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<th>Title</th>
<th>From intrinsic motivation to passion in sport and exercise: A self-determination theory framework</th>
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Adolescence is a critical period in the study of physical activity (PA). Research evidence has shown that there is a decline in participation in PA in young people over their teenage years with ages 11 to 12 thought to be a critical age period at which PA begins to diminish. The purpose of this study was to examine the relationships between students’ perceived autonomy support, behavioural regulations, and enjoyment in a physical education (PE) context, using a self-determination theory framework. Participants were 1854 secondary school students aged between 13 and 19 years from Singapore. Questionnaires were used to assess perceived autonomy support, behavioural regulations, and enjoyment in PE. Results showed that perceived autonomy support predicted more self-determined forms of behavioural regulations in PE (intrinsic and identified) positively and negatively predicted more controlling forms of regulations (external and amotivation). Only intrinsic motivation positively predicted enjoyment. On the other hand, amotivation negatively predicted enjoyment. The findings highlight the importance of perceived autonomy support in fostering more self-determined forms of behavioural regulations and intrinsic motivation in school PE.

1 Introduction

Regular physical activity (PA) participation in children and adolescents is important because it confers many favourable physical and mental health benefits (see Strong et al., 2005 for review). Moreover, Shephard and Trudeau (2000) suggested that a physically active lifestyle in adulthood could originate from an active lifestyle in one’s adolescence. In face of widespread global obesity epidemic and its related health costs, such research findings call for effective strategies to promote PA participation in our young people. Nonetheless, many studies (e.g., Wang et al., 2006) have shown that many young people are not meeting PA guidelines. In addition, research evidence (e.g. Gordon-Larsen et al., 2000) has shown that PA participation decreases with age. Particularly, ages 11 to 12 years were thought to be a critical age period at which PA started to decrease.

School physical education (PE) has been identified as a significant and impactful context to reach out to the young people, being in a position to contribute towards their increased levels of PA (Gordon-Larsen et al., 2000). Positive PE experiences can influence adolescents to adopt physically active lifestyles in adulthood. As such, effective
interventions/strategies need to be placed appropriately in school PE in a bid to promote regular PA participation in the young, which will hopefully track into adulthood (Sallis et al., 1999).

A useful motivational theory that has been successfully applied in the PE context to help us better understand our students, is the self-determination theory (SDT; Deci, & Ryan, 1987). The SDT proposes that human beings have innate psychological needs for autonomy, competence and relatedness. When these needs are satisfied, it is theorised that a person's enjoyment of activities and the autonomous self-regulation of behaviours will increase. Self-determined behaviour can be described by three distinct motivational states – amotivation (lack of motivation), extrinsic motivation (engaging for reasons that emanate from outside of the self, e.g., rewards) and intrinsic motivation (engaging for reasons that emanate from within the self or within the activity itself). Extrinsically motivated behaviours are further characterised by four types of regulation: external regulation, introjected regulation, identified regulation, and integrated regulation (Deci & Ryan, 1987). These three motivational states are ordered along a self-determination continuum as illustrated in Figure 1.

![Figure 1. Self-determination continuum.](image)

The SDT further proposes that as one's motivational state moves towards intrinsic motivation, adaptive cognitive, affective and behavioural outcomes will result. High levels of intrinsic motivation in PE therefore, are desirable because this will mean that students will participate for reasons not limited to the influence of the setting, and will be more likely to become physically active out of their own volition. Moreover, research evidence has suggested that enjoyment is a significant correlate of PA of children and adolescents (e.g., Sallis et al., 2000).

The purpose of this study was to examine the relationships between students' perceived autonomy support in PE, behavioural regulations, and enjoyment. It was hypothesised that perceived autonomy support predicted more self-determined forms of behavioural regulations in PE (intrinsic and identified) positively and negatively predicted more controlling forms of regulations (introjected, external and amotivation). It was further hypothesised that the more self-determined forms of behavioural regulations in PE positively predicted student's enjoyment in PE, while the controlling forms of regulations negatively predicted their enjoyment in PE.
2 Methods

Responses were obtained from 1854 secondary school students aged between 13 and 19 years from Singapore. Perceived autonomy support during PE was measured using a modified version of the Sport Climate Questionnaire (SCQ; Deci, 2001). The wording of the SCQ was changed slightly to suit the PE context. There were fifteen items (e.g., “I feel that my PE teacher provides me with choices and options” and “My PE teacher listens to how I would like to do things in PE lessons”) that the students responded to, on a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

Students’ behavioural regulation for PE was assessed using Goudas and his colleagues’ Perceived Locus of Causality scale (PLOC: Goudas et al., 1994). The students in the present study responded to 17 items (four items for external regulation and introjected regulation and three items for identified regulation, intrinsic motivation and amotivation) measured on scales ranging from 1 (strongly disagree) to 7 (strongly agree). Each item followed the stem “I take part in PE.” (e.g., “because PE is fun” (intrinsic motivation), “because I want to learn sport skills” (identified regulation), “because I would feel bad about myself if I did not” (introjected regulation), “because I will get into trouble if I do not” (external regulation), and “but I do not see why we should have PE” (amotivation)]. The PLOC scale has been used in various studies in PE and has been shown to have clear factor structure and high internal reliabilities with the exception of introjected regulation whose Cronbach’s alpha coefficient is usually slightly below 0.70.

