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1 Perceived coach behaviors and athletes' engagement and disaffection in youth  
2 sport: The mediating role of the psychological needs.

3

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## Abstract

Understanding how coaches influence adolescents' levels of engagement and disaffection in youth sport is important in light of the high attrition in this population. Grounded in self-determination theory, we proposed and tested a mediation model that described pathways linking perceptions of coach behavior (autonomy supportive versus controlling) to adolescents' engagement and disaffection via psychological need satisfaction and thwarting in youth sport. One-hundred and fifty-three young soccer players ( $M_{age} = 13.96 \pm 1.41$ ) completed a questionnaire that assessed the study variables. Structural equation modelling supported the hypothesised model. Perceptions of autonomy support positively predicted psychological need satisfaction which, in turn, positively predicted engagement. Perceptions of controlling behaviors positively predicted psychological need thwarting which, in turn, positively predicted disaffection. In addition, a number of cross-over paths emerged. The findings substantiate claims that encouraging self-directed action, and reducing controlling behaviors, is critical in order to foster engagement and avoid disaffection in youth sport.

*Keywords:* Motivation, Athlete, Psychological Need Satisfaction, Autonomy Support

1            Participation in youth soccer is a popular pastime for children and adolescents.  
2        Indeed, according to the Federation Internationale de Football Association (FIFA,  
3        2007), 22 million of those under the age of 16 play the game regularly worldwide. Yet  
4        beyond this age, participation in youth sports such as soccer decreases sharply  
5        (Department for Culture, Media and Sport, 2012a). In the United Kingdom, for  
6        instance, estimates suggest that as many as 25,000 16 year-olds drop out of youth  
7        sport each year and more than half of the population over 16 do not participate in any  
8        sport at all (Department for Culture, Media and Sport, 2010; 2012b). One important  
9        antecedent of continued participation is perceived coach behavior (Gervis & Dunn,  
10       2004; Horn, 2008). Understanding coach behaviour and how it shapes experiences in  
11       youth sports such as soccer is therefore essential in order to promote participation  
12       beyond late adolescence.

### 13       **Behavioral engagement and disaffection in youth sport**

14           Adolescents who continue participation in youth sport appear outwardly to be  
15       displaying a pattern of behavior akin to engagement. Numerous models of  
16       engagement have been proposed in the contexts of work, education, and sport (e.g.,  
17       Appleton, Christenson, & Furlong, 2008; Lonsdale, Hodge & Raedeke, 2007;  
18       Schaufeli, Salanova, González-Romá, & Bakker, 2002). One of the most prominent  
19       approaches to engagement is that developed by Skinner and colleagues (e.g., Skinner,  
20       Kindermann, Connell & Wellborn, 2009; Skinner, Kindermann & Furrer, 2009;  
21       Skinner, Furrer, Marchand & Kinderman, 2008). According to these researchers, the  
22       primary feature of engaged behavior is proactive and energetic involvement in  
23       achievement activities. It encompasses an array of self-regulatory strategies, including  
24       effort exertion and persistence, as well as mental efforts such as concentration,  
25       attention, asking questions, and contributing to discussions. Engagement is important  
26       to understand because it is linked to a number of adaptive outcomes for adolescents

1 that include greater well-being and task adherence (e.g., Blair & Razza, 2007; Duda,  
2 2001; Guthrie, Schafer, & Huang, 2001).

3 The antithesis of engagement is disaffection. In contrast to engagement,  
4 disaffection captures passive and reactive behaviors reflecting a lack of self-  
5 regulation. These behaviors encompass disinterest, a lack of initiation, a lack of effort,  
6 and giving up. Disaffection also includes indicators of ritualistic participation and  
7 mental withdrawal, such as a lack of attention and concentration. Considered  
8 alongside engagement, disaffected behaviors provide additional insight into youth  
9 sport. This is because they are linked to a number of maladaptive outcomes for  
10 adolescents that include greater ill-being and higher attrition (e.g., Furrer, Skinner,  
11 Marchand, & Kindermann, 2006; Kirk, 2005; Skinner et al., 2009).

## 12 **Self-determination theory**

13 Self-determination theory (SDT; Deci & Ryan, 2008; Niemiec, Ryan, & Deci,  
14 2010) can be used to explain the coach behaviors that catalyze engagement and  
15 disaffection in youth sport. SDT is a macro-theory of human motivation with  
16 applications to sport and exercise (Standage & Ryan, 2012). According to SDT, two  
17 coach motivational styles create the conditions necessary for engagement and  
18 disaffection. The first, autonomy support, refers to the degree to which coaches  
19 encourage athletes to take initiative in sport and be active problem-solvers, provide  
20 meaningful rationales for necessary limits, and take an athlete, rather than coach  
21 perspective (Mageau & Vallerand, 2003). Such provisions are understood to allow  
22 youth sports participants to endorse external events as personally meaningful and,  
23 thus, cultivate their engagement. In support of this tenet of SDT, numerous studies  
24 have found perceptions of autonomy support to predict attentive, effortful, persistent,  
25 and active participation in sport (e.g., Curran, Hill & Niemiec, 2013; Sarrazin,  
26 Vallerand, Guillet, Pelletier & Cury, 2002; Smith, Ntoumanis, & Duda, 2007).

