Psychosocial Mechanisms Underpinning Motivation in Youth Sports Participants

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The candidate confirms that the work submitted is his/her own, except where work which has formed part of jointly-authored publications has been included. The contribution of the candidate and the other authors to this work has been explicitly indicated below. The candidate confirms that appropriate credit has been given within the thesis where reference has been made to the work of others.

For Auntie June, Granddad Curran and Granny Packer.

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Abstract

Children's participation in youth sport is ubiquitous in UK society, yet high levels of attrition are evident in adolescence (Department for Culture, Media and Sport, 2012a). This attrition has been credited, in part, to questionable coaching behaviours that derogate children's experiences in youth sport. Using self-determination theory (Deci & Ryan, 1985, 2000; Ryan & Deci, 2000, 2002) as a guiding framework, the purpose of this thesis was to better understand the coach-related antecedents of children's adherence and attrition in youth sport by examining the motivational processes that contribute to their engagement versus disaffection. In study one, children's perceptions of autonomy, competence and relatedness, or psychological need satisfaction, were examined alongside in their tendency to exhibit high levels of cognitive and affective engagement. In study two, a mediation model was tested whereby coach autonomy support and control were hypothesised to exhibit positive indirect effects on children's engagement and disaffection in youth sport respectively via both psychological need satisfaction and psychological need thwarting. In study three, the previous study was replicated and extended with three waves of data. The final study of this thesis examined the interaction of coach autonomy support and structure to extend the findings of the previous studies. Overall, the findings suggest that structure and autonomy support from coaches will help to safeguard children's adherence to youth sport because they jointly facilitate psychological need satisfaction and engagement. In contrast, control from coaches is likely to lead to children's attrition in youth sport since such provisions undermine the psychological needs and produce disaffection.

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Chapter One: An engagement framework for children's adherence and attrition in youth sport

1.1 Adherence and attrition in youth sport

Participation in sport is a popular pastime for children in the UK. Recent estimates suggest that as many as 80% of those aged 5 to 15 years participate regularly in some form of youth sport (Department for Culture, Media and Sport, 2012a). However, beyond this age, participation decreases sharply (Gould, Feltz, Horn, & Weiss, 1982; Petlichkoff, 1996; Department for Culture, Media and Sport, 2012a). Estimates suggest that 25,000 16 year-olds drop out of youth sport each year, and Sport England's Active People Survey shows that more than half of the population over 16 do not participate in personalany sport (Department for Culture, Media and Sport, 2010; 2012b). Rather than providing a foundation for life-long physical activity, then, youth sport experiences appear to be mixed. While some children report positive experiences, others describe negative experiences that contribute to their dropout (Fraser-Thomas, Cote & MacDonald, 2010). Understanding the processes that shape youth sport experiences is therefore essential in order to safeguard adherence to sport and physical activity across the lifespan.

Of all youth sporting activities, soccer accounts for 53% of participation in the UK, or 1.47 million children aged 11 to 15 (Department for Culture Media and Sport, 2010). This reflects a global trend indicating soccer is one of the most popular youth sports, with over 22 million junior players worldwide (Federation Internationale de Football Association, 2007). The popularity of soccer is likely a consequence of its manifold benefits. Soccer is highly accessible to all ages, heritages and socio-economic backgrounds due to its inexpensive and relatively simple organisation. Similarly, as a team sport and form of regular physical activity, soccer also confers many opportunities to develop peer relations and to enhance psychological and physical health (see Stolen, Chamari, Castagna, & Wisloff, 2005). However, like most sports, attrition is high following adolescence and experiences vary (Brackenridge, Pitchford, & Wilson, 2011).

One important influence on children's decisions to participate versus dropout is the coach (Gervis & Dunn, 2004; Horn, 2008). Coaches spend a considerable amount of time with children in youth sport and are instrumental role models. They play a significant role in shaping children's motivations (e.g., Jõesaar, Hein & Hagger, 2012; Keegan, Spray, Harwood, & Lavallee, 2010; Mageau & Vallerand, 2003), competencies (e.g., Horn, 1985; Roberts & Kristiansen, 2012; Strachan, Côté, & Deakin, 2009), and emotions (e.g., Adie, Duda & Ntoumanis, 2008, 2012; Bartholomew, Ntoumanis, Ryan, & Thogersen-Ntøumani, 2011). This influence, moreover, is likely to go beyond that of other important agents, such as parents, since coach behaviours are readily internalised by children on account of their proximity and contextual importance in this domain (Conroy & Coatsworth, 2006).

Unfortunately, there is high variability in the quality of coaching in the UK. This is especially the case in grass-roots soccer where coaches are largely parent volunteers with little formal education or training in how their actions impact children's experiences (Wiersma & Sherman, 2005). According to the English Football Association's National Game Strategy Review (2008), soccer coaches in the UK often exhibit detrimental behaviours that negatively impact on children's adherence. Their report highlighted that youth soccer was beset by abusive and demeaning verbalisations by coaches, and has been used as impetus for a programme to promote more pro-social behaviour known as 'Respect' (The Football Association, 2009). This trend is not confined to the UK. A strike by young soccer players in Italy, for example, was prompted by aggressive touchline behaviours and insulting language from adults (Kingston, 2007). Furthermore, Kidman, Mackenzie and Mackenzie (1999) reported that out of seven popular youth sports in New Zealand (netball, cricket, T-ball, miniball, rugby, hockey and soccer), soccer was the sport in which most negative verbalisations and behaviours were observed.

Soccer, then, is an important domain in which to examine children's youth sports experiences. As such, within the domain of soccer, the broad aim of this thesis is to identify how coaches influence the youth sport experiences that provide a basis for children's adherence or attrition beyond adolescence. The initial chapters of this thesis are dedicated to providing a conceptual overview of adherence and attrition, and how they might be facilitated in youth sport. This overview is followed by empirical tests of the theoretical framework presented. Finally, the thesis finishes with an attempt to integrate the findings of the empirical studies into current understanding of adherence and attrition in youth sport and highlights important practical implications. Firstly, though, the benefits of youth sports adherence are described as a broad rationale for the contemporary salience of this topic.

1.2 The physical, psychological and social health benefits of adherence in youth sport

Physical inactivity contributes to children's ill-health (Lobstien, Millstone, Jacobs & Stirling, 2006; Biddle & Asare, 2011). Perhaps most worryingly, physical inactivity is correlated with high Body Mass Index in childhood (Andersen, Crespo, et al., 1998; Janssen & LeBlanc, 2010; Tremblay & Willms, 2003), and high Body Mass Index in childhood is strongly correlated with obesity in adulthood (Herman, Craig, Gauvin & Katzmarzyk, 2009; Serdula , Ivery, Coates, Freedman , Williamson & Byers, 1993). Obese adults are at risk of many chronic conditions such as type 2 diabetes, coronary heart disease and stroke, certain cancers (e.g., bowel, breast, and kidney) and dyslipidaemia (Calle & Thun, 2004; Leong & Wilding, 1999; Shiroma & Lee, 2010). Furthermore, children's physical inactivity is also positively associated with indices of psychological impairment such as depressed mood, anxiety and reduced self-esteem (Biddle & Asare, 2011). In light of the harmful consequences of physical inactivity for children, the World Health Organisation categorise it in the top ten risk factors of lost years to healthy life (Lobstein, Baur, & Uauy, 2004).

The health benefits of regular physical activity in children are, on the other hand, manifold. Research indicates that regular physical activity significantly reduces cardiovascular and diabetes risk factors and increases skeletal health for children (Biddle, Gourley & Stensel, 2004). The benefits of habitual activity also extend to psychological health. Multiple studies indicate that physical activity alleviates symptoms of depression, anxiety, and stress (Penedo & Dahn, 2005) and facilitates increases in quality of life, subjective well-being and vitality (Ryan & Deci, 2001; Fox, 1997; Wilson & Rodgers, 2007). Indeed, relative to those who are inactive, active children report higher self-perceptions, moral development, achievement, and cognitive functioning (Ewing & Seefeldt, 2002; Fox, 1999).

Youth sport participation provides a means of regular physical activity and readily meets the requirements for the maintenance of health and fitness (Ainsworth, Haskell et al., 1993; British Heart Foundation, 2009). Sport-specific adaptations are evident for children in terms of cardiorespiratory health, muscular strength, endurance and power across a variety of recreational sports, such as tennis (Bencke, Damsgaard et al., 2002), basketball (Tsunawake, Tahara, Moji, Muraki, Minowa, & Yukawa, 2003), swimming (Máček, Bell et al., 1989) and soccer (Hansen, Bangsbo, Twisk, & Klausen, 1999; McMillan, Helgerud, Macdonald, & Hoff, 2005). In addition, studies comparing regular youth sport participants with sedentary children have observed lower total cholesterol and dyslipidaemia (Brites, Verona, de Geitere, Fruchart, Castro, & Wikinski, 2004; Máček et al., 1989) as well as favourable changes in body composition (i.e., lower percentage of body fat; Tsunawake et al., 2003).

In addition to the enhancement of physical health, youth sport participation is considered to provide a number of specific psychological and social benefits. These include opportunities to learn better emotion-regulation, fine-tune inter-personal skills, develop quality peer relationships, and gain outside academic competencies (Smith, 2003; Smoll & Smith, 2002; Slutzky & Simkins, 2009). It is also well documented that sports participation contributes to enhanced motor competence, physical self-concept and self-esteem (Dishman, Hales, et al., 2006; Slutsky & Simpkins, 2009; Ulrich, 1987). Youth sport may also be an important vehicle of societal welfare (Conroy & Coatsworth, 2007). Research indicates that youth sport reduces social isolation, increases confidence in peer relations (Eccles, Barber, Stone, & Hunt, 2003; Weiss & Ferrer-Caja, 2002), and occupies time in which juvenile crime and arrest is disproportionally represented (i.e. evenings and weekends; Gottfredson, Gottfredson, & Weisman, 2001).

Alongside these immediate benefits, participation in youth sport also has salugentic effects that extend across the lifespan. This is because it appears participation in youth sports at late childhood contributes to the development of habitual physical activity in adulthood (e.g., Kjonniksen, Anderssen & Wold, 2009; Trost, Owen, Bauman, Sallis & Brown, 2002; Tammelin Näyhä, Hills & Järvelin, 2003)**.** A Finnish study (Telama et al., 2006), for instance, found that participation in youth sports at age 14 years was positively associated with self-reported physical activity at 31 years. Similarly, Kjonniksen and colleagues (2009) more recently found that youth sports participation in Denmark during childhood and adolescence was positively related to frequency of self-reported leisure-time physical activity in young adulthood (aged 23 years). In short, the importance of participation and adherence in youth sport for children’s immediate and long-term psychological, social and physical health is readily apparent.

1.3 Adherence versus attrition in youth sport

Adherence in youth sport, though, is not always fostered and attrition is common among mid-to-late adolescents. Attrition in youth sport is, in part, understood to be a reaction to a number of external and internal factors that undermine enjoyment and produce enervated functioning (Duda & Ntoumanis, 2005; Martens, 1973; Scanlan, 1984). This notion is supported by accounts provided by youth sport participants. In one particularly illuminating study, Sarrazin, Vallerand, Guillet, Pelletier and Cury (2001) found that youth handball dropouts reported lower competence, enjoyment and coach social support than their persistent counterparts. Likewise, in another study, Robinson and Carron (1982) noted that youth football dropouts reported lower competence, less enjoyment and less social support than those who continued. These findings exemplify decades of research that has found personal satisfaction, enjoyment, competence and social support to be central to persistence, whereas a lack of enjoyment, boredom, perceptions of incompetence and perceived adult pressure are central to withdrawal (Allender, Cowburn & Foster, 2006; Bennie & O'Connor, 2006; Calvo, Gimeno, Jimenez, Gallego Murcia, 2010; Enoksen, 2011; Fraser-Thomas, Cote & Deakin, 2008; Mulvihill, Rivers & Aggleton, 2000; Pelletier, Fortier, Vallerand, & Briere, 2001; Ryska, Hohensee, Cooley & Jones, 2002; Ullrich-French & Smith, 2009; Woods et al., 2010).

A common theme that emerges from this research is that there are consistent differences between children who sustain participation in sport and those who dropout. Here, the notion of engagement is drawn upon in order to better understand the nature of positive and negative youth sport experiences, and the likelihood of future participation (Connell & Wellborn, 1991; Lonsdale, Hodge & Raedeke, 2007a; Skinner & Belmont, 1993; Wellborn, 1991). Engagement is an outward expression of children's interest, and speaks closely to the key indicators of persistence that are critical to long-term adherence in youth sport (i.e., enjoyment and competence; cf. Reeve, Jang, Carrell, Jeon & Barch 2004; Skinner, Kindermann & Furrer, 2009). Conversely a lack of engagement, or disaffection, is an outward expression of children's disinterest, and speaks closely to the key indicators of pre-dropout that are influential in long-term attrition (i.e., lack of enjoyment and incompetence; cf. Connell & Wellborn, 1991; Skinner, Kindermann, Connell & Wellborn, 2008). A detailed understanding of the nature of engagement will thus provide insight into the dynamics of participation motivation in youth sport. Next, as a framework for the central outcomes in this thesis, an overview of the engagement concept is provided.

1.4 An engagement perspective on children's adherence and attrition in youth sport

Fostering positive experiences is central to the facilitation of children's adherence in youth sport. Not surprisingly, then, numerous definitions of youth sport experience have been forwarded by researchers. Such definitions typically converge on behavioural, affective and cognitive outcomes of sports participation (Evans & Roberts, 1997; Vierimaa, Erickson, Cote & Gilbert, 2012; Wilson & Rodgers, 2007). One specific framework that describes these outcomes, in concert, is the engagement framework (Skinner & Belmont, 1993; Skinner et al., 2009; Wellborn, 1991). Within this framework, the extent to which children are engaged in achievement activities provides important information regarding the positivity of their experiences. More importantly, though, this framework also describes the salient emotions and behaviours that encapsulate children's task adherence and attrition (Wellborn, 1991).

In sport, relatively little research has been afforded to the concept of engagement. Instead, researchers in this domain have preferred concepts such as effort, persistence, commitment, enjoyment, satisfaction, vitality, positive affect and flow to describe, in isolation, aspects of children engagement in sport. All of these concepts, though, are understood to reflect a multi-dimensional engagement construct described in other domains such as education (e.g., Appleton, Christenson, & Furlong, 2008; Fredricks, Blumenfeld & Paris, 2004; Reeve & Tseng, 2011) and work (e.g., Maslach & Lieter, 1997; Schaufeli, Salanova, Gonzalez-Roma, & Bakker, 2002). Given the potentially informative nature of the engagement framework for children's adherence in youth sport, an integration of these perspectives seems warranted. In an effort to do so, the following sections are dedicated to a review of the engagement construct across multiple domains.

1.5 Work engagement

In the occupational domain, Schaufeli and others (Maslach & Lieter, 1997; Scahufeli et al., 2002) have forwarded a conceptualisation of work engagement that has purported cross-over applications to sport (Lonsdale, Hodge, & Jackson, 2007b; Lonsdale et al., 2007a). According to this framework, engagement is described as an energetic state of fulfilment experienced by employees encapsulated by the degree of vigor, dedication, and absorption that they commit to their work (Scalufeli et al.,. 2002). Vigor is high levels of energy accompanied by persistence. Dedication is one's work being associated with a sense of meaningfulness, significance and pride. Finally, absorption reflects the capacity to focus and concentrate deeply on tasks assigned at work. From this perspective, engagement is a positive cognitive-affective experience that can be considered the opposite of burnout, a negative psychological state (Maslach & Lieter, 1997).

Research suggests that work engagement is positively related to a number of adaptive outcomes. Most notably, for occupational psychologists, work engagement is associated with enhanced performance presumably because it energises high levels of persistence. For example, at the individual level, work engagement has been linked with higher colleague performance ratings for in- and extra-role performance, increased responsibility and customer approval (Bakker, Demerouti & Verbeke, 2004; Gierveld & Bakker, 2005; Salanova, Agut, and Peiro, 2005; Schaufeli, Taris & Bakker, 2006). Similarly, at the organisational level, work engagement has been linked with enhanced financial turnover and customer loyalty (Salanova et al., 2005; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007).

Work engagement is also conducive to positive emotionality and self-regard in employees. For instance, links between work engagement and enhanced employee self-efficacy, commitment, life satisfaction and psychological well-being have been evidenced in a number of studies (e.g., Hakenen, Bakker & Schaufeli, 2006; Hakanen & Schaufeli, 2012; Koyuncu, Burke & Fiksenbaum, 2006; Llorens, Bakker, Schaulfeli & Salanova, 2006). Likewise, work engagement can also provide some resiliency to negative affect and cognition. This is because extant research has indicted that work engagement is associated with reduced employee psychological ill-being, depressed mood and burnout (Hakanen et al., 2006; Hakanen & Schaufeli, 2012; Schaufeli & Bakker, 2004). In short, work engagement has a number of adaptive consequences that make it an important source of positive experience, adherence and efficacy for employees.

1.6 Athlete engagement

In line with Schaufeli et al's (2002) work engagement model, a sport-specific conceptualisation of athlete engagement has been forwarded by Lonsdale and colleagues (2007a, 2007b). According to these authors, athlete engagement is an "enduring, relatively stable sport experience, which refers to generalised positive affect and cognitions about one's sport as a whole" (Hodge et al., 2008 p. 187). Based on interview content and factor analyses in elite adult athletes, Lonsdale et al's (2007a, 2007b) athlete engagement is characterised by four dimensions; vigor, dedication, confidence and enthusiasm. Two of these dimensions (viz. vigor and dedication) parallel those of Schaufeli et al (2002), and two (viz. confidence and enthusiasm) are specific to the sports context.

Within Lonsdale et al's (2007a, 2007b) athlete engagement model, vigor in sport reflects a state of mental and physical liveliness. Interview data provided strong support for the presence of vigor in athletes' lived experiences (Lonsdale et al., 2007a) and follow-up factor analyses supported the uniqueness of a vigor factor consisting of energy and liveliness in the overall engagement factor (Lonsdale et al., 2007b). Similarly, Lonsdale et al (2007a, 2007b) also found that athletes exhibit *dedication* in sport or a proactive "desire to invest effort and time towards achieving goals one views as important" (Lonsdale et al., 2007a, p. 472). Dedication was found to be consistently experienced by all of the athletes interviewed by Lonsdale (Lonsdale et al., 2007a) and analysis supported its relevance to a higher-order engagement factor (Lonsdale et al., 2007b). Absorption, however, was not retained in Lonsdale et al's (2007a, 2007b) conceptualisation of engagement because (a) only 62% of interviewed athletes identified it as an important aspect of their engagement and (b) Lonsdale et al (2007a) consider it to resemble a flow-like state (Jackson & Eklund, 2002) that they argue reflects a consequence, rather than component, of engagement.

In addition to vigor and dedication, Lonsdale et al (2007a, 2007b) found support for two further aspects of engagement that are unique to the sports context. The first, confidence, reflects athletes' belief in their ability to perform well and achieve desired goals (Lonsdale et al., 2007a). This theme emerged strongly across all of the 15 athletes interviewed by Lonsdale et al (2007a) and was found to load uniquely on the higher-order engagement factor in subsequent analyses (Lonsdale et al., 2007b). The final aspect of athlete engagement, found to be important for athletes, was enthusiasm. Enthusiasm is defined by Lonsdale et al (2007b) as feelings of excitement and high levels of enjoyment in sport. Unlike the other elements of athlete engagement, enthusiasm did not emerge from interview content analyses. Rather, enthusiasm emerged when subsequent principle component analyses suggested that the enthusiasm and excitement elements of vigor overlapped with items tapping enjoyment, such that vigor and enthusiasm were best represented by a two-factor solution in the engagement model (Lonsdale et al., 2007b).

This model provides a useful working conceptualisation of the affective and cognitive elements of engagement in sport. It is somewhat limited, however, insomuch as it does not make a distinction between cognitive-affective experiences in sport and the behaviours exhibited by engaged athletes. Therefore, while Lonsdale et al's (2007a, 2007b) athlete engagement may capture the thoughts and feelings that characterise engaged behaviour, it does not adequately capture the behavioural intensity of engagement. This is significant because engagement functions as a salient *behavioural* pathway by which athletes inner motives contribute to their competencies, experiences and, importantly, adherence in sport (cf. Reeve et al., 2004). Thus, in addition to Lonsdale et al's (2007a, 2007b) conceptualisation of athlete engagement, it is important to consider other descriptions of the construct which include behavioural aspects that have been provided in other achievement contexts, such as education.

1.7 School engagement

There is reason to believe that models of engagement validated in education have cross-domain applications to sport. For instance, both domains require children to dedicate themselves over a sustained period of time in order to develop competencies. Further, both include exposure to the rigours of evaluation and both embrace competitive elements. Likewise, both are domains in which leadership behaviours are critical for learning and performance. The generality of engagement across educational and sport domains has some support. Martin (2008) found that controlling for between domain differences in mean level engagement, items capturing engagement across education and sport were not considered significantly different. Therefore, it is likely that items capturing elements of engagement in the education domain also capture the important elements of the construct in sport.

As the concept of school engagement has cross-over applications to sport, approaches to school engagement may further our understanding of children's sporting adherence. Numerous studies and reviews (e.g., Appleton et al., 2008; Fredricks et al., 2004) have been conducted by educational psychologists on the topic of children's school engagement. One notable approach to school engagement that might be particularly helpful in describing children's sporting adherence is Skinner and colleagues' school engagement (Connell & Wellborn, 1991; Skinner & Belmont, 1993; Skinner et al., 2009; Skinner et al., 2008). In their bipartite model, Skinner et al describe two important aspects of engagement that underpin children's active involvement in school, namely; behavioural and emotional engagement. As will become clear, each of these elements of engagement has key applications to sports participation motivation and adherence.

1.7.1 Behavioural engagement

According to Skinner and colleagues (Skinner & Belmont, 1993; Skinner et al., 2009; Skinner et al., 2008), behavioural engagement entails active involvement in learning activities. It encompasses an array of behaviours including effort exertion and persistence, as well as mental efforts such as concentration, attention, asking questions and contributing to classroom discussions. Behavioural engagement is important to understand. This is because children's efforts and persistence correspond to their skill mastery and performance in achievement contexts (Duda, 2001). Such competencies, in turn, underwrite task adherence and thus promote long-term participation in achievement domains such as education and sport (Kirk, 2005; Harter, 1978).

Research on the consequences of behavioural engagement in school supports these ideas. For instance, studies indicate that high behavioural engagement underpins children's adaptability to achievement demands in the classroom, and is therefore a key contributor to academic performance (e.g., Blair & Razza, 2007; Guthrie, Schafer, & Huang, 2001; Ladd, Birch, & Buhs, 1999). By contrast, low behavioural engagement has been found to undermine children's classroom task persistence, and therefore inhibits academic accomplishment (Furrer, Skinner, Marchand, & Kindermann, 2006). As such, behavioural engagement appears to be an important motivational source of efficacy for children, which promotes adaptive development and adherence in school.

Given the role of children's behavioural engagement in the development of competence, it may also be an important outcome for youth sports adherence. Indeed, as in the educational domain, numerous studies attest to an interplay between children's competence and their propensity to persist in youth sport (Joesaar, Hein & Hagger, 2011; Papaioannou, Bebetsos, Theodorakis, Christodoulidis & Kouli, 2006; Pelletier et al., 2001; Roberts, Kleiber & Duda, 1981; Sarrazin et al., 2002; Smith, Ntoumanis, Duda & Vansteenkiste, 2011; Taylor, Ntoumanis, Standage & Spray, 2010; Ullrich-French & Smith, 2009; Vazou, Ntoumanis & Duda, 2006). Jõesaar et al (2011), for instance, found that youth basketball, soccer and volleyball dropouts report significantly lower perceptions of competence than their persistent counterparts. Similarly, Ullrich-French and Smith (2009) noted that perceived competence positively predicted youth soccer player's one-year continuation. Accordingly, through their effects on efficacy, children's expressions of effort, persistence, concentration and attention may be important behavioural prerequisites of their adherence in youth sport.

1.7.2 Emotional engagement

Emotional engagement entails cognitive and affective reactions in the classroom. Such reactions include enjoyment, interest, happiness and satisfaction (Skinner & Belmont, 1993). Parallels can be drawn between these aspects of school engagement and the dimensions of Lonsdale's athlete engagement. This is because both address the positive thoughts and feelings that typically accompany participation. In addition to the work of Lonsdale et al (2007a, 2007b), numerous studies have employed measures of positive affect (e.g., Ntoumanis & Biddle, 1999; Quested & Duda, 2010, 2011), enjoyment (e.g., Alvarez, Balaguer, Castillo & Duda, 2009; Duda & Nicholls, 1992), vitality (e.g., Adie et al 2008, 2012; Reinboth & Duda, 2006) and satisfaction (Chen & Kee, 2008; Perna, Ahlgren & Zaichkowsky, 1999; Vallerand, Rousseau et al., 2006), typically under the umbrella term of psychological well-being, to demarcate aspects of children's emotional engagement in sport (for a review see Wilson & Rodgers, 2007). The importance of children's positive emotionality in sport is thus readily apparent.

Yet emotional engagement is more than just a phenomenological outcome for children. It also has important implications for children's adherence in sport and as such compliments the behavioural aspects of engagement in the bipartite engagement framework (Skinner et al., 2008). This is because emotional engagement provides the psychological energy that gives rise to, and sustains, engaged behaviour (Connell & Wellborn, 1991). Presumably, this process is underpinned by the highly motivating influence of personal satisfaction and enjoyment in habitual physical activity (see Teixeira, Carraca, Markland, Silva & Ryan, 2012).

Studies in sport support this notion. For instance, aspects of athletes' emotional engagement appear to be important correlates of their sustained participation and behavioural intensions (Alvarez et al., 2009; Gill, Gross, & Huddleston, 1983; Gillet, Berjot, Vallerand & Amoura, 2012; Mouratidis, Vansteenkiste, Lens & Sideridis, 2008; Salguero, Gonzalez-Boto, Tuero & Mirquez, 2003). Likewise, it is also well understood that enjoyment and satisfaction are central to children's decisions to persist in youth sports (Calvo et al., 2010; Ryska et al., 2002; Ullrich-French & Smith, 2009; see also Weiss & Petlichkoff, 1989; Weiss & Williams, 2004). This interplay, between emotional engagement and behavioural engagement, is consistent across the lifespan from childhood (Ullrich-French & Smith, 2009), to early adulthood (Ingledew, Markland & Ferguson, 2009), to middle adulthood (Mullan & Markland, 1997) to older adulthood (Dacey, Baltzell & Zaichkowsky, 2008). Thus, children's expressions of enjoyment, interest, happiness, and satisfaction in sport can be considered important emotional prerequisites of their adherence.

1.8 Disaffection

The opposite of engagement is disaffection (Connell & Wellborn, 1991). Disaffection occupies the negative pole of the engagement continuum. It follows, then, that elements of disaffection reflect opposites of elements of engagement (i.e., behavioural and emotional). That is, whereas engagement contains active behavioural and positive emotional elements, disaffection contains passive behavioural and negative emotional elements (Skinner et al., 2009). Consequently, disaffection is participation in sport that is accompanied by apathy and disinterest.

Strictly speaking the opposite of engagement is disengagement. However, it is impossible to capture this construct in participating children. As such, disaffection refers to pre-disengagement behaviours and emotions exhibited by children who are experiencing helplessness or whose motivation has been damaged by coercion (Deci & Ryan, 1985) over-competitiveness (Ames, 1992), pressure (Amorose & Horn, 2000) and conditional regard (Hewitt & Flett, 1991), as well as by boredom or apathy. When opportunity for activity withdrawal is restricted, disaffected behaviours may manifest that reflect mental or emotional, but not behavioural, withdrawal such as passivity, lack of initiation, lack of effort, and giving up (Skinner et al., 2008).

1.8.1 Behavioural disaffection

According to Skinner and colleagues (Skinner & Belmont, 1993; Skinner et al., 2009; Skinner et al., 2008), disaffected behaviours include those prototypically associated with pre-disengagement; namely, passivity, lack of initiation, lack of effort and giving up. Furthermore, they also include indicators of mental withdrawal and ritualistic participation such as a lack of attention and concentration (Skinner et al., 2009). In essence, these aspects of behavioural disaffection reflect passive involvement (Connell & Wellborn, 1991). Unlike behavioural engagement, then, behavioural disaffection does not contribute to the development of competence (cf. Duda, 2001; Kirk, 2005; Harter, 1978). Consequently, alongside other factors, disaffected behaviours are likely to reflect those indicative of attrition (Skinner et al., 2008).

To date, little research has examined behavioural disaffection outside of the classroom. Yet disaffected behaviours, such as mental withdrawal and giving up, are evident in sport and qualitative studies indicate they are symptomatic of athletes' pre-dropout (e.g., Fredricks, Alfeld-Liro, Hruda, Eccles, Patrick & Ryan, 2002; Gould et al., 1982; Klint & Weiss, 1986). Disaffection in youth sport is likely to result from a number of factors that are inhibitive of participation motivation. These include perceptions of incompetence, social isolation and a lack of challenge (Bennie & O'Connor, 2006; Fredricks et al., 2004; Sarrazin et al., 2002; Woods et al., 2010). As such, behavioural disaffection's examination alongside behavioural engagement as a behavioural indicator of children's (pre)attrition in youth sport is warranted.

1.8.2 Emotional disaffection

Disaffected emotions reflect enervated emotion (mental tiredness, sadness, and boredom), alienated emotion (frustration and anger) and negative cognition (anxiety and worry). As such, these aspects of emotional disaffection encompass a constellation of negative thoughts and feelings in the classroom. In sport, many studies have examined aspects of emotional disaffection such as negative affect (e.g., Bartholomew et al., 2011; Curran, Appleton, Hill & Hall, 2011, 2013), boredom (Alvarez et al., 2009), anxiety and worry (e.g., Chan, Lonsdale & Fung, 2012; Hall & Kerr, 1997; O'Rourke, Smith, Smoll & Cumming, 2011; Smith, Smoll & Cumming, 2007). Typically, such studies consider these aspects of emotional disaffection as outcomes variables that reflect children's negative experiences in sport. In a similar vein, emotional disaffection is considered to be an important source of negative phenomenology for children in school.

As with emotional engagement, though, emotional disaffection also describes those thoughts and feelings that give rise to children's behavioural disaffection in the classroom (Skinner et al., 2008). This is because disaffected emotions reflect a lack of personal interest in learning activities and thus precipitate passive behaviour. In sport, this interplay is supported by studies that have documented relationships between a lack of enjoyment and dropout (e.g., Bennie & O'Connor, 2006; Enoksen, 2011; Woods et al., 2010). As a consequence, emotional disaffection might be considered an important emotional indicator of children's (pre)attrition in youth sport. It also completes Skinner and colleagues' engagement framework.

1.9 Chapter summary

In summary, adherence in youth sport is important for children in the UK. This is because such physical activities confer manifold physical, psychological and social benefits both in the immediate and long-term. Yet youth sport is not a panacea for positive experience and can, at times, foster a number of negative experiences that ultimately result in attrition. Accordingly, it is the aim of this thesis to identify the important factors accountable for producing the positive and negative experiences associated with adherence and attrition in youth sport. In this first chapter, such experiences were conceptualised in terms of children's youth sports engagement and disaffection.

Overall, the links between children's engagement and adherence in sport are clear. According to Schaufeli, Lonsdale and Skinner (Lonsdale et al., 2007; Schaufeli et al., 2002; Skinner et al., 2008), engaged individuals are *active* participants who exhibit high levels of positive emotionality and behavioural intensity. Disaffected individuals, by contrast, are *passive* participants who exhibit high levels of negative emotionality and mental withdrawal. These concepts reflect well documented motivational processes that are conducive to children's sustained participation in engagement (i.e., personal satisfaction, enjoyment and competence; Calvo et al., 2010; Jõesaar et al., 2012; Pelletier et al., 2001; Ryska et al., 2002; Sarrazin et al., 2002; Ullrich-French & Smith, 2009) and to their dropout in disaffection (i.e., lack of interest, boredom and incompetence; Bennie & O'Connor, 2006; Enoksen, 2011; Woods et al., 2010).

Given the strong link between children's engagement and adherence, it is important to understand how and why sport participation becomes engaging or disaffecting. To do so, it may be useful to set children's engagement and disaffection within the purview of a theoretical framework. In doing so, specific and testable hypothesises can be generated regarding the origins of engagement and disaffection in youth sport. One theoretical framework that has notable explanatory utility in children's engagement is self-determination theory (Connell & Wellborn, 1991; Deci & Ryan, 1985; Hodge et al., 2008). This theory provides a conceptual approach to understanding children's motivation and, importantly, it affords an identification of the salient antecedents of engagement and disaffection that arise out of that motivation. As the guiding framework for the empirical research which follows, it is then important to examine in detail the relevance of self-determination theory for children's engagement and disaffection in youth sport.

Chapter Two: A Self-Determination Theory Perspective on Children's Engagement and Disaffection in Youth Sport

2.1 Self-determination theory

Self-determination theory is a conceptual framework of human motivation with applications to sport and exercise (see Standage & Ryan, 2012). Whereas other motivational frameworks describe how children's beliefs, goals and cognitions influence their sporting experiences (e.g., achievement goal theory; Nicholls, 1986, theory of planned behaviour; Ajzen, 1991), self-determination theory is distinctive because it emphasises children's innate motivational resources (Reeve, 2012). Its philosophical starting point is in its organismic-dialectic outlook, which purports that human beings have a number of innate motivational resources which interact with the environment to promote optimal functioning (Deci & Ryan, 1985, 2000; Ryan & Deci, 2000, 2002). Accordingly, humans are oriented toward behavioural integration, via a fulfilment of these motivational resources, and hence are active (as opposed to passive) participants in shaping their own motivation – to be, as the theory states, self-determined. This organismic approach to motivation emerged from earlier work in psychoanalytical (Freud, 1960), humanistic (Rogers, 1963) and developmental (Piaget, 1971) traditions of human nature.

Each of these traditions extolls the importance of internal developmental process in self-actualisation and optimal psychological functioning. Yet self-determination theory extends such meta-theorizing in an important way. According to self-determination theory, tendencies toward self-actualization and psychological wellness are triggered by social contexts that provide support for human autonomy, competence and relatedness – motivational resources that are discussed in detail later. In the same vein, humans are also vulnerable to control, incompetence and alienation, particularly when the social context is actively thwarting of their tendency toward behavioural integration. In doing so, self- determination theory

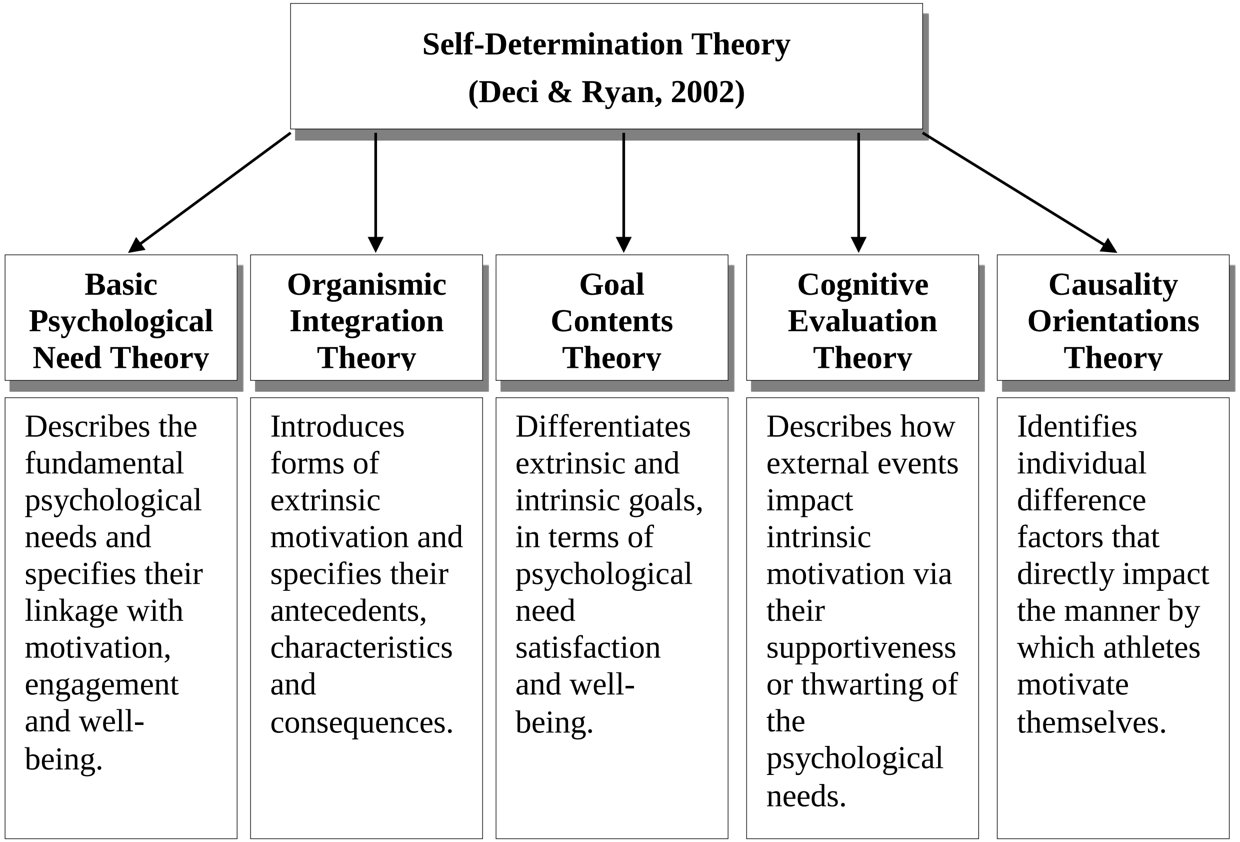

Figure 2.1 The five mini-theories of self-determination theory (adapted from Reeve, 2012)

may offer useful recommendations regarding how coaches might evoke the important motivational resources of autonomy, competence and relatedness in children to facilitate engagement and adherence or eschew disaffection and attrition in youth sport (Reeve, 2012).

As research grounded in self-determination theory has progressed, different motivational constructs and problems have arisen that have contributed to the development of the theory. To explain these motivational processes, and to overcome their associated problems, five mini-theories have emerged (see Figure 2.1; Reeve, 2012). Basic psychological need theory centres on innate and evolved psychological needs as fundamental nutrients of the organism that directly confer high quality-motivation and psychological wellness. Organismic integration theory centres on the behavioural internalisation of extrinsic motivation, and describes why children enact externally important, but not intrinsically interesting, behaviours. Goal contents theory outlines the “what” of motivation. That is, the content of the goals that children strive for in youth sport and how they impact psychological wellness. Cognitive evaluation theory describes how and in what way events in the social-context (e.g., punishment, feedback, rewards) influence children’s intrinsic motivation for youth sport. Finally, causality orientations theory identifies the individual difference factors that describe whether children dispositionally motivate themselves in an intrinsic or extrinsic manner. These mini-theories are now described in turn.

2.2 Basic psychological need theory

As with the over-arching tenets of self-determination theory, basic psychological need theory has its roots in organismic psychology. Within this framework, needs are defined as organismic necessities of healthy functioning. Psychological needs, then, represent a subset of these necessities that are essential for the physical, psychological and social health of the organism (Deci & Ryan, 2012).

Three psychological needs are described by basic psychological need theory that are purported to act as sources of children's intrinsically motivated tendency to be curious, seek novelty and master challenges. The first, autonomy, is the need to experience behaviour as originating from within the self. It represents the inner endorsement and self-determination of one's behaviour (Deci & Ryan, 1985). The second, competence, is the need to feel that one can effectively negotiate their interactions with the environment. It reflects the innate desire to approach and master achievement-oriented tasks (Deci, 1975). The third, relatedness, is the need to create close bonds and attachments with significant others. It embodies the will to be immersed in warm, caring and reciprocally responsive inter-personal relationships (Ryan, 1995).

Basic psychological need theory has three important contributions to make to the self-determination theory framework (Reeve, 2012). In the first of these contributions, basic psychological need theory describes the specific antecedents of children's behavioural integration and optimal functioning. As such, basic psychological need theory represents a unifying principle – linking social-contextual factors, facilitative or inhibitive of psychological need satisfaction, to the cognitive, affective and behavioural experiences that these needs catalyse (Vansteenkiste, Niemiec & Soenens, 2010). Secondly, the basic psychological needs describe why some children exhibit positive experiences in sport and others exhibit negative experiences in sport, since psychological need satisfaction produces psychological and behavioural well-being whereas psychological need thwarting produces psychological and behavioural ill-being (Ryan & Deci, 2000). Thirdly, the psychological needs allow for hypotheses to be made regarding which specific aspects of the sporting environment will be supportive versus inhibitive of children's optimal functioning in sport. That is, those conditions which support or thwart children's perceptions of autonomy, competence and relatedness.

2.3 The empirical basis of basic psychological need theory in sport and exercise

A central assumption of basic psychological need theory is that opportunities for autonomy, competence and relatedness directly confer optimal (as opposed to problematic) psychological and behavioural functioning in humans. As such the psychological needs, and the environmental provisions that support them, should positively predict adaptive outcomes. In support of basic psychological need theory, psychological need satisfaction has been observed to positively predict optimal functioning in a number of life's domains, including school (e.g., Jang, Kim & Reeve, 2012; Jang, Reeve, Ryan & Kim, 2009; Skinner et al., 2009), work (e.g., Baard, Deci & Ryan, 2004; Deci et al., 2001; Van den Broeck, Vansteenkiste, De Witte & Lens, 2008) and healthcare (e.g., Halvari, Halvari, Bjornebekk & Deci, 2013; Ng, Ntoumanis, et al., 2012; Williams, Niemiec, Patrick, Ryan & Deci, 2009). Similarly, supports for the psychological needs have also been found to predict increases in optimal functioning in the same domains (e.g., Deci et al., 2001; Jang et al., 2012; Halvari et al., 2013).

More germane to the focus of the current thesis, a growing body of evidence also attests to the importance of the psychological needs and their supports for optimal functioning in sport and exercise. Positive associations between psychological need satisfaction and a number of positive outcomes including positive affect (e.g., Mack, Wilson, Oster, Kowalski, Crocker & Sylvester, 2011; Gaudreau, Amiot & Vallerand, 2009; Podlog, Lochbaum & Stevens, 2010), vitality (e.g., Adie et al., 2008; Reinboth & Duda, 2006; Reinboth, Duda & Ntoumanis, 2004), self-esteem (Amorose, Anderson-Butcher & Cooper, 2009; Coatsworth & Conroy, 2009; Standage, Gillison, Ntoumanis & Treasure, 2012), satisfaction (Reinboth et al., 2004; Smith, Ntoumanis

& Duda, 2007), enjoyment (Alvarez et al., 2009) and engagement (Hodge et al., 2009) have been documented in athletes and exercisers. Likewise, the psychological needs have also been shown to predict adaptive behavioural outcomes such as persistence and effort in sport (e.g., Sarrazin et al., 2002; Smith et al., 2011; Smith et al., 2007), as well as adults' adherence to exercise (viz. competence; see Teixeira et al., 2012). In an important extension to these findings, Gagne et al and Adie et al (Adie et al., 2012; Gagne, Ryan & Bargmann 2003) further demonstrated that psychological need satisfaction not only contributes to optimal functioning in sport at the between-person level but also at the within-person level. According to their studies, within-person variations in psychological need satisfaction contribute to within-person fluctuations in positive affect, vitality and self-esteem in young gymnasts and soccer players.

