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Motivation and athlete engagement

A cross-sectional study in youth ice hockey players

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Abstract

Motivation in youth athletes is believed to lead to higher level of engagement and long lasting sport participation (Chatzisarantis, Hagger, Biddle, Smith & Wang, 2003; Lonsdale, Hodge & Raedeke, 2007). Based on the Self-determination Theory (SDT; Deci & Ryan; 1985; 2000), the current study adopted Vallerand's (1997) model of the assumed sequential relationship between perceived autonomy support, thwarting and satisfaction of basic psychological needs, self-determined motivation and athlete engagement. The hypothesized mediational role of self-determined motivation was also studied.

Results from a cross-sectional sample of 242 youth ice hockey players offered support for the proposed model, thus perceived autonomy support was indirectly supported. Partially mediation was confirmed for self-determined motivation in the link between psychological need satisfaction and athlete engagement. These findings underscore the importance of need satisfaction (particularly competence and autonomy) in predicting enduring positive sport experiences. Furthermore, current findings suggest important differences in perceived intrinsic motivation and core athlete engagement dimensions in practitioners respectively amount of training hours per week. This suggests that ice hockey players express differences in their psychological adaptation, which ultimately, may moderate how they invest time in their ice hockey career, and therefore affects their engagement towards ice hockey. Practical recommendations for coaches are offered for the adoption of need-supportive training structures that promote support for the basic psychological needs for autonomy, competence and relatedness.

Table of Contents

| | |
|---|-----------|
| Acknowledgements | 3 |
| Abstract..... | 4 |
| List of tables | 8 |
| List of figures | 9 |
| Abbreviations | 10 |
| 1 Introduction | 11 |
| 2 Literature review | 13 |
| 2.1 What is self-determination theory? | 13 |
| 2.2 Basic psychological needs..... | 14 |
| 2.2.1 The need for autonomy..... | 14 |
| 2.2.2 The need for competence..... | 15 |
| 2.2.3 The need for relatedness..... | 16 |
| 2.3 Need thwarting - tapping the darker side of sport participation..... | 16 |
| 2.4 Need satisfaction - a predictor of positive outcomes? | 18 |
| 2.4.1 The balance in need satisfaction | 18 |
| 2.5 The motivational continuum..... | 21 |
| 2.6 Intrinsic motivation - nourished by internal rewards? | 23 |
| 2.7 Extrinsic motivation - four types of regulations..... | 24 |
| 2.7.1 External regulation | 25 |
| 2.7.2 Introjected regulation | 25 |
| 2.7.3 Identification regulation | 26 |
| 2.7.4 Integration regulation | 27 |
| 2.8 Supporting and undermining internalization | 27 |
| 2.9 Athlete engagement..... | 29 |
| 2.10 The association between self-determination and athlete engagement | 31 |
| 2.10.1 Presenting the research model | 34 |
| 2.11 Goal, research field, research question and hypotheses..... | 36 |
| 2.11.1 Hypotheses..... | 36 |
| 3 Method | 37 |
| 3.1 Participants | 37 |

| | |
|---|-----------|
| 3.2 Measures | 38 |
| 3.2.1 General questions | 38 |
| 3.2.2 Need thwarting..... | 38 |
| 3.2.3 Need satisfaction | 39 |
| 3.2.4 Balance of need satisfaction | 40 |
| 3.2.5 Self-determined motivation | 40 |
| 3.2.6 Athlete engagement..... | 41 |
| 3.3 Procedures and recruitment | 42 |
| 3.4 Data analysis | 43 |
| 3.5 Descriptive statistics..... | 44 |
| 4 Results | 46 |
| 4.1 Hypothesis 1: Need thwarting, need satisfaction and balanced needs predicting self-determined motivation | 46 |
| 4.1.1 Preliminary analyses | 46 |
| 4.1.2 Primary analyses- test of hypothesis 1 | 49 |
| 4.2 Hypothesis 2: Need thwarting, need satisfaction, balanced needs and self- determined motivation predicting athlete engagement..... | 52 |
| 4.2.1 Preliminary analyses | 52 |
| 4.2.2 Primary analyses- test of hypothesis 2 | 53 |
| 4.3 Hypothesis 3: Mediating relationship between need satisfaction and athlete engagement..... | 56 |
| 4.3.1 Preliminary analyses | 56 |
| 4.3.2 Primary analyses- test of hypothesis 3 | 57 |
| 5 Discussion..... | 59 |
| 5.1 Thwarting and satisfaction of basic psychological needs influencing self- determined motivation..... | 60 |
| 5.2 Need thwarting, need satisfaction and self-determined motivation influencing athlete engagement..... | 62 |
| 5.3 Balance in need satisfaction- worth emphasizing? | 64 |
| 5.4 The meditational role of self-determined motivation..... | 65 |
| 5.5 Practical recommendations for coaches | 67 |
| Limitations | 69 |
| Conclusion..... | 71 |
| Future research | 73 |
| References | 74 |

| | |
|---|------------|
| Appendices | 80 |
| Appendix A: Instruments. | 81 |
| Appendix B: Approval by Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS | 91 |
| Appendix C: Information letter to the participant clubs. | 93 |
| Appendix D: Support letter from Norwegian Ice Hockey Association. | 95 |
| Appendix E: Protocol for coaches. | 97 |
| Appendix F: Information letter to the research participants. | 99 |
| Appendix G: Permission to use figure | 101 |

List of tables

| | |
|---|----|
| Table 1: Descriptive statistics for need thwarting, need satisfaction, balance in need satisfaction, self-motivation and athlete engagement in junior athletes (mean \pm s). | 47 |
| Table 2: Intercorrelations for need thwarting, need satisfaction, balance in need satisfaction, self-motivation and athlete engagement in junior athletes. | 48 |
| Table 3: Multiple regression predicting self-determined motivation for junior athletes. | 51 |
| Table 4: Multiple Regression predicting athlete engagement for junior athletes. | 55 |

List of figures

| | |
|---|----|
| Figure 1: Schematic representation of Self-determination theory illustrating the features of three of the component subtheories: Basic psychological needs theory, Cognitive evaluation theory and Organismic integration theory..... | 22 |
| Figure 2: Research model of the sequential supported links among self-determination theory constructs; social, psychological, motivation, and athlete engagement in ice hockey. (1) Indirect links between social factors and need thwarting/need satisfaction; (2) influences of need thwarting and need satisfaction on motivation; (3) impact of need thwarting and need satisfaction on athlete engagement; (4) Links between the various motivation types and athlete engagement; (5) a test of the proposed sequence of motivational processes. | 35 |
| Figure 3: Club participation and their respective players. | 37 |
| Figure 4: Differences in mean intrinsic motivation scores between training groups. ... | 50 |
| Figure 5: Differences in mean athlete engagement scores between training groups..... | 54 |
| Figure 6: Mediation of self-determined motivation on need satisfaction and athlete engagement..... | 58 |

Abbreviations

| | |
|-------|--|
| SDT | Self-determination Theory |
| U18 | Series nationwide for players under 18 years |
| U20 | Series nationwide for players under 20 years |
| PNTS | Psychological Need Thwarting Scale |
| BPNES | Basic Psychological Needs in Exercise Scale |
| SDI | Self-determination Index |
| AEQ | Athlete Engagement Questionnaire |
| AE | Athlete Engagement |

1 Introduction

The noun *motivation* is often used in everyday life as an electric, unstructured manner that may mask its true value and importance as a predictor of behavior (White, 1959). Motivation can be defined as an “*internal state that energizes and drives action or behavior and determines its direction and persistence*” (Hagger & Chatzisarantis, 2007; p.xi).

According to Vallerand & Losier (1999) there are several causes that underlie an athlete’s participation in sports, which may affect rate of energy, effort and endurance. Orlick & Partington (1988) suggested that an athlete’s motivation is one of the fundamental pillars for succeeding in sports. Without an adequate amount of motivation, love for doing sports, it is unlikely that the athlete is able to carry the amount of training and acquire the skills to achieve the level of expertise. Motivation motives may differ from time to time, but they have an important function in the maintenance of activity. Self-determination theory (Deci & Ryan, 1985) advocates the fulfillment of basic psychological needs for autonomy, competence and relatedness, and provides a useful framework for the current study to explain the motivation of an athlete and to promote the preservation of activity in sport (Hagger & Chatzisarantis, 2007).

It has been postulated that the main reasons for young people to participate in sports are related to the quality of their engagement, that is, with their interest and enjoyment in the sport (Lonsdale et al., 2007). Athlete engagement has been referred to as “... *a persistent, positive, cognitive-affective experience in sport that is characterized by confidence, dedication, enthusiasm and vigor*” (Lonsdale et al., 2007; p.472).

Accordingly, there is interesting evidence supporting athletes who enjoy sports are the ones being more intrinsically motivated (Brière, Vallerand, Blais & Pelletier, 1995).

Ranging on a motivation continuum, athlete engagement is proposed to be located as an opposite state relative to negative psychological states such as burnout (Lonsdale et al., 2007), where behaviour is proposed to be self-determined. From a SDT perspective, Ryan & Deci (2000) uphold that the social context surrounding athletes (e.g., motivational climate) can affect their level of intrinsic motivation, and therefore the quality of athlete’s engagement. Specifically, it has been postulated that the

motivational climate is related to athlete's motivation through the satisfaction of their basic psychological needs for autonomy, competence and relatedness (Deci & Ryan, 1985). Ultimately, the type of motivation and motivation climate experienced by the athlete are assumed to be important for their affective states, as well as their quality of sport engagement (Duda, 2001).

In the current study, sport engagement among youth ice hockey players was examined, through looking at basic psychological need thwarting (Bartholomew, Ntoumanis, Ryan & Thøgersen-Ntoumani, 2011), basic psychological need satisfaction (Deci & Ryan, 2000; Vlachopoulos & Michailidou, 2006) and self-determined motivation (Pelletier, Fortier, Vallerand, Tuson, Briere & Blais, 1995) in relation to athlete engagement (Lonsdale et al., 2007). At the heart of SDT is the premise that individuals are active in their pursuit to satisfy three basic and universal psychological needs for autonomy, competence and relatedness. Furthermore, the satisfaction of these needs determine the direction and persistence of an individual toward engaging in activities that are likely to result in satisfying these needs (Hagger & Chatzisarantis, 2007). Environmental conditions that diminishes or thwart one or several of these needs, is theorized to undermine the individual self-determined motivation and applying negative consequences on the enduring engagement (Deci & Ryan, 2000).

2 Literature review

The purpose with this chapter is to present theoretical framework and relevant research as a basis for the current study. Initially will self-determination theory be presented and elaborated, further explaining humans innate psychological needs, the different degrees of motivation and how this may have an impact on behavioural outcomes. Furthermore, a clarification of athlete engagement and relevant research from the academic field are elaborated. Lastly, hypotheses that constitute the core of this study will be presented.

2.1 *What is self-determination theory?*

In the study of motivation, the concept of needs was early employed in empirical psychology, defined in terms of their physiological or psychological content (Deci & Ryan, 2000). Discussions of the degree to which the physiological or psychological needs was innate or learned, constituted a fundamental basis for motivation. Although the cognitive theory direction in psychology in the 1960s repudiated and replaced the concept of needs with theories regarding goal selection and goal pursuit, Self-determination Theory (SDT; Deci & Ryan, 1985) has nonetheless maintained the concept of needs, were SDT claims that basic needs is essential, even in achievement motivation (Deci & Ryan, 1985, 2000). Furthermore, SDT upholds that the social context surrounding athletes (e.g., the motivational climate created by the coach) can affect their level of self-determined motivation, via satisfaction of their basic psychological needs for autonomy, competence and relatedness (Deci & Ryan, 2000; Reinboth, Duda & Ntoumanis, 2004). Ultimately, the motivational climate experienced by the athlete is assumed to be important for the quality of sport engagement (Duda, 2001). Due to the importance of the social and personal aspect of sport experiences in relation to qualitative engagement, where participation through self-determined reasons is essential, SDT is currently one of the most relevant motivation theories.

The self-determination theory is a dialectic, organismic theory of human motivation that focuses on explaining the basis of human behavior and the extent to which behaviors are autonomous or self-determined (Deci & Ryan, 2000; Hagger & Chatzisarantis, 2007). The theory has an organic approach where one sees all individuals as active and

development-oriented people; humans have an innate desire to be motivated and curious, they therefore naturally seek challenges in the environment. The purpose is to master new activities by using ones abilities and potential in the best possible way. By mastering new challenges and activities, a human experience occurs. These experiences are further integrated into the “self”, where the goal is to experience psychological growth and development (Ryan & Deci, 2000a). This development of the “self” occurs when people actively try to gain control over forces that influence them. To which extent the individual shows self-determined behavior will depend on ones management to master challenges and integrate the process to the “self”. It also depends on the individual’s degree of acting out of their own inner choice and needs rather than external forces (Deci & Ryan, 1985). Furthermore, the SDT notes that the social environment can either have a promotional or obstructive impact on the development processes (Ryan & Deci, 2002). In this context, the SDT emphasizes three psychological needs as a basic fundamental to human’s natural tendency for psychological growth and development (Hagger & Chatzisarantis, 2007).

2.2 Basic psychological needs

At the heart of self-determination theory is the premise that individuals are active in their pursuit to satisfy three basic and universal psychological needs. These needs- the need for autonomy, competence and relatedness- function as basis for an understanding of human motivation (Deci & Ryan, 1985; Deci & Ryan, 2000). Deci & Ryan (2000) refer to human needs as “*necessary conditions for psychological health or well-being and their satisfaction are thus hypothesized to be associated with the most effective functioning*” (p.229). From a practical point of view, needs function as motivational antecedents, which determine the direction and persistence of an individual toward engaging in goal-directed behaviors that are likely to result in satisfying these needs (Deci & Ryan, 1985; Hagger & Chatzisarantis, 2007).

2.2.1 The need for autonomy

The need for *autonomy* or self-determination refers to the desire of being one’s own rise to their behavior based on their interests and values (Deci & Ryan, 2000). Autonomy refers to volition, were individuals desire to self-organize experience and behavior

towards activity to be concordant with ones integrated sense of “self” (Deci, 1980). Self-determination can be defined as the experience of choice- the experience of freedom of pressure, were the participation is fully voluntarily (Deci & Ryan, 1991). Furthermore, autonomous actions that are initiated and guided by “the self” can be understood in accordance to successful development and self-regulated behaviour (Deci & Ryan, 1985). When experiencing the opposite, when individuals’ action do not act in accordance with this “self”, their action is hypothesized within SDT to be affected by controlling forces surrounding the individual (e.g., pressure or as external forces). As long as these external regulations are in consistent with ones values and interests, the action will consistent with the individual’s sense of autonomy and the individual will still be self-determined motivated (Deci & Ryan, 2000; Ryan & Deci, 2002). Nix, Ryan, Manly & Deci (1999) further underline this preparation of autonomy when stating that autonomous human behaviour is said to be flowing from the self, and importantly, expressing the self. Social context that support individual’s autonomy have further been demonstrated positive influences on athletes self-determined motivation and their engagement (Ryan & Deci, 2000; Álvarez, Balaguer, Castillo & Duda, 2009).

2.2.2 The need for competence

The need for *competence* refers to the feeling of being good and efficient in one’s activity and further having an opportunity to influence one’s capacity in one’s environment. White (1960) defined competence as “...*fitness or ability to carry on those transactions with the environment that result in its’ maintaining, growing and flourishing*” (p.100), when he postulated this as a basic human need. Competence also refers to mastering ones environment and different social context, which leads the individual to seek challenges that are optimal for their capacity. Through this activity, the individual tries to maintain and increase their capacity leading to the experience of efficiency and achievement by controlling desired outcomes (Deci & Ryan, 2008; Ryan & Deci, 2002). Deci & Ryan (1985) claim that if this action takes place, the individual will be rewarded with an inner feeling of competence from the activity. DeCharms (1968) included some more facets when describing humans need to be an origin of action- to feel they are promoter of activities, and to feel they can regulate their own actions. Competence has further been linked to enhanced engagement- achieving important goals and being efficient in one’s activity predict enhanced athlete engagement (Ryan & Deci, 2000a, 2000b; Hodge, Lonsdale & Jackson, 2009).

2.2.3 The need for relatedness

Lastly, the human also has a need to show that one cares about others, and know that others care back. This need for *relatedness* refers to relating meaningfully and closely to others in activities as well as to the social environment the individual sustain in (Ryan & Deci, 2002). It is important to mark the quality, and not the quantity of relatedness. A context that makes people feel a sense of connectedness and belonging where the individual could experience being with others in a secure environment, supports the need for relatedness. Deci & Ryan (2000) state that most people develop in interaction with others. When people feel relationally insecure or alienated, they are more inhibited and defensive and less likely to experience interests or enjoyment in their activities. This could lead to a reduction and affect the intrinsic motivation negatively. In other words, feeling rejected and unloved tends to undermine intrinsic motivation and further promotes less self-determined individuals (Hagger & Chatzisarantis, 2007).

SDT suggests that these three needs are essential for psychological growth and development. Environmental conditions that support the feelings of, autonomy, competence and relatedness are thus expected to facilitate psychological development. Environmental conditions or any factor that diminishes feelings of these needs is theorized to undermine motivation, achievement and further engagement (Deci & Ryan, 1985; Deci & Ryan, 2000; Hagger & Chatzisarantis, 2007).

2.3 *Need thwarting - tapping the darker side of sport participation*

Within SDT the basic psychological needs are referred to as fundamental nutrients essential for growth, integrity and well-being, and further play a sustaining role in an individual's motivation and engagement. In contrast, when a social context thwarts or neglects one of these needs, motivation and positive experiences are hypothesized to wither (Deci & Ryan, 2000). More recently, Bartholomew, Ntoumanis, Ryan, Bosch and Thøgersen-Ntoumani (2011) posited that low scores on measures of basic psychological need satisfaction may simply reflect need dissatisfaction and not adequately tap the active nature and intensity of need frustration that Deci and Ryan (2000) described as states of need thwarting (e.g., "I do not feel related" versus "I feel I

am rejected”). From a SDT perspective, an individual experience needs to be thwarted when feelings of their perceived basic psychological needs to be actively undermined by others. Compared to feelings of dissatisfaction, the negative experiential state of need thwarting is far more likely to lead to negative outcome and ill-being (Grolnick, 2003; Kasser, Ryan, Zax & Sameroff, 1995). In a study by Hodgins & Liebeskind (1998), they examined how people with strong controlled orientations (e.g., external locus of causality or amotivation) tend to behave in ways that further thwart basic need satisfaction. Specifically, they investigated the degree to which social predicaments responded to those predicaments trying to save face, blaming others, and aggravating the distress rather than trying to mitigate the awkwardness. Results from the study indicated that those who were high on the controlled and impersonal orientations (e.g., complying or defying, orientations that are theorized to result from thwarted need satisfaction during development) tended to behave more defensively to protect themselves and in so doing aggravated the discomfort of others. Such behavior would further frustrate the need for relatedness and would also be likely to frustrate the needs for competence and autonomy. Hodgins and colleague (1998) further claims that even though these people may have saved face, their behaviour would not constitute true social competence, nor would it be autonomous because the individual were being controlled by their own ego involvements. Deci & Ryan (2000) have further linked such behaviour as resulted from thwarting of psychological needs, to negative accommodations (e.g., by valuing of materialism) as an attempt to immediately try to satisfy this shortage of their thwarted needs. In such regards, people are persistent in their attempts to satisfy primary needs, devising new paths when old routes no longer work. Nonetheless, Ryan and Deci (2000b) claims that persistent deprivation of any need has costs for psychological health and motivation.

Thus, in spite of people’s persistent attempts to satisfy the fundamental needs for autonomy, competence, and relatedness, if the social context provides no reliable paths that allow fulfillment of these critical needs, and if people stay in such context that consistently block need satisfaction, SDT predicts significant psychological costs and accommodations (Deci & Ryan, 2000). In such context, when the social environment blocks satisfaction of the need for autonomy, the promotion of controlled motivation will be present. Moreover, Deci and Ryan (2000) further claim further when such environment also block satisfaction of the needs for competence and relatedness, tends

to promote amotivation, and that these controlled and amotivational orientations, relative to the autonomous orientations, would negatively effect well-being and performance. In line with such theorizing, Bartholomew et al. (2011) demonstrated compared to need satisfaction, that need thwarting would better predict negative outcomes and diminished functioning, and could further be used as an indirect measure to tap individual's darker side of sport participation.

2.4 Need satisfaction - a predictor of positive outcomes?

In contrast to need thwarting, need satisfaction has been demonstrated as a stronger predictor of subjective energy or vitality (e.g., positive affective state associated with psychological health). More specifically, Ryan and Fredrick (1997) linked subjective vitality to need fulfillment; the more one feel autonomy, competence or relatedness, the more vitality is reported. Furthermore, Hodge et al. (2009), as stated previously, demonstrated that need satisfaction would positively influence and predict athlete engagement. These findings provide preliminary support for the utility of measuring need satisfaction alongside need thwarting and indicate that need satisfaction may be better predictor of optimal functioning and positive outcome such as engagement.

Ryan and Deci (2002) propose that humans' basic needs for autonomy, competence and relatedness possess an important role in order to explain the framework behind human motivation. SDT suggests that the fulfillment of these three needs are essential, and further describe motivation on a continuum ranging from being extrinsic to intrinsic motivation, depending on the fulfillment of the three needs for autonomy, competence and relatedness.

2.4.1 The balance in need satisfaction

Several studies have found support for the hypothesis that all the three needs for autonomy, competence and relatedness matters when considering people's experience of psychological health, and moreover, their perceived feeling of well-being. According to SDT, psychological needs are evolved experiential requirements that all individuals must have in order to grow to their fullest potential (e.g., like plants require key nutrients as soil, sun and water) to thrive (Ryan, 1995). Moreover, SDT postulates the

existence and propose that each need for autonomy, competence and relatedness is a distinct necessity for psychological health. Furthermore, the fundamental needs should not vary much in their importance for different individuals. If satisfaction of any of the basic psychological needs are lacking, Fisher (1978) proposed that it would influence the amount of intrinsic motivation. Nix, Ryan, Manly & Deci (1999) agrees to this by stating that this would influence the intrinsic motivation and moreover, the vitality. Seen from a more practical view, all individuals require certain types of experiences to get their needs met. Thus, what varies is to which extent they manage to get such satisfaction. In such regard, the SDT retains that needs are experiential requirements, not behavioral motives (Deci & Ryan, 2000). Deci and Ryan (2000) concluded by stating that if all three needs are satisfied in a properly quantity, the result will become “...behaviours characterized by choice, volition, and autonomy rather than pressure, demand, and control” (p. 243): Moreover, the researchers suggest that the proper quantity of the three needs will lead to higher quality behaviour and greater psychological well-being. This latter statement underscore the importance of balanced need satisfaction, whether at the bottom or the top of the perceived satisfaction scale, the balance between the need for autonomy, competence and relatedness would positively affect qualitative motivation.

In a longitudinal study of Sheldon & Niemiec (2006), participants with a more balanced level of satisfaction in all three needs were positive predictor of psychological health and well-being compared to when needs were satisfied in an imbalanced manner, independent of total amount. Over a period of 3 months, the study also revealed that balanced need satisfaction best suited when facilitating people’s psychological health and well-being. Interestingly, the authors state that the psychological needs will often be satisfied to an equal extent, but individuals will now and again experience an imbalance in the satisfaction even though the total amount is the same. Such positive outcomes of need satisfaction as motivation, vitality and well-being have further being linked to engagement (Hodge et al., 2009; Álvarez et al., 2009).

From a more practical context, and to exemplify the importance of balanced need satisfaction, contemplate these examples; an entrepreneur has recently determined himself to expand his business, and since he is the owner, he must work very long hours to pursue his dream. He is his own boss, and he experience very good satisfaction of his

need for autonomy (e.g., a score of 6 on a scale ranging from 1 to 7). Moreover, his business has grown quite successful, in which he experience very good satisfaction of his need for competence (e.g., a 6). However, despite these satisfactions, he is unable to spend much time with his family and friends, and thus he experiences low satisfaction of his need for relatedness (e.g., a 3). In contrast, when considering another example; a woman is working part-time at a kindergarten, in which she is successful, and thus experiences good satisfaction of her need for competence (e.g., a 5). In planning her own days and enjoying her spare time with family and friends, she experiences good satisfaction of her needs for autonomy and relatedness (e.g., 5s on both). When summing up these individuals' score of need satisfaction, they both would get a medium satisfaction- the woman displaying a balanced satisfaction, whereas the entrepreneur would have an imbalanced need satisfaction. An important question then becomes; is the greater balance in need satisfaction experienced by the woman more facilitative of psychological health, even though both she and the entrepreneur experience the same total amount of need satisfaction? Pursuant to the research, the woman would receive the highest scores on the variables of psychological health and well-being, thus the entrepreneur would be advised to not put all eggs in one basket (Linville, 1987).

Work in other domains suggests that internal variability and greater self-complexity is problematic for psychological health. For example, Paradise and Kernis (2002) found that unstable self-esteem was associated with less positive psychological functioning, especially for people with high self-esteem, where greater self-complexity could in many situations act as a cognitive buffer against stress-related illness and depression (Linville, 1987). According to Linville's (1987) model, greater self-complexity involves more self-aspects and greater distinctions among these, aiding a person dealing with problems because she or he has something to rebound upon when the stakes are high. A supportive environment of good friends, a challenging job, and interesting spare-time hobbies may portray a person with greater self-complexity and help her through a more vulnerable time (e.g., through a divorce).

Moreover, satisfaction of a person's self-complexity may in addition prevent depression, stress, and more specifically, reduce physical symptoms and illness following high levels of stressful events. In such regards, Milyavskaya et al., (2009) claims that possessing great self-complexity may in addition promote balance in need

satisfaction across contexts- where balance in need satisfaction at home, with friends and in a job, resulted in improved well-being and lower drop-out intentions among adolescence. Milyavskaya et al., (2009) further suggest that experiencing balance in need satisfaction in important domains in one's life, might boost confidence in future pursuits. When experiencing the opposite- when experiencing an imbalance in need satisfaction- chronic stress and role conflict may be the result, leading the individual to diminished experienced psychological health and well being (Donahue, Robins, Roberts & John, 1993; Sheldon & Niemiec, 2006). Satisfaction of the three basic psychological needs as well as the balance of need satisfaction has also found to reflect a persons' engagement in harmonious, rather than obsessive passions (Vallerand et al., 2003), where obsessive passions can consume a person's life, engendering stress and role conflicts that detract from psychological health and well-being (Seguin-Levesque, Lalliberte, Pelletier, Blanchard & Vallerand, 2003). Pursuant to the SDT, the fulfillment of need satisfaction and its balance is hypothesized to represent a likely motivational precursor for athlete engagement, where higher levels of athlete engagement are expected when the three basic psychological needs are simultaneously satisfied in sport.

2.5 The motivational continuum

Motivation was previously defined as an “*internal state that energizes and drives action and determines its direction and persistence*” Hagger & Chatzisarantis, 2007; p.xi). This definition refers to individuals being “moved” to act (Ryan & Deci, 2000b), and may arise from quite different forces, ranging from being intrinsic to extrinsic (Ryan & Deci, 2000). SDT further distinguishes mainly between three types of motivation: intrinsic, extrinsic and amotivation (see figure 1). This differentiation is based on the reasons causing the individual to engage in an activity (Ryan & Deci, 2000b). On the motivational continuum of SDT, intrinsic motivated behaviour is placed far left, where the placement is known as the prototype of self-determined motivation. Moreover, it is believed that motivation is the foundation of sport performance and achievement (Duda & Treasure, 2001). Without motivation, Hagger and colleague (2007) claim that even the most gifted performer is unlikely to reach his or her athletic potential. In such lines, Vallerand and Losier (1999) state that motivation is seen as an indicator of why individuals choose to participate in an activity. Nevertheless, to be well-prepared for

challenges that may inhibit or limit participation (e.g., stress, nervousness, rehabilitation after injury and practice hours), the athletes need to be strong psychologically and possess the motivation that is needed to resolve the challenges. This has further been supported by Deci and Ryan (2000), who points out that no matter what activity the individual engage in, the engagement is a result of motivation and dedication. SDT and specifically its component theory called cognitive evaluation theory (CET), propose that the experience of autonomy, competence and relatedness are necessary conditions for the maintenance and enhancement of intrinsic motivation (Deci & Ryan, 2000; Hagger & Chatzisarantis, 2007).

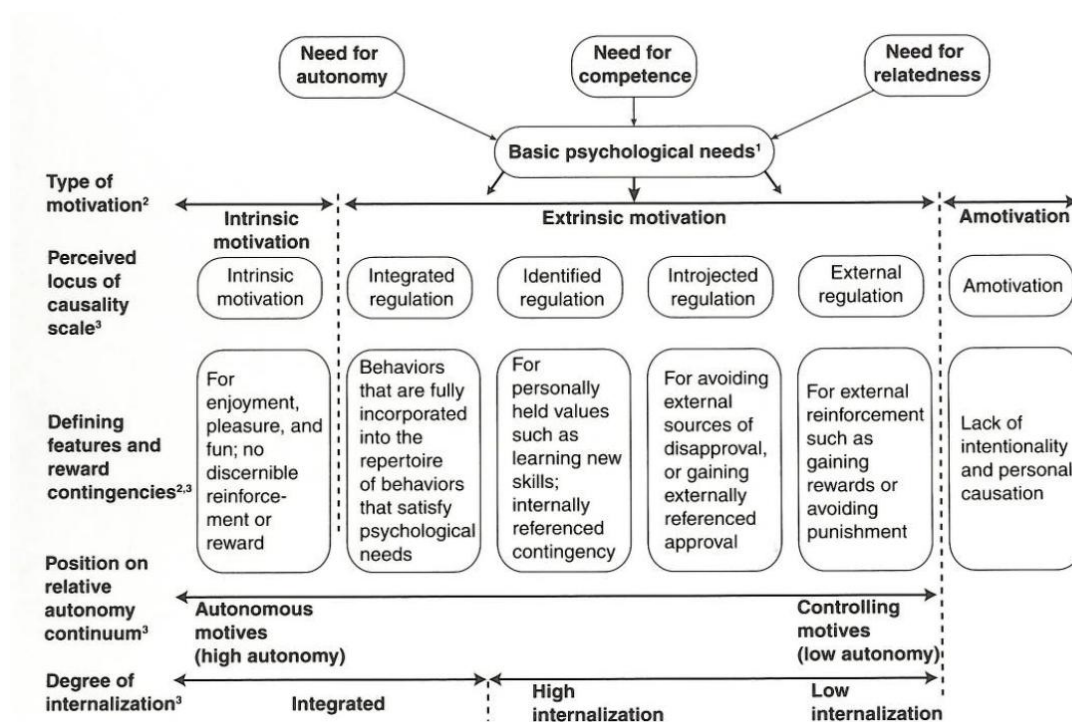


Figure 1: Schematic representation of Self-determination theory illustrating the features of three of the component subtheories: Basic psychological needs theory, Cognitive evaluation theory and Organismic integration theory¹.

¹ Copyright © Martin S. Hagger. Reprinted, with permission, from R.M. Ryan and E.L. Deci. 2007, Active human nature: Self-determination theory and the promotion and maintenance of sport, exercise and health. In *Intrinsic motivation and self-determination in exercise and sport*, edited by M.S. Hagger and N.L.D. Chatzisarantis (Champaign, IL: Human Kinetics), p.8.

2.6 *Intrinsic motivation - nourished by internal rewards?*

Intrinsic motivation is by Deci and Ryan (1985) described as a positive energy central to all human nature, and could be defined in terms of the task being interesting, or in terms of the satisfaction gained from the engagement (Ryan & Deci, 2000b). Skinner's (1953) Operant theory and Hull's (1943) Learning theory underlines this further, where the Operant theory refers to intrinsically motivated behaviours as being performed due to external rewards or reinforcement, whereas Learning theory describe intrinsic motivation as behaviour derived from psychological drives caused by satisfaction of innate psychological needs (Ryan & Deci, 2000b). A common denominator of the different proposals to intrinsic motivation, have since then been referred to as when doing activities found interesting by the individual, without achieving external rewards (Deci & Ryan, 2000; 2000b). White (1959) continued the description of intrinsic motivation, suggesting a description fitting Learning theory- suggesting that these were a result of inner motives and a desire to achieve feelings of efficacy and competence (Deci & Ryan, 2000). Specifically, these desires to achieve feelings of efficacy and competence were done without the necessity of external reinforcements or rewards (Deci & Ryan, 2000b). The rewards for acting in such behaviour are "in the activity itself", which rely on internal rewards such as the pleasure obtained from satisfaction of basic psychological needs rather than any external rewards (Deci & Ryan, 1991). According to Deci (1980), intrinsically motivated behaviours are originally self-determined, acted naturally and spontaneously because of interest and enjoyment. To further uphold this intrinsic motivation, the basic psychological need for autonomy and competence has to be satisfied (Deci & Ryan, 2000).

Building on these seminal ideas, SDT uses the concept of intrinsic motivation as a cornerstone in its theoretical foundations of all learning and development (Deci & Ryan, 1985). Deci and Ryan (2000) have further postulated that elements in the social context can facilitate or undermine intrinsic motivation to which degree the innate basic psychological needs are supported. Within the competitive context, both informational and controlling aspects can arise. These aspects are relatively prominent, where they help to determine the effect on individual's perception of the psychological satisfaction of autonomy and competence, and therefore the intrinsic motivation (Ryan & Deci, 2002). The informational component is linked to the idea that a competitive environment can offer optimal challenges and competence feedback, resulting in

feelings of efficiency and therefore enhancing intrinsic motivation. On the other hand, controlling components are often included as people feel pressure to win, either from others or from their own ego involvement (Ryan, 1982). Thus competitive settings with such pressure to win are expected to undermine intrinsic motivation, whereas those athletes that focus on task involvement and mastery can maintain or even enhance intrinsic motivation (Reeve & Deci, 1996; Hagger & Chatzisarantis, 2007). These statements have been supported by Deci (1971), which stated that intrinsic motivation increased when verbal reinforcements and positive feedback were used. In contrast, Sharp, Pelletier & Lévesque (2006) argue that without providing external rewards you cannot activate all; there will always exist individuals who will not be motivated without this offer. Especially, if individuals receive external rewards and these ends, the participation plunges. Nevertheless, Deci (1971) suggested that there is no support for the prediction that external rewards decrease intrinsic motivation. This is also supported in Deci and Ryan's (1991) conclusion, saying that external rewards do not necessarily undermine intrinsic motivation. More importantly, whether external rewards decrease or increase intrinsic motivation, depends on the way feedback is worded (Ryan, 1982), and the context in which external rewards are offered (Ryan, Mims & Koestner, 1983). Although the needs for autonomy and competence are both necessary conditions for the maintenance and enhancement of intrinsic motivation, SDT suggests that intrinsic motivation processes are most able to take root in contexts where the need for relatedness is supported (Hagger & Chatzisarantis, 2007). In such lining, SDT suggest that the intrinsic and extrinsic dichotomy in relation to self-determination should not be considered as two reverse concepts, but should rather be viewed in the nature of it internalization.

2.7 Extrinsic motivation - four types of regulations

There are various types of extrinsic motivation, ranging from those that are controlled externally to those that are self-endorsed and personally valued and therefore volitional and autonomous (Hagger & Chatzisarantis, 2007). Extrinsic motivation consists of four types of regulation- external, introjected, identified and integrated regulation, ranging on the motivation continuum (see figure 1). These forms of regulation are further separated depending on the degree of extrinsic influence on the SDT continuum, and

can vary greatly in degree of autonomy (Ryan & Deci, 2000b). In contrast to intrinsic motivation, extrinsic motivated behaviour is motivated by expected outcomes or contingencies not inherent in the activity itself (Deci & Ryan, 2000).

2.7.1 External regulation

This regulation is located at the opposite extremity on the motivation continuum compared to intrinsic motivation- where the behaviour is controlled by specific external contingencies (Deci & Ryan, 2000). Individuals motivated by this regulation, are driven by satisfying an external demand such as reward, or want to avoid a threatened punishment (Ryan & Deci, 2000; 2000b). For example, when a member of the men's ice hockey team plays "hard" because he expect to be rewarded for reaching an externally defined goal. In this case, the source of motivation is alien to the self of the actor, so his motivation is dependent on the continued presence of external monitoring and reinforcement for its maintenance. This form of extrinsic motivation has the smallest degree of self-determined motivation and is located closest amotivation on the self-determined continuum (see figure 1). Deci and Ryan (1985) add, and further state that behaviour regarded as controlled, do often suffer from poor maintenance, and come to stop when rewards are stopped or lacking.

2.7.2 Introjected regulation

Behaviours that are motivated by introjection are quite close to resembling behaviours motivated by external regulation. Here, rather than having other people controlling the actor's behaviour with rewards and punishment, the introjected regulated individuals administer the contingent consequences themselves (Deci & Ryan, 2000; Ryan, 1982). Continuing from the example above, an ice hockey player whose motivation for playing is introjected regulated will reward himself for meeting standards or reaching goals with pride and self-aggrandizement and will punish himself for failure with shame and anxiety, and at somewhat more sophisticated level with guilt (Ryan, 1982). Engagement in such behaviour is grounded in feelings of pressure or to avoid guilt or anxiety, or to achieve ego-enhancement of pride (Ryan & Deci, 2000b). In contrast to external regulation, introjected regulation is more likely to be maintained, but are yet an unstable form of regulation since the behaviour is partially internalized into the self.

Deci and Ryan (2000) view the internalization process as a central process in socialization, providing perspectives ranging from internalization being something that gets done by the individuals in the socializing environment. From a SDT perspective, internalization is an active, natural process in which individuals attempt to transform socially sanctioned or external requests into personally endorsed values and self-regulation (Deci & Ryan, 1985). When the internalization process functions optimally, individuals can reconstitute formerly external regulations so the individual can be self-determined while enacting them. In doing so, individuals will identify with the importance of social regulations, assimilate them into their integrated sense of self, and fully accept them as their own (Deci and Ryan, 2000; Hagger & Chatzisarantis, 2007). In other words, the internalization process focuses on how people can change externally motivated behavior to be completely self-determined regulated within themselves, and how the social environment influences these processes. However, when the internalization process is forestalled, regulations and values may either remain external or be only partially internalized to the self (Deci & Ryan, 2000). This makes introjected regulations very interesting, concerning that these regulations are within the person, but still relatively external to the self.

2.7.3 Identification regulation

Further on the self-determined continuum we find the identified regulation. This is the process through which people recognize and accept the underlying value and purpose of a behavior (Deci & Ryan, 2000). By identifying with a behavior's value, the individuals have more fully accepted it as their own. The resulting behavior would be more autonomous, although it would still be extrinsically motivated because the behavior would still be instrumental, rather than being done solely as a source of spontaneous enjoyment and satisfaction (Deci & Ryan, 2000). For example, a woman who exercises because she personally believes this enhances her energy and health is extrinsically motivated, but also autonomous (the behavior is self-endorsed and valued). Identified regulations are thus considered with even more maintenance and commitment than external and introjected regulation, and more importantly, the motivation is more powerful. Furthermore, at a still more autonomous level of functioning, this woman could fully coordinate and assimilate the regulation of exercise into her overall life goals and style of living; we call this integrated regulation (Hagger & Chatzisarantis, 2007).

2.7.4 Integration regulation

The most self-determined and fullest form of internalization of extrinsic motivation is the integrated regulation. Not only does integration involve identifying with the importance of behaviors, but also integrating those identifications with others aspects of the self (Deci & Ryan, 2000). Here the value for behaving is reflectively brought into congruence with other values and needs and thus becomes not only volitional, but also stable and well anchored within the personality (Hagger & Chatzisarantis, 2007). As such, what was initially external regulation will have been fully transformed into self-regulation, and the result is self-determined extrinsic motivation (Deci & Ryan, 2000). In other words, the more one is internalizing the reasons to act in specific ways, the more one is assimilating the reasons to act oneself, and the more self-determined (Ryan & Deci, 2000b). Nonetheless, the behaviours are still considered extrinsic motivated, because they are done for expected outcomes or rewards, even though the individual is fully volitionally valuing the behaviour. Due to the internalization, the regulations could be characterized on a continuum ranging from being autonomous to controlled, see figure 1 (Deci & Ryan, 2000).

2.8 Supporting and undermining internalization

As stated earlier, external regulation is according to Deci and Ryan (2000) description of SDT, located at the least internalized regulation and the most controlled form of extrinsic motivation. This is because the behaviour is regulated by rewards or punishments that are external to the self, mediated from others where the individual could not control the outcome. Ryan and Deci (2000b) highlight this and state that the primary reason why individual engage in externally motivated behaviours is because these are valued by significant others, being family members, coaches or close friends. Ultimately, this aspect could in the language of SDT be referred to as relatedness, one of the basic psychological needs, which have by Deci and Ryan (2000) been hypothesized to have a more distal role in individual's self-determined motivation and psychological health.

As one moves towards more internalized forms of regulation and intrinsic motivation on the motivation continuum (see figure 1), the behaviour will continually become more autonomous. Proceeding from external regulation through introjection, identification and integration, the regulation will gradually become more within the “self” (Deci & Ryan, 2000). As the individual moves across the regulations, he or she are hypothesized to experience a stepwise internalization, where the individual will little by little feel as the owner of the behaviour, and further perceive lessened conflict behaving in accordance with the regulation. Ryan and Deci (2000b) further add, as when the individual display behaviour internalized to the level of integration regulation, basic psychological needs for autonomy, competence and relatedness have to a fuller extent being satisfied (Deci & Ryan, 2000). Leading to a lesser extent of opposing identities and role conflicts, the result will be a uniform and healthy identity, “*adopted in the service of basic psychological needs*” (Ryan & Deci, 2002b, p.254). Nevertheless, Csikszentmihalyi (1975) reminds and demonstrate that intrinsic motivation and integration regulation are separated by a vertical line (see figure 1), which is intended to emphasize that fully internalized extrinsic motivation does not typically become intrinsic motivation. It rather remains extrinsic motivation because, even though fully volitional, it is instrument and external to the “self” rather than being “autotelic”.

At the farthest right end on the motivational continuum in figure 1, is amotivation (Deci & Ryan, 2000). In comparison to autonomous and controlled activities, which involve different types of regulatory processes, amotivation is a state in which people lack the intention to behave, and thus lack motivation as that term is defined in the cognitive-motivational tradition (Deci & Ryan, 2000). In the language of SDT, people are likely to be amotivated when they lack either a sense of efficiency or a sense of control with respect to a desired outcome- that is, when they are not able to regulate themselves with respect to a behavior (Pelletier, Dion, Tucson, & Green-Demers, 1999). To summarize on goal-directed activities, Deci & Ryan (2000) briefly state that they differ in the extent to which they are autonomous or self-determined. That is, to the extent in which they are enacted with a full sense of volition and choice. As stated earlier, intrinsic motivation and well-internalized extrinsic motivation are the bases for autonomous or self-determined behavior. In contrast, behavior is considered controlled or non-self-determined to the extent that people feel pressured to do it. External and introjected regulations are the processes through which behavior is controlled. Deci and Ryan

further states in relation to SDT, “...our approach focuses on the kind of motivation or regulation-specifically, the degree to which it is self-determined versus controlled” (Deci & Ryan 2000; p. 237). This statement further underlines SDT organismic dialectic approach, which views humans as being self-motivated, curious, interested, vital, and eager to succeed, because success itself is personally satisfying and rewarding (Deci & Ryan, 2008). This dialectic part of the approach involves this integrative tendency when the internally forces and events of the self meets externally forces and integrate them into the self, further being able to gain a sense of being an agent with respect to the self (Deci & Ryan, 1991). When an individual successfully ends this process, Deci and Ryan (1991) postulate that the individual will be left with improved psychological health- the well-being precursors.

2.9 Athlete engagement

It has been postulated that the main reasons for young people to participate in sports are related to the quality of their engagement, that is, with their interest and enjoyment in the sport (Lonsdale et al., 2007). Accordingly, there is interesting evidence supporting athletes who enjoy sports, are the ones being more intrinsically motivated (Brière, Vallerand et al., 1995). From a SDT point of view, Ryan & Deci (2000) uphold that the social context surrounding athletes (e.g., motivational climate) can affect their level of autonomous motivation, and therefore the quality of athlete’s engagement. Especially, it has been postulated that the motivational climate is related to athlete’s motivation through the satisfaction of their basic psychological needs of autonomy, competence and relatedness (Deci & Ryan, 1985). Ultimately, the type of motivation and motivation climate experienced by the athlete are assumed to be important for their affective states, as well as their quality of sport engagement (Duda, 2001).

Building from a qualitative investigation of elite athletes, athlete engagement has been characterized as an enduring, relatively stable sport experience, which refers to generalized positive affect and cognition about one’s sport as a whole (Lonsdale, Hodge & Raedeke, 2007; Lonsdale et al., 2007). Furthermore, Lonsdale and colleagues (2007) define athlete engagement as a persistent, positive, cognitive-affective experience in sport that is characterized by core dimensions such as confidence, dedication, vigor and

enthusiasm. *Confidence* is represented as “... a belief in one’s ability to attain a high level of performance and achieve desired goals” (Lonsdale et al., 2007; p.472). *Dedication* is defined as “... a desire to invest effort and time towards achieving goals one views as important” (Lonsdale et al., 2007; p.472). More precisely, dedication is a strong sense of involvement with one’s sport, alongside a sense of significant challenge. *Vigor* is defined as a sense of physical, mental and emotional liveliness, which is characterized by high levels of energy and mental resilience. Finally, *Enthusiasm* is defined as feelings of excitement and high levels of enjoyment (Lonsdale et al., 2007). Especially, athletes’ experience of enthusiasm occurs when an individual is fully concentrated and happily engrossed in his or hers sport to the extent that time passes quickly and they have difficulty detaching themselves from their sport (Schaufeli, Salanova, Gonzales-Roma & Bakker, 2002). According to Lonsdale and colleagues (2007), athlete engagement may allow researchers to better understand the complexities of human behavior in sport, and provide a framework for the promotions of positive sport experiences. Further suggesting, athlete engagement may be particular relevant for elite athletes, who invest extraordinary amounts of time and effort to be successful (Baker, Cote & Abernethy, 2003; Lonsdale et al., 2007). Not only would knowledge concerning athlete engagement illuminate its potential antecedents and consequences, but also lead to practical implications regarding possible benefits from enhanced athlete engagement such as decreased burnout and increased enjoyment. Moreover, Schaufeli and Salanova (2007) have suggested that athlete engagement may be the conceptual opposite of burnout. The authors hypothesized that athlete engagement and athlete burnout represent opposite poles on an underlying experiential continuum. This hypothesized relation has further been empirically supported (e.g., Marsh, 1998), although there do exist less clear support, indicating that there may not exist a clear strong negative linear relation between athlete engagement dimensions and burnout symptoms (Lonsdale et al., 2007). Nonetheless, Schaufeli and Salanova (2007) have furthermore advocated the promotion of athlete engagement with one’s work as the best method to prevent negative outcomes, such as burnout.

Interestingly, engagement dimensions have also been examined in relation to work related settings. In a study by Schaufeli et al., (2001), workers who reported high scores on engagement have been shown to exhibit high energy and self-efficacy. Bakker and Demerouti (2008) found that engaged workers carried their enthusiasm and energy with

them outside of the organization and felt a sense of accomplishment at the end of the work day. Furthermore, in a study by Schaufeli & Van Rhenen (2006), the association between positive emotions and engagement was examined and the authors reported a strong relationship between the two variables. Engagement has also been shown to be positively related to health, where engaged workers reported fewer psychosomatic complaints than co-workers who displayed low levels of engagement (Schaufeli, Taris & van Rhenen, 2008; Demerouti, Bakker, De Jonge, Janssen & Schaufeli, 2001). This low presence of diseases is further supported by Schaufeli and Bakker (2004), who reported that, engaged workers suffered from fewer self-reported headaches, cardiovascular problems, and stomach aches. These statements underscore the positive effect of being engaged, which at the most basic level, links to sets of positive emotions. From a more quantitative view, engaged individuals have been characterized as being immersed and happily engrossed in their activity (Schaufeli & Bakker, 2004).

2.10 The association between self-determination and athlete engagement

Self-determination theory has been suggested as a potential basis for examining the antecedents for athlete engagement (Lonsdale et al., 2007). The “*satisfaction*” or fulfillment of basic psychological needs for autonomy, competence and relatedness have been positively associated with employee engagement (Deci, Ryan, Gagné, Leone, Usunov & Kornazheva, 2001), and are thus hypothesized to represent a likely motivational precursor for athlete engagement. According to Ryan & Deci (2002), the extent to which these needs are satisfied will determine the degree to which positive psychological outcomes are experienced, such as engagement, while the extent to which these needs are thwarted or frustrated, will determine the degree to which negative psychological consequences are expected (e.g., burnout).

Fredrick (1999) revealed interesting evidence, indicating that athletes who enjoy sports the most are the ones who report being more intrinsically motivated. Moreover, the desire for enjoyment has been positively related to a higher frequency of sport participation. The self-determination theory upholds that the social context surrounding athletes (e.g., the motivational climate created by the coach) can affect their level of

intrinsic motivation and their athletic engagement to sports. Specifically, it has been postulated that the motivational climate that surrounds the athletes, is related to athletes' motivation via the satisfaction of their basic psychological needs for autonomy, competence and relatedness (Reinboth et al., 2004). Therefore, the type of motivation experienced by the athletes is also stated to have an impact on their affective states. Ultimately, Duda (2001) claims that the motivational climate is assumed to be important for the quality of sport engagement, in such athlete engagement dimensions as enthusiasm, vigor, dedication and confidence.

Cognitive evaluation theory postulates that the controlling form of motivation (e.g., lesser forms of internalized forms of regulations such as external regulation), like the use of punishment or rewards, promotes an external locus of causality, which reduces feelings of autonomy and the corresponding self-determined motivation. However, the use of more autonomous forms of motivation (e.g., more internalized forms of regulation such as identified and integrated regulations) as providing the athletes with choices and options, would facilitate a more perceived internal locus of causality and thus, increase feelings of autonomy and, consequently, more self-determined ways of regulation are promoted resulting in a positive athletic engagement (Deci & Ryan, 1985; 1991). Moreover, SDT indicates that the impact of social factors on behavior regulation does not occur automatically, but instead regulation is mediated by perceptions of autonomy, competence and relatedness. Thus, to the extent that social factors promote satisfaction of the basic psychological needs, self-determined motivation will increase, and vice versa, which ultimately would lead to qualitative athlete engagement (Deci, Vallerand, Pelletier & Ryan, 1991). Deci (1980) supports this, and adds that within SDT, self-determined motivation is associated with positive cognitive, emotional, and behavioral consequences for the individuals. In such regards, when considering affective consequences, there has been hypothesized that more self-determined types of motivation will contribute to promote positive affect and decrease negative affective responses (e.g., increase vitality and decrease exhaustion).

Incorporating the main points of self-determination theory, Vallerand (1997) proposed a hierarchical model of intrinsic and extrinsic motivation that operates at three levels: global, contextual, and situational. For each level of generality, Vallerand proposed following logical sequence of association, proposed by SDT: social

factors → psychological mediators → types of motivation → consequences. There is further found strong support for these theoretical predictions within SDT, where research has confirmed Vallerand (1997) sequential proposal (e.g., Deci & Ryan, 1985; 1991; 2000; 2002; Ntoumanis, 2001; 2005; Standage, Duda, & Ntoumanis, 2003; 2005). In research by Gagné, Ryan and Bargmann (2003), the associations between the coach-created environment and basic psychological needs was analyzed with a sample of gymnasts from a competition team and reported positive relations between autonomous coaches and the gymnasts' perception of autonomy, competence and relatedness. Thus, to the degree of gymnasts' perceived need fulfillment, through their perception of autonomy, competence and relatedness, was a result from the sport context created by coaches or significant others surrounding the athletes. In a study carried out with basketball players by Blanchard and Vallerand (1996), a sequentially analysis of the relation between autonomy support, basic psychological needs, and self-determined motivation was conducted, using a self-determination index to assess the latter variable. The researchers found that the more coach autonomy support perceived by the players, the more autonomous, competent and related to the team they felt, and that such perception had positive effects on their self-determined motivation. This was supported by Balaguer, Castillo and Duda (2008), where the perception of coach autonomy support corresponded to greater satisfaction of the needs of autonomy, competence, and relatedness, thus observing that the more autonomous, competent and relatedness the athletes felt, the higher was their self-determined motivation (cited in Vallerand & Losier, 1999). More recently in the context of physical education (Standage et al., 2005), the needs for autonomy, competence and relatedness have been combined in a composite variable called psychological need satisfaction, in relation as SDT assumes that the three needs coexist. This is supported by Ntoumanis (2005), stating that the assumed relationship of a composite psychological need satisfaction would positively predict self-determined motivation. Regarding the investigations that have examined the implications of motivational regulations on athletes' emotional responses, there have been positive relations between more self-determined motivations (e.g., such as intrinsic and/or identified regulation) and enjoyment in sport (Brière et al., 1995; McAuley, Duncan & Tammen, 1989), as well as the existence of negative relationships between less self-determined types (e.g., external regulation and amotivation) and enjoyment (Brière et al., 1995).

2.10.1 Presenting the research model

Inspired by Vallerand (1997), we adopted the empirically supported motivational sequence incorporated in SDT. Specifically, figure 2 presents each link in relation to the measurements used in the current study. In this model, it was hypothesized a indirect link between the social environment and the perception of thwarting and satisfaction of basic psychological needs, which in turn, would be related to self-determined motivation, which would be related to athlete engagement in sport. More specifically, there were hypothesized a negative relation between need thwarting and self-determined motivation and athlete engagement, whereas a positive relation would exist between need satisfaction and self-determined motivation and athlete engagement. Self-determined motivation would further be positively related to athlete engagement. This model is the first to us the composite variable of basic psychological need thwarting applied to the sport context in a study of the interplay between the index of self-determined motivation and athlete engagement. Moreover, we studied how the satisfaction of basic psychological needs can act as a potential positive predictor of athletes' engagement. SDT proposes that psychological need satisfaction mediates the link between the social environment and self-determined motivation (Ryan & Deci, 2000), and that self-determined motivation mediates the links between psychological need satisfaction and engagement (Vallerand, 2001). Going one step further, the current study examined the hypothesized mediational effects of self-determined motivation between need satisfaction and athlete engagement in youth ice hockey players.