1           The second motivational style is controlling behavior. It refers to the degree to  
2 which coaches apply pressure to athletes to meet demands, solve problems on behalf  
3 of athletes and adopt their own perspective, rather than the athlete's perspective  
4 (Bartholomew, Ntoumanis & Thøgersen-Ntoumani, 2009; Mageau & Vallerand,  
5 2003). These provisions are thought to socially impose the relevance of external  
6 events to youth sports participants without cultivating personal relevance and, thus,  
7 disaffection. In comparison to the amount of research examining autonomy support,  
8 little empirical research has examined the role of controlling behavior by coaches in  
9 adolescents' experiences in sport. However, support for this tenet of SDT is offered by  
10 qualitative studies in which many adolescents have reported controlling coach  
11 behavior as central to their decisions to withdraw (Fraser-Thomas & Côté, 2009;  
12 Fraser-Thomas, Côté & Deakin, 2008).

### 13 **SDT's mediation model of behavioral engagement and disaffection**

14           To explain the effects of coach motivational style on adolescents' engagement  
15 and disaffection in youth sport, SDT proposes a mediation model (see Jang, Kim &  
16 Reeve, 2012) based on an organismic-dialectic outlook (Reeve, Deci & Ryan, 2004;  
17 Vansteenkiste & Deci, 2004). This outlook purports that human beings have innate  
18 motivational resources which interact with the social-context to promote optimal  
19 functioning (Ryan & Deci, 2000). These motivational resources take the form of three  
20 basic psychological needs. Autonomy is the need to experience behavior as  
21 originating from within the self. It represents the inner endorsement and self-  
22 determination of one's behavior (Deci & Ryan, 1985). Competence is the need to feel  
23 that one can effectively negotiate their interactions with the environment. It reflects  
24 the innate desire to approach and master achievement-oriented tasks (Deci, 1975).  
25 Finally, relatedness is the need to create close bonds and attachments with significant  
26 others. It embodies the will to be immersed in caring and reciprocally appreciated

1 inter-personal relationships (Ryan, 1995). In sport and exercise settings, a growing  
2 body of research supports the role of the psychological needs in promoting  
3 persistence, effort and adherence (e.g., Sarrazin et al., 2002; Smith, Ntoumanis, Duda  
4 & Vansteenkiste, 2011; Teixeira et al., 2012).

5         Returning to SDT's mediation model, these psychological needs represent a  
6 unifying principle – linking coach behaviors to the behavioral outcomes exhibited by  
7 youth sports participants (Vansteenkiste & Ryan, 2013). A number of studies in sport,  
8 and in other domains, have supported this mediation model as it relates to children's  
9 cognitions and affect (e.g., Adie, Duda & Ntoumanis, 2008; Jang et al., 2012;  
10 Reinboth, Duda & Ntoumanis, 2004). This research has typically focused on  
11 examining the benefits of perceived autonomy support and psychological need  
12 satisfaction. Reinboth et al (2004), for instance, found that perceived autonomy  
13 support from coaches positively correlated with psychological need satisfaction  
14 which, in turn, correlated positively with vitality and life satisfaction in a sample of  
15 youth sports participants. Similar findings have also been reported by Adie and  
16 colleagues (Adie et al., 2008; Adie, Duda & Ntoumanis, 2012), who observed that  
17 perceived coach autonomy support was positively associated with the psychological  
18 needs which, in turn, correlated positively with vitality in adult and adolescent  
19 athletes.

20         Research has more recently begun to examine perceptions of controlling  
21 behavior by coaches and psychological need thwarting – the perception that the  
22 psychological needs are actively frustrated (as opposed to simply unmet). Work  
23 conducted by numerous researchers is similarly supportive of SDT's mediation model  
24 in this regard. Specifically, in addition to replicating findings regarding autonomy  
25 support and need satisfaction, this research has reported that perceived controlling  
26 behaviors by coaches positively predicted psychological need thwarting which, in

1 turn, positively predicted negative affect, depression, and burnout among adult and  
2 adolescent athletes (Bartholomew, Ntoumanis, Ryan & Thøgersen-Ntoumani, 2011;  
3 Balaguer, González, et al., 2012). In addition, this research suggests that the effects of  
4 psychological need thwarting on negative outcomes extend beyond the contributions  
5 made by psychological need satisfaction (Gunnell, Crocker, Wilson, Mack & Zumbo,  
6 2013). Therefore, owing to its unique explanatory ability in negative outcomes, the  
7 inclusion of the pathway from controlling behaviors to psychological need thwarting  
8 in SDT's mediation model appears to be important.

9           In light of the importance of both pathways in SDT's mediation model,  
10 research has begun to examine the unique and collective effects of psychological need  
11 satisfaction and thwarting in SDT's mediation model. Bartholomew, Ntoumanis, Ryan  
12 and Thøgersen-Ntoumani (2011), for example, compared the predictive ability of  
13 psychological need satisfaction and thwarting and found significant effects of both on  
14 athletes' vitality, but only psychological need thwarting was a significant predictor of  
15 athlete burnout. Similar findings are also evident in the work of Balaguer et al. (2012)  
16 and Gunnell et al. (2013) and suggest that there are occasions when psychological  
17 need satisfaction and thwarting operate in tandem and others when they operate  
18 separately depending on the outcomes assessed. Consequently, examination of the  
19 unique (captured via two separate pathways) and collective (captured via two separate  
20 pathways and two cross-over pathways) influences of psychological need satisfaction  
21 and thwarting is likely to offer further insight into their influence on negative and  
22 positive experiences in sport.

