



## Coach autonomy support predicts autonomous motivation and daily moderate-to-vigorous physical activity and sedentary time in youth sport participants



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### ABSTRACT

**Objective:** Guided by self-determination theory (Deci & Ryan, 1987), this study tested a trans-contextual model linking perceptions of the social environment created by the youth sport coach to levels of autonomous and controlled motivation, and objectively measured daily moderate-to-vigorous physical activity (MVPA) and sedentary time (ST) in young football players.

**Design:** The study employed a cross-sectional design, assessing physical activity using accelerometers.

**Method:** 105 male youth sport footballers ( $M$  age =  $12.79 \pm 1.85$  years) wore a GT3X accelerometer for 7 days. Measures of height and weight were recorded. Participants completed a multi-section questionnaire assessing perceptions of autonomy support and controlling coaching behaviours, and motivation toward their participation in sport and physically active games.

**Results:** Path analysis supported a model in which players' perceptions of coach-provided autonomy support positively predicted autonomous motivation for sport engagement. In turn, autonomous motivation was positively associated with MVPA, and negatively related to ST (min/day). Controlling coach behaviours were positively linked to controlled motivation. However, controlled motivation for sport and physically active games was unrelated to daily MVPA and ST. Perceptions of coach-provided autonomy support had a significant positive indirect effect on daily MVPA, and a significant negative indirect effect on daily ST.

**Conclusions:** Results suggest that autonomy supportive coach behaviours are related to daily physical activity patterns in young male footballers. Theory-based interventions that aim to encourage autonomy supportive coaching, and subsequently foster autonomous reasons for sport engagement, may enhance the potential of youth sport for increasing daily MVPA and reducing ST among children and adolescents active in this setting

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A wide body of research indicates engagement in PA above a moderate intensity (i.e., moderate-to-vigorous physical activity, MVPA) is related to positive health outcomes in children (Carson & Janssen, 2011; Ekelund et al., 2012; Janssen & Leblanc, 2010; Mark & Janssen, 2011; Martinez-Gomez, Eisenmann, Tucker, Heelan, & Welk, 2011; Ness et al., 2007; Prentice-Dunn & Prentice-Dunn, 2011). Specifically, higher levels of MVPA are associated with reduced risk of obesity during childhood (Ness et al., 2007), improved cardio-metabolic health (Ekelund et al., 2012) and a reduction in the presence of inflammatory markers associated with

cardiovascular disease and type II diabetes in youth (Carson & Janssen, 2011). Such findings have led to the development of evidence-based guidelines which state children should engage in at least 60 min and up to several hours of MVPA per day (Janssen & Leblanc, 2010; Strong et al., 2005).

More recently, researchers have begun to investigate the negative effects of sedentary behaviour on health outcomes related to obesity and non-communicable diseases (Carson & Janssen, 2011; Chaput et al., 2012; Gaya et al., 2009; Henderson et al., 2012; Martinez-Gomez et al., 2012; Mitchell, Pate, Beets, & Nader, 2013; Prentice-Dunn & Prentice-Dunn, 2011). Sedentary behaviour refers to any waking behaviour characterised by low energy expenditure (typically  $\leq 1.5$  metabolic equivalents) and little physical movement (e.g., behaviours undertaken in a sitting or reclining posture)

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(*Sedentary Behaviour Research Network, 2012*). Existing research focused on sedentary behaviour and health has largely examined associations between total sedentary time (ST) (i.e., the sum of the time spent in all sedentary behaviours), and/or time spent engaged in a specific sedentary behaviour (e.g., television viewing) and health outcomes (*Tremblay et al., 2011*). Results from studies investigating the relationships between total ST and health are somewhat equivocal. For example, some studies have reported positive associations between ST and indicators of adiposity, cardiovascular risk and type 2 diabetes (*Gaya et al., 2009; Henderson et al., 2012; Mitchell et al., 2013; Sardinha et al., 2008*) where others have reported no associations (*Carson & Janssen, 2011; Chaput et al., 2012; Colley et al., 2013; Ekelund, Brage, Griffin, & Wareham, 2009*). Conversely, engagement in specific sedentary behaviours are more consistently linked to negative health outcomes, with positive relationships reported between TV viewing and computer use with obesity associated health outcomes (*Carson & Janssen, 2011; Martinez-Gomez et al., 2012; Tremblay et al., 2011*). Nevertheless, a recent systematic review concluded that decreasing any type of sedentary time is associated with lower health risks in youth aged 5–17 years (*Tremblay et al., 2011*). As such, the most recent PA guidelines have included a recommendation for children to minimise time spent engaged in sedentary pursuits (*Department of Health, 2011; US Department of Health and Human Services, 2013*).

Despite the endorsement of evidence-based recommendations for MVPA and ST across the globe, youth are becoming increasingly sedentary (*Nelson, Neumark-Stzainer, Hannan, Sirard, & Story, 2006*), and only a small percentage of children are engaging in sufficient levels of MVPA to meet recommended guidelines (*Craig & Mindell, 2008; Riddoch et al., 2007*). Thus, there is a need to understand what motivates children to engage in MVPA, as well as the psycho-social factors that might contribute towards engagement in ST in order to promote health-conducive PA patterns in youth. Concerning the encouragement of MVPA in particular, past work has suggested that physically active children are more likely to become physically active adults (*Telama et al., 2005*). Thus, childhood seems to be a critical developmental period in which the formation of positive PA habits (i.e., higher levels of MVPA participation) may be relevant to the promotion of lifelong PA engagement and reduced risk of overweight and associated diseases during adulthood.

### Youth sport as a setting for physical activity promotion

Traditionally, efforts to increase MVPA and reduce ST among youth across the globe have targeted the school setting. Certainly, the school is uniquely placed as the only environment which almost all youth experience from early childhood to adolescence. However, recent survey data indicates between 34% and 68% of school-aged youth engage in youth sport in western countries (*Australian Bureau of Statistics, 2009; National Council of Youth Sports, 2008; UK Statistics Authority, 2013*). As such, youth sport also represents an important and globally relevant domain with regard to promoting engagement in MVPA and reducing ST in children and adolescents. Studies have demonstrated youth sport participants are more active than their non-sporting counterparts (*Nelson et al., 2011*). However, recent research indicates that whilst youth sport can offer children and adolescents the opportunity to engage in MVPA, MVPA accrued during youth sport time alone is not sufficient to meet recommended guidelines (*Leek et al., 2011; Wickel & Eisenmann, 2007*). Studies have also revealed youth sport participants to spend as much as 11 h per day sedentary (*Machado-Rodrigues et al., 2012; Van Hoye et al., 2013*). Thus, participation in youth sport may not necessarily mitigate the health risks of engaging in low levels of MVPA and high levels of ST. Moreover, past studies have reported that around one in four youth

sport participants are overweight (*Dowda, 2001*), and 48% of obese youth report participation in sport (*BeLue, Francis, Rollins, & Colaco, 2009*). It seems, therefore, that a consideration of factors that predict daily engagement in MVPA and ST among youth sport participants may have important implications for encouraging healthier PA-related behaviours (i.e., higher daily MVPA and less ST) during non-youth sport time, and subsequently, reducing the risk of poor health among children and adolescents active in the youth sport setting. However, despite the potential utility of youth sport as a context for PA promotion, studies to date have largely neglected to examine the concomitants of MVPA engagement and ST among youth sport participants.

### Self-determination theory

Self-determination theory (SDT; (*Deci & Ryan, 1987, 2000*) is a theoretical framework increasingly used to explain why some individuals are more likely to engage in PA than others (*Chatzisarantis & Hagger, 2009; Edmunds, Ntoumanis, & Duda, 2008; Hagger et al., 2009; Standage, Gillison, Ntoumanis, & Treasure, 2012; Teixeira, Carraca, Markland, Silva, & Ryan, 2012; Vierling, Standage, & Treasure, 2007*). A central tenet of SDT is that behaviour is directed by motivation regulations that vary in levels of self-determination. These motivation regulations are on a continuum ranging from those that are more autonomous to more controlled, with the former linked to more adaptive outcomes (*Alvarez, Balaguer, Castillo, & Duda, 2009; Bartholomew, Ntoumanis, Ryan, & Thogersen-Ntoumani, 2011; Cox, Smith, & Williams, 2008; Deci & Ryan, 1987, 2008; Owen, Astell-Burt, & Lonsdale, 2013; Pelletier, Fortier, Vallerand, & Brière, 2001; Teixeira et al., 2012*).

Intrinsic motivation (IM) is the quintessential form of autonomous motivation and represents the most self-determined (autonomous) regulation. When intrinsically motivated, individuals engage in an activity primarily for the inherent rewards such as interest, fun and satisfaction (*Deci & Ryan, 2000*). Four types of extrinsic motivation exist which vary in the extent to which they are self-determined; i.e., integrated, identified, introjected and external regulations. Integrated (i.e., the individual participates in sport because this behaviour is integrated with his/her sense of self and reflects the individual's true goals and values) and identified (i.e., the person identifies with the value of sport and chooses to take part as a means to achieve personal goals and outcomes) regulations are autonomous forms of extrinsic motivation, as the source of behaviour regulation emanates from the self. However, it has been argued that the advanced nature of integrated regulation (i.e., established and fully internalised values and goals) means this behavioural regulation is often not prevalent until adulthood (*Vallerand, 1997*). As a result, studies among youth largely focus on examining the consequences of intrinsic and identified regulations, often combining the two to represent autonomous motivation. Introjected (i.e., participation in sport regulated by contingencies that have been partially internalised, for example to avoid feelings of shame or guilt, or to attain ego enhancement) and external (i.e., sport participation regulated by external demands, rewards or pressures) regulation are considered controlled forms of extrinsic motivation (*Deci & Ryan, 2008*). SDT also recognises amotivation, characterised by a lack of or absence of motivation (*Ryan, 1995*). Previous research has indicated more autonomous forms of motivation towards PA (e.g., daily, and/or within leisure time, exercise, physical education settings) to be positively associated with levels of PA engagement among both adults and children (*Aelterman et al., 2012; Gillison, Standage, & Skevington, 2011; Owen et al., 2013; Sebire, Jago, Fox, Edwards, & Thompson, 2013; Standage et al., 2012; Taylor, Ntoumanis,*

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