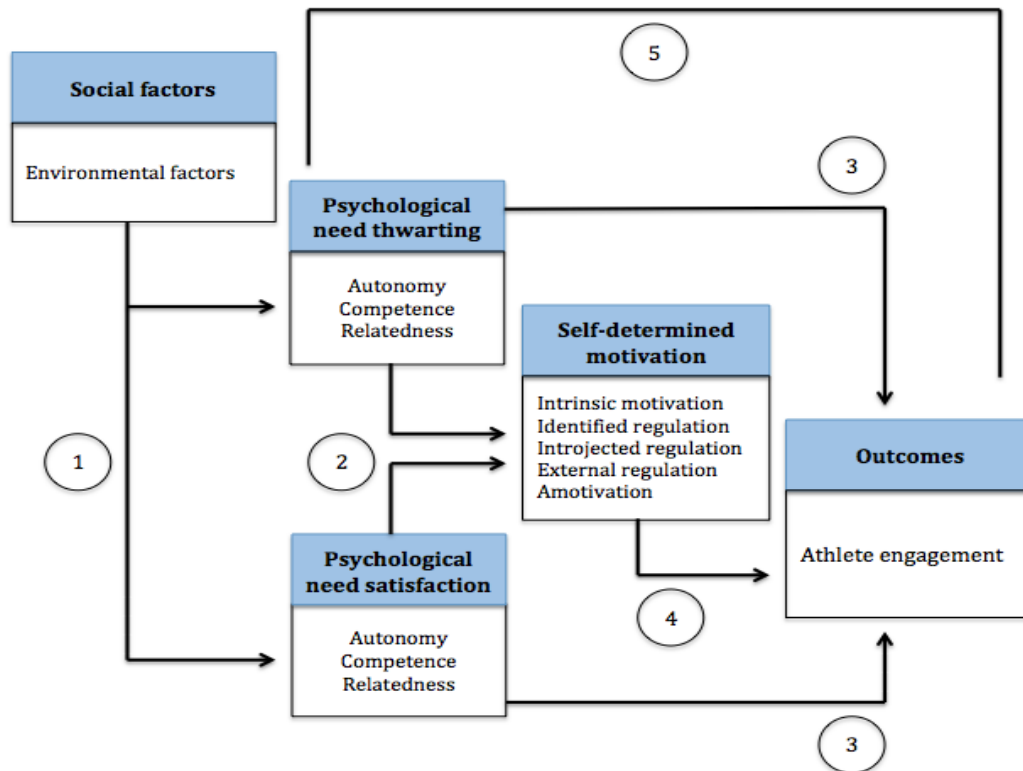


Figure 2: Research model of the sequential supported links among self-determination theory constructs; social, psychological, motivation, and athlete engagement in ice hockey. (1) Indirect links between social factors and need thwarting/need satisfaction; (2) influences of need thwarting and need satisfaction on motivation; (3) impact of need thwarting and need satisfaction on athlete engagement; (4) Links between the various motivation types and athlete engagement; (5) a test of the proposed sequence of motivational processes.

2.11 Goal, research field, research question and hypotheses

Within the SDT framework, the goal of this study was to investigate how motivational processes influence ice hockey engagement in Norwegian youth players. These questions- the associations between need thwarting, need satisfaction, self-determined motivation and athlete engagement, and whether balanced need satisfaction is important in predicting engagement, were investigated in the current study, by means of the current research hypotheses.

2.11.1 Hypotheses

H1: Self-determined motivation is associated with need thwarting, need satisfaction and balance in need satisfaction. More specifically, need thwarting would best predict self-determined motivation through perceived thwarted relatedness.

H2: Athlete engagement is associated with need thwarting, need satisfaction, balance in need satisfaction and self-determined motivation. Basic psychological needs satisfaction is the strongest predictor of athlete engagement beyond the predictive contribution of balanced basic psychological needs, while perceived competence best predicts athlete engagement.

H3: Self-determined motivation mediates the relationship between basic psychological need satisfaction and athlete engagement.

3 Method

3.1 Participants

Participants in the current study were 242 ice hockey players. Due to the screening process (17.36%, N=42), which reasoning will be presented under data analysis, 200 participants were included in the final analyses. The remaining participants were aged 16-21 years (mean 18.77 years, SD=1.21) competing in Norwegian junior elite ice hockey series within their respective club (N=10). On average, the participants have played ice hockey for 11.29 years (SD=2.56) and use an average of 15.12 hours (SD=5.39) per week in training to pursue their ice hockey career. Fifty-five per cent of the participants played for junior elite group U18² (N=110), whereas forty-five per cent played for junior elite group U20³ (N=90). Furthermore, fifteen per cent of the participants (N=30) report having competed at the Norwegian junior national team. Figure 3 presents the club participation and their respective ice hockey players, prior to the screening process.

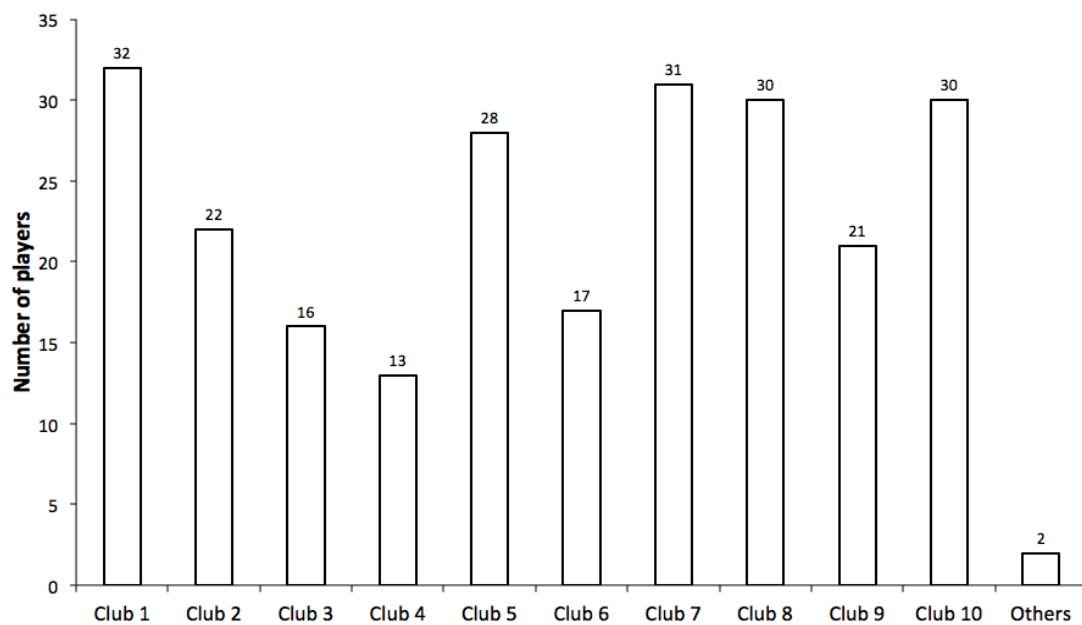


Figure 3: Club participation and their respective players.

² Series nationwide for players under 18 years (e.g., aged sixteen years or older).

³ Series nationwide for players under 20 years (e.g., aged eighteen years or older).

3.2 Measures

To measure the hypotheses of this current study, there was composed a questionnaire-package for measuring the variables of interests (see appendix A). A pilot study was conducted on a group of eight sport students aged between 16-18 years from St Olav High School. This was done to investigate whether the questions were understandable for the age group, and to see how much time the participators spent on completion of the questionnaire. The participators used 20 minutes to complete the questionnaire. It was made certain adjustment referred to the players' background and their future intentions with the sport of hockey. The pilot study was considered to be successful.

3.2.1 General questions

The general questions enquired about personal and sports characteristics. Participants filled in their birth year, how many years they had been playing competitive ice hockey, elite level (e.g., either U18 or U20), club affiliation, national experiences within U18 and U20 and the number of training hours they engaged in per week. In addition, players listed their future intention within ice hockey (e.g., "I wish to pursue my hockey career"), the number of ice hockey games they undertook each season and to which degree they were satisfied with they're own performance in these games.

3.2.2 Need thwarting

A Norwegian translated version of the Psychological Need Thwarting Scale (PNTS; Bartholomew, Ntoumanis, Ryan & Thøgersen-Ntoumani, 2011) was used to measure participants need thwarting. PNTS is a domain specific self-report instrument measuring need thwarting in sport. The scale consist of twelve items, four covering each of the three needs- the need for autonomy (e.g., "I feel prevented from making choices with regards to the way I train"), the need for competence (e.g., "There are situations where I am made to feel inadequate") and the need for relatedness (e.g., "I feel I am rejected by those around me"). The stem for each question was "how do you perceive the ice hockey environment". The participants answered each question using a seven-point likert scale ranging from (1) "Strongly disagree" to (7) "Strongly agree". In the current study, the Cronbach alpha coefficient (Cranach's α ; Cronbach, 1951) for PNTS was 0.86, were the subscales ranging from 0.80 on autonomy, 0.76 on competence, and, 0.74 on relatedness. These alpha coefficients were acceptable on the basis of DeVellis (2003) criterion of alpha coefficients .70 for hypothesized measures of a construct. An overall

score for PNTS were achieved by averaging all three subscales, thus a global score were computed for each subscale.

In the present study, initially, the PNTS was translated in November 2012 into Norwegian by using the “translation-back-translation” technique (Beaton, Bombardier, Guillemin & Ferraz, 2000), which required the contribution of two bilingual translators. The questionnaire was at first hand, translated from English to Norwegian by the investigator from this current study-translator A. Following, the last translators received the Norwegian version. This version was then independently translated from Norwegian back to English by translators B and C-two bilingual university faculty member with master degrees in English literature and language. Comparison of the version that was re-translated into English by translators B and C, with the original English PNTS questionnaire, revealed that the meaning of the items was identical. Consequently, translator A, B and C, agreed upon keeping the preliminary Norwegian version. Subsequently, three native Norwegian speakers studying for a master degree in sport science commented on the translated scale and slight modifications were made in the wording to enhance item clarity and comprehension.

3.2.3 Need satisfaction

A Norwegian version of the Basic Psychological Needs in Exercise (BPNES; Vlachopoulos & Michailidou, 2006) translated by Solberg, Hopkins, Ommundsen and Halvari (2012) was used to measure participants need satisfaction. The latter authors used the “translation back translation” method (Beaton, Bombardier, Guillemin & Ferraz, 2000), which has resulted in a more frequently use of the BPNES within Norway. BPNES has it’s similarities to PNTS (e.g., domain specific self-report instrument), thus measuring need satisfaction in exercise settings. The scale consist of twelve items, four covering each of the three needs- the need for autonomy (e.g., “I feel like I have a say in choosing what exercises I do”), the need for competence (e.g., “I Feel like I am able to complete exercises that are personally challenging”) and the need for relatedness (e.g., “I feel connected to the other players on the team”). The stem for each question was “how do you perceive the ice hockey environment”. The participants answered each question using a seven-point likert scale ranging from (1) “Strongly disagree” to (7) “Strongly agree”. Furthermore, a reliability analyses were conducted on the BPNES and all three of the BPNES subscales. In the current study, the Cronbach

alpha coefficient on BPNES was 0.86, were the subscales ranging from 0.84 on autonomy, 0.85 on competence, and, 0.89 on relatedness. An overall score for BPNES were achieved by averaging all three subscales, thus a global score were computed for each subscale.

3.2.4 Balance of need satisfaction

To assess Participants' balance of need satisfaction, a method recommended by Sheldon & Niemiec (2006) were used. Inspired by the authors, the balance score was computed by means of calculating the three different needs mean values, and then calculating the variance between the three score. Given the seven-point likert scale, the balance score could range from 0 (e.g., indicating equal satisfaction among the three needs and perfect balance) to 12 (e.g., indicating the maximum summed difference among the needs; as yielded by mean scores of 1, 4 and 7, interpreted as low balance). To ease the interpretation, the balance score were transformed in SPSS by subtracting the participants score by the highest observed score, which were 7. The balance score were like this inverted; a score of -5 indicated minimal balance whereas a score of 7 indicated perfect balance.

3.2.5 Self-determined motivation

A Norwegian version of the Sport Motivation Scale (SMS; Pelletier et al., 1995) translated by Lemyre, Roberts & Stray-Gundersen (2007) was used to assess participants' self-determined motivation. The scale is a twenty-eight sport-specific measure. The stem for question was: "Why do you practice ice hockey?" Participants were then requested to rate the extent to which the items explained their participation motives on a seven-point liker scale anchored by (1) "strongly disagree and (7) "strongly agree". The SMS consists of seven 4-items subscales. These seven subscales assess, respectively: (1) Intrinsic motivation to Know (IM Knowledge; e.g., "For the pleasure it gives me to know more about the sport I compete in"); (2) Intrinsic motivation to Accomplish (IM Accomplishment; e.g., "Because I feel a lot of personal satisfaction when mastering certain difficult training techniques"); (3) Intrinsic motivation to Experience Stimulation (IM Stimulation; e.g., "For the pleasure I have in experiencing excitement"); (4) Identified regulation (e.g., "Because it's one of the best ways I have chosen to develop other aspects of myself"); (5) Introjected Regulation (e.g., "Because I must do ice hockey to feel good about myself"); (6) External

Regulation (e.g., “To show others how good I am in ice hockey”); and (7) Amotivation (e.g., “I used to have good reasons for participating in ice hockey, but now I am asking myself if I should continue doing it”). To test the hypotheses in the current study, we computed an index of self-determined sport motivation (SDI). The SDI integrates scores on each motivation subscale into a single score corresponding to the participants’ position on a self-determination continuum, thus reduce the number of variables in the analyses. Guidelines found in the SDT literature were followed (e.g., Frenet, Guay & Senecal, 2004; Vallerand & Rousseau, 2001) and the following formula was used: $((2 * \text{Intrinsic Motivation}) + (\text{Identified Regulation})) - (((\text{Introjected Regulation} + \text{External Regulation}) / 2) + (2 * \text{Amotivation}))$. In the current study, the Cronbach alpha coefficient on SMS was 0.76, where reliability analyses yielded alpha scores ranging from 0.64 to 0.82 for all seven SMS subscales. Although there were reported alpha coefficients below $\alpha = .70$ acceptance criterion (Devellis, 2003), all seven subscales were included in further analyses based on conceptual arguments (Pallant, 2011).

3.2.6 Athlete engagement

A Norwegian translated version of the Athlete Engagement Questionnaire (AEQ; Lonsdale et al., 2007) was used to measure participant’s engagement. The AEQ was translated using the “translation-back-translation” technique (Beaton et al., 2000), which was formally presented in the translation of PNTS. The AEQ is comprised of four subscales: confidence (e.g., “I believe I am capable of accomplishing my goals in ice hockey”), dedication (e.g., “I am determined to achieve my goals in ice hockey”), enthusiasm (e.g., “I feel excited about my sport”), and vigor (e.g., “I feel really alive when I participate in my sport”). Participants responded to all AEQ items using a five-point likert scale ranging from (1) “almost never” to (5) “almost always”. The stem for each question was “How often you felt this way during this season”. An overall score for AEQ were achieved by averaging all four subscales. The Cronbach alpha coefficient for AEQ in the current study was 0.90, whereas, alpha scores ranging from 0.80 to 0.85 for all four AEQ subscales.

3.3 Procedures and recruitment

Prior to the collection of data, we obtained permission to conduct the study from a human subjects' research committee, Personvernombudet for forskning, Norsk Samfunnsvitenskapelig Datatjeneste A/S (appendix B), standard procedures for the protection of research participants were followed.

An information package (appendix C), including a letter written by the Norwegian Ice Hockey Association (see appendix D) supporting the significance and goal of the current study, was sent by e-mail to targeted Norwegian elite team officials. Within a week of sending the information package, team coaches were contacted by telephone to ask if they were interested in participating in the study. Team coaches who wished to collaborate were asked to arrange a meeting between the investigator and youth athletes.

During December 2012, the investigator travelled within Norway, at training facilities to offer additional information and administer the midseason survey investigating athletes' engagement towards ice hockey. Due to two travelling challenges, two clubs in regards of their respective coach received an envelope sent by mail containing information packages and letters of consent to be completed by the participants (appendix E), as well as pre-addressed and pre-stamped return envelopes. In an effort to make the data collection procedures as similar as possible, detailed guidelines were provided and a list of instructions was given to each participant to read (appendix F). Before conducting the questionnaire, it was emphasized that: (a) there were no right or wrong responses to any of the items, (b) their team officials or coaches would not see their responses in order to elicit honest responses about their own perception of their ice hockey experiences, (c) the completed questionnaires would be treated in strictest confidence and anonymous, and (d) the data would be analyzed in terms of group responses rather than as individual responses. Participants were also notified that participation in the study was voluntary and that they could withdraw at any time without negative repercussions.

To the end of January 2013, no clubs or athletes refused to participate, nor did any withdraw from the study. The inventory took approximately 20 minutes to complete, after which the athletes were thanked for their cooperation. In total, 242 ice hockey players participated in the original data collection, while 200 was included in the final

data analyses due to the screening process. To ensure that the athletes and their respective elite clubs were informed of the main research findings, they were promised a written research report containing the significance findings of the study.

3.4 Data analysis

All data was coded in the analysis process, keeping the participants of the study strictly confidential. The screening process was applied to prevent erroneous and misleading data. During the screening process, 1 candidate was removed due to club affiliation outside Norway, 1 was removed due to ignorance of the player's club affiliation in Norway (the player added instead an inappropriate comment), 4 were removed because of their gender, 31 were removed because they were too young and 5 candidates were removed due to missing items (due to large parts of the questionnaire was missing). In total, 42 candidates (17.36%) were excluded during the screening process. Accordingly, analyzes in the IBM Statistical Package for the Social Science Statistics 19 (SPSS) were conducted on n=200 Norwegian youth ice hockey players.

Missing Value Analysis (MVA) was completed in SPSS after screening process, prior to analysis. The results from this analysis displayed four numbers of cases missing 1 item, where the missing value percent was ranging from 0.5% to 1% within PNTS (1 missing item), SMS (2 missing items) and AEQ (1 missing item). There were not run any further tests since the MVA percent were lesser than 5 per cent (Tabachnick & Fidell, 2001). The Little MCAR test during the analysis, was not significant ($p < .67$), indicating that the missing values were random missing (Tabachnick & Fidell, 2001). In a survey analysis, this is according to Acock (2005), a more common and realistic assumption, which is referred to as data Missing at Random (MAR). Further on, the MAR assumption is valid if it can be assumed that the pattern of missing values is conditionally random, which in relation to this study, neither elite level, age or club are mechanisms that help to explain whether or not a respondent answered a question. Consequently, one can assume that missing values, is Missing at Random, thus there is evidence to use Expectation Maximization algorithm (EM) to replace the missing values (Acock, 2005). A mean substitution procedure Expectation Maximization algorithm (EM) was used in SPSS to deal with missing data. EM is a technique that calculates the

mean value for the variable and gives every missing case this value. This method ensure that the mean for the distribution as a whole does not change, but the variance of the relevant variables are reduced because mean is now closer to itself than to the missing values it replaces. A critical angle to this method is further underlined by Tabachnick and Fidell (2001), who state that the correlation to other variables is reduced if the EM technique is misused.

The data was analyzed using the IBM Statistical Package for the Social Science Statistics 19 (SPSS). Graphical representations were made using Microsoft Excel Mac 2011. Descriptive statistics, Pearson correlations (r), and Multiple Regression Analyses were used to investigate the relationship between need thwarting, need satisfaction, self-determined motivation and athlete engagement (Pallant, 2011; Tabachnick & Fidell, 2001). The Multivariate Regression Analyses exploit the hierarchically design of the dataset, in which the dependent variables could be regressed on multiple independent variables (Tabachnick & Fidell, 2001). Additionally, multivariate analysis of variance (ANOVA) was used to assess whether there were differences between the collapsing training groups “training hours per week” (Group 1: 12hrs or less, $n=72$; Group 2: 13-18hrs, $n=68$; Group 3: 19hrs or more, $n=60$).

3.5 Descriptive statistics

The data was initially tested for normal distribution by applying the Shapiro-Wilk test, where the results revealed violation of normality on the data. Descriptive statistics displayed positive skewness for PNTS, whereas a negative skewness for BPNES, SDI and AEQ, indicating that PNTS answers were located at the left of the scale, whereas the majority of the answers of BPNES, SDI and AEQ were located at the right end of the scale. The kurtosis displayed negative values below zero for PNTS, indicating a distribution too peaked, whereas positive kurtosis values for BPNES, SDI and AEQ, indicating that the distribution was rather peaked (Tabachnick & Fidell 2001).

Accordingly, when data violate normal distribution (e.g., $SIG=0.01$), a use of non-parametric test are encourage in the analysis process. Nevertheless, in this current study the use of parametric tests have been applied. According to Pallant (2011), parametric statistics show more statistical power, in which they are more sensitive in detecting a

relationship or difference among groups. Accordingly, Hair, Black, Babin, Anderson & Tatham (2006) have stated that samples with ≥ 200 participants, diminish the impact of skewness because of its quantity. Howell (2007) supports these statements, when underlining assumptions for doing regression analyses- were the distribution for many of the tests is necessary to be normal, substantial to moderate departures from a multivariate-normal distribution are likely to be tolerated. Nevertheless, as a basis for this study and to control for a type I error, the level of significance have been set to alpha $p < 0.05$, unless otherwise is specified.

Considering the cross-sectional design of the current study, and because of the purpose of predicting the outcome in one variable and further holding other independent variables constant/controlling for other variables, the Multivariate Regression analyses were considered as an appropriate test to conduct (Pallant, 2011).

4 Results

4.1 Hypothesis 1: Need thwarting, need satisfaction and balanced needs predicting self-determined motivation

To test the assumptions that self-determined motivation was associated to need thwarting, need satisfaction and balance need satisfaction, and whether any of the variables proved greater predictions, regression analyses where self-determined motivation were regressed on need thwarting, need satisfaction and balance in need satisfaction was conducted. Table 2 presents the intercorrelations from these analyses.

4.1.1 Preliminary analyses

An overview over the descriptive statistics reported in table 1 for junior athletes indicates that the current population did have some levels of thwarting of their innate basic psychological needs, where athletes report highest value of undermined autonomy. Moreover, athletes' need satisfaction and its balance reported relative encouraging values, indicating that the current population did not have any great variability in their need satisfaction for autonomy, competence and relatedness. Thus, their need fulfillment could be considered moderate to strong; most athletes presented a varying self-determination index score. Especially, the current population expressed slightly higher intrinsic motivation than lesser forms of self-motivation regulations, thus the junior population yielded relatively low scores on amotivation. However, the wide range of SDI responses suggest important differences in their self-determined motivation (e.g., -6.75 to 14.74).

Pearson product-moment correlation coefficients were used initially to examine the relationship between self-determined motivation, need thwarting, need satisfaction and balanced needs. For the current population, self-determined motivation in midseason reported a significant relationship to all variables. Specifically, using Cohen's (1988) determination of relationship, self-determined motivation reported a negative moderate relationship to need thwarting, whereas a moderate but positive relation to need satisfaction ($p < .001$), thus reporting a small positive relation to balanced needs ($p < .01$). Additionally, PNTS was moderate but negatively related to BPNES ($p < .001$).

Table 1: *Descriptive statistics for need thwarting, need satisfaction, balance in need satisfaction, self-motivation and athlete engagement in junior athletes (mean \pm s).*

| Variables | Mean | SD | Elite group U18 (n=110) | | Elite group U20 (n=90) | | Scale |
|--------------------------------|-------------|-----------|--------------------------------|------|-------------------------------|------|--------------|
| Needs thwarting (PNES) | 2.65 | 1.09 | 2.70 | 1.08 | 2.60 | 1.11 | 1 to 7 |
| Autonomy | 3.00 | 1.35 | 2.95 | 1.35 | 3.07 | 1.36 | 1 to 7 |
| Competence | 2.75 | 1.21 | 2.86 | 1.16 | 2.60 | 1.25 | 1 to 7 |
| Relatedness | 2.21 | 1.13 | 2.28 | 1.14 | 2.13 | 1.13 | 1 to 7 |
| Needs satisfaction (BPNES) | 5.82 | 0.88 | 5.86 | 0.78 | 5.78 | 0.99 | 1 to 7 |
| Autonomy | 5.53 | 1.08 | 5.60 | 1.02 | 5.44 | 1.14 | 1 to 7 |
| Competence | 5.85 | 0.89 | 5.91 | 0.79 | 5.76 | 1.01 | 1 to 7 |
| Relatedness | 6.09 | 1.00 | 6.06 | 0.91 | 6.13 | 1.12 | 1 to 7 |
| Balance in needs | 6.60 | 0.56 | 6.62 | 0.53 | 6.57 | 0.59 | -5 to 7 |
| Self-determination index (SDI) | 6.13 | 4.06 | 6.31 | 4.24 | 5.92 | 3.84 | - 18 to 18 |
| Intrinsic motivation | 5.40 | 1.09 | 5.41 | 1.16 | 5.39 | 1.00 | 1 to 7 |
| To know | 5.47 | 1.17 | 5.52 | 1.24 | 5.41 | 1.09 | 1 to 7 |
| To accomplish | 5.10 | 1.21 | 5.11 | 1.26 | 5.09 | 1.16 | 1 to 7 |
| To experience stimulation | 5.64 | 1.17 | 5.61 | 1.20 | 5.66 | 1.13 | 1 to 7 |
| Extrinsic motivation | 4.04 | 1.14 | 3.91 | 1.12 | 4.21 | 1.14 | 1 to 7 |
| Identified regulation | 4.08 | 1.34 | 3.95 | 1.32 | 4.24 | 1.35 | 1 to 7 |
| Introjected regulation | 4.03 | 1.33 | 3.84 | 1.33 | 4.26 | 1.32 | 1 to 7 |
| External regulation | 4.01 | 1.33 | 3.94 | 1.31 | 4.12 | 1.36 | 1 to 7 |
| Amotivation | 2.36 | 1.26 | 2.29 | 1.21 | 2.45 | 1.32 | 1 to 7 |
| Athlete engagement (AEQ) | 4.22 | 0.60 | 4.27 | 0.56 | 4.15 | 0.64 | 1 to 5 |
| Confidence | 4.03 | 0.72 | 4.07 | 0.68 | 3.97 | 0.76 | 1 to 5 |
| Dedication | 4.20 | 0.73 | 4.30 | 0.63 | 4.06 | 0.81 | 1 to 5 |
| Vigor | 4.16 | 0.68 | 4.17 | 0.65 | 4.15 | 0.72 | 1 to 5 |
| Enthusiasm | 4.48 | 0.59 | 4.52 | 0.58 | 4.42 | 0.60 | 1 to 5 |

Table 2: Intercorrelations for need thwarting, need satisfaction, balance in need satisfaction, self-motivation and athlete engagement in junior athletes.

| Variables | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. |
|----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|------------------|-----|-------------------|-----|
| 1. Need thwarting | - | | | | | | | | | | | | | | | |
| 2. Autonomy | .89 ^a | - | | | | | | | | | | | | | | |
| 3. Competence | .91 ^a | .72 ^a | - | | | | | | | | | | | | | |
| 4. Relatedness | .85 ^a | .61 ^a | .68 ^a | - | | | | | | | | | | | | |
| 5. Need satisfaction | -.42 ^a | -.35 ^a | -.39 ^a | -.36 ^a | - | | | | | | | | | | | |
| 6. Autonomy sat. | -.39 ^a | -.40 ^a | -.36 ^a | -.27 ^a | .89 ^a | - | | | | | | | | | | |
| 7. Competence sat. | -.34 ^a | -.28 ^a | -.35 ^a | -.27 ^a | .89 ^a | .70 ^a | - | | | | | | | | | |
| 8. Relatedness sat. | -.35 ^a | -.26 ^a | -.33 ^a | -.42 ^a | .88 ^a | .65 ^a | .70 ^a | - | | | | | | | | |
| 9. Balance in needs | -.18 ^b | -.22 ^b | -.17 ^c | -.08 | .32 ^a | .57 ^a | .17 ^c | .09 | - | | | | | | | |
| 10. Self-determination | -.47 ^a | -.41 ^a | -.41 ^a | -.42 ^a | .37 ^a | .37 ^a | .37 ^a | .25 ^a | .20 ^b | - | | | | | | |
| 11. Intrinsic motivation | -.23 ^a | -.18 ^b | -.19 ^b | -.23 ^a | .26 ^a | .27 ^a | .27 ^a | .16 ^c | .15 ^c | .79 ^a | - | | | | | |
| 12. Identified regulation | .02 | .09 | .03 | -.08 | .07 | .03 | .02 | .11 | .01 | .29 ^a | .41 ^a | - | | | | |
| 13. Introjected regulation | .00 | .09 | -.07 | -.03 | .10 | .10 | .08 | .09 | .05 | .07 | .39 ^a | .54 ^a | - | | | |
| 14. External regulation | .13 | .21 ^b | .09 | .02 | .02 | -.04 | -.01 | .09 | -.00 | .07 | .35 ^a | .62 ^a | .62 ^a | - | | |
| 15. Amotivation | .54 ^a | .47 ^a | .51 ^a | .44 ^a | -.36 ^a | -.35 ^a | -.37 ^a | -.25 ^a | -.20 ^b | -.81 ^a | -.37 ^a | .11 | .08 | .09 | - | |
| 16. Athlete engagement | -.32 ^a | -.27 ^a | -.31 ^a | -.26 ^a | .53 ^a | .51 ^a | .55 ^a | .34 ^a | .25 ^a | .59 ^a | .50 ^a | .03 | .10 | .07 | -.55 ^a | - |

Note: Need thwarting=Psychological Need Thwarting Scale, Need satisfaction=Basic Psychological Needs in Exercise Scale, Self-determination=Self-determination Index, Athlete engagement=Athlete Engagement Questionnaire, ^ap<0.001, ^bp<0.01, ^cp<0.05 (2-tailed).

4.1.2 Primary analyses- test of hypothesis 1

Table 3 presents the results from the regression analyses, when self-determined motivation were regressed on need thwarting, need satisfaction and balance need satisfaction. To explore how much of the variance in self-determined motivation can be explained by the sets of independent variables, and whether perceived thwarted relatedness would be the strongest predictor of self-determined motivation, hierarchical multiple regression were directed.

The results from the first regression underlined that need thwarting were the greatest predictor, accounting for 22.2 per cent of the variance in self-determined motivation. Need satisfaction and balanced needs accounted for 3.7 and 0.5 per cent, respectively, thus the latter variable were reported as a non-significant predictor. To investigate this further, a second regression analysis was conducted where self-determined motivation were regressed on the various subscales of thwarted needs for relatedness, autonomy and competence independently. These results revealed that the three thwarted needs totally explained 22.4 per cent of the variance in self-determined motivation, where thwarted relatedness was reported as the strongest predictor accounting for 18 per cent of the variance in self-determined motivation. Thwarted autonomy displayed a significant contribution of 3.8 per cent, whereas thwarted competence was reported as a non-significant contributor in predicting self-determined motivation. The results were somewhat changed in the third and last regression, when self-determined motivation were regressed on subscales of need satisfaction for competence, autonomy and relatedness independently. The three needs totally explained 16.2 per cent, where competence, autonomy and relatedness accounted for 13.6, 2.3 and 0.3 per cent, respectively, thus the latter variable was reported as a non-significant predictor in self-determined motivation.

Additionally, a one-way between-groups analysis of variance was conducted to explore the impact of training hours on levels of intrinsic motivation, as measured by the Sport motivation scale (SMS). Participants were divided into three groups according to their amount of trainings hours per week (Group 1: 12hrs or less; Group 2: 13 to 18hrs; Group 3: 19hrs or more). There was a statistically significant difference at the $p < .05$ level in intrinsic motivation scores for the three training groups: $F(2, 197) = 3.44$, $p = .03$. The effect size, calculated using eta squared, was .03 (Cohen, 1988). Post-hoc

comparisons using the Tukey HSD test indicated that the mean score for group 1 (M=5.18, SD=1.13) was significantly different from group 3 (M=5.68, SD=1.05). Group 2 (M=5.39, SD=1.06) did not differ significantly from either group 1 or 3. This indicates that there is a difference in the mean intrinsic motivation scores between players and their respectively amount of training hours, where athletes with a weekly amount of 19 hours or more report greater intrinsic motivation than players training 12 hours or less per week. Figure 4 presents the difference in mean intrinsic motivation scores between the different training groups.

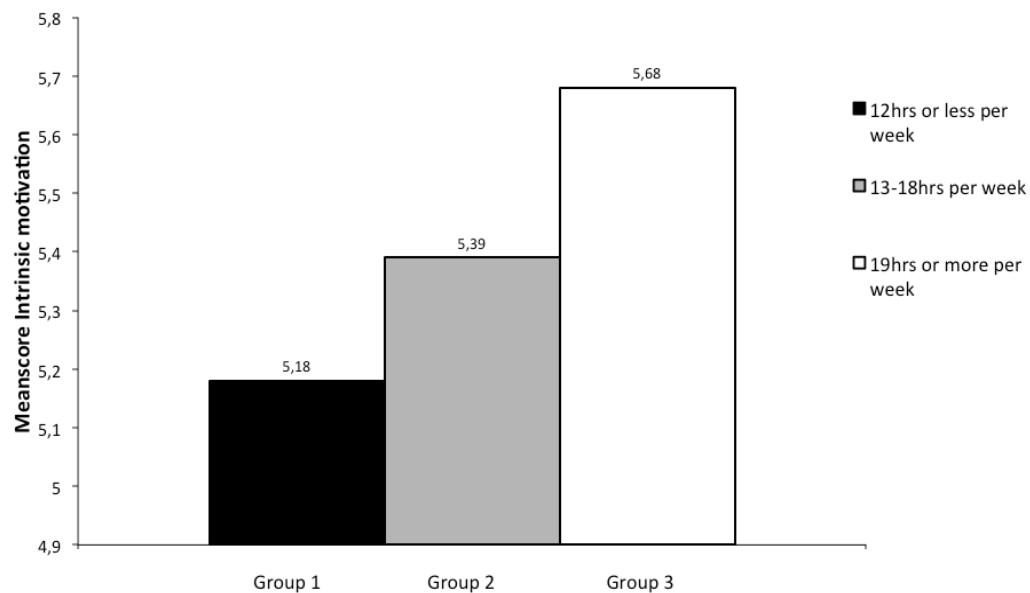


Figure 4: Differences in mean intrinsic motivation scores between training groups.

Table 3: Multiple regression predicting self-determined motivation for junior athletes.

| Variables in Equation | Mult R | R ² | R ² Cha | β | Sig. |
|---------------------------------|--------|----------------|--------------------|---------|------|
| <i>Total self-determination</i> | | | | | |
| Model 1 PNTS | .471 | .222 | .222 | -.471 | .000 |
| Model 2 PNTS | .508 | .258 | .037 | -.383 | .000 |
| BPNES | | | | .211 | .002 |
| Model 3 PNTS | .513 | .263 | .005 | -.379 | .000 |
| BPNES | | | | .189 | .008 |
| Balance needs | | | | .071 | .273 |
| <i>Need Thw. subscales</i> | | | | | |
| Model 1 Relatedness | .424 | .180 | .180 | -.424 | .000 |
| Model 2 Relatedness | .467 | .218 | .038 | -.276 | .001 |
| Autonomy | | | | -.245 | .002 |
| Model 3 Relatedness | .473 | .224 | .006 | -.227 | .011 |
| Autonomy | | | | -.183 | .051 |
| Competence | | | | -.126 | .217 |
| <i>Need Sat. subscales</i> | | | | | |
| Model 1 Competence | .368 | .136 | .136 | .368 | .000 |
| Model 2 Competence | .398 | .159 | .023 | .220 | .017 |
| Autonomy | | | | .212 | .021 |
| Model 3 Competence | .403 | .162 | .003 | .260 | .012 |
| Autonomy | | | | .240 | .014 |
| Relatedness | | | | -.086 | .376 |

Note: Mult R=multiple coefficient of correlation, R²=coefficient of determination, R²Cha=change R², β =standardized beta value, Sig.=level of significance, PNTS=Psychological Need Thwarting Scale, BPNES=Basic Psychological Needs in Exercise Scale, Balance needs=Balance in need satisfaction.

4.2 Hypothesis 2: Need thwarting, need satisfaction, balanced needs and self-determined motivation predicting athlete engagement

In the previous analyses, need thwarting and need satisfaction turned out to be significant contributors in predicting self-determined motivation. Thus, the contribution of balance need satisfaction was not significant. Moreover, when determining which variable that would best predict self-determined motivation, perceived basic psychological need thwarting, whereas perceived thwarted relatedness reported the strongest contribution in predicting athletes' self-determined motivation. Interestingly, ice hockey players that exceeded 19 hours of training per week reported higher levels of intrinsic motivation than athletes training 12 hours or less. In line with hypothesis 2, and to test the assumption that athlete engagement were associated with need thwarting, need satisfaction, balance in need satisfaction and self-determined motivation, and whether any of the variables could prove greater predictions, multiple regression analyses were directed where athlete engagement were regressed on the aforementioned variables. Table 2 presents the intercorrelations from these analyses.

4.2.1 Preliminary analyses

An overview over the descriptive statistics yields that the current elite population is highly engaged in ice hockey. In terms of confidence, dedication, vigor and enthusiasm, the athletes report highest mean score regarding their enthusiasm ($M=4.48$, $SD=0.59$). For a complete overview over the descriptive statistics, see table 1.

In participants' midseason, their athlete engagement reported a significant relation to all the aforementioned variables. Especially, athlete engagement reported a moderate negative relation to need thwarting, whereas a strong but positive relation to need satisfaction ($p<.001$). Moreover, athlete engagement reported a small positive relation to balanced needs, thus reporting a strong positive relation to self-determined motivation ($p<.001$). Worth mentioning; athlete engagement reported a positive strong relation to intrinsic motivation, whereas a strong but negative relation to amotivation ($p<.001$). Interestingly, athlete engagement did not display any significant relation to the lesser forms of self-motivation of identified, introjected or external regulation ($p<.ns$).

4.2.2 Primary analyses- test of hypothesis 2

The primary analyses investigated whether need thwarting, need satisfaction and self-determined motivation could predict athlete engagement, and, if need satisfaction were able to predict engagement beyond balanced needs, was investigated using regression analyses. Table 4 presents the results from the regression analyses when athlete engagement were regressed on need thwarting, need satisfaction, balance need satisfaction and self-determined motivation.