### 23 **The present research**

24           The present research, then, had two aims. First, we intended to build upon the  
25 work of Bartholomew et al (2011) and others (Balaguer et al., 2012; Gunnell et al.,  
26 2013) by testing SDT's mediation model in relation to engagement and disaffection in



1 youth sport (see Figure 1). In this model, autonomy support from coaches was  
2 hypothesised to positively predict athletes' psychological need satisfaction which, in  
3 turn, was hypothesised to positively predict their engaged behavior. By contrast,  
4 coaches' provision of a controlling motivational style was hypothesised to positively  
5 predict athletes' psychological need thwarting which, in turn, was hypothesised to  
6 positively predict their disaffected behavior.

7 In testing this model, the second aim of the present research was to identify the  
8 unique and collective effects of the psychological needs (both satisfaction and  
9 thwarting) on engagement and disaffection. To do this, in addition to the hypothesised  
10 parallel paths, the cross-over paths in SDT's mediation model were also examined  
11 (Figure 1; dashed arrows). On the basis of SDT, it was hypothesised that perceived  
12 autonomy support from coaches would negatively predict athletes' psychological need  
13 thwarting which, in turn, would negatively predict their engagement. By contrast,  
14 perceived control from coaches was expected to negatively predict athletes'  
15 psychological need satisfaction which, in turn, would negatively predict their  
16 disaffection.

## 17 **Method**

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

1 was given to the participants. The questionnaire took approximately 20 minutes to  
2 complete.

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

5 **Behavioral engagement and disaffection.** Engaged and disaffected behaviors  
6 were assessed using the behavioral sub-scales of the Engagement Versus Disaffection  
7 with Learning Scale (EVDLS; Skinner et al., 2009; Wellborn, 1991). These items  
8 were adapted to focus participants on soccer training. Behavioral engagement was  
9 measured using five items that tapped athletes' effort, attention, and persistence while  
10 participating in soccer (e.g. "I try hard to do well in training"). Behavioral disaffection  
11 was assessed using five items that tapped athletes' lack of effort and withdrawal from  
12 soccer (e.g. "In training, I do just enough to get by"). These scales have been found to  
13 be valid and internally reliable in educational contexts (Skinner et al., 2008; Skinner,  
14 Kindermann & Furrer, 2009).

15 As the scale was adapted in the current study, it was considered necessary to  
16 more closely assess its psychometric properties. The factor structure of the adapted  
17 EVDLS for youth sport was thus examined using confirmatory factor analysis,  
18 employing structural equation modelling with maximum likelihood estimation. A  
19 measurement model was stipulated that included two correlated latent factors:  
20 behavioral engagement (five observed indicators) and behavioral disaffection (five  
21 observed indicators). This model demonstrated acceptable fit to the observed data:  $\chi^2$   
22 (34) = 88.10,  $p < .001$ ;  $\chi^2/df = 2.59$ ; TLI = .92; CFI = .92; SRMR = .07; RMSEA  
23 = .10 (Hu & Bentler, 1995; Hu & Bentler, 1995; Marsh, Hau & Wen, 2004;  
24 Schermelleh-Engel, Moosbrugger, & Müller, 2003). Consequently, the analyses  
25 supported the use of the adapted sub-scales.

1           **Psychological need satisfaction.** Psychological need satisfaction was assessed  
2 using the Basic Need Satisfaction in Sport Scale (BNSSS adapted for soccer; Ng,  
3 Lonsdale & Hodge, 2011). This twenty-item scale measures three aspects of  
4 autonomy satisfaction; choice (four items; e.g. “In soccer, I can take part in the  
5 decision-making process”), volition (three items e.g. “I feel I participate in soccer  
6 willingly”), and internal locus of control (three items; e.g. “In soccer, I feel I am  
7 pursuing goals that are my own”), relatedness satisfaction (five items; e.g. “In soccer,  
8 I feel close to other people”), and competence satisfaction (five items; e.g. “I have the  
9 ability to perform well in soccer”). The three aspects of autonomy were averaged to  
10 produce a score of total autonomy in current study. This scale has been found to  
11 possess adequate psychometric properties in sport (see Ng et al., 2011).

12           **Psychological need thwarting.** Psychological need thwarting was measured  
13 using the Psychological Need Thwarting Scale (PNTS adapted for soccer;  
14 Batholomew, Ntoumanis, Ryan & Thogersen-Ntmoumani, 2011). This twelve-item  
15 scale measures autonomy thwarting (four items; e.g. “I feel pushed to behave in  
16 certain ways in soccer.”), relatedness thwarting (four items; e.g. “I feel others in  
17 football can be dismissive of me.”), and competence thwarting (four items; e.g. “There  
18 are situations in soccer where I am made to feel inadequate.”). This scale has been  
19 found to possess adequate psychometric properties in sport (see Bartholomew et al.,  
20 2011).

