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ARTICLE

# Psychological Needs and the Quality of Student Engagement in Physical Education: Teachers as Key Facilitators

**Thomas Curran and Martyn Standage**
University of Bath

Motivation research is central to understanding why certain students exhibit high levels of behavioral, cognitive, and emotional engagement with learning, and why others lack interest, display boredom, and withdraw effort (i.e., are disaffected). In this review, tenets within self-determination theory (SDT) are used to provide a theoretically-informed account of student engagement and disaffection in the context of school physical education (PE). Our review centers on the proposition within SDT that the satisfaction of basic psychological needs (i.e., for autonomy, competence, and relatedness) provide the energizing basis for optimal motivational functioning and wellness. Teacher strategies and class structures are reviewed in the context of whether they satisfy or frustrate these psychological needs. To amalgamate the reviewed literature, a mediated model depicting a 'student-teacher dialectical' framework is presented. Several practitioner recommendations for supporting student engagement in PE are then offered. Lastly, findings of past interventions within the school context are presented and discussed.

***Keywords:*** PE, motivation, adolescent, teaching

Physical inactivity is a global health issue, identified now as the fourth leading risk of mortality worldwide (World Health Organization, 2010). Faced with lifestyles rich in technological advancement and sedentary pursuits, children are increasingly seeing physical activity opportunities engineered out of their lives due to demographic and economic shifts. Indeed, self-report data from 105 countries show 80.3% of adolescents aged 13–15 years to achieve less than 60-minutes of moderate-to-vigorous activity per day (Hallal et al., 2012). Although the determinants of physical activity are multifaceted and reside at different levels of influence (e.g., Sallis, Bauman, & Pratt, 1998), physical education (PE) is uniquely positioned to address children and adolescents' physical inactivity as the setting affords all children with physical activity opportunities. This said, existing reviews indicate that PE interventions committed to enhancing physical activity have had mixed results—with maintenance of behavior change a particularly elusive outcome (Dobbins, Husson, DeCorby, & LaRocca, 2013). One plausible reason for this is that far too many children commence school as unmotivated, uninterested, and disengaged from PE (e.g., Cardinal, Yan, & Cardinal, 2013; Enright & O'Sullivan, 2010; Tischler & McCaughtry, 2011). In the absence of engagement, instrumental efforts to increase the amount of PE, or train teachers in the provision of new pedagogical materials, are unlikely to be sustainable in the long-term (Cleland, Tully, Kee, & Cupples, 2012).

The promotion of engagement, then, should be a central focus of PE intervention. In this review, we provide a comprehensive theoretical and empirical overview of the engagement construct using self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2017) as a guiding framework. SDT is a meta-theory of human motivation and is especially applicable because it elucidates not only the "what" (i.e., goal) and "why" (i.e., reason) of PE motivation, but also the engagement that arises out of that motivation (Reeve, 2012). We begin our review with a description of engagement and its conceptual opposite, disaffection, in PE. Next, we embed engagement and disaffection within the purview of SDT and, using the framework, describe how classroom conditions at times support, but at other times thwart, students' underlying motivational resources and engagement. Lastly, we present several practical recommendations to assist PE teachers in supporting student engagement and conclude with a review of pertinent interventions.

The authors are with the Centre for Motivation and Health Behaviour Change, Department for Health, University of Bath, Bath, United Kingdom. Address author correspondence to Martyn Standage at m.standage@bath.ac.uk.

# Engagement and Disaffection in Physical Education

## Engagement

Conceptual approaches to engagement may help researchers and practitioners to better understand the psychological processes that underpin proactive, energetic, and sustained participation in PE. Numerous reviews have been conducted on the topic of school engagement (e.g., Appleton, Christenson, & Furlong, 2008; Fredricks, Blumenfeld, & Paris, 2004). One notable approach that is particularly well-studied is Skinner and colleagues' model (Connell & Wellborn, 1991; Skinner & Belmont, 1993; Skinner, Kindermann, & Furrer, 2009). In their bipartite model, Skinner and her colleagues describe two important dimensions of engagement, namely behavioral and emotional. As will become clear, each of these dimensions has distinct implications for PE participation.

***Behavioral Engagement.*** According to Skinner and colleagues (Skinner & Belmont, 1993; Skinner et al., 2009), behavioral engagement entails active involvement in learning activities. It encompasses an array of behaviors including effort, exertion, and persistence as well as mental efforts such as concentration, attention, asking questions, and contributing to classroom discussions. Behavioral engagement is important to understand because children's efforts and persistence correspond to their skill development and performance in achievement contexts such as PE (Duda, 2001). These competencies, in turn, support persistence in the face of challenge or failure and, hence, promote long-term participation in physical activities (Harter, 1978; Kirk, 2005).

Research on the consequences of behavioral engagement in school supports these ideas. For instance, studies show high behavioral engagement to underpin 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). In contrast, low behavioral engagement has been shown to undermine children's classroom task persistence and, therefore, inhibits academic accomplishment (Furrer, Skinner, Marchand, & Kindermann, 2006). As such, behavioral engagement appears to be an important motivational source of efficacy for children, which promotes positive development and adherence to challenging domains such as PE.

***Emotional Engagement.*** Emotional engagement entails cognitive and affective reactions in the classroom. Such reactions include (among others) interest, concentration, enjoyment, happiness, and satisfaction (Skinner & Belmont, 1993). Parallels can be drawn between these aspects of school engagement and other models of general engagement in work and sport (Bakker, Schaufeli, Leiter, & Taris, 2008; Lonsdale, Hodge, & Raedeke, 2007). This is because both address the positive thought patterns and emotions that typically accompany high-quality forms of participation motivation (Curran, Hill, Hall, & Jowett, 2015). Numerous studies have employed measures of positive affect (e.g., Duncan, 1993; Standage, Duda, & Ntoumanis, 2005; Vlachopoulos & Biddle, 1997), enjoyment (e.g., Fairclough, 2003; Goudas & Biddle, 1993; Prochaska, Sallis, Slymen, & McKenzie, 2003), vitality (e.g., Mouratidis, Vansteenkiste, Lens, & Sideridis, 2008; Taylor & Lonsdale, 2010; Vlachopoulos, 2012), happiness (e.g., Cheng & Furnham, 2002; Natvig, Albrektsen, & Qvarnstrøm, 2003; Uusitalo-Malmivaara, 2012), and satisfaction (e.g., Baena-Extremera, Gómez-López, Granero-Gallegos, Ortiz-Camacho, 2015; Danielsen, Samdal, Hetland, & Wold, 2009; Suldo, Riley, & Shaffer, 2006), typically under the umbrella term of 'well-being,' to demarcate aspects of children's emotional engagement in school and PE (for a review see Langford et al., 2014).

Yet emotional engagement is more than just an experiential outcome for children. It also has important implications for children's long-term persistence in PE. In this regard, emotional engagement compliments the behavioral aspects of engagement in the bipartite engagement framework because it provides the psychological energy that gives rise to, and sustains, engaged behavior (Connell & Wellborn, 1991). Studies in school and PE support this notion. For instance, aspects of children's emotional engagement (e.g., enthusiasm and positive affect) predict increased effort and persistence in school over time (Pinxten, Marsh, De Fraine, Van Den Noortgate, & Van Damme, 2013). Likewise, it is also well understood that enjoyment and satisfaction are central to children's decisions to persist in sport and PE (Calvo, Cervelló, Jiménez, Iglesias, & Murcia, 2010; Ryska, Hohensee, Cooley, & Jones, 2002; Ullrich-French & Smith, 2009; see also Weiss & Petlichkoff, 1989). Accordingly, children's expressions of enjoyment, interest, happiness, and satisfaction can be considered important emotional prerequisites of their long-term participation in PE.

***A Brief Comment on Cognitive and Agentic Engagement.*** Work by Reeve and colleagues (e.g., Reeve, 2012, 2013; Reeve & Lee, 2014) has led to a proposed extension of bipartite models of school engagement. These scholars purport that, alongside behavioral and emotional elements, engagement includes cognitive and agentic dimensions. Cognitive engagement refers to students' desire to seek conceptual, rather than surface knowledge in the classroom. It encapsulates several deep learning (e.g., elaboration) and self-regulatory strategies (e.g., planning, goal setting, and monitoring). Agentic engagement, on the other hand, refers to the extent of a child's contribution to his/her own learning, for instance, by asking questions, expressing opinions, and instructing the teacher in one's preferences and needs (Reeve, 2013). This dimension of school engagement is unique because whereas behavioral, emotional, and cognitive engagement emerge reactively from interactions with the classroom, agentic engagement reflects children's proactivity in engaging themselves to render their social

context to be more engagement supportive. This process, of course, is facilitated by engagement supporting provisions from the teacher and, as such, agency likely encapsulates a mutually reinforcing set of teacher-student engaging behaviors. Results from factor analyses indicate that cognition and agency are indeed important common causes in the higher-order engagement factor, positively loading alongside behavioral and emotional components (Reeve, 2013; Reeve & Tseng, 2011). The outcomes of cognitive and agentic engagement are less well-studied than those of behavioral or emotional engagement but initial research indicates that it is an important criterion of children's persistence and achievement in school (Jang, Kim, & Reeve, 2012; Reeve & Lee, 2014).

## Disaffection

Children do not always express engagement in school but, instead, show signs of disaffection (Connell & Wellborn, 1991). Disaffection occupies the negative pole of the engagement continuum. It refers to predisengaged behaviors 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/or conditional regard (Hewitt & Flett, 1991), as well as by boredom or apathy. When the opportunity for activity withdrawal is restricted, as is the case in school, disaffected behaviors may manifest that reflect mental or emotional, but not behavioral, withdrawal such as passivity, lack of initiation, the absence of effort, and giving up (Skinner et al., 2009). Disaffection is therefore an important motivational source of helplessness in children, which impedes achievement in PE.

