

Exploring Links to Unorganized and Organized Physical Activity During Adolescence: The Role of Gender, Socioeconomic Status, Weight Status, and Enjoyment of Physical Education

Enrique García Bengoechea, Catherine M. Sabiston, Rashid Ahmed, and Michelle Farnoush

There is limited research on participation context in studies of physical activity correlates during adolescence. Using an ecological approach, this study explored the association of gender, socioeconomic status (SES), weight status, and physical education enjoyment with participation in organized and unorganized physical activity contexts in a representative sample of Canadian adolescents. Drawing on data from the National Longitudinal Survey of Children and Youth (Cycle 3), we conducted multiple logistic regression analyses to model the associations among the variables of interest. Girls participated less frequently in unorganized physical activities than boys (adjusted odds ratios [AORs] ranging from 0.57 to 0.65, 95% confidence intervals [CIs] range: 0.46–0.72 to 0.52–0.81). Adolescents in the middle and high SES categories participated more in organized physical activity than their peers in the low SES category (AOR = 1.40–1.87, CI = 1.06–1.84 to 1.41–2.47). Obese adolescents were generally less active than their overweight and normal weight counterparts, particularly in unorganized physical activity contexts (AOR = 0.63–0.66, CI = 0.43–0.92 to 0.44–0.99). Physical education enjoyment was consistently correlated with participation in organized and unorganized physical activity when all variables were considered (AOR = 1.58–3.98, CI = 1.22–2.05 to 3.14–5.03).

Key words: physical activity promotion, school, youth

Despite recent calls to take action against sedentary lifestyles (e.g., Active Healthy Kids Canada, 2008; Coalition for Active Living, 2004), physical activity levels among Canadian youth remain alarmingly low. In a representative sample of children and adolescents ages 5–19 years (Canadian Fitness and Lifestyle Research Institute [CFLRI], 2007), pedometer data revealed that 75–90% of Canadian youth are not active enough to meet current recommendations. Not surprisingly, a Report Card on Children and Physical Activity (Active Healthy

Kids Canada, 2008) gave a “D” grade to Canada for the fourth consecutive year. These findings are of concern, because physical activity improves many physiological, metabolic, psychological, and social aspects of human life and confers significant protection from chronic diseases (Donatelle, 2007; World Health Organization, 2008; Zwiren & Hutchinson, 2003). Taking into account these health benefits and the low current participation rates among children and adolescents, understanding key factors and settings associated with youth physical activity involvement remains an important research agenda.

Systematic reviews have presented empirical findings suggesting differential effects for biological, demographic, psychological, behavioral, social, and physical correlates of adolescents’ physical activity (Sallis, Prochaska, & Taylor, 2000; Van der Horst, Paw, Twisk, & Van Mechelen, 2007). These comprehensive reviews are consistent with an ecological approach of health behavior (Sallis et al., 2000) and the overarching idea that human behavior is a product of person and environment interactions (Bronfenbrenner, 1999). An ecological approach

Submitted: April 17, 2008
 Accepted: January 3, 2009

Enrique García Bengoechea, Catherine M. Sabiston, and Michelle Farnoush are with the Department of Kinesiology and Physical Education at McGill University. Rashid Ahmed is with the Population Health Research Group at the University of Waterloo.

focused specifically on physical activity settings (García Bengoechea, 2002; García Bengoechea & Johnson, 2001) provided evidence that the context in which physical activity participation takes place is critically important. For example, organized and unorganized youth physical activity contexts may differ greatly in terms of the need for support, social interactions, and overall availability. Both the Van der Horst et al. (2007) and the Sallis et al. (2000) reviews focused on correlates of *overall* physical activity; thus, the extent to which the direction and strength of correlates vary as a function of participation context remains largely unknown.

Drawing on the categorization of variables used by Van der Horst et al. (2007) and Sallis et al. (2000), we investigated the association of three variables identified as having demographic and biological underpinnings (i.e., gender, socioeconomic status [SES], and weight status) and one variable pertaining to the social-psychological domain (i.e., enjoyment of school-based physical education) with participation in organized and unorganized physical activity. Both activity contexts have been identified as providing suitable opportunities for adolescents to meet current physical activity guidelines and, therefore, are key targets for youth physical activity promotion (Active Healthy Kids Canada, 2008; CFLRI, 2007).

An ecological perspective focused on the demographic and biological factors suggests gender is a consistent and strong correlate of overall physical activity during adolescence, whereas SES and weight status demonstrated inconsistent effects (Sallis et al., 2000; Van der Horst et al., 2007). Specifically, studies using both self-report and objective measures of physical activity indicated that boys are more physically active than girls (e.g., CFLRI, 2007; Troiano et al., 2008; Trost et al., 2002; Vilhjalmsón & Kristjansdóttir, 2003). However, there is evidence indicating that participation context may account for gender differences in overall physical activity levels during adolescence. Specifically, girls often report lower enrollment in organized sports clubs compared to boys (Vilhjalmsón & Kristjansdóttir, 2003). Also, individuals of lower SES are less likely to be attracted to, sign up for, and persist in a variety of health promotion programs (Gauvin, 2003). In addition, inequities in available organized physical activity programs may also exist in schools and communities based on socioeconomic gradients (O'Loughlin, Paradis, Kishchuk, Barnett, & Renaud, 1999; Salmon, Timperio, Cleland, & Venn, 2005). Unfortunately, most of the evidence linking SES and physical activity was based on global physical activity levels at the expense of understanding whether participation happens in organized or unorganized settings. Finally, the relationship between weight status and physical activity also needs to be clarified within the context of physical activity. There is limited research showing that adolescent weight status is highly correlated with select physical

activity behavior, such as strength training, enrollment in physical education, or sports participation and yet uncorrelated with other physical activity behaviors (Levin, Lowry, Brown, & Dietz, 2003).

Physical education enjoyment is an important psychosocial variable to consider when exploring links to physical activity, because participation in school-based physical education has been associated with higher levels of leisure-time physical activity in adolescents (Gordon-Larsen, McMurray, & Popkin, 2000; Myers, Strikmiller, Webber, & Berenson, 1996; Pate, Ward, O'Neill, & Dowda, 2007). Moreover, intervention studies suggested that school-based physical education is an important determinant of physical activity in youth (Kahn et al., 2002; Salmon, Booth, Phongsavan, Murphy & Timperio, 2007). Furthermore, unlike most variables conceptualized within the demographic and biological category, school-based physical education is a *modifiable* physical activity determinant (Van der Horst et al., 2007). For example, the trans-contextual model (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003) suggests that physical education teachers have a captive audience to promote autonomy, which is associated with self-determined physical activity motivation (defined as intrinsically interesting and enjoyable; Deci & Ryan, 2002), which leads to higher leisure-time physical activity participation (Hagger, Chatzisarantis, Barkoukis, Wang, & Baranowski, 2005; Lonsdale, Sabiston, Raedeke, Ha, & Sum, 2009). It appears that if physical education programs are enjoyable for students they may encourage adolescents, and particularly adolescent girls, to become more active (Wallhead & Buckworth, 2004). In support of this, physical education enjoyment has demonstrated links to physical activity intensity outside of school (Carroll & Loumidis, 2001) and may mediate the relationship between physical education experiences and leisure-time physical activity levels (Cox, Williams, & Smith, 2007). Thus, physical education enjoyment may play a crucial role in physical activity engagement more generally and may have a unique impact on different physical activity contexts. This latter proposition has not been tested empirically.

Adolescence constitutes an important period to study physical activity correlates, as overall physical activity levels decline rapidly during this time (CFLRI, 2007; Troiano et al., 2008; Trost et al., 2002). Based on the literature previously reviewed, there is a need to consider the participation context when exploring factors associated with physical activity during this important developmental period. In light of this, and in a manner consistent with an ecological approach (García Bengoechea, 2002; Sallis et al., 2000; Van der Horst et al., 2007), the purpose of this study was to examine the association of gender, SES, weight status, and physical education enjoyment with organized and unorganized physical activity participation among a representative sample of Canadian adolescents.

Method

Data Sources

We analyzed data from Cycle 3 of the biennial National Longitudinal Survey of Children and Youth (NLSCY), conducted by Statistics Canada and Human Resources Development Canada. In particular, the NLSCY follows a representative sample of Canadian children, from newborn to age 11 years into adulthood, with data collection occurring at 2-year intervals. Data for Cycle 3 were collected between October 1998 and June 1999. Data for this study were collected by paper and pencil questionnaires administered by trained interviewers in the respondents' households. We chose Cycle 3, because it is the last cycle in which a comprehensive composite measure of SES is available for each child. In this survey, a response rate of 88% was achieved based on the percentage of all eligible children. To ensure the survey represented the target population, the sample was stratified based on province/territory and age group. A poststratification procedure was also used to ensure consistency between survey estimates and demographic estimates produced by Statistics Canada (for more details, see Statistics Canada, 2001).

Participants

Participants were 1,641 (52.3% boys, 47.7% girls) Canadian adolescents ages 12–13 years old and 1,518 (50.6% boys, 49.4% girls) Canadian adolescents ages 14–15 years old at the time of data collection for whom data were available for all the variables examined in this study. This represents 85.3% of the total NLSCY sample for 12–15-year-olds ($n = 3,702$). In particular, 10.5% ($n = 385$) of the total available cases were missing data on physical education enjoyment. There were a few significant ($p < .01$) differences between adolescents for whom data on physical education enjoyment was available versus those for whom it was not. Adolescents who did not answer the physical education enjoyment question were overrepresented in the older adolescent group (69.7% vs. 47.8% for those who answered the question). In addition, there were fewer individuals with no physical education data represented in unorganized sport at school (14.1% vs. 38.4%) and outside of school (31.9% vs. 65.6%), compared to those for whom data on physical education enjoyment were available.

Measures

The NLSCY attempts to capture the diversity of factors affecting child health and development. Toward this end, a multidisciplinary consultation was carried out to develop the survey questions. The NLSCY expert advisory group consisted of researchers in child develop-

ment and the social sciences and key stakeholders from federal and provincial child development programs. Statistics Canada (2001) provided detailed information on the procedures for testing the psychometric properties of the NLSCY Cycle 3. The physical education and physical activity variables used in this study, however, were designed as single-item questions, and information such as factor structure and internal consistency coefficients is not available for these variables.

SES was a derived variable that included the parents' education level, prestige of the parents' occupation, and household income. For analyses, and in a manner consistent with previous research (e.g., García Bengoechