce, B.A., Gano-Overway, L.A., & Campbell, A.L. (2009) Perceived motivational climate's influence on goal orientations, perceived competence, and practice strategies across the athletic season. *Journal of Applied Sport Psychology*, 21, 381-394.

Brunet, J., & Sabiston, C.M. (2009) Social physique anxiety and physical activity: a self-determination theory perspective. *Psychology of Sport and Exercise*, 10, 329-335.

Campbell, J.D., & Lavallee, L.F. (1993) Who am I? The Role of Self-Concept Confusion

in Understanding the Behavior of People with Low Self-Esteem. In Baumeister, R.F. *Self-Esteem: The puzzle of Low Self-Regard*. New York: Plenum, 1993.

Cecchini, J.A., González, C., Carmona, Á.M., Arruza, J., Escarti, A., & Balagué, G. (2001) The influence of the physical education teacher on intrinsic motivation, self-confidence, anxiety, and pre- and post-competition moods. *European Journal of Sport Science*, 4, 1-11.

Cecchini, J.A., Gonzalez, C., Carmona, A.M. & Contreras, O. (2004) Relationships among motivational climates, achievement goals, intrinsic motivation, self-confidence, anxiety and mood in young tennis players. *Psicothema*, 16, 104-109.

Cervello, E., Santos Rosa, F.J., Garcia Calvo, T., Jimenez, & Iglesias, D. (2007) Young tennis players' competitive task involvement and performance: the role of goal orientations, contextual motivational climate, and coach-initiated motivational climate. *Journal of Applied Sport Psychology*, 19, 304-321.

Chantal, Y., Guay, F., Dobreva-Martinova, T., & Vallerand, R.J. (1996) Motivation and elite performance: an exploratory investigation with Bulgarian athletes. *International Journal of Sport Psychology*, 27, 173-182.

Coatsworth, J.D., & Conroy, D.E. (2009) The effects of autonomy-supportive coaching, need satisfaction, and self-perceptions on initiative and identity in youth swimmers. *Developmental Psychology*, 45, 320-328.

Cox, A., & Williams, L. (2008) The roles of perceived teacher support, motivational climate, and psychological needs satisfaction in student's physical education motivation. *Journal of Sport and Exercise Psychology*, 30, 222-239.

Darby, P, & Hassan, D. (2007) Introduction: locating sport in the Irish diaspora. *Sport in Society*, 10, 333-346.

DeBurca, M. (1980) *The GAA: A history of the Gaelic Athletic Association*. Dublin: Cumann Lutchless Gael.

De Charms, R. (1968) *Personal causation: the internal affective determinants of behavior*. New York: Academic Press, 1968.

Deci, E.L. (1971) Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology*, 1, 105-115.

Deci, E.L., & Ryan, R.M. (1985) *Intrinsic motivation and self-determination in*

human behaviour. New York: Plenum, 1985.

Deci, E. L. and Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska Symposium on Motivation: Perspectives on motivation* (pp. 237-288). Lincoln: University of Nebraska Press.

Deci, E.L., & Ryan, R.M. (2000) Self-determination theory and facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68-78.

Deci, E.L., Ryan, R.M., Gagné, M., Leone, D.R., Usunov, J., Kornazheva, B.P. (2001) Needs satisfaction, motivation, and well-being in the work organizations of a former eastern bloc country: a cross-cultural study of self-determination. *Personality and Social Psychology Bulletin*, 27, 930-942.

Doran, D.A., Donnelly, J.P., & Reilly, T. (2003) Kinanthropometric and Performance Characteristics of Gaelic Games Players. In Reilly, T., & Marfell-Jones, M. *Kinanthropometry VIII: Proceedings of the 8th International Conference of the International Society for the Advancement of Kinanthropometry (ISAK)*. (pp. 181-191), London, Routledge.

Elliott, E.S., & Dweck, C.S. (1988) Goals: an approach to motivation and achievement. *Journal of Personality and Social Psychology*, 54, 5-12.