***Behavioral Disaffection.*** According to Skinner and colleagues (Skinner & Belmont, 1993; Skinner et al., 2009), disaffected behaviors include those prototypically associated with predisengagement namely, passivity, lack of initiation, lack of effort, and giving up. Further, 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 behavioral disaffection reflect passive involvement (Connell & Wellborn, 1991). Unlike behavioral engagement, then, behavioral disaffection does not contribute to the development of competence in PE (Duda, 2001; Kirk, 2005). As such, alongside other factors, disaffected behaviors are likely to reflect those associated with helplessness and enervated functioning (Skinner et al., 2009).

Studies show that disaffection is associated with poor quality coping, motivational deficits, low achievement, and diminished resilience in school (see Skinner, 2016, for a review). To date, though, researchers have made little attempt to examine behavioral disaffection in the specific context of school PE. Nonetheless, disaffected behaviors such as mental withdrawal and giving up are evident in such settings and qualitative studies indicate that they are symptomatic of predropout across several physical activities (e.g., Fredricks et al., 2002; Gould, Feltz, Horn, & Weiss, 1982; Klint & Weiss, 1986). Disaffection in PE is likely to result from several factors that are inhibitive of participation motivation. These include perceptions of incompetence, social isolation, and a lack of challenge (Bennie & O'Connor, 2006; Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002). As such, behavioral disaffection's examination alongside behavioral engagement as a behavioral indicator of children's enervation in PE is necessary and, indeed, more research is warranted.

***Emotional Disaffection.*** Disaffected emotions reflect exhaustion (mental tiredness, sadness, and boredom), alienation (frustration and anger), and negative cognition (anxiety and worry). Accordingly, these aspects of emotional disaffection encompass a constellation of negative thoughts and feelings in the classroom. In PE, many studies have examined aspects of emotional disaffection such as negative affect (e.g., Mouratidis, Vansteenkiste, Lens, & Auweele, 2009; Ntoumanis, 2005; Standage et al., 2005), boredom (e.g., Carpenter & Morgan, 1999; Ntoumanis, 2001; Standage et al., 2005), anxiety, and worry (e.g., Barkoukis, Koidou, & Tsorbatzoudis, 2010; Cox, Duncheon, & McDavid, 2009; Goudas & Biddle, 1993). Typically, such studies consider these aspects of emotional disaffection as outcomes variables that reflect children's negative experiences or 'ill-being'.

As with emotional engagement, though, emotional disaffection also describes those thoughts and feelings that give rise to children's behavioral disaffection in the classroom (Skinner et al., 2009). This is because disaffected emotions reflect a lack of personal interest in learning activities and thus precipitate passive behavior. In PE, this interplay is supported by studies that have documented negative associations between a lack of enjoyment and effort (e.g., Mouratidis et al., 2008; Ntoumanis, 2001; Taylor, Ntoumanis, Standage, & Spray, 2010). Consequently, emotional disaffection might be considered an important emotional indicator of children's enervation and disengagement in PE.

## Summary

The importance of the engagement construct in underpinning high-quality participation in PE is clear. According to Skinner (Skinner et al., 2009) and others (e.g., Reeve, 2012), engaged children are *active* participants who exhibit high levels of positive emotionality and behavioral intensity. Disaffected children, 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 and adolescents' long-term engagement (i.e., personal satisfaction, enjoyment, and competence; Calvo et al., 2010; Pelletier, Fortier, Vallerand, & Briere, 2001; Ryska et al., 2002; Sarrazin et al., 2002; Ullrich-French & Smith, 2009) and ongoing disaffection (i.e., lack of interest, boredom, and incompetence; Bennie & O'Connor, 2006; Enoksen, 2011; Woods, Tannehill, Quinlan, Moyna, & Walsh, 2010).

Given the strong link between children's engagement and long-term participation, it is important to understand how and why PE 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 phenomena and testable hypothesizes can be generated regarding the origins of engagement and disaffection in PE and thereby the salient points of intervention. To this end, SDT is one theoretical framework that has notable explanatory utility in children's engagement (Connell & Wellborn, 1991; Deci & Ryan, 1985; Reeve, 2012). Indeed, SDT provides a conceptual approach to understanding the quality of children's motivation and, importantly, it affords an identification of the salient antecedents of engagement and disaffection that arise out of that motivation.