The enjoyment subscale of the Intrinsic Motivation Inventory (IMI: McAuley et al., 1989) was adapted to assess enjoyment (3 items, e.g., “I enjoy PE very much”). The items were measured on a seven-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Data were analysed using IBM SPSS Statistics 18 and EQS 6.1 for Windows. IBM SPSS Statistics 18 was used to provide the descriptive statistics, as well as to access the internal reliabilities of the subscales. Path analysis using Structural Equation Modelling (SEM) was carried out with EQS 6.1 for Windows.

3 Results

Table 1 presents the means, standard deviations, Cronbach’s alphas, and intercorrelations. All internal consistency coefficients indicated satisfactory reliabilities of at least 0.77, with the exception of introjected regulation. Results show that the students reported high perceived autonomy support in their PE classes, and also high scores on enjoyment in PE. The students exhibited a self-determination profile that is high in intrinsic motivation and identified regulation, moderate in introjected and external regulations and low in amotivation. The Pearson correlations reveal that perceived autonomy support is significantly related to intrinsic motivation and identified regulation positively, while significantly related to external regulation and amotivation, negatively. Perceived autonomy support, intrinsic motivation and identified regulation were also positively related to enjoyment, while external regulation and amotivation were negatively related to enjoyment.
Table 1. Descriptive statistics, Cronbach’s alphas, and correlation of the main variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>a</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Autonomy Support</td>
<td>0.927</td>
<td>4.33</td>
<td>1.03</td>
<td>1.47</td>
<td>.520&quot;</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Intrinsic Motivation</td>
<td>0.875</td>
<td>5.1</td>
<td>1.47</td>
<td>.488&quot;</td>
<td>.818&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identified Regulation</td>
<td>0.819</td>
<td>4.94</td>
<td>1.4</td>
<td>.004</td>
<td>-0.006</td>
<td>.148&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introjected Regulation</td>
<td>0.67</td>
<td>3.12</td>
<td>1.21</td>
<td>0.004</td>
<td>-0.006</td>
<td></td>
<td>.412&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External Regulation</td>
<td>0.839</td>
<td>3.54</td>
<td>1.62</td>
<td>-0.331&quot;</td>
<td>-0.526&quot;</td>
<td>-0.384&quot;</td>
<td>.412&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amotivation</td>
<td>0.775</td>
<td>2.74</td>
<td>1.46</td>
<td>-0.370&quot;</td>
<td>-0.626&quot;</td>
<td>-0.534&quot;</td>
<td>.229&quot;</td>
<td>.650&quot;</td>
<td></td>
</tr>
<tr>
<td>Enjoyment</td>
<td>0.953</td>
<td>4.96</td>
<td>1.63</td>
<td>.526&quot;</td>
<td>.834&quot;</td>
<td>.659&quot;</td>
<td>-0.036</td>
<td>-0.522&quot;</td>
<td>-0.607&quot;</td>
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Note: **p < 0.01

Figure 2. Standardised estimates for the structural equation model.
Due to the relatively large normalised estimate of Mardia’s coefficient (multivariate kurtosis = 219.63), the data were analysed using robust maximum likelihood analysis. The robust indices of fit indicated that the hypothesised model fit the data well ($S-B_\text{X}^2 = 2882.68, p < 0.05; S-B_\text{X}^2/d.f. = 5.38; \text{NNFI} = 0.92, \text{CFI} = 0.93, \text{RMSEA} = 0.05$). As hypothesised, perceived autonomy support positively predicted intrinsic motivation and identified regulation, while negatively predicted introjected and external regulations, and amotivation (all paths significant at $p < 0.05$). However, results showed that only intrinsic motivation positively predicted enjoyment, while amotivation on the other hand, negatively predicted enjoyment (see Figure 2).

4 Discussion

According to the SDT, an autonomy-supportive teacher reduces controlling pressures and promotes more autonomous forms of behavioural regulations. The students’ high mean scores in perceived autonomy support, autonomous regulations and enjoyment in PE reflect a favourable picture of PE in Singapore. The strong positive correlations of perceived autonomy support with intrinsic motivation, identified regulation, and enjoyment, further reinforces the importance of an autonomy-supportive PE class environment. Additionally, there is also a strong positive correlation between intrinsic motivation and enjoyment in PE. In other words, PE teachers should endeavour to create autonomy-supportive environments in PE as one who successfully does so is more likely to encourage autonomous regulations in the students, which in turn enhances their enjoyment in PE. Greater enjoyment, consequently, would help foster positive attitudes towards and encourage participation in both PE and PA.

The strong and significant ($p < .05$) paths revealed that students’ perceived autonomy-support positively predicted more autonomous forms of regulation (intrinsic motivation and identified regulation) in the PE context. This reiterates the importance of PE teachers adopting motivational strategies that promote students’ autonomy (e.g., providing choices of tasks, decision-making opportunities, and/or clear rationales for the activities), in order to foster more self-determined forms of student behaviour in PE. The strong and positive path between intrinsic motivation and enjoyment, coupled with the strong and negative path between amotivation and enjoyment, further highlights the need to facilitate students’ self-determined behaviour in PE. This is pertinent, especially in view of research evidence that have positively associated PE enjoyment with out of school PA participation (e.g., Sallis, et al., 1999).

The results of this study clearly indicates the importance of fostering self-determined motivation in PE in order to enhance students’ positive experiences and potentially, their PA participation in and out of school. In other words, it is important that students feel autonomously regulated in terms of PE participation, because this can lead to positive outcomes and facilitate PA participation beyond school.
References