Gagné, M., Ryan, R.M., & Bargmann, K. (2003) Autonomy support and need satisfaction in the motivation and well-being of gymnasts. *Journal of Applied Sport Psychology*, 15, 372-390.

Gillet, N., Bernot, S., & Rosnet, E. (2009) An analysis of the impact of environmental conditions on the relationships between need satisfaction and intrinsic motivation in sport. *International Journal of Sport Psychology*, 40, 249-269.

Goudas, M., & Biddle, S.J.H. (1994) Perceived motivational climate and intrinsic motivation in school physical education classes. *European Journal of Psychology of Education*, 9, 241-250.

Hanin, Y.L. (1978) A study of anxiety in sports. In W.F.Straub (Ed.), *Sports psychology: An analysis of athlete behavior* (pp. 236-249). Ithaca, NY: Mouvement.

Hollembeak, J., & Amorose, A.J. (2005) Perceived coaching behaviours and

college athletes' intrinsic motivation: a test of self-determination theory. *Journal of Applied Sport Psychology*, 17, 20-36.

Kavussanu, M., & Roberts, G.C. (1996) Motivation in physical activity contexts: The relationship of perceived motivational climate to intrinsic motivation and self-efficacy. *Journal of Sport and Exercise Psychology*, 18, 264-280.

Kernis, M.H., Paradise, A.W., Whitaker, D.J., Wheatman, S.R., Goldman, B.N. (2000) Master of one's psychological domain? not likely if one's self-esteem is unstable. *Personality and Social Psychology Bulletin*, 26, 1297-1305.

Kiely, P.D., Ashraff, M., O'Grady, P., Dawson, M.J., & O'Beirne, J.G. (2003) Hand-related hurling injuries. *Injury*, 8, 561.

King, S., & Darby, P. (2007) Becoming Irlandés: hurling and Irish identity in Argentina. *Sport in Society*, 3, 425-438.

Kipp, L., & Amorose, A.J. (2008) Perceived motivational climate and self-determined motivation in female high school athletes. *Journal of Sport Behavior*, 108-129.

Maehr, M.L., & Nicholls, J.G. (1980) Culture and achievement motivation: A second look. In N.Warren (Ed.), *Studies in cross cultural psychology*. San Diego, CA: Academic Press.

Maehr, M.L. (1984) Meaning and motivation: Toward a theory of personal investment. In Ames, R., & Ames, C. (Eds), *Research on motivation in education* (Vol.1 , pp.39-73). San Diego, CA: Academic Press.

Mallett, C.J. (2005) Self-determination theory: A case study of evidence-based coaching. *The Sport Psychologist*, 19, 417-429.

Markland, D. (1999) Self-determination moderates the effects of perceived competence on intrinsic motivation in an exercise setting. *Journal of Sport & Exercise Psychology*, 21, 351-361.

Martens, R., Vealey, R.S., & Burton, D. (1990) Competitive anxiety in sport, Human Kinetics: Champaign, IL.

McCormack, P. (2007) *A study of the leadership and coaching behaviors of high level hurling coaches*. Unpublished Master Thesis. Waterford Institute of Technology, Department of Health, Sport and Exercise Science.

McGrath, J.E. (1970) *Social and psychological factors in stress*. New York: Holt, Rinehart and Winston.

McIntyre, M. (2005) A comparison of the physiological profiles of elite Gaelic footballers, hurlers and soccer players. *British Journal of Sports Medicine*, 39, 437-439.

McIntyre, T., Mahoney, G., & Moran, A. (1998) Professional sport psychology in Ireland. *The Irish Journal of Psychology*, 4, 504-515.

Mouratidis, A., Vansteenkiste, M., Lens, W., & Sideridis, G. (2008) The motivating role of positive feedback in sport and physical education: evidence for a motivational model. *Journal of Sport & Exercise Psychology*, 30, 240-268.

Newton, M., Duda, J.L., & Yin, Z. (2000) Examination of the psychometric properties of the perceived motivational climate in sport questionnaire 2 in a sample of female athletes. *Journal of Sport Sciences*, 18, 275-290.