# A SDT Perspective on Engagement and Disaffection

## SDT

SDT (Ryan & Deci, 2017) is a conceptual framework of human motivation with applications to PE (e.g., see Ntoumanis & Standage, 2009; Standage, Gillison, & Treasure, 2007; Standage & Ryan, 2012). Whereas other motivational frameworks describe how children's beliefs, goals, and cognitions influence their school experiences (e.g., achievement goal theory; Nicholls, 1989, the theory of planned behavior; Ajzen, 1991), SDT is distinctive because it emphasizes children's innate motivational resources (Reeve, 2012). Within SDT, the philosophical starting point is an organismic-dialectic paradigm, which purports that human beings have several proactive innate motivational resources that interact with social environments to promote optimal human thriving and wellness (Ryan & Deci, 2017). Accordingly, humans are oriented toward behavioral integration, via a fulfillment 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.

SDT's 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 SDT extends such meta-theorizing in an important way. According to SDT, organismic tendencies toward self-actualization and psychological wellness are triggered and nurtured within social contexts that provide support for feelings of autonomy, competence, and relatedness—motivational resources (viz., basic psychological needs) that we discuss in detail later. In the same vein, humans are also vulnerable to feelings of being controlled, criticized, and alienated, particularly when the social context is actively thwarting of their basic psychological needs and a tendency toward behavioral integration. In doing so, SDT offers useful recommendations regarding how teachers might evoke inherent motivational resources in children to facilitate engagement or circumvent disaffection in PE (Reeve, 2012).

## Basic Psychological Need Theory

The role of inherent motivational resource in self-actualization and engagement is formalised within a mini-theory of SDT known as basic psychological need theory (BPNT). As with the over-arching tenets of SDT, BPNT has its roots in organismic psychology. Here, needs are defined as organismic necessities of healthy functioning, development, and wellness. Psychological needs, then, represent a subset of these necessities that are essential for the physical, psychological, and social health of the organism (Deci & Ryan, 2000). Three psychological needs are described within BPNT 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 behavior as originating from within the self. It represents the inner endorsement and self-determination of one's behavior (Deci & Ryan, 1985). The second, competence, is the need to feel that one can effectively negotiate their interactions within the environment (White, 1959). 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 interpersonal relationships (Ryan, 1995).

Three important contributions to the broader SDT framework are offered within BPNT (Reeve, 2012). First, the mini-theory describes the specific antecedents of children's behavioral integration and optimal functioning. As such, BPNT represents a unifying principle—linking social-contextual factors, facilitative or inhibitive of psychological need satisfaction, to the cognitive, affective, and behavioral experiences that these needs catalyze (Vansteenkiste & Ryan, 2013). Second, basic psychological needs describe why some children exhibit engagement in PE contexts and others exhibit disaffection in PE, because psychological need satisfaction leads to psychological, social, and behavioral wellness whereas psychological need frustration results in psychological, social, and behavioral ill-being (Ryan & Deci, 2017). Third, the psychological needs allow for hypotheses to be specified with regard to which specific aspects of the PE classroom environment will be supportive versus thwarting of children's optimal functioning and engagement in PE, that is, the conditions which support or thwart student perceptions of autonomy, competence, and relatedness (viz., *need supportive* vs. *need thwarting* contexts; cf. Ryan & Deci, 2017).

## The Empirical Basis of BPNT in PE

A central assumption of BPNT is that opportunities for autonomy, competence, and relatedness directly confer

optimal psychological, social, and behavioral functioning in humans. As such, the psychological needs, and the environmental provisions that support them, should positively predict adaptive outcomes such as engagement. In support of BPNT, psychological need satisfaction has been shown to positively predict optimal functioning in a number of life's domains, including sport (e.g., Curran, Hill, & Niemiec, 2013; Gaudreau, Amiot, & Vallerand, 2009; Podlog, Lochbaum, & Stevens, 2010), 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 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; Halvari et al., 2013; Jang et al., 2012).

Germane to the focus of this review, a growing body of evidence also attests to the importance of the psychological needs and their supports for aspects of engagement in PE. Positive associations between psychological need satisfaction and several positive PE-related outcomes including positive affect (Standage et al., 2005), vitality (Taylor & Lonsdale, 2010), concentration (Ntoumanis, 2005; Standage et al., 2005), and enjoyment (e.g., Cox, Smith, & Williams, 2008; Cox & Williams, 2008) have been documented in PE students. The psychological needs have also been shown to positively predict adaptive behavioral outcomes such as persistence and effort in PE across both self-reported measures (e.g., Barkoukis, Hagger, Lambropoulos, & Tsorbatzoudis, 2010; Taylor & Lonsdale, 2010; Zhang, Solmon, Kosma, Carson, & Gu, 2011) and via teacher ratings of motivated behavior (Standage, Duda, & Ntoumanis, 2006). Similarly, the basic needs have predicted students' objectively estimated physical activity engagement outside of the classroom (Standage, Gillison, Ntoumanis, & Treasure, 2012), participation in optional PE lessons (Ntoumanis, 2005; Sanchez-Oliva, Sanchez-Miguel, Leo, Kinnafick, & Garcia-Calvo, 2014), and more global markers of well-being such as general self-esteem (Standage & Gillison, 2007), physical self-concept, and health-related quality of life (Standage et al., 2012). In an important extension to these findings, McDavid, Cox, and McDonough (2014) and Taylor et al. (2010) demonstrated that higher psychological need satisfaction not only corresponds with higher PE engagement at the between-person level but also contributes to increases in within-person PE engagement and physical activity over time.

