Testing a Model of Physical Education Enjoyment and Physical Activity Among High School Students

by Hairul A. Hashim, J. Robert Grove and Peter Whipp

Abstract
The importance of physical education (PE) enjoyment in promoting adolescent participation in physical activity (PA) is generally recognized. However, research findings indicate a consistent decline in enjoyment of PE among students, especially high school students. This decline has been partly attributed to a lack of understanding of the processes that underlie enjoyment of PE. Utilizing a framework of sport enjoyment proposed by Scanlan and Lewthwaite (1986), the present study examined a model of PE enjoyment processes and PA involvement among adolescents aged 11 to 16 years. The sample consisted of 203 Western Australian adolescents (Mean age = 13.5, SD = 0.98). Participants completed self-report measures of PE teaching processes and PA involvement. The model was analyzed using Structural Equation Modeling. The results revealed an acceptable measurement fit of the model ($\chi^2 = 46.21, df = 19, p < .001; RMR = .03; CFI = .97; RMSEA = .08$). Furthermore, significant unstandardized regression weights were also obtained for all of the paths loadings indicating a good structural fit. The model was also tested for group invariance. The results revealed a nonsignificant model invariance between male and female samples ($\chi^2 = 5.3, p = .51$). The findings support the notion that PE enjoyment is important in promoting adolescent PA. To promote PE enjoyment, we believe that certain number of processes, particularly activity-related excitement, should be considered when structuring the PE program.

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The relationships between physical activity (PA) and health-related outcomes are well documented. Indeed, there is evidence that PA provides an array of physical, psychological, social, and emotional benefits for individuals of all ages (Caroll & Loumidis, 2001; Center for Disease Control and Prevention [CDC], 1997; Wankel & Berger, 1990). Among adolescents, it has been specifically shown that higher levels of PA are associated with higher levels of perceived competence (Caroll & Loumidis, 2001) and lower levels of anxiety and depression (Parlitt & Eston, 2005). It has also been shown that PA is associated with an increase in cardiovascular fitness (Imperatore, Cheng, Williams, Fulton, & Gregg, 2006), a reduced risk of being overweight (Sharma, 2006), and a tendency to possess fewer risk factors associated with coronary heart disease (Trost et al., 2002). The recommended level of PA for adolescents to achieve these benefits is 30 – 60 minutes of moderate to vigorous activity per day (Corbin & Pangrazi, 1999). Unfortunately, a large proportion of adolescents do not meet this recommended level. For instance, in a recent survey in the United States, only 35.8% of high school students met currently recommended levels of PA (CDC, 2006). In an Australian study, although a sizeable percentage of adolescents had adequate PA, girls (and especially older girls) were lower in PA compared to boys (Booth et al., 1997). Given these findings, a number of researchers believe it is necessary to further investigate factors that could potentially enhance adolescent involvement in PA (Sallis, Prochaska, & Taylor, 2000; Sallis, Prochaska, Taylor, & Hill, 1999).

Physical education (PE) is viewed an excellent platform to promote PA among adolescents (Blansky & Whipp, 2004; CDC, 2001). Specifically, it was argued that PE could provide opportunities for adolescents to learn a wide range of activities that could potentially lead to healthier lifestyles in adulthood (Anderssen & Wold, 1992; Fairclough, Stratton, & Baldwin, 2002). It was also argued that enjoyment of PE could potentially promote adolescent involvement of PA. However, in PE literature, the relationship between enjoyment and PA appears to be inconsistent. For instance, in a study of PA determinants among children in grades 4 to 12, Sallis et al. (1999) revealed that enjoyment of PE was a predictor of PA across all grades for boys. Among girls, PE enjoyment emerged as a predictor of physical activity except for younger children in grades 4 to 6.