21           **Perceived autonomy support.** An adapted sport version (Gillet, Vallerand,  
22 Paty, Gobanche, Berjot, 2010) of the Perceived Autonomy Support Scale for Exercise  
23 Settings (PASSSES; Hagger, Chatzisarantis, Hein, Pihu, Soos &Karsai, 2007) was  
24 employed to measure perceived coach autonomy support. This twelve-item inventory  
25 taps athletes’ perceptions of their coaches’ provision of autonomy support (e.g. “I feel  
26 that my coach provides me with choices, options and opportunities about whether to

1 play soccer”). This adapted version of the PASSES has been found to possess  
2 adequate psychometric properties in sport (see Gillet et al., 2010).

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

13       **Analytical strategy.** Structural equation modelling (AMOS version 18.0;  
14 Arbuckle, 2007) with maximum likelihood estimation was the primary data analysis  
15 strategy. Using a two-step method, a confirmatory factor analysis was first used to  
16 assess the measurement model and was followed by an assessment of the hypothesised  
17 model (Anderson & Gerbing, 1988). This approach first establishes the fit of the  
18 measurement model by examining the relation of the observed variables (e.g.,  
19 psychological need satisfaction) to their underlying constructs (e.g., autonomy,  
20 competence, and relatedness). Secondly, this approach then establishes the fit of the  
21 structural model (i.e., Figure 1) by comparing the hypothesised variance-covariance  
22 matrix to the sample variance-covariance matrix. If the two variance-covariance  
23 matrices are closely matched (implied by fit indices), the conclusion is that the  
24 hypothesised model approximates the data well.

25       To determine the statistical significance of the mediated pathways in the  
26 current study, indirect effects were calculated and their 95% confidence intervals were

1 derived using a distribution of the products method (*PRODCLIN* programme;  
2 MacKinnon, Fritz, Williams & Lockwood, 2007). Indirect effects are the product of  
3 the coefficients (i.e., *ab*; Hayes, 2009), where *a* is the path from the predictor to the  
4 mediator and *b* is the path from the mediator to the criterion. The 95% confidence  
5 interval denotes the upper and lower boundary of an indirect effect that would be  
6 observed 95 times out of 100 if a sample of the same size were to be drawn from the  
7 population. Provided that a null or zero effect is not observed between the upper and  
8 lower bound of the 95% confidence interval, the indirect effect is deemed significant  
9 at the  $p < .05$  level.

## 10 **Results**

11 **Preliminary analysis.** Missing value analysis revealed that there were 113  
12 complete cases and 40 incomplete cases. Of the cases with incomplete data, none had  
13 more than 3 items missing ( $M = 1.38$ ,  $SD = .66$ , range = 1-3). Missing values were  
14 therefore replaced with the mean of the non-missing items in the respective sub-scale  
15 for each individual case (Graham, Cumsille & Elek-Fisk, 2003). A central assumption  
16 of structural equation modelling is a normal distribution. However, while the data was  
17 considered approximately univariate normal (absolute skewness  $M = .16$ ,  $SD = .49$ ,  
18  $SE = .12$ ; absolute kurtosis  $M = .54$ ,  $SD = .29$ ,  $SE = .39$ ), estimates of multivariate  
19 kurtosis (Mardia's normalised coefficient = 27.52) indicated the data was multivariate  
20 asymmetrical (Kline, 1998). Conventional modelling using maximum likelihood  
21 estimation is robust to small violations of normality (McDonald & Ho, 2002).

22 However, concerns arise regarding the type I error attached to the chi-square statistic  
23 under circumstances of moderate to major violations (Curran, West, & Finch, 1996).

24 This problem was remedied in two ways. Firstly, model fit was not solely  
25 based on the interpretation of the chi-square. Following guidelines provided by Hu &  
26 Bentler (1995), two absolute (Standardised Root Mean Square Residual [SRMR] and

1 Root Mean Squared Error of Approximation [RMSEA]) and two incremental (Tucker  
2 Lewis Index [TLI] and Confirmatory Fit Index [CFI]) fit indexes were reported. Fit  
3 was deemed acceptable in the current study if; TLI and CFI > .90 and RMSEA < .10  
4 (Hu & Bentler, 1995; Marsh et al., 2004; Schmeller-Engel et al., 2003). Secondly,  
5 structural equation analysis was followed by a bootstrapping procedure that drew  
6 5000 replication samples to test parameter stability. Bootstrapping produces an  
7 empirical representation of the sampling distribution of path coefficients by treating  
8 the observed sample as a representation of the population in miniature, one that is  
9 repeatedly resampled as a means of reproducing the original sampling process (Hayes,  
10 2009). Provided the bootstrap estimate closely approximates the sample coefficient,  
11 high path stability can be inferred.