Just as high psychological need satisfaction contributes to engagement in PE, low psychological need satisfaction has been found to contribute to disaffection. Here, numerous studies document negative associations between psychological need satisfaction and negative affect (e.g., Ntoumanis, 2005; Ntoumanis, Pensgaard, Martin, & Pipe, 2004; Standage et al., 2005), enervation (e.g., Ntoumanis, 2001; Standage, Duda, & Ntoumanis, 2003; Taylor & Ntoumanis, 2007), and boredom (Ntoumanis, 2001; Standage et al., 2005). Less research has investigated the role of psychological need frustration in PE disaffection, but studies in youth sport are suggestive. In a series of studies, Curran and colleagues found that young athletes psychological need frustration positively predicts their levels of behavioral disaffection (Curran, Hill, Hall, & Jowett, 2014; Curran, Hill, Ntoumanis, Hall, & Jowett, 2016). Similarly, in a separate series of studies among young athletes, Bartholomew et al. (Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011; Bartholomew, Ntoumanis, Ryan, & Thogersen-Ntoumani, 2011) showed psychological frustration to be positively associated with emotional indicators of engagement such as negative affect and burnout.

## Supporting Psychological Need Satisfaction

SDT is not only concerned with the consequences of psychological need satisfaction, but also the key antecedents of these basic needs. Within SDT, children's proactive pursuit of the basic psychological needs occurs within social contexts that can either support or thwart them. As such, environmental factors—particularly teaching behaviors—are understood to interact with the psychological needs children bring to the classroom. Hence children's motivations, and the behaviors of the teacher, share a reciprocal relationship. As children immerse themselves in pursuit of autonomy, competence, and relatedness, they simultaneously receive and internalize sources of motivation from teachers.

This reciprocal relationship, between children's inherent motivational resources and the behaviors exhibited by teachers, resides at the center of the student-teacher dialectical framework within SDT (Reeve, 2012). To the extent that children can develop competencies, be curious, express opinion, and pursue their interests, the consequence of the student-teacher interaction will be synergistic (i.e., teacher behaviors are concordant with children's psychological needs), resulting in elevated engagement. However, the degree to which teacher behaviors inhibit children's ability to be curious, self-express, and pursue their interests, the consequence of the student-teacher interaction will be antagonistic (i.e., teacher behaviors are incongruent with children's psychological needs), resulting in disaffection. It is not only the teacher who can influence children's psychological need satisfaction in PE. Interactions with parents, peers, and more macro-level factors (e.g., social norms, school values, and school organization) have an influence. However, the student-teacher bond is particularly important in the PE-context and, indeed, special attention has been paid to understanding its dynamic from the perspective of SDT (see Ntoumanis & Standage, 2009).

## Teacher Structure and Motivational Styles

The fundamental role of PE teachers (and other instructors) is to develop competencies. They typically do so with the use of clear expectations, rewards, goals, help,

support, and feedback (among other levers). Within SDT, one important environmental source of this competence support is structure, which is defined as "the extent to which [socialisers] provide clear and consistent guidelines, expectations, and rules for behaviors, without respect to the way in which they are promoted" (Grolnick & Ryan, 1989, p. 144). Structure is thus a standalone concept within SDT 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 children feel incompetent, isolated, and helpless (Soenens et al., 2007).

Accompanying aspects of structure in the student-teacher dialectical framework are motivational styles. Motivational styles refer to the degree to which the PE teacher confers opportunities to receive rewards, feedback, and evaluation (i.e., structure) in a context that is facilitative or inhibitive of psychological need satisfaction. The teacher motivational style, according to the student-teacher dialectical framework, is the single most important aspect of the classroom environment (Reeve, 2012). This is because teachers' motivational styles determine the manner and degree by which structuring events in the classroom are internalized by students and thereby behaviorally integrated within their self-concept.

## Autonomy Support and Interpersonal Control

Although contemporary research within SDT is moving toward understanding 'need-supportive' and 'need-thwarting' social contexts, two specific motivational styles have traditionally been purported to moderate the effect of structure on children's motivation and engagement. The first, autonomy support, refers to the degree to which teachers encourage children to take initiative in PE, be active problem solvers and take a child, rather than teacher perspective (Grolnick, 2003; Mageau & Vallerand, 2003). Several researchers have described the key components of autonomy support. For example, Grolnick and Ryan (1989) and Reeve (2006) 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 teacher empathy (cf. Koestner, Ryan, Bernieri, & Holt, 1984). Another component of autonomy support includes the provision of desired choice and joint-decision making (Marbell & Grolnick, 2013; Reeve, 2006), 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. Together, these provisions allow children to self-endorse structuring events and, hence, cultivate their psychological needs—resulting in engagement.