Moreover, inconsistencies have also emerged in a number of other studies. For instance, in a study conducted by Caroll and Loumidis (2001), they observed higher enjoyment of PE among students in a high activity group when compared to low activity and no activity groups. On the other hand, Trost et al. (1997) revealed that PE enjoyment was a significant predictor of vigorous physical activity only among girls. In a more recent study, Fairclough (2003) observed negative correlations between enjoyment of PE and moderate-to-vigorous physical activity (MVPA) among girls. Furthermore, when participants were categorized into low and high MVPA groups, lower levels of PE enjoyment were observed in the high activity group. A recent review of PA determinants has also shown some inconsistent findings. Specifically, Sallis et al. (2000) reviewed 102 published studies that focused on the determinants of physical activity among children and adolescents (3 to 18 years). Among children, a negative association between PE enjoyment and PA was obtained in one study, while another study found no association between these two variables. In adolescent samples, the relationship between these two variables was inconclusive (Sallis et al., 2000). Given a widespread assumption that enjoyment of PE is related to participation in physical activity, these discrepancies are worthy of further consideration.

In addition to the inconsistent relationship between enjoyment of PE and PA involvement, there is also evidence suggesting an age-related decline in student enjoyment of PE. For instance, in a longitudinal study of PE enjoyment among students in grades 4, 5, and 6, Prochaska, Sallis, Slymen, and McKenzie (2003) revealed a consistent decline in PE enjoyment from 4th to 6th grades. In an Australian study conducted among older students (years 8 and 10), the proportion of male students who enjoyed PE fell from 82% in year 8 to 71% in year 10. Among female students, the proportion fell from 70% in year 8 to 62% in year 10 (Booth et al., 1997). Parallel findings were also observed among Greek...
students in grades 5, 7, and 10 (Digelidis & Papaioannou, 1999). In Digelidis and Papaioannou’s (1999) study, a consistent decline in PE enjoyment was also revealed as students progressed to higher grades. Several researchers have argued that the decline in student enjoyment of PE can be attributed to a lack of understanding about the processes that underlie enjoyment in PE. These researchers have emphasized the need to further analyze these processes so that PE programs serve to maximize enjoyment (Griffin, Chandler, Sariscsany, 1993; Hashim, Grove, & Whipp, 2008; Ntoumanis, Pensgaard, Martin, & Pipe, 2004).

Youth Sport Enjoyment Framework

In youth sport research, Scanlan and Lewthwaite (1986) have proposed a two-dimensional model of enjoyment. This model contains four quadrants reflecting different combinations of enjoyment processes: Achievement-Intrinsic, Achievement-Extrinsic, Nonachievement-Intrinsic, and Nonachievement-Extrinsic. Scanlan and Lewthwaite (1986) define the Achievement-Intrinsic quadrant in terms of self-derived perceptions of competence and control (e.g., mastery and perceived ability). Achievement-Extrinsic, is defined as “perceptions of competence and control derived from other people such as positive social evaluation and recognition” (p. 33). The third quadrant, Nonachievement-Intrinsic, reflects the predictors of enjoyment associated with sensations inherent to physical activity and movement such as tension release, action, exhilaration and excitement. The last quadrant, Nonachievement-Extrinsic, reflects enjoyment derived from the “nonperformance aspects of sport, such as affiliating with peers and having positive interaction with adults” (Scanlan & Lewthwaite, 1986, p. 33).

Hashim et al. (2008) validated this framework using confirmatory factor analysis in PE settings. Their finding offers support for this model to be used in PE settings. Specifically, they confirmatory factor analysis in PE settings. Their finding offer Lewthwaite, 1986, p. 33).

Method

Participants

Students from grades 8, 9, and 10 (N = 203) from three public high schools participated in this study. The percentages of participants from years 8, 9, and 10 were 28.3%, 33.3%, and 38.4%, respectively. The sample contained 55.6% boys and 44.4% girls, with a mean age of 13.5 years (SD = 0.98).

Instruments

Data were collected using self-report instruments. In addition to demographic information, the questionnaire included measures of PE teaching processes, out-of-school PA, and within school PA. Descriptions of each of these measures are presented below.