The results from the first regression indicated that need thwarting, need satisfaction and self-determined motivation were significant predictors of athlete engagement, thus balanced needs were reported as an insignificant contributor. Need thwarting accounted for a significant contribution of 10 per cent, whereas need satisfaction and self-determined motivation accounted for 18.8 and 17.1 per cent, respectively, underlining need satisfaction as the greatest predictor of athlete engagement. These relations were further investigated. In the second regression, athlete engagement was regressed on the various thwarted needs for competence, autonomy and relatedness independently. The three thwarted needs totally explained 10.4 per cent of the variation in athlete engagement, thus thwarted competence were the only measure reporting a significant contribution of 9.8 per cent of the prediction. In the third regression, when athlete engagement was regressed on the need satisfaction subscales, the results were somewhat different, but supporting of the previous regression. The three needs totally explained 35.1 per cent of the prediction. Competence was reported as the greatest significant predictor, accounting for 30.5 per cent of the variance in athlete engagement, whereas autonomy and relatedness accounted for significantly 3 and 1.5 per cent, respectively.

Additionally from previous section, a one-way between groups analysis of variance was conducted to explore the impact of training hours in ice hockey on levels of athlete engagement, as measured by the Athlete engagement questionnaire (AEQ). Participants were as previous divided into three groups according to their amount of trainings hours per week. There was a statistically significant difference at the $p < .05$ level in athlete engagement scores for the three groups: $F(2, 197) = 4.34, p = .014$. The effect size, calculated using eta squared, was .04. Post-hoc comparisons using the Tukey HSD test indicates that the mean scores for group 1 ($M=4.06, SD=0.65$) was significantly different from group 3 ($M=4.35, SD=0.53$). Group 2 ($M=4.26, SD=0.56$) did not differ

significantly from either Groups 1 or 3. This indicates that there is a difference between athletes' training amount per week and their respectively athlete engagement dimensions. The post-hoc test indicates further those athletes who have a training amount of 19 hours per week or more, report higher levels of overall athlete engagement than athletes who train for 12 hours or less per week. Figure 5 presents the mean athlete engagement scores in regards players' respectively amount of training hours per week.

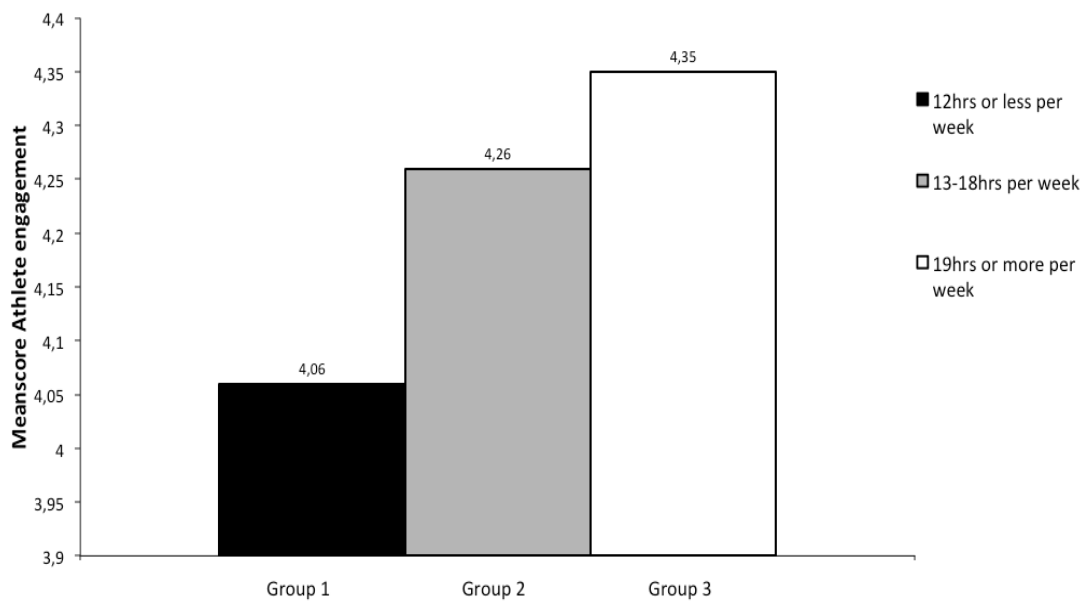


Figure 5: Differences in mean athlete engagement scores between training groups.

Table 4: Multiple Regression predicting athlete engagement for junior athletes.

| Variables in Equation | | Mult R | R ² | R ² Cha | β | Sig. |
|---------------------------------|--------------------|--------|----------------|--------------------|---------|------|
| <i>Total athlete engagement</i> | | | | | | |
| Model 1 | PNTS | .316 | .100 | .100 | -.316 | .000 |
| Model 2 | PNTS | .536 | .288 | .188 | -.118 | .075 |
| | BPNES | | | | .476 | .000 |
| Model 3 | PNTS | .542 | .294 | .006 | -.113 | .088 |
| | BPNES | | | | .451 | .000 |
| | Balance needs | | | | .083 | .192 |
| Model 4 | PNTS | .682 | .465 | .171 | .069 | .266 |
| | BPNES | | | | .360 | .000 |
| | Balance needs | | | | .049 | .381 |
| | SDI | | | | .482 | .000 |
| <i>Need Thw. subscales</i> | | | | | | |
| Model 1 | Competence | .313 | .098 | .098 | -.313 | .000 |
| Model 2 | Competence | .318 | .101 | .003 | -.254 | .010 |
| | Autonomy | | | | -.081 | .408 |
| Model 3 | Competence | .322 | .104 | .003 | -.215 | .051 |
| | Autonomy | | | | -.063 | .533 |
| | Relatedness | | | | -.077 | .418 |
| <i>Need Sat. subscales</i> | | | | | | |
| Model 1 | Competence | .552 | .305 | .305 | .552 | .000 |
| Model 2 | Competence | .579 | .336 | .030 | .381 | .000 |
| | Autonomy | | | | .244 | .003 |
| Model 3 | Competence | .592 | .351 | .015 | .467 | .000 |
| | Autonomy | | | | .302 | .000 |
| | Relatedness | | | | -.181 | .034 |
| <i>Mediation</i> | | | | | | |
| Model 1 | BPNES | .525 | .276 | .276 | .525 | .000 |
| Model 2 | BPNES | .678 | .459 | .183 | .355 | .000 |
| | SDI | | | | .461 | .000 |
| Model 3 | BPNES | .686 | .471 | .011 | .377 | .000 |
| | SDI | | | | .432 | .000 |
| | BPNES \times SDI | | | | -.111 | .041 |

Note: Mult R=multiple coefficient of correlation, R²=coefficient of determination, R²Cha=change R², β =standardized beta value, Sig.=level of significance, PNTS=Psychological Need Thwarting Scale, BPNES=Basic Psychological Needs in Exercise Scale, Balance needs=Balance in need satisfaction, SDI=Self-determination Index, BPNES \times SDI=Interaction effect variable.

4.3 Hypothesis 3: Mediating relationship between need satisfaction and athlete engagement

In the previous analyses, basic psychological need thwarting and need satisfaction turned out to be dual predictors in self-determined motivation and athlete engagement, thus need satisfaction was reported as the strongest predictor of athlete engagement. Specifically, among the three innate psychological needs, perceived competence was the strongest predictor of athlete engagement. In correspondence with hypothesis 3, that self-determined motivation would mediate the relationship between need satisfaction and athlete engagement, sequential multiple regression analyses were performed to explore this relation further.

4.3.1 Preliminary analyses

According to Baron and Kenny (1986) a variable is confirmed as a mediator if these criteria's are confirmed: 1) there is a significant relationship between the independent variable and the dependent variable, 2) there is a significant relationship between the independent variable and mediator, 3) the mediator still predicts the dependent variable after controlling for the independent variable, and 4) the relationship between the independent variable and dependent variable is reduced when the mediator is in the equation. Thus, the mediation is said to be perfect if the relationship between independent variable and dependent variable is diminished, but not zero, mediation is said to be partial (cited in Tabachnick & Fidell, 2001; p. 160). In other words, self-determined motivation is confirmed a mediator if there is a relationship between need satisfaction and athlete engagement, there is a relationship between need satisfaction and self-determined motivation, self-determined motivation predict athlete engagement after controlling for need satisfaction, and the relationship between need satisfaction and athlete engagement is smaller when self-determined motivation is in the equation. If the relationship between need satisfaction and athlete engagement is plausibly zero when self-determined motivation is in the equation, the mediation is perfect. If the relationship is smaller, but not zero, mediation is partial.

Following the recommendations of Baron and Kenny (1986), previous correlations analyses have confirmed a positive strong association between 1) need satisfaction and athlete engagement and a positively moderate association between 2) need satisfaction and self-determined motivation. Moreover, there have been reported a strong positive

significant relation between self-determined motivation and athlete engagement. Lastly, examining if self-determined motivation would predict athlete engagement after controlling for need satisfaction, and if the relationship between need satisfaction and athlete engagement would be decreased when self-determined motivation is in the regression, a sequential multiple regression analysis was conducted. Thus, examining if self-determined motivation completely or partial mediates the effect of need satisfaction on athlete engagement.

4.3.2 Primary analyses- test of hypothesis 3

Table 4 presents the results from the regression analyses when athlete engagement were regressed on need satisfaction, self-determined motivation (SDI) and the interaction effect variable. To generate a “BPNES x self-determined motivation” effect term, both variables were centered (e.g., converted to z-score), and the variable was created by multiplying the two-centered predictors (Aiken & West, 1991; Lemyre et al., 2007). Following the recommendations of Baron and Kenny (1986), need satisfaction was entered as the first independent variable in the sequential multiple regression, whereas self-determined motivation index was entered as the second independent variable. Any variation in athlete engagement explained by the self-determined motivation variable that had not already been explained by need satisfaction, would appear in the second step. An interaction effect between self-determined motivation and need satisfaction would be visible in the third step, explaining any additional variation in athlete engagement beyond that which need satisfaction and self-determined motivation accounted for, alone and independently. As seen in table 4, when analyzing the junior sample, total athlete engagement was significantly predicted by need satisfaction ($R^2=27.6$, $F(1, 198)=75.49$, $p < .000$). A significant increment in R^2 was found when adding self-determined motivation to the prediction model ($R^2=18.3$, $F(2, 197)=83.66$, $p < .000$). There was reported a significant interaction or moderating effect of self-determined motivation on need satisfaction and total athlete engagement ($R^2=1.1$, $F(3, 196)=58.10$, $p < .041$), where the interaction variable reported a beta value ($\beta = -.11$). These results indicate that the direct relations between basic psychological need satisfaction and athlete engagement contribute a significant improvement to the fit in comparison to the indirect model, so the hypothesis of total mediation was rejected. Over a more detailed analysis over the beta coefficients, the direct relation coefficients between psychological need satisfaction and athlete engagement was still significant

when mediated by the effect of self-determined motivation, these coefficients were lower than those observed when self-determined motivation did not mediate between psychological need satisfaction and athlete engagement (beta dropped from .53 to .36, $p < .000$). This was also supported when the semi-partial correlation for the interaction variable was investigated. The R^2 between need satisfaction and athlete engagement dropped when the mediation of self-determined motivation was included in the equation ($.276 - .107 = .169$).

Summing up, the multiple regression analysis confirmed the hypothesized effect of a mediating relationship between need satisfaction and athlete engagement. Specifically, self-determined partially mediated the effect of psychological need satisfaction on athletes' engagement. That is, psychological need satisfaction is both directly and indirectly (through self-determined motivation) related to athletes reported athlete engagement. Figure 6 presents the mediation of self-determined motivation on need satisfaction and athlete engagement.

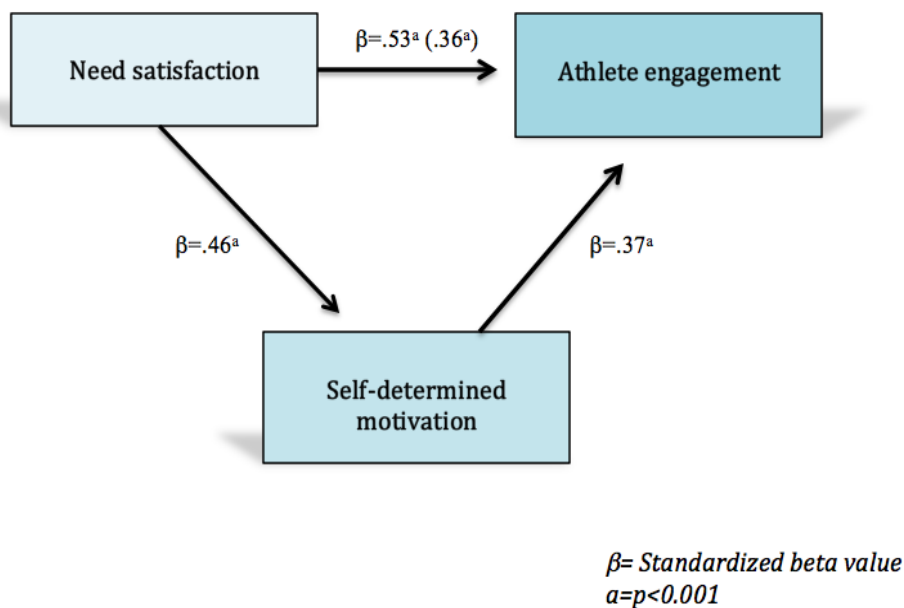


Figure 6: Mediation of self-determined motivation on need satisfaction and athlete engagement.

5 Discussion

The main goal of the present investigation was to provide greater insight into the motivational processes that accounted for varying levels of players' motivation and to which degree this motivation in turn predicted athlete engagement in a sample of youth ice hockey players. More specifically, the current study investigated the relationship between basic psychological need thwarting, basic psychological need satisfaction, self-determined motivation and athlete engagement in young athletes at mid-season point.

The self-determination theory differentiates between three innate psychological needs - the need for autonomy, competence and relatedness, in the understanding of human motivation. Furthermore, SDT claims that these innate psychological needs are essential for experiencing psychological growth and satisfaction with life (Deci & Ryan, 1991), and must be satisfied for optimal motivation and effective functioning (Deci & Ryan, 2000; Ryan, 1995). In the present study, we explored a model adopted by Vallerand (1997) encompassing the following theory-based hypotheses: a) an autonomy supportive or controlled social sport context would predict changes in perceived autonomy, competence and relatedness; b) autonomy, competence and relatedness would facilitate self-determined motivation; and c) athlete engagement would be a function of self-determined motivation. Current study findings are in line with each of these tenets (e.g., Hagger, Chatzisarantis, Culverhouse & Biddle, 2003; Hagger, Chatzisarantis, Barkoukis, Wang & Baranowski, 2005), thus the first tenet was indirectly supported (e.g., through thwarting and satisfaction of basic psychological needs). An additional question investigated, was whether the athletes benefitted from balanced basic psychological need satisfaction, where it was beneficial that the need for autonomy, competence and relatedness was equally satisfied, or if this was of lesser importance in predicting athlete engagement as long as the total amount need satisfaction were satisfied to a certain extent.

5.1 *Thwarting and satisfaction of basic psychological needs influencing self-determined motivation*

According to SDT, self-determined learning and healthy functioning are not direct functions of social factors, but are dependent on the satisfaction of three innate basic psychological needs, namely the needs for autonomy, competence and relatedness (Deci & Ryan, 1991; 2000). To this end, according to Deci and Ryan (1991), autonomy-supportive environments (e.g., social contexts that support choice, initiation, and understanding) as opposed to controlling environments (e.g., social contexts that are authoritarian, pressuring, and dictating) facilitate self-determined motivation, healthy development and optimal psychological functioning through satisfaction of the three innate psychological needs. In the language of SDT, elements in the social context can facilitate or undermine intrinsic motivation as a function of the degree to which they support versus thwart satisfaction of the three psychological needs. In such lines, environment do not cause motivation, which is a property of the living organism, but rather either nurture or diminish it (Hagger & Chatzisarantis, 2007).

The current study's findings support our first hypothesis. In young ice hockey players at mid-season, we found that their self-determined motivation was related to need thwarting, need satisfaction and balanced needs. In addition, the findings revealed a moderate but negative relationship between self-determined motivation and need thwarting, whereas a moderate but positive relationship between self-determined motivation and need satisfaction, thus balanced needs displayed a small positive relationship. Interestingly, correlation analyses revealed a moderate negative relation between PNTS and BPNES, indicating that the two scales represent similar, but somewhat different aspects of the social environment and may further represent opposites (Bartholomew et al., 2011; Deci & Ryan, 2000). In the language of SDT, when youth ice hockey players perceive that their basic psychological needs are satisfied, they report a higher degree of self-determined motivation.

These finding partially supported our first hypothesis. To investigate these findings further, we conducted regression analyses. Thus SDT does not consider the basic psychological needs to have a hierarchical structure, rather all needs must be fulfilled to allow for continual psychological growth and motivation, previous research have alluded the predictive utility of the needs independently of one another in determining

which need is the best predictor (Hagger, Chatzisarantis & Harris, 2006; Ryan & Deci, 2000a). We were interested in the unique contribution of need thwarting, and whether perceived thwarted relatedness would display the greatest contribution in predicting self-determined motivation. The assumption is that thwarting of the innate basic psychological needs would frame self-determined motivation. When an athlete experiences thwarting of the innate need for relatedness, this would severely affect self-determined motivation. This is what we found in the regression analyses. Results indicated that basic psychological need thwarting, need satisfaction and balanced needs accounted for 22.2 %, 3.7% and 0.5% respectively of additional variance in athletes self-determined motivation in midseason, thus the latter variable was reported as an modest non-significant predictor. Specifically, when analyzing the innate basic psychological needs independently from both PNTS and BPNES, thwarting of the need for relatedness was reported as the strongest predictor in self-determined motivation, whereas satisfaction of the need for perceived competence turned out to be an important significant independent predictor. Hypothesis 1 was confirmed- basic psychological need thwarting was the greatest predictor of self-determined motivation in athletes' midseason. Thus, their self-determined motivation was prone to the importance of athletes' perceived thwarting for the need relatedness. This confirmation may also indicate the importance of how athletes perceive their social environment. Furthermore, the proposed research model (see Figure 2) accounted for 26 per cent of the variance of self-determined motivation.

These results are in line with self-determination theory's proposition that the fulfillment of basic psychological needs for autonomy, competence and relatedness is necessary for self-determined motivation to be attained and maintained (Deci & Ryan, 2000).

Conversely, when these needs are not nurtured or undermined, autonomous motivation is diminished (Deci & Ryan, 2008; Deci & Ryan, 2000; Grolnick, 2003). Especially, SDT suggests that although the support for relatedness is not so proximal as support for autonomy and competence, it is nonetheless essential for self-determined motivation to thrive. In such lining, autonomous motivational processes are most able to take root in contexts where the need for relatedness is supported- that is, contexts where individuals feel a sense of connectedness and belonging (Deci & Ryan, 2000). The results are also consistent with former research suggesting that greater need satisfaction promote self-determined motivation in sport (Álvarez et al., 2009). Blanchard, Amiot, Perreault,

Vallerand and Provencher (2009) found evidence supporting this, when concluding with results suggesting that perceived psychological need satisfaction predicted self-determination in sport, ensuing greater sport satisfaction and positive emotions in sport.

Additional analyses revealed an interesting relation between athletes' amount of training hours per week and their reported intrinsic motivation scores. More specifically, ice hockey players that exceeded 19 hours of training per week reported higher levels of intrinsic motivation than athletes training for 12 hours or less. In the language of SDT, this could indicate that athletes who are engrossed in their sport may experience more enjoyment, accomplishment (e.g., mastering difficult training techniques) and stimulation (e.g., excitement towards ice hockey) relative to less engrossed practitioners. This could also indicate that athletes fueled by higher intrinsic motivation do engage themselves to a greater extent than their peers with lower intrinsic motivation (Gill, Gross & Huddleston, 1983).

5.2 *Need thwarting, need satisfaction and self-determined motivation influencing athlete engagement*

Self-determination theory posits that higher levels of self-determination on the continuum are associated with enhanced psychological functioning (Deci & Ryan, 2000). More specifically, in the context of sport and physical activity, a number of studies have found more effectiveness, intentional persistence, personal adjustment and positive coping as one moves from amotivation to intrinsic motivation (Chatzisarantis et al., 2003; Vallerand & Losier, 1999). In line with self-determination theory, it is argued that differences in the qualitative of motivation could affect subsequent engagement in elite athletes (Deci & Ryan, 2000; Hodge et al., 2009). In other words, the more self-determined the motivation, the more likely will the athlete activate himself in ice hockey. The current study's findings support our second hypothesis. In ice hockey players' midseason, their athlete engagement was related to need thwarting, need satisfaction, balanced needs and self-determined motivation. More specifically, study findings revealed a moderate but negative relationship between athlete engagement and need thwarting, a strong but positive relationship between athlete engagement and need satisfaction, thus balanced needs reported a small positive relation. There was also

reported a strong positive relationship between athlete engagement and self-determined motivation. Worth mentioning; athlete engagement displayed a strong positive relation to intrinsic motivation, whereas a non-significant relation to the lesser forms of self-determinations (e.g., identified, introjected and external regulation), thus reporting a strong but negative relation to amotivation. In the language of SDT, when athletes report higher need fulfillment, they also perceived higher self-determined motivation, which lead to perceived higher athlete engagement towards ice hockey.

These finding provided a partial support for the second hypothesis. To investigate these findings further, we conducted regression analyses. We were in this hypothesis, interested in the unique contribution of need satisfaction in predicting athlete engagement beyond the influence of balanced needs, and whether perceived competence would be important in this prediction. The assumption is that when an athlete is engaged, need fulfillment and self-determined motivation is high, were the athlete feels highly competent and efficient. This is what we found in the regression analyses. Results indicated that basic psychological need thwarting, need satisfaction, balanced needs and self-determined motivation accounted for 10%, 19%, 06% and 17% respectively of additional variance in athletes engagement in midseason, thus balanced needs displayed an insignificant contribution. When analyzing the innate basic psychological needs independently, the importance of feeling efficient and competent was underlined by the current results. Thus regressions indicated an important contribution of perceived autonomy in the prediction of athlete engagement. Interestingly, the regression reported a somewhat lesser importance of athletes' perceived relatedness in predicting athlete engagement, indicating that athletes' perceived relatedness may not play a substantive role for the current population, as long as perceived competence and autonomy was proportionally fulfilled. Hypothesis 2 was confirmed- the importance of need satisfaction was illuminated when this variable were the greatest predictor of athlete engagement, where athletes' perceived competence were reported as the strongest predictor of athlete engagement. Furthermore, the proposed research model (see Figure 2) accounted for 46.5 per cent of the variance of athlete engagement.

These results are in line with Ryan and Deci's (2002) suggested proposition that while necessary for growth and development, the psychological need for relatedness may play a more distal role than competence and autonomy in relation intrinsic motivation, and thereby outcomes such as athlete engagement. In a study by Hodge and colleagues (2009) on 201 athletes representing a variety of 51 sports, they reported a positive link between athletes need satisfaction and their athlete engagement. More specifically, athletes perceived competence and autonomy were particularly strong predictors of athlete engagement, further explaining a significant portion in the variance of athlete engagement. These findings were also supported in findings of Álvarez and colleagues (2009), which reported a significant sequential relation between basic psychological needs, self-determined motivation and engagement among 370 young male soccer players.

Additional analyses revealed an interesting relation between athletes' amount of training hours per week and their reported athlete engagement dimensions. More specifically, ice hockey players that exceeded 19 hours of training per week reported higher core engagement dimensions of confidence, dedication, vigor and enthusiasm than their peers training for 12 hours or less. This could indicate that athletes with higher athlete engagement (e.g., enduring positive experiences, rather than momentary affective responses) invest more time to pursue their ice hockey career than their peers reporting lower levels of athlete engagement (Lonsdale et al., 2007). An additional question was raised in this current study concerning the importance of athletes balance in need satisfaction in predicting athlete engagement. This will be further discussed.

5.3 Balance in need satisfaction- worth emphasizing?

In past research, Sheldon & Niemiec (2006) found that the balance in need satisfaction, in addition to the total amount of need satisfaction, is important for psychological health and well-being. In the current study, athlete's balance in need satisfaction accounted for lesser importance in predicting the outcome variable athlete engagement. The balance score in need satisfaction contributed for a small non-significant percentage, underlining its lesser importance. Contrastingly, in research by Milyavskaya and colleagues' (2009) results underlined the importance of experiencing need satisfaction in different life

contexts in a balanced manner, when assessing young participants' well-being and school adjustment. Together, these results support the importance of consistency for psychological functioning. In the current study, the research study was conducted during the athletes' mid-season, at which point they were asked questions pertaining to their ice hockey participation. Basic psychological needs satisfaction in different contexts was not assessed. When the athletes rated their need satisfaction, their total (cumulative) need satisfaction was satisfied to an appropriate extent, reportedly moderate to strong, while reporting small levels of need thwarting. If the need satisfaction for perceived autonomy, competence and relatedness were not equally satisfied, a balance in need satisfaction variable may have been of more importance, especially if the study was of a longitudinal design.

5.4 The meditational role of self-determined motivation

Strong support was found for a positive relationship among need satisfaction, self-determined motivation and athlete engagement. Athlete's basic psychological need satisfaction, more specifically their perceived need for competence and autonomy appeared to exert self-determined motivation (the mediator) and the direct effects on athlete engagement, suggesting that knowledge of an athlete's psychological need satisfaction is sufficient to predict athlete engagement. It could also indicate that knowledge of an athlete's SDI may also be sufficient to predict athlete engagement. In relation to SDT, self-determined motivation would be a logical outcome due to need fulfillment, which is found in the current study as a positive predictor of athlete engagement (Deci & Ryan, 2000; Hodge et al., 2009). The degree of self-determined motivation manifested in athletes is further hypothesized to influence athlete engagement (Àlvarez et al., 2009), in such that the higher self-determined motivation, the higher athlete engagement.

Those seeking ways to enhance an athlete's ability to experience outcomes such as athlete engagement should understand the extent to which athlete's basic psychological needs for competence, autonomy and relatedness are being satisfied. Regression analysis indicates that all innate psychological needs were significant contributors in predicting athlete engagement, thus perceived relatedness reported a lesser importance.

The combined effect model, revealed the direct contribution of need satisfaction to overall athlete engagement, was the variable explained the most variance of the outcome variable (supporting hypothesis 2). These finding indicated a strong relationship between basic need satisfaction and athlete engagement. As hypothesized and in line with self-determination theory, need satisfaction predicted self-determined motivation; and needs satisfaction and self-determined motivation predicted athlete engagement for this sample of youth athletes. In addition, the results from the preliminary analyses indicated that the basic needs for competence and autonomy were particularly important for this group of junior athletes with respect to and athlete engagement.

When athlete engagement was regressed on need satisfaction and the mediating variable, results from the sequential regression analysis revealed interesting support for the hypothesized relation between PNTS and BPNES (Bartholomew et al., 2011). Need fulfillment and SDI were able to predict 46 per cent of the variance in athlete engagement, which is a significant attribution in predicting athletes' engagement in their midseason. This may indicate that BPNES partially or completely overlaps portions of PNTS in predicting positive outcomes as athlete engagement, further suggesting that the two measures may represent bipolar opposites.

These results are in line with findings of Àlvarez et al., (2009), which reported a partial mediation of self-determined motivation between basic psychological need satisfaction and behavioural outcomes such as enjoyment and boredom, which lead the researcher to interpret that the mechanisms influencing players' emotional responses are satisfaction of the needs for autonomy, competence and relatedness, and the degree of self-determined motivation manifested. Furthermore, in this discussion practical recommendations for coaches surrounding athletes will be discussed.

5.5 Practical recommendations for coaches

To promote adaptive learning, effort, self-determined motivation and athlete engagement, coaches and significant others should aim to facilitating learning by providing young athletes with autonomy-supportive environments (e.g., social context that support choice, initiation, and understanding). These environments typically foster the fulfillment of basic psychological needs for autonomy, competence and relatedness (Deci & Ryan, 1985). Current findings are important for practitioners as they suggest that supporting need satisfaction may help athletes to enhance both self-determined motivation and athlete engagement, ensuring long-term participation.

As Deci and Ryan (2000) claim that the social environment do not cause motivation, but rather nurture or diminish it as a function of the degree to which they support the three basic psychological needs. Thus, coaches would be well informed to commit time and energy to develop an understanding of motivation and the motivation process. To this end, coaches are encourage to establish a training and competition environment that will assist the athletes in feeling, autonomous, competent and related to teammates and support of coaching staff (Mageau & Vallerand, 2003).

To favor autonomy need fulfillment, Hagger and Chatzisarantis (2007) suggested an increase in opportunities for athletes' involvement in decision-making and provide opportunities for choice in all aspects of their training and performance. Accordingly, coaches should require of players to work together to discuss or identify their future goals, which would provide a forum for self-reflection about personally goals. For example, a coach might ask a performer, "we can't always win ice hockey matches, so what keeps you motivated if you do not win?". Coaches are further advised to encourage the players to delve deep into what really motivate their participation in ice hockey. The same strategy can be used in one-to-one discussion with the athletes to establish goals, and more importantly, sett personal goals that are agreed upon by the athletes themselves and personally relevant to them. To favor competence need fulfillment, a coach is advised to provide appropriate informational and positive feedback that will expose the player to optimal task and skill challenges (Deci & Ryan, 2000; Hagger and Chatzisarantis, 2007). Furthermore, under these evaluations, coaches are recommended to implement performance plans that use self-referenced standards and indicators of advancement. Coaches can use team talks and visual aids prior

practice to remind players of their goals and how each practice session fits in with these goals. *Relatedness*. Finally, coaches are encouraged to create a safe environment, and especially, take the time to get to know their players well to favor the fulfillment of the need for relatedness (Hagger & Chatzisarantis, 2007). This will provide players with a sense that they are safe, understood, valued and respected by the coach, both as a person and as an ice hockey player. Moreover, one-to-one meetings between the coach and the player may also be sufficient in which coaches can explore the goal and motives for players' participation in ice hockey, and get to know the player as an individual, which is hypothesized to increase player-coach relation (Deci & Ryan, 1985; 2000; Ericsson, K. A., 2003).

Limitations

Participants. The participant clubs in the current study were selected from the official website of the Norwegian Ice Hockey Association (2013), where 10 of 11 clubs within Norway were contacted. This mid-season period was strategically chosen as all teams were more available as there was a break from the ongoing series that extended to the month of March. Given that Norway's U20 national team participated in the World Junior Ice Hockey Championships (WJHC) in December, it was difficult to know in advance how many U20 players we could lose in our data collection period. An important attribute of the present study was to include both junior sub-populations (e.g. U18 and U20) to form an overall junior population. However, due to the accessibility of U20 national team players, the mid-season survey was administered as planned. Generalizability to the current ice hockey junior population should thus be strong. However, the specificity and homogeneity of this sample limits the generalizability of the findings to sports outside ice hockey, outside Norway.

Instruments. The original works of Bartholomew et al., (2011) addresses athletes experience in sport and have further developed a scale tapping the darker side of athletic experience. As such, the use of PNTS has been hypothesized to adequately tap the intensity of need frustration that Deci and Ryan (2000) describe as states of need thwarting. Lower internal validity scores for the Norwegian translated version of the PNTS than those reported in Bartholomew and colleagues (2011) original work could suggest that the translated version should be reviewed to address any possible cultural ambiguities, as athletes thwarting of their basic psychological needs may be experienced differently by individuals from different sport cultures. Furthermore, one could argue the use of PNTS in relation to measure positive behavioral outcomes such as athlete engagement, as it has been demonstrated to better predict feelings of exhaustion and ill-being and therefore be more functional measuring negative consequences. In such lines, the use of PNTS could function as an indirect measure that include the presence of illness and need frustration. Need thwarting does not simply reflect the perception that need satisfaction is low, but moreover the perception that need satisfaction are being obstructed or actively frustrated within a given context (Bartholomew et al., 2011). The BPNES, unlike PNTS, is a scale that assesses athletes basic psychological need satisfaction (Vlachopoulos & Michailidou, 2006) and is thus hypothesized to better

predict vitality and positive behavioural outcomes as athlete engagement. The BPNES reported satisfying internal validity scores (Pallant, 2011). To date, relative few research studies have used the SDI. Though no norm exists at this time as to what is considered high or low on the SDI, the single score index offers quick information about the motivation of an junior athlete on a scale with a low negative to high positive self-determination score. The higher the positive index score, the more self-determined the motivation. However, current study findings are in line with previous research using the SDI in sports (e.g., Álvarez et al., 2009; Lemyre et al., 2007). Building from a qualitative investigation of elite athletes, Lonsdale, Hodge and Raedeke (2007) started a project consuming of develop a measurement that measures the enduring core of athlete engagement, defined in accordance with an athlete's confidence, dedication, vigor and enthusiasm. Moreover, Lonsdale and colleagues (2007) employ that such a measurement as AEQ will assist knowledge and development in the sport area and therefore being promise as a measure of future engagement among elite athletes. Although this athlete engagement scale has high internal validity scores (Ryan & Fredrick, 1997), research by Hodge, et al., (2009) disclose even strong alpha coefficients, ranging from .84 to .89 on the four subscales of AEQ. Furthermore, all data were based on self-report measures which introduce the possibility of bias due to common method variance, which is related to the participants themselves (Podsakoff, MacKenzie, Lee & Podsakoff, 2003).

Conclusion

Within the framework of SDT, the goal of the present investigation, using a cross-sectional design, aimed to investigate the motivational processes that accounted for varying levels of players' motivation and to which degree this motivation in turn predicted athlete engagement in a sample of youth ice hockey players. The survey was conducted to investigate the relations between basic psychological need thwarting, basic psychological need satisfaction, self-determined motivation and athlete engagement in their mid-season. First, we tested a motivational sequence that proffered that the perception of basic psychological need thwarting would best predict players' self-determined motivation. Specifically, athletes' thwarted need for relatedness was reported as the strongest independent predictor, thus being negatively related to self-determined motivation. Secondly, we further tested the motivational model in the prediction of athlete engagement. Current findings indicated that the perception of players' need satisfaction and self-determined motivation holds positive implications for players' enduring positive sport experiences. Thus perceived need satisfaction was reported as the strongest predictor of athlete engagement, athletes' perceived competence need fulfillment was reported as the strongest independent predictor. Additionally, the relative contribution of balanced need satisfaction was examined, which displayed a modest in-significant contribution in predicting the outcome variable athlete engagement. In the third and last step, we examined the hypothesized mediating role of self-determined motivation between psychological need satisfaction and athlete engagement. This hypothesis was confirmed, which underscored the importance of need fulfillment.

These results suggest that satisfaction of basic psychological needs are important antecedents of self-determined motivation and athlete engagement, as they suggest that supporting need satisfaction may help athletes to enhance both self-determined motivation and athlete engagement, ensuring long-term participation.

Finally, those seeking ways to enhance an athlete's ability to experience self-determined motivation and outcomes such as athlete engagement should understand the extent to which athlete's basic psychological needs are equally being satisfied. While high motivation in athletes is an important asset in achieving elite performance, the quality of

the motivation is the key (Lemyre, Treasure & Roberts, 2006) and coaches should adopt support and training structures that promote support for the basic psychological needs for autonomy, competence and relatedness (Vallerand, 2001). Based on the current findings, one can argue that athletes experiencing need fulfillment and fuelled by more self-determined sources of motivation are more likely to engage themselves in sports, ensuring engagement dimensions and long-term participation, than athletes experiencing lower need fulfillment energized by less self-determined sources of motivation.

Future research

Further research is needed to provide more definitive evidence for the motivational processes influencing athlete engagement. The current cross-sectional design used in the current study precludes any causality among the variables. It is important for future research to examine the proposed conditional process model using longitudinal and qualitative methods in athletes from different sports and competitive contexts to examine further how motivation shifts over time and how this may affect athlete engagement, and more importantly; how to promote and sustain the positive sport experiences of athlete engagement dimensions as confidence, dedication, vigor and enthusiasm. As such, study design that includes measure tapping the social environment (e.g., autonomy support) would be able to determine an overall determination of prediction influencing athlete engagement. Finally, further research is needed to provide more definitive evidence of how the PNTS and BPNES tap, partially overlapping the social environment, and to which degree the two measures influence self-determined motivation and behavioural outcomes as athlete engagement.

Lonsdale and colleagues (2007) suggested that a greater understanding of athlete engagement might help sport psychologist develop effective burnout prevention strategies and promote more positive sport experiences. A larger population in addition to longer periods of data collection would allow for better understanding of the relationship between the social environment, psychological mediators, motivation and consequences (Vallerand, 1997).

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Appendices

Appendix A: Instruments.