The second motivational style purported to moderate the effects of structure on children's PE engagement is a controlling motivational style. Controlling teachers pressure children to meet demands, solve problems for them, and take the teacher, rather than students' perspective (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009; Grolnick, 2003; Mageau & Vallerand, 2003). Teacher control has been operationalized to include the demonstration of highly controlling behaviors (e.g., rewards, pressure, and harsh punishment) in addition to the exhibition of psychological control (e.g., guilt inducement and conditional regard; Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010). These provisions block students' ability to make a connection between structuring events and the personal relevance of such events and, in so doing, frustrate children's psychological needs—resulting in disaffection.

## A Mediation Model of Student Engagement and Disaffection

The student-teacher dialectical framework has been described previously (Reeve, 2012) and similar frameworks have been outlined in sport (Mageau & Vallerand, 2003), parenting (Grolnick, Deci, & Ryan, 1997), and healthcare (Patrick & Williams, 2012) literatures. Within PE, as in other domains, the broad ideas contained within this framework have been supported by an extensive body of research that has examined how motivational climates (Standage et al., 2003), feedback (Mouratidis et al., 2008), competition (Ntoumanis & Biddle, 1999), and teacher motivational style (e.g., Cheon, Reeve, Yu, & Jang, 2014; Haerens, Aelterman, Vansteenkiste, Soenens, & Van Petegen, 2015; Hein, Koka, & Hagger, 2015) influence students' psychological needs. Recently, researchers have begun to integrate motivational style research in tests of an overall student-teacher dialectical framework (e.g., Jang et al., 2012; Jang, Kim, & Reeve, 2016; Reeve & Lee, 2014). These tests, broadly, resemble the mediation model shown in Figure 1. Children's perceptions of their teacher's autonomy support and control are reported alongside their perceptions of psychological need satisfaction and frustration and indicators of engagement and disaffection. The horizontal lines in Figure 1 represent hypothesized causal relationships, in which teacher motivational style is assumed to cause changes in the psychological needs that, in turn, are assumed to cause changes in students' levels of engagement and disaffection.

In education settings, research has reported support for a mediation model of engagement and disaffection grounded within SDT. In Korean high school students, for instance, Jang, Reeve, Ryan, and Kim (2009) found that autonomy support from teachers positively correlated with classroom autonomy and competence which, in turn, correlated positively with classroom behavioral engagement. Similar findings have been reported in work

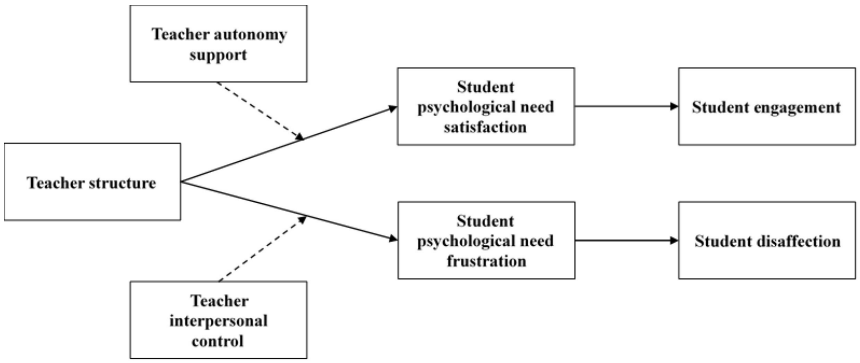


**Figure 1** — An SDT-informed mediation model of PE engagement and disaffection.

with Belgian PE students. Here, Haerens et al. (2015) found that perceptions of PE teachers' autonomy support were positively associated with a linear composite of all three psychological needs that, in turn, correlated positively with integrated forms of motivation. In the same study, perceptions of PE teacher control were positively correlated with composite need frustration, which positively predicted students' enervated functioning. These pathways, from teacher motivational style to student psychological needs and engagement, have further support in longitudinal classroom research (e.g., Jang et al., 2012; Jang et al., 2016) and experimental studies (e.g., Aelterman, Vansteenkiste, et al., 2013; Perlman, 2013; Tessier, Sarrazin, & Ntoumanis, 2010).

In one especially illuminating study, Jang et al. (2012) found longitudinal support for the mediated effect of semester start teacher autonomy support on children's semester end classroom engagement through midsemester psychological need satisfaction. Several reciprocal effects were also noted by these authors that substantiate a mediation model couched within SDT several ways. Most notably, the relationship between psychological need satisfaction and engagement was reciprocal—an effect that has subsequently been replicated in school (Reeve & Lee, 2014) and sport (Curran et al., 2016). However, not only do psychological needs and engagement share reciprocal relations, but so do motivational styles and engagement. To this latter effect, Jang et al. (2016) showed that increases in student engagement and disaffection respectively predict increases in teacher autonomy support and control. Collectively, these relationships are suggestive of a positive upward spiral, whereby increases in autonomy support yield heightened psychological need satisfaction that, in turn, supports gains in behavioral engagement which feed back into heightened autonomy support, and so on. Importantly, though, these data show that just as this upward spiral may be triggered by autonomy support, it can also be reversed by the provision of control. Taking heed of these findings, research is now needed to examine the reciprocal interplay among agentic engagement, need-supportive contexts, and students' behavioral and emotional engagement in PE contexts.