Nicholls, J.G. (1984) Conceptions of ability and achievement motivation. In Ames, R., & Ames, C. (Eds), *Research on motivation in education* (Vol.1, pp.39-73), San Diego, CA: Academic Press.

Nicholls, J.G., (1989) *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press.

Ntoumanis, N. (2001) A self-determination approach to the understanding of motivation in physical education. *British Journal of Educational Psychology*, 71, 225-242.

Papaioannou, A., & Kouli, O. (1999) The effect of task structure, perceived motivational climate and goal orientations on students' task involvement and anxiety. *Journal of Applied Sport Psychology*, 11, 51-71.

Pelletier, L.G., Fortier, M.S., Vallerand, R.J., & Briére, N.M. (2001) Associations among perceived autonomy support, forms of self-regulation, and persistence: a prospective study. *Motivation and Emotion*, 25, 279-306.

Pensgaard, A.M., & Roberts, G.C. (2002) Elite athletes' experience of the motivational climate: the coach matters. *Scandinavian Journal of Medicine & Science in Sports*, 12, 54-59.

Quested, E., & Duda, J.L. (2009) Perceptions of the motivational climate, needs

satisfaction, and indices of well- and ill-being among hip hop dancers. *Journal of Dance Medicine and Science*, 13, 10-19.

Quested, E., & Duda, J.L. (2010) Exploring the social environmental determinants of well- and ill-being in dancers: a test of basic needs theory. *Journal of Sport and Exercise Psychology*, 32, 39-60.

Raudsepp, L., & Kais, K. (2008) Confirmatory factor analysis of the revised competitive state anxiety inventory-2 among Estonian athletes. *International Journal of Sport and Exercise Psychology*, 6, 85-95.

Reilly, T., & Collins, K. (2008) Science and the gaelic sports. *European Journal of Sport Science*, 8, 231-240.

Reinboth, M., Duda, L., & Ntoumanis, N. (2004) Dimensions of coaching behavior, need satisfaction, and the psychological and physical welfare of young athletes. *Motivation and Emotion*, 28, 297-313.

Reinboth, M., & Duda, J. (2006) Perceived motivational climate, need satisfaction and indices of well-being in team sports: a longitudinal perspective. *Psychology of Sport and Exercise*, 7, 269-286.

Richer, S.F., & Vallerand, R.J. (1998) Construction and validation of the perceived relatedness scale (ESAS). *European Review of Applied Psychology*, 48, 129–137.

Rosenberg, M. (1965). *Society and the adolescent child*. Princeton, NJ: Princeton University Press.

Ryan, R.M. (1995) Psychological needs and the facilitation of integrative processes. *Journal of Personality*, 63, 397-427.

Sarrazin, P., Guillet, E., & Cury, F. (2001) The effect of coach's task- and ego-involving climate on the changes in perceived competence, relatedness, and autonomy among girl handballers. *European Journal of Sport Science*, 4, 1-10.

Sarrazin, P., Vallerand, R.J., Guillet, E., Pelletier, L.G., & Cury, F. (2002) Motivation and dropout in female handballers: a 21-month prospective study. *European Journal of Social Psychology*, 32, 395-418.

Sheldon, K.M., & Bettencourt, B.A. (2002) Psychological need-satisfaction and subjective well-being within social groups. *British Journal of Social Psychology*, 41, 25-38.

Smith, R.E., Smoll, F.L., & Cummings, S.P. (2007) Effects of a motivational climate intervention for coaches on young athletes' sport performance anxiety. *Journal of Sport and Exercise Psychology*, 29, 39-59.

Spielberger, C.D. (1966) *Anxiety and behavior*. New York: Academic Press.

Spielberger, C.D., Gorsuch, R.L., & Lushene, R.L. (1970) *Manual for the state-trait anxiety inventory*. Palo Alto, CA: Consulting Psychologists.

Thøgersen-Ntoumani, C., & Fox, K.R. (2007) Exploring the role of autonomy for exercise and its relationship with mental well-being: A study with non-academic university employees. *International Journal of Sport and Exercise Psychology*, 5, 227-239.

Treasure, D.C., Lemyre, P.N., Kuczka, K.K., Standage, M. (2007) Motivation in Elite-Level Sport: A Self-Determination Perspective. In Hagger, M.S., & Chatzisarantis, N.L.D. *Intrinsic Motivation and Self-Determination in Exercise and Sport* (pp.153-165). Human Kinetics: Champaign, IL.

Vallerand, R.J. (1983) The effect of differential amounts of positive verbal feedback on the intrinsic motivation of male hockey players. *Journal of Sport Psychology*, 5, 100-107.

Vallerand, R.J., & Reid, G. (1984) On the causal effects of of perceived competence on intrinsic motivation: a test of cognitive evaluation theory. Journal of Sport Psychology, 6, 94-102.

Vallerand, R.J., Deci, E.L., & Ryan, R.M. (1987) Intrinsic motivation in sport. *Sport and Exercise Reviews*, 15, 389-425.

Vallerand, R.J., Pelletier, L. G., Blaise, M. R., Briére, N. M., Senécal, C., & Valliéres, E. F. (1992) The academic motivation scale: A measure of intrinsic, extrinsic and amotivation in education. *Educational and Psychological Measurement*, *52,* 1003–1019.

Vallerand, R.J., Pelletier, L. G., Blaise, M. R., Briére, N. M., Senécal, C., & Valliéres, E. F. (1993) On the assessment of intrinsic, extrinsic and amotivation in education: Evidence on the concurrent and construct validity of the Academic Motivation Scale. *Educational and Psychological Measurement, 53,* 159–172.

Vallerand, R.J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp.

271-360). New York: Academic Press.

Vallerand, R.J., & Losier, G.F. (1999) An integrative analysis of intrinsic and extrinsic motivation in sport. *Journal of Applied Sport Psychology*, 11, 142-169.

Vallerand, R.J., & Rousseau, F.L. (2001) Intrinsic and Extrinsic Motivation in Sport and Exercise. In Singer, R.S., Hausenblas, H.A., & Janelle, C.M. *Handbook of Sport Psychology* (2nd ed., pp. 389-416). NY, Wiley.

Vello, H., Haggard, M.S. (2006) Global self-esteem, goal achievement orientations, and self-determined behavioural regulations in a physical educational setting. *Journal of Sport Sciences*, 25, 149-159.

Weiss, M.R., & Ferrer Caja, E. (2002) Motivational orientations and sport behaviour. In T.S.Horn (Ed.), *Advances in sport psychology* (2nd ed., pp. 101-184). Champaign, IL: Human Kinetics.

White, R.M. (1959) Motivation reconsidered: The concept of competence. *Psychological Review*, 66, 297-333.

Wilson, P. M., & Rodgers, W. M. (2002). The relationship between exercise motives and physical self-esteem in female exercise participants: An application of self-determination theory. *Journal of Applied Biobehavioral Research*, 7, 30 – 43.

Wylie, R.C. (1974) *The self-esteem concept (Vol.1): A review of methodological and measuring instruments*. (2nd Ed.) Lincoln, NE: University of Nebraska Press.

INTERNET SOURCES

http://www.gaa.ie/page/gaa_hurling_senior_championship_2009.html

http://www.gaainfo.com/comp.php?co=intercounty&year=2010&comp=shc

http://www.psych.rochester.edu/SDT/index.php

APPENDICES

Appendix 1.