Spørreskjema for ishockeyspillere 16-21 år
Vinteren 2012



Det er viktig at du krysser nøye av i boksen



Seksjon for Coaching og Psykologi



1. Hvilket årstall er du født?

| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|

2. Hvor mange år har du spilt ishockey?

| | |
|--|--|
| | |
|--|--|

3. Hvilken eliteserie spiller du for?

Eliteserien U18

Eliteserien U20

4. Hvilken klubb spiller du for sesongen 2012/2013?

| |
|--|
| |
|--|

5. Har du spilt på en av de respektive landslagene?

U18-Landslag

U20- Landslag

6. Hvor mange timer bruker du på ishockeytrening per uke?

| | |
|--|--|
| | |
|--|--|

Vi ønsker å belyse hvordan du oppfatter ishockey miljøet. Vennligst kryss av i hvilken grad du er enig eller uenig med hvert utsagn:

| | Helt uenig | | Nøytral | | | | Helt enig |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. Jeg føler meg hindret fra å gjøre valg i forhold til måten jeg trener på. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Det finnes situasjoner hvor jeg opplever å føle meg utilstrekkelig. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Jeg føler meg presset til å oppføre meg på bestemte måter. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Jeg føler meg avvist av de rundt meg. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Jeg føler meg tvunget til å følge treningsbeslutninger som er gjort for meg. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Jeg føler meg utilstrekkelig fordi jeg ikke får muligheten til å utnytte mitt potensial. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Jeg føler meg presset til å være enig med treningsregimet. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Jeg føler andre kan være avvisende mot meg. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Det oppstår situasjoner hvor jeg føler meg uskikket. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Jeg føler andre spillere misliker meg. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Det er tider hvor jeg blir fortalt ting som får meg til å føle meg inkompetent. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. Jeg føler andre spillere på laget er misunnelig når jeg oppnår suksess. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Vi ønske fortsatt å belyse hvordan du oppfatter ishockey miljøet. Se på påstandene og kryss av i hvor stor grad du er enig:

| | Helt uenig | | Delvis enig | | | Helt enig | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. Treningen stemmer i stor grad med mine valg og interesser. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Jeg føler at jeg har stor fremgang i forhold til målet mitt med ishockeytreningen. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Jeg føler meg veldig fornøyd sammen med de andre spillerne. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Jeg føler at treningen passer godt med måten jeg vil trene på. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Jeg føler at jeg kan omgås de andre spillerne på en vennlig måte. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Jeg føler at jeg utfører øvelsene i treningen veldig effektivt. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Måten jeg trener på er helt klart slik jeg ønsker at en trening skal være. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Jeg føler at treningen er noe jeg får til. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Jeg føler meg veldig trygg sammen med de andre spillerne. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Jeg føler sterkt at jeg har mulighet til å gjøre egne valg i forhold til min trening. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Jeg føler jeg kan klare de øvelsene treningen legger opp til. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. Jeg føler jeg har god og åpen kommunikasjon med de andre spillerne. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Hvorfor driver du med idretten din?

Vi ønsker å finne ut hvorfor du spiller ishockey. Vennligst kryss av i hvilken grad spørsmålene stemmer for deg:

| | Helt uenig | | Delvis enig | | | Helt enig | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. På grunn av gleden av å gjøre noe spennende. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. På grunn av gleden det gir meg å lære mer om ishockey. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Jeg pleide å ha gode grunner for å spille ishockey, men nå er jeg usikker på om jeg skal fortsette. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. For gleden av å lære og mestre nye treningsteknikker. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Jeg vet ikke lengre, jeg føler at jeg ikke helt får det til på ishockeybanen. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Fordi det gir meg respekt fra folk jeg kjenner. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Fordi det er etter min mening den beste måten å treffe folk på. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Fordi jeg synes det er personlig tilfredsstillende å føle at jeg mestrer vanskelig treningsøvelser. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Fordi det er absolutt nødvendig for meg å drive med ishockey for å holde meg i form. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Fordi det gir prestisje å bli en god ishockeyspiller. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Fordi jeg synes det er en av de beste måtene å utvikle andre sider av meg selv på. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. For gleden ved å forbedre svake sider ved meg selv. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. For spenningen ved å bli totalt engasjert i en aktivitet. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

- | | | | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 14. Fordi jeg må drive med ishockey for å føle meg vel og fornøyd. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. Fordi det gir meg glede å utvikle ishockey- ferdighetene mine. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. Fordi folk rundt meg synes det er viktig å prestere bra. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. Fordi det er en fin måte å lære mange ting som kan være til nytte i andre områder av livet mitt. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. Fordi det gir gode følelser å drive med en idrett jeg liker. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. Jeg vet ikke lengre, jeg tror ikke ishockey er noe for meg. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. På grunn av gleden jeg får ved å få til vanskelige bevegelser. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. Fordi jeg ville hatt dårlig samvittighet hvis jeg ikke brukte tida mi på ishockey. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. For å vise andre hvor flink jeg er i ishockey. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. På grunn av tilfredsstillelsen jeg føler av å lære en ny teknikk. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. Fordi det er den beste måter å opprettholde et godt vennskapsforhold med mine venner. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. Fordi jeg liker følelsen av å være fullstendig oppslukt i ishockey. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. Fordi jeg føler jeg må drive med ishockey regelmessig. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. For gleden av å oppdage nye teknikker og strategier for å prestere bedre. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. Jeg spør ofte meg selv: jeg klarer jo aldri å nå målene jeg setter for meg selv. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Sport erfaringskalaen

Nedenfor er noen påstander om folks erfaringer innen idrett. Ved hjelp av skalaen nedenfor, vennligst oppgi hvor ofte du har følt det slik om din deltakelse i ishockey denne sesongen. Din idrettslige deltakelse omhandler all trening og konkurranse/kamp. Det finnes ingen riktige eller gale svar, så ikke bruk for mye tid på ett spørsmål og svar så ærlig som du kan ved å sette kryss under det nummeret som passer for deg.

| | Nesten aldri 1 | Sjelden 2 | Noen ganger 3 | Ofte 4 | Nesten alltid 5 |
|---|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1. Jeg tror jeg er i stand til å oppnå mine mål i min idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 2. Jeg føler meg opprømt når jeg deltar i min idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 3. Jeg er dedikert til å nå mine mål innen idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 4. Jeg føler meg spent over min idrett | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 5. Jeg føler meg i stand til å lykkes i idretten min. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 6. Jeg føler meg energisk når jeg deltar i min idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 7. Jeg er bestemt på å oppnå mine mål i idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 8. Jeg er begeistret for min idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 9. Jeg tror jeg har de ferdighetene/teknikkene som skal til for å oppnå suksess i min idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 10. Jeg føler meg virkelig levende når jeg deltar i min idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 11. Jeg er viet til min idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 12. Jeg liker min idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |

| | Nesten aldri 1 | sjelden 2 | Noen ganger 3 | Ofte 4 | Nesten alltid 5 |
|---|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 13. Jeg er sikker på mine evner. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 14. Jeg føler meg mentalt opp- merksom når jeg deltar i min idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 15. Jeg ønsker å jobbe hardt for å oppnå mine mål innen idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 16. Jeg har det gøy i min idrett. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |

Fremtidige intensjoner

Vi ønsker å finne ut i hvilken grad du har til hensikt å delta i sporten ishockey fremover. Kryss av under det aktuelle nummeret som passer deg i hvor stor grad dine intensjoner er:

| | Nei | | | | Ja |
|---|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | 1 | 2 | 3 | 4 | 5 |
| 1. Jeg skal bedrive ishockey minst 4 ganger i uken over det neste året. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 2. Jeg ønsker å satse på min ishockey karriere. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 3. Jeg ønsker å bedrive andre aktiviteter ved siden av ishockey. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| 4. Jeg har en annen idrettsaktivitet siden av ishockey. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |

Til slutt:

1. Hvor mange kamper spiller du i året?

2. Er du totalt sett fornøyd med din egen prestasjon i disse kampene (kryss av det alternativet som passer deg best)?

Svært fornøyd

Ganske fornøyd

Fornøyd

Litt fornøyd

Ikke fornøyd i det hele tatt

***Appendix B: Approval by Personvernombudet for forskning,
Norsk samfunnsvitenskapelig datatjeneste AS.***



Pierre-Nicolas Lemyre
Seksjon for coaching og psykologi
Norges idrettshøgskole
Postboks 4014 Ullevål stadion
0806 OSLO

Harald Hårfagres gate 29
N-5007 Bergen
Norway
Tel +47-55 58 21 17
Fax +47-55 58 96 50
nsd@nsd.uib.no
www.nsd.uib.no
Org.nr 985 321 884

Vår dato: 26.11.2012

Vår ref:32178 / 3 / IB

Deres dato:

Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 21.11.2012. Meldingen gjelder prosjektet:

| | |
|----------------------|--|
| 32178 | <i>Motivasjon og fremtidige intensjoner blant unge elite ishockeyspillere: En kvantitativ studie sett i lys av Self-Determination Theory</i> |
| Behandlingsansvarlig | <i>Norges idrettshøgskole, ved institusjonens øverste leder</i> |
| Daglig ansvarlig | <i>Pierre-Nicolas Lemyre</i> |
| Student | <i>Jan Åge Kristensen</i> |

Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstiller kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i melde skjemaet, korrespondanse med ombudet, eventuelle kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/forsk_stud/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, <http://pvo.nsd.no/prosjekt>.

Personvernombudet vil ved prosjektets avslutning, 01.06.2013, rette en henvendelse angående status for behandlingene av personopplysninger.

Vennlig hilsen

Vigdis Namtvedt Kvalheim

Inga Brautaset

Inga Brautaset tlf: 55 58 26 35

Vedlegg: Prosjektvurdering

Kopi: Jan Åge Kristensen, Bjørndalsveien 18, 1708 SARPSBORG

Avdelingskontorer / District Offices

OSLO NSD Universitetet i Oslo, Postboks 1055 Blindern, 0316 Oslo Tel +47-22 85 52 11 nsd@uio.no
TRONDHEIM NSD Norges teknisk-naturvitenskapelige universitet, 7491 Trondheim Tel +47-73 59 19 07 kyrre.svarva@svt.ntnu.no
TROMSØ NSD SVF, Universitetet i Tromsø, 9037 Tromsø Tel +47-77 64 43 36 nsdmaa@svt.uio.no

Appendix C: Information letter to the participant clubs.

Søknad om å gjennomføre en spørreundersøkelse om ishockeyspilleres motivasjon innen de respektive eliteseriene for U18 og U20 herrer.

I forbindelse med et forskningsprosjekt om ishockeyspilleres motivasjon for fremtidige intensjoner til å spille ishockey, vil vi invitere deres lag og spillere til å delta.

Forskningsprosjektet *"Motivasjon og fremtidige intensjoner"* tar utgangspunkt i norske ishockeyspillere. I dette prosjektet velger vi å fokusere på U18 og U20, hvor vi ønsker å innhente informasjon fra spillernes synsvinkel, det vil si hvordan deres motivasjon påvirker deres engasjement og fremtidige intensjoner innen sporten ishockey. Målet med prosjektet er å øke kunnskapen om ishockeyspilleres motivasjon og hvordan den påvirker enkelte spillers fremtidige deltakelse. Et viktig mål for prosjektet er å bidra med nyttig kunnskap for ishockey Norge. Prosjektet er støttet av Norges Ishockeyforbund, der alle lag og spillere oppfordres til å delta.

Innsamlingen av informasjon vil skje i form av utfylling av et spørreskjema som gjennomføres av spillerne, noe som vil ta ca 30 minutter. Prosjektet vil følge forskningsetiske retningslinjer. Utfylling av spørreskjemaet er frivillig og helt anonymt.

Vi ønsker å kunne gjennomføre undersøkelsen i løpet uke 49 og 50. Om det er en mulighet hadde det vært fint om vi kunne kommet og gjennomført spørreundersøkelsen i forbindelse med en trening eller kamp. Vi tar kontakt på telefon i løpet av de neste dagene for å nærmere avtale eventuelt tidspunkt.

Håper på positivt svar vedrørende forespørsel. Etter forskningsprosjektet er slutt vil en forskningsrapport bli tilsendt.

Dersom dere skulle ønske mer informasjon om prosjektet gjerne Jan Åge Kristensen på tlf 971 67 542, eller e-post janagekristensen@gmail.com

Med vennlig hilsen

Jan Åge Kristensen
Masterstudent

Nicolas Lemyre, PhD
Førsteamanuensis

Seksjon for Coaching og Psykologi

Appendix D: Support letter from Norwegian Ice Hockey Association.



**NORGES
ISHOCKEYFORBUND**
The Norwegian Ice Hockey Association

Oslo, 20. November 2012

Norges Ishockeyforbund synes det er spennende at det blir gjennomført forskningsprosjekt ved våre høyskoler som tar sikte på å øke kunnskapen om vår idrett. I denne undersøkelsen fra Norges Idrettshøgskole settes det søkelys på motivasjonen til å spille ishockey blant spillere I aldersgruppen U18 og U20, samt hvordan dette påvirker den enkeltes videre deltakelse innen ishockeysporten.

Den type informasjon som en slik undersøkelse bygger på kan være til stor nytte for Norges Ishockeyforbund I sitt videre arbeid med å utvikle framtidens strategier. Vi håper derfor spillerne støtter opp om prosjektet, og ønsker lykke til med arbeidet.

Med vennlig hilsen
NORGES ISHOCKEYFORBUND

Petter Salsten
Sportsjef/Assisterende Generalsekretær

Postadresse
Norges Ishockeyforbund
0864 OSLO
Besøksadresse
Sognsveien 75 J, Ullevaal Stadion

Telefon
+47 21 02 90 00
Telefaks
+47 21 02 96 31

E-postadresse
hockey@hockey.no
Hjemmeside
www.hockey.no

Appendix E: Protocol for coaches.

Protokoll for datainnsamling Desember 2012- for trenere Eliteserien U18 og U20

- Introduksjon:

Du som trener skal gjennomføre spørreundersøkelsen ”Motivasjon blant ishockeyspillere” med dine spillere på vegne av Norges Idrettshøgskole. Prosjektet er støttet av Norges Ishockeyforbund og gjennomføres KUN i eliteserieklubbene for aldersgruppen U18 og U20. Svarene spillerne avgir i denne undersøkelsen vil være til stor nytte for fremtidens utvikling innen ishockey. Derfor er det utrolig viktig at spillerne får tid til å gjennomføre skjemaet og svarer så ærlig som overhode mulig!

- Organisering:

Alle spillerne samles i et oppholdsrom/lokale, der de i fellesskap skal få tid til å fylle ut spørreskjemaet. Denne prosessen vil ta ca 30 min. Her er det viktig at spillerne på forhånd har mottatt tilstrekkelig informasjon om prosjektet, der de har forståelse for at prosjektet er frivillig og helt anonymt.

- Gjennomførelse:

Med hvert skjema medfølger en konvolutt. Etter hver spiller har fylt ut skjemaet, legges det direkte inn i den medfølgende konvolutten og lukkes. Etter alle spillerne har gjennomført spørreskjemaet og lagt de i den medfølgende konvolutten, samles alle konvoluttene inn og legges i en større eske merket ”Utfylte spørreskjemaer”.

Esken merket ”Utfylte spørreskjemaer” sendes videre til adressen nedenfor. Skulle det oppstå noen spørsmål eller noe annet skulle dukke opp, så er det bare å ta kontakt. Det som vil skje videre når vi mottar spørreskjemaene, er at vi vil analysere resultatene så snart vi har mottatt og samlet resten av datainnsamlingen fra de andre klubbene. Deretter vil vi utarbeide en rapport til dere hvor dere får se resultatene.

Datainnsamlingen sendes til adresse:

Jan Åge Kristensen
Olav M. Troviks vei 2, H0708
0864 OSLO

Du som trener eller en del av trenerteamet ønskes lykke til med gjennomførelsen!

Med vennlig hilsen

Jan Åge Kristensen
Masterstudent
Tlf: 971 67 542
janagekristensen@gmail.com

Nicolas Lemyre, PhD
Førsteamanuensis

Seksjon for Coaching og Psykologi

Appendix F: Information letter to the research participants.

Forespørsel om deltakelse i forskningsprosjekt

Vi ønsker å invitere deg som spiller til å svare på et spørreskjema i forbindelse med forskningsprosjektet "Motivasjon og fremtidige intensjoner" blant norske ishockeyspillere.

Hensikten med prosjektet er å innhente viktige synspunkt og informasjon fra Norges ishockeyspillere (16-20 år) om motivasjon og effekten den har på engasjement. Prosjektet er støttet av Norges Ishockeyforbund. Den type resultat som forekommer av dette prosjektet vil være til stor nytte for ishockey Norge i sitt videre arbeid med å utvikle framtidens strategier. Vi håper og oppfordrer derfor alle spillere til å møte opp og støtte om prosjektet.

Dere vil få utdelt et spørreskjema som tar ca 30 minutter å gjennomføre. Alle spørsmålene er stort sett avkryssingsspørsmål der du slipper å skrive utfyllende svar. En må kunn sette kryss eller ringe rundt det svaralternativet som passe best.

Deltakelsen i prosjektet er frivillig. All informasjon vil bli behandlet konfidensielt, og ingen enkeltpersoner kan gjenkjennes i masteroppgaven. Ved prosjektslutt i mai måned 2013 vil all informasjon bli anonymisert, og all informasjon som kan eventuelt kobles til deres identitet vil bli slettet. Resultatene vil ikke bli offentliggjort enkeltvis men vil heller bli brukt i masteroppgaven og artikler som omhandler temaet.


Prosjektet er meldt inn til personvernombud for forskning, Norske samfunnsvitenskapelig datatjeneste AS. Ved uklarheter eller spørsmål, vennligst ta kontakt med Jan Åge Kristensen.

Med vennlig hilsen

Jan Åge Kristensen
Masterstudent
Tlf: 971 67 542
janagekristensen@gmail.com

Nicolas Lemyre, PhD
Førsteamanuensis

Appendix G: Permission to use figure

 **Jan Åge Kristensen** <janagekristensen@gmail.com>
til custserv ▾

2. apr. ☆



Hello Human Kinetics


I am currently working on my master thesis on the Norwegian School of Sport Sciences. I am writing about motivation and its relation to athlete engagement. I was wondering if I could get permission to use the figure 1.1 "Schematic representation of self-determination theory illustrating the features of three of the component subtheories" from Hagger and Chatzisarantis (2007) *Intrinsic Motivation and Self-determination in Exercise and Sport*, page 8.

I will of course credit the authors, and also add a copyright notion.

Thank you for your time.


Best regards



 **Martha Gullo** <marthag@hkusa.com>
til meg ▾

9. apr. (For 8 dager siden) ☆



 engelsk ▾ > norsk ▾ [Oversett e-posten](#)

[Slå av for: engelsk](#) x

Dear Jan Åge Kristensen,

From what I understand, Human Kinetics does not control the rights to figure 1.1 on page 8 of *Intrinsic Motivation and Self-Determination in Exercise and Sport*. I believe Martin S. Hagger owns and controls the rights to it.

If you would like to contact Professor Hagger to request permission to use that figure in your thesis, you may be able to reach him using the contact information at <http://oasisapps.curtin.edu.au/staff/profile/view/Martin.Hagger>.

If he approves your request, please use the following credit line:

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If there's anything else I can help you with, please let me know.


Best regards,
Martha

Martha Gullo
Senior Permissions Manager
Human Kinetics, Inc.
www.humankinetics.com

 **Martin Hagger**
til meg ▾

12. apr. (For 5 dager siden) ☆



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Dear Jan Åge,

Thanks for checking with Human Kinetics. You have my permission to use the figure in your thesis. I wish you the best of luck with your PhD studies and your future research.

Best wishes,

Martin

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