12         **Assessment of the measurement model.** The measurement model consisted  
13 of seven related latent factors that represented all study variables. Scores for each item  
14 were used as the measured variables for the latent engagement and disaffection  
15 factors. Subscales were used as measured variables for the latent factors; perceived  
16 controlling motivational style, psychological need satisfaction and psychological need  
17 thwarting. As perceived autonomy support contained a large number of items, three  
18 random parcels of items were used as manifest variables (Little, Cunningham, Shahar  
19 & Wilderman, 2002). Standardised factor loadings for the manifest variables were  
20 significant (autonomy support  $M \beta = .88$ , range = .78-.93; control  $M \beta = .83$ , range =  
21 .68-.97; psychological need satisfaction  $M \beta = .86$ , range = .79-.96; psychological  
22 need thwarting  $M \beta = .85$ , range = .79-.91; engagement  $M \beta = .75$ , range = .63-.85;  
23 disaffection  $M \beta = .64$ , range = .50-.83), and each of these latent factors demonstrated  
24 acceptable composite reliability (see Table 1; Nunnally & Bernstein, 1994).  
25 Furthermore, the measurement model exhibited an acceptable fit to the data:  $\chi^2 =$   
26 377.86 (215),  $p < .05$ ;  $\chi^2/df = 1.57$ ; TLI = .92; CFI = .93; SRMR = .06; RMSEA = .07



1           The purpose of this study was two-fold. First, we intended to test SDT's  
2 mediation model in relation to behavioral engagement and behavioral disaffection in  
3 youth sport. In this model, perceived autonomy support from coaches was  
4 hypothesised to positively predict athletes' psychological need satisfaction which, in  
5 turn, was hypothesised to positively predict their engagement. By contrast, perceived  
6 control from coaches was hypothesised to positively predict athletes' psychological  
7 need thwarting which, in turn, was hypothesised to positively predict their  
8 disaffection. Second, in addition to the hypothesised parallel paths, the cross-over  
9 paths were concurrently tested to examine unique and collective effects in SDT's  
10 mediation model. It was hypothesised that perceived autonomy support from coaches  
11 would negatively predict athletes' psychological need thwarting which, in turn, would  
12 negatively predict their engagement. By contrast, perceived controlling behavior from  
13 coaches was expected to negatively predict athletes' psychological need satisfaction  
14 which, in turn, would negatively predict their disaffection.

15           Findings indicated that the hypothesised model possessed an adequate fit to the  
16 observed data. Furthermore, the parallel paths were significant and in the hypothesised  
17 directions. Additional support for the model was provided by the indirect effects, with  
18 all but two (those containing a non-significant cross-over path from psychological  
19 need thwarting to engagement) reaching significance. As regards the second aim of  
20 this study, with the exception of the psychological need thwarting to engagement path,  
21 the hypothesised cross-over paths were also statistically significant and in the  
22 expected directions.

### 23 **Relationships between perceptions of the coach and youth sports participants'** 24 **engagement and disaffection**

25           At the zero-order level, the provision of autonomy support from coaches  
26 positively correlated with engagement and negatively correlated with disaffection. By



1 contrast, a controlling motivational style negatively correlated with engagement and  
2 positively correlated with disaffection. These findings indicate that the two types of  
3 coaching behavior have a differential relationship with engagement and disaffection in  
4 a manner observed for affective outcomes by others (Adie et al., 2008; Bartholomew,  
5 Ntoumanis, Ryan & Thøgersen-Ntoumani, 2011; Balaguer et al., 2012; Reinboth et  
6 al., 2004). In doing so, the results substantiate the notion that encouraging self-  
7 directed action and tempering the use of controlling behavior have high predictive  
8 utility in sport. Notably, in an extension to extant research, our findings indicate that  
9 the predictive utility of perceived autonomy support and control extend to the  
10 adherence and attrition fostering self-regulatory strategies (e.g., attention, persistence  
11 and effort versus passivity, disinterest and a lack of initiation) evident in engagement  
12 and disaffection.

### 13 **SDT's mediation model**

14 Consistent with findings from previous research (Adie et al., 2008;  
15 Bartholomew, Ntoumanis, Ryan & Thøgersen-Ntoumani, 2011; Balaguer et al., 2012;  
16 Jang et al., 2012; Reinboth et al., 2004), the effects of perceived coach autonomy  
17 support and perceived coach control to engagement and were mediated, to varying  
18 degrees, by the satisfaction and thwarting of the psychological needs. As was  
19 expected, perceptions that coaches' provide autonomy support corresponded with  
20 higher engagement via higher psychological need satisfaction. Moreover, autonomy  
21 supportive coaches also appear to quell disaffection. This is because autonomy  
22 support indirectly predicted lower disaffection via lower psychological need thwarting  
23 and higher psychological need satisfaction. In this regard the current findings closely  
24 mirror the mechanisms described in SDT. Psychological need fulfilment ensures  
25 personal endorsement of sports participation and this volitional regulation paves the

1 way for enjoyment, effort and persistence which, here, promotes proactivity and offers  
2 resistance to passivity in youth sport (Ntoumanis, 2012).

3 Perceptions of controlling coach behaviors, by contrast, indirectly contributed  
4 to higher disaffection and lower engagement. This is because a controlling  
5 motivational style predicted higher psychological need thwarting and lower  
6 psychological need satisfaction. According to SDT, low psychological need  
7 satisfaction and high psychological need thwarting provoke adolescents to relinquish  
8 the personal endorsement of their sporting participation for compensatory  
9 environmental motives (e.g., others approval, rewards, punishment avoidance). This  
10 controlled regulation is influential in athletes' negative affect and boredom  
11 (Ntoumanis, 2012) and appears to promote passivity and disinterest as well as a  
12 waylay to effort and persistence in youth sport. Overall, these findings support and  
13 build upon extant research (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani,  
14 2011; Balaguer et al., 2012; Gunnell et al., 2013) by further indicating that  
15 psychological need thwarting is important alongside psychological need satisfaction in  
16 order to understand positive and negative experiences in sport.