Given that psychological need satisfaction confers optimal functioning for athletes and exercisers, it follows that supports for the psychological needs will also do so. Within basic psychological need theory, numerous sport and exercise studies have evidenced the salugentic role of autonomy, competence and relatedness supports. In particular, supports for autonomy (e.g., provision of choice, rationales and empathy) have been found to correlate positively with a number of adaptive outcomes including positive affect (Bartholomew et al., 2011), vitality (e.g., Adie et al., 2008; Reinboth et al., 2004; Rouse, Ntoumanis, Jolly & Williams, 2011), enjoyment (Alvarez et al., 2009), satisfaction (Smith et al., 2007), exercise intensions (Chatzisarantis, Hagger & Smith, 2007; Vierling, Standgae & Treasure, 2007) and persistence (Pelletier et al., 2001; Vansteenkiste, Simons, Lens, Sheldon & Deci, 2004) in athletes and exercisers. Autonomy-supportive interventions have also been successful in enhancing athletes' self-esteem (Coatsworth & Conroy, 2009), adults enjoyment of physical activity (Edmunds, Ntoumanis & Duda, 2008) and exercise adherence (e.g., Fortier, Sweet, O'Sullivan & Williams, 2006; Silva, Vieira, et al., 2010; Wilson, Evens, Williams, Mixon, Sirard & Pate, 2005). In a similar way, supports for athletes' competence (e.g., positive feedback, rules and limits) have been found to predict increased positive affect, vitality and performance (Mouratidis et al., 2008; Mouratidis, Lens & Vansteenkiste, 2010). And, though research examining relatedness supports (e.g., warmth, care and interest) is comparatively sparse in sport and exercise, a handful of studies have documented their positive effects for physical education students (e.g., Cox, Duncheon & McDavid, 2009; Cox & Williams, 2008; Taylor & Ntoumanis, 2007). The relevance of basic psychological needs and their supports to optimal functioning in sport and exercise is thus readily apparent.

2.4 Organismic integration theory

Sport is a context in which many children exhibit high levels of intrinsic interest and is unique in this respect when compared to other domains (i.e., education, work, healthcare; Vallerand, 2004). Nevertheless, there will be times when children engage in sporting activities that are a means to an outcome separate to that of the task itself (e.g., circuit training for enhanced fitness). Organismic integration theory, then, is the mini-theory within self-determination theory that describes the motivation underpinning these activities (Ryan & Connell, 1989; Vansteenkiste et al., 2010). Using a concept called internalisation, organismic integration theory outlines the conditions under which children do, do not or only partially assimilate extrinsic motives into the self-concept (Reeve, 2012). The theory posits that children are inclined to internalise aspects of the social-context in such a way as to integrate extrinsic motivational processes so that they align with their ambient goals and values (e.g., accepting the personal relevance of training drills to being a good athlete). In other words, children proactively seek to endorse, as personally important, established norms, limits, rules and behaviours in their sporting environments. To the extent that internalisation is full (i.e., events in the social-context are fully accepted by the self), psychological adjustment and engagement are produced. However, to the extent that internalisation does not occur, or is incomplete, psychological mal-adjustment and disaffection are likely.

Since athletes display variability in their degree of behavioural internalisation, four types of extrinsic motivation have been conceptualised that vary in their amount of self-determination. External regulation is the type of extrinsic motivation purported to be the least autonomous. That is, external regulation exists as a motivational force devoid of behavioural internalisation and personal relevance. It exists, simply, as means to an end. A child would demonstrate an external regulation when they participate in sport for reasons outside of the self, such as to obtain a reward or avoid a punishment (e.g., “I participate in my sport because if I don’t other people will not be pleased with me”; Lonsdale et al., 2008). Introjected regulation is a form of extrinsic motivation that has been only partially internalised and as such is also considered to be low in relative autonomy. With introjected regulation, motivation emanates from internal compulsion. Participation is initiated because it serves to maintain or bolster self-worth, and minimises bouts of self-conscious affect and cognition (e.g., rumination, shame, guilt). A child would exhibit an introjected regulation when they participate in sport because they would feel guilty if they did not (e.g., “I participate in my sport because I would feel ashamed if I quit”; Lonsdale et al., 2008). Both extrinsic and introjected regulations motivate children in the absence of personal endorsement, and as such are considered controlled forms of extrinsic motivation (Standage & Ryan, 2012).

Progressing toward more autonomous forms of extrinsic motivation, identified regulation reflects a motivational force that considers the value of an activity. That is, while the external regulator is not inherently interesting, it nevertheless possesses enough personal relevance to render it sufficient to be self-endorsed. In other words, when one has an identified regulation, motivation emanates from choice owing to the personal benefits attached to the activity. A child would exhibit an identified regulation when they participate in sport because they want to keep fit (e.g., "I participate in sport because the benefits are important to me"; Lonsdale et al., 2008). Integrated regulation is the most autonomous form of extrinsic motivation. It emerges as children begin to identify with the demands of sport in such a way as to equate "working hard in sport" with "I'm a sportsperson" (Reeve, 2012). Integrated regulation possesses an analogous degree of self-determination to that of intrinsic motivation but they differ in an important way. Whereas intrinsic motivation is a spontaneous response predicated upon implicit interest, identified regulation requires considerable reflection and self-awareness (Reeve, 2012). A child would demonstrate an identified regulation when they highly identify with the activity (e.g., "I participate in sport because it's part of who I am"; Lonsdale et al., 2008). Both identified and integrated types of behavioural regulation include an element of psychological freedom and perceived choice. As such, they are considered autonomous forms of motivation (Standage & Ryan, 2012).

By incorporating organismic integration theory in the over-arching self-determination theory framework, intrinsic and extrinsic motivations were no longer considered antagonists (Vansteenkiste et al., 2010). Instead, autonomous and controlled regulations are distinguished insomuch as they differ in their degree of internalisation. Organismic integration theory extends basic psychological need theory in that whereas the basic psychological needs describe children's inborn motivational resources, organismic integration theory describes children's acquired motivational resources (Reeve, 2012).

2.5 The empirical basis of organismic integration theory in sport and exercise

Organismic integration theory posits that greater behavioural internalisation is associated with enhanced psychological and behavioural functioning. As such, well internalised motivation (viz. identified and integrated) should predict greater well-being than partial or non-internalised motivation (viz. external and introjected). Typically, three approaches have been taken to examine this hypothesis (Vansteenkiste et al., 2010). First, researchers have examined the interplay between the various forms of extrinsic motivation and indicators of psychological, social and behavioural wellness. Second, researchers have examined the experiential effects of well internalised (viz. autonomous) versus partial- and non-integrated (viz. controlled) motivation composites. Third, researchers have used a relative autonomy index to predict indicators of psychological and behavioural wellness, in which forms of extrinsic motivation are differentially weighted in accordance with their position on the continuum of self-determination (Vallerand, 1997; 2001). Across these approaches, numerous studies in work, school, parenting and healthcare have indicated that well internalised motivation, relative to partial- and/or non-internalised motivation, is associated with enhanced psychological and behavioural functioning (see Deci & Ryan, 2000, 2008; Vansteenkiste et al., 2010 for reviews).

Support for the predictions of organismic integration theory is also forthcoming in sport and exercise settings. Well internalised motivation (viz. relative autonomy index, autonomous composite and separate identified or integrated regulation scores) has been correlated with a number of adaptive outcomes for athletes and exercisers that include higher positive affect (Gagne et al., 2003; Mouratidis et al., 2010), dispositional flow (Lonsdale, Hodge & Rose, 2008), adaptive coping (Amiot, Gaudreau & Blanchard, 2004; Gaudreau & Antl, 2008), physical self-esteem (Standage et al., 2012), amount of physical activity (e.g., Brunet & Sabiston, 2009; Ingledew & Markland, 2008; Wilson, Rodgers & Fraser, 2002), effort

(Vansteenkiste, Simons, Soenens & Lensm 2004) and persistence (e.g., Pelletier et al., 2001; Mouratidis et al., 2010; Sarrazin et al., 2002) as well as lower anxiety (e.g., Brunet & Sabiston, 2009; Gillison, Standage & Skevington, 2011; Thøgersen-Ntoumani & Ntoumanis, 2006) and burnout (e.g., Cresswell & Eklund, 2005; Curran et al., 2011; Lemyre, Treasure & Roberts, 2006). Partial- or non-internalised motivation (viz. controlled composite and external and introjected regulation scores), on the other hand, has been shown to be correlated with higher negative affect (Mouratidis et al., 2008), anxiety (Thorgersen-Ntoumani & Ntoumanis, 2006), burnout (Cresswell & Eklund, 2005; Jowett, Hill, Hall & Curran, 2013) and non-optimal coping (Amoit et al., 2004; Gaudreau & Antl, 2008) as well as lower dispositional flow (Lonsdale et al., 2008), health-related quality of life (Standage et al., 2012) and self-esteem (Thorgersen-Ntoumani & Ntoumanis, 2006). In short, supporting the tenets of organismic integration theory, well internalised motivation appears to be influential in optimal functioning whereas partial- or non-internalised motivation appears to be antagonistic to psychological and physical health for athletes and exercisers.

2.6 Goal contents theory

Goal contents theory is the aspect of self-determination theory that describes what children endeavour to attain in sport. In other words, the content of their goals. Aligned with the self-determination theory tradition, goal contents theory differentiates between intrinsic and extrinsic goals (Kasser & Ryan, 1993; 1996; 2001). These different goals have divergent effects on children’s motivation and psychological wellness. For instance, participation in pursuit of intrinsic goals, such as personal development, affords opportunities for basic psychological need satisfaction and greater psychological wellness. By contrast, extrinsic goals, such as the pursuit of fame or enhanced status, undermine the psychological needs and confer diminished psychological wellness.

Participation underpinned by extrinsic goals inhibits development and psychological well-being even when they are attained (Niemiec, Ryan & Deci, 2009; Vansteenkiste, Timmermans, Lens, Soenens & Van den Broeck, 2008). Thus, in contrast to traditional approaches to goal setting in sport (e.g., Locke & Latham, 1994), psychological wellness within goal contents theory is not so much determined by the attainment of goals per se but, rather, by their aspirational outlook (i.e., intrinsic or extrinsic; Reeve, 2012). Intrinsic goals are understood to produce more psychological wellness. This is because such a goal catalyses self-regulated learning strategies that are conducive to on-task persistence and greater enjoyment. By contrast, extrinsic goals undermine levels of psychological well-being since persistence typically gives rise to opportunities for failure that reflect negatively on ones sense of self-esteem.

Goal contents theory compliments the broader self-determination theory framework. This is because while the theories identified thus far (i.e., organismic integration theory and basic psychological need theory) describe the psychological processes that give rise to behaviour (i.e., “why am I doing this?”), goal contents theory instead describes the psychological processes that give meaning to behaviour (i.e., “what am I doing this for?”). In so doing, goal contents theory provides an account of what children are striving for, and how intrinsic and extrinsic aspirational outlooks affect their psychological wellness.

2.7 The empirical basis of goal contents theory in sport and exercise

The key prediction of goal contents theory is that intrinsic and extrinsic goal contents, regardless of their attainment, divergently predict well- and ill-being. In support of the theory, numerous studies across various domains (viz. healthcare, education and work), attest to the positive contribution that intrinsic and extrinsic goals make to psychological and social well- and ill-being respectively (Grouzet, Kasser, et al., 2005; Niemiec et al., 2009; Kasser & Ryan, 1993; 1996; 2001; Sheldon, Ryan, Deci & Kasser, 2004; Vansteenkiste, Neyrinck, Niemiec, Soenens, de Witte & Van den Broeck, 2007; Vansteenkiste et al., 2008; Williams, Cox, Hedberg & Deci, 2000). Similarly, other work in healthcare domains has demonstrated that the effects of goal contents generalise beyond psychological and social well-being to health-related outcomes (Vansteenkiste et al., 2010). Specifically, relative to extrinsic goals, intrinsic goals predict a greater belief that good physical condition is important (Reifman, Barnes, Dintcheff, Uhteg & Farrell, 2001) as well as health related behaviours such as higher tobacco abstinence (Niemiec, Ryan, Deci & Williams, 2009) and lower self-reported illness (Miquelon & Vallerand, 2006). The importance of intrinsic goals to optimal functioning and extrinsic goals to maladjustment is thus evident.

In sport and exercise, the adaptive and maladaptive nature of intrinsic and extrinsic goals is also evident. Athletes' intrinsic goals have been correlated with higher positive affect, satisfaction, enjoyment, vitality and effort, as well as lower negative affect and exhaustion (Chatzisarantis & Hagger, 2007; Smith et al., 2007, 2011). Athletes' extrinsic goals, by contrast, have been associated with higher negative affect, exhaustion and disengagement (Smith et al., 2007, 2011). Similarly, in exercise settings intrinsic goals, relative to extrinsic goals, have been shown to contribute to enhanced self-esteem, vitality and daily moderate to vigorous physical activity (via autonomous motivation; Sebire, Standage & Vansteenkiste, 2009, 2011). Research by Vansteenkiste and colleagues (Vansteenkiste, Simons, Lens, Sheldon & Deci, 2004) is also noteworthy as it concerns exercise behaviours in physical education students. These authors found that priming an exercise activity in terms of an intrinsic goal (i.e., "This activity helps you remain physically fit and prevents you from becoming sick at a later age") increased behavioural engagement relative to extrinsic goal priming (i.e., "Doing this activity help you to remain physically appealing to others and prevents you from gaining weight at a later age"). Together, these findings substantiate goal contents theory by supporting the notion that intrinsic and extrinsic goals confer positive and negative behavioural and psychological outcomes, respectively, in athletes and exercisers.

2.8 Cognitive evaluation theory

Cognitive evaluation theory was self-determination theory's first mini-theory (Deci, 1975). It emerged out of theorising and research concerned with the effect of external events (i.e., rewards, praise and punishments) on people's curiosity, spontaneity, interest and enjoyment (Vansteenkiste et al., 2010). These inherently pleasurable experiences, referred to as intrinsic motivation, are purported to emerge from satisfaction of0 the psychological needs (Ryan & Deci, 2000). Thus, according to cognitive evaluation theory, any external event affecting perceived autonomy, competence and relatedness would also influence intrinsic motivation.

Within cognitive evaluation theory, all events that occur outside of people's volition (e.g., external events such as cups, medals and scholarships) have two functional elements. First, the *controlling* element of an external event pressures children toward a specific outcome or goal. A child might perceive an instruction in sport to be controlling if the instruction is accompanied by a reward or incentive for compliant behaviour (e.g., "If you come to extra training, I will give you a place in the team"). Controlling events undermine intrinsic motivation since they socially implant reasons for participation in sport and thereby inhibit perceptions of autonomy. Non-controlling events, by contrast, safeguard autonomy and thus protect intrinsic motivation. Second, the *informational* element of an external event, encapsulates the communication of competence relevant feedback. Informational events are perceived as those that relay feedback regarding improvement, development and enhanced functioning (e.g., “you have been given this trophy because you worked really hard in training and improved your shooting”). Informational events serve to maintain intrinsic motivation since they provide for satisfactions to competence, whereas demeaning events undercut intrinsic motivation since they thwart perceptions of competence.

In the over-arching self-determination theory framework, cognitive evaluation theory is critical because it outlines the specific training ground conditions that might produce versus undermine children’s inherent motivational tendency to be intrinsically motivated and thus exhibit engagement in youth sport. For example, frustrations to intrinsic motivation common to the sports domain include; rules and limits (Koestner, Ryan, Bernieri & Holt, 1984), competition (Deci, Betley, Kahle, Abrams & Porac, 1981) and evaluation (Ryan, 1982). Conversely, supports to intrinsic motivation in sport include; choice (Katz & Assor, 2007), encouragement (Reeve & Jang, 2006) and positive feedback (Ryan, 1982). Similarly, the overall style in which these external events are conveyed by socialisers has important implications for intrinsic motivation. In particular, autonomy supportive (i.e., “you might like to”) and controlling (i.e., “you must”) inter-personal styles moderate the effect of an external event on intrinsic motivation such that when rewards, limits and feedback are communicated in an autonomy supportive manner intrinsic motivation is sustained whereas when those same events are communicated in a controlling manner, intrinsic motivation is undermined (Koestner et al., 1984; Reeve & Deci, 1996; Ryan, 1982; Ryan, Mims & Koestner, 1983).

2.9 The empirical basis of cognitive evaluation theory in sport and exercise

Cognitive evaluation theory centres on the factors that undermine or support intrinsic motivation. Since intrinsic motivation encompasses spontaneity and volition, any external events that coerce or pressure people to think, feel or behave in certain ways should undermine it (Vansteenkiste et al., 2010). Indeed, imposed goals (Mossholder, 1980), deadlines (Amabile, Dejong & Lepper, 1976), evaluation (Ryan, 1982), competition (Deci et al., 1981) and surveillance (Plant & Ryan, 1985) have all been shown to undermine intrinsic motivation. Likewise, in support of cognitive evaluation theory, results support the undermining impact of experimentally manipulated reward contingencies on intrinsic motivation (see Deci, Koestner & Ryan, 1999 for review). Yet, also in support of cognitive evaluation theory, these deleterious effects appear to be buffered when communicated in a non-controlling way (Ryan, Mims & Koestner, 1983).

Similarly, according to cognitive evaluation theory, the undermining of intrinsic motivation can also be attenuated by the provision of informational feedback, optimal challenge and choice. Environmental provisions of choice, optimal challenge and feedback have indeed been shown to enhance intrinsic motivation (e.g., Patall, Cooper & Robinson, 2008; Shapira, 1976; Vallerand & Reid, 1984). However, just as the manner by which rewards are communicated impacts their effects on intrinsic motivation, so too does the manner by which feedback and choice are delivered. Supporting cognitive evaluation theory, numerous experimental studies have also shown that feedback and choice delivered in an autonomy supportive fashion has vitalizing effects for intrinsic motivation (Koestner et al., 1984; Moller, Deci & Ryan, 2006), whereas feedback and choice delivered in a controlling way undermines intrinsic motivation (Koestner et al., 1984; Moller et al., 2006; Ryan, 1982). The tenets of cognitive evaluation theory thus have a robust empirical basis.

In sport and exercise, however, few experimental or field studies in real world settings have tested the major tenets of cognitive evaluation theory (Standage & Ryan, 2012). Instead, support for the theory has been gleaned from numerous cross-sectional studies that have documented the positive effects of informational feedback and choice to athletes' and exercisers intrinsic motivation (see Hagger & Chatzisarantis, 2007; Ntoumanis, 2012; Standage & Ryan, 2012; Ryan, Williams, Deci & Patrick, 2009 for reviews). A notable exception to this cross-sectional work is an experimental study by Vallerand and Reid (1984). These authors were interested in the effects of success or failure feedback on students' perceived competence and intrinsic motivation for a balance task. Findings suggested that positive feedback enhanced perceptions of competence that, in turn, enhanced intrinsic motivation. Though more work is needed in real world settings, initial research in sport and exercise supports the tenets of cognitive evaluation theory for physical tasks.

2.10 Causality orientations theory

Causality orientations theory describes the individual difference factors which orient children's behaviours in sport (Deci & Ryan, 1985). That is, causality orientations theory reflects an application of self-determination theory to the psychology of personality. According to causality orientations theory, children are dispositionally predisposed to either an autonomous or a controlled causality orientation. An autonomous causality orientation reflects a tendency to interact with the environment in a manner that is congruent with one's ambient interests, goals and values. A controlling causality orientation, by contrast, encapsulates a tendency to interact with the environment in a manner that is congruent with the attainment of external rewards, incentives and inner contingencies (i.e., to bolster self-esteem). A child might, for instance, typically approach sport (and other life spheres) with an autonomous orientation, exhibiting high levels of intrinsic motivation and self-regulation, and only occasionally endorse an extrinsic or introjected regulation. Another child, on the other hand, might typically endorse a controlled orientation toward sport (and other life spheres), and only occasionally endorse an autonomous orientation. Put simply, causality orientations refer to motivational typicality, as opposed to moment-to-moment regulation.

Causality orientations make an important contribution to self-determination theory. This is because they describe how motivational processes at the dispositional level of generality can, in a top-down fashion, influence motivational processes at contextual and situational levels (Vallerand, 1997). For example, the mindful and self-aware nature of autonomously oriented children might protect them from movement toward more controlled forms of motivation at the contextual level, and against frustrations to the psychological needs at the situational level. Conversely, the defensive and self-conscious nature of a child with a controlled orientation might inhibit their propensity to perceive their motivation as autonomous at the contextual level, and their needs as satisfied at the situational level. In incorporating the individual difference perspective to the other four mini-theories, causality orientations theory completes the self-determination framework.

2.11 The empirical basis of causality orientations theory in sport and exercise

Consistent with the self-determination theory tradition, causality orientations theory holds that autonomous and controlled orientations divergently contribute to an array of intra- and inter-personal outcomes. Across a number of domains, this central position has been empirically supported. An autonomous orientation has been found to correlate with higher autonomous motivation (Williams, Grow, Freedman, Ryan & Deci, 1996), task persistence (Koestner, Bernieri & Zuckerman, 1992), confidence (Koestner & Zuckerman, 1994), interpersonal attachment (Bridges, Frodi, Grolnick & Spiegel, 1983) openness to experience (Olesen, 2011) and conscientiousness

(Koestner et al., 1992). A controlled orientation, conversely, correlates with higher defensive functioning (Knee, Neighbours & Vietor, 2001) and controlling socialisation (Bridges et al., 1983; Reeve, 1998), as well as lower academic commitment (Wong, 2000), openness to experience and agreeableness (Olesen, 2011). Importantly, autonomous and controlled orientations have also been found to moderate the effect of rewards on situational intrinsic motivation, attesting to the notion that that an autonomous orientation protects individuals from threats to in-the-moment intrinsic motivation, whereas controlled orientations do not provide such resiliency (Hagger & Chatzisarantis, 2011).

To date, however, few studies have examined the application of causality orientations theory within sport and exercise settings. Yet a couple of exceptions are noteworthy. Rose and colleagues (Rose, Markland & Parfitt, 2001; Rose, Parfitt & Williams, 2005) found that autonomous orientations were associated with more integrated forms of motivation, whereas controlled orientations were associated with higher external regulation and self-consciousness in adult exercisers. Other studies have sought to prime automatic and unconscious motivational orientations for physical activity tasks and observed similar results (Banting, Dimmock & Grove, 2011; Radel, Sarrazin & Pelletier, 2009). Specifically, the subliminal priming of autonomous orientation led adults to perform better, invest more effort, persist longer, and enjoy a physical activity task more than participants who had been subliminally primed with controlled orientation. Initial support, then, is forthcoming for the central tenets of causality orientations theory in sport and exercise.

2.12 Self-determination theory and children's engagement in youth sport

As a macro theory of human motivation, self-determination theory provides an account of children's inherent motivational resources (i.e., psychological needs, intrinsic motivation), acquired motivational resources (i.e., goal contents, causality orientations and autonomous versus controlled motivation) and social-contextual conditions (i.e., autonomy support and control) that are likely to produce optimal functioning. Similarly, self-determination theory also offers a number of testable hypotheses in relation to children's youth sports engagement and hence is a useful guiding framework for this thesis. Specifically, satisfactions to the psychological needs of autonomy, competence and relatedness may be especially important intrapersonal catalysts of children's engaged behaviour and emotion in youth sport. This is because, according to basic need and organismic integration theories, the psychological needs provide for the full behavioural integration necessary for effortful and persistent behaviour. By contrast, obstructions to the psychological needs may be especially important intrapersonal antecedents of children's disaffected behaviour in youth sport. This is because frustrations to autonomy, competence and relatedness result in partial and non-behavioural integration, which catalyse withdrawal, disinterest and frustration.

In addition to this, coach autonomy supportive and controlling motivational styles may represent the important interpersonal catalysts of children's youth sports engagement and disaffection. This is because, according to basic psychological need and cognitive evaluation theories, autonomy supportive and controlling motivational styles fulfil and inhibit the psychological needs respectively. The psychological needs thus represent a unifying principal that links the social context to children's engagement and disaffection in youth sport. This mediation model has been tested in other domains (education; Jang et al., 2012, work; Deci et al., 2001) and its application to the youth sports context has potentially important implications for understanding how and why coaches influence children's youth sports adherence and attrition.

2.13 The empirical basis of self-determination theory's mediation model of children's engagement in youth sport

Studies examining the unifying role of the psychological needs in relationships between the coach and children's engagement in youth sport have varied in their approach. Some have adopted indices of subjective well- and ill-being that are indicative of emotional engagement and disaffection (e.g., positive and negative affect, vitality and exhaustion, enjoyment and boredom; Adie et al., 2012; Alvarez et al., 2009; Batholomew et al., 2011; Gagne et al., 2003; Reinboth et al., 2004), whereas others have taken a behavioural outlook (e.g., persistence; Ntoumanis, 2005). Moreover, some have utilised cross-sectional designs (Alvarez et al., 2009; Bartholomew et al., 2011; Reinboth et al., 2004) and others longitudinal designs (Adie et al., 2012; Gagne et al., 2003; Ntoumanis, 2005) to test their hypotheses. Overall, consistent results have emerged across these studies. In support of basic psychological need, cognitive evaluation and organismic integration theories, the psychological needs appear to be important mediators of the coach-engagement relationship.

Specifically, in cross-sectional studies on emotional engagement, coach behaviours and the psychological needs have been examined as key predictors in tests of mediation models using structural equation modelling. To summarise findings, coach autonomy support has been found to positively predict autonomy satisfaction (Reinboth et al., 2004), as well as a composite of the psychological needs (Alvarez et al., 2009; Bartholomew et al., 2011). This psychological need satisfaction, in turn, positively predicts aspects of children's emotional engagement in youth sport such as satisfaction (Alvarez et al., 2009; Reinboth et al., 2004), enjoyment (Alvarez et al., 2009), vitality (Reinboth et al., 2004) and positive affect (Bartholomew et al., 2011). By contrast, coach control has been found to positively predict a psychological need thwarting composite that, in turn, positively predicts negative affect in youth sports participants (Bartholomew et al., 2011). Coach autonomy support thus appears to be influential for the psychological need satisfaction that is necessary for children's emotional engagement in youth sport. Coach control, on the other hand, appears to contribute to the psychological need thwarting that is necessary for children's emotional disaffection in youth sport.

In addition to these cross-sectional findings, a number of longitudinal studies have examined self-determination theory's mediation model using random slopes (Adie et al., 2012; Gagne et al., 2003) and regression based analyses (Ntoumanis, 2005). Using a diary methodology with young female gymnasts, Gagne and colleagues (2003) found that coach autonomy support measured at study start predicted higher within-person daily psychological need satisfaction that, in turn, accounted for increases in within-person positive affect from pre to post practice over a 4-week period. Likewise, Adie and colleagues (2012) used a similar analysis with young soccer players and found that the mediated effects of autonomy support to within-person growth in vitality were significant via within-person growth in competence and relatedness over two competitive seasons. Additionally, though not situated in the realm of youth sport, a study by Ntoumanis (2005) is also relevant. This is because Ntoumanis (2005) examined the transition from compulsory to optional Physical Education, which is akin to the voluntary domain of youth sport. In line with the aforementioned findings, Ntoumanis (2005) found that composite psychological need support from PE teachers (including autonomy support) positively predicted children's composite psychological need satisfaction that, in turn, positively predicted participation in optional PE a year later (via autonomous motivation and behavioural intensions). Together, these studies extend the cross-sectional findings by supporting the application of self-determination theory's mediation model over time.

Across four studies contained within the current thesis, this body of research will be extended in a number of important ways. First, the relative contribution of each psychological need to each aspect of children's engagement in youth sport will be explored. Second, self-determination theory's mediation model in relation to children's behavioural engagement and behavioural disaffection in youth sport will be tested. Third, temporal precedence in self-determination theory's mediation model will be examined. Finally, the inter-play between coach structure and autonomy support, in relation to self-determination theory's mediation model, will be studied. The specific contribution of these extensions to the current literature will be described in each of the empirical chapters that follow.

2.14 The studies in this thesis

Within this thesis, then, there are four studies. The first study examines the intrapersonal psychological processes outlined by self-determination theory that produce engagement. That is, the inter-relationships between children's psychological need satisfaction and their engagement in youth sport. The second study of this thesis extends this model to incorporate the role of the coach motivational style, and to examine the divergent pathways to engagement and disaffection via psychological need satisfaction and thwarting. In study three, the same set of relationships to those in study two are examined, but over three time points across a competitive soccer season. Study three sought to provide more robust support for the stability of the proposed model, as well as to identify any reciprocal and non-stable relationships. Finally, in study four, an extension to models tested in studies two and three is proposed and tested. In it, autonomy support from coaches was considered a moderating factor in the relationship between structure (external events such as rules, limits and feedback) and children's psychological need satisfaction which, in turn, was expected to predict their levels of engagement and disaffection. As a prelude to the empirical chapters that follow, these studies are now described.

2.13.1 Study one

In study one it was my intention to examine the role of psychological need satisfaction in children's expressions of cognitive and affective engagement in youth sport. Specifically, as seen in Figure 2.2, I tested the cross-sectional inter-relationships between autonomy, competence and relatedness, and confidence, dedication, enthusiasm and vigor. The impetus behind this initial study was two-fold. First, I wanted to test the specific dynamics of the psychological needs-engagement relationship as specified by self-determination theory. In other words, whether the psychological needs do indeed positively predict children's engagement in youth sport and, if so, which psychological needs are most important in predicting which aspects of engagement. Second, I wanted to replicate and extend extant research on this topic by confirming the positive association between the psychological needs and athlete engagement in youth sports participants.

Research question: Is psychological need satisfaction correlated with athlete engagement in youth sports participants and, if so, which psychological needs are most important in predicting which aspects of engagement?

Key hypothesis: Psychological need satisfaction will have a positive multivariate relationship with athlete engagement.

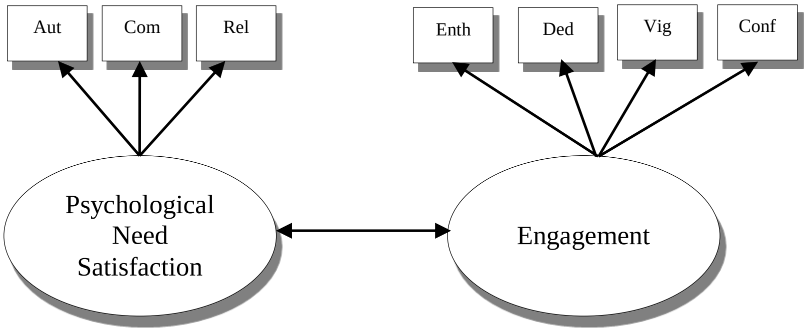

Figure 2.2 The relationship between psychological need satisfaction and athlete engagement as tested in study one.

2.13.2 Study two

In study two, study one was extended to examine self-determination theory's mediation model of children's engagement an disaffection in youth sport. Following from study one, then, I wanted to examine the antecedent role of the coach motivational style in relationships between the psychological needs and children's engagement and disaffection. In doing so, I tested the validity of the psychological needs (both satisfaction and thwarting) as the unifying process underpinning the coach motivational style-engagement relationship. It was anticipated that support for this mediation model would substantiate the processes, outlined by self-determination theory, which are instrumental to children's engagement and disaffection in youth sport. This model is presented in Figure 2.3.

Research question: Do the psychological needs mediate associations between coach motivational style and children's behavioural engagement and behavioural disaffection in youth sport?

Key hypothesis: Coach autonomy support and control will share a positive indirect relationship with behavioural engagement and behavioural disaffection respectively via psychological need satisfaction and thwarting.

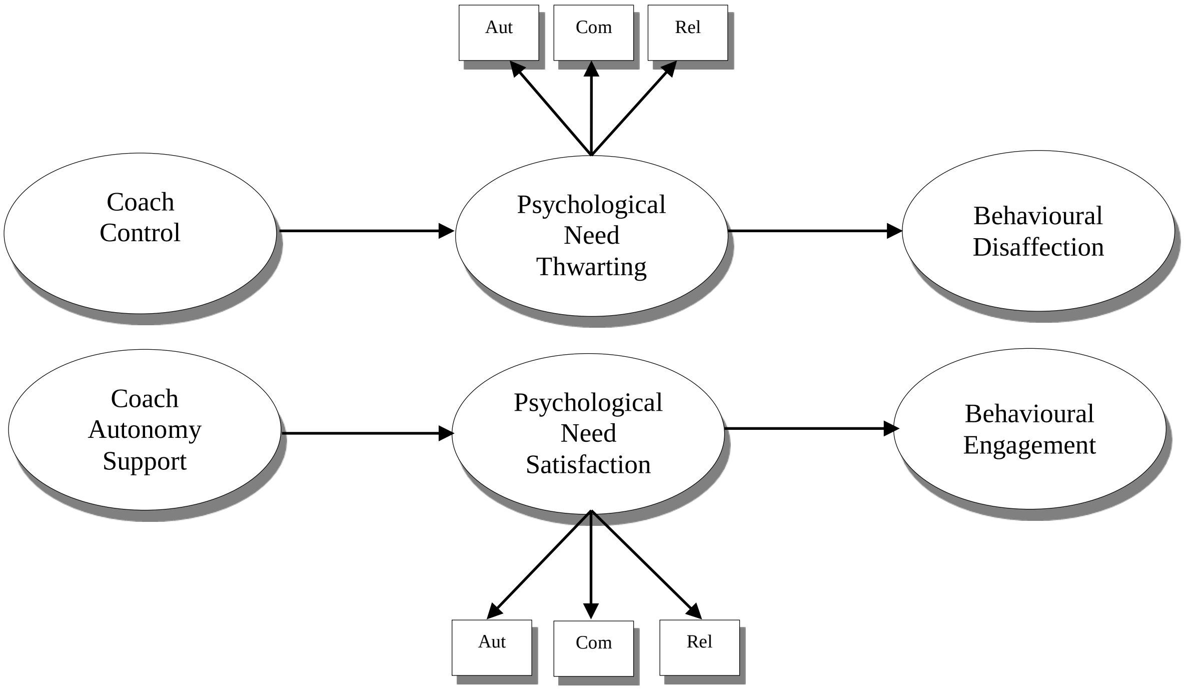

Figure 2.3 Self-determination theory's mediation model of children's behavioural engagement and behavioural disaffection in youth sport as tested in studies two and three.

2.13.3 Study three

An important assumption of the causal process in Figure 2.3 is that of temporal precedence (i.e., the predictors precede the mediators that precede the criterions in time). One way in which this can be examined is by controlling for prior levels of the psychological needs and children's behavioural engagement and behavioural disaffection in the model. In study three, then, the same set of relationships tested in study two were examined longitudinally with three waves of data. By doing so, conclusions can be drawn regarding how a coach motivational style predicts changes in the psychological needs that, in turn, predict changes in children's behavioural engagement and behavioural disaffection. Such changes not only give an indication of temporality in relationships (i.e., whether the psychological needs precede engagement in time), but also stability in relationships (i.e., whether the strength of an association changes over time). This information is useful because it captures the pathways tested in study two, as they dynamically unfold over time.

Research question: Does mid-season psychological need satisfaction and thwarting mediate associations between season start coach motivational style and season-end children's behavioural engagement and disaffection in youth sport?

Key hypothesis: Season start coach autonomy support and control will share a positive indirect relationship with season-end behavioural engagement and disaffection respectively via mid-season psychological need satisfaction and thwarting.

2.13.4 Study four

In the fourth study of the thesis I extended studies one, two and three by introducing the concept of structure and examining the moderating role of autonomy support in the mediation of structure to children's behavioural engagement and behavioural disaffection via psychological need satisfaction. This model can be seen in Figure 2.4, and reflects a first stage moderated mediation model (i.e., where the path from structure to psychological need satisfaction is moderated by autonomy support). Structure is an important component of the social-context and refers to informational events such as the provision of rules, limits and feedback. As described by cognitive evaluation theory, these informational events serve to cultivate children's competence, and thereby engagement, in youth sport. They are also enacted in a context of coach motivational style and, as such, it was my intention to examine the consequences of structure on behavioural engagement and behavioural disaffection at high versus low autonomy support. Such tests provide important information regarding how coaches' provision of structure interacts with their motivational style to influence children's engagement and disaffection in youth sport.

Research question: Is the mediation of coach structure to children's behavioural engagement and behavioural disaffection in youth sport moderated by coach autonomy support?

Key hypothesis: Coach autonomy support will moderate the mediation of coach structure to children's behavioural engagement and disaffection in youth sport because children who experience higher levels of autonomy support will show a stronger positive association between structure and basic psychological need satisfaction.

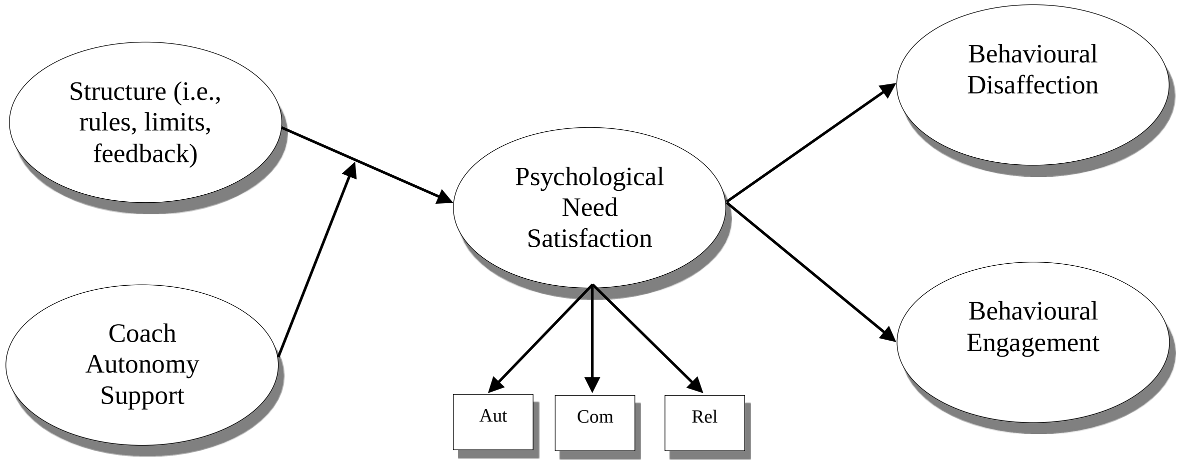

Figure 2.4 The moderated mediation model of children's behavioural engagement and behavioural disaffection in youth sport as tested in study four.

Chapter Three: The relationship between psychological need satisfaction and children's engagement in youth soccer

3.1 Introduction

The work of Hodge and colleagues (2008) is the only study to examine the psychological need satisfaction-engagement relationship in a sample of young elite athletes. These authors used a sport specific conceptualisation of engagement borrowed from Schaufeli et al’s (2002) work in the occupational domain. Their findings revealed that autonomy and competence positively predicted an engagement composite, containing confidence, dedication, enthusiasm and vigour. These results were the first to support the self-determination theory proposal that psychological need satisfaction catalyses engagement in sport. The aim of the first study of this thesis was to build on this research in two ways. First, this study will examine relationships between psychological need satisfaction and children’s engagement in the youth sports context. Second, this study will examine the relative importance of each psychological need for each aspect of children’s youth sport engagement. Such goals have important theoretical and practical implications because, as will become clear, there is reason to suspect that certain psychological needs may be more important than others in predicting the cognitive and emotional features of engagement.

3.1.2 The psychological needs and engagement

As discussed in chapter two, a useful framework in which to examine children’s youth sport engagement is self-determination theory. To recap, self-determination theory proposes that humans possess inborn motivational resources necessary for optimal functioning. These motivational resources are reflected by the psychological needs of autonomy, competence and relatedness. According to basic psychological need theory, these psychological needs directly contribute to enhanced psychological wellness (Ryan & Deci, 2000). This is because the psychological needs represent organismic tendencies that give rise to the psychological energy necessary for expressions of satisfaction, positive emotionality, enjoyment, vitality and persistence in achievement domains such as sport (see Ryan & Deci, 2007 for a review).

Many researchers argue that the salugentic nature of the fulfilment of psychological needs may extend to children's engagement (Connell & Wellborn, 1991; Hodge et al., 2008; Skinner et al., 2008, 2009; Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008; Wellborn, 1991). Specifically, when children feel they have a sense of volition, efficacy and social connection, the person-environment consequence is synergy whereby children personally endorse the manner by which environmental events make them think and feel. Engagement can be understood as the result of this synergy (Connell & Wellborn, 1991; Ryan & Deci, 2000; Reeve, 2012). Yet when the psychological needs are not met, the consequence of the person-environment interaction is antagonism whereby children do not personally endorse the manner by which environmental events make them think and feel. Disaffection can be understood as the result of this antagonism (Connell & Wellborn, 1991; Skinner et al., 2009).

These ideas are evident in empirical research examining cognitive-emotional models of engagement outside of sport (e.g., education; Skinner et al., 2008, work; Schaufeli et al., 2002). Perceived competence, for instance, is positively associated with engagement in school (e.g., Connell et al., 1994; Rudolph et al., 2001; Skinner et al., 1990) and work (e.g., Bakker, Gierveld, & Van Rijswijk, 2006; Xanthopoulou et al., 2007; Xanthopoulou et al., 2008). Similarly, numerous studies have supported the positive link between student and employee autonomy and their engagement (e.g., Skinner, Zimmer-Gembeck, and Connell, 1998; Hakanen et al., 2006; Jang et al., 2012). Likewise, perceptions of social connectedness and support are also associated with greater levels of work and school engagement (e.g., Furrer & Skinner, 2003;

Hakanen et al., 2006; Schaufeli & Bakker, 2004) and these relationships extend to a composite of autonomy, competence and relatedness (Deci et al., 2001; Van den Broeck et al., 2008).

Unlike in school and work domains, though, very little research has been afforded to the psychological need satisfaction-engagement relationship in sport. This is because until recently (Lonsdale et al., 2007a, 2007b), researchers lacked a sports-specific measure of cognitive-emotional engagement. With the advent of Lonsdale et al's (2007a, 2007b) conceptualisation, researchers have begun to examine the antecedents of athlete engagement. In the first, and to date only study on this topic, Hodge and colleagues (2008) had 201 elite adult athletes report on their perceptions of psychological need satisfaction and levels of engagement. Using structural equation modelling, results revealed that latent autonomy and competence factors positively predicted a latent athlete engagement composite of confidence, dedication, enthusiasm and vigour. Initial findings, therefore, appear to support the positive role of psychological need satisfaction in elite athletes' engagement.

Hodge et al (2008) provided initial insight in to the psychological need satisfaction-athlete engagement relationship. However, the precise nature of this association is unclear because taking a composite approach to athlete engagement does not allow the specific predictive ability of the psychological needs to be assessed. It is possible that certain psychological needs are more salient than others in predicting aspects of athlete engagement. For instance, there is reason to suspect that competence may be particularly important for the more cognitive aspects of engagement (i.e., confidence and dedication). This is because competence affords a sense of perceived controllability over goal attainment (Skinner et al., 2003) that is likely to be especially relevant to athletes' future success appraisals and application. Autonomy and relatedness, conversely, might be expected to more readily facilitate the affective aspects of engagement (i.e., enthusiasm and vigour). This is because these needs reflect psychological freedom and social connectedness that are likely to be especially relevant to enhanced energy and positive emotionality (see Ryan & Deci, 2008).