Physical Education Teaching Processes Questionnaire. A 20-item questionnaire developed by Hashim et al. (2008) was used to measure six teaching processes previously shown to predict enjoyment in PE. The processes were self-referent competency (SRC), other-referent competency (ORC), teacher-generated excitement (TGE), activity-generated excitement (AGE), peer interaction (PI), and parental encouragement (PE). In their initial analysis, Hashim et al. (2008) reported adequate validity and reliability for this questionnaire. Examples of the items used to assess each of the processes and their subscale alphas are: “My sport skills have improved from doing PE” (SRC; .84); “When doing PE activities, I am one of the best in my PE class” (ORC; .89); “My PE teacher gets me involved in PE activities” (TGE; .81); “I am enthusiastic about PE activities” (AGE; .89); “PE gives me a chance to spend time with my friends” (PI; .77); and “My parents encourage my involvement in physical education” (PE; .70).

Physical activity. A single-item measure was used to assess student physical activity outside of the school setting as well within school PA. Specifically, students were asked: “Outside school hours in this term, how much time did you spend doing physical activities that made you get out of breath or sweat?” The response options were (1) Never, (2) About ½ hour per week, (3) About 1 hour per week, (4) About 2-3 hours per week, (5) About 4-6 hours per week and (6) 7 or more hours per week. For within school PE, students were asked: “During your PE classes, how much time do you spend exercising hard enough to make you get out of breath or sweat?”. The response options were (a) Not much time at all, (b) About a quarter of the time, (c) about half of the time, (d) more than half of the time, (e) Almost all the time. These questions have been used widely in other studies, and support for the validity of this measure has been reported elsewhere (Booth, Okely, Chey, & Bauman, 2001).
Procedures and Analysis

Prior to data collection, permission to conduct the study was obtained from relevant authorities. Specifically, approval was obtained from the University Human Ethics Committee, the relevant State Department of Education and Training, the school Principals, and Heads of PE Departments (HOD) within the participating schools. Times and locations for questionnaire administration were then organized by the HODs within each school. Prior to collecting the data, informed consent forms were distributed and signed by students and their parents.

Participants were provided with standardized instructions during the data collection process. Specifically, students were told that they would be responding to a series of statements reflecting their opinion and experience with regard to PE and their participation in PA within PE as well as outside of the school setting. To minimize the effects of social desirability, students were advised that the survey was not a test, and that there were no right or wrong answers. It was also emphasized that honest responses would help the researchers to better understand their PE and PA experiences. Questionnaire completion took place in a classroom setting, and participants took an average of 10 minutes to complete the instrument.

Confirmatory factor analysis (CFA) model fit was evaluated using multiple fit indices. The selected indices were the chi-square statistic ($\chi^2$), the root mean square residuals (RMR; Bentler, 1990), the comparative fit index (CFI; Bentler, 1990), and the root mean square error of approximation (RMSEA; Browne & Kudeck, 1993). A good model fit is indicated by values of .90 or higher for CFI. RMR values less than .05 reflect a close fit, while values of .1 or lower indicate reasonable fit for the RMR (Bentler, 1990). For the RMSEA, values of .05 or lower indicate close fit while values less than .08 indicate acceptable fit (Browne & Kudeck, 1993).

Results

Prior to the main analysis, a CFA and reliability estimates were conducted for the PE teaching processes questionnaire. Our findings closely mirrored the results reported by Hashim et al. (2008). Specifically, CFA revealed adequate goodness of fit ($\chi^2 = 277.4, df = 155, p < 0.001; \text{RMR} = 0.05; \text{CFI} = 0.95; \text{RMSEA} = 0.06$). Moreover, significant unstandardized factor loadings were obtained for all of the items, and standardized factor loading ranged from .63 to .88. Detailed descriptions of standardized item loadings are presented in Table 2. In addition, acceptable alpha coefficients were also obtained. Alpha coefficients for each of the subscales were as follows: SRC = .89, ORC = .86, TGE = .72, AGE = .91, PI = .74, PE = .74.

The subscale scores were then computed and examined for accuracy, missing values and distributional properties. Missing values were minimal, and mean substitutions were used where necessary. The frequency distribution revealed some departures from normality. However, no variable transformations were deemed necessary. The full-sample descriptive statistics are presented in Table 1.

The results of the Structural Equation Modeling revealed a close fit of the model ($\chi^2 = 46.21, df = 19, p < .001; \text{RMR} = .03; \text{CFI} = .97; \text{RMSEA} = .08$). Significant unstandardized regression weights were obtained for all of the path loadings. In exception of two paths, all other standardized regression weights were above .5. Detailed descriptions of individual path loadings are presented in Table 2. Given an adequate fit of the hypothesized model, the model was further tested for invariance between male and female samples. The result of the invariance analysis revealed a nonsignificant chi-square difference between male and female ($\chi^2 = 5.3, p = .51$).

| Table 1. Full-Sample Descriptive Statistics for the Primary Measures. |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
|                         | N     | Min   | Max   | Mean  | Std. Deviation | Skewness | Kurtosis |
|                         |       |       |       |       | Statistic | Std. Error | Statistic | Std. Error |
| Out of School PA        | 203   | 1.00  | 5.00  | 3.38  | 1.23       | -.27     | .17       | -.78       | .34         |
| Within School PA        | 203   | 1.00  | 5.00  | 3.50  | 0.94       | -.23     | .17       | .22        | .34         |
| SRC                     | 203   | 1.00  | 5.00  | 3.87  | 0.89       | -.94     | .17       | .85        | .34         |
| ORC                     | 203   | 1.00  | 5.00  | 3.36  | 0.86       | -.14     | .17       | -.11       | .34         |
| ACGE                    | 203   | 1.00  | 5.00  | 3.78  | 0.92       | -.17     | .17       | .47        | .34         |
| TGE                     | 203   | 1.00  | 5.00  | 3.76  | 0.70       | -.58     | .17       | 1.12       | .34         |
| Parent                  | 203   | 1.00  | 5.00  | 3.78  | 0.89       | -.60     | .17       | .17        | .34         |
| Peer                    | 203   | 1.00  | 5.00  | 3.86  | 0.85       | -.85     | .17       | .93        | .34         |
The findings of the present study also suggested that both mastery and performance competence are positively related to student PE enjoyment. This finding again was similar to results obtained by Hashim et al. (2008), who argued that a combined emphasis on both forms of competence may be useful in creating an optimal learning environment for students. Parallel findings were also observed in a study of an elementary PE running program conducted by Xiang, McBride, and Bruene (2004). They noted that students with multiple goal approaches were higher in enjoyment as well as performance than students with any singular orientation.

The researchers also noted that the behaviors of social agents (parents, peers, and teachers) were positively correlated with student enjoyment of PE. These findings provide support for Hashim et al.’s (2008) contention that PE classes should be structured in a way that enhances interaction between students. Doing so will undoubtedly enhance student enjoyment and create an environment conducive to their learning. The findings also strengthen the notion that parental involvement is imperative to student enjoyment of PE. Because a lack of involvement by parents is sometimes due to misunderstanding of the value of PE (Sheehy, 2006), conscious attempts should be made to make the potential benefits known. Moreover, given that informed parents are more likely to be involved with their children’s PE, regular and structured communications could be used to promote student enjoyment of PE (Wilkinson & Schneck, 2003).

In summary, the findings support the notion that PE enjoyment is important in promoting adolescent PA. To ensure that PE is perceived as enjoyable, the researchers believe that certain teaching processes should be considered when structuring the PE program. More specifically, the program should: (1) focus on challenging, exciting, and group-specific activities; (2) foster positive interaction and involvement between the students and a variety of social agents (e.g., teachers, parents, peers); and (3) provide opportunities for the demonstration of both self- and other-referent competence.

Although the findings offer some practical values, it must be acknowledged that the measure of PA was restricted to an estimate of PA duration. Therefore, it is necessary to replicate the findings groups of student. For instance, Fairclough (2003) noted different preferences for activities among boys and girls. Specifically, the researcher revealed that boys tended to favor team activities while girls favored individual activities. In another instance, Westerstahl, Barnekow-Bergkvist, and Jansson (2005) indicated that girls tended to choose lower-intensity activities than boys. In order to ensure that the activities are positively experienced by all students, the activities should: (1) match student needs and preferences; (2) be perceived as exciting and challenging by the students, and (3) offer a wide range of choices. These characteristics are similar to those described by Csikszentmihalyi (1975) as promoting flow experiences. In fact, findings obtained by Dishman et al. (2005) also offer partial support for the potential contributions of these processes to enjoyment of PE. Specifically, Dishman et al. (2005) employed a number of instructional strategies that include: (a) gender-separate activities; (b) a wider choice of activities; (c) activities that match student preferences (girls); (d) minimize the role of competition; and (e) small-group activities. They concluded that these strategies have the potential to increase student enjoyment of PE as well as their levels of PA (Dishman et al., 2005).

Detailed descriptions of individual path loadings for both samples are also presented in Table 2.

### Table 2. Detailed Descriptions of Individual Path Loadings

<table>
<thead>
<tr>
<th></th>
<th>Overall Model</th>
<th>Male Sample</th>
<th>Female Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>URW</td>
<td>SRW</td>
<td>URW</td>
</tr>
<tr>
<td>PA → PE ENJ</td>
<td>1.02***</td>
<td>.99</td>
<td>0.66***</td>
</tr>
<tr>
<td>PE ENJ → Parental Encouragement</td>
<td>1.34***</td>
<td>.72</td>
<td>1.00***</td>
</tr>
<tr>
<td>PE ENJ → Peer Interaction</td>
<td>1.00</td>
<td>.56</td>
<td>0.75***</td>
</tr>
<tr>
<td>PE ENJ → TGE</td>
<td>1.23***</td>
<td>.86</td>
<td>0.87***</td>
</tr>
<tr>
<td>PE ENJ → ACGE</td>
<td>1.78***</td>
<td>.92</td>
<td>1.16***</td>
</tr>
<tr>
<td>PE ENJ → ORC</td>
<td>1.49***</td>
<td>.83</td>
<td>1.00***</td>
</tr>
<tr>
<td>PE ENJ → SRC</td>
<td>1.58***</td>
<td>.86</td>
<td>1.11***</td>
</tr>
<tr>
<td>PA → Out of School</td>
<td>1.00</td>
<td>.40</td>
<td>1.00</td>
</tr>
<tr>
<td>PA → Within School</td>
<td>0.36**</td>
<td>.09</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Note: *** < .001; ** < .01; URW = Unstandardized regression weight; SRW = Standardized regression weight; PA = Physical activity; PE ENJ = PE Enjoyment; TGE = Teacher-generated excitement; ACGE = Activity-generated excitement; ORC = Other-referent competency; SRC = Self-referent competency.
using a more comprehensive measure of PA. Specifically, it would be desirable to obtain information about frequency, intensity, and duration in order to gain a more complete understanding of the relationship between PE enjoyment and adolescent PA. Moreover, the finding represents general processes that students perceived to be associated with PE enjoyment. In the present study, activity-generated excitement emerged as the strongest predictor of enjoyment. This finding, without doubt, reinforces the importance of providing exciting and stimulating activities for students in school-based PE programs. However, given its nature, the finding does not offer any information as to what could be construed as exciting and stimulating activities. Given that activity-generated excitement could be influenced by a number of factors, such as gender and skills, it would be desirable to identify the specific types of activity that would be considered “exciting” by specific groups of students.

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References