17 Examination of the cross-over pathways provided further insight into the  
18 unique and combined effects of the psychological satisfaction and thwarting. The  
19 findings provided support for the findings of some previous studies (e.g., Aide et al.,  
20 2008; Balaguer et al., 2012; Gunnell et al., 2013), but not others (Bartholomew,  
21 Ntoumanis, Ryan & Thøgersen-Ntoumani, 2011), in that psychological need  
22 satisfaction uniquely contributed to both positive (viz. engagement) and negative  
23 outcomes (viz. disaffection) whereas psychological need thwarting uniquely predicted  
24 only disaffection (and not engagement). These effects suggest that although  
25 psychological need satisfaction is principally understood to contribute to positive  
26 experiences, it can also prevent the emergence of negative experience via a

1 development of the psychological resources necessary for effective coping  
2 (Vansteenkiste & Ryan, 2013). By contrast, contrary to expectations, psychological  
3 need thwarting appears to elicit only negative experiences with an absence of any  
4 effect on positive experience. Accordingly, although less likely to contribute to  
5 athletes' disaffection, coaches who merely provide reduced opportunity for  
6 psychological need thwarting are unlikely to promote any engagement.

### 7 **Limitations and future research**

8         The current study has a number of limitations. First, it employed a non-  
9 experimental, cross-sectional design. Accordingly, it is not possible to infer causality  
10 between the studied variables. Developing this line of research should involve the use  
11 of longitudinal data to support the temporal precedence implied by SDT's mediation  
12 model. This particularly important in light of Jang et al's (2012) finding that  
13 children's psychological need satisfaction and engagement share a reciprocal  
14 relationship, and Reeve's (2009) assertion that disaffection may evoke controlling  
15 (rather than autonomy-supportive) strategies from socializers over time. Second, data  
16 were collected among youth soccer players in the UK. Such a homogeneous sample  
17 limits the generalizability of the findings. It is important for future research to  
18 examine these dynamics in other, more competitive, sport contexts. Third, the current  
19 study did not assess perceptions of structure from coaches. According to SDT,  
20 structure refers to the help, support, rules and limits that coaches provide to support  
21 children's competence in sport (Mageau & Vallerand, 2003). Recent studies have  
22 shown that structure and autonomy support interact to predict higher psychological  
23 need satisfaction and engagement in school (Jang, Reeve & Deci, 2010; Sierens,  
24 Vansteenkiste, Goossens, Soenens & Dochy, 2009) and sport (Curran et al., 2013).  
25 Therefore, it is important for future research to integrate both autonomy support and  
26 structure within SDT's mediation model.

## 1 **Creating bridges between motivation and self-regulation in sport and exercise**

2           The relationship between motivation related concepts (e.g., needs, goals,  
3 efficacy) and self-regulation (e.g., planning, monitoring, meta-cognition) is dynamic  
4 and reciprocal (Martin, 2012; Zimmerman & Capillo, 2003). SDT offers a distinctive  
5 account of this relationship. This is because SDT centres on innate motivational  
6 resources (viz. the psychological needs) and how they govern behaviour. This deviates  
7 somewhat from other approaches to motivation that might guide practice, such as  
8 achievement goal theory (Nicholls, 1984). For example, within achievement goal  
9 theory, individual differences (e.g., goal orientations) are understood to be  
10 developmentally acquired. By contrast, SDT assumes inherent internal actualisation  
11 tendencies reside within each individual that must be cultivated. In addition, in  
12 achievement goal theory, high perceptions of competence (regardless of how it is  
13 construed) contribute to adaptive self-regulation. However, in SDT, high competence  
14 is, in isolation, insufficient to promote optimal self-regulation, as complementary  
15 needs for autonomy and relatedness must also be fulfilled (Ryan & Deci, 2000).  
16 Although these differences may appear subtle, the ramifications for practice may be  
17 considerable if one approach or the other is adopted since coaches might seek to  
18 nurture (as opposed to impart) the antecedents of self-regulation by offering support  
19 for a wider array of motivation resources (as opposed to just competence).

20           As discussed, within the SDT framework autonomy-support describes the  
21 motivational style through which coaches and others create conditions to nurture  
22 athletes' inner motivational resources. This includes listening to, and acting upon,  
23 athletes' ideas, offering them opportunity to take initiative, providing them with  
24 meaningful rationales for necessary limits, acknowledging any negative experiences  
25 and providing them with a number of desired choices (Reeve, 2006). Similarly,  
26 providing adequate structure that fosters competence is also known to be important

1 (Grolnick & Ryan, 1989). This includes providing rules and limits prior to an activity,  
2 help and support during and activity, and informational feedback after an activity  
3 (Reeve, 2006). By providing structure in a context of autonomy support, coaches  
4 provide fertile conditions for athletes' self-regulation via the concurrent facilitation of  
5 autonomy and competence (Curran et al., 2013).

6 Above all, our results underscore the need for effective coach education. In  
7 youth sport, coaches are typically parent volunteers (Wiersma & Sherman, 2005) and  
8 receive very little formal training in how their behaviors influence athletes' underlying  
9 motivation. The key message stemming from this study is that supporting athletes'  
10 autonomy, and resisting the temptation to utilize controlling behaviours, is central to  
11 the cultivation of positive experiences in youth sport. We therefore encourage a  
12 greater focus among sport psychologists on the evaluation of interventions aimed at  
13 enhancing coaches' ability to recognise, and support, the psychological needs of their  
14 young athletes. By this means, coaches will be better equipped to promote athletes'  
15 adaptive self-regulation (viz. engaged behaviors) and, thereby, greater adherence to  
16 youth sport.

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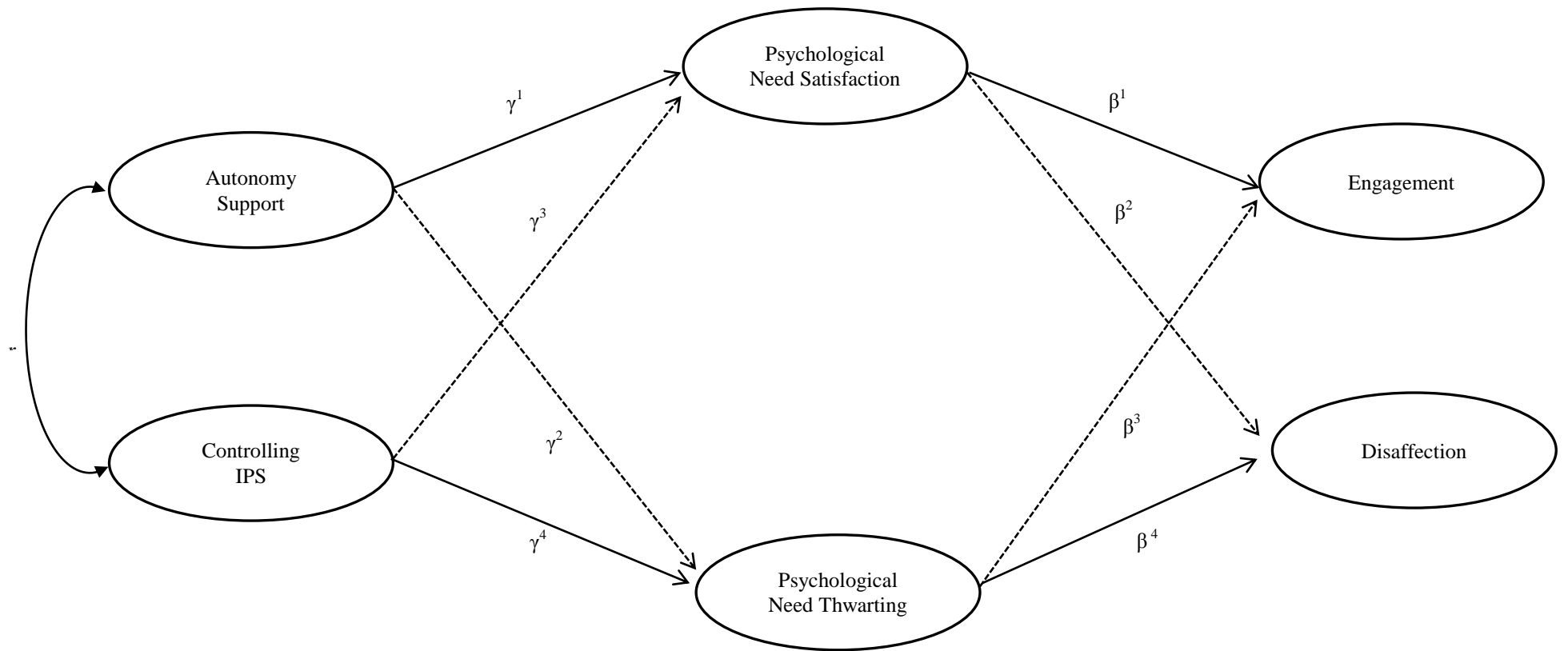
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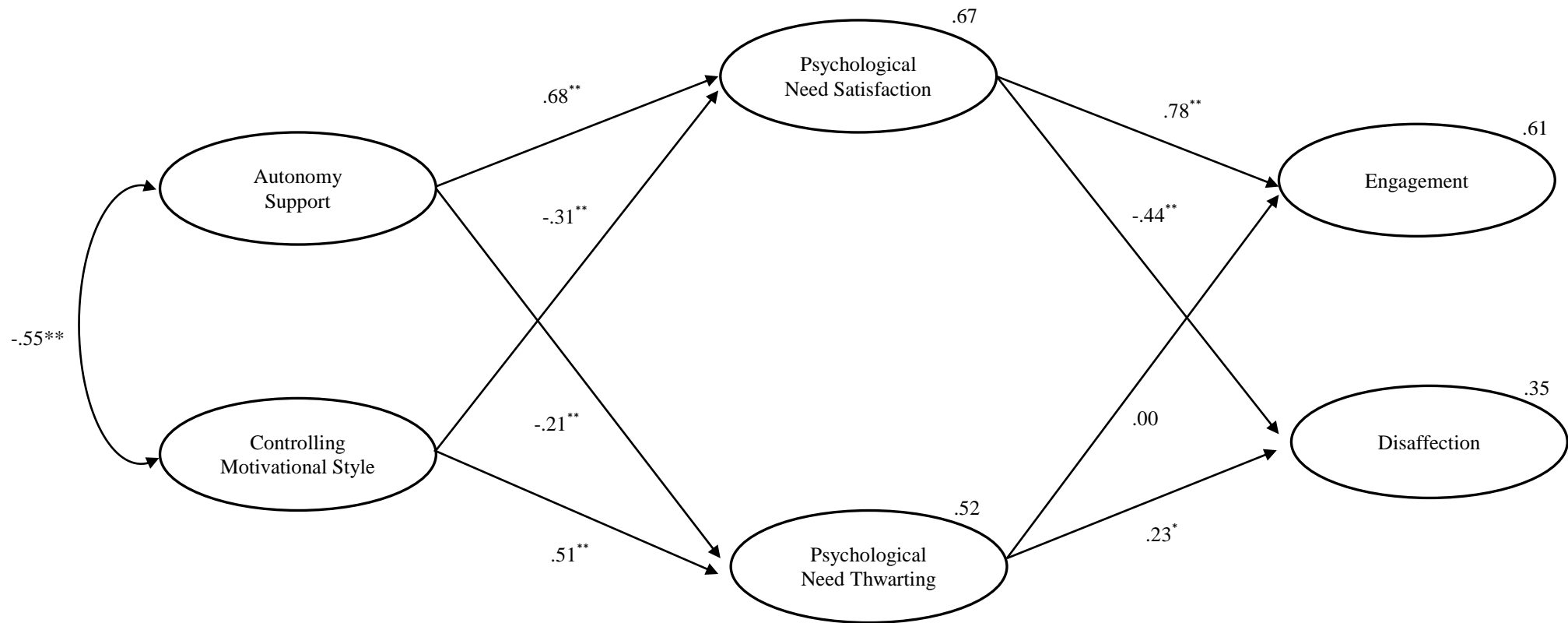
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**Figure 1.** Hypothesised motivation mediation model of coach inter-personal style, psychological need satisfaction/thwarting and behavioral engagement/disaffection. Path letters denote paths in Table 4.1. *Note.* dashed lines indicate a hypothesised negative relationship; un-dashed lines indicate a hypothesised positive relationship.