Research is broadly supportive of these ideas. Competence appears to explain most variance in cognitive outcomes in school and work (Deci et al., 2001; Skinner et al., 2008). In a sample of school children, for example, Skinner and colleagues (2008) found that of the three psychological needs competence explained the most variance in classroom anxiety. By contrast, affective outcomes appear to most strongly correlate with autonomy and relatedness, particularly in free choice activities (e.g., Reis, Sheldon, Gable, Roscoe & Ryan, 2000; Ryan, Berstein & Brown, 2010; Sheldon, Ryan & Reis, 1996; Skinner et al., 2008). For example, in a diary-based study, Reis et al (2000) found that positive affect in university students was most pronounced at the weekend and this effect was accounted for by increases in autonomy (and not competence). Likewise, using a similar research design, Ryan et al (2010) more recently noted that relatedness, too, positively contributed to daily weekend positive affect over and above competence in employees.

Similarly, in sport, the relative importance of each psychological need for athletes cognitive and affective functioning has varied across studies (e.g., Lonsdale, Hodge & Rose, 2009; Perreaut, Gaudreau, Lapointe & Lacroix, 2007; Reinboth et al., 2004). In studies on athlete burnout (the conceptual opposite of engagement), Lonsdale et al (2009) and Perreaut et al (2007) have found that whereas competence is the strongest predictor of the cognitive aspect of the syndrome (viz. reduced accomplishment), autonomy appears to be most discriminative of the energetic-affective aspects of syndrome (viz. devaluation and exhaustion). Such observations allude to the possibility that certain needs may also be more important than others in explaining the different aspects of athlete engagement. This possibility, though, has yet to be tested and thus it is currently unclear which psychological needs are most important in explaining the variability in each aspect of athlete engagement.

3.1.3 Purpose of study one

The purpose of this study was three-fold. The first purpose was to examine the multivariate relationship between psychological need satisfaction and aspects of children's engagement in youth sport. The second purpose was to examine the univariate relationships between the psychological needs and each aspect of children's engagement in youth sport. The third purpose was to examine the relative predictive ability of each psychological need in relation to each aspect of children's engagement in youth sport.

Based on the theoretical arguments and empirical evidence presented above, it was hypothesised that psychological need satisfaction would exhibit a positive multivariate relationship with athlete engagement. Similarly, it was hypothesised that all the psychological needs would positively predict each aspect of children's engagement in sport. Finally, the importance of each psychological need in athlete engagement was expected to vary depending on the specific aspect of athlete engagement being predicted. Specifically, of the psychological needs, it was expected that competence would explain the largest proportion of variance in the cognitive aspects of athlete engagement (viz. confidence and dedication). By contrast, autonomy and relatedness were expected to explain larger proportions of variance than competence in the affective aspects of athlete engagement (viz. enthusiasm and vigour).

3.2 Method

3.2.1 Participants and procedure

Prior to the study commencing, ethical approval was granted by the ethics committee of York St John University. Two hundred and sixty (110 male, 150 female; M age = 13.53 years, SD = 1.27, range = 11-16) young recreational soccer players, attached to clubs in the north of England, made up the sample of this study. The children reported that they had been playing soccer for an average of 5.59 (SD = 2.31) years, and had been attached to their clubs for an average of 3.47 (SD = 2.20) years. Soccer clubs were contacted ahead of any data collection to discuss the project and its main objectives. Provided clubs were happy to take part, consent forms were sent to parents and returned (Appendix A). Data collection was conducted in a training session setting. A multi-section questionnaire was given to the participants as well as a clipboard and pen. Confidentially was emphasised as well as the importance of not conferring. The questionnaire took approximately 20 minutes to complete.

3.2.2 Measures

3.2.2.1 Psychological need satisfaction

Psychological need satisfaction was measured using an adapted version of the 21-item Basic Psychological Need Satisfaction Scale (BPNS-work version; Ilardi, Leone, Kasser, & Ryan, 1993 see Appendix M). Participants respond on a 5-point Likert scale ranging from 1 “strongly disagree” to 5 “strongly agree”. The need for autonomy was measured with seven items, 3 of which were reverse scored. An example item for autonomy is “I feel free to express my ideas and opinions”. The need for relatedness is measured using eight items, with three reverse scored. An example item for relatedness is “people I spend time with are generally pretty friendly towards me”. The need for competence is measured using six items, three of which are reverse scored. An example item for competence is “I do not get much of a chance to show how good I am”. The BPNS has been found to be psychometrically sound in various contexts (e.g., Gagne, 2003; Wei, Shaffer, Young, Zakalik, 2005).

3.2.2.2 Athlete engagement

Athlete engagement was measured with the 16-item Athlete Engagement Questionnaire (AEQ; Lonsdale et al., 2007b see Appendix L). This measure consists of 4 subscales, each with 4 items that measure; confidence (e.g., "I believe I am capable of accomplishing my goals in sport"), dedication (e.g., "I am determined to achieve my goals in sport"), enthusiasm (e.g., "I feel excited about my sport") and vigour (e.g., "I feel really alive when I participate in my sport"). Participants respond on a 5-point Likert scale ranging from 1 "almost never" to 5 "almost always". Initial validation of the athlete engagement scale reveals an adequate fit of the four factor structure and good psychometric properties (Lonsdale et al, 2007b).

3.2.3 Analytical strategy

A two-stage analytical strategy was employed to test the hypotheses of the current study. In the first stage, canonical correlational analyses were conducted to identify the multivariate relationships between the psychological needs and the aspects of athlete engagement. Canonical correlations (*Rc*) reflect the strength of the relationship between pairs of latent scores. Such scores are derived from the construction of linear composites based on the unique weighting of the original variables (see Tabachnick & Fidell, 2007 for a detailed explanation of canonical correlational analysis). In the second stage, separate hierarchical multiple regression analyses were employed to examine the relationships and relative predictive ability between the psychological needs and aspects of athlete engagement. Multiple regression examines the predictive ability of a number of predictor variables (i.e., the psychological needs) on one criterion variable (i.e., each of the following: confidence, dedication, enthusiasm or vigour). Controlling for the inter-relationships between the predictor variables, multiple regression analysis generates the unique predictive ability of each of the predictors on the criterion.

3.3 Results

3.3.1 Preliminary analysis

Missing value analysis revealed that there were 173 complete cases and 87 incomplete cases. Incomplete cases are common in cross-sectional research and it is important that they are handled correctly. The default option in common statistical software (e.g., SPSS, SAS) is to delete cases with missing data listwise (i.e., remove the case from analysis). However, this approach is problematic for a number of reasons. First, listwise deletion reduces sample size and therefore power to detect effects resulting in increased Type II error (failure to reject a false null hypothesis). Second, listwise deletion produces biased estimates when there is systemacity to the missingness in the data (Tabachnick & Fidell, 2007). The missing data for incomplete cases should thus, where possible, be imputated and one common approach to this is with the mean of the closest points (e.g., non-missing items in a scale; Graham, Cumsille & Elek-Fisk, 2003).

The philosophy of data imputation is that it is useful in order to retain valuable information that would otherwise be lost (Knight et al., 2010). As such, imputating cases with large amounts of missing data (i.e., > 5%) is problematic because the stability of estimates deteriorates as the fraction of missing data increases (see Bodner, 2008; Schafer, 1997). In keeping with the recommendations of statisticians in this area (e.g., Tabachnick & Fidell, 2007; Graham et al., 2003), participants whose percentage of item non-response exceeded 5% were removed from analysis. This process led to the removal of 6 participants. Of the remaining sample, none of the participants had more than 3 items missing ($M = 1.00$, $SD = 0.47$, range = 1-3). Consequently, missing values were imputated with the mean of the non-missing items in the respective sub-scale for each individual case (Graham et al., 2003). In addition, data was screened for univariate and multivariate outliers. Two significant univariate and seven significant multivariate outliers were removed ($p < .001$; Tabachnick & Fidell, 2007). Subsequent inspection of the distribution of the data indicated univariate and multivariate normality (Kline, 1998). The remaining sample was 245 (99 male, 146 female; M = 13.51 years; s = 1.26; range = 11-16).

Cronbach's alphas were calculated for all the scales employed in the current study. The reliability of the autonomy scale was not acceptable ($\alpha = .43$). Exploratory factor analysis revealed that the three reverse items and one non-reversed item possessed poor factor loadings. As such, these items were removed to improve the reliability of the scale. Subsequent analysis revealed the revised autonomy scale possessed adequate internal reliability ($\alpha = .62$)[1]. All other scales in the current study demonstrated sufficient internal reliability (see Table 1; Lowenthal, 1996).

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[1] Although the revised autonomy scale exhibited reliability below recommended levels (e.g., $\alpha > .70$; Tabachnick & Fidell, 2007), it was retained for two reasons. First, scales with less than 5 items often have distributions that fall below .70. Therefore, a more lenient criterion (i.e. > .60) has been suggested for such circumstances (Lowenthal, 1996). Secondly, as an alternative indicator of reliability, the average inter-item correlation ($r_{it} = .31$) for this subscale suggested reasonable internal consistency.

Table 3.1 *Descriptive statistics and Pearson moment correlations.*

	1	**2**	**3**	**4**	**5**	**6**	**7**	**M (SD)**	**α**	**Skew**	**Kurt**
1. Autonomy	---							3.74 (.69)	.62	-.28	-.09
2. Competence	.49	---						3.67 (.54)	.62	.21	-.42
3. Relatedness	.60	.62	---					3.93 (.59)	.79	-.13	-.57
4. Confidence	.32	.53	.28	---				3.72 (.72)	.81	-.02	-.67
5. Dedication	.33	.43	.37	.71	---			3.94 (.65)	.79	-.25	-.52
6. Enthusiasm	.34	.38	.45	.55	.66	---		4.25 (.57)	.74	-.77	.24
7. Vigour	.37	.50	.43	.65	.66	.71	---	3.92 (.67)	.81	-.29	-.39

All correlations significant at the p <.01 level. The standard error of skewness and kurtosis was .16 and .31 respectively.

3.3.2 Primary analysis

3.3.2.1 Descriptive statistics and Pearson moment correlations between psychological need satisfaction and dimensions of athlete engagement

Table 3.1 contains the Pearson moment correlations, means, Cronbach alphas and indicators of normality among the measured variables. As expected, all of the psychological needs exhibited positive correlations with all aspects of athlete engagement. As such, the preliminary analyses provide initial support for the study hypotheses.

3.3.2.2 The multivariate relationship between psychological need satisfaction and athlete engagement

Canonical correlation analysis was employed to test the hypothesised multivariate relationships between aspects of psychological need satisfaction and athlete engagement. In this analysis, the predictor variable psychological need satisfaction was reflected by a linear composite of autonomy competence and relatedness. The criterion variable, athlete engagement, was reflected by a linear composite of confidence, dedication, enthusiasm and vigour. Canonical functions were considered meaningful when the squared multiple correlation exceeded .10 and they were statistically significant at the p <.05 level (Tabachnick & Fidell, 2007). Measured factors contributed to the canonical variate when their canonical factor loadings (r_s) exceeded .30 (Tabachnick & Fidell, 2007).

Analyses revealed that the overall multivariate relationship was significant: Wilks' $\lambda = .70$, $F(4, 490) = 24.01$, $p < .01$. As can be seen in Table 3.2, two meaningful canonical functions emerged in the analysis. The first possessed a positive canonical correlation (Rc = .58). Examination of the canonical loadings revealed that all of the psychological needs loaded highly on the first canonical variate (-.65 to -

.98). As such, the first canonical variate was deemed to reflect composite psychological need satisfaction. Likewise, all elements of athlete engagement loaded highly on the second canonical variate (-.69 to -.92). As such, the second canonical variate was deemed to reflect composite athlete engagement. The composite psychological need satisfaction variate explained an average of 61% of the variance in the psychological needs, whereas the composite athlete engagement variate explained an average of 67% of the variance in the aspects of engagement. Overall, the canonical correlation between the two variates indicates that lower levels of composite psychological need satisfaction are associated with lower levels of composite athlete engagement. As such, a positive relationship is inferred (Tabachnick & Fidell, 2007).

Table 3.2 *Canonical correlation between athlete engagement and psychological need satisfaction.*

	Function 1		Function 2	
Variable	r_s	r_s^2	r_s	r_s^2
Autonomy	-.65	.42	-.31	.10
Relatedness	-.66	.44	-.74	.55
Competence	-.98	.96	-.06	.00
Adequacy		.61		.22
Redundancy		.20		.03
Confidence	-.92	.85	-.27	.07
Dedication	-.77	.59	-.24	.06
Vigour	-.89	.79	-.31	.10
Enthusiasm	-.69	.48	-.63	.40
Adequacy		.67		.16
Redundancy		.22		.02
Canonical correlation (R_c)		.58		.39
R_c^2		.33		.15

The second meaningful canonical function to emerge also exhibited a positive canonical correlation (*Rc* = .39). Examination of the canonical loadings revealed that two of the psychological needs, relatedness and autonomy, loaded on the first canonical variate (relatedness = -.74; autonomy = -.31). The first canonical variate, then, was deemed to reflect autonomy and relatedness satisfaction. Likewise two elements of athlete engagement, vigour and enthusiasm, loaded highly on the second canonical variate (vigour = -.31; enthusiasm = -.63). As such, the second canonical variate was deemed to be reflective of affective engagement. The autonomy and relatedness satisfaction variate explained an average of 22% of the variance in the psychological needs, whereas the affective engagement variate explained an average of 16% of the variance in the aspects of engagement. Overall, the canonical correlation between the two variates indicates that lower levels of autonomy and relatedness are associated with lower levels of affective engagement. As such, a positive relationship is inferred (Tabachnick & Fidell, 2007).

3.3.2.3 The predictive ability of the psychological needs in relation to elements of athlete engagement

Four regression analyses were performed to test the relative predictive ability of the psychological needs in relation to aspects of athlete engagement. Results are reported in Table 3.4. The first hierarchical regression indicated that the psychological needs explained 29% of variance in confidence ($F = 34.11$, $p < .01$). Autonomy ($\beta = .15$, $p < .05$) and competence ($\beta = .74$, $p < .01$) positively predicted confidence. By contrast, relatedness was a negative predictor of competence ($\beta = -.19$, $p < .05$). This finding may be indicative of suppression since it does not correspond with bivariate correlation between relatedness and competence. Suppression is evident when the relationship between a predictor and a criterion is substantially increased or changes direction when another predictor is added to the model (Cohen, Cohen, West & Aiken 2003). The implications of this potential suppression are discussed later.

The second hierarchical regression indicated that the psychological needs explained 20% of variance in dedication (F = 21.26, p <.01). Competence was the only psychological need to significantly predict dedication (β = .37, p <.01). The third hierarchal regression indicated that the psychological needs explained 21% of the variance in enthusiasm (F = 22.66, p <.01). Relatedness was the only psychological need to significantly predict enthusiasm (β = .30, p <.05). Finally, in the fourth hierarchical regression, the psychological needs explained 28% of variance in vigour (F = 31.48, p <.01). Competence was the only psychological need to significantly predict vigour (β = .44, p <.01).

In addition to the beta weights, structure coefficients are reported in Table 3.4. Structure coefficients consider both the zero-order correlation, as well as the regression coefficient of a predictor on a criterion (Thompson & Borrello, 1985). They thus reflect the stereoscopic relational dynamics within the data that are otherwise overlooked when only beta weights are reported (Courville & Thompson, 2001). Across all four multiple regression analyses, the structure coefficients indicated that all three psychological needs had meaningful explanatory power in all four aspects of engagement (i.e., $r_s > .50$). As such, multiple regression results provide partial support for the study hypotheses concerning the univariate relationships between the psychological needs and aspects of athlete engagement.

Table 3.3 *The predictive ability of the psychological needs in relation to elements of athlete engagement*

Variable	**β**	***p***	***pr***	$r_{y,x1(x2)}$	r_s
Confidence (F[3, 241] = 34.11, *p* = .00; R = .55; Radj^2 = .29)					
Autonomy	.15	.04	.11	.01	.58
Competence	.56	.00	.43	.18	.96
Relatedness	-.19	.04	-.11	.01	.51
Dedication (F[3, 241] = 21.26, *p* = .00; R = .46; Radj^2 = .20)					
Autonomy	.11	.12	.09	.01	.72
Competence	.31	.00	.24	.06	.91
Relatedness	.11	.19	.08	.01	.80
Enthusiasm (F[3, 241] = 22.64, *p* = .00; R = .47; Radj^2 = .21)					
Autonomy	.09	.23	.07	.01	.72
Competence	.14	.06	.12	.02	.81
Relatedness	.31	.00	.24	.06	.96
Vigour (F[3, 241] = 31.48, *p* = .00; R = .53; Radj^2 = .28)					
Autonomy	.11	.13	.08	.01	.70
Competence	.36	.00	.27	.07	.94
Relatedness	.15	.06	.11	.01	.81

Note. R = multiple regression coefficient; R_{adj}^2 = adjusted R-squared; β = standardized beta coefficients; *p* = probability value; F = F statistic; ***pr*** = part-correlation coefficient; $r_{y,x1(x2)}$ = estimate of unique variance per predictor variable in the regression models where values represent the square of the part-correlation coefficients for each predictor (Hair, Black, Babin, Anderson, & Tatham, 2006); r_s = structure coefficients for each predictor variable included in the regression models estimated with the following formula: *r*/R (where *r* is the zero-order correlation and R is the multiple regression coefficient).

3.4 Discussion

The first purpose of this study was to examine the multivariate relationship between the psychological needs and aspects of children's engagement in youth sport. The second purpose was to examine the univariate relationships between the psychological needs and each aspect of children's engagement in youth sport. The third purpose was to examine the relative predictive ability of each psychological need in relation to each aspect of children's engagement in youth sport. It was hypothesised that the psychological needs would be positively associated with children's engagement in youth sport. It was also expected that the psychological needs would positively predict each aspect of children's engagement in youth sport. Further to these hypotheses, the importance of each psychological need in athlete engagement was expected to vary depending on the specific aspect of athlete engagement being predicted. Specifically, of the psychological needs, it was expected that competence would explain the largest proportion of variance in the cognitive aspects of athlete engagement (viz. confidence and dedication). By contrast, autonomy and relatedness were expected to explain larger proportions of variance than competence in the affective aspects of athlete engagement (viz. enthusiasm and vigour).

The findings concerning the multivariate relationships provided support for the hypotheses. Canonical correlation analyses indicated that lower levels of psychological need satisfaction were associated with lower levels of children's engagement in sport. As such, a linear combination of autonomy, competence and relatedness was positively associated with a linear combination of confidence, dedication, enthusiasm and vigour. A second meaningful canonical function also emerged in this analysis that is noteworthy. This function suggested that a linear combination of autonomy and relatedness was positively associated with a linear combination of the affective aspects of engagement (viz. vigour and enthusiasm).

As regards direct effects of the psychological needs to the aspects of athlete engagement, results provided mixed support for the hypotheses. In support of the hypotheses, autonomy positively predicted confidence, relatedness positively predicted enthusiasm, and competence positively predicted confidence, dedication and vigour. Yet, contrary to expectations, autonomy did not emerge as a significant predictor of dedication, enthusiasm and vigour, competence was unrelated to enthusiasm, and relatedness was unrelated to dedication and vigour. Results also revealed that, contrary to expectations, relatedness had a negative relationship with confidence. The bivariate correlations and structure coefficients indicate that this effect may be due to suppression – a possibility that is described at the end of this discussion.

As regards the relative predictive ability of the psychological needs in terms of children's engagement, the findings also produced mixed support for the hypotheses. Supporting expectations, competence was the strongest predictor of the cognitive aspects of engagement (viz. confidence and dedication). Likewise, as expected, relatedness emerged as the most important predictor of enthusiasm. Contrary to the hypotheses, autonomy did not emerge as a dominant predictor of any of the aspects of engagement and competence most strongly predicted vigour, an affective aspect of engagement. An examination of the structure coefficients confirmed the regression findings regarding the relative predicative ability of the psychological needs in aspects of athlete engagement but also supported their unique contributions. In all, then, findings appear to replicate those of Hodge et al (2009) in a youth sports context, but provide a number of important extensions.

3.4.1 Psychological need satisfaction and children's engagement in sport

According to self-determination theory, the psychological needs are important antecedents of behavioural integration and thus engagement (Connell & Wellborn, 1991; Skinner et al., 2008). As discussed, this notion has some support from initial research on elite athlete engagement (Hodge et al., 2008). The current study's findings were similarly supportive of this model. A linear combination of the psychological needs positively associated with a linear combination of aspects of children's engagement in sport. It appears, therefore, that the psychological needs provide a basis for children's agency in sport, which underpins expressions of their cognitive and affective engagement (Deci & Ryan, 2000).

Support for this process is important for the understanding of children's engagement in youth sport. This is because it provides an insight into those intrapersonal processes that may contribute to higher enthusiasm, dedication, confidence and vigour. As outlined by organismic integration theory, when children feel autonomous, competent and related they identify with self-determined forms of motivation (viz. integrated and intrinsic). Such motivation engenders high levels of personal satisfaction, enjoyment and persistence in sport (i.e., high engagement; Standage & Ryan, 2012) because it reflects an alignment of external demands with personal goals. Put simply, children who perceive their needs as fulfilled exhibit higher engagement because they want to participate (as opposed to feeling they have to participate).

In an extension to the work of Hodge et al (2008), though, these broad theoretical implications must be qualified in a number of important ways. In particular, a second meaningful canonical function emerged in the analyses, which alludes to the possibility that certain psychological needs may be important in explaining certain aspects of engagement. Specifically, a linear combination of autonomy and relatedness had a positive association with a linear combination of enthusiasm and vigour. Notably, enthusiasm and vigour are the aspects of engagement that reflect affective interactions with sport. Thus it would appear that in support of studies inside (Lonsdale et al., 2009; Perreaut et al., 2007) and outside (Reis et al., 2000; Ryan et al., 2010; Sheldon et al., 1996; Skinner et al., 2008) of sport, autonomy and relatedness are particularly relevant psychological needs for children's affective engagement.

The notion that autonomy and relatedness may speak closely to the emotional indicators of engagement has a number of theoretical implications. In particular, it alludes to the possibility that different strands of engagement emerge from different psychological needs. In this case, the emotional strand of children's engagement is seemingly triggered by increased autonomy and relatedness satisfaction (although results also reveal that competence too has a role in affective engagement by way of its positive prediction of vigour). This observation is perhaps not surprising on a couple of counts. First, numerous studies have attested to the strong proximal influence that satisfying interpersonal connections have on positive affect presumably because such connections serve to enhance self-perception and regard (see Watson & Clark, 1994). Second, autonomy entails a sense that one's activities and goals are self-chosen and is as such conducive to high levels of on-task satisfaction and positive emotionality (Ryan & Deci, 2000).

3.4.2 Comparative importance of the psychological needs in children's sporting engagement

The findings of the hierarchical regression analyses also allude to the possibility that certain psychological needs are particularly important for certain aspects of engagement. As expected, results revealed that competence was the strongest predictor of the cognitive (viz. confidence and dedication) aspects of engagement. They also revealed that, contrary to expectations, competence was the strongest predictor of one of the affective aspects of engagement (vigour). Children who perceive themselves as having high competence typically do so because they have constructed detailed internal schemata's of how their actions and outcomes in sport are linked. As such, competence engenders a high degree of perceived controllability over performance and goal attainment. In doing so, children with high competence are inclined to exhibit the positive sport-related cognitions (viz. confidence and dedication) that are indicative of engagement. Likewise, as the results indicate, they are also likely to experience high levels of mental energy as a consequence.

The results also revealed that, as expected, relatedness was the strongest predictor of the other affective aspect of engagement, namely enthusiasm. Also as expected, relatedness had little relative explanatory power in the cognitive aspects of engagement (viz. confidence and dedication). Involvement in youth sport with people that children like and by whom they feel liked in return thus appears to have an energetic function, catalysing enthusiasm and thereby interest and willingness to participate. Yet at the same time strong social bonds may represent an independent and separate process to the control beliefs that are critical to cognitive engagement in youth sport. Together with previous research (e.g., Furrer & Skinner, 2009; Hakanen et al., 2006; Schaufeli & Bakker, 2004), then, these findings substantiate claims that positive social bonds function as a motivational resource that serves to initiate and sustain children's on-task affective engagement.

Unexpectedly, however, autonomy did not emerge as a dominant predictor of any of the elements of engagement. This finding is important as it appears to indicate that autonomy, relative to competence (and to a lesser extent relatedness), is more distally associated with children's engagement in youth sport. This finding, though unexpected, isn't without precedence in physical contexts. Numerous studies, utilising samples that include athletes (Reinboth et al., 2004), physical education students (Ntoumanis, 2001; Taylor et al., 2010) and dancers (Quested & Duda, 2009, 2010), have shown that competence predicts greater variance in cognitive and affective outcomes than autonomy and these findings may reflect context-specific processes. Deci and Ryan (1985) have noted that the relative importance of each psychological need to an individual's optimal functioning may depend, in part, on the context in which their behaviours are enacted. Given the central role of competence for achievement in sporting domains, one might expect that competence would be a dominant psychological need in this context.

The results of the multiple regression analysis must nevertheless be interpreted in the context of findings that are indicative of suppression. The bivariate and structural relation between relatedness and confidence was positive. However, following the inclusion of autonomy and competence as predictors in the regression equation, the effect reversed in direction. This highlights the salience of considering the overall (as well as partialled) correlations between the study variables. This is particularly important when, as is the case in the current study, the predictors are highly correlated. In such circumstances, a predictor can have a large absolute correlation with a criterion but still have a zero (or even reversed) beta weight provided one or more of the other predictors in the model are assigned credit for that predictor's shared explanatory ability. To overcome this problem, Thompson and colleagues (Thompson, 1999; Thompson & Borrello, 1985) and others (e.g., Courville & Thompson, 2001) argue that both beta weights and structure coefficients should be interpreted in regression models. The scrutiny of the structure coefficients in the current study is thus important.

In contrast to the beta weights, an inspection of the structure coefficients highlights the importance of all three psychological needs in children's engagement. That is, in the context of their zero-order correlations, all the psychological needs had meaningful explanatory power in the engagement regression models ($r_s > .50$). When considered alongside the beta weights, the structure coefficients suggest that the psychological needs operate both independently and in combination to produce increases in children's engagement. In other words, according to the structure coefficients, although competence and relatedness remain most predictive of children's confidence, dedication, vigour (competence) and enthusiasm (relatedness), the three psychological needs also have synergistic effects on these outcomes.

3.5 Conclusion

Overall, the findings of the present study support and extend those of Hodge and colleagues (2008) to the youth sports context. That is, cognitive and affective engagement appears to be important for youth sports participants, and psychological need satisfaction appears to be an important catalyst of it. This is because the canonical correlation analysis and structural relationships revealed a positive association. Yet this link is extended by the finding that certain needs were more important than others in predicting aspects of engagement. That is, though the structure coefficients suggested that all the psychological needs had meaningful explanatory power in the aspects of engagement, competence, and to a lesser extent relatedness, were the dominant psychological needs in these relationships.

In sum, children appear to exhibit higher levels of engagement when they perceive their psychological needs, particularly those of competence and relatedness, to be met. Children are, though, social organisms and as such psychological need satisfaction occurs in a social-context. Consequently, it is important for research interested in understanding children's engagement in youth sport to examine the manner by which important socializers can provide support for autonomy, competence, and relatedness (Connell & Wellborn, 1991; Reeve, 2006b). Accordingly, in the next chapter, I describe and test self-determination theory's mediation model of children's engagement and disaffection in youth sport. This model provides a description of how, and under what conditions, the coach influences the satisfaction of the psychological needs that, in turn, contribute to engagement.

Chapter Four: A test of self-determination theory's mediation model of children's behavioural engagement and behavioural disaffection in youth sport

4.1 Introduction

To better understand the antecedents of children's engagement in youth sport, relationships between psychological need satisfaction and athlete engagement were examined in the first study of this thesis. These relationships were based upon self-determination theory and it was expected that the psychological needs of autonomy, competence and relatedness would positively correlate with confidence, dedication, enthusiasm and vigour. Canonical correlation analysis indicated that higher psychological need satisfaction is indeed associated with higher engagement and thus support was forthcoming for this hypothesis. In an extension to this research, study two developed this line of enquiry in three ways. First, attention turns to identifying the antecedents of the psychological needs in the form of coach motivational style. Second, the psychological needs are differentiated in terms of their satisfaction and thwarting. Third, the measurement of engagement is developed to include indicators of disaffection.

4.1.1 The athlete-coach dialectical framework within self-determination theory: A mediation model

Self-determination theory offers a framework for the understanding of the key antecedents of the psychological needs. This is because children's proactive pursuit of the psychological needs occurs within social-contexts that can either support or thwart them. As such, according to self-determination theory, environmental factors – particularly coaching behaviours – are understood to interact with the psychological needs children bring to the sports field. Hence children's motivations, and the behaviours of the coach, share a reciprocal relationship. As children immerse themselves in pursuit of autonomy, competence and relatedness, they simultaneously receive and internalise sources of motivation from coaches.

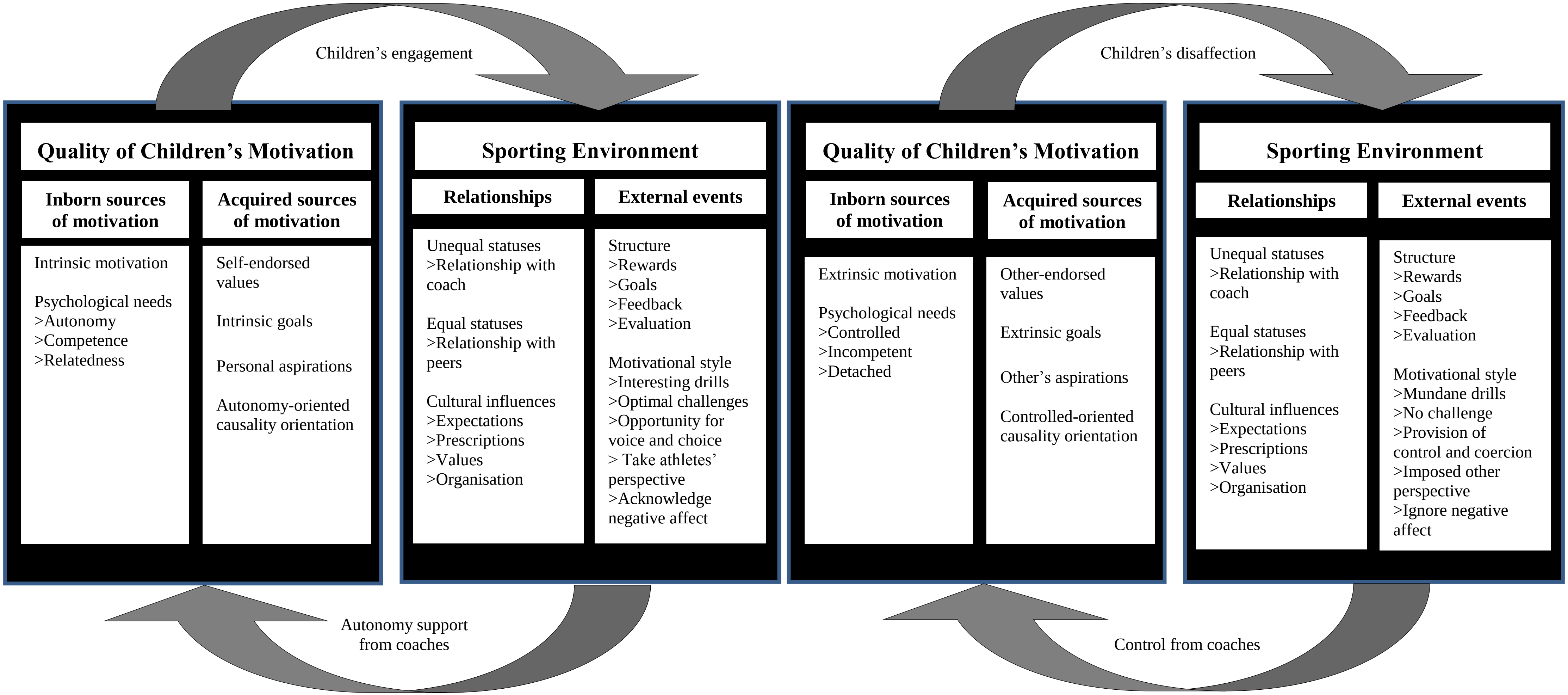

Figure 4.1 Athlete-coach dialectical framework within self-determination theory (adapted from; Reeve, 2012).

This reciprocal relationship, between children's inherent motivational resources and the behaviours exhibited by coaches, resides at the centre of the athlete-coach dialectical framework within self-determination theory (cf. Reeve, 2012; see also Mageau & Vallerand, 2003). To the extent that children are able to develop competencies, be curious, express opinion and pursue their interests, the consequence of the athlete-coach interaction will be synergy (i.e., coach behaviours are concordant with personal goals), resulting in elevated psychological need satisfaction, full integration and engagement. However, to the extent that coach behaviours inhibit children's ability to be curious, self-express, and pursue their interests, the consequence of the athlete-coach interaction will be antagonism (i.e., coach behaviours are incongruent with personal goals), resulting in inter-personal conflict, partial behavioural integration and disaffection. This dialectical framework can be seen in Figure 4.1 (adapted from Reeve, 2012). In this figure, the conditions of the coach-athlete dialect that produce engagement (left) versus disaffection (right) are presented.

In the left hand boxes (i.e., quality of athlete motivation), the motivational processes accountable for children's engagement and disaffection in sport, as described by basic psychological need theory, organismic integration theory and causality orientations theory, are presented. Within basic psychological need theory, children's inborn sources of motivation include the need to feel autonomous, competent and related as well as to exhibit curiosity, interest, spontaneity and enjoyment (i.e., intrinsic motivation). Within organismic integration theory, children's acquired sources of motivation include aspects of the environment that are fully internalised either as self-endorsed values, intrinsic goals and personal aspirations, or partially internalised as other-endorsed values, other's aspirations and extrinsic goals.

Within causality orientations theory, children's acquired sources of motivation include individual difference factors that dispositionally regulate behaviour in either an autonomous or controlled manner.

The upper arrows in the figure signify how children's engagement and disaffection in youth sport can emerge out of their inborn and acquired sources of motivation. In addition, by feeding forward into the youth sport environment, this arrow also signifies the desire of children to effectively interact with their social-context – seeking out behavioural integration in the form of opportunities for psychological need satisfaction. The boxes on the right hand side of the dialectical framework, then, represent the elements of the sporting environment that can either cultivate or inhibit children's inherent and acquired sources of motivation. Influences include interpersonal relationships with coaches, parents and peers as well as more macro level factors that might include social norms, league expectations, club structure, club values and club organisation. All of these influences have clear effects on children's motivation for youth sport. However, the athlete-coach bond is particularly important in the youth sports context and, indeed, special attention has been paid to understanding its dynamic from the perspective of self-determination theory (see Bartholomew, Ntoumanis, Thogersen-Ntoumani, 2009; Mageau & Vallerand, 2003; Ntoumanis, 2012).

In line with cognitive evaluation theory, some aspects of the coaching environment are events necessary to scaffold children's development in youth sport. That is, events which are essential to provide information regarding competence. Given that the fundamental role of coaches (and other instructors) is to develop achievement related competencies, such events are commonly evoked in youth sport. These events might include, as seen in Figure 4.1, rewards, goals, feedback, help, expectations and evaluation. According to self-determination theory, one important environmental source of feedback, help, expectation and evaluation is structure, which is defined as “the extent to which [socialisers] provide clear and consistent guidelines, expectations and rules for behaviours, without respect to the way in which they are promoted” (Grolnick & Ryan, 1989, p. 144). Structure is thus a standalone concept encompassing a provision of resources necessary to cultivate achievement related competencies. Structured contexts are logical and consistent such that in these settings children understand what is expected of them, and can anticipate the way in which others will react to their actions. In doing, structure provides children with internal schemata of how their actions and outcomes are linked. In the absence of structure, learning is experienced as chaotic (Jang, Reeve, & Deci, 2010) and, as a result, children may feel incompetent, isolated, and helpless (cf. Soenens, Vansteenkiste et al., 2007).

Accompanying aspects of structure in the athlete-coach dialectical framework are motivational styles exhibited by coaches. Motivational styles refer to the degree to which the coach confers opportunities to receive rewards, feedback and evaluation in a context this is facilitative or inhibitive of psychological need satisfaction. The coach motivational style, according to the athlete-coach dialectical framework, is the single most important aspect of the sporting environment (Mageau & Vallerand, 2003; see also Reeve, 2012). This is because, according to cognitive evaluation theory, coaches’ motivational styles determine the manner and degree by which structuring events in the social-context are endorsed as personally meaningful by athletes. The arrows at the bottom of the Figure 4.1 signify the external events (structure and motivational style) in the sporting environment that provide athletes with opportunities for autonomy, competence, relatedness, or hindrances that restrict these opportunities (Reeve, 2012).

Within self-determination theory, two specific motivational styles are purported to moderate the effect of structure on children's motivation and engagement. The first, autonomy support, refers to the degree to which coaches encourage children to take initiative in sport, be active problem solvers and take a child, rather than coach perspective (Black & Deci, 2000; Grolnick, 2003; Mageau & Vallerand, 2003). Several researchers have described the key components of autonomy support. Grolnick and Ryan (1989) and Reeve (2006b), for instance, highlight the importance of valuing children's thoughts and feelings by acknowledging negative affect. This psychological component of autonomy support is linked to the notion of coach empathy (cf. Koestner et al., 1984). Another component of autonomy support includes the provision of desired choice and joint-decision making (Marbell & Grolnick, 2013; Reeve, 2006b), which are purported to facilitate perceptions of volition. Finally, Assor, Kaplan and Roth (2002) similarly assert that an important aspect of autonomy support is to cultivate children's independence by allowing them to feel free to express their thoughts and opinions. In all, such provisions allow children to self-endorse structuring events and, thus, nurture their inborn and acquired sources of motivation – resulting in engagement.

The second motivational style purported to moderate the effects of structure on children's engagement is a controlling motivational style. Controlling coaches pressure children to meet demands, solve problems for them and take the coach, rather than child's perspective (Bartholomew et al., 2009; Grolnick, 2003; Mageau & Vallerand, 2003). Coach control has recently been operationalized to include the demonstration of highly controlling behaviours (e.g., rewards, pressure and harsh punishment) in addition to the exhibition of psychological control (e.g., guilt inducement and conditional regard; Bartholomew et al., 2010). These provisions stop athletes making a connection between structuring events and the personal relevance of such events and, thus, inhibit children's inborn and acquired sources of motivation – resulting in disaffection.

The athlete-coach dialectical framework within self-determination theory has been described previously (Mageau & Vallerand, 2003) and similar frameworks have been outlined in education (Reeve, 2012), parenting (Grolnick, Deci & Ryan, 1997) and healthcare (Patrick & Williams, 2012). Within sport, as in other domains, the broad ideas contained within this framework have been supported by an extensive body of research that has examined how rewards (Ryan, 1980), feedback (Mouratidis et al., 2010; Mouratidis et al., 2008), competition (Ntoumanis & Biddle, 1999) and coaches' motivational style (e.g., Aide et al., 2008; Bartholomew et al., 2011; Gagne et al., 2003) influence athletes' motivation. For instance, Mouratidis and colleagues (2008) showed that positive feedback from teachers positively predicted children's autonomous motivation and behavioural intensions for physical education. Similarly, Gagne et al (2003) noted that autonomy support from coaches positively predicted autonomous motivation in child gymnasts.

Recently, researchers (e.g., Adie et al., 2012; Bartholomew et al., 2011; Reinboth et al., 2004) have begun to integrate this research in tests of the overall athlete-coach dialectical framework. These tests, broadly, resemble the mediation model shown in Figure 4.2. Children's perceptions of their coaches' autonomy support and control are reported alongside their perceptions of psychological need satisfaction and thwarting and indicators of engagement and disaffection. The horizontal lines in Figure 4.2 represent hypothesised causal relationships, in which coach motivational style is assumed to cause changes in the psychological needs that, in turn, are assumed to cause changes in athletes' levels of engagement and disaffection. As will become clear, findings from various tests of the paths in this motivation mediation model have supported these hypotheses.

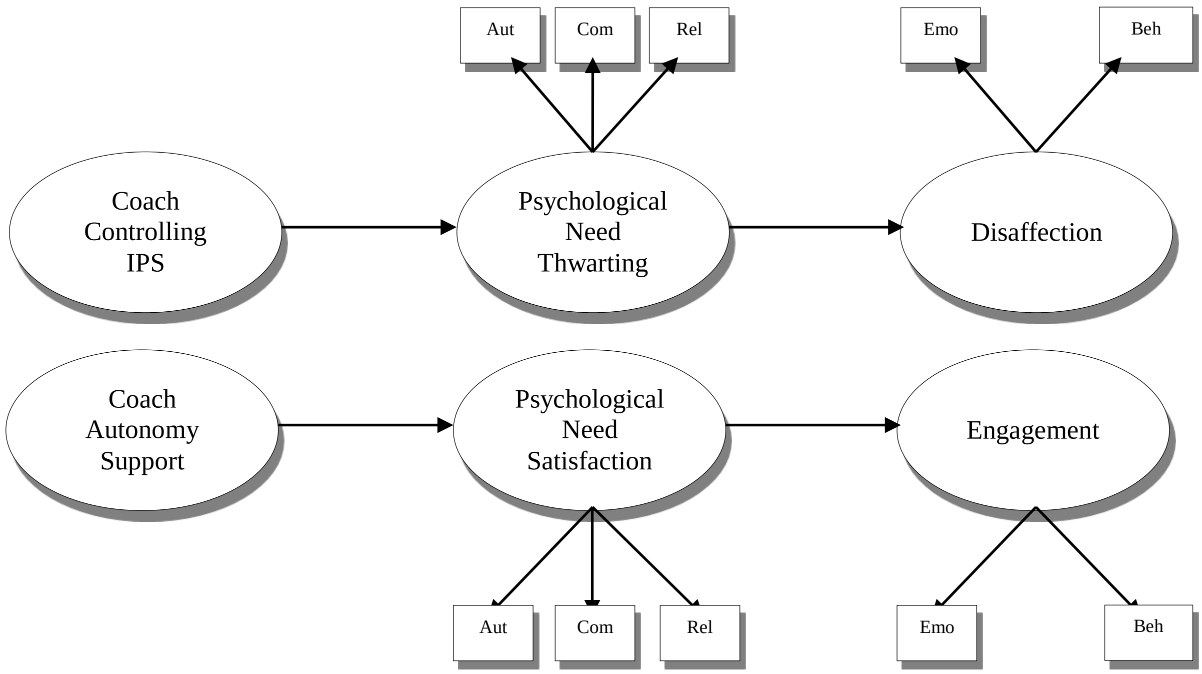

Figure 4.2 Self-determination theory's mediation model of children's engagement and disaffection in youth sport.