Full Table One-way ANOVA for all variables

Table 10. One-Way ANOVA for all variables for each team

Variable		Sum of squares	Df	Mean Square	F	Sig.
Task Climate	Between Groups	0,13	2	0,07	0,19	0,831
	Within Groups	20,61	57	0,36		
	Total	20,74	59			
Ego Climate	Between Groups	0,49	2	0,24	0,60	0,553
	Within Groups	23,08	57	0,41		
	Total	23,56	59			
Competence	Between Groups	0,85	2	0,43	0,56	0,574
	Within Groups	43,27	57	0,76		
	Total	44,12	59			
Autonomy	Between Groups	9,37	2	4,68	3,94	0,025
	Within Groups	67,74	57	1,19		
	Total	77,11	59			
Relatedness	Between Groups	5,45	2	2,73	4,07	0,022
	Within Groups	38,15	57	0,67		
	Total	43,60	59			
Amotivation	Between Groups	0,02	2	0,01	0,01	0,991
	Within Groups	57,21	57	1,00		
	Total	57,23	59			
External	Between Groups	3,35	2	1,68	0,94	0,398
	Within Groups	102,08	57	1,79		
	Total	105,43	59			
Introjected	Between Groups	1,23	2	0,62	0,34	0,711
	Within Groups	102,31	57	1,80		

	Total	103,54	59			
Identified	Between Groups	11,42	2	5,71	3,16	0,05
	Within Groups	102,97	57	1,81		
	Total	114,39	59			
IM to know	Between Groups	4,44	2	2,22	1,25	0,295
	Within Groups	101,50	57	1,78		
	Total	105,94	59			
IM to accom	Between Groups	6,19	2	3,09	2,63	0,081
	Within Groups	67,00	57	1,18		
	Total	73,19	59			
IM to exp stim	Between Groups	3,22	2	1,61	1,39	0,258
	Within Groups	66,21	57	1,16		
	Total	69,43	59			
Cog Anxiety	Between Groups	0,64	2	0,32	0,78	0,463
	Within Groups	23,32	57	0,41		
	Total	23,96	59			
Som Anxiety	Between Groups	1,66	2	0,83	3,31	0,043
	Within Groups	14,26	57	0,25		
	Total	15,92	59			
Confidence	Between Groups	0,24	2	0,12	0,48	0,623
	Within Groups	14,39	57	0,25		
	Total	14,63	59			
Self-Esteem	Between Groups	0,18	2	0,09	0,97	0,385
	Within Groups	5,25	57	0,09		
	Total	5,43	59			

Appendix 2.

Pre-questionnaire information and consent form

INFORMED CONSENT FORM

Investigator(s):

Mark Quinlan,
Master's In Sport and Exercise Psychology,
University of Jyväskylä,
Finland

Tel: +358442112566 or (087)2103475
Email: mark.c.quinlan@jyu.fi

I am invited to participate in a research study as part of a Master's Thesis in Sport and Exercise Psychology. The purpose of this study is to investigate the relationship between perceived motivational climate, motivation and psychological well-being of hurlers. Participation in this study will lead to a better understanding of the psychological thought process of hurlers and their motivation behind their involvement.

I am required to complete initial questionnaires relating to the study. These are to be distributed to the participants at a practice session by a member of the coaching staff and to be filled out by the participants and returned at the next session. It should take approximately 30-40 minutes to complete. The second questionnaire will take 20-30mins to complete. The questionnaires will be collected and the data analysed and the results discussed.

Your consent form will be separated from the questionnaire immediately upon collection, and no link will remain between your name and your data to guarantee anonymity. Data will be stored securely and will be made available only to the persons listed above who are conducting the study. No reference will be made in oral or written reports that could link you to the study. Your confidential data may be used in future research, presentations or teaching opportunities.

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed, your data will be returned to you or

destroyed. Likewise, the Researcher may terminate your participation in the study at any time.

Consent

Your signature on this form indicates that you are at least 18 years of age and have understood to your satisfaction the information regarding participation in this research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities.

I have read the above information and agree to participate voluntarily in this study. I have received a copy of this form.

Name _____ Date

____/____/_____ (dd/mm/yyyy)

Signature _____

Appendix 3.

Battery of Questionnaires

PART 1) DESCRIPTIVE INFORMATION

Please fill in the blank, tick the box, or circle the appropriate response when responding to the items below.