# Practitioner Recommendations

## The Provision of Autonomy Support

As we have seen, structuring PE environments to be autonomy supportive is a means of creating and supporting motivationally adaptive conditions for the development of student engagement. Effective provision of autonomy support, then, is an important skill for PE teachers to develop. To this end, Su and Reeve's (2011) meta-analysis of 19 intervention studies designed to assist people to support autonomy substantiates the effectiveness of such an approach (i.e., $d$ =.63). Moreover, moderator effect analyses across the 11 interventions delivered to teachers showed the effect to be especially large in the school setting ($d$ = 1.16). To guide this empirically-supported means of intervention, Reeve (2006) provided five guidelines for supporting teachers to be autonomy supportive. Here, we describe each of these recommendations in turn to provide a practical overview of how PE teachers might develop their autonomy supportive provision.

Reeve's (2006) first recommendation is that teachers should attempt to nurture children's inner resources. Put simply, this means that teachers should find ways to coordinate children's instruction (i.e., structure) 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 PE, where possible, are fun and exciting. For example, PE teachers could give children the opportunity to decide the team formation before a game, or choose which activities they would like to participate in. Providing support for children's inner resources is an important building block for their sense of self-determination (viz., psychological need satisfaction).

Reeve's (2006) second recommendation for autonomy supportive instruction is to rely on informational, noncontrolling language. That is, teachers should flexibly relay messages to their students 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 nondemeaning. In doing, children can identify the underlying cause of their poor technique or performance and take adaptive action to remedy the problem. The use of informational and noncontrolling 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 teacher (relatedness).

The third guideline that Reeve (2006) offers for teachers seeking to be more autonomy supportive is to communicate value and provide meaningful rationales. In other words, teachers should seek to make sure students are aware of the use, value, importance, or otherwise unapparent personal relevance of engaging in PE tasks. This might be achieved, for instance, by giving a meaningful rationale when uninteresting tasks are required (e.g., Cross-country is not the most fun activity, I know, but it is really important for people to have good health so they can achieve in other areas of life). Such a rationale allows children to internalize the task as personally meaningful. Consequently, communicating value and a meaningful rationale, generates greater self-determination.

The penultimate recommendation that Reeve (2006) provides for autonomy support is to, acknowledge and accept negative affect. Acknowledging and accepting negative affect serves to counter the motivational problem that teachers often encounter when they negotiate conflicts between what students want to do, and what teachers need students to do. A teacher may, for instance, require students to work on their passing when they may want to practice their shooting. Instead of combatting this conflict with controlling measures (e.g., Just get on with it.), autonomy supportive teachers show an understanding of the students' 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 acknowledgment may be followed by a rationale to change the student's frame of reference for the task they display a resistance to (e.g., taking shots can only happen when the ball is passed to the right area). Acknowledging and accepting negative affect has the dual benefit of helping children internalize otherwise uninteresting activities (autonomy), as well as cultivating secure bonds between the coach and athlete (relatedness).

In the final recommendation that Reeve (2006) makes, specific behaviors are presented that subsume the four aspects of autonomy support above. Such autonomy-supportive behaviors, according to Reeve (Reeve, 2006; Reeve, Bolt, & Cai, 1999) and others (e.g., Deci, Schwartz, Sheinman, & Ryan, 1981), include: (a) listening carefully, (b) creating opportunities for curiosity and self-initiation, (c) providing opportunities for peer learning and co-operation, (d) arranging learning environments that encourage active participation, (e) encouraging effort, (f) praising development and mastery, (g) offering progress-enabling feedback, (h) responding consistently to subordinates' questions and queries, and (i) communicating a clear acknowledgment of subordinates perspectives. While one could perhaps quibble with the inclusion of some of these behaviors as autonomy supports (e.g., f and g are more reflective of competence support), they nevertheless provide a useful framework from which teachers can ground their motivational style. The data we have reviewed clearly show that such behaviors have the beneficial outcome of supporting engagement in PE students via elevated psychological need satisfaction.

## The Provision of Structure

As can be seen in Figure 1, structure and autonomy support are orthogonal such that they interact in a synergistic manner to predict greater psychological need satisfaction and thereby engagement. Although there is ample research and recommendation on autonomy support, much less attention has been devoted to the components of structure within SDT. This said, Reeve (2006) has provided a framework for understanding what structure might look like in practice. Here, Reeve argues that there are three subcomponents 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-focused 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 should feel able to effectively interact with their PE environments (Skinner & Belmont, 1993).

It is important to remember, at this point, that these elements of structure encompass those behaviors that teachers would consider central to their teaching, and this might explain why relatively less research has been devoted to the concept (i.e., unlike autonomy support, teachers already provide it). Yet the findings of several studies in school (e.g., Jang et al., 2010; Hospel & Galand, 2016; Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009) and sport (Curran et al., 2013) suggest that such behaviors are insufficient to keep children engaged. In addition, coaches should be aware of the way in which this structure is conveyed as it can produce either attentive, effortful, and persistent students, or passive, apathetic, and disinterested students. That is, as we have seen, engagement is produced when teachers provide rules and expectations, support, supervision, instruction, and feedback with an abiding sense of support for student choicefulness and volition. By contrast, disaffection appears to be produced when teachers provide this same structure with an abiding sense of coercion and control.

To 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 teachers to provide a sense of structure without

compromising autonomy. This might be achieved, for instance, by introducing rules and limits with a meaningful rationale (see above), or by organizing the content of goals, learning activities, and competition strategies in concordance with student 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 both autonomy and competence but, in line with the central role of autonomy in behavioral integration, autonomy has been the central focus of these interventions (see Deci, Connell, & Ryan, 1989; Ntoumanis, 2012).[1] Hence, in what follows, we focus on the, results of interventions committed to supporting student autonomy.

### Interventions

Implementing SDT in the classroom, a handful of researchers have developed interventions committed to enhancing high school teacher autonomy support. These interventions involve informational sessions (i.e., presentations) and/or independent study resources (e.g., websites, workbooks, etc.) that, using the recommendations outlined in the previous section, educate teachers in how to be autonomy supportive. Broadly, such sessions and resources appear effective both in the enhancement of teacher autonomy support, as well as student motivation and engagement. For example, Reeve, Jang, Carrell, Jeon, and Barch (2004) showed that a one-hour information session supplemented by web-based resources on autonomy supportive teaching yielded increases in observed teacher autonomy supportive classroom behaviors over a control group with no treatment. In turn, increased teacher autonomy support generated increased effort and persistence among their students (i.e., engagement). Analogous effects have also been elucidated for teacher autonomy supportive interventions on the reduction of Korean high school student disaffection (Cheon & Reeve, 2015).

Within the sphere of PE, autonomy supportive interventions have been equally successful. In one such intervention, guided by the work of Reeve et al. (2004), Tessier et al. (2010) used an informational session to educate French high school PE teachers on the implementation of autonomy support and followed this with an individualized-guidance program during an 8-week teaching cycle. Results of this program indicated that teachers in the experimental group, relative to a no treatment control group, employed more autonomy-supportive behaviors. Similar training programs have been observed to yield commensurate effects on PE teacher autonomy-supportive behaviors and (favorable) beliefs about autonomy support (Aelterman, Vansteenkiste, Van den Berghe, De Meyer, & Haerens, 2014). Finally, extending these findings, Cheon and colleagues (Cheon, Reeve, & Moon, 2012; Cheon, Reeve, & Song, 2016) show that at least two PE teacher autonomy supportive instructional sessions (separated by 6-weeks) can yield increased student engagement, and decreased student disaffection, over the course of a Korean high school semester. These authors also show that, in support of an SDT-informed mediation model, changes in student engagement and disaffection are attributable to the increased student psychological need satisfaction and lowered psychological need frustration that follow the intervention enhanced PE teacher autonomy support.

## Conclusion

For millions of children worldwide, PE is an important source of physical activity. As such, engagement in PE carries great potential as a vehicle for children's enhanced health and well-being. The intention of this review was to help researchers and practitioners realize this potential by describing the salient components of engagement and, using SDT as a guiding framework, proving an overview of how they are cultivated in PE. Within SDT, psychological needs for autonomy, competence, and relatedness are especially influential to engagement because their satisfaction promotes behavioral integration and, by extension, associated emotions (e.g., enjoyment, vitality, positive affect) and behaviors (e.g., persistence, concentration, effort). Ensuring that children perceive that they have adequate opportunity to develop competencies, self-direct behaviors, and be connected to others is therefore of paramount importance. These opportunities are replete in PE when teachers provide students with structure (e.g., rules, limits, and feedback) in a context of autonomy support (e.g., voice, choice, and initiative). By contrast, such opportunities are thwarted by conveying the same structure in a context of control (e.g., coercion, reward, and conditional regard). We hope that our practical recommendations on the provision of autonomy support offer a useful starting point for teachers in the development of children's engagement in PE.

## Note

1. Within SDT, teachers can also provide supports for relatedness (see Emm-Collison, Standage, & Gillison, 2016). However, many of these behaviors are encapsulated within autonomy support so we have omitted a discussion of relatedness support here.

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