4.1.2 The influence of coaches' motivational style on children's psychological needs

According to self-determination theory, autonomy supportive behaviours are purported to support the psychological needs (Mageau & Vallerand, 2003). This is because permitting athletes the opportunity to voice and act on their ideas in sport is likely to afford satisfaction of the need for autonomy. Similarly, conveying trust in athletes' abilities to be self-directed in their behaviours is likely to satisfy competence. Likewise, taking interest in and respecting athletes' perspectives is likely to facilitate relatedness. Controlling coach behaviours, conversely, produce disaffection because they interfere with and actively thwart children's psychological needs. This is because the restriction of athletes input into their actions undermines perceptions of autonomy. Moreover, the discerning tone that accompanies a controlling inter-personal style conveys the message to athletes that they are ineffective in meeting coach demands. Finally, the detached demeanour that accompanies a controlling inter-personal style is not conducive to healthy inter-personal attachment.

Evidence for the positive role of autonomy support in the satisfaction of psychological needs is beginning to accumulate in domains other than sport. Baard and colleagues (2004), for instance, found that managers' autonomy support was positively correlated with autonomy, competence and relatedness in banking employees. These findings were found to be consistent across cultures in Bulgarian and US service industry employees (Deci et al., 2001). Further, analogous results have also been documented in education (Jang, Kim & Reeve, 2012), exercise (Edmunds, Ntoumanis & Duda, 2007), close relationships (Deci, La Guardia, Moller, Scheiner & Ryan, 2006), and parenting (Grolnick & Ryan, 1989) among others.

In sport, as in these other domains, research has found that autonomy support is an important facilitator of athletes' psychological need satisfaction. Gagne et al (2003) found that coach autonomy support correlated positively with daily expressions of autonomy and relatedness satisfaction in a sample of gymnasts. Further, Adie and colleagues (2012) and Quested and Duda (2011) found that autonomy support from coaches prospectively correlated positively with autonomy, competence and relatedness in dancers, adult sports participants and youth sports participants. Finally, Bartholomew et al (2011) found that coach autonomy support positively predicted a composite measure of psychological need satisfaction in a sample of adult athletes. In short, the importance of autonomy support for athletes' psychological need satisfaction is apparent.

Unlike autonomy support, however, relationships between control from coaches and athletes' psychological need satisfaction are less clear. Whereas controlling behaviours are suggested to undermine the satisfaction of the psychological needs, there is little evidence to support this hypothesis. Blanchard, Amiot, Perreault, Vallerand and Provencher (2009), for example, found no bivariate association between coach control and autonomy, competence and relatedness in a sample of adolescent athletes. More recently, Bartholomew and colleagues (2011) similarly noted that coach control had no relationship with composite psychological need satisfaction in adolescent sport participants. These findings indicate that a controlling inter-personal style may create contexts that actively obstruct or thwart the psychological needs, rather than contribute to lower need satisfaction per se (Bartholomew et al., 2011).

Researchers have thus recently turned their attention to the concept of psychological need thwarting in sport. This is because the frustration or thwarting of psychological needs is purported to describe the process underpinning negative behavioural, psychological and social consequences from the perspective of self-determination theory (Deci & Ryan, 2000). Bartholomew and colleagues (2011) describe psychological need thwarting as more than simply a lack of psychological need satisfaction. According to these authors, psychological need thwarting operates orthogonally with psychological need satisfaction and entails an active obstruction of autonomy, competence and relatedness. As such, the psychological needs are likely to be thwarted when an individual's sense of choice is restricted; they feel ineffective or the context is actively demeaning; and agents in the social-context are cold or rejecting (Vansteenkiste et al., 2010).

Bartholomew et al (2011) recently examined relationships between coach control and athletes' psychological need thwarting. They found that whereas control from coaches did not predict athletes' composite psychological need satisfaction, a moderate positive association was found between this motivational style and athletes' composite psychological need thwarting. These findings suggest that controlling coach practices have more utility in predicting the thwarting of psychological needs than in inhibiting their satisfaction. Integrating psychological need thwarting alongside psychological need satisfaction when testing the consequences of the coach motivational style (i.e., autonomy support and control), therefore, is important.

4.1.3 The influence of psychological need satisfaction to children's engagement and disaffection

The relationship between psychological need satisfaction and children's engagement in youth sport was of central interest in study one of this thesis. Results supported findings elsewhere (Hodge et al., 2008) regarding the multivariate relationships between children's psychological need satisfaction and their cognitive and affective engagement in sport. More broadly, though, the importance of autonomy, competence and relatedness for aspects of engagement has also been documented in a variety of life's domains, including education (Gillison et al., 2008), work (Van den Broeck et al., 2008), healthcare (Markland & Tobin, 2010), and close relationships (La Guardia, Ryan, Couchman, & Deci, 2000), among others (see Milyavskaya & Koestner, 2011). Consistent results have also been reported across the lifespan, including in childhood (Barkoukis, Hagger, Lambropoulos, Tsorbatzoudis, 2010), adolescence (Curran et al., 2013), adulthood (Ryan et al., 2010) and older adults (Kirkland, Karlin, Stellino & Pulos, 2011).

A growing body of research in the sport domain also attests to the importance of psychological need satisfaction for aspects of children's engagement in sport. In a sample of child sport participants, Jõesaar and Hein (2011) and Gagne et al (2003) noted that persistent athletes perceived more autonomy, competence and relatedness than those who dropped out. Similarly, Smith and colleagues (2007; 2011) and Taylor, Ntoumanis, Standage and Spray (2011) noted that the psychological needs were positively correlated with self-reported effort in adult athletes and physical education students. In addition, as regards emotional engagement, Reinboth and colleagues (Reinboth et al., 2004; Reinboth & Duda, 2006) found that the need for autonomy, competence and relatedness predicted subjective vitality and satisfaction (affective engagement) in youth sport participants. Gagne et al (2003) and Adie et al (2008; 2012) likewise observed that variation in subjective vitality was facilitated by the satisfaction of autonomy, competence and relatedness in a sample of youth gymnasts and soccer players.

In addition to each individual psychological need, numerous studies in sport have also examined the impact of an autonomy, competence and relatedness composite. The rationale for this is three fold. First, Deci and Ryan (2002) assert that the basic psychological needs are interrelated, such that one need cannot be satisfied in the absence of the other two. Second, the psychological needs consistently possess strong positive inter-correlations (e.g. Lonsdale et al., 2009; Stebbings, Taylor, & Spray, 2011). Finally, the psychological needs co-vary with positive and negative outcomes in a consistent manner (e.g. Hodge et al., 2008; Lonsdale et al., 2009; Quested & Duda, 2010). Taking this approach, Ntoumanis (2005) and Standage, Duda and Ntoumanis (2005) found that composite psychological need satisfaction was positively associated with self-regulation in physical education students. In addition, Avarez et al (2009) found that composite psychological need satisfaction also significantly predicted self-regulation and enjoyment in youth soccer players. In short, the importance of psychological need satisfaction (both a composite and individual needs) in aspects of children's engagement in sport is well documented.

Much less research has been afforded to the psychological need thwarting-disaffection relationship. This is primarily because operational distinctions between psychological need satisfaction and thwarting have only recently been established (see Bartholomew et al., 2011). Nevertheless, in one relevant study, Evans, McPherson and Davison (2012) found that children who dropped out of music instruction reported significantly higher psychological need thwarting than their engaged counterparts. Furthermore, Bartholomew et al (2011) similarly noted that psychological need thwarting positively predicted aspects of disaffection such as negative affect, depression and burnout in a sample of adult athletes. Initial evidence, then, appears to support the role of psychological need thwarting in aspects of disaffection.

4.1.4 The mediation of the coach-engagement relationship by the psychological needs

As discussed, according to the self-determination theory, the psychological needs represent a unifying principle in relationships between the social context and children's engagement. The psychological needs are thus an explanatory mechanism that mediate links between coach and children's engagement in youth sport. Tests of this mediation model must therefore consider all paths from coach motivational style to the psychological needs to children' s engagement and disaffection as seen in Figure 4.2. A number of studies in sport, and in other domains, have attempted this.

Reinboth et al (2004), for instance, found that autonomy support from coaches positively correlated with psychological need satisfaction that, in turn, correlated positively with subjective vitality and life satisfaction in a sample of youth sports participants. Similar findings have also been reported by Aide and colleagues (2008, 2012), who observed that coaches' autonomy support was positively associated with all three psychological needs that, in turn, correlated positively with vitality in adult athletes.

Extending this work, researchers have more recently begun to concurrently examine coach control and psychological need thwarting alongside autonomy support and psychological need satisfaction. This research, conducted by numerous authors (Bartholomew et al., 2011; Belaguer, Gonzalez, et al., 2012; see also Blanchard et al., 2009), is similarly supportive of self-determination theory's mediation model. As in other research examining this pathway in the model (e.g., Adie et al., 2008, 2012; Reinboth et al., 2004), these authors found that autonomy support from coaches positively predicted psychological need satisfaction that, in turn, positively predicted positive affect and vitality in adult and adolescent athletes. Extending research, they also found that controlling behaviours by coaches positively predicted psychological need thwarting that, in turn, positively predicted adult and adolescent athletes' negative affect, depression and burnout. Subsequent analyses have further revealed that the effects of psychological need thwarting to negative outcomes extend beyond the contributions made by psychological need satisfaction (Gunnell, Crocker, Wilson, Mack & Zumbo, 2013). Therefore, owing to its unique explanatory ability in negative outcomes, the inclusion of the pathway from controlling behaviours to psychological need thwarting – alongside autonomy support and psychological need satisfaction – is important.

The salience of coaches' motivational style to children's psychological needs, and thereby engagement and disaffection, is readily apparent. Yet while evidence for the importance of both pathways in self-determination theory's mediation model is beginning to accrue, there remain a number of unanswered issues on this topic. In particular, with the recent emergence of two divergent pathways (autonomy-psychological need satisfaction versus control-psychological need thwarting), research has only just begun to ascertain their unique and collective effects. To this end, Bartholomew et al (2011) reported significant effects of both psychological need satisfaction and thwarting to athletes' vitality, whereas psychological need thwarting emerged as the only significant predictor of burnout. Balaguer et al (2012) and Gunnell et al (2013), on the other hand, found significant effects of psychological need satisfaction and thwarting to athletes' burnout and negative affect, whereas psychological need satisfaction emerged as the only significant predictor of vitality and positive affect. As such, the extent to which psychological need satisfaction and thwarting inhibit negative and positive experiences in sport remains unclear – alluding to the importance of further testing these processes concurrently.

Based on the evidence presented above, an integration of aspects of coach behaviour in tests of children's engagement and disaffection in youth sport is warranted. Study two of this thesis, then, extended study one by measuring perceptions of coach behaviour (viz. autonomy support and control) and psychological need thwarting. In doing so, self-determination theory's mediation model can be fully examined in this context. In addition to this, two other extensions were made in this second study of the thesis. These include an examination of behavioural engagement and an integration of disaffection. Attention now turns to these concepts.

4.1.6 Examining behavioural engagement.

It is striking that no research has yet been afforded to examining self-determination theory's mediation model in relation to children's behavioural engagement in youth sport. Behavioural engagement, as described in chapter one, is particularly important to understand in this context for a number of reasons. To recap, behavioural engagement functions as the pathway linking children's motivational processes to their subsequent learning and development (Duda, 2001; Kirk, 2005; Wellborn, 1991). Research of Finn and colleagues, using National Educational Longitudinal Survey data in the US, indeed shows that behavioural engagement is an instrumental predictor of academic achievement in school children (see Finn & Zimmer, 2012). This learning and achievement, in turn, cultivates the perceived behavioural control that is influential in children decisions to persist versus dropout of youth sport (Mulvihill et al., 2000; Pelletier et al., 2001; Ullrich-French & Smith, 2009).

Furthermore, despite a general acknowledgement that engagement encapsulates cognitive and affective elements, researchers have debated their overlap with children's motivation – attesting to the importance of assessing behavioural engagement in motivational models (see Martin, 2012).Voelkl (2012), for example, suggests that affective identification with school is a form of motivation that produces behavioural engagement in learning activities. Likewise, Ainley (2012) notes that inner psychological factors, such as interest (viz. affect), encompass the motivation underpinning active involvement in school (viz. behavioural engagement). Hence, in line with the notion that engaged behaviour represents the most proximal and observable manifestation of engagement (Christenson, Reschly, et al., 2008; Clearly & Zimmerman, 2012), the current study turns to understanding behavioural, rather than cognitive and affective, engagement in youth sport.

4.1.5 Integrating disaffection

It is also striking that very few concurrent tests of the divergent processes within self-determination theory that signpost children's behavioural engagement and disaffection have been conducted (see Figure 3). As a pre-cursor to dropout, behavioural disaffection is important to understand alongside behavioural engagement. When children dropout of youth sport, they leave the control of the youth sport environment and are often difficult to reach thereafter. Consequently, it is difficult to re-engage them. Dropping out of youth sport, though, is only one end of a more general process of disaffection, a process that typically begins much earlier (cf. Connell & Wellborn, 1991; Henry, Knight & Thornberry, 2012; Skinner et al., 2008). In terms of prevention, then, measuring disaffection may be informative as regards the early antecedents of youth sports attrition.

Integrating behavioural disaffection is also informative theoretically. Recent research has highlighted the relevance of both psychological need satisfaction and thwarting for unifying relationships between coach autonomy support and control to athletes' indicators of positive and negative emotional adjustment (Bartholomew et al., 2011). Yet it is unclear if these indirect relationships extend to behavioural indicators of positive and negative adjustment. Moreover, high psychological need thwarting may speak more closely than low psychological need satisfaction to the motivational processes that contribute to children's disaffection in youth sport. Concurrent tests of psychological need thwarting and satisfaction will allow for a test of this hypothesis.

4.1.7 The present research

The present research had two aims. First, we intend to extend the work of Bartholomew et al (2011) and Balaguer et al (2012) by testing the adequacy of self-determination theory's mediation model in relation to children's behavioural engagement and behavioural disaffection in youth sport (see Figure 4.3). In this model, autonomy support from coaches was hypothesised to positively predict children's psychological need satisfaction that, in turn, was hypothesised to positively predict their engaged behaviour. By contrast, coaches' provision of a controlling interpersonal style was hypothesised to positively predict children's psychological need thwarting that, in turn, was hypothesised to positively predict their disaffected behaviour.

The second aim of the present research was to identify the unique and collective effects of the psychological needs (both satisfaction and thwarting) to behavioural engagement and behavioural disaffection. To do this, in addition to the hypothesised parallel paths, the cross-over paths in self-determination theory's mediation model were concurrently examined (Figure 4.3; dashed arrows). Conflicting findings make empirically grounded expectations difficult, however on the basis of self-determination theory, it was hypothesised that autonomy support from coaches would negatively predict psychological need thwarting that, in turn, would negatively predict behavioural disaffection. By contrast, control from coaches was expected to negatively predict psychological need satisfaction that, in turn, would negatively predict behavioural disaffection.

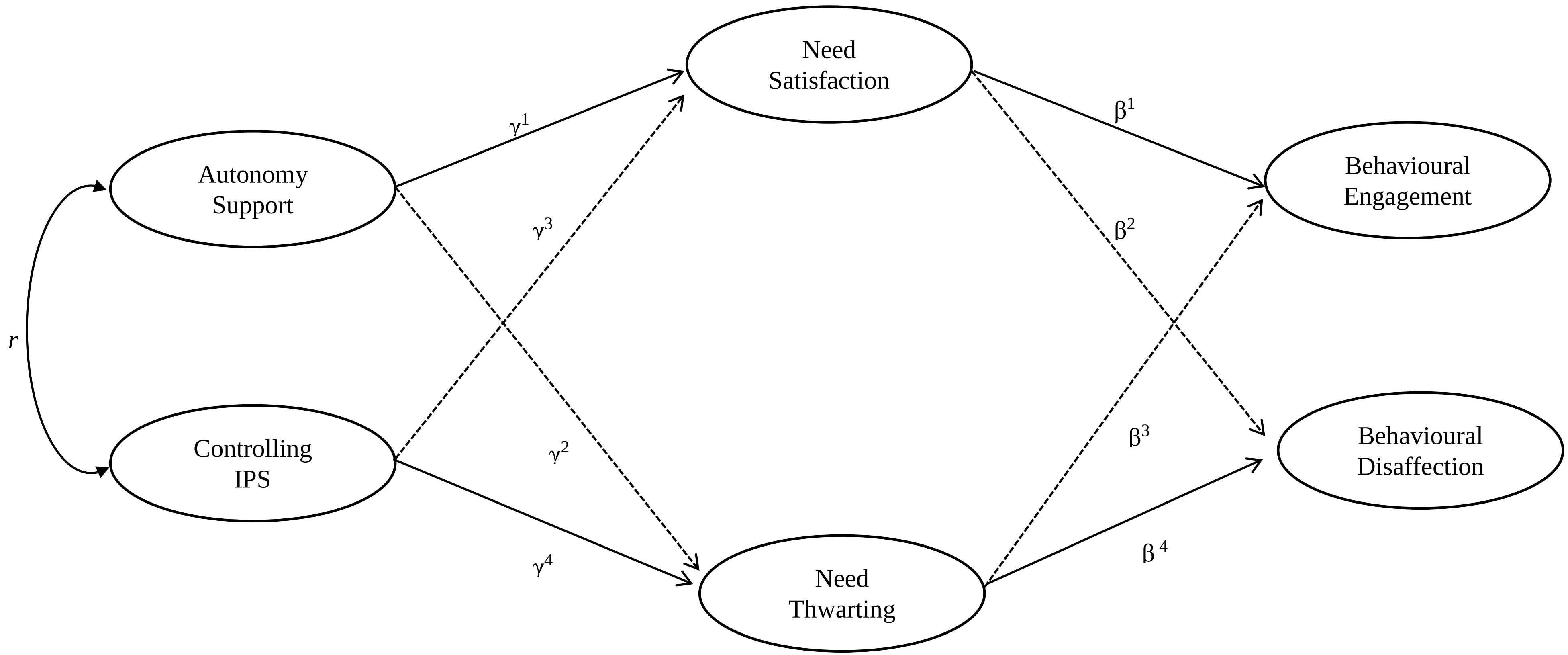

Figure 4.3 Hypothesised mediation model of coach inter-personal style, psychological need satisfaction/thwarting and behavioural engagement/disaffection. Path letters denote paths in Table 4.1. *Note.* dashed lines indicate a hypothesised negative relationship; un-dashed lines indicate a hypothesised positive relationship.

4.2 Method

4.2.1 Participants and procedure

One-hundred and fifty-three (115 male, 38 female; M age = 13.96 years, *s* = 1.41, range = 12-18) young recreational soccer players were the sample of this study. The athletes reported that they had been playing soccer for an average of 7.04 (SD = 2.21) years and had been attached to their clubs for an average of 3.56 (SD = 2.39) years. Prior to data collection, ethical approval was provided by the research ethics committee of York St John University and parental consent was sought for the children's participation (Appendix C). Data collection was conducted in a training session setting, where the lead author was on hand at all times to give general instructions and answer any questions. A multi-section questionnaire was given to the participants. The questionnaire took approximately 20 minutes to complete.

4.2.2 Instruments

All items were responded to on a seven-point Likert scale, which ranged from 1 (*not true at all*) to 7 (*very true*).

4.2.2.1 Behavioural engagement and disaffection

Engaged and disaffected behaviours were assessed using the behavioural sub-scales of the Engagement Versus Disaffection with Learning Scale (EVDLS; Skinner et al., 2009; Wellborn, 1991 see Appendix Q). These items were adapted to focus participants on soccer training. Behavioural engagement was measured using five items that tapped children's effort, attention and persistence while participating in soccer (e.g. "I try hard to do well in training"). Behavioural disaffection was assessed using five items that tapped children's lack of effort and withdrawal from soccer (e.g. "In training, I do just enough to get by"). These scales have been found to be valid and internally reliable in educational contexts (Skinner et al., 2008; Skinner et al., 2009).

As the scale was adapted in the current study, it was considered necessary to assess the psychometric properties of this scale more closely. The factor structure of the adapted EVDLS for soccer was assessed using confirmatory factor analysis, using structural equation modelling with maximum likelihood estimation. A measurement model was defined that included two correlated latent factors: behavioural engagement (five observed indicators) and behavioural disaffection (five observed indicators). This model demonstrated acceptable fit to the observed data: χ^2 (34) = 88.10, $p < .001$; $\chi^2/df = 2.59$; IFI = .92; CFI = .92; SRMR = .07; RMSEA = .10 (Schmeller-Engel, Moosbrugger, & Müller, 2003). Consequently, the analyses supported the use of the adapted sub-scales.

4.2.2.2 Psychological need satisfaction

Psychological need satisfaction was assessed using the Basic Need Satisfaction in Sport Scale (BNSSS adapted for soccer; Ng, Lonsdale & Hodge, 2011 see Appendix O). This twenty-item scale measures autonomy satisfaction (ten items; e.g. "In soccer, I can take part in the decision-making process, relatedness satisfaction (five items; e.g. "In soccer, I feel close to other people") and competence satisfaction (five items; e.g. "I have the ability to perform well in soccer"). This scale has been found to possess adequate psychometric properties in sport (Ng et al., 2011).

4.2.2.3 Psychological need thwarting

Psychological need thwarting was measured using the Psychological Need Thwarting Scale (PNTS adapted for soccer; Bartholomew, Ntoumanis, Ryan & Thogersen-Ntmoumani, 2011 see Appendix P). This twelve-item scale measures autonomy thwarting (four items; e.g. "I feel pushed to behave in certain ways in soccer."), relatedness thwarting (four items; e.g. "I feel others in football can be dismissive of me.") and competence thwarting (four items; e.g. "There are situations in soccer where I am made to feel inadequate.”). This scale has been found to possess adequate psychometric properties in sport (Bartholomew et al., 2011).

4.2.2.4 Perceived autonomy support

An adapted sport version (Gillet, Vallerand, Paty, Gobancé, Berjot, 2010 see Appendix S) of the Perceived Autonomy Support Scale for Exercise Settings (PASSES; Hagger, Chatzisarantis, Hein, Pihu, Soos & Karsai, 2007) was employed to measure perceived coach autonomy support. This twelve-item inventory taps children’s perceptions of their coaches’ provision of autonomy support (e.g. “I feel that my coach provides me with choices, options and opportunities about whether to play soccer”). This adapted version of the PASSES has been found to possess adequate psychometric properties in sport (Gillet et al., 2010).

4.2.2.5 Perceived controlling interpersonal style

The Controlling Coach Behaviours Scale (CCBS; Bartholomew et al., 2010 see Appendix R) was employed to measure perceived coach controlling interpersonal style. This fifteen-item inventory measures children’s perceptions of their coaches controlling use of rewards (four items; e.g. “My coach only uses rewards or praise to make me train harder”), negative conditional regard (four items; e.g. “My coach pays me less attention if I have displeased him/her”), intimidation (four items; e.g. “My coach threatens to punish me to keep me in line in training”) and excessive personal control (three items; e.g. “My coach tries to control what I do during my free time”). This scale has also been found to possess adequate psychometric properties in sport (Bartholomew et al., 2010).

4.2.3 Analytical strategy

Structural equation modelling (AMOS version 18.0; Arbuckle, 2007) with maximum likelihood estimation was the primary data analysis strategy. Using a two-step method, a confirmatory factor analysis was first used to assess the measurement model and was followed by an assessment of the hypothesised model (Anderson & Gerbing, 1988). This approach first establishes the validity of the measurement model by examining the relation of the observed variables (e.g., psychological need satisfaction) to their underlying constructs (e.g., autonomy, competence and relatedness). Secondly, this approach then establishes the validity of the casual model by comparing the hypothesised variance-covariance matrix to the sample variance-covariance matrix. If the two variance-covariance matrices are closely matched (implied by fit indices), the conclusion is that the hypothesised model approximates the data well.

To determine the statistical significance of the mediated pathways in the current study, indirect effects were calculated and their 95% confidence intervals were calculated using a distribution of the products method (*PRODCLIN* programme; MacKinnon, Fritz, Williams & Lockwood, 2007). Indirect effects are the product of the coefficients (i.e., *ab*; Hayes, 2009), where *a* is the path from the predictor to the mediator and *b* is the path from the mediator to the criterion. The 95% confidence interval denotes the upper and lower boundary of an indirect effect that would be observed 95 times out of 100 if a sample of the same size were to be drawn from the population. Provided that a null or zero effect is not observed between the upper and lower bound of the 95% confidence interval, the indirect effect is deemed significant at the $p < .05$ level.

4.3 Results

4.3.1 Preliminary analysis

Missing value analysis revealed that there were 113 complete cases and 40 incomplete cases. Of the cases with incomplete data, none had more than 3 items missing (M = 1.38, SD = .66, range = 1-3). Missing values were therefore replaced with the mean of the non-missing items in the respective sub-scale for each individual case (Graham et al., 2003). A central assumption of structural equation modelling is a normal distribution. However, while the data was considered approximately univariate normal (absolute skewness $M = .16$, $s = .49$, SE = .12; absolute kurtosis $M = .54$, $s = .29$, SE = .39), estimates of multivariate kurtosis (Mardia's normalised coefficient = 27.52) indicated the data was multivariate asymmetrical (Kline, 1998). Conventional modelling using maximum likelihood estimation is robust to small violations of normality (McDonald & Ho, 2002). However, concerns arise regarding the type I error (rejection of a true null hypothesis) attached to the chi-square statistic under circumstances of moderate to major violations (Curran, West, & Finch, 1996).

This problem was remedied in two ways. Firstly, model fit was not solely based on the interpretation of the chi-square. Following guidelines provided by Hu & Bentler (1995), two absolute (Standardised Root Mean Square Residual [SRMR] and Root Mean Squared Error of Approximation [RMSEA]) and two incremental (Tucker Lewis Index [TLI] and Confirmatory Fit Index [CFI]) fit indexes were reported. Fit was deemed acceptable in the current study if; IFI and CFI > .90 and RMSEA < .10 (Marsh, Hau & Wen, 2004; Schmeller-Engel et al., 2003). Secondly, structural equation analysis was followed by a bootstrapping procedure that drew multiple replication samples to test parameter stability (Efron & Tibshirani, 1998). Bootstrapping produces an empirical representation of the sampling distribution of path coefficients by treating the observed sample as a representation of the population in miniature, one that is repeatedly resampled as a means of reproducing the original sampling process (Hayes, 2009). The resampling is achieved with replacement such that a new sample of the same size is produced by using the characteristics of the original sample. After every resample path coefficients are estimated. This process is repeated for a total number of k times (where k is some large number, typically at least 1000) and the mean path coefficient across these iterations is reported as the bootstrap estimate. Provided the bootstrap estimate closely approximates the sample coefficient, high stability can be inferred.

4.3.2 Assessment of the measurement model

The measurement model consisted of 7 related latent factors that represented all study variables. Scores for each item were used as the measured variables for the latent behavioural engagement and disaffection factors. Subscales were used as measured variables for the latent factors; controlling interpersonal style, psychological need satisfaction and psychological need thwarting. As autonomy support contained a large number of items, three random parcels of items were used as manifest variables (Little, Cunningham, Shahar & Wilderman, 2002). Item parceling reduces the number of parameters estimated, resulting in more stable parameter and model fit estimates (Bagozzi & Edwards, 1998; Bandalos & Finney, 2001; Little et al., 2002). Further, when there is evidence of non-normality in the data, studies indicate item parceling improves the distribution of the indicators and thus estimates of model fit are enhanced in comparison to the original items (Bandalos, 2002).

Each of these latent factors demonstrated acceptable composite reliability (Dillon-Goldstien's rho = .94 for autonomy support, .93 for control, .93 for psychological need satisfaction, .93 for psychological need thwarting, .89 for behavioural engagement and .85 for behavioural disaffection; Nunnally & Bernstein, 1994). Composite reliability is understood to be more indicative of construct reliability than traditional approaches (e.g., Cronbach's alpha) because it considers the relative influence of each indictor to its higher order factor (Silva, Markland et al., 2010). Furthermore, the measurement model exhibited an acceptable fit to the data: χ^2 = 377.86 (215), p < .05; χ^2/df =1.57; TLI = .92; CFI = .93; SRMR = .06; RMSEA = .07 and the error free correlations between all latent factors were significant.

Autonomy support was positively associated with psychological need satisfaction (r = .77, p <.01) and behavioural engagement (r = .67, p <.01), and inversely associated with psychological need thwarting (r = -.57, p <.01), behavioural disaffection (r = -.44, p <.01) and controlling interpersonal style (r = -55, p <.01). A controlling interpersonal style was inversely related to psychological need satisfaction (r = -.55, p <.01) and behavioural engagement (r = -.55, p <.01), and positively associated with psychological need thwarting (r = .67, p <.01) and behavioural disaffection (r = .44, p <.01). Psychological need satisfaction was positively related to behavioural engagement (r = .74, p <.01) and inversely related to psychological need thwarting (r = -.67, p <.01) and behavioural disaffection (r = -.55, p <.01). Psychological need thwarting was inversely associated with behavioural engagement (r = -.49, p <.01) and positively associated with behavioural disaffection (r = .50, p <.01). Finally, behavioural engagement was inversely related to behavioural disaffection (r = -.65, p <.01).

4.3.3 Structural equation modelling

The hypothesised model that was tested can be seen in Figure 4.3. Fit indexes suggested the hypothesized model possessed an adequate fit to the data: χ^2 (221) = 422.14 , p < .05; χ^2/df = 1.91; TLI = .90; CFI = .92; SRMR = .07; RMSEA = .08. Autonomy support divergently predicted psychological need satisfaction (γ = .68, p< .01) and thwarting (γ = -.31, p< .01). Likewise, controlling interpersonal style divergently predicted psychological need satisfaction (γ = -.21, p< .01) and thwarting (γ = .51, p< .01). Psychological need satisfaction, in turn, divergently predicted behavioural engagement (β = .78, $p < .01$) and disaffection (β = -.44, $p < .01$). Psychological need thwarting predicted behavioural disaffection (β = .23, $p < .05$) but not engagement (β = .00, $p > .05$). The hypothesised model accounted for 65% of the variance in psychological need satisfaction, 52% of the variance in psychological need thwarting, 61% of the variance in behavioural engagement and 35% of the variance in behavioural disaffection.

4.3.4 Bootstrap analysis

Bootstrapping was employed to test the stability of the hypothesised model parameters. To do this 1000 new samples were drawn with replacement from the original data set, and the cumulative mean parameter estimates were inspected. The resulting means for each standardised path coefficient across the 1000 iterations were almost identical to those derived from the maximum likelihood estimation method. Therefore, high parameter stability can be inferred (see Table 4.1).

4.3.5 Indirect effects

Specific indirect effects were calculated to further test the mediating role of psychological need satisfaction and thwarting. To do this, specific indirect effects were calculated and their 95% confidence intervals were inspected using MacKinnon and colleagues' (2007) *PRODCLIN* programme. All specific indirect effects were significant with the exception of the specific indirect effects of the two inter-personal styles on behavioural engagement via psychological need thwarting (see Table 4.2).

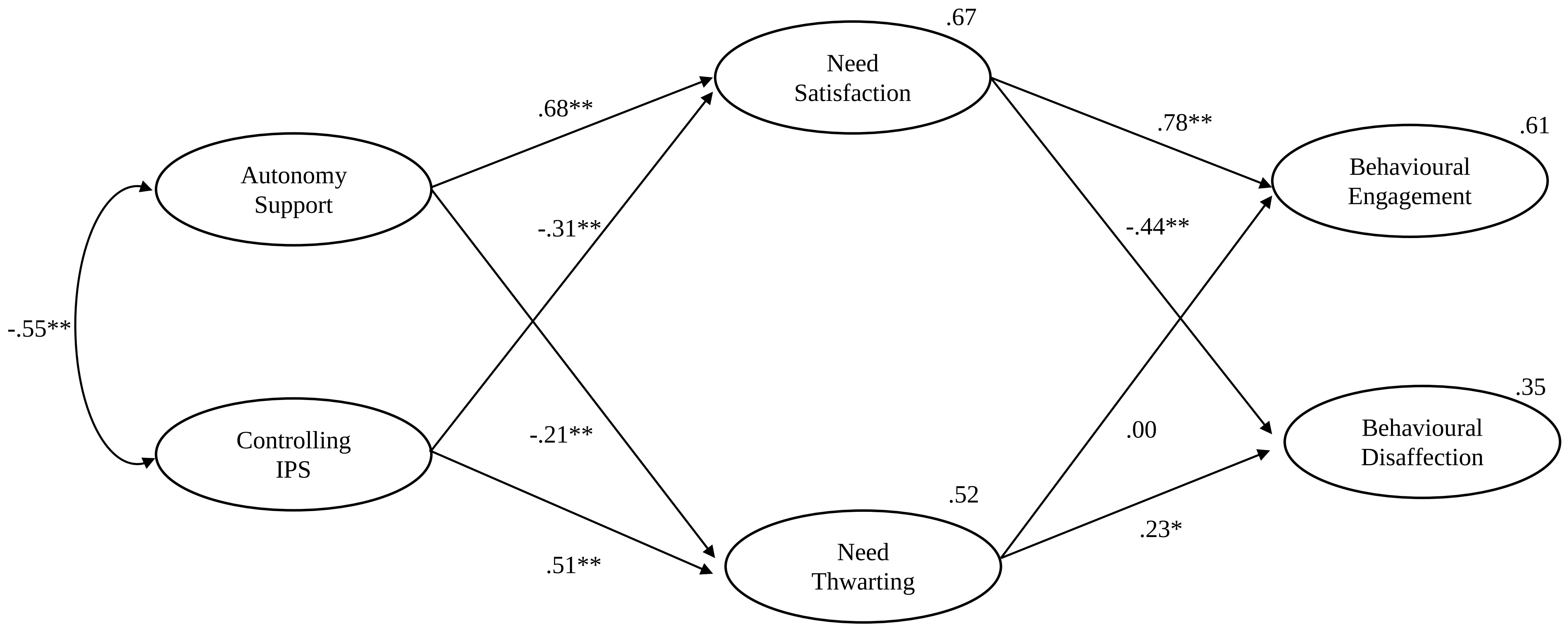

Figure 4.4 Results of structural equation modelling for the hypothesised mediation model. *p <.05, **p <.01.

Table 4.1 *Standardised coefficients for the paths in the hypothesized model and results from the bootstrap analysis.*

	Standardised coefficient	Bootstrap analyis for hyp. model		
Path	Hypothesised model	Mean st. coefficient	SE	95% CI st. coefficient
Autonomy support to psychological need satisfaction (γ^1)	.68**	.67	.10	.45 to .85
Autonomy support to psychological need thwarting (γ^2)	-.31**	-.31	.12	-.31 to -.07
Controlling IPS to psychological need satisfaction (γ^3)	-.21**	-.21	.09	-.21 to -.41
Controlling IPS to psychological need thwarting (γ^4)	.51**	.50	.10	.51 to .32
Psychological need satisfaction to behavioural engagement (β^1)	.78**	.78	.09	.57 to .94
Psychological need satisfaction to behavioural disaffection (β^2)	-.44**	-.45	.13	-.44 to -.69
Psychological need thwarting to behavioural engagement (β^3)	.00	-.00	.12	-.25 to .20
Psychological need thwarting to behavioural disaffection (β^4)	.23*	.23	.15	-.06 to .51
Correlation autonomy support and controlling IPS (*r*)	-.55**	-.54	.07	-.69 to -.40

Note. St. coefficient = standardised coefficient; CI = confidence interval; hyp = hypothesised. Bootstrap analysis was based on 1000 iterations. The standardised coefficient columns denote the standardised betas or gammas of the various paths with the exception of *r* which denotes the bivariate correlation.*p <.05, **p <.01.

Table 4.2 *Specific indirect effects.*

Predictor (X) → Mediator (M) → Outcome (Y)	Indirect effect *ab* (SE)	95% CI
Engagement		
Autonomy support→Need satisfaction→Behavioural engagement	.53 (.10)	.34 to .74
Autonomy support → Need thwarting→ Behavioural engagement	-.00 (.03)	-.05 to .05
Controlling IPS →Need satisfaction→Behavioural engagement	-.16 (.05)	-.27 to -.70
Controlling IPS →Need thwarting→ Behavioural engagement	.00 (.04)	-.09 to .09
Disaffection		
Autonomy support→Need satisfaction →Behavioural disaffection	-.30 (.07)	-.44 to -.17
Autonomy support → Need thwarting→ Behavioural disaffection	-.07 (.03)	-.13 to -.02
Controlling IPS→Need satisfaction→Behavioural disaffection	.09 (.03)	.04 to .16
Controlling IPS → Need thwarting→ Behavioural disaffection	.11 (.04)	.04 to .20

Note. The 95% confidence intervals for the indirect effects were those derived from the *PRODCLIN* programme that produces confidence intervals on the basis of a distribution-of-the-product-method (Mackinnon et al., 2007).

4.4 Discussion

The purpose of this study was two-fold. First, I intended to test self-determination theory's mediation model in relation to behavioural engagement and behavioural disaffection in youth sport. In this model, autonomy support from coaches was hypothesised to positively predict psychological need satisfaction that, in turn, was hypothesised to positively predict youth sports participants' engaged behaviour. By contrast, control from coaches was hypothesised to positively predict psychological need thwarting that, in turn, was hypothesised to positively predict youth sports participants' disaffected behaviour.

Second, in addition to the hypothesised parallel paths, the cross-over paths were concurrently tested to examine unique and collective effects in self-determination theory's mediation model. It was hypothesised that autonomy support from coaches would negatively predict psychological need thwarting that, in turn, would negatively predict behavioural disaffection. By contrast, control from coaches was expected to negatively predict psychological need satisfaction that, in turn, would negatively predict behavioural disaffection. Findings indicated that the hypothesised model possessed an adequate fit to the observed data and, with the exception of the psychological need thwarting-behavioural engagement path, all hypothesised relationships were significant and in the expected directions. Additional support for the model was provided by the indirect effects, with all but two (those containing the null path between psychological need thwarting and behavioural engagement) reaching significance.

4.5 self-determination theory's mediation model of behavioural engagement and behavioural disaffection

At the zero-order level, the provision of autonomy support from coaches positively correlated with behavioural engagement and negatively correlated with behavioural disaffection. By contrast, a controlling-interpersonal style negatively correlated with behavioural engagement and positively correlated with behavioural disaffection. These findings indicate that the two types of coaching behaviour have a differential relationship with behavioural engagement and behavioural disaffection in a manner observed for affective outcomes by others (Adie et al., 2008; Bartholomew et al., 2011; Balaguer et al., 2012; Reinboth et al., 2004). In doing so, the results substantiate the notion that encouraging self-directed action and tempering the use of controlling behaviour have high predictive utility in sport. Notably, in an extension to extant research, our findings indicate that the predictive utility of autonomy support and a controlling interpersonal style extend to the adherence and attrition fostering self-regulatory strategies (viz. attention, persistence and effort versus passivity, disinterest and a lack of initiation) evident in engagement and disaffection.

Consistent with findings from previous research (Adie et al., 2008; Bartholomew et al., 2011; Balaguer et al., 2012; Reinboth et al., 2004), the effects of coach autonomy support and control to behavioural engagement and disaffection were mediated, to varying degrees, by the satisfaction and thwarting of the psychological needs. As was expected, coaches' provisions of autonomy support indirectly corresponded with higher behavioural engagement via higher psychological need satisfaction. Moreover, autonomy supportive coaches also appear to keep behavioural disaffection in check. This is because autonomy support indirectly predicted lower behavioural disaffection via lower psychological need thwarting and higher psychological need satisfaction. According to self-determination theory, the psychological needs underpin children's personal endorsement of sports participation.

This volitional regulation is influential in athletes' satisfaction and enjoyment (Ntoumanis, 2012) and, thus, appears to pave the way for both a promotion of effort and persistence as well as a resistance to passivity and disinterest in youth sport.

Controlling coaches, by contrast, indirectly contributed to higher behavioural disaffection and lower behavioural engagement. This is because a controlling interpersonal style predicted higher psychological need thwarting and lower psychological need satisfaction. According to self-determination theory, low psychological need satisfaction and high psychological need thwarting provoke adolescents to relinquish the personal endorsement of their sporting participation for compensatory environmental motives (e.g., others approval, rewards, punishment evasion). This controlled regulation is influential in athletes' negative affect and boredom (Ntoumanis, 2012) and, thus, appears to pave the way for a promotion of passivity and disinterest as well as a resistance to effort and persistence in youth sport. Overall, the findings support self-determination theory's mediation model and, in doing, underscore the unifying role of autonomy, competence, and relatedness in the effect of the sporting environment (the coach) to children's behavioural engagement and behavioural disaffection in youth sport.

The results also have important implications for the unique and combined effects of the psychological needs in sports populations. Corresponding with the research of some authors (e.g., Aide et al., 2008; Balaguer et al., 2012; Gunnell et al., 2013), but not others (Bartholomew et al., 2011), psychological need satisfaction uniquely contributed to both positive (viz. behavioural engagement) and negative outcomes (viz. behavioural disaffection). These effects suggest that psychological need satisfaction has a dual role in fostering behavioural engagement and buffering behavioural disaffection in youth sport. Such duality reinforces the importance of autonomy supportive coach behaviours that serve to promote psychological need satisfaction.

This duality, though, was not displayed by psychological need thwarting, which uniquely predicted disaffection, but not engagement. This finding is akin to that observed elsewhere (Balaguer et al., 2012; Gunnell et al., 2013). Psychological need thwarting thus appears to have effects that are important in the onset of behavioural disaffection but contribute little unique explanatory ability in behavioural engagement. It is noteworthy that the compensatory motives sought by athletes' when their needs are thwarted (e.g., others approval, rewards, punishment evasion) can contribute to behavioural investment, at least in the short term, alluding to a potential counteractive effect. Nevertheless, studies have indicated that psychological need thwarting is important in uniquely explaining negative experience (Bartholomew et al., 2011; Balaguer et al., 2012; Gunnell et al., 2013) and the current findings support this notion. In doing so, the importance of resisting the use of controlling strategies to motivate athletes is further reinforced since such provisions cultivate psychological need thwarting.

4.5 Conclusion

In summary, the results of the present study support self-determination theory's mediation model in the context of children's behavioural engagement and behavioural disaffection in youth sport. Specifically, autonomy support safeguards their behavioural engagement and eschews disaffection. This is because such provisions provide for the satisfaction of psychological needs and resists psychological need thwarting. By contrast, coaches' provision of control appears to produce higher levels of behavioural disaffection, and lower levels of behavioural engagement, in youth sport. This is because such provisions both thwart and undermine the satisfaction of adolescents' psychological needs. The results speak to the adaptive role of autonomy support and psychological need satisfaction in sustaining adolescents' behavioural engagement and thereby adherence in youth sport.

Chapter Five: A longitudinal test of a self-determination theory's mediation model of children's behavioural engagement and behavioural disaffection in youth sport

5.1 Introduction

In an effort to better understand the antecedents of psychological need satisfaction in youth sport, a mediation model of children's behavioural engagement and disaffection was tested in the second study of this thesis. This mediation model was based upon self-determination theory's athlete-coach dialectical framework. Specifically, the psychological needs (satisfaction versus thwarting) were posited to mediate relationships between coach motivational styles (autonomy supportive versus controlling) and children's engagement and disaffection in sport. Structural equation modelling showed that the hypothesised model fit the data well and thus initial results are supportive of this framework. A critical assumption in these models is that coach behaviours cause changes in children's psychological needs that in turn cause changes in their engagement and disaffection. However, owing to the cross-sectional nature of the study design, the findings only provide an initial indication of this possibility and did not directly assess change.

The inclusion of change to analyses is important because self-determination theory makes a number of important predictions regarding the motivational dynamics of children's engagement. Most notably, self-determination theory adopts an organismic-dialectical outlook wherein the organism and the environment share a reciprocal relationship (Deci & Ryan, 1985, 2000; Ryan & Deci, 2000, 2002). Accordingly, children are proactive in both receiving and seeking out opportunities for psychological need satisfaction. One of the ways in which children seek out psychological need satisfaction is by being actively engaged in youth sport (Jang et al., 2012; Reeve, 2012). As such, these constructs are not easily disentangled temporally. Longitudinal data that contain a temporal component allow such reciprocity to be captured and as such should be preferred in tests of such psychological process (Cole & Maxwell, 2003; Maxwell & Cole, 2007).

There are, though, many logistical constraints to longitudinal designs in psychology. In particular, longitudinal designs require a large sample size across multiple waves of data and thus carry a heavy time and financial burden for researchers. Perhaps understandably, then, the use of cross-sectional data is the convention in most empirical tests of mediation in sport psychology. According to SportDiscuss and PsycInfo, in 2012 a number of popular sports journals (the *Journal of Sport and Exercise Psychology; Psychology of Sport and Exercise;* the *Journal of Sport Sciences; Medicine and Science in Sport and Exercise;* the *International Journal of Sport and Exercise Psychology; Sport, Exercise and Performance Psychology;* and the *Scandinavian Journal of Sport and Exercise*) carried 20 tests of mediation. Of these, 13 (65%) were based on cross-sectional data. Another 3 (15%) did not make use of their longitudinal data, by design flaw or otherwise, and utilised panel designs that treat earlier variables as predictors of later variables. Eighty per cent of the studies were thus essentially cross-sectional in that they tested mediation with no control for time.

Among the truly longitudinal designs, other problems were in evidence. Three (15%) studies employed what Cole and Maxwell (2003) term *half-longitudinal* designs, which allow time to elapse between the predictor and the mediator or the mediator and the criterion, but not both. The remaining study employed a random slopes model that tracks intra-individual change, but provides no information regarding temporal precedence. None of the 20 reviewed studies had fully longitudinal designs. That is, no study: (a) controlled for prior levels of the mediator when testing the relationship between the predictor at time one and the mediator at time two and;

(b) controlled for prior levels of the criterion when testing the relationship between the mediator at time two and the criterion at time three. This brief review highlights an important issue. That is, mediational tests of longitudinal data, including that of study two, do not follow recent methodological advances for multi-wave designs (e.g., Cole & Maxwell, 2003; Mackinnon, 2008; Selig & Preacher, 2009). As will be described, this has implications for the inferences that can be made regarding the relationship between predictors, mediators and criterion variables.

5.1.1 Problems with mediation analysis using cross-sectional data

By definition, mediational models imply change over-time. In this thesis, the coach motivational style (autonomy supportive versus controlling) is purported to influence children's psychological need satisfaction and thwarting in sport, which in turn influences children's engagement and disaffection in youth sport. Unless this causal process has reached equilibrium (i.e., all variables plateau), applying cross-sectional data to it is intuitively problematic and has a number of complications (Cole & Maxwell, 2003; Gollob & Reichardt, 1991). The problems can be broadly categorised into four assumptions: (1) the assumption that mediated effects are instantaneous; (2) the assumption that measures of variables at previous time points have no impact upon the mediated effect; (3) the assumption that mediated effects are not time dependent and; (4) the assumption that paths in the mediation model are unidirectional.

5.1.1.1 The assumption that mediated effects are instantaneous

Causal effects emerge over time. Take, for example, the role of the coach in children's engagement in sport. Only under very seldom conditions would it be appropriate to suggest that the coaches effect on children's engagement is instantaneous. Yet when mediated effects are examined cross-sectionally, this assumption is made. That is, relationships are static and reflect longitudinal trends at whichever time we chose to measure them. Clearly, this assumption is problematic given that, more likely, the coach-athlete engagement relationship develops and changes over the course of time. Taking a snap-shot of the mediated effect, therefore, cannot capture the dynamic nature of the causal process.

5.1.1.2 The assumption that measures of variables at previous time points have no impact upon the mediated effect

Variables often exert an influence upon themselves over time. For instance, children's engagement in sport at the beginning of a soccer season is likely to have an influence on children's engagement at the end of a soccer season. The cross-sectional description of the mediated effect, however, assumes these autoregressive paths (those that run from one observation of a variable to the sequential observation of the same variable) to be zero. It is well established that conclusions based on casual models that omit key predictors can be seriously in error (Selig & Preacher, 2009). Thus, the omission of previous measures of mediator and criterion variables has implications for the validity of conclusions drawn from mediation models based on cross-sectional data.

Practically speaking, if there is no control for initial levels of the mediator and criterion variables, estimates of causal paths may be spuriously inflated if stability is high, and spuriously deflated if stability is low (Cole & Maxwell, 2003). In whichever case, it is unlikely that a mediated effect derived from cross-sectional data will capture the true longitudinal effect in the mediation model (Cole & Maxwell, 2003; Maxwell & Cole, 2007; 2011). Cole and Maxwell (2003) suggest that it is not sufficient to simply allow a time interval between the predictor and the mediator and then between the mediator and the criterion (sometimes referred to as a panel design). This is because biased estimates of effects may remain due to the potentially confounding effects of prior levels of the mediator and the criterion. In short, failing to control for the effects of prior levels of the mediator and criterion variables upon themselves can lead to biased estimates of the mediated effect when the data is cross-sectional.

5.1.1.3 The assumption that mediated effects are not time dependent

Effect sizes of the mediated effect typically depend on the amount of time separating intervals of data collection. If we were to assess the impact of the coach upon children's engagement in sport over one month, we might expect a smaller effect than if we were to track the same relationship over a year. Just as cross-sectional mediation analysis assumes effects to be instantaneous, so too does it struggle to consider their time dependency. In many respects, this limitation cannot be fully overcome by the implementation of longitudinal designs, since no one time interval can be considered optimal to understand a causal relationship (Selig & Preacher, 2009). Yet failure to consider any impact of time upon the mediated effect precludes control of the time dependency of effects (Selig, Preacher, & Little, 2009). Consequently, when possible, longitudinal examination of effects is preferable.

5.1.1.4 The assumption that paths in the mediation model are unidirectional

Common to many causal effects in the social sciences is the potential for reciprocal relationships. Taking study two as an exemplar, according to the athlete-coach dialectical framework, while psychological need satisfaction can be considered to influence children's engagement in sport, children's engagement in sport could also be suggested to influence children's psychological need satisfaction. Children actively seek to satisfy their own needs as well as to receive opportunities to do so from the social-context (see Reeve, 2012). The temporal ordering of variables, though, cannot be determined using cross-sectional data. This decision, then, is made on the basis of either: (a) strong theoretical support for unidirectionality or; (b) longitudinal data that empirically support unidirectionality. The former represents a solely conceptual approach to the determination of where elements of a mediation model reside in time, whereas the latter follows both theory and an empirical approach. Longitudinal data therefore provides a sounder basis for testing the sequencing or temporal ordering of observed effects.

Overall, cross-sectional data can, at times, provide biased estimates of the true longitudinal mediated effect. And, indeed, cross-sectional approaches to mediation have been empirically demonstrated to under- and over-estimate effects (Maxwell & Cole, 2007; 2011). For example, Maxwell and Cole (2007; 2011) documented that the pattern of bias associated with cross-sectional data was strongly associated with the degree of stability in the predictor, mediator and criterion variables (when compared to autoregressive models of change). They conclude that only under very seldom found conditions (i.e., effects that have reached equilibrium) would an estimation of the mediated effect using cross-sectional data equal the mediated effect derived from longitudinal data. Such findings underscore the need to extend the manner by which mediated effects are examined in this thesis. To do this, several contemporary classes of models for testing longitudinal mediation, with the collection of three or more waves of data, can be employed (Mackinnon, 2008; Selig & Preacher, 2009). One class of models, that have particular utility for the current thesis, are cross-lagged panel mediation models (Gollob & Reichardt, 1991; Cole & Maxwell, 2003).

5.1.2 Cross-lagged panel mediation models

The fundamental tenet of cross-lagged panel mediation models is that the mean of a variable at one time point depends upon the mean of the same variable an earlier time point. Derived from a univariate simplex model (Marsh, 1993), where one variable is measured at a number of time intervals for a set of individuals, cross-lagged panel mediation models are trivariate in structure and include predictors, mediators and criterions (Gollob & Reichardt, 1991; later adapted by Cole & Maxwell, 2003). Figure 5.1 provides an overview of the basic structure of this model with three waves of data. Path estimation and the assessment of standard errors is typically accomplished using structural equation modelling (Cole & Maxwell, 2003; MacKinnon, 2008). As described in study four, this involves identifying a set of path estimates that yield a hypothesised variance-covariance matrix (implied by self-determination theory), which most closely reproduces the sample variance-covariance matrix.

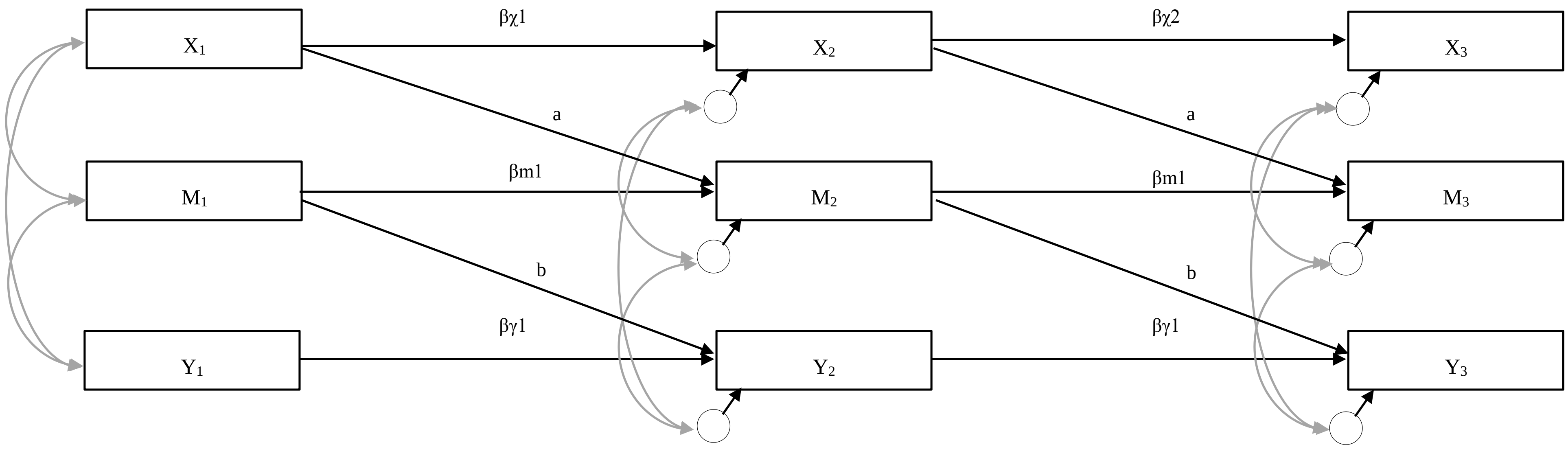

Figure 5.1 Basic three-wave cross-lagged panel mediation model

The conventional longitudinal mediated effect can be calculated by *ab* as seen in Figure 5.1. Most conventionally, so as to reflect temporal precedence in the model, the $X_1 \rightarrow M_2$ path is used to denote *a*, and the $M_2 \rightarrow Y_3$ path is used to denote *b*. The calculation of standard errors and the construction of confidence limits, as per cross-sectional mediation, remain the same (MacKinnon, 2008). At this point, it is also worthy of mention that the residuals at waves 2 and 3 are allowed to covary. MacKinnon (2008) suggests that this is necessary to reflect the possibility of reciprocal relationships among the predictor, mediator and criterion variables. Cole and Maxwell (2003) additionally note that allowing residuals to covary provides researchers with the opportunity to model the possibility that other mediating or criterion variables are missing from the model. If not controlled for, these potential confounders could bias estimates.

A particularly appealing aspect of the cross-lagged mediation model is that many extensions can be applied to it. These include the addition of extra waves, the addition of extra indirect paths (e.g., $X_1 \rightarrow Y_2 \rightarrow Y_3$), the examination of contemporaneous mediation (i.e., $X_1 \rightarrow M_1 \rightarrow Y_1$) and the assessment of path stability over time (i.e., the assessment of whether a relationship is stable, enhanced or diminished as time elapses). Most notably, in the case of the athlete-coach dialectical framework, possible reciprocal relationships (i.e. $M_2 \rightarrow Y_3$, $Y_2 \rightarrow M_3$) and mediated effects (e.g., $X_1 \rightarrow Y_2 \rightarrow M_3$) can also be modelled using the cross-lagged panel mediation design. Figure 5.2 shows a modified cross-lagged panel mediation model with both autoregressive and cross-lagged paths. The addition of these paths increases the possible directions of influence in the model and, therefore, allows a more comprehensive depiction of the degree to which X_1 indirectly influences Y_3 (Selig & Preacher, 2009).

5.1.3 A longitudinal test of self-determination theory's mediation model of children's engagement and disaffection in youth sport

The cross-lagged panel design, then, is conducive to the assessment of change in complex mediation models. This is important for the current thesis as the mediational model proposed in study two has an unconventional profile of two predictors, two mediators and two criterion variables. In addition, owing to its ability to model change, the cross-lagged panel model also allows for the assessment of reciprocal relationships across time. Given the possible reciprocal nature of relationships within the athlete-coach dialectical framework, testing for reciprocal effects is necessary and potentially insightful. Most importantly, though, because they reflect the longitudinal structure of causal mechanisms, cross-lagged panel mediation models provide a means of testing the temporal structure of self-determination theory's mediation model (Cole & Maxwell, 2003; Mackinnon, 2008; Selig & Preacher, 2009).

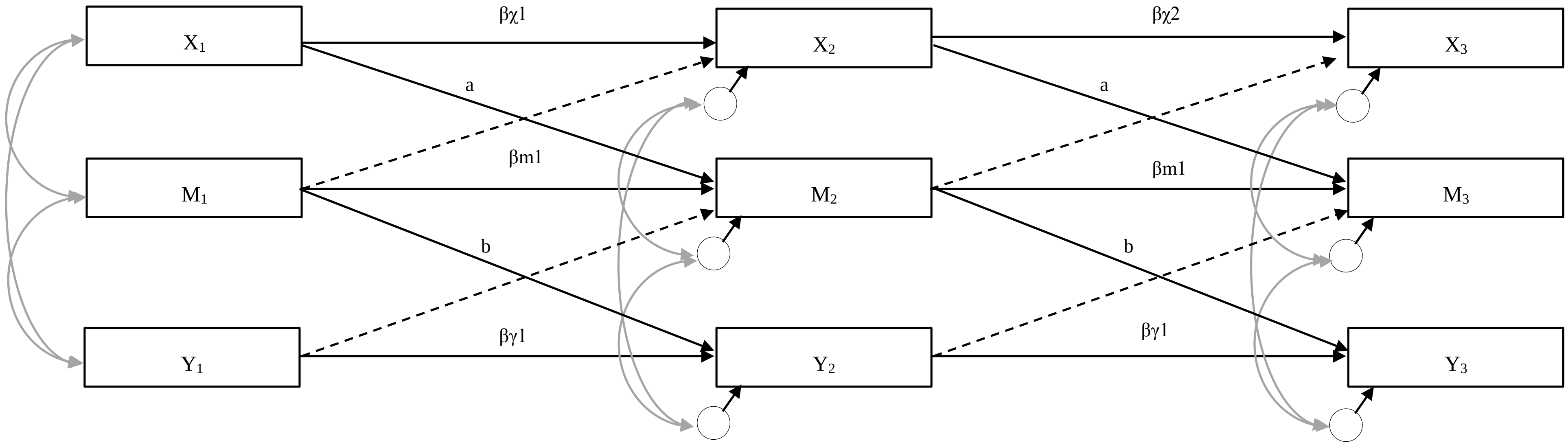

Figure 5.2 Modified three-wave cross-lagged panel mediation model with autoregressive and cross-lagged (dashed) paths.

It was thus the intention of study three to replicate and extend study two using a cross-lagged panel mediation model with three waves of data. The adoption of a cross-lagged panel mediation model provides a necessary next step in terms of assessing the implied relationships in self-determination theory's mediation model. Such a model would allow an examination of whether coach motivational style predicts changes in the satisfaction and thwarting of children's psychological needs, which in turn predicts changes in the behavioural engagement and behavioural disaffection of children in youth sport. As has been discussed in this chapter, this longitudinal approach overcomes the problems inherent in cross-sectional mediation analysis. Before embarking on these tests, though, it is important to ground the current study in the context of extant longitudinal research on this topic.

5.1.3.1 Extant longitudinal research

As described above, from a technical perspective, cross-sectional analysis of mediation assumes that causal processes are instantanious, time invariant and uni-directional (Gollob & Reichardt, 1991). Consequently, cross-sectional studies can overestimate true mediated effects when stability (rate of change) is low, and underestimate true mediated effects when stability is high (Cole & Maxwell, 2007, 2011). In an attempt to address some of these issues, a handful of studies have adopted longitudinal designs to assess self-determination theory's mediaiton model in youth sport (Adie et al., 2012; Reinboth & Duda, 2006). In one such study Reinboth and Duda (2006) found that change in task-involvement from coaches (emphasizing effort, mastery, co-operation and development) positively predicted change in autonomy, competence and relatedness. In turn, change in autonomy and relatedness positively predicted change in subjective vitality. These changes were observed across two measurement occasions over the course of a competitive season in a sample of university athletes.

There are a couple of limitations of such half-mediation models (Cole & Maxwell, 2003). First, temporal precedence cannot be established since it is unclear from Reinboth and Duda's study whether prior change in the mediator influences later change in the criterion. Second, analyses are restricted to the examination of mean-level growth only and do not consider the impact of within-person change. In response to this latter limitation, Adie, Ntoumanis and Duda (2012) recently conducted a novel longitudinal study of young elite athletes' welfare over two competitive soccer seasons. Adie and colleagues (2012) were specifically interested in the mediational role of autonomy, competence and relatedness in the coach autonomy support-subjective vitality relationship. Using the hierarchal structure of their data by allowing slopes to vary across individuals, these authors found that the mediated effects of autonomy support on within-person growth in subjective vitality were significant via competence and relatedness. These findings provide an advance to the understanding of the athlete-coach dialectical framework by establishing its consistence across athletes' developmental trajectories. Yet, as the slopes in Adie et al's study were assessed at the same occasions, the interpretation is that growth in the mediator contributes to growth in the criterion but not that *prior* growth is related to *later* growth (Mackinnon, 2008). Therefore, despite the advances made by longitudinal work in this area, temporal precedence in self-determination theory's mediation model is still to be established.

Outside of sport, though, one study has examined the student-teacher dialectical framework using a fully longitudinal design. In it, Jang et al (2012) found support for the hypothesised mediated effect of semester start perceived autonomy support on children's semester end classroom engagement through mid-semester autonomy satisfaction. A number of reciprocal and non-stationary effects were also noted by these authors that qualify self-determination theory's mediation model in several ways. First, perceived autonomy support contributed to mid-semester gains in autonomy need satisfaction, but not late-semester gains. This supports the notion that changes in motivational style, once formalised, are relatively static. Second, the effect of autonomy satisfaction on classroom engagement emerged late in the semester, but not early in the semester. As such it was only the changes, and not the initial levels, of autonomy satisfaction that produced the effects. Finally, and perhaps most notably, the relationship between children's autonomy satisfaction and their engagement was reciprocal. Therefore, just as autonomy satisfaction contributes to engagement, so too does engagement contribute to autonomy satisfaction.

The findings of Jang et al (2012) underscore the need to examine self-determination theory's mediation model over time. This is because they highlight the complexity of its motivational processes that appear responsive to change, are non-static and exhibit reciprocity. There are, nevertheless, a couple of theoretical limitations of Jang et al's (2012) study. First, aspects of children's motivation were solely tapped using autonomy satisfaction, omitting the two other important psychological needs of competence and relatedness. Second, they did not concurrently examine a pattern of relationships that might lead to the opposite of engagement in the form of disaffection (viz. inter-personal control and psychological need thwarting). Future research is required that addresses these limitations.

Extending initial longitudinal work in sport and education settings (e.g., Adie et al., 2011; Jang et al., 2012; Reinboth & Duda, 2006), study three of this thesis replicated study two using a cross-lagged panel design. Such a design allows for a statistical control of prior levels of psychological need satisfaction and thwarting, and behavioural engagement and disaffection (Cole & Maxwell, 2003; Mackinnon, 2008). In doing, several effects can be tested that provide important information regarding the dynamics of self-determination theory's mediation model. These effects are presented in Figure 5.3 and include; temporal effects, reciprocal effects, stationary effects and additional pathways of influence.

5.1.3.2 Temporal effects in the hypothesised model

For temporal precedence to be tested in the hypothesised model, a fundamental prerequisite is that the anticipated cause must precede the outcome in time (Cole & Maxwell, 2003). A minimum requirement therefore is that data is collected on the mediators (psychological need satisfaction and thwarting) and outcomes (children's behavioural engagement and disaffection) at three time points across a competitive soccer season. In doing so, changes in the mediators and outcomes can be modelled such that predictors predict change in mediators that predict change in outcomes. A cross-lagged design allows for concurrent tests of three types of effects. The first of which is the test of temporal precedence in the model and these effects are indicated by the boldface lines in Figure 5.3.

5.1.3.3 Reciprocal effects in the hypothesised model

The second type of effect is that of reciprocal causation. Reciprocal causation refers to the degree to which one variable affects, and is affected by, its outcome over time. Statistical inferences of reciprocity are made when both pathways, to and from two variables, are significant. These potential effects appear as the dashed lines in Figure 5.3. Such effects cannot be modelled in cross-sectional analyses and represent the dynamic nature of relations within self-determination theory's athlete-coach dialectical framework. These reciprocal effects have been tested, and supported, previously in educational contexts (Jang et al., 2012). It remains to be seen, though, whether results generalise to youth sport contexts.

5.1.3.4 Stationary effects in the hypothesised model

The third type of effect is that of stationary. Stationary is the stability of an effect that one variable has on another early in the season (e.g., time 1 versus time 2) versus that same effect later in the season (e.g., time 2 versus time 3). For example, if the two effects are the same, the effect is considered stationary. If the effect is significantly larger or smaller, it is considered to be more or less pronounced over time. In the model in Figure 5.3, 10 tests of stationary effects are possible. Four involve the hypothesised mediated effects (i.e., psychological need satisfaction to behavioural engagement; psychological need satisfaction to behavioural disaffection; psychological need thwarting to behavioural engagement; psychological need thwarting to behavioural disaffection). Four involve the reciprocal effects (i.e., behavioural engagement to psychological need satisfaction; behavioural engagement to psychological need thwarting; behavioural disaffection to psychological need satisfaction; behavioural disaffection to psychological need thwarting). Finally, there are four stationary effects that reflect the influence of each variable upon itself in the model (i.e. from time 1 to time 2, and from time 2 to time 3). These effects are represented by the horizontal lines in Figure 5.3.

5.1.3.5 Additional pathways of influence in the hypothesised model

As well as temporal, reciprocal and stationary effects, the cross-lagged panel model allows for the examination of additional pathways of influence. According to Mackinnon (2008), the more paths included in the cross-lagged model, the broader picture one gets of the magnitude of the total indirect effect of the predictor on the criterion (i.e., the sum of the many different longitudinal mediated effects in the model). To maximise the directional influence of the model it is necessary to stipulate all possible paths from the predictors at time one to the mediators at time two, and from the mediators at time two to the criterions at time three. Such a model has the ability to track additional mediated effects that, though not hypothesised, represent potential other pathways by which the predictors influence the criterions. In terms of model specification, these paths are shown in Figure 5.3 as the direct effect of autonomy support and control from coaches at time one to children's behavioural engagement and behavioural disaffection at time two. Modelling these paths allows for an examination of multiple additional mediated effects (e.g., control → behavioural engagement → psychological need satisfaction) that are potentially insightful but would otherwise have been considered zero if not included.

5.1.3.6 The present study

Overall, the primary purpose of the current study was to build upon study two's cross-sectional investigation by longitudinally testing the assumptions of self-determination theory's mediaiton model of children's behavioural engagement and behavioural disaffection. The present study also represented an opportunity to extend extant research (e.g., Adie et al., 2011; Jang et al., 2012; Reinboth & Duda, 2006) by tracking the mean level changes in children's psychological need satisfaction and thwarting, and behavioural engagement and disaffection, over a competitive soccer season. In doing so, it is possible to identify temporal precedence in the model, path stability, reciprocal relationships and other pathways of influence. The hypothesised cross-lagged panel mediation model appears in Figure 5.3.

Given the dearth of research examining engagement in youth sport using a fully-longitudinal design, it is difficult to make empirically grounded hypotheses regarding the temporal, reciprocal, stationary and additional effects in the model.

Nevertheless, some expectations can be made using self-determination theory, the outcomes of study two and Jang et al’s (2012) research with school children. In terms of the temporal effects, the psychological needs (satisfaction and thwarting) were expected to mediate the effects of coach motivational style (autonomy support and control) to children’s behavioural engagement and disaffection in the same way as they did in study two. In terms of reciprocal and stationary effects, the relationship between the psychological needs and children’s engagement and disaffection was expected to emerge late in the season (as opposed to early) and operate reciprocally as it did in Jang et al’s (2012) study. Finally, in terms of additional effects, as per Jang et al (2012), it was expected that perceptions of the coach would influence the psychological needs and children’s engagement and disaffection at season end via their autoregressive paths at mid-season.

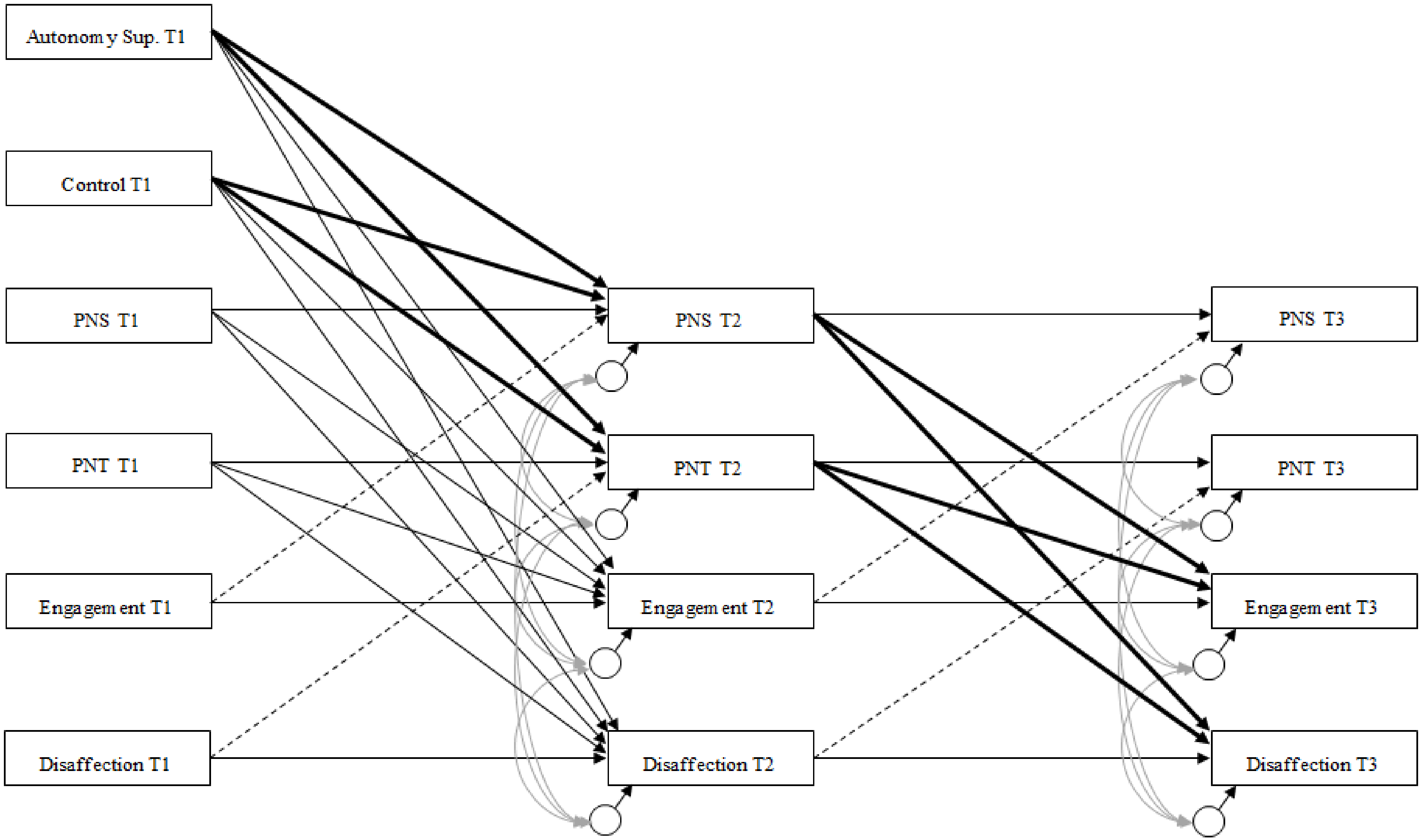

Figure 5.3 A self-determination theory based cross-lagged panel mediation model of children's behavioural engagement and behavioural disaffection in youth sport. The eight downwardly sloped boldfaced solid lines represent the paths that denote the hypothesised mediation model. The four upwardly sloped non-boldfaced dashed lines test for possible cross-lagged effects. The eight downwardly faced non-boldface solid lines test for additional mediated effects. The eight non-boldface solid parallel lines test for path stability over time. Note. PNS = psychological need satisfaction; PNT = psychological need thwarting; T = Time.

5.2 Method

5.2.1 Participants and procedure

The participants were youth soccer players aged 12-18 years. On average, participants reported that they had been playing soccer for 6.69 (s = 2.92) years, spent 5.05 (s = 2.92) hours a week playing soccer and had been with their coach for 3.53 (s = 2.53) years. A multi-section questionnaire was given to the participants in a training session setting at three time points; season start (n = 316; female n = 80), mid-season (n = 219; female n = 58) and season end (n = 197; female n = 49). The attrition from season start to mid-season and season end was due to several factors. First, two clubs were unable to recruit the required number of players to their teams and therefore were forced to close soon after the season started. Second, two further clubs declined to participate in subsequent data collections after the administration of the first questionnaire. Finally, a particularly severe winter, and subsequent fixture congestion, resulted in a failure to schedule time two and three data collection with three clubs.

Participants who completed only one questionnaire were removed. One hundred and fifty-eight participants (female n = 38) completed the questionnaires at all three time points. Two hundred and fifty-two participants (female n = 67) completed the questionnaire at least twice (i.e. season start and mid-season or season start and season end). The data from those participants who completed at least two time points were used in all subsequent analyses. The study received ethical approval from York St John University. All participants were treated in accordance with the ethical guidelines pertaining to consent, confidentiality and response anonymity. Data collection was conducted under my supervision and I was on hand at all times to give general instructions and answer any questions. The questionnaires took approximately

15 minutes to complete at each time point, and were matched over time using a coding system to protect anonymity.

5.2.2 Instruments

Instruments that assessed perceptions of the coach (i.e. autonomy support and a controlling inter-personal style) were administered at the season start only. The other instruments (i.e., psychological need satisfaction, psychological need thwarting, behavioural engagement and behavioural disaffection) were administered at all three time points. All items were responded to on a Likert scale, which ranged from 1 (*not true at all*) to 7 (*very true*).

5.2.2.1 Behavioural engagement and disaffection

Engaged and disaffected behaviours were assessed using the behavioural sub-scales of the Engagement Versus Disaffection with Learning Scale (EVDLS; Skinner et al., 2009; Wellborn, 1991 see Appendix Q). These items were adapted to focus participants on soccer training. Behavioural engagement was measured using five items that tapped children's effort, attention and persistence while participating in soccer (e.g. "I try hard to do well in training"). Behavioural disaffection was assessed using five items that tapped children's lack of effort and withdrawal from soccer (e.g. "In training, I do just enough to get by"). These scales have been found to be valid and internally reliable in educational contexts (Skinner et al., 2008; Skinner et al., 2009) and support for their validity as adapted scales was documented in study two.

5.2.2.2 Psychological need satisfaction

Psychological need satisfaction was assessed using the Basic Need Satisfaction in Sport Scale (BNSSS adapted for soccer; Ng et al., 2011 see Appendix O). This twenty-item scale measures autonomy satisfaction (ten items; e.g. "In soccer, I can take part in the decision-making process"), relatedness satisfaction (five items; e.g. "In soccer, I feel close to other people") and competence satisfaction (five items; e.g. "I have the ability to perform well in soccer"). This scale has been found to possess adequate psychometric properties in sport (Ng et al., 2011).

5.2.2.3 Psychological need thwarting

Psychological need thwarting was measured using the Psychological Need Thwarting Scale (PNTS adapted for soccer; Batholomew et al., 2011 see Appendix P). This twelve-item scale measures autonomy thwarting (four items; e.g. "I feel pushed to behave in certain ways in soccer."), relatedness thwarting (four items; e.g. "I feel others in football can be dismissive of me.") and competence thwarting (four items; e.g. "There are situations in soccer where I am made to feel inadequate."). This scale has been found to possess adequate psychometric properties in sport (Bartholomew et al., 2011).

5.2.2.4 Perceived autonomy support

An adapted sport version (Gillet et al., 2010) of the Perceived Autonomy Support Scale for Exercise Settings (PASSES; Hagger et al., 2007 see Appendix S) was employed to measure perceived coach autonomy support. This twelve-item inventory taps children's perceptions of their coaches' provision of autonomy support (e.g. "I feel that my coach provides me with choices, options and opportunities about whether to play soccer"). This adapted version of the PASSES has been found to possess adequate psychometric properties in sport (Gillet et al., 2010).

5.2.2.5 Perceived controlling interpersonal style

The Controlling Coach Behaviours Scale (CCBS; Bartholomew et al., 2010 see Appendix R) was employed to measure perceived coach controlling interpersonal style. This fifteen-item inventory measures children's perceptions of their coaches controlling use of rewards (four items; e.g. "My coach only uses rewards or praise to make me train harder"), negative conditional regard (four items; e.g. "My coach pays me less attention if I have displeased him/her"), intimidation (four items; e.g. "My coach threatens to punish me to keep me in line in training") and excessive personal control (three items; e.g. "My coach tries to control what I do during my free time"). This scale has also been found to possess adequate psychometric properties in sport (Bartholomew et al., 2010).

5.2.3 Data analysis

We employed cross-lagged path analysis with autoregressive and cross-lagged paths to examine the hypothesised mediation model using AMOS version 18.0 (Arbuckle, 2007). This approach allowed for both a longitudinal examination of the hypothesised relationships between the study variables, and an assessment of the reciprocal influences of psychological need satisfaction and thwarting upon behavioural engagement and disaffection. To evaluate model fit within the path analysis, we relied on a combination of incremental (IFI and CFI) and absolute (RMSEA) fit indexes (Kline, 2011). Fit was deemed acceptable in the current study if; IFI and CFI > .90 and RMSEA < .10 (Marsh et al., 2004; Schmeller-Engel et al., 2003).

5.3 Results

5.3.1 Preliminary analyses

In keeping with the philosophy of data imputation (Knight et al., 2010), missing data were handled differently at and across time points. At each time point, for those that responded, missing values were replaced with the mean of the non-missing items in the respective sub-scale for each individual case (Graham et al., 2003). This approach was justified on account of the low number of missing items at each of the three time points (season start M = .44, s = .92, range = 1-5; mid-season M

= .59, *s* = 1.35, range = 1-8; season end M = .62, *s* = 1.47, range = 1-13) and evidence of randomness (Little's MCAR χ^2 for data across all time points = 154.61, *df* = 152, *p* = .43) in the distribution of the missing data (Tabachnick & Fidell, 2007). Across the time points, where missing data was evident as a result of questionnaire non-response, the Full Information Maximum Likelihood (FILM) estimation procedure employed by AMOS (version 18.0; Arbuckle, 2007) was used. The FILM estimation method uses all the information of the dataset to estimate means and variances for the missing portions of a variable, based on the observed portions of other variables. FILM produces consistent and stable estimates when the data are missing at random, and produces less biased estimates than other methods when the data deviate from randomness (Wothke, 1998).

Means, standard deviations, Cronbach's alpha coefficients, composite reliabilities and inter-correlations for each variable at each time point can be found in Table 5.1. All scales demonstrated acceptable internal consistency and composite reliability (> .70; Tabachnick & Fidell, 2007). Overall, participants reported above mid-scale levels of autonomy support, psychological need satisfaction and behavioural engagement across the three time points. By contrast, the participants typically reported below mid-scale levels of coach control, psychological need thwarting and behavioural disaffection across the three time points. In general, the inter-relationships were in the directions predicted by self-determination theory, thereby lending initial support to the hypotheses.

5.3.2 Test of the hypothesised path model and causal effects.

The results for the cross-lagged path analysis for the hypothesised model appear in Figure 5.4. The findings suggest that the full path model including the hypothesized effects, the reciprocal effects and the stationary effects fit the data adequately (χ^2 = 105.51 [33]; IFI = .94; CFI = .94; RMSEA = .09, 90% CI [.07-.11]). Notably, three of the hypothesised mediation paths were significant. First, season start autonomy support predicted mid-season psychological need satisfaction controlling for season start psychological need satisfaction ($\gamma = .17$, $p < .05$). Second, season start coach control predicted mid-season psychological need satisfaction controlling for season start psychological need satisfaction ($\gamma = -.14$, $p < .05$). Third, mid-season psychological need satisfaction predicted season end behavioural engagement controlling for mid-season behavioural engagement ($\beta = .23$, $p < .01$). Other significant stationary paths worthy of mention include the path between season start autonomy support and mid-season behavioural disaffection controlling for season start behavioural disaffection ($\gamma = -.18$, $p < .05$); the path between season start coach control and mid-season behavioural engagement controlling for season start behavioural engagement ($\gamma = -.15$, $p < .05$); and the path between season start psychological need satisfaction and mid-season behavioural disaffection controlling for season start behavioural disaffection ($\gamma = .18$, $p < .05$).

Table 5.1 *Scale reliabilities, descriptive statistics, and inter-correlations for the study measures.*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.Autonomy support	.95													
2.Control	-.51**	---												
3.PNS T1	.45**	-.33**	---											
4.PNT T1	-.55**	.51**	-.39**	---										
5.BE T1	.40**	-.26**	.55**	-.32**	.83									
6.BD T1	-.41**	.51**	-.20*	.56**	-.42**	.81								
7.PNS T2	.40**	-.25**	.62**	-.27**	.30**	-.07	---							
8.PNT T2	-.31**	.34**	-.24*	.51**	-.29**	.33**	-.27**	---						
9.BE T2	.40**	-.23**	.42**	-.29**	.44**	-.23*	.49**	-.15	.78					
10.BD T2	-.20**	.27**	-.02	.28**	-.22*	.50**	-.13	.38**	-.20**	.72				
11.PNS T3	.26**	-.21*	.38**	-.20**	.21**	-.11	.54**	-.13	.39**	-.07	---			
12.PNT T3	-.35**	.28**	-.34**	.46**	-.34**	.19*	-.38**	.44**	-.22*	.18*	-.33**	---		
13.BE T3	.33**	-.13	.32**	-.22**	.30**	-.09	.42**	-.15	.53**	-.16*	.60**	-.21*	.76	
14.BD T3	-.23*	.19*	-.21*	.35**	-.35**	.36**	.03	.18*	-.24*	.35**	-.11	.25*	-.22*	.77
M	5.40	2.50	5.40	2.75	5.67	2.73	5.47	2.64	5.70	2.80	5.47	2.71	5.75	2.80
SD	1.14	1.13	.91	1.14	1.05	1.31	.89	1.22	.97	1.21	.89	1.30	.93	1.24

Note. Scale reliabilities (Cronbach's α) are shown on the diagonal. PNS = psychological need satisfaction; PNT = psychological need thwarting, BE = behavioural engagement; BD = behavioural disaffection; T = Time. The Cronbach's α values for the individual measures that were used to form the coach control, basic psychological need satisfaction and basic psychological need thwarting composites were as follows: conditional regard (α = .80), intimidation (α = .84), negative use of rewards (α = .79), excessive personal control (α = .87), autonomy satisfaction (T1 α = .85; T2 α = .86; T3 α = .84), competence satisfaction (T1 α = .85; T2 α = .82; T3 α = .88), relatedness satisfaction (T1 α = .82; T2 α = .79; T3 α = .84), autonomy thwarting (T1 α = .79; T2 α = .82; T3 α = .87), competence thwarting (T1 α = .81; T2 α = .86; T3 α = .90) and relatedness thwarting (T1 α = .82; T2 α = .87; T3 α = .88). $^{*}p < .05$, $^{**}p < .01$.

5.3.3 Tests for mediation

Examination of the significant paths in the cross-lagged model alluded to the existence of two hypothesised mediated effects and four other additional mediated effects (see Table 5.2). To test the statistical significance of these mediated effects, specific indirect effects were calculated and their 95% confidence intervals were inspected using MacKinnon and colleagues' (2007) *PRODCLIN* programme. In the case of the hypothesized effects, the positive indirect effect of season start autonomy support on season end behavioural engagement via mid-season psychological need satisfaction was significant (95% CI: .01, .08), as was the negative indirect effect of season start control from coaches on children's season end behavioural engagement via mid-season psychological need satisfaction (95% CI: -.07, -.01). In the case of the additional mediated effects, the negative indirect effect of autonomy support on season end behavioural disaffection via mid-season behavioural disaffection was significant (95% CI: -.01, -.13). Likewise, children's mid-season behavioural engagement significantly mediated the negative effect of season start coach control on children's season end psychological need satisfaction (95% CI: -.02, -.05) and behavioural engagement (95% CI: -.01, -.11).

Table 5.2 *Specific indirect effects.*

	Indirect effect	
Predictor (X) → Mediator (M) → Outcome (Y)	***ab* (SE)**	**95% CI**
Autonomy support T1→Psychological need satisfaction T2→Behavioural engagement T3	.04 (.02)	.01 to .08
Autonomy support T1 → Behavioural disaffection T2 → Behavioural disaffection T3	-.06 (.03)	-.01 to -.13
Control T1 → Psychological need satisfaction T2 → Behavioural engagement T3	-.03 (.02)	-.07 to -.01
Control T1 → Behavioural engagement T2 → Psychological need satisfaction T3	-.02 (.01)	-.02 to -.05
Control T1 → Behavioural engagement T2 → Behavioural engagement T3	-.05 (.03)	-.01 to -.11
Psychological need satisfaction T1 → Behavioural disaffection T2 → Behavioural disaffection T3	.06 (.04)	-.01 to .14

Note. The 95% confidence intervals for the indirect effects were those derived from the *PRODCLIN* programme that produces confidence intervals on the basis of a distribution-of-the-product-method (Mackinnon et al., 2007). For clarity, we present only the variables of interest and not the statistical controls.

5.3.4 Tests of path stability

To test for path stability, 12 chi-square difference tests were conducted. In these tests, the overall model was compared with models in which the parameter from time 2 to time 3 was constrained to equal the parameter of the path from time 1 to time 2. If the chi-square is non-significant (i.e., no significant improvement in fit) then effects are considered to be stable. However, if the chi-square is significant (i.e., improvement in fit) then effects are considered to be unstable. Three of the four effects of the repeated measures were found to be stable; psychological need satisfaction ($\Delta\chi^2(1) = .46$, *ns*), psychological need thwarting ($\Delta\chi^2(1) = .19$, *ns*) and behavioural disaffection ($\Delta\chi^2(1) = .38$, *ns*). Children's behavioural engagement, though, was unstable (βs of .19 versus .37), $\Delta\chi^2(1) = 5.74$, $p < .05$, suggesting that changes in behavioural engagement are more pronounced late season than they are early season.

Three of the four hypothesised paths were found to be stable. The path from psychological need satisfaction to behavioural disaffection ($\Delta\chi^2(1) = .14$, *ns*) demonstrated stationary. Likewise, the paths from psychological need thwarting to behavioural engagement ($\Delta\chi^2(1) = .04$, *ns*) and behavioural disaffection ($\Delta\chi^2(1) = 2.84$, *ns*) were also stationary. Though significantly stable ($\Delta\chi^2(1) = .91$, *ns*), the path between psychological need satisfaction and behavioural engagement was not evident early in the season (i.e., from time 1 to time 2; $\beta = .16$, $p > .05$), but rather emerged late in the season (i.e., time 2 to time 3; $\beta = .23$, $p < .01$). Therefore, there is evidence of instability in relationships between this particular set of variables.

Of the four possible reciprocal effects, three were significantly stable. The relationship between behavioural engagement and psychological need thwarting was stationary ($\Delta\chi^2(1) = .62$, *ns*). As were the relationships between behavioural disaffection and psychological need satisfaction ($\Delta\chi^2(1) = .04$, *ns*) and thwarting ($\Delta\chi^2(1) = 1.10$, *ns*). The relationship between behavioural engagement and psychological need satisfaction was, however, unstable (βs of -.09 versus .22), $\Delta\chi^2(1) = 5.74$, $p < .05$. It appears, therefore, that the effect of behavioural engagement on psychological need satisfaction is a function of changes in behavioural engagement, rather than initial levels.

5.3.5 Tests for reciprocal effects

One of the four tested reciprocal effects was found to be significant. Specifically, mid-season psychological need satisfaction predicted season end behavioural engagement controlling for mid-season behavioural engagement ($\beta = .23$, $p < .01$), and mid-season behavioural engagement predicted end of season psychological need satisfaction controlling for mid-season psychological need satisfaction ($\beta = .22$, $p < .01$). Furthermore, as discussed above, this reciprocal effect was not stationary (i.e., it only emerged between time 2 and time 3). These findings are suggestive of reciprocal causality in relationships between behavioural engagement and psychological need satisfaction.

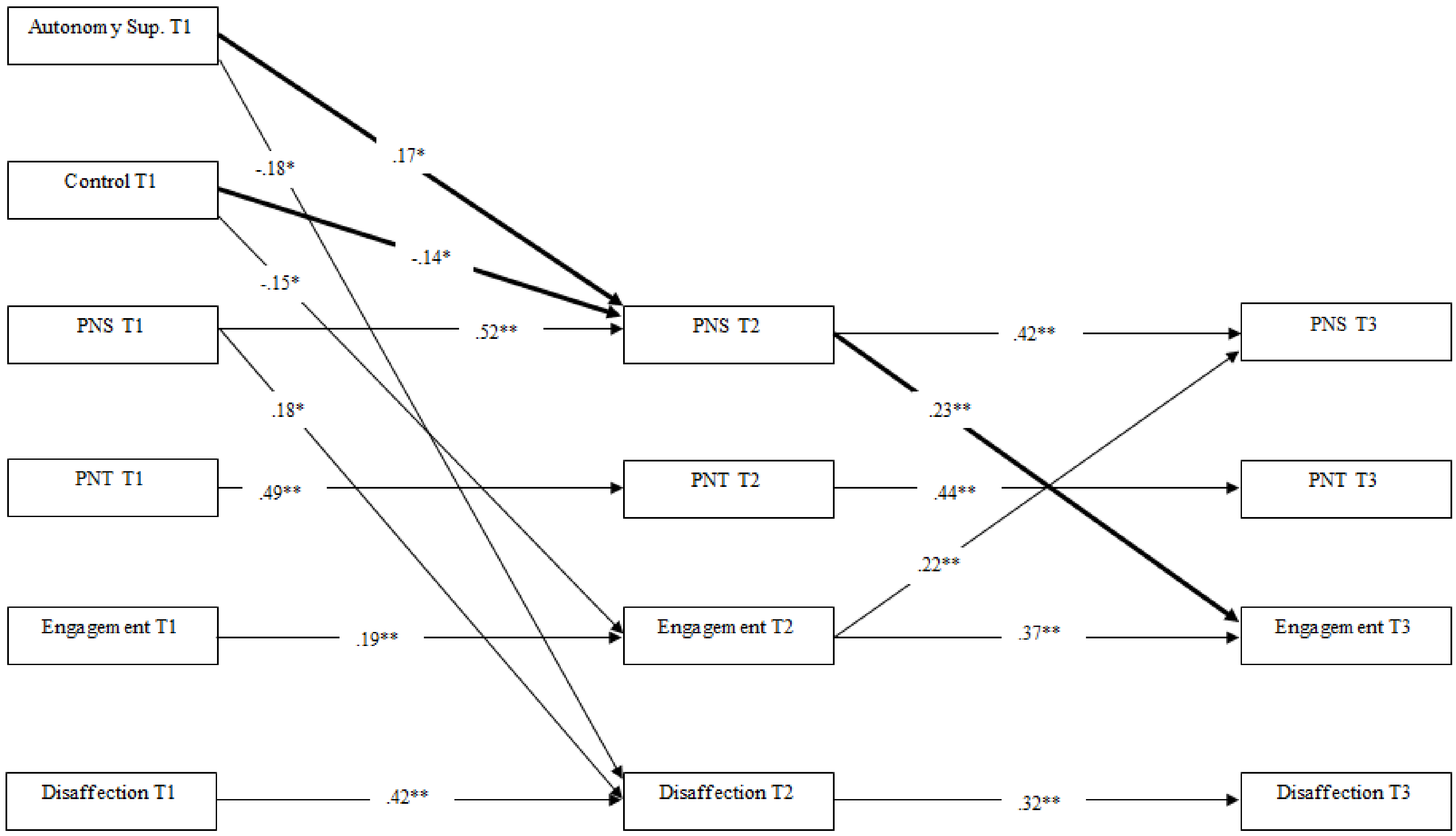

Figure 5.4 Standardised parameter estimates for the test of the hypothesised model. In the interest of clarity, only significant paths are presented. Model fit: χ^2 = 105.51 (33); IFI = .94; CFI = .94; RMSEA = .09, 90% CI [.07-.11]. Note. PNS = psychological need satisfaction; PNT = psychological need thwarting; T = Time.

5.4 Discussion

Study two of this thesis documented support for self-determination theory's mediation model of children's engagement and disaffection in sport. This research, however, relied on cross-sectional data. The present study utilised a cross-lagged panel mediation model to address this limitation and to extend work in other domains (e.g., education; Jang et al., 2012). Results revealed partial support for self-determination theory's mediation model. That is, the relationships between season start autonomy support and control from coaches, and children's season end behavioural engagement were mediated by mid-season psychological need satisfaction. However, no effects were observed in the case of children's psychological need thwarting and behavioural disaffection. Findings also qualified the hypothesised model in an important way by showing expected path non-stability, and the existence of reciprocal effects.

5.4.1 Temporal effects

First, it is important to comment on the mediated effects that are the basis of self-determination theory's athlete-coach dialectical framework. Season start autonomy support from coaches positively predicted increases in season end behavioural engagement via increases in mid-season psychological need satisfaction. By contrast, season start perceptions of control from coaches predicted decreases in season end behavioural engagement via decreases in mid-season psychological need satisfaction. These findings support and extend those observed in study two, and other sports based research (e.g., Adie et al., 2008, 2012; Reinboth & Duda, 2006), by confirming the temporal precedence of the hypothesised mediational sequence. In doing, our results reiterate the adaptive nature of coach autonomy support, and the maladaptive nature of coach control, in terms of children's behavioural engagement in sport.

The mediated effects of coach motivational style on children's behavioural disaffection via psychological need satisfaction and thwarting were non-significant. This was due to a lack of association between perceptions of coaches' motivational style (autonomy support and control) and psychological need thwarting, and the lack of an association between psychological need satisfaction and thwarting, and behavioural disaffection. It is possible that psychological need thwarting is not a dominant predictor of behavioural disaffection. The active thwarting of psychological needs may, for instance, precipitate anxiety and worry more readily than a passive disinterest (cf. Bartholomew et al., 2011).

This conclusion, though, may be premature for a number of reasons. Most notably, just as psychological need thwarting exhibited no association with behavioural disaffection, neither did psychological need satisfaction. Thus, it cannot be said that either process was accountable for changes in children's passivity. As well, it is possible that the time span was too short to observe any effects on children's behavioural disaffection. Cole and Maxwell (2003) have noted that if stability is high, then mediated effects may be under estimated in relation to their true values. The high stability of behavioural disaffection, in addition to the low mean scores on disaffection across the time points, alludes to this possibility. Future research should attempt to examine these dynamics over a longer time period in an attempt to extricate possible effects.

5.4.2 Stability effects

The effect of psychological need satisfaction on children's behavioural engagement in sport was not stable in either direction. As expected, in line with Jang et al (2012), a significant effect of psychological need satisfaction on children's behavioural engagement was not evident early in the season (i.e., from time 1 to time 2), but rather emerged late in the season (i.e., time 2 to time 3). This was similarly the case for the same set of relationships in the opposite direction (i.e., behavioural engagement to psychological need satisfaction). These findings attest to the importance of longitudinal research in this area. This is because, as seen in Table 5.1, psychological need satisfaction and behavioural engagement were significantly inter-correlated at all three time points. As such, these effects at the cross sectional levels were significant. Yet it was only changes in psychological need satisfaction and changes in children's behavioural engagement (as opposed to initial levels) that produced the observed effects in the cross-lagged model. Children who report increases in their behavioural engagement are thus those who report early season increases in psychological need satisfaction and not those who begin the season with high psychological need satisfaction.

5.4.3 Reciprocal effects

The effect of psychological need satisfaction and children's behavioural disaffection was reciprocal. As hypothesised, mid-season psychological need satisfaction positively predicted season end children's behavioural engagement. However, children's mid-season behavioural engagement also predicted their season-end psychological need satisfaction, even after controlling for mid-season psychological need satisfaction. Further, this reciprocal effect was not stationary – it only occurred later in the season. As such, while season start coach motivational style (autonomy support and control) is an important predictor of mid-season psychological need satisfaction, children's behavioural engagement may have just as important influence on their psychological need satisfaction at season end. It appears, therefore, that in line with the self-determination theory's dialectical framework, children have the capacity to strive for and meet their own psychological needs in youth sport through increases in effortful and attentive engagement.

This finding is in concordance with that of Jang et al (2012). These authors similarly found that children's term-end classroom engagement (behavioural and agentic) had a reciprocal relationship with mid-term autonomy satisfaction in Korean school children. Jang et al (2012) speculated that this effect may be unique to autonomy satisfaction because other longitudinal research has identified no such reciprocal causality between motivational variables and children's engagement in school (Berger & Karabenick, 2011). However, our findings suggest that the reciprocity of relationships may extend more broadly to the satisfaction of all three psychological needs. A more fine grained analysis, disaggregating the psychological needs, will however be needed to fully confirm this conclusion.

It is intuitive to think that mid-season gains in children's concentration, attention, effort and persistence would provide them with opportunities for the satisfaction of the psychological needs. For instance, by applying effort, attention and concentration to what they do in sport, children take initiative over their development and thereby are more likely to experience concomitant increases in autonomy. As well, the persistence and goal-directed effort that is expended when children are behaviourally engaged is conducive to higher achievement and thereby competence. Similarly, the attention and concentration that characterise behaviourally engaged children is beneficial for inter-personal attachment in achievement contexts.

The implication of this finding is that psychological processes in children's sport are more complex than might be modelled in cross-sectional analyses. It is true that the model explained significant variance in the hypothesised mediated effects.

Yet, if only hypothesised relationships were modelled, the analysis would have considered otherwise significant reciprocal paths as zero. That is, the significant path from mid-season behavioural engagement to season end psychological need satisfaction would have been omitted and thereby overlooked. Above all, our results show that children's psychological need satisfaction in sport functions as consequence of both season start autonomy support and control from coaches, and their mid-season gains in behavioural engagement.

5.4.5 Additional effects

Some additional effects emerged. Notably, and unexpectedly, there was a positive effect of season start psychological need satisfaction on mid-season behavioural disaffection that, in turn, predicted season end behavioural disaffection. This unexpected finding may be indicative of suppression. At the zero-order level, psychological need satisfaction and behavioural disaffection share a negative association across the three time points. Though these effects do not represent change, they reflect a divergence from the positive path coefficient in the mediation model. As explained in study one, suppression occurs when regression weights are inflated or reversed in the presence of highly correlated predictor variables. It is possible that the other season start predictor variables in the mediation model suppressed the variance in psychological need satisfaction that was irrelevant to the prediction of behavioural disaffection - thereby leaving only negative variance to be explained. Further research, however, is needed to confirm that the positive relationship between season start psychological need satisfaction and mid-season behavioural disaffection observed in this study is not a genuine effect.

Another noteworthy additional mediated effect to emerge in the analysis was the negative effect of season start control on season end psychological need satisfaction via mid-season behavioural engagement. Such a finding speaks to the notion that perceptions of control have detrimental effects on psychological need satisfaction both directly and indirectly (via children's behavioural engagement). This is important because it appears that being controlling is, in and of itself, enough to catalyse decreases in children's own psychologically need supportive behaviours of effort, persistence, attention and concentration. The implication is that control from coaches restricts opportunities for children to both receive and seek out psychological need satisfaction from their environment.

Finally, there are two further additional mediated effects that are worthy of mention. These are the positive and negative effects of season start autonomy support and control on season end psychological need satisfaction via mid-season psychological need satisfaction. Such effects are in concordance with self-determination theory and underscore the divergent roles that autonomy support and control play in children's psychological need satisfaction and thwarting over time. That is, it appears that autonomy support produces increases in season end autonomy, competence and relatedness satisfaction because of the effects prior levels of these needs have on latter levels. Conversely, it appears that control produces decreases in season end autonomy support for the same reason.

5.4.6 Theoretical Implications

These results have several implications for self-determination theory as it speaks to children's engagement and disaffection in youth sport. Specifically, the findings support those of others (Jang et al., 2012) suggesting that self-determination theory's mediation model provides a useful conceptual overview of children's engagement. This is because, in line with the hypotheses, the positive mediation of autonomy support on children's season end behavioural engagement in youth sport via mid-season psychological need satisfaction was supported. Yet it is also the case that, in addition to this finding, there were other important effects to emerge that qualify the results of studies one and two in a number of important ways. Firstly, although psychological need satisfaction predicted gains in children's behavioural engagement, it was only changes in psychological need satisfaction, and not initial levels, which elicited such an effect. Accordingly, it appears that children's engagement in youth sport is cultivated, and their disaffection kept in check, by autonomy supportive coach behaviours that facilitate gains in autonomy, competence and relatedness.

Also of note is that the effect of psychological need satisfaction on behavioural engagement was reciprocal. This reciprocity speaks to the dialectical nature of the child and their environment insomuch as is appears children seek out opportunities for psychological need satisfaction in the shape of engaged behaviours. These relationships are suggestive of a positive upward spiral (i.e., psychological need satisfaction to behavioural engagement to psychological need satisfaction and so on). Importantly, the results show that just as this upward spiral may be triggered by autonomy support, it can also be inhibited by a provision control. Consequently, controlling coaches may risk fostering children's disaffection in youth sport as their provisions impede the engagement and psychological need satisfaction that appear central to an upward spiral toward adherence.

5.5 Conclusion

The findings from this longitudinal test of self-determination theory's motivation mediation model of behavioural engagement and behavioural disaffection produced two central conclusions. First, the mediation of mid-season psychological need satisfaction in relationships between season-start coach motivational style (autonomy support and control) and season-end engagement was supported across the multi-wave design. Second, the emergence of reciprocal and non-stationary effects qualified the mediational model in a number of ways. Notably, the results extended the hypothesized set of relationships in study two by revealing that children's behavioural engagement in sport functions as both an antecedent and consequence of children's psychological need satisfaction. Furthermore, both these effects only emerged in response to changes in the variables, and not initial levels. In sum, then, this study supports self-determination theory's mediation model as it relates to children's engagement in youth sport but highlights the complexity in relationships that speaks to the need to examine these dynamics, when possible, over time.

Chapter Six: A conditional process model of children's behavioural engagement and behavioural disaffection in sport based on self-determination theory

6.1 Introduction

In an effort to better understand the dynamic nature of the coach-engagement relationship, as it develops over time, the same model of children's engagement tested in the second study of this thesis was examined in the third study of this thesis using three waves of data. In this model, season start coach motivational style (autonomy supportive versus controlling) was expected to predict changes in mid-season psychological need satisfaction and thwarting that, in turn, were expected to predict changes in children's season-end engagement and disaffection. In partial support of this model, cross-lagged panel analyses showed that children's engagement in youth sport is enhanced by earlier (and later) gains in psychological need satisfaction that are facilitated by coach autonomy support. Autonomy support, though, is a motivational style and as such is only one, albeit important, coach provision. According to self-determination theory, there are other provisions by the coach that are similarly important in fostering engagement in youth sport. One such provision is structure and refers to the rules, limits, support and feedback that coaches provide to children as a means of developing their competence (Mageau & Vallerand, 2003). Accordingly, in this final study, the models tested in studies one, two and three were extended by introducing the influence of structure alongside autonomy support as important elements of the social-context.

6.1.1 Structure and its importance

A structured environment is organised to cultivate perceptions of competence (Connell & Wellborn, 1991; Grolnick & Ryan, 1989). To perceive themselves as competent, a child needs to have an understanding of how their actions and outcomes in domains such as youth sport are linked. Thus, competence involves a control belief whereby the causes of success and failure are clearly recognisable (Skinner, 1990). The provision of structure, then, confers information to children regarding the implications of their actions. Reeve (2006b) suggests that structure has three central elements. The first involves setting clear and consistent rules, limits and expectations prior to an activity. The second involves offering help, support and guidance during an activity. The third involves giving positive, constructive and informational feedback after an activity.

The omission of structure in the models tested in studies two and three is important. This is because, to this point, measures of autonomy support and control have been deemed sufficient to capture the aspects of the social-context that satisfy versus thwart the psychological needs. Yet, according to self-determination theory, structure is not implicit to conceptualisations of autonomy support and control but, rather, operates in conjunction with these motivational styles (Grolnick & Ryan, 1989). As such, coaches provide structure when they plan training sessions, verbalise support and deliver feedback. By contrast, they provide autonomy support or control when these elements of structure are conveyed in a context of voice and choice or coercion and intimidation. Given a coaches' motivational style and their provision of structure are largely independent, the question arises as to how they interact to produce children's engagement in youth sport.

6.1.2 The combined influence of structure and autonomy support

The interactive influence of autonomy support and structure is conceptualised as a conditional process (moderated mediation) model of children's engagement and disaffection in the current study (see Figure 6.1). The first component of the proposed conditional process model (labelled A) was that structure from coaches would relate positively to children's behavioural engagement and negatively to behavioural disaffection in sport. The second component (labelled B) was that structure from coaches would relate positively to children's satisfaction of the basic psychological needs for autonomy, competence, and relatedness in sport. The third component (labelled C) was that children's satisfaction of the basic psychological needs would relate positively to behavioural engagement and negatively to behavioural disaffection in sport. The fourth component (labelled D) was that the association between structure and basic psychological need satisfaction would be moderated by autonomy support from coaches, such that children who experienced higher levels of autonomy support would show a stronger positive association between structure and basic psychological need satisfaction. That is, the mediation by basic psychological need satisfaction was hypothesized to be evident only among those who reported higher levels of autonomy support. Next, I describe the theoretical and empirical foundations for these hypotheses.

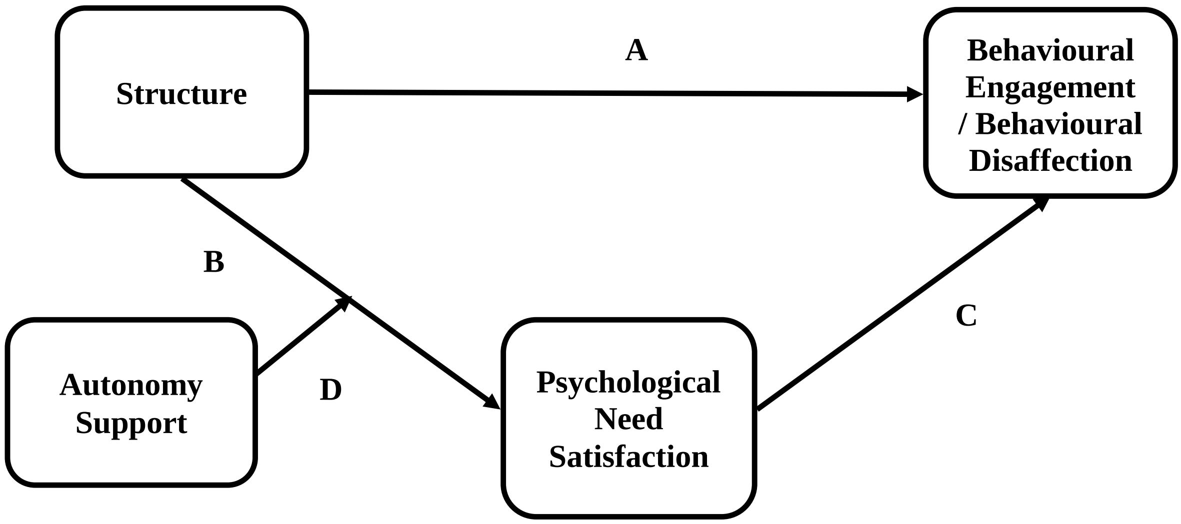

Figure 6.1 The hypothesized conditional process model.

6.1.3 Engagement in Sport and Structure from Coaches

Within self-determination theory, one of the important tasks that coaches have is to provide a sense of structure. According to Reeve (2002, 2006; see also Vansteenkiste, Sierens et al., 2012), structure is considered to entail three key elements. The first refers to the provision of clear and consistent limits, expectations, guidelines, rules and goals before activity engagement. The second refers to the provision of help, guidance, assistance and advice during activity engagement. The third refers to the provision of constructive and informative feedback and reinforcement post activity engagement. These elements of structure are considered important because they facilitate a sense that one has the ability to elicit desired responses from the environment. In other words, structure cultivates perceived control and predictability over goal attainment (Tucker, Zayco et al., 2002). When expectations are vague and help in the face of challenge is not forthcoming (i.e., a lack of structure), competencies have little opportunity to develop. The consequence of this is low perceived goal controllability, stress, anxiety, rumination over how to improve, and ultimately helplessness or amotivation (Soenens et al., 2007).

To date, only a small amount of research using self-determination theory has examined structure in the sport domain, possibly due to a lack of instrumentation in this context. Rather, much of the research on structure has been conducted in the education domain (Jang et al., 2010; Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009; Skinner et al., 1990). There are at least two reasons to expect similar correlates of structure among athletes as have been found among students. One is that the correlates of structure are likely to be evident across a variety of life's domains (Ryan & Deci, 2000). A second reason is that analogous constructs, such as evaluation, feedback, and instruction, have been shown to be important for athletes' motivation and development in sport (Horn, 1985; Roberts & Kristiansen, 2012;

Strachan, Côté, & Deakin, 2009). Therefore, it was hypothesized that structure from coaches would relate positively to athletes' behavioural engagement and negatively to behavioural disaffection in sport.

6.1.4 Mediation by Basic Psychological Need Satisfaction

If support is found for the divergent relations of structure from coaches to children's behavioural engagement and behavioural disaffection in sport, then an important next step in this line of inquiry is to identify a possible mechanism that might explain these associations. Within self-determination theory's mediation model, and as evidenced in this thesis, the basic psychological needs are a unifying principle that is used to explain social-contextual influences on psychological integration, social wellness, and physical health. Mageau and Vallerand (2003) have argued that coaches' motivational styles are likely to be associated with athletes' basic psychological need satisfaction. In an extension to their model, it is possible that structure from coaches may relate positively to children's satisfaction of each of the basic psychological needs in youth sport. Providing clear expectations and strategies for success, as well as competence-relevant feedback, is likely to afford satisfaction of the need for competence. In addition, structure from coaches is likely to be associated with satisfaction of the need for relatedness because it involves offering help and guidance in the face of setbacks to better accomplish goals. Finally, structure from coaches is likely to be associated with satisfaction of the need for autonomy because it facilitates perceived control over goal attainment and the development of intentions for action (Reeve, 2006a; Skinner et al., 1990). In support of these ideas, structure has been found to be positively associated with satisfaction of all three psychological needs in a physical education setting (Taylor & Ntoumanis, 2007), as well as with self-regulated learning among secondary school children (Sierens et al., 2009).

Therefore, it was hypothesized that satisfaction of the basic psychological needs for autonomy, competence, and relatedness would mediate the positive relation of structure from coaches to children's behavioural engagement and the negative relation of structure from coaches to children's behavioural disaffection in sport.

6.1.5 Moderation by Autonomy Support from Coaches

Although structure from coaches is expected to be associated with higher levels of basic psychological need satisfaction, the magnitude (and perhaps even direction) of this association may depend on how structure is conveyed to athletes. According to self-determination theory's athlete-coach dialectical framework, the way in which coaches introduce information, expectations, strategies, support, limits, and other aspects of structure can be perceived by athletes as either supportive or inhibitive of their volition. To date, no published study has examined the interaction of autonomy support and structure in the prediction of basic psychological need satisfaction in the sport domain. This may be because autonomy support and structure can be viewed as antagonistic, as the imposition of rules and expectations (two elements of structure) may resemble a controlling interpersonal style (Daniels & Bizar, 1998). Yet within self-determination theory, autonomy support and structure are considered to be largely independent constructs (Jang et al., 2010), such that structure can be enacted in a way that supports choice, volition, and self-initiation (autonomy support) or in a way that is perceived to be pressuring and coercive (control).

Early support for this proposition was provided by Koestner and colleagues (1984), who found that the way in which rules were set affected children's intrinsic motivation in an education setting. Limits that were set in an autonomy-supportive way did not undermine intrinsic motivation, whereas limits that were communicated in a controlling style undermined intrinsic motivation. More recently, Sierens et al. (2009) and Jang et al. (2010) found that autonomy support and structure interacted to yield positive correlates in the education domain. Therefore, it was hypothesized that the association between structure from coaches and children's psychological need satisfaction would be moderated by autonomy support from coaches. Specifically, it was anticipated that children who experienced higher levels of autonomy support would show a stronger positive association between structure and psychological need satisfaction.

Taken together, this set of hypotheses points toward the specification of a conditional process model of behavioural engagement and behavioural disaffection in sport based on self-determination theory. The possibility that the indirect relations of structure to behavioural engagement and behavioural disaffection are moderated by autonomy support alludes to an explanatory model that cannot be captured using simple mediation or moderation analyses. This conditional process model (moderated mediation; Preacher, Rucker, & Hayes, 2007) would establish the strength of the indirect effect across levels of the moderator and, in doing so, would yield a deeper understanding of the associations among these variables. Such findings would support self-determination theory's athlete-coach dialectical framework and, importantly, may also inform an understanding of how and why the way in which coaches relate to children's affects their engagement and disaffection in youth sport.

6.2 Method

6.2.1 Participants and Procedure

Participants were 281 youth soccer players (202 boys, 79 girls) with a mean age of 13.67 years (*SD* = 1.49) and a range from 11 to 18 years. The participants had been playing soccer for an average of 6.76 years (*SD* = 2.34) and had been attached to their clubs for an average of 3.47 years (*SD* = 2.33). The questionnaire was administered in a training session setting during which the lead author was present to give general instructions and to answer any questions.

6.2.2 Measures

Responses to all measures were made on a 7-point scale from 1 (*not true at all*) to 7 (*very true*).

6.2.2.1 Structure and autonomy support from coaches

A modified version of the Teacher as a Social Context Questionnaire (Belmont, Skinner, Wellborn, & Connell, 1988 see Appendix N) assessed children's perceptions of structure (8 items; e.g., "The coach always tells us what he/she expects of us in soccer") and autonomy support (8 items; e.g., "The coach gives us lots of choices about how we do tasks in soccer") from coaches. Psychometric support for the reliability and concurrent validity of this measure has been found in a physical education setting (Taylor & Ntoumanis, 2007), and evidence of its two-factor structure has been found among secondary school children (Sierens et al., 2009).

6.2.2.2. Basic psychological need satisfaction

The Basic Needs Satisfaction in Sport Scale (BNSSS; Ng et al., 2011 see Appendix O) assessed children's satisfaction of autonomy (10 items; e.g., "I feel I participate in soccer willingly"), competence (5 items; e.g., "I have the ability to perform well in soccer"), and relatedness (5 items; e.g., "In soccer, I feel close to other people"). Support for the psychometric properties of this measure has been found in past research (Ng et al., 2011).

6.2.2.3 Behavioural engagement and behavioural disaffection

A modified version of the Engagement Versus Disaffection with Learning Scale (Skinner et al., 2009 see Appendix Q) assessed children's behavioural engagement (5 items; e.g., I try hard to do well in training) and behavioural disaffection (5 items; e.g., In training, I do just enough to get by). Broadly, the items used to measure behavioural engagement assessed effort, attention, and persistence in soccer, whereas those used to measure behavioural disaffection assessed lack of effort during, and withdrawal from, soccer. Support for the reliability and validity of this measure has been found in educational contexts (Skinner et al., 2008; Skinner et al., 2009) and support for their validity as adapted scales was documented in study two.

6.2.3 Construct Formation

Structure, autonomy support, behavioural engagement, and behavioural disaffection were calculated as weighted linear composites of scale items using the partial least squares path model (PLS-PM) algorithm in XLSTAT (version 2012.1; Addinsoft, Paris, France). Basic psychological need satisfaction was calculated as the weighted linear composite of autonomy, competence, and relatedness using the same algorithm.[1] PLS-PM is a structural equation modelling analysis that uses least squares estimation. The major advantage of using this approach to form constructs is that it allows each item (or subscale) to make a unique contribution (Hair, Ringle, & Sarstedt, 2011). More specifically, PLS-PM's iterative estimation method provides case values of latent variables based on the relative weight relations of indicators to their higher order factors (Haenlein & Kaplan, 2004). As such, unlike the traditional

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[1] PLS-PM is a structural equation modelling technique that provides case values for variables on the basis of relative weight relations. Though this approach has the advantage of allowing each manifest variable to load uniquely on its higher order factor, relative weights can be adjusted according to their associations with exogenous variables. An alternative approach may have been to construct the variables via EFA. This limitation notwithstanding, the correlations between the variables constructed in PLS-PM and averaging were extremely high (structure = .99; autonomy support = .99; psychological need satisfaction = 1.00; engagement = 1.00; disaffection = 1.00)

averaging approach where each indicator is given an equal weighting, each latent variable case value estimated in PLS-PM is based on the best estimated indicator weights (Silva, Markland et al., 2010). The unstandardized case values representing these constructs were used in all subsequent analyses.

6.2.4 Analytical Strategy

In the current study, the indirect effect of structure from coaches to children's behavioural engagement and behavioural disaffection in youth sport via psychological need satisfaction was modelled. This indirect effect, in turn, was hypothesised to be moderated by autonomy support from coaches as depicted in Figure 6.1. That is, the indirect effect of structure from coaches to children's behaviourual engagement and behavioural disaffection was hypothesised to be moderated by autonomy support from coaches because autonomy support from coaches moderates the effect of structre from coaches to children's psychological need satisfaction. This conditional process model is assessed in two steps (see Hayes, 2009; Preacher et al., 2007). First, simple mediation is assessed to determine the significance of the indirect effect of strucutre to children's engagement and disaffection. Second, the coefficients from two multiple regression models are inspected to determine the significance of the structure x autonomy support interaction on psychological need satisfaction and the effect of psychological need satisfaction to engagement and disaffection. Provided all effects are significant, conditional indirect effects are caculated (using an augmented indirect effect formula that includes the interaction term; see Table 6.3 notes) to test for moderated mediaiton.

6.3 Results

6.3.1 Preliminary Analyses

There were 227 participants who provided complete data. In accordance with the recommendations of Tabachnick and Fidell (2007), 31 participants with missing data were removed because their item non-response exceeded 5%. Since none of the participants in the remaining sample had more than 2 missing items, those values were replaced by the mean of the corresponding scale (Graham et al., 2003). Standardized z-scores larger than 3.29 ($p < .001$) and Mahalanobis distances greater than χ^2 (6) = 22.46 ($p < .001$) were used to identify participants as univariate and multivariate outliers (Tabachnick & Fidell, 2007). Five participants were removed on this basis. This resulted in a final sample of 245 participants (172 boys, 73 girls). These data were normal at the univariate (average absolute skew = .35, s = .16, SE = .16; average absolute kurtosis = .53, s = .15, SE = .31) and multivariate (Mardia's normalised coefficient = 3.71) levels.

Table 6.1 presents scale reliabilities (Cronbach's α and Dillon-Goldstein's rho), means, standard deviations, and intercorrelations for the study measures. The measures used to assess each of the constructs were reliable (α > .70; Tabachnick & Fidell, 2007) with the exception of behavioural disaffection (α = .68), which was retained for two reasons. First, lower internal reliability (α) among scales with small number of items is more common (Lowenthal, 1996). Second, an assessment of composite reliability for this measure was found to be acceptable (Dillon-Goldstein's rho = .79; Nunnally & Bernstein, 1994). At the zero-order level, all of the variables were significantly intercorrelated and in the directions predicted by SDT, thereby providing some preliminary support for the hypotheses.

Table 6.1 *Scale reliabilities, descriptive statistics, and intercorrelations for the study measures.*

Measures	**1**	**2**	**3**	**4**	**5**
1.Structure	.76				
2.Autonomy Support	.64***	.73			
3.Basic Psychological Need Satisfaction	.39***	.44***	--		
4.Behavioural Engagement	.30***	.40***	.62***	.83	
5.Behavioural Disaffection	-.21***	-.38***	-.41***	-.43***	.68
Composite Reliability (Dillon-Goldstein's rho)	.82	.81	.92	.88	.79
M	4.88	4.84	5.31	5.41	2.52
SD	1.19	1.09	1.01	1.14	1.08

Note. Scale reliabilities (Cronbach's α) are shown on the diagonal. The Cronbach's α values for the individual measures that were used to form the basic psychological need satisfaction composite were as follows: autonomy (α = .85), competence (α = .87), and relatedness (α = .82). $^{***}p < .001$.

6.3.2 Primary Analyses

6.3.2.1 Behavioural engagement

The analytic methods discussed in Preacher and Hayes (2008) were used to examine simple mediation (see Table 6.2). This involved the assessment of unconditional indirect effects (i.e., *ab*) as well as the amount of common variance explained in the predictor-criterion relationship by the mediator (i.e., mediated effect; Holmbeck, 1997). As shown, the unconditional indirect effect was significant (95% bias correction and acceleration confidence interval [95% BCa CI]: {0.1419, 0.3126} with 5000 resamples). Structure from coaches predicted children's psychological need satisfaction ($b = .33$, $p < .001$), which in turn predicted behavioural engagement ($b = .66$, $p < .001$). Controlling for the mediator, the relation of structure to behavioural engagement was reduced from $b = .28$ ($p < .001$) to $b = .06$ (*ns*). The signs of the unconditional indirect effect and path coefficients are consistent with the interpretation that structure increases psychological need satisfaction that, in turn, increases behavioural engagement.

The analytic methods discussed in Preacher et al. (2007) were then used to examine moderation of this indirect effect by autonomy support from coaches, which generated two multiple regression models. The mediator variable model specified psychological need satisfaction as the dependent variable, and the dependent variable model specified behavioural engagement as the dependent variable (see Table 6.3). In the mediator variable model, the interaction of structure with autonomy support predicted basic psychological need satisfaction ($b = .18$, $p < .001$). The sign of the interaction is consistent with the interpretation that the relationship between structure and psychological need satisfaction is larger for children with higher autonomy support. In the dependent variable model, basic psychological need satisfaction predicted behavioural engagement (*b* = .60, *p* < .001). The sign of the beta weight is consistent with the interpretation that higher psychological need satisfaction is associated with higher behavioural engagement. Given the significance of the interaction and the b_1 path, it makes sense to probe the indirect effect by estimating conditional indirect effects at values of the moderator. To do this, bootstrap confidence intervals were calculated to determine the values of the moderator at which the conditional indirect effect was significant. With 5000 resamples, the conditional indirect effect was significant at 1*SD* above the mean (95% BCa CI: {0.1376, 0.3677}) and at the mean (95% BCa CI: {0.0400, 0.2114}), but was non-significant at 1*SD* below the mean (95% BCa CI: {-0.0969, 0.1010}) of autonomy support.

Table 6.2 *Unconditional indirect effect of structure from coaches to children's behavioural engagement through their basic psychological need satisfaction*.

Sample Size = 245			
Number of Bootstrap Resamples = 5,000			
Direct and Total Effects	***b***	***SE***	***t***
b (YX)	.2822	.0582	4.84^{***}
b (MX)	.3298	.0501	6.58^{***}
b (YM.X)	.6647	.0612	10.86^{***}
b (YX.M)	.0630	.0519	1.21
Indirect Effect and Significance Using Normal Distribution	**Effect**	***SE***	***z***
	.2192	.0391	5.61^{***}
Bootstrap Results for Indirect Effect	**Mean**	***SE***	**95% BCa CI**
	.2192	.0430	{0.1419, 0.3126}
Effect Size for Indirect Effect	$\boldsymbol{\kappa^2}$	***SE***	**95% BCa CI**
	.2384	.0397	{0.1652, 0.3215}

Notes. *b* (YX) = the total effect of the independent variable (structure) on the dependent variable (behavioural engagement). *b* (MX) = the effect of the independent variable on the mediator (psychological need satisfaction). *b* (YM.X) = the effect of the mediator on the dependent variable, controlling for the independent variable. *b* (YX.M) = the effect of the independent variable on the dependent variable, controlling for the mediator. κ^2 = standardised value of the indirect effect, where 0 implies no linear indirect effect and 1 implies that the indirect effect is as large as it could have been (Preacher & Kelley, 2011). $^{***}p < .001$

Table 6.3 *Conditional indirect effect of structure from coaches to children's behavioural engagement through their psychological need satisfaction.*

Sample Size = 245			
Number of Bootstrap Resamples = 5,000			
	Mediator Variable Model (DV = Psychological Need Satisfaction)		
Predictor	***b***	***SE***	***t***
Structure (a_1)	-.6771	.2066	-3.28^{**}
Autonomy Support	-.6120	.2287	-2.68^{**}
Interaction (a_3)	.1812	.0432	4.19^{***}
	Dependent Variable Model (DV = Behavioural Engagement)		
Predictor	***b***	***SE***	***t***
Psychological Need Satisfaction (b_1)	.5986	.0651	9.19^{***}
Structure	-.2736	.2134	-1.28
Autonomy Support	-.0836	.2345	-0.36
Interaction	.0541	.0452	1.19
	Conditional Indirect Effect at Different Values of Moderator		
Values of Moderator	$(a_1 + a_3W)\ b_1$	***SE***	***z***
1 *SD* Below the Mean	.0023	.0489	0.48
At the Mean	.1216	.0439	2.77^{**}
1 *SD* Above the Mean	.2409	.0590	4.09^{***}

Notes. The conditional indirect effect is calculated by $(a_1 + a_3W)\ b_1$, where a_1 is the path from structure to psychological need satisfaction (from the mediator variable model), a_3 is the path from the interaction of structure with autonomy support to psychological need satisfaction (from the mediator variable model), W is autonomy support, and b_1 is the path from basic psychological need satisfaction to behavioural engagement (from the dependent variable model). $^{**}p < .01$, $^{***}p < .001$

Finally, the Johnson-Neyman technique (Johnson & Neyman, 1936) was used to examine the regional significance of the conditional indirect effect across a range of values of the moderator. This approach allows the confidence intervals of the conditional indirect effect to be continuously plotted around the conditional indirect effect for all values of autonomy support. In doing so, the exact values of the moderator where the confidence bands for the conditional indirect effect either begin to contain or no longer contain zero can be determined (Bauer & Curran, 2005). Results suggested that the conditional indirect effect was antagonistic (see Figure 6.2), such that the conditional indirect effect was positive when autonomy support was higher than 4.7136 ($[a_1 + a_3W]b_1 = .11$; 95% BCa CI: {0.0237, 0.1962}) and was negative when autonomy support was lower than 2.4271 ($[a_1 + a_3W]b_1 = -.14$; 95% BCa CI: {-0.2961, -0.0053}).

6.3.2.2 Behavioural disaffection

The same analytic methods discussed above were used to examine simple mediation (see Table 6.4). As shown, the unconditional indirect effect was significant (95% BCa CI: {-0. 2113, -0. 0841} with 5000 resamples). Structure from coaches predicted children's basic psychological need satisfaction ($b = .33$, $p < .001$), which in turn predicted behavioural disaffection ($b = -.42$, $p < .001$). Controlling for the mediator, the relation of structure to behavioural disaffection was reduced from $b = -.19$ ($p < .001$) to $b = -.05$ (*ns*). The signs of the unconditional indirect effect and path coefficients are consistent with the interpretation that stricture increases psychological need satisfaction that, in turn, decreases behavioural disaffection.