Current Age: _____ Years

Hurling Experience:

Age initially started hurling:
_____ Years

How long have you been with this team _____ Years & Months

How many hours do you hurl on average per week (including training sessions and matches)?

_____ Hours

Position _____

PART 2) INSTRUCTIONS

- Please answer all the questions as honestly and carefully as possible.
- There are no right or wrong answers so please answer as you truly feel.
- Please circle the appropriate answer to indicate how much you agree or disagree with each question or how much what is described is like you or not like you.

Example

If you answer **not much like me** for question 1, you put a circle around number 2.

If you answer **completely like me** for question 2, you put a circle around number 5.

Q	When I get up in the morning…	Not at all like me	Not much like me	Somewhat like me	Like me	Completely like me
1	I am still tired	1	(2)	3	4	5
2	The first thing I do is brush my teeth	1	2	3	4	(5)

PART 3) Questionnaire

a) Thoughts about hurling – Sport Motivation Scale (SMS; Pelletier, Fortier, Vallerand, Tucson, Briére & Blaise, 1995)

i. Using the scale below, please choose the number that best represents how appropriate each of the potential reasons are for you in terms of <u>why you participate in hurling</u>

Why do you participate in hurling?	Does not apply at all	Applies Moderately	Applies exactly

Why do you participate in hurling?	Does not apply at all				Applies Moderately		Applies exactly
1. For the enjoyment I get from doing something exciting.	1	2	3	4	5	6	7
2. For the enjoyment of knowing more about hurling.	1	2	3	4	5	6	7
3. I used to have good reasons for participating in hurling, but now I am asking myself if I should continue doing it.	1	2	3	4	5	6	7
4. For the fun of discovering new skills/movements/ways of expressing myself.	1	2	3	4	5	6	7
5. I don't know anymore; I have the feeling that I am not capable of succeeding in hurling.	1	2	3	4	5	6	7
6. Because it allows me to be well thought of by people I know.	1	2	3	4	5	6	7
7. Because, in my opinion, it is one of the best ways to meet people.	1	2	3	4	5	6	7
8. Because I feel a lot personal satisfaction while mastering certain difficult skills/techniques.	1	2	3	4	5	6	7
9. Because it is absolutely necessary to participate in hurling if one wants to be in shape.	1	2	3	4	5	6	7
10. For the prestige of being a hurler.	1	2	3	4	5	6	7
11. Because it is one of the best ways I have chosen to develop other aspects of myself.	1	2	3	4	5	6	7
12. For the enjoyment I feel while improving some of my weaknesses.	1	2	3	4	5	6	7
13. For the excitement I feel when I am really involved in hurling.	1	2	3	4	5	6	7
14. Because I must participate in hurling to feel good about myself.	1	2	3	4	5	6	7
15. For the satisfaction I experience while I am perfecting my hurling abilities.	1	2	3	4	5	6	7
16. Because people around me think it is important to be in shape.	1	2	3	4	5	6	7
17. Because it is a good way to learn lots of things which could be useful to me in other areas of my life.	1	2	3	4	5	6	7
18. For the intense emotions that I feel while I am hurling.	1	2	3	4	5	6	7
19. It is not clear to me anymore: I don't really think I belong in hurling.	1	2	3	4	5	6	7

20. For the enjoyment that I feel while executing certain difficult movements and skills.	1	2	3	4	5	6	7
21. Because I would feel bad if I was not hurling.	1	2	3	4	5	6	7
22. To show others how good I am at hurling.	1	2	3	4	5	6	7
23. For the enjoyment I feel while learning techniques/ skills that I have never tried before.	1	2	3	4	5	6	7
24. Because it is one of the best ways to maintain good relationships with my friends.	1	2	3	4	5	6	7
25. Because I like the feeling of being totally involved in hurling.	1	2	3	4	5	6	7
26. Because I feel I *must* hurl regularly.	1	2	3	4	5	6	7
27. For the enjoyment of discovering new ways of performing.	1	2	3	4	5	6	7
28. I often ask myself why I hurl, as I can't seem to achieve goals that I set for myself in hurling.	1	2	3	4	5	6	7

b) Your ability to hurl – Perceived Competence - Intrinsic Motivation Inventory (IMI; McAuley, Duncan & Tammen, 1989)

i. Respond to the following statements considering your experiences <u>as a hurler in this team</u>:

	Strongly disagree			**Neutral**			**Strongly agree**
I think I am pretty good at hurling.	1	2	3	4	5	6	7
I am satisfied with my hurling.	1	2	3	4	5	6	7
After practicing a particular skill for a while, I feel pretty competent.	1	2	3	4	5	6	7
I am pretty skilled at hurling.	1	2	3	4	5	6	7
I can't hurl very well.	1	2	3	4	5	6	7

c) Your choices and decisions in the hurling team – Perceived Autonomy – Work Satisfaction Scale (Deci et al., 2001)

i. Please respond to each of the following statements by rating how you feel when <u>participating in hurling in this team</u>.

Q	In this hurling team…	Not at all true			Neutral			Very true
1	I feel free to express my ideas and opinions.	1	2	3	4	5	6	7
2	I feel free to do things my own way.	1	2	3	4	5	6	7
3	I feel I can give a lot of inputs to deciding what skills/movements I want to practice.	1	2	3	4	5	6	7
4	I have the opportunity to take part in deciding what drills should be used.	1	2	3	4	5	6	7
5	I have a say in what happens in training sessions and team meetings and I feel free to give my opinion.	1	2	3	4	5	6	7
6	I feel I have a lot of inputs in deciding how training sessions are to be carried out.	1	2	3	4	5	6	7

d) Support within the hurling team – Perceived Relatedness – Need for Relatedness Scale (NFRS; Richer & Vallerand, 1998)

i. Please circle the answer that best describes <u>how you feel when participating in this hurling team</u>

Q	In this hurling team I feel…	Strongly disagree		Neutral		Strongly agree
1	Supported.	1	2	3	4	5
2	Listened to.	1	2	3	4	5
3	Understood.	1	2	3	4	5
4	Valued.	1	2	3	4	5
5	Safe.	1	2	3	4	5

Perceived Motivational Climate – Perceived Motivational Climate in Sport Questionnaire 2 (PMCSQ-2; Newton, Duda & Yin, 2000)

ii. Read each of the following items carefully and respond to each item in terms of how you view the <u>typical atmosphere in your hurling team.</u>

Q	In this hurling team…	Strongly disagree		Neutral		Strongly agree
1	The coaches want us to try new skills/movements.	1	2	3	4	5
2	The coaches get mad when a hurler makes a mistake.	1	2	3	4	5
3	The coaches give most of their attention to the "stars".	1	2	3	4	5
4	Each hurler contributes in some important way.	1	2	3	4	5
5	The coaches believe that all of us are crucial to the success of a performance.	1	2	3	4	5

6	The coaches praise hurlers only when they outperform other hurlers.	1	2	3	4	5
7	The coaches think that only the lead hurlers contribute to the success of a performance.	1	2	3	4	5
8	Hurlers feel good when they try their best.	1	2	3	4	5
9	Hurlers are not selected for the best roles if they make mistakes.	1	2	3	4	5
10	Hurlers at all skill levels have an important role in performances.	1	2	3	4	5
11	Hurlers help each other learn.	1	2	3	4	5
12	Hurlers are encouraged to outperform the other hurlers.	1	2	3	4	5
13	The coaches have their own favourites.	1	2	3	4	5
14	The coaches make sure hurlers improve on skills or movements they're not good at.	1	2	3	4	5
15	The coaches yell at hurlers for messing up.	1	2	3	4	5
16	Hurlers feel successful when they improve.	1	2	3	4	5
17	Only the best hurlers get praise.	1	2	3	4	5
18	Hurlers are punished when they make a mistake.	1	2	3	4	5
19	Each hurler has an important role.	1	2	3	4	5
20	Trying hard is rewarded in training sessions and matches.	1	2	3	4	5
21	The coaches encourage hurlers to help each other.	1	2	3	4	5
22	The coaches make it clear who they think are the best hurlers.	1	2	3	4	5
23	Hurlers are "fired up" (positively excited) when they perform better than their fellow hurlers in a match.	1	2	3	4	5

24	If you want to be picked for the starting team you must be one of the best hurlers.	1	2	3	4	5
25	The coaches emphasise always trying your best.	1	2	3	4	5
26	Only the top hurlers "get noticed" by the coaches.	1	2	3	4	5
27	Hurlers are afraid to make mistakes.	1	2	3	4	5
28	Hurlers are encouraged to work on their weaknesses.	1	2	3	4	5
29	The coaches favour some hurlers more than others.	1	2	3	4	5
30	The focus is to improve each training session/match performance.	1	2	3	4	5
31	The hurlers really "work together" as a team when it comes to matches.	1	2	3	4	5
32	Each hurler feels as if they are an important team member.	1	2	3	4	5
33	The hurlers help each other to get better and excel.	1	2	3	4	5

e) Thoughts about how you see yourself – State Cognitive and Somatic Anxiety, and State Self-Confidence – Competitive Anxiety in Sport Inventory 2 (CSAI-2; Martens, Vealey & Burton, 1990)

i. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel right now- at this moment. There are no right or wrong answers. Do not spend on any one statement, but choose the answer which best describes your feelings right now:

Q	In this hurling team…	Not at All	Somewhat	Moderately So	Very much so
1	I am concerned about this competition	1	2	3	4

2	I feel nervous.	1	2	3	4
3	I feel at ease.	1	2	3	4
4	I have self-doubts.	1	2	3	4
5	I feel jittery.	1	2	3	4
6	I feel comfortable.	1	2	3	4
7	I am concerned that I may not do as well in this competition as I could do.	1	2	3	4
8	My body feels tense.	1	2	3	4
9	I feel self-confident.	1	2	3	4
10	I am concerned about losing.	1	2	3	4
11	I feel tense in my stomach.	1	2	3	4
12	I feel secure.	1	2	3	4
13	I am concerned about choking under pressure.	1	2	3	4
14	My body feels relaxed.	1	2	3	4
15	I'm confident I can meet the challenged	1	2	3	4
16	I'm concerned about performing poorly.	1	2	3	4
17	My heart is racing.	1	2	3	4
18	I'm confident about performing well.	1	2	3	4
19	I'm concerned about reaching my goal.	1	2	3	4
20	I feel my stomach sinking.	1	2	3	4
21	I feel mentally relaxed.	1	2	3	4
22	I'm concerned that others will be disappointed with my performance.	1	2	3	4
23	My hands are clammy.	1	2	3	4

24	I'm confident because I mentally picture myself reaching my goal.	1	2	3	4
25	I'm concerned I won't be able to concentrate.	1	2	3	4
26	My body feels tight.	1	2	3	4
27	I'm confident coming through under pressure.	1	2	3	4

Global Self-Esteem – Rosenberg's Self-Esteem Scale (Rosenberg, 1965)

ii. Below is list of statements dealing with your general feelings about yourself. Read each statement carefully and respond to the items to indicate how you feel.

Q	In this hurling team…	Strongly Agree	Agree	Disagree	Strongly Disagree
1	On the whole I am satisfied with myself.	1	2	3	4
2	At times, I think I am no good at all.	1	2	3	4
3	I feel that I have a number of good qualities.	1	2	3	4
4	I am able to do things as well as most people.	1	2	3	4
5	I feel I do not have much to be proud of.	1	2	3	4
6	I certainly feel useless at times.	1	2	3	4
7	I feel that I am a person of worth, at least on an equal plane with others.	1	2	3	4
8	I wish I could have more respect for myself.	1	2	3	4
9	All in all, I am inclined to feel that I am a failure.	1	2	3	4
10	I take a positive attitude toward myself.	1	2	3	4