**Figure 2.** Results of structural equation modelling for the hypothesised motivation mediation model. \*p <.05, \*\*p <.01. *Note.* figures above the exogenous variables refer to the variance explained ( $R^2$ ) by the endogenous variables. The exogenous variable residuals were uncorrelated



Table 1. Composite reliabilities and zero-order correlations.

Measures	1	2	3	4	5	6
1. Autonomy Support	---					
2. Controlling inter-personal style	-.55 <sup>***</sup>	---				
3. Psychological need satisfaction	.77 <sup>***</sup>	-.55 <sup>***</sup>	---			
4. Psychological need thwarting	-.57 <sup>***</sup>	.67 <sup>***</sup>	-.67 <sup>***</sup>	---		
5. Engagement	.67 <sup>***</sup>	-.55 <sup>***</sup>	.74 <sup>***</sup>	-.49 <sup>***</sup>	---	
6. Disaffection	-.44 <sup>***</sup>	.44 <sup>***</sup>	-.55 <sup>***</sup>	.50 <sup>***</sup>	-.65 <sup>***</sup>	---
Composite Reliability (Dillon-Goldstein's $\rho$ )	.94	.93	.93	.93	.89	.85

<sup>\*\*\*</sup> $p < .001$

*Table 1* Standardised coefficients for the paths in the hypothesized model and results from the bootstrap analysis.

Path	Standardised coefficient	Bootstrap analysis for hyp. model		
	Hypothesised model	Mean st. coefficient	SE	95% CI st. coefficient
Autonomy support to psychological need satisfaction ( $\gamma^1$ )	.68**	.67	.10	.45 to .85
Autonomy support to psychological need thwarting ( $\gamma^2$ )	-.31**	-.31	.12	-.31 to -.07
Controlling IPS to psychological need satisfaction ( $\gamma^3$ )	-.21**	-.21	.09	-.41 to -.21
Controlling IPS to psychological need thwarting ( $\gamma^4$ )	.51**	.50	.10	.32 to .51
Psychological need satisfaction to engagement ( $\beta^1$ )	.78**	.78	.09	.57 to .94
Psychological need satisfaction to disaffection ( $\beta^2$ )	-.44**	-.45	.13	-.69 to -.44
Psychological need thwarting to engagement ( $\beta^3$ )	.00	-.00	.12	-.25 to .20
Psychological need thwarting to disaffection ( $\beta^4$ )	.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 2 Specific indirect effects.

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

## Appendix A

### *Items for the modified version of the Engagement Versus Disaffection with Learning Scale*

#### *(behavioral subscales)*

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

*Notes.* Items 1, 2, 8, 9, and 10 are used to assess engagement. Items 3, 4, 5, 6, and 7 are used to assess disaffection.