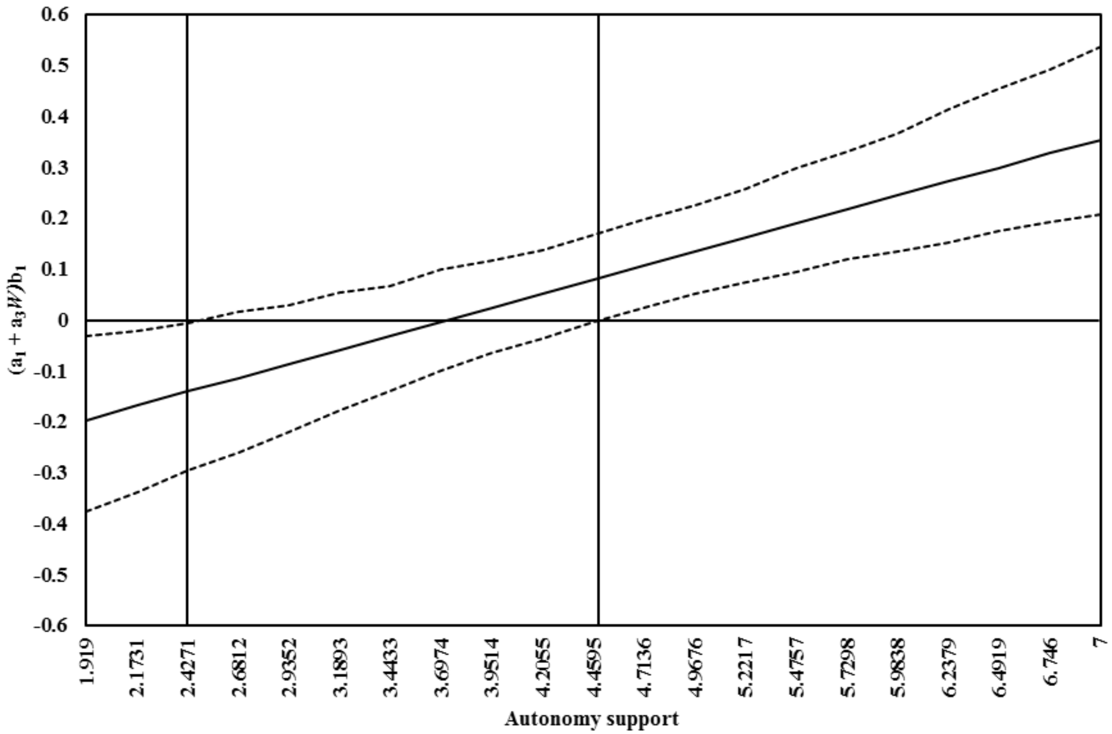

Figure 6.2 Plot of the conditional indirect effect of structure from coaches to children's behavioural engagement through their basic psychological need satisfaction. *Notes*. $(a_1 + a_3W)b_1$ = the conditional indirect effect. The solid plot depicts the trajectory of the conditional indirect effect, and the dashed plots depict the upper and lower limits of the 95% BCa CI. The vertical lines depict the boundaries of the regional significance of the conditional indirect effect.

Table 6.4 *Unconditional indirect effect of structure from coaches to children's behavioural disaffection through their psychological need satisfaction.*

Sample Size = 245			
Number of Bootstrap Resamples = 5,000			
Direct and Total Effects	***b***	***SE***	***t***
b (YX)	-.1909	.0567	-3.37^{***}
b (MX)	.3298	.0501	6.59^{***}
b (YM.X)	-.4159	.0676	-6.15^{***}
b (YX.M)	-.0538	.0573	-0.94
Indirect Effect and Significance Using Normal Distribution	**Effect**	***SE***	***z***
	-.1372	.0307	-4.47^{***}
Bootstrap Results for Indirect Effect	**Mean**	***SE***	**95% BCa CI**
	-.1372	.0322	{-0.2113, -0.0841}
Effect Size for Indirect Effect	κ^2	***SE***	**95% BCa CI**
	.1463	.0307	{0.0919, 0.2141}

Notes. *b* (YX) = the total effect of the independent variable (structure) on the dependent variable (behavioural disaffection). *b* (MX) = the effect of the independent variable on the mediator (psychological need satisfaction). *b* (YM.X) = the effect of the mediator on the dependent variable, controlling for the independent variable. *b* (YX.M) = the effect of the independent variable on the dependent variable, controlling for the mediator. κ^2 = standardised value of the indirect effect, where 0 implies no linear indirect effect and 1 implies that the indirect effect is as large as it could have been (Preacher & Kelley, 2011). $^{***}p < .001$

The analytic methods discussed in Preacher et al. (2007) were then used to examine moderation of this indirect effect by autonomy support from coaches (see Table 6.5). In the mediator variable model, the interaction of structure with autonomy support predicted basic psychological need satisfaction (b = .18, p < .001). The sign of the interaction is consistent with the interpretation that the relationship between structure and psychological need satisfaction is larger for children with higher autonomy support. In the dependent variable model, basic psychological need satisfaction predicted behavioural disaffection (b = -.36, p < .001). The sign of the beta weight is consistent with the interpretation that higher psychological need satisfaction is associated with lower behavioural engagement. Given the significance of the interaction and the b_1 path, it makes sense to probe the indirect effect by estimating conditional indirect effects at values of the moderator. To do this, bootstrap confidence intervals were calculated to determine the values of the moderator at which the indirect effect was significant. With 5000 resamples, the indirect effect was significant at 1*SD* above the mean (95% BCa CI: {-0.2462, -0.0729}) and at the mean (95% BCa CI: {-0.1413, -0.0242}), but was non-significant at 1*SD* below the mean (95% BCa CI: {-0.0629, 0.0560}) of autonomy support.

Finally, the Johnson-Neyman technique (Johnson & Neyman, 1936) was used to examine the regional significance of the conditional indirect effect across a range of values of the moderator. Results suggested that the conditional indirect effect was antagonistic (see Figure 3), such that the conditional indirect effect was negative when autonomy support was higher than 4.7136 ($[a_1 + a_3W]b_1$ = -.06; 95% BCa CI: {-0.1328, -0.0159}) and was positive when autonomy support was lower than 2.1731 ($[a_1 + a_3W]b_1$ = .10; 95% BCa CI: {0.0134, 0.2194}).

Table 6.5 *Conditional indirect effect of structure from coaches to children's behavioural disaffection through their psychological need satisfaction.*

Sample Size = 245			
Number of Bootstrap Resamples = 5,000			
	Mediator Variable Model (DV = Basic Psychological Need Satisfaction)		
Predictor	***b***	***SE***	***t***
Structure (a_1)	-.6771	.2066	3.28**
Autonomy Support	-.6120	.2287	2.68**
Interaction (a_3)	.1812	.0432	4.19***
	Dependent Variable Model (DV = Behavioural Disaffection)		
Predictor	***b***	***SE***	***t***
Basic Psychological Need Satisfaction (b_1)	-.3617	.0708	-5.11***
Structure	-.1385	.2320	-0.60
Autonomy Support	-.5515	.2549	-2.16*
Interaction	.0517	.0492	1.05
	Conditional Indirect Effect at Different Values of Moderator		
Values of Moderator	**($a_1 + a_3W$) b_1**	***SE***	***z***
1 *SD* Below the Mean	-.0013	.0295	-0.04
At the Mean	-.0727	.0295	-2.47*
1 *SD* Above the Mean	-.1441	.0435	-3.31***

Notes. The conditional indirect effect is calculated by ($a_1 + a_3W$) b_1, where a_1 is the path from structure to psychological need satisfaction (from the mediator variable model), a_3 is the path from the interaction of structure with autonomy support to psychological need satisfaction (from the mediator variable model), W is autonomy support, and b_1 is the path from psychological need satisfaction to behavioural disaffection (from the dependent variable model). * $p < .05$, ** $p < .01$, *** $p < .001$

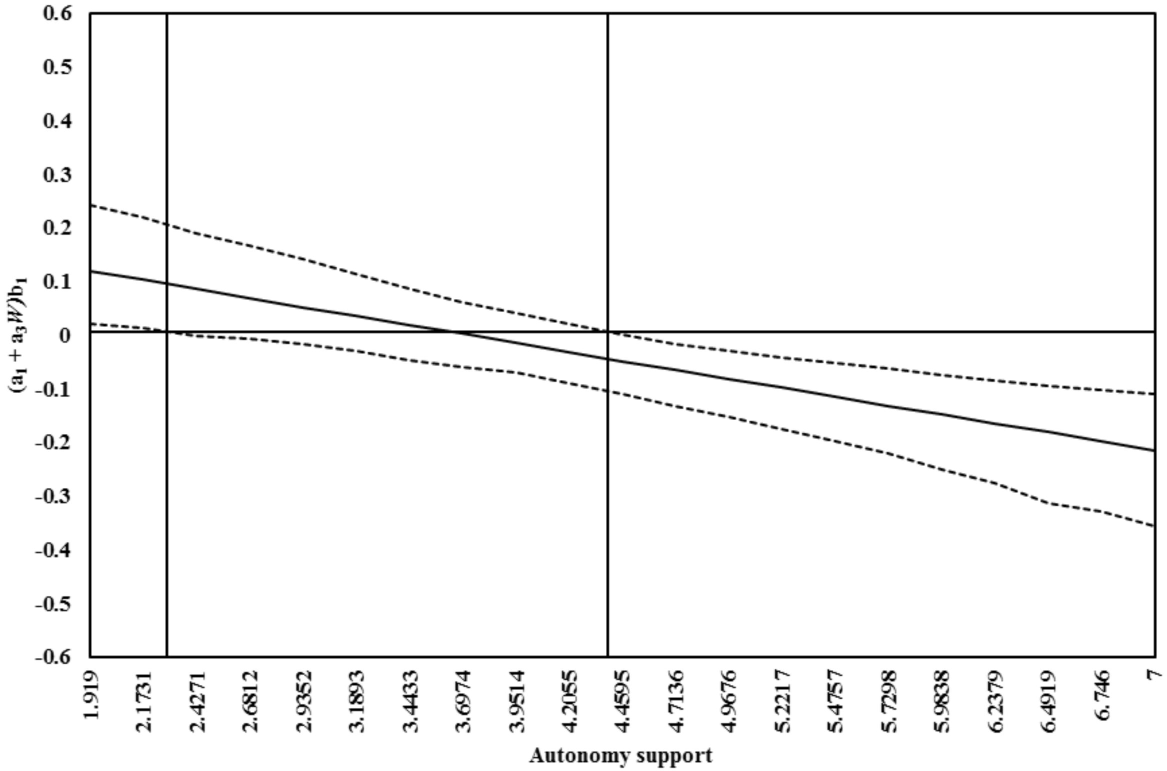

Figure 6.3 Plot of the conditional indirect effect of structure from coaches to children's behavioural disaffection through their basic psychological need satisfaction. *Notes*. $(a_1 + a_3W)b_1$ = the conditional indirect effect. The solid plot depicts the trajectory of the conditional indirect effect, and the dashed plots depict the upper and lower limits of the 95% BCa CI. The vertical lines depict the boundaries of the regional significance of the conditional indirect effect.

6.4 Discussion

This study tested a conditional process model of children's behavioural engagement and behavioural disaffection in sport based on self-determination theory. In terms of simple mediation, it was hypothesized that structure from coaches would relate positively to children's behavioural engagement and negatively to behavioural disaffection in sport, and that these divergent associations would be explained (mediated) by children's satisfaction of the basic psychological needs for autonomy, competence, and relatedness. Results supported these predictions. It appears, therefore, that structure from coaches affords children opportunities for satisfaction of basic psychological needs, which in turn is associated with higher levels of behavioural engagement and lower levels of behavioural disaffection in sport.

According to self-determination theory, though, the way in which coaches provide structure can be perceived by children as either supportive of their choice and volition (autonomy support) or pressuring and coercive (control). In terms of moderated mediation, then, it was hypothesized that the strength of the indirect effects would depend on children's perceptions of autonomy support from coaches. Results supported this prediction. The interaction of structure with autonomy support predicted basic psychological need satisfaction, and thus mediation was evident only among children who reported levels of autonomy support at or above the mean. As well, the conditional indirect effects were antagonistic. That is, the conditional indirect effect of structure on behavioural engagement was positive for those who reported higher levels of autonomy support, but was negative for those who reported lower levels of autonomy support. In contrast, the conditional indirect effect of structure on behavioural disaffection was negative for those who reported higher levels of autonomy support, but was positive for those who reported lower levels of autonomy support.

6.4.1 Theoretical Implications

These findings have important theoretical implications for self-determination theory's mediation model in the youth sport domain. Structure from coaches predicted higher levels of behavioural engagement and lower levels of behavioural disaffection, suggesting that clear instructions and positive feedback from coaches are conducive to children's investment in sport. Also in line with self-determination theory, these divergent relations were reduced to non-significance after controlling for children's satisfaction of the psychological needs. Such evidence of mediation attests to basic psychological need satisfaction as an explanatory mechanism in the association between the social context (the coach) and motivational outcomes in youth sport (behavioural engagement and behavioural disaffection). In an extension to the previous studies in this thesis, these results suggest that provision of information, expectations, strategies, support, limits, and other aspects of structure is not necessarily inhibitive of volitional engagement in sport, as at the zero-order level this approach was conducive to children's experience of basic psychological need satisfaction and behavioural engagement.

Importantly, although structure from coaches predicted psychological need satisfaction, this positive relation was moderated by autonomy support and was stronger among children who experienced higher levels of autonomy support from their coaches. Thus, children are more likely to experience basic psychological need satisfaction when coaches provide structure with support for choice, volition, and self-initiation (autonomy support) rather than in a context of pressure to think, feel, and behave in particular ways (control). In an extension to self-determination theory's mediation model, then, structure and autonomy appear to interact synergistically in predicting psychological need satisfaction, and therefore it is important that future research examines both constructs to develop a more complete understanding of how the social-context influence motivational outcomes.

It follows from this interaction that the indirect effects of structure to both behavioural engagement and behavioural disaffection through psychological need satisfaction were moderated by autonomy support. So much so, in fact, that autonomy support reversed the direction of these indirect effects at low levels. Children thus appear to experience satisfaction of their psychological needs in contexts that are both structured *and* autonomy supportive, and such satisfaction provides the psychological energy necessary for higher engagement and lower disaffection in youth sport. Without autonomy support, coaches may communicate information, expectations, strategies, limits, and other aspects of structure in a controlling way, which undermines children's perceptions of agency, capability, and support. This lack of psychological need satisfaction, in turn, gives rise to lower engagement and higher disaffection. Extending traditional approaches to self-determination theory's mediation model (e.g., Adie et al., 2008; Bartholomew et al., 2011; Reinboth et al., 2004; see also Mageau & Vallerand, 2003), the provision of structure alongside autonomy support appears to create optimal conditions for motivation and engagement.

6.5 Conclusion

In sum, the results of this final study suggests that sport contexts which are replete with structure and autonomy support are associated with higher levels of behavioural engagement and lower levels of behavioural disaffection. This is because, in line with self-determination theory, such contexts afford the most optimal opportunity for satisfaction of autonomy, competence, and relatedness. By contrast, and also in line with self-determination theory, structure from coaches in the absence of autonomy support was unrelated to basic psychological need satisfaction. These findings extend those of studies one, two and three by highlighting the importance of coaches' providing guidance, expectations, and feedback (i.e., structure) in a way that respects children's volition (i.e., autonomy support) in order to generate higher behavioural engagement and lower behavioural disaffection.

Chapter Seven: General Discussion

7.1 Purpose of the thesis

Participation in youth sport confers many physical, psychological and social benefits for children that are conducive to adherence across the lifespan (Kjonniksen et al., 2009; Trost et al., 2002; Tammelin et al., 2003; Van Mechelen et al., 2002). Yet it is also the case that youth sport can precipitate many psychological and social costs that, in part, mean children dropout and cease participation beyond adolescence (Gould et al., 1982; Petlichkoff, 1996; Brackenridge et al., 2011). Coaches are understood to be instrumental in determining whether youth sports participants adhere versus dropout of youth sport. Hence, understanding how and why coaches influence children's adherence and attrition in youth sport is important. To this end, generating insight into the coach-related antecedents of engagement versus disaffection may be particularly illuminating since the concepts of engagement and disaffection encompass behaviours and emotions prototypically associated with the motivational processes underpinning long-term participation (viz. psychological need satisfaction) or dropout (viz. psychological need thwarting).

Few systematic empirical attempts to examine the antecedents of engagement and disaffection have been made in youth sport, despite this being a particularly fertile topic for research in other, similar, domains (e.g., education; see Fredricks et al., 2004 for review). As such, it is currently difficult to draw any firm conclusions regarding the specific coach behaviours that give rise to them. Within the purview of self-determination theory, the present thesis was undertaken with the intention of identifying the coach-related antecedents of children's engagement and disaffection in youth sport, and the psychological processes underpinning their effects. In this final chapter, the results of the studies in this thesis will be summarised and integrated in an attempt to describe how they speak to the coach behaviours that may facilitate adherence and eschew attrition in youth sport.

7.2 Summary of findings

In concordance with the fundamental tenets of self-determination theory, links between perceptions of coach structure and motivational style, psychological need satisfaction and thwarting, and indicators of engagement and disaffection were examined across the four studies in this thesis. In general, the studies were supportive of the application of self-determination theory as a conceptual approach by which to examine the coach-related antecedents of children's engagement and disaffection in youth sport. Most notably, the results are the first to support the mediating role of the psychological needs in relationships between the coach and children's behavioural engagement versus behavioural disaffection in youth sport. High psychological need satisfaction was found to predict high behavioural engagement, whereas high psychological need thwarting and low psychological need satisfaction predicted high behavioural disaffection. These psychological needs were satisfied when coaches were perceived to provide high structure and autonomy support, whereas they were thwarted when coaches were perceived to be highly controlling.

The first study of this thesis examined the multivariate and univariate relationships between children's psychological need satisfaction and their cognitive-emotional engagement. The findings indicated that psychological need satisfaction and children's engagement in youth sport shared a positive association. In addition, although all the psychological needs had meaningful explanatory utility in all aspects of engagement, competence emerged as the dominant psychological need in these relationships, thereby suggesting that special attempt should be made to support this need in youth sport. In the three subsequent studies, the coach-related antecedents of the psychological needs were examined to better understand how coaches influence levels of engagement in youth sport.

The next cross-sectional study indicated that autonomy support from coaches and behavioural engagement shared a positive association that was explained by higher psychological need satisfaction. By contrast, control from coaches and behavioural disaffection shared an inverse association that was explained by higher psychological need thwarting and lower psychological need satisfaction. This study was the first to test self-determination theory's mediation model in relation to children's behavioural engagement in youth sport and was supportive of its hypotheses. Furthermore, by examining psychological need satisfaction and thwarting concurrently, this study was also the first to signpost the divergent processes underpinning children's behavioural engagement and behavioural disaffection in youth sport. It was limited, though, by its cross-sectional design that did not provide any temporal information about the study variables.

The penultimate study, then, sought to examine these mediational pathways over the course of a competitive season. This way, prior levels of the psychological needs and indicators of behavioural engagement could be controlled in analyses using autoregressive paths. Notably, this study was the first to apply a fully longitudinal cross-lagged analysis to self-determination theory's mediation model in sport. The findings of this study indicated that the mediational effect of mid-season psychological need satisfaction on the relationship between season start autonomy support from coaches and children's season end behavioural engagement in sport was significant. However, support was not forthcoming for the mediational effect of mid-season psychological need thwarting on the relationship between season start control from coaches and children's season end behavioural disaffection. In addition, this study was suggestive of the presence of important non-stable and reciprocal effects that have important implications, explained in more detail later, for models of children's engagement in youth sport.

Having established support for the mediational influence of the psychological needs in facilitating the divergent associations of autonomy support to children's behavioural engagement (viz. positive) and disaffection (viz. negative), the final study of this thesis was the first to examine the potential moderating role of autonomy support in the structure, psychological need satisfaction, and engagement mediational sequence. This conditional process model indicated that psychological need satisfaction mediated the divergent effects of structure on children's behavioural engagement (viz. positive) and disaffection (viz. negative) in youth sport. Furthermore, these mediated effects were antagonistically moderated by autonomy support. When autonomy support was high, structure exhibited a positive indirect relationship with behavioural engagement and a negative indirect relationship with behavioural disaffection, whereas when autonomy support was low, structure exhibited a negative indirect relationship with behavioural engagement and a positive indirect relationship with behavioural disaffection.

7.3 Children's behavioural engagement and behavioural disaffection in youth sport

Self-determination theory is largely predicated upon the notion that humans are (pro)active organisms. In other words, humans seek out opportunities to feel volitional, effective and close to important others because these experiences support their natural tendencies toward behavioural integration. However, within self-determination theory, humans are also vulnerable to disinterest, control, incompetence and isolation. This is because social-contexts can be unsupportive, or actively thwarting, of their innate psychological growth tendencies. As such, self-determination theory adopts a dialectical perspective whereby humans' tendency toward behavioural integration is met either by supportive or inhibiting environmental features.

At the core of self-determination theory is thus the hypothesis that when the psychological needs are satisfied, they promote the organismic tendencies toward psychological growth and an internalization of ambient values, beliefs, and practices into the self (Niemiec & Ryan, 2013). Thus, psychological need satisfaction is understood to underpin the autonomous behavioural regulation that encapsulates effortful, persistent and attentive behaviours indicative of engagement (Connell & Wellborn, 1991). Yet, when the psychological needs are thwarted, socially-implanted values and beliefs – antagonistic to psychological growth and internalization – come to regulate behaviour. Thus, psychological need thwarting is understood to underpin the controlled behavioural regulation that encapsulates passive, disinterested and detached behaviours indicative of disaffection. Corresponding with research in and outside of sport (e.g., Adie et al., 2008, 2012; Bartholomew et al., 2011; Deci et al., 2001; Pelletier et al., 2001; Jang et al., 2012; Skinner et al., 2008), the results of this study support this theorising. This is because, across the four studies, psychological need satisfaction predicted higher behavioural engagement and lower behavioural disaffection, whereas psychological need thwarting predicted higher behavioural disaffection.

The psychological needs appear to be proximal predictors of children's engagement and disaffection in youth sport. It follows, then, that any antecedents of the psychological needs also speak to engagement. Self-determination theory assumes that humans are social organisms and, therefore, psychological need satisfaction and thwarting occurs in a social-context. Consequently, it is important for research interested in the antecedents of psychological need satisfaction and thwarting to examine the manner by which socializers provide support for, or obstruct, perceptions of autonomy, competence, and relatedness (Connel & Wellborn, 1991; Reeve, 2006b; Ryan & Deci, 2000). According to self-determination theory, two important motivational styles can be adopted by socializers that cultivate and inhibit the psychological needs respectively.

The first, autonomy support, is purported to cultivate psychological need satisfaction because it entails a trust in children's abilities to be self-directed in their interactions with sport (Black & Deci, 2000). This conceptualisation was evident across the studies of this thesis as, supporting extant research (e.g., Adie et al., 2008; Bartholomew et al., 2011; Quested & Duda, 2010), autonomy support was positively associated with psychological need satisfaction and negatively associated with psychological need thwarting. The second, a controlling inter-personal style, is purported to produce psychological need thwarting because it entails coercion, socialisation by reward and punishment (Bartholomew et al., 2010). This conceptualisation was also evident in the current thesis as, across the four studies, control from coaches negatively correlated with psychological need satisfaction and positively correlated with psychological need satisfaction. Overall, then, this thesis speaks to the unifying role of psychological needs in linking coach motivational style to children's engagement in sport.

In addition to these broad findings, though, studies three and four offer a number of important extensions. Firstly, in study three, the effect of psychological need satisfaction on children's behavioural engagement was not stable and responded only to changes in psychological need satisfaction. As such, children's engagement in youth sport appears to be facilitated only when children perceive gains in their autonomy, competence and relatedness. This finding attests to the importance of autonomy support in providing opportunities for children to experience *increased* psychological need satisfaction. Such increases have clear implications for children's later levels of behavioural engagement.

Yet what is most interesting about this effect is not its instability but, rather, it's reciprocity as also evidenced in study three. Just as earlier gains in psychological need satisfaction produce later gains in engagement, so too did earlier gains in engagement produce later gains in psychological need satisfaction. This finding speaks to the notion that children both seek out, and receive, sources of motivation from their environment in a reciprocal fashion. In other words, not only is it the case that autonomy support provides opportunities for autonomy, competence and relatedness but so too do children, through their effortful and persistent behaviours, strive toward the satisfaction of these needs for themselves. This reciprocal relationship alludes chiefly to a positive upward spiral, whereby increases in psychological need satisfaction feed into increases in behavioural engagement that feed back into increases in psychological need satisfaction and so on. Maintaining this upward spiral is potentially critical for children's adherence in youth sport and the results of studies two and three attest to the importance of autonomy support in this regard. Autonomy support thus not only catalyses motivation but also creates conditions in which children motivate themselves.

However, in an extension to these findings, study four provided evidence to suggest that other coaching provisions may supplement the influence of autonomy support on psychological need satisfaction and thereby children's adherence in youth sport. Specifically, supporting research in education (Reeve et al., 2006; Sierens et al., 2010), results suggested that autonomy support and structure were interactive correlates of psychological need satisfaction. Structure refers to the rules, limits, feedback and evaluation that coaches provide to children as a means of developing their competence in youth sport. When such provisions are enacted in a context of autonomy support, the results indicate that high psychological need satisfaction is the result. Conversely, when structure is enacted without an abiding sense of autonomy support, low psychological need satisfaction is the result.

This interaction, between autonomy support and structure, necessarily meant that the mediated effects of psychological need satisfaction on the structure to engagement and disaffection relationship were moderated by autonomy support. Such significant conditional indirect effects attest to the importance of supporting both children's autonomy and competence for their engagement in youth sport. This is presumably because autonomy and competence are the central foundational psychological needs of intrinsic motivation (Deci, 1975). Thus, it is particularly important to concurrently provide support for both (see also Reeve et al.,2006b). In short, findings appear to indicate that that the engagement critical to children's adherence in youth sport is facilitated when coaches provide structure with respect for children's volition. By contrast, the disaffection indicative of pre-attrition in youth sport is enhanced when coaches provide structure without respect for children's volition.

7.4 Practical implications

One of the reasons for undertaking this thesis was to better understand what it is that coaches do to promote adherence versus attrition in youth sport. As such, in addition to the conceptual contribution this thesis makes to this topic, it also provides some valuable implications for practice. Such implications are aligned with theoretical foundations upon which this thesis is based and, importantly, are underpinned by the empirical support provided by this as well as other research.

7.4.1 Recommendation 1: Promote perceptions of autonomy support

In studies two and three this thesis examined the role of autonomy support and control in psychological need satisfaction and thwarting – the foundations of behavioural engagement and disaffection. Foremost amongst the findings is that autonomy support from coaches appears to be an important predictor of children's psychological need satisfaction which, in turn, triggers a positive upward spiral to enhanced engagement. Recently, Reeve (2006b) has provided five guidelines for practitioners interested in how to be autonomy supportive in learning contexts. The first is that coaches should attempt to nurture children's inner resources. Put simply, this means that coaches should find ways to co-ordinate children's instruction in such a way that supports their interests, sense of enjoyment and preference for volition. This may be achieved by supporting children's initiative taking in competitive situations, or by making sure that tasks in sport, where possible, are fun and exciting. For example, coaches could give children the opportunity to decide the team formation prior to a game, or choose which training drills they would like to participate in. Providing support for children's inner resources is an important building block for their sense of self-determination.

The second recommendation for autonomy supportive instruction is to rely on informational, non-controlling language. That is, coaches should flexibly relay messages to their athletes with information rich, competence-affirming statements that describe why they are doing well or making progress (e.g., "Good effort! Because you're striking the ball with your laces, your shooting is improving."). Communicating feedback in this manner allows problems to be met with constructive solutions through language that is encouraging and non-demeaning. In doing, children are in a position to identify the underlying cause of their poor technique or performance and take adaptive action to remedy the problem. The use of informational and non-controlling language has clear and positive implications for children's sense of ownership over their development (autonomy), efficacy and goal progress (competence) and relationship with the coach (relatedness).

The third guideline for practitioners seeking to be more autonomy supportive is to communicate value and provide meaningful rationales. In other words, coaches should seek to make sure children are aware of the use, value, importance or otherwise unapparent personal relevance of engaging in sporting tasks. This might be achieved, for instance, by giving a meaningful rationale when uninteresting tasks are required (e.g., "Fitness training is not the most fun activity, I know, but it is really important for players to have good endurance so they can press the opposition"). Such a rationale allows children to internalise the task as personally meaningful. As a consequence, communicating value and a meaningful rationale generates greater self-determination.

The penultimate recommendation that Reeve (2006b) provides for autonomy support is to acknowledge and accept negative affect. Acknowledging and accepting negative affect serves to counter the motivational problem that coaches often encounter when they negotiate conflicts between what athletes want to do, and what coaches need athletes to do. A coach may, for instance, need a child to work on their passing when the child may want to practice their shooting. Instead of combatting this conflict with controlling measures (e.g., "Just get on with it."), autonomy supportive coaches show an understanding of the athletes perspective and accept the negative feelings (e.g., "I understand that passing might seem boring, so I appreciate how you feel when we practice it.”). This acknowledgement may be followed by a rationale in an attempt to change the athlete’s frame of reference for the task they display a resistance to. Acknowledging and accepting negative affect has the dual benefit of helping children internalise otherwise uninteresting activities (autonomy), as well as cultivating secure bonds between the coach and athlete (relatedness).

In the final recommendation that Reeve (2006b) makes, specific behaviours are presented that subsume the four aspects of autonomy support above. Such autonomy supportive behaviours, according to Reeve (2006; Reeve, Bolt & Cai, 1999) and others (e.g., Deci, Schwartz, Shienman & Ryan, 1981), include; (1) listening carefully; (2) creating opportunities for curiosity and self-initiation; (3) providing opportunities for peer learning and co-operation; (4) arranging learning environments that encourage active participation; (5) encouraging effort; (6) praising development and mastery; (7) offering progress-enabling feedback; (8) responding consistently to subordinates’ questions and queries; and (9) communicating a clear acknowledgement of subordinates perspectives. While I might quibble with the inclusion of some of these behaviours as autonomy supports (e.g., 6 and 7), they nevertheless provide a useful framework from which coaches can ground their motivational style. The results of this thesis suggest that such behaviours have the beneficial outcome of producing behavioural engagement in children through elevated psychological need satisfaction.

7.4.2 Recommendation 2: Reduce perceptions of a controlling motivational style

In addition to promoting autonomy support, the studies of the thesis suggest that perceptions of control should be reduced to maximise engagement. Why a coach might adopt a controlling motivational style is a complex issue, and may be due to a number of inter-related factors. Such factors are important to recognise as study two of this thesis suggests that control from coaches predicts increases in psychological need thwarting, which makes behavioural disaffection and thereby attrition more likely. Furthermore, in study three, despite the failure of these findings to be replicated longitudinally, control from coaches exhibited a negative indirect effect on behavioural engagement via lower psychological need satisfaction across three waves of data. In line with extant research (see Bartholomew et al., 2009), then, control from coaches has clear implications for children's maladjustment in sport.

Given that athletes' engagement typically suffers when coaches are controlling, why might they persist in enacting such instructional behaviours? Pellerier, Seguin-Levesque and Legault (2002) and Reeve (2009) offer a framework that can be used to answer this question. According to this framework, three pressures are purported to orient one towards a controlling inter-personal style. These include; (1) pressure from above; (2) pressure from below; and (3) pressure from within. Using this framework as a guiding principle, it is possible to identify the specific institutional, cultural, interpersonal and intrapersonal factors that might promote the use of controlling tendencies by grassroots coaches in the UK.

Pressure from above refers to influences that arise from outside demands (e.g., sporting association, club, parents and the media), which centre on either; (a) responsibility and accountability; or (b) culturally valued norms. In the case of the former, coaches are often placed under a great deal of pressure by their club, or the children's parents, to ensure that their athletes perform well – and crucially, win (Brooking, 2010). When coaches are pressured to produce certain outcomes, though, the reaction is typically to become a social conduit, passing along that pressure to their athletes in the form of a controlling motivational style (Reeve, 2009). In the case of the latter, a culturally held norm in the UK is that controlling coaches, who shout and holler from the side-lines, are more effective than autonomy-supportive coaches, who have minimal interference on athletes decision making in sport (cf. Magowan, 2012). This problem is exacerbated by the pressure laden influences that pervade youth sport culture (e.g., evaluation, competition and rewards). The natural reaction for coaches is to enact controlling strategies that produce immediate benefits (i.e., behavioural intensity) ignoring the damaging long-term effects that these strategies might have (i.e., reduction in motivation and engagement).

Pressure from below refers to influences that arise from subordinate passivity and disengagement. When coaches perceive that their athletes are episodically disinterested or unmotivated, the typical reaction is to adjust their motivational style in such a way as to coerce or cajole athletes into action. This is also the case for athletes that are perceived as difficult or unruly (cf. Grolnick, Weiss, McKenzie & Wrightman, 1996). Athletes may even seek out controlling strategies from coaches, looking for reasons to persist, having adopted an externalised regulation for sport. Yet it is important that coaches are not seduced by such pressures from below and instead seek to face such challenges with motivational styles that promote autonomy.

Finally, pressure from within refers to influences that arise from a coaches own beliefs, values and personality dispositions. In practice, coaches may possess certain control-oriented personality dispositions (e.g., defensiveness, ego orientation, neuroticism, perfectionism and controlled causality orientation) that render controlling motivational instruction more likely. It is well understood that the values and belief systems that socialisers possess strongly correlate with their motivational styles in social settings (see Prinzie, Stams, Dekovic, Reijntjes & Belsky, 2009 for review). And indeed, controlling personality dispositions appear to predict controlling socialisation (Reeve, 1998). Thus, coaches may also exhibit controlling tendencies when they enter the sports field with a controlled personality of their own.

There are several ways in which these pressures can be alleviated so that coaches do not feel the need to employ controlling instruction to children in sport. The first applies to pressures from above and is to de-emphasise the importance of, and meaning granted to, winning at the grass-roots level – be that from sporting organisations, clubs or parents. Instead, the focus should be on the *process*, and not the outcome, of children’s development in sport such as enjoyment and skill mastery. This is because these factors align with the elements of coaching behaviour that underwrite an autonomy supportive style. This may, for sporting organisations, necessitate an emphasis that rewards such as cups and medals are achieved by effort and application. In the case of clubs and parents, this might involve emphasis that effort, curiosity and mastery supersede winning, ability and reward.

Indeed, according to cognitive evaluation theory, children’s intrinsic motivation need not be undermined by rewards, provided they are perceived as competence affirming and non-controlling (Deci & Ryan, 1987; Ryan, 1982). That is, external incentives need be presented in such a way as not to appear the impetus for behaviour but, instead, an indicator of success and competence. In doing so, the perceived origin of children’s sports participation becomes less to do with the incentive and more to do with the inherent value placed on participation (Hagger, Keatley et al., 2013). Hence, participation will persist even in the absence of the incentive. Providing rewards and incentives in a non-controlling and competence affirming manner is thus important for policymakers and stakeholders in youth sport to recognise.

As regards pressure from below, it is critical that coaches recognise that episodic passivity and demotivation are natural reactions to momentary disinterest. Therefore, instead of attempting to coerce children into action, coaches might want to take the child's frame of reference, display empathy, and provide a meaningful rationale for the task. This way, coaches do not succumb to the temptation to respond to disaffection with control, but instead use it as an opportunity to display more autonomy support. As coaches become increasingly aware of the consequences of their motivational style, they gain a greater capacity to behave in an adaptive, autonomy supportive way, rather than in an impulsive, habitual and reactive manner (Reeve, 2009). Hence, education and intervention is critical if coaches are to understand, endorse, and enact autonomy support.

Finally, in the case of pressure from within, it is important that coaches are mindful of their own values and beliefs, and think about how they might impact the way that they motivate children in sport. In particular, it is of critical importance for coaches to want to be autonomy supportive, and fully endorse its value. There are two fundamental reasons why coaches might want to be autonomy supportive. The first is that, as this thesis has demonstrated, children benefit from its provision. The second is that, as research has showed, autonomy supportive socialisers demonstrate less exhaustion and more psychological well-being than their controlling counterparts (Deci et al., 2006; Roth, Assor, Kanat-Maymon & Kaplan, 2007). Integrating these lessons into any intervention that attempts to educate coaches in the provision of autonomy support is essential.

7.4.3 Recommendation 3: Combine autonomy support with structure

In the final study, support was found for a conditional process model of children's engagement and disaffection in sport. Rather than autonomy support per-se, results indicated that both autonomy and structure interacted in a synergistic manner to predict greater psychological need satisfaction (and thereby elevated behavioural engagement and reduced behavioural disaffection). Furthermore this synergy was antagonistic such that when autonomy support was low, structure exhibited a positive indirect effect on disaffection and a negative indirect effect on behavioural engagement. These results provide a number of reflections that make important extensions to the practical recommendations already mentioned.

One of the key contributions of this thesis is the description of coach structure as a relatively orthogonal construct to coach autonomy support and control. This is important because structure and notions of autonomy support and control are often confounded. Taking a self-determination theory perspective, Reeve (2009) purports that the provision of feedback constitutes an element of autonomy support (see point 6, above). Further, in defining elements of parenting, other authors have posited that rules and limits can only ever be imposed with an abiding sense of controllingness or punishment (e.g., Baumrind, 1971; Rodrigo, Janssens & Ceballos, 1999). The results of this thesis suggest that autonomy support and control are not structuring features per-se but, rather, ways in which structure might be *conveyed*. When children sense that structure is conveyed in a context of autonomy support, they are inclined to feel competent and in control of their actions - meaning behavioural engagement is more likely.

While there is ample research and recommendation on autonomy support, much less attention has been devoted to the components of structure within self-determination theory. This said, Reeve (2006; see also Farkas & Grolnick, 2010) has provided a framework for understanding what structure might look like in practice. Specifically, Reeve argues that there are three sub-components of structure that occur at different stages of the learning process. These components include; (a) presenting clear goals, rules and expectations before a learning activity, (b) offering help, guidance and supervision during a learning activity and (c) giving positive, constructive and task-focussed information feedback after a learning activity. Defined this way, structure has the primary role of cultivating children's fundamental need for competence because students who receive structure have the opportunity to feel able to effectively interact with their sporting environments (Skinner & Belmont, 1993).

It is important to remember, at this point, that these elements of structure encompass those behaviours that coaches would consider central to their coaching. Yet the findings of study four suggest that such behaviours are insufficient to keep children engaged in sport. In addition, coaches should be aware of how the way in which this structure is conveyed produces either attentive, effortful and persistent athletes, or passive, apathetic and disinterested athletes. That is, behavioural engagement is produced when coaches' provide rules and expectations, support and supervision and instruction and feedback with an abiding sense of support for children's choicefulness and volition. By contrast, behavioural disaffection appears to be produced when coaches provide this same structure with an abiding sense of coercion and control.

Some elements of structure (such as rules) may seem antagonistic to certain aspects of autonomy support (such as choice provision). However, it is possible for coaches to provide a sense of structure without compromising autonomy. This might be achieved, for instance, by introducing rules and limits with a meaningful rationale, or by organizing the content of goals, training regimens, and competition strategies in concordance with children's ideas and suggestions. As Jang et al. (2010) articulated, providing expectations and limits (structure) in a context that encourages choice and volition (autonomy support) enables children to maintain a sense of autonomy while fostering their competence. Research has shown that socializers can be trained to provide support for the basic psychological needs (Deci, Connell, & Ryan, 1989;

Ntoumanis, 2012), and the current thesis suggests that special emphasis in such interventions may be placed on training socializers to provide structure in a way that respects autonomy.

7.5 Criticisms of self-determination theory

As discussed, this thesis has provided support for the application of self-determination theory to explanations of children's engagement and disaffection in youth sport. These findings notwithstanding, a number of criticisms have been levied at the framework (e.g., Iyengar and DeVoe, 2003; Iyengar & Lepper, 2000; Markus & Kitayama, 2003; Schwartz, 2000, 2004; Stephens, Markus & Townsend, 2007) and it is important the results of this thesis are interpreted in the context of them. These include critiques of the adaptive nature of autonomy support, the relevance of autonomy for certain populations as well as the findings in the current thesis that did not support self-determination theory. Each of which is described in turn.

7.5.1 Is autonomy support adaptive?

One of the most fervently debated components of self-determination theory is whether the provision of autonomy supportive features, such as choice and self-direction, are universally adaptive. Indeed some suggest the provision of choice, and the encouragement of self-direction, might be demotivating (Iyengar & Lepper, 2000), devaluing (Hand, 2006) or even tyrannical (Schwartz, 2000, 2004). For example, Schwartz (2000, 2004) and others (e.g., Iyengar & Lepper, 2000) have suggested that the provision of choice, under certain circumstances, can be inhibitive of psychological freedom. The crux of this argument is that as choice increases so too does the opportunity for cost associated with decision making. Thus, the more alternatives there are, the deeper our sense of loss will be and hence the less satisfaction we will derive from the choice we make. Several studies have supported this contention, whereby participants exposed to an experimental condition with less choice reported more satisfaction with their decision than those exposed to more (see Schwartz, 2000, 2004 for review). An excessive number of options and choices thus appear to be demotivating.

In youth sport, it is easy to see how there may be costs associated with too much choice in the environment. This is because youth sport is, typically, the domain of the novice who may have difficulty in linking their actions with the desired outcomes. Under such circumstances, children may become overwhelmed by the proposition of making decisions and taking ownership of their learning. Yet while having a voice and choice is a hallmark of autonomy support it is not, by itself, defining of what it means to be autonomy supportive (Ryan & Deci, 2006). What is more important, according to self-determination theory, is the *meaning* attached to such choice.

By analogy, one soccer player can have many choices regarding what to do in a training session and not feel autonomous whereas another player may have only one option and feel autonomous provided that such an option is fully endorsed by the player. In essence, the effect of choice in self-determination theory depends heavily on how it is conveyed (i.e., whether it is perceived as genuine and in concordance with ones values). Indeed, when choice is not tested in the narrow sense of making decisions between a set of (often meaningless) experimenter imposed options, and instead tested against a set of alternatives that are genuinely endorsed as meaningful by the participants, we find that it is no longer psychologically inhibiting (Moller et al., 2006). In other words, while too many choices can have the effect of undermining satisfaction, when we instead facilitate people's experience of *choicefulness* or volition (viz. autonomy support; Ryan & Deci, 2006) a very different pattern of findings emerge.

7.5.2 Is autonomy relevant for all populations?

In addition to the criticisms of autonomy support, there are also a number of criticisms of self-determination theory's psychological needs. Notably, although the specification of the psychological as universal requirements for optimal functioning and behavioural engagement is central to the framework, this premise has also been subject to fervent debate. In such debates, criticisms have tended to centre on the relevance of autonomy (as opposed to competence and relatedness) across demographic groups. For instance, Markus and Kitayama (2003) and Iyengar and DeVoe (2003) have questioned the importance of autonomy to individuals who reside in collectivist cultures of Eastern societies. The feminist scholar Judith V. Jordan (1997) has similarly cautioned that autonomy may be a predominantly male value with little importance for women. This is because, according to Jordan (1997), a gender gap exists between the "separate, autonomous and objective male self and a relational, connected and empathetic female self" (p. 21) in Western culture. Finally, there have been criticisms from some that autonomy is considered more salient to those of higher socio-economic status than those of working class heritage (see Stephens et al., 2007).This is because middle-class individuals have the time, resources and cultural capital necessary to value autonomous decision making whereas working-class individuals often do not (Stephens, Fryberg & Markus, 2011).

Common to all these criticisms is the notion that autonomy is only important to those in demographic groups that embrace its value. However, according to self-determination theory, autonomy does not refer to a culture-, gender-, or class-specific values but rather reflects the inner endorsement of behavioural experiences (Niemiec et al., 2013) and data support this view. Notably, several studies have demonstrated that relative autonomy is associated with enhanced well-being irrespective of culture, gender or socio-economic status (e.g., Chirkov & Ryan, 2001; Chirkov, Ryan, Kim & Kaplan, 2003; Sheldon, Elliot et al., 2004). Autonomy, then, when defined as an inner endorsement of one's behaviour, does not interfere with the inter-dependency that is purported to pervade Eastern culture and working class communities (viz. Markus & Kitayama, 2003; Stephens et al., 2007). Rather, autonomy is compatible with ones decision to remain dependent on others provided that such a decision is made in a volitional (versus controlled) manner (Kins, Beyers, Soenens & Vansteenkiste, 2009).

7.5.5 What about this thesis?

So far, I have described some of the criticisms levied at various aspects of self-determination theory. However, I am yet to describe the findings in this thesis that highlight shortcomings in the framework. There are a couple of findings that are particularly relevant in this regard. First, as evidenced in study one, competence, and to a lesser extent relatedness, appear to be the most important psychological needs for children's engagement in youth sport. This finding is somewhat at odds with self-determination theory since, according to the framework, autonomy is the most important psychological need for behavioural integration and thus engagement (Ryan & Deci, 2000). As discussed, this may be a context specific finding that is unique to the sports domain. Yet it is nevertheless noteworthy that children appear to attribute their engagement in youth sport to perceptions of competence and relatedness more so than they do to autonomy. Further research is required to examine the relative contribution of the psychological needs to children's engagement in achievement domains.

Second, according to Deci and Ryan (2000) and others (Bartholomew et al., 2011), impaired functioning is more proximally associated with psychological need thwarting than it is to low psychological need satisfaction. Yet the findings of study two suggest that low psychological need satisfaction may be more important than high psychological need thwarting for children's behavioural disaffection. This observation appears to indicate that certain aspects of impaired functioning, such as passivity, are more aligned with low autonomy, competence and relatedness than high control, incompetence and detachment. When the psychological needs are actively thwarted, compensatory social replacements such as positive regard are typically sought which can sustain behavioural intensity, at least in the short term (cf. Ryan, 1995; Ryan & Deci, 2000). It is thus possible that psychological need thwarting, while psychologically debilitating, does not overly impede children's short-term behavioural intensions in youth sport. This is not the case for low psychological need satisfaction, which may be more reflective of the domain apathy that is indicative of disaffection (i.e., "It does not matter to me if I feel autonomous, competent and related in youth sport"). Consequently, it is possible that low psychological need satisfaction should be considered the best proximal predictor of some aspects of children's impaired functioning, including in-the-moment passivity.

These shortcomings notwithstanding, the psychological needs remain important determinants of cognitive, affective and behavioural health outcomes. That is, regardless of their origin, autonomy, competence and relatedness explain large proportions of the variance in health outcomes across the lifespan, including among adolescents (Thøgersen-Ntoumani, Ntoumanis, & Nikitaras, 2010), young adults (Niemiec et al., 2009), and working adults (Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010). In addition, these relationships are consistent across cultures, including in Bulgaria (Deci et al., 2001) and China (Vansteenkiste, Lens, Soenens, & Luyckx, 2006). Furthermore, in concordance with research on psychological need satisfaction, the current thesis demonstrated that psychological need satisfaction is important for children's engagement in sport. The practical significance of the psychological needs, then, cannot be repudiated and this thesis attests to the positive influence of their satisfaction.

7.6 Limitations

As well as critiques of the self-determination theory, the findings of this thesis must also be considered in the context of the limitations of each study. Apart from study three, the studies within this thesis employed non-experimental, cross-sectional, designs. As such, it is not possible to infer causality between the studied variables. This is particularly important in light of the reciprocal and non-stable effects evidenced in study three. Developing this line of research should involve the use of longitudinal data to support the temporal precedence implied by the hypothesized models of children's engagement and disaffection in youth sport. A notable extension to this thesis might be to monitor perceptions of coach control longitudinally. This is because Reeve (2009) has speculated that disaffection may evoke controlling (rather than autonomy-supportive) strategies from teachers over time.

A further limitation of non-experimental and cross-sectional designs is that all data are based on self-report measures. This systematic source of measurement error can inflate associations among constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). It is important for future research to utilize alternative measures, such as observation, to corroborate the findings of the current thesis. Observational measures rely on behaviourally anchored rating scales and offer a flexible means of assessing actual (rather than perceived) coach practice. Researchers have adopted this approach in other domains (Jang et al., 2010), and similar work is needed in sport.

Moreover, data were collected among youth soccer players in England, and thus the specificity and homogeneity of this sample limits the generalizability of the findings. It is interesting to note that sport is a context in which behaviour is fairly well integrated into children's self-concepts (Vallerand, 2004), and therefore coach behaviours such as structure may be less important in sport than in other life spheres (cf. Jang et al., 2010). It is important for future research to examine these dynamics in other achievement contexts and life domains. Linked to this limitation, the current study did not assess athletes' perceptions of involvement from coaches. Involvement refers to the interest and concern that socializers (such as coaches) show toward those for whom they have responsibility (Skinner et al., 1990) and this form of social support may be particularly important for children's adherence in youth sport (see Weiss & Petlichkoff, 1989). Indeed, Mageau and Vallerand (2003) have argued that involvement is an important part of the coach-athlete relationship, even though it may have a more distal role in motivational outcomes compared to autonomy support and structure (Koestner & Losier, 2002; Markland & Tobin, 2010). It is important for future research to examine the dynamics among autonomy support, structure, and involvement in youth sport.

Another limitation concerns the composite approach taken to indicate the level of psychological need satisfaction that was reported by the participants in studies two, three and four. Recent research in youth sport and dance domains (e.g., Adie et al., 2008, 2012; Quested & Duda, 2010; Reinboth et al., 2004) has indicated that perceived autonomy supportive coach behaviours have unique predictive ability in children's autonomy, competence and relatedness. Notably, these studies have revealed that autonomy support typically explains more variance in autonomy and relatedness satisfaction than competence satisfaction. These effects are intuitively understandable given implicit to autonomy support is a promotion of volitional functioning and an active interest in one's perspective or internal frame of reference. It is possible, then, that the effects of the social-context on psychological need satisfaction in studies one, two and three were carried largely through autonomy and relatedness.

A lack of disaggregation of the psychological needs also has implications for the need satisfaction-engagement relationship. It is important to note, first of all, that self-determination theory typically does not specify a link between the type of psychological need satisfied (or unsatisfied) and the specific type of behaviour that ensues. Instead, psychological need satisfaction is said to provide a non-specific impetus for healthful, proactive behaviour in general. In other words, it is the concurrent satisfaction of all three needs that matters when it comes to psychological integration and wellness (Niemiec et al., 2013; Sheldon & Niemiec, 2006) and data support this view. The psychological needs consistently possess strong positive inter-correlations (e.g., Lonsdale et al., 2009; Stebbings et al., 2011) and co-vary with positive and negative outcomes in a robust manner (e.g., Hodge et al., 2008; Lonsdale et al., 2009; Quested & Duda, 2010).

Nevertheless, some researchers have examined the psychological needs in an effort to identify which is most discriminative of certain motivational outcomes (e.g., athlete burnout; Aide et al., 2012; Quested & Duda, 2011). This was also the purpose of study one of this thesis. It is interesting to note that in study one competence emerged as the psychological need that explains most variance in youth sports participants' cognitive engagement and this finding is consistent across physical domains including in older athletes (Reinboth et al., 2004), physical education students (Ntoumanis, 2001; Taylor et al., 2010) and dancers (Quested & Duda, 2009, 2010). Deci and Ryan (1985) have noted that the relative importance of each psychological need to an individual's optimal functioning may depend, in part, on the context in which their behaviours are enacted. Given the central role of competence for success in sporting domains, one might expect that competence would be a dominant motivator in this context. As such, the potential salience of competence in children's expressions of behavioural engagement in youth sport may have been overlooked in studies two, three and four of this thesis due to the approach taken to conceptualise psychological need satisfaction. Accordingly, the disaggregation of the psychological needs, as well as their composite, is something that could be concurrently examined in future work in this area.

In the current thesis, the face validity of the psychological need thwarting items may suggest they tap an interpersonal, rather than intrapersonal concept (e.g., "I feel pushed to behave in certain ways in football"). Further, two different instruments were used to measure autonomy support in studies two, three and four. These measures also differ from the array of scales employed in the broader sports literature (e.g., Sport Climate Questionnaire, Jõesaar et al., 2012; Health Care Climate Questionnaire, Adie et al., 2012). It is also noteworthy that the lack of a sport-specific measure of structure in study four necessitated the use of a modified version of the Teacher as a Social Context Questionnaire (Belmont et al., 1988). Although this measure has been useful in assessing structure in education domains, there may be some unique elements of structure in sport that this measure does not assess. Notably, an important task for coaches is to develop motor (as opposed to cognitive) competencies. As such, coaches often invoke physical training drills, regimens and tests that are not the domain of classroom teachers.

In light of these measurement issues, an integrative measurement approach may be necessary so that researchers are consistent in their application of assessment tools that tap aspects of the social-context in sports. In particular, there is a need to develop a multi-dimensional assessment tool, grounded in self-determination theory, which measures coaches' provision for all three psychological needs – or indeed their lack thereof. That is, their provision of autonomy support versus control (autonomy satisfaction versus thwarting), structure versus chaos (competence satisfaction versus thwarting) and involvement versus neglect (relatedness satisfaction versus thwarting). The development and application of this multi-subscale instrument would help to unify research in the area. Yet more than this, such an instrument will help examine how, and to what extent, *specific* elements of the social environment interact to predict psychological need satisfaction. In light of the findings contained within study four, this is a particularly interesting and potentially rewarding avenue for future research.

Finally, gender differences were not explored in this thesis. The rationale behind this decision was that self-determination theory asserts that the psychological needs are universal across gender (Ryan & Deci, 2000). As such, the same motivational processes are expected to catalyse engagement in both boys and girls. However, research outside of self-determination theory indicates that gender differences do exist for motivation in youth sport. Notably, boys seem to value interpersonal competition and normative achievement more than girls (e.g., Finkenberg, 1991; Koivula, 1999; Whitehead, Evans, & Lee, 1997). Accordingly, it is important for future research to better understand the interaction between gender and motivation, as it applies to the psychological needs.

7.7 The unique contributions of this thesis and future research avenues

Notwithstanding its limitations, this thesis has provided a number of novel findings that extend extant literature. Firstly, study one was the first study to investigate which psychological needs were most important in predicting elements of cognitive and affective engagement. Extending work in elite athletes (Hodge et al., 2008), results revealed that although all psychological needs exhibited meaningful structural relationships with all aspects of athlete engagement (i.e., confidence, dedication, enthusiasm and vigour), competence emerged as the strongest predictor of confidence, dedication and vigour. Thus, in the context of children's engagement in youth sport, findings imply the novel implication that coaches should be particularly cognizant of opportunities to develop competence.

Secondly, the findings of study two were the first to support a mediation model of children's behavioural engagement and behavioural disaffection in youth sport based on self-determination theory (see Mageau & Vallerand, 2003; Reeve, 2012). Extending findings that were supportive of this model for emotional outcomes (Bartholomew et al., 2011), results revealed that coach autonomy support and control divergently predicted behavioural engagement and behavioural disaffection via satisfaction and thwarting of the psychological needs. The novel implication here is that autonomy supportive coach behaviours pave the way for higher effort, persistence and attention in youth sport because they facilitate psychological need satisfaction whereas controlling coach behaviours pave the way for higher disinterest, passivity and apathy because they facilitate psychological need thwarting.

Thirdly, the results of study three were the first to apply a fully longitudinal design to self-determination theory's mediation model of engagement in youth sport. In addition to temporally supporting self-determination theory's mediation model across time (in the case of behavioural engagement), a number of important extensions were also elucidated in this research that included the instability and reciprocity of the psychological need satisfaction-engagement relationship. One of the central original implications of this research is that psychological need satisfaction and behavioural engagement may share a cyclical upward spiral toward adherence (i.e., psychological need satisfaction produces behavioural engagement that produces psychological need satisfaction and so on) and that this spiral is initiated and sustained by coach autonomy support, and inhibited by coach control.

Finally, study four extended self-determination theory's mediation model by conducting a conditional process analysis that combines moderation and mediation. This is an important extension because self-determination theory proposes both moderational and mediational hypotheses regarding the motivational dynamics of engagement (see Frakas & Grolnick, 2010; Reeve, 2012). To date, researchers have studied these processes separately (moderation; Jang et al., 2010; Sierens et al., 2009 mediation; Adie et al., 2008, 2012; Reinboth et al., 2004) yet the current research was the first to attempt to integrate them. Results indicated that the indirect effect of coach structure to children's behavioural engagement via psychological need satisfaction was positive when autonomy support was high and negative when autonomy support was low. Similarly, results also indicted that the indirect effect of coach structure to children's behavioural disaffection via psychological need satisfaction was negative when autonomy support was high and positive when autonomy support was low. The novel implication here is that both coach structure and autonomy support are necessary for children's engagement in youth sport because they synergistically interact to predict higher psychological need satisfaction. From these original contributions, a number of future research avenues can be proposed. In particular, an emphasis in moving forward research within self-determination theory should be to take theory into practice, and pay more attention to the ‘real world’ impact on children’s experiences.

7.7.1 Future research avenue 1: Understanding the structure-autonomy support interplay

The findings of study four, and extant classroom research, suggest that structure and autonomy support are synergistic predictors of children’s engagement. The conclusion here is that competence and autonomy supports combine to produce adaptive outcomes in school and sport. An interesting question that arises from this conclusion is at what specific levels of autonomy support do children benefit from structure? Study four went some way to answering this question by generating a region of significance for conditional indirect effects. Yet far more work is needed to understand the structure-autonomy support interplay in sport, and in other domains, since the desire for these provisions may vary according to children’s levels of competence.

To illustrate, imagine two groups of youth sports participants. One group are highly experienced and confident in their abilities, the other are inexperienced and doubtful of their actions. It is possible that, at least in the short term, structure may interact with autonomy support at lower levels in the latter group than it does in the former. This is because without high levels of initial guidance and direction, children with low competence are not given the tools by which to function independently and, therefore, high autonomy support may be counterproductive for them. As they develop, though, this desire for structure is likely to be superseded by a desire for more autonomy support. Hence, at different stages of competency, the structure-autonomy support interaction may differ.

By determining the levels of autonomy support at which structure produces gains in motivation and engagement, coaches are able to tailor their provision of psychological need support to suit their athletes. One way this can be achieved is by employing the Johnson-Neyman (1936) technique to probe conditional effects across the range of autonomy support scores in different populations. In doing so, interpretations can be made regarding the specific amount of autonomy support that is required to elucidate gains in engagement from structure in, say, those with high and low competence. This technique also has novel implications for the socialisation of other important health behaviours such as weight management, rehabilitation, and exercise as well as drug, alcohol and tobacco abstinence. Thus, future research grounded in self-determination theory should harness the utility of conditional effect probing to better understand the structure-autonomy support interplay for motivation and engagement at different levels of competence in diverse domains.

7.7.2 Future research avenue 2: Understanding children's own need satisfying strategies

Another important finding in the thesis is that psychological need satisfaction and behavioural engagement share a reciprocal relationship. It is important that future research monitors this relationship as the implication is that children can independently seek to fulfil their own needs. Within self-determination theory, no research has specifically examined the strategies that children might independently adopt to experience gains in intra-personal competence, autonomy and relatedness. This thesis indicates that putting forth effort, energy and persistence is one way of doing so but there may be others. For example, children may deliberately plan, monitor and self-evaluate in an effort to feel competent and autonomous. Likewise, children may engage in mindful or meta-cognition to experience the same outcomes.

Identifying these strategies is important because, in addition to autonomy support and structure, coach provisions can be made to facilitate children's psychological needs by giving them opportunity to engage in their own need satisfying strategies.

7.7.3 Future research avenue 3: Intervention studies

Broadly, the results of this thesis attest to the role of coach autonomy support in cultivating children's engagement in youth sport. Such findings substantiate and extend extant cross-sectional and longitudinal research on this topic. Missing from this literature, though, are intervention studies committed to comparing the provision of autonomy support against "normal" coaching practice in youth sport. The advantage of such a design is that it allows researchers to determine causality in relationships between coach behaviours and children's engagement. Research conducted by Smith and Smoll (see Smith & Smoll, 1997 for review) has supported the positive role that coach intervention can have on children's youth sports engagement, and thus similar work is needed drawing from self-determination theory.

This said, it is important to highlight that while intervention studies are beginning to accrue in domains other than sport (e.g., exercise, work and healthcare; Edmunds et al., 2008; Silva, Markland et al., 2008; Williams, McGregor et al., 2006), effect sizes for autonomy support outside of the laboratory are typically small-to-moderate (see Ng et al., 2012; Su & Reeve, 2011). It is thus possible that additional gains in outcomes may be elucidated by integrating elements of structure alongside autonomy support in such interventions. In settings where competence support is salient for both the initiation and maintenance of behaviour change (e.g., weight loss, tobacco abstinence and exercise), such an approach may be particularly effective. The current thesis speaks to the importance of placing special emphasis on training socializers to provide structure in a way that respects autonomy – as opposed to solely supporting autonomy per-se. Hence, it is important that future research harnesses the salugentic effects of both autonomy support and structure in future interventions committed to enhancing children's engagement in youth sport.

7.8 Conclusion

For millions of children in the UK, youth sport is important pastime. Youth sports promote heightened psychological, social and physical welfare. As such, children's adherence to youth sport is important. Yet, increasingly, children who have reached adolescence are choosing to dropout and this attrition is, in part, attributable to detrimental coaching behaviours. Using the concepts of engagement and disaffection, the findings of this thesis help to better understand how and why coaches promote adherence versus attrition in youth sport.

Most notably, the findings suggest that the psychological needs of autonomy, competence and relatedness are influential in children's engagement. This is because the satisfaction of these psychological needs was found to promote engagement and eschew disaffection. As a consequence, it follows that any coach behaviours facilitative of the psychological needs must also facilitate children's engagement in youth sport. The findings of studies two, three and four together suggest that when coaches provide structure (viz. rule, limits, feedback) with autonomy support (viz. voice and desired choice), children report higher psychological need satisfaction and thereby higher engagement and lower disaffection. By contrast, when coaches structure youth sports environments in a controlling manner (viz. reward, coercion, punishment) children report lower psychological need satisfaction and thereby lower engagement and higher disaffection.

Reflecting on the broad findings of this thesis, it appears that children's psychological needs are indeed important for their engagement in youth sport.

Ensuring children perceive they have adequate opportunity to develop competencies, self-direct behaviours and be connected to others is thus likely to be paramount to their adherence in this domain. The results of this thesis, and research that has examined the consequences of psychological need support more broadly, suggest that such tendencies are cultivated by providing children with rules, limits and feedback in a context of autonomy support. In contrast, these tendencies are inhibited by conveying these same provisions in a context of control. To conclude, then, children's adherence in youth sport is likely facilitated, and attrition kept in check, by coaching behaviours that respect children's volition. This is because such behaviours cultivate psychological need satisfaction and thereby engagement.

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Appendices

Informed consent forms

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Appendix A: Parent and guardian consent form

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Study two

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Appendix L: The Athlete Engagement Questionnaire (AEQ; Lonsdale et al., 2007b).

Appendix M: The Basic Psychological Need Satisfaction Scale (BPNS-work version adapted for sport; Ilardi, Leone, Kasser, & Ryan, 1993).

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Appendix O: The Basic Needs Satisfaction Scale in Sport (BNSSS; Ng et al., 2011).

Appendix P: The Psychological Need Thwarting Scale (PNTS; Bartholomew et al, 2011).

Appendix Q: The Engagement versus Disaffection with Learning Scale (EVDLS behavioural subscales adapted for sport; Skinner et al., 2009; Wellborn, 1991).

Appendix R: The Controlling Coach Behaviours Scale (CCBS; Bartholomew et al., 2010).

Appendix S: The Perceived Autonomy Support Scale for Exercise Settings (PASSES; Gillet, Vallerand, Paty, Gobanche, Berjot, 2010).

Appendix A

Study one: Parent and guardian consent form

Dear Parent:

My name is Thomas Curran and I am writing to request your child's involvement in a project that is being carried out by myself and a team of researchers at York St John University, which is led by Professor Howard Hall (h.hall@yorksj.ac.uk). We are interested in understanding your child's experiences in sport and how they affect their motivation to play football.

This research has been endorsed by your child's club, the European Commission, and the English FA. The primary aim of which is to inform coach education programs, with a focus on improving the training effectiveness and welfare of young footballers. To help me achieve this, I request your child's assistance. During a training session your child will be asked to complete a short questionnaire that should take between 10 and 15 minutes to complete. Your child's participation in this research project is voluntary and he/she is free to withdraw at any time without prejudice. Your child's responses to the questionnaire will be completely anonymous and only group data will be reported following data analysis. Once collected, the data will be stored in a locked filing cabinet at York St John University and is only accessible to myself and my supervisor. After 5 years all data will be destroyed.

This project has received the full support of the Sport Research Ethics Committee at York St John University. Upon request, I will be happy to supply a written report on the research findings once the investigation has been completed. For further information about the research, or information about your child's rights as a participant, you can contact Dr Simon Rouse, Chair of the Sport Research Ethics Committee. His telephone number is (01904) 876901, or you can contact him by email at s.rouse@yorksj.ac.uk. I greatly appreciate your assistance with this project and I wish to thank you at this point. If you give consent for your child to participate in the research you need not do anything else.

If, however, you <u>do not</u> wish your child to take part in this research project please sign the bottom of this form and return it to the club.

Sincerely,

Thomas Curran (MSc, BSc).

Please sign below, **<u>only if you do not wish your child to participate</u>** in the research described above.

I have read and understand the above information and **do not consent** to my child participating in this research investigation.

Signature: .... Date: ....

Appendix B

Study one: Participant informed consent form

Dear Participant:

My name is Thomas Curran and I am writing to request your involvement in a project that is being carried out by myself and a team of researchers at York St John University, which is led by Professor Howard Hall (h.hall@yorksj.ac.uk). We are interested in understanding your experiences in sport and how they affect your motivation to play football.

This research has been endorsed by both your club and the English FA. The primary aim of which is to inform coach education programs, with a focus on improving the coach effectiveness and welfare of young footballers. To help me complete this research I request your assistance. I would like you to complete the attached questionnaire. This should take approximately 10 minutes. Your participation in this research project is voluntary and you are free to withdraw at any time without prejudice. Your responses to the questionnaire will be completely anonymous and only group data will be reported. Once collected, the data will be stored in a locked filing cabinet at York St John University and will only be accessible to myself and my supervisor. After 5 years all data will be destroyed. If you are willing to take part in this research project please sign the bottom of this consent form before completing the questionnaire.

This project has received the full support of the Sport Research Ethics Committee at York St John University. Upon request, I will be happy to supply a written report on the research findings once the investigation has been completed. Furthermore, I would be pleased to present the research findings to members of your club or organization who might be interested. For further information about the research, or information about your rights as a participant, you can contact Dr Simon Rouse, Chair of the Sport Research Ethics Committee. His telephone number is (01904) 876901, or you can contact him by email at s.rouse@yorksj.ac.uk. I greatly appreciate your assistance with this project and I wish to thank you at this point for taking the time to help.

Sincerely,

Thomas Curran (MSc, BSc).

I understand the above information and agree, voluntarily, to participate in this investigation.

Signature: ....

Date: ....

Appendix C

Study two: Parent and guardian consent form

Dear Parent:

My name is Thomas Curran and I am writing to request your child's involvement in a project that is being carried out by myself and a team of researchers at York St John University, which is led by Professor Howard Hall (h.hall@yorksj.ac.uk). We are interested in understanding your child's experiences in sport and how they affect their motivation to play football.

The primary aim of this project is to inform coach education programs, with a focus on improving the training effectiveness and welfare of participants. To help me achieve this, I request your child's assistance. During a training session your child will be asked to complete a short questionnaire that should take between 10 and 15 minutes to complete. Your child's participation in this research project is voluntary and he/she is free to withdraw at any time without prejudice. Your child's responses to the questionnaire will be completely anonymous and only group data will be reported following data analysis. Once collected, the data will be stored in a locked filing cabinet at York St John University and is only accessible to myself and my supervisor. After 3 years all data will be destroyed.

This project has received the full support of the Research Ethics Committee at York St John University. Upon request, I will be happy to supply a written report on the research findings once the investigation has been completed. For further information about the research, or information about your child's rights as a participant, you can contact Dr Simon Rouse, Chair of the Research Ethics Committee. His telephone number is (01904) 876901, or you can contact him by email at s.rouse@yorksj.ac.uk. I greatly appreciate your assistance with this project and I wish to thank you at this point. If you give consent for your child to participate in the research you need not do anything else.

If, however, you do not wish your child to take part in this research project please sign the bottom of this form and return it to the club.

Sincerely,

Thomas Curran (MSc, BSc).

Please sign below, **only if you do not wish your child to participate** in the research described above.

I have read and understand the above information and **do not consent** to my child participating in this research investigation.

Signature: .... Date: ....

Appendix D

Study two: Participants verbal assent transcript

Researcher:

“Hi there my name is Thomas and my job is to research the thoughts and feelings of athletes when they participate in sport. We want to know how your thoughts and feelings affect your experiences in sport and we think this research can help tell us that.

I am going to give you information and invite you to be part of a research study. Your name is not required and only the researchers will see your responses. You can choose whether or not you want to participate. If you do not want to take part in this research, you do not have to, even if your parents have agreed.

There may be some words you don’t understand or things that you want me to explain more about because you are interested or concerned. Please feel free to ask me at any time and I will explain.

Would you like to take part?”

Appendix E

Study two: Participant's debrief sheet

Please take this sheet with you

Dear athlete,

I would like to thank you for your time in helping with my research project. I hope the information you have given us will lead to a better understanding of the thoughts and feeling of young sports players.

If this questionnaire has in anyway made you feel bad, you can speak to someone at ChildLine about your thoughts and feelings by phoning: 0800 1111.

Thanks again!

Thomas Curran.

Appendix F

Study three: Parent and guardian consent form

Dear Parent or Guardian:

My name is Thomas Curran and I am writing to request your child's involvement in a project that is being carried out by myself and a team of researchers at York St John University, which is led by Professor Howard Hall (h.hall@yorksj.ac.uk). We are interested in understanding your child's experiences in sport and how they affect their motivation to play football.

The primary aim of this project is to inform coach education programs, with a focus on improving the training effectiveness and welfare of participants. To help me achieve this, I request your child's assistance. During three training sessions over the course of this season your child will be asked to complete a short questionnaire that should take between 10 and 15 minutes to complete. Your child's participation in this research project is voluntary and he/she is free to withdraw at any time without prejudice. Your child's responses to the questionnaire will be completely anonymous and only group data will be reported following data analysis. Once collected, the data will be stored in a locked filing cabinet at York St John University and is only accessible to myself and my supervisor. After 3 years all data will be destroyed.

This project has received the full support of the Research Ethics Committee at York St John University. Upon request, I will be happy to supply a written report on the research findings once the investigation has been completed. For further information about the research, or information about your child's rights as a participant, you can contact Dr Simon Rouse, Chair of the Research Ethics Committee. His telephone number is (01904) 876901, or you can contact him by email at s.rouse@yorksj.ac.uk. I greatly appreciate your assistance with this project and I wish to thank you at this point. If you give consent for your child to participate in the research you need not do anything else.

If, however, you <u>do not</u> wish your child to take part in this research project please sign the bottom of this form and return it to the club.

Sincerely,

Thomas Curran (MSc, BSc).

Please sign below, **<u>only if you do not wish your child to participate</u>** in the research described above.

I have read and understand the above information and **do not consent** to my child participating in this research investigation.

Signature: .... Date: ....

Appendix G

Study three: Participants verbal assent transcript

Researcher:

“Hi there my name is Thomas and my job is to research the thoughts and feelings of athletes when they participate in sport. We want to know how your thoughts and feelings affect your experiences in sport and we think this research can help tell us that.

I am going to give you information and invite you to be part of a research study. Your name is not required and only the researchers will see your responses. You can choose whether or not you want to participate. If you do not want to take part in this research, you do not have to, even if your parents have agreed.

There may be some words you don’t understand or things that you want me to explain more about because you are interested or concerned. Please feel free to ask me at any time and I will explain.

Would you like to take part?”

Appendix H

Study three: Participant's debrief sheet

Please take this sheet with you

Dear athlete,

I would like to thank you for your time in helping with my research project. I hope the information you have given us will lead to a better understanding of the thoughts and feeling of young sports players.

If this questionnaire has in anyway made you feel upset or uncomfortable, you can speak to someone at ChildLine about your thoughts and feelings by phoning: 0800 1111.

Thanks again!

Thomas Curran.

Appendix I

Study four: Parent and guardian consent form

Dear Parent:

My name is Thomas Curran and I am writing to request your child's involvement in a project that is being carried out by myself and a team of researchers at York St John University, which is led by Professor Howard Hall (h.hall@yorksj.ac.uk). We are interested in understanding your child's experiences in sport and how they affect their motivation to play football.

The primary aim of this project is to inform coach education programs, with a focus on improving the training effectiveness and welfare of participants. To help me achieve this, I request your child's assistance. During a training session your child will be asked to complete a short questionnaire that should take between 10 and 15 minutes to complete. Your child's participation in this research project is voluntary and he/she is free to withdraw at any time without prejudice. Your child's responses to the questionnaire will be completely anonymous and only group data will be reported following data analysis. Once collected, the data will be stored in a locked filing cabinet at York St John University and is only accessible to myself and my supervisor. After 3 years all data will be destroyed.

This project has received the full support of the Research Ethics Committee at York St John University. Upon request, I will be happy to supply a written report on the research findings once the investigation has been completed. For further information about the research, or information about your child's rights as a participant, you can contact Dr Simon Rouse, Chair of the Research Ethics Committee. His telephone number is (01904) 876901, or you can contact him by email at s.rouse@yorksj.ac.uk. I greatly appreciate your assistance with this project and I wish to thank you at this point. If you give consent for your child to participate in the research you need not do anything else.

If, however, you <u>do not</u> wish your child to take part in this research project please sign the bottom of this form and return it to the club.

Sincerely,

Thomas Curran (MSc, BSc).

Please sign below, **<u>only if you do not wish your child to participate</u>** in the research described above.

I have read and understand the above information and **do not consent** to my child participating in this research investigation.

Signature: .... Date: ....

Appendix J

Study four: Participants verbal assent transcript

Researcher:

“Hi there my name is Thomas and my job is to research the thoughts and feelings of athletes when they participate in sport. We want to know how your thoughts and feelings affect your experiences in sport and we think this research can help tell us that.

I am going to give you information and invite you to be part of a research study. Your name is not required and only the researchers will see your responses. You can choose whether or not you want to participate. If you do not want to take part in this research, you do not have to, even if your parents have agreed.

There may be some words you don’t understand or things that you want me to explain more about because you are interested or concerned. Please feel free to ask me at any time and I will explain.

Would you like to take part?”

Appendix K

Study four: Participant's debrief sheet

<u>Please take this sheet with you</u>

Dear athlete,

I would like to thank you for your time in helping with my research project. I hope the information you have given us will lead to a better understanding of the thoughts and feeling of young sports players.

If this questionnaire has in anyway made you feel bad, you can speak to someone at ChildLine about your thoughts and feelings by phoning: 0800 1111.

Thanks again!

Thomas Curran.

Appendix L

Athlete Engagement Questionnaire (AEQ; Lonsdale et al., 2007b).

Below are some statements people have made about their experiences in football. Using the scale provided, please indicate how often you have felt this way about your participation in football.

Almost Never	Rarely	Sometimes	Frequently	Almost Always
1	**2**	**3**	**4**	**5**

When training or playing football..

1. I believe I am capable of accomplishing my goals.	1	2	3	4	5
2. I am dedicated to achieving my goals.	1	2	3	4	5
3. I feel energised when I participate.	1	2	3	4	5
4. I feel excited.	1	2	3	4	5
5. I feel capable of success.	1	2	3	4	5
6. I am determined to achieve my goals.	1	2	3	4	5
7. I feel energetic when I participate.	1	2	3	4	5
8. I am enthusiastic.	1	2	3	4	5
9. I believe I have the skills/technique to be successful.	1	2	3	4	5
10. I am devoted.	1	2	3	4	5
11. I feel really alive when I participate.	1	2	3	4	5
12. I enjoy football.	1	2	3	4	5
13. I am confident in my abilities.	1	2	3	4	5
14. I want to work hard to achieve my goals.	1	2	3	4	5
15. I feel mentally alert when I participate.	1	2	3	4	5
16. I have fun.	1	2	3	4	5

Appendix M

The Basic Psychological Need Satisfaction Scale (BPNS-work version adapted for sport; Ilardi, Leone, Kasser, & Ryan, 1993).

The following question is asking you to think about how you feel when playing for your football club.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	**2**	**3**	**4**	**5**

When I practice or play football for my club..

1. I get to choose what I want to do.	1	2	3	4	5
2. I like the people I spend time with.	1	2	3	4	5
3. I don’t think I am very good.	1	2	3	4	5
4. I feel stressed.	1	2	3	4	5
5. People I know tell me I am good.	1	2	3	4	5
6. I get along with the people I meet.	1	2	3	4	5
7. I mostly keep to myself.	1	2	3	4	5
8. I feel free to express my ideas and opinions.	1	2	3	4	5
9. The people I spend time with I consider to be my friends.	1	2	3	4	5
10. I learn interesting new things.	1	2	3	4	5
11. I have to do what I am told.	1	2	3	4	5
12. People I spend time care about me.	1	2	3	4	5
13. I usually think that I am good at what I do.	1	2	3	4	5
14. People I usually spend time care about how I feel.	1	2	3	4	5
15. I do not get much of a chance to show how good I am.	1	2	3	4	5
16. Of the people I spend time with, there are not many I consider to be good friends.	1	2	3	4	5
17. I feel like I can pretty much be myself.	1	2	3	4	5
18. The people I spend time with do not seem to like me too much.	1	2	3	4	5
19. I often do not feel very good.	1	2	3	4	5
20. Its not often that I have a say in how things should be done.	1	2	3	4	5
21. People I spend time with are generally pretty friendly towards me.	1	2	3	4	5

Appendix N

The Teacher as a Social Context Questionnaire (TSCQ adapted for sport; Belmont et al., 1988).

These questions are interested in the attitudes of coach. Using the scale below, please shade the number that best describes how you feel.

Not at all True			Quite True			Very True
1	**2**	**3**	**4**	**5**	**6**	**7**

1. Everytime I do something wrong, my coach acts differently.	1	2	3	4	5	6	7
2. My coach gives me a lot of choices about how to do the tasks in football.	1	2	3	4	5	6	7
3. My coach doesn't make it clear what he/she expects of me in football.	1	2	3	4	5	6	7
4. My coach is always getting on my case about work in football.	1	2	3	4	5	6	7
5. My coach shows me how to complete tasks for myself.	1	2	3	4	5	6	7
6. My coach makes sure I understand before he/she moves on.	1	2	3	4	5	6	7
7. My coach talks about how I can use things we learn in training.	1	2	3	4	5	6	7
8. My coach keeps changing how he/she acts towards me.	1	2	3	4	5	6	7
9. My coach doesn't give me much choice about how I do activities.	1	2	3	4	5	6	7
10. My coach always tells me what he/she expects of me in football.	1	2	3	4	5	6	7
11. It seems like my coach is always telling me what to do.	1	2	3	4	5	6	7
12. If I can't complete a task, my coach shows me different ways to try help me.	1	2	3	4	5	6	7
13. My coach checks to see if I'm ready before he/she starts a new activity.	1	2	3	4	5	6	7
14. My coach doesn't explain why what I do in football is important to me.	1	2	3	4	5	6	7
15. My coach listens to my ideas.	1	2	3	4	5	6	7
16. My coach doesn't listen to my opinion.	1	2	3	4	5	6	7
17. Everytime I do something wrong, my coach acts consistently.	1	2	3	4	5	6	7
18. My coach never gets on my case about work in football.	1	2	3	4	5	6	7
19. My coach always acts the same way towards me.	1	2	3	4	5	6	7
20. My coach gives a lot of choice about how I do activities	1	2	3	4	5	6	7

21. My coach explains why what I do in football is important to me.	1	2	3	4	5	6	7
22. My coach listens to my opinion	1	2	3	4	5	6	7

Appendix O

The Basic Needs Satisfaction Scale in Sport (BNSSS; Ng et al, 2010).

The following questions are asking you to think about how you typically feel when playing football. Using the scale below, please shade the number that best describes how you feel.

Not at all True			Quite True			Very True
1	**2**	**3**	**4**	**5**	**6**	**7**

1. In football, I feel close to other people.	1	2	3	4	5	6	7
2. In football, I feel I am pursuing goals that are my own.	1	2	3	4	5	6	7
3. I feel I participate in football willingly.	1	2	3	4	5	6	7
4. In football, I get opportunities to make choices.	1	2	3	4	5	6	7
5. In football, I feel that I am being forced to do things that I don't want to do.	1	2	3	4	5	6	7
6. I can overcome challenges in football.	1	2	3	4	5	6	7
7. I show concern for others in football.	1	2	3	4	5	6	7
8. I choose to participate in football according to my own free will.	1	2	3	4	5	6	7
9. In football, I have a say in how things are done.	1	2	3	4	5	6	7
10. There are people in football who care about me.	1	2	3	4	5	6	7
11. I am skilled at football.	1	2	3	4	5	6	7
12. I feel I am good at football.	1	2	3	4	5	6	7
13. In football, I can take part in the decision making process.	1	2	3	4	5	6	7
14. I get opportunities to feel that I am good at football.	1	2	3	4	5	6	7
15. In football, I really have a sense of wanting to be there.	1	2	3	4	5	6	7
16. In football, I feel I am doing what I want to be doing.	1	2	3	4	5	6	7
17. I have the ability to perform well in football.	1	2	3	4	5	6	7
18. In football, there are people who I can trust.	1	2	3	4	5	6	7
19. I have close relationships with people in football.	1	2	3	4	5	6	7
20. In football, I get opportunities to make decisions.	1	2	3	4	5	6	7

Appendix P

The Psychological Need Thwarting Scale (PNTS; Bartholomew et al, 2011).

The following questions are asking you to think about how you feel when playing football. Using the scale below, please shade the number that best describes how you feel.

Not at all True			Quite True			Very True
1	**2**	**3**	**4**	**5**	**6**	**7**

1. I feel prevented from making choices with regard to the way I train in football.	1	2	3	4	5	6	7
2. There are situations in football where I am made to feel inadequate.	1	2	3	4	5	6	7
3. I feel pushed to behave in certain ways in football.	1	2	3	4	5	6	7
4. I feel I am rejected by those around me in football	1	2	3	4	5	6	7
5. I feel forced to follow training decisions made for me in football.	1	2	3	4	5	6	7
6. I feel inadequate in football because I am not given opportunities to fulfil my potential.	1	2	3	4	5	6	7
7. I feel under pressure to agree with the training regime I am provided in football.	1	2	3	4	5	6	7
8. I feel others in football can be dismissive of me.	1	2	3	4	5	6	7
9. Situations occur in football in which I am made to feel incapable.	1	2	3	4	5	6	7
10. I feel other people involved in football dislike me.	1	2	3	4	5	6	7
11. There are times when I am told things that make me feel incompetent in football.	1	2	3	4	5	6	7
12. I feel that other people in football are envious when I achieve success.	1	2	3	4	5	6	7

Appendix Q

The Engagement versus Disaffection with Learning Scale (EVDLS behavioural subscales adapted for sport; Skinner et al., 2009; Wellborn, 1991).

The following questions are asking you to think about how you typically behave when playing football. Using the scale below, please shade the number that best describes how you behave.

Not at all True			Quite True			Very True
1	**2**	**3**	**4**	**5**	**6**	**7**

1. I try hard to do well in football.	1	2	3	4	5	6	7
2. When I'm in training, I listen very carefully	1	2	3	4	5	6	7
3. I don't try very hard at football	1	2	3	4	5	6	7
4. When I'm in training, I listen very carefully	1	2	3	4	5	6	7
5. When I'm in training, I do just enough to get by	1	2	3	4	5	6	7
6. When I'm in training, my mind wanders.	1	2	3	4	5	6	7
7. When I'm in training, I just act like I'm working.	1	2	3	4	5	6	7
8. When I'm in training, I think about other things	1	2	3	4	5	6	7
9. I pay attention in training	1	2	3	4	5	6	7
10. When I'm in training, I participate in training discussions.	1	2	3	4	5	6	7

Appendix R

The Controlling Coach Behaviours Scale (CCBS; Bartholomew et al., 2010).

These questions are interested your general experiences with your current coach. Each coach has a different coaching style and no one style is necessarily better than another. Using the scale below, please indicate how much you agree or disagree with each statement.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Strongly Disagree	Disagree
1	**2**	**3**	**4**	**5**	**6**	**7**

1. My coach is less friendly with me if I don’t make the effort to see things his/her way.	1	2	3	4	5	6	7
2. My coach shouts at me in front of others to make me do certain things.	1	2	3	4	5	6	7
3. My coach only uses rewards/praise so that I stay focused on tasks during training.	1	2	3	4	5	6	7
4. My coach is less supportive of me when I am not training and competing well.	1	2	3	4	5	6	7
5. My coach tries to control what I do during my free time.	1	2	3	4	5	6	7
6. My coach threatens to punish me to keep me in line during training.	1	2	3	4	5	6	7
7. My coach tries to motivate me by promising to reward me if I do well.	1	2	3	4	5	6	7
8. My coach pays me less attention if I have displeased him/her.	1	2	3	4	5	6	7
9. My coach intimidates me into doing the things that he/she wants me to do.	1	2	3	4	5	6	7
10. My coach tries to interfere in aspects of my life outside of my sport.	1	2	3	4	5	6	7
11. My coach only uses rewards/praise so that I complete all the tasks he/she sets during training.	1	2	3	4	5	6	7
12. My coach is less accepting of me if I have disappointed him/her.	1	2	3	4	5	6	7
13. My coach embarrasses me in front of others if I do not do the things he/she wants me to do.	1	2	3	4	5	6	7
14. My coach only uses rewards/praise to make me train harder.	1	2	3	4	5	6	7
15. My coach expects my whole life to centre on my sport participation.	1	2	3	4	5	6	7

Appendix S

The Perceived Autonomy Support Scale for Exercise Settings (PASSES; Gillet, Vallerand, Paty, Gobanche, Berjot, 2010).

These questions are interested your general experiences with your current coach. Each coach has a different coaching style and no one style is necessarily better than another. Using the scale below, please indicate how much you agree or disagree with each statement.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Strongly Disagree	Disagree
1	**2**	**3**	**4**	**5**	**6**	**7**

1. I feel that my coach provides me with choices, options and opportunities about whether to play football.	1	2	3	4	5	6	7
2. I think that my coach understands why I choose to play football	1	2	3	4	5	6	7
3. My coach displays confidence in my ability to play football.	1	2	3	4	5	6	7
4. My coach encourages me to play football.	1	2	3	4	5	6	7
5. My coach listens to me about football.	1	2	3	4	5	6	7
6. My coach provides me with positive feedback when I play football.	1	2	3	4	5	6	7
7. I am able to talk to my coach about football.	1	2	3	4	5	6	7
8. My coach makes sure I understand why I need to play football.	1	2	3	4	5	6	7
9. My coach answers my questions about playing football.	1	2	3	4	5	6	7
10. My coach cares about me when I play football.	1	2	3	4	5	6	7
11. I feel I am able to share my experiences of football with my coach.	1	2	3	4	5	6	7
12. I trust my coach's advice in football.	1	2	3	4	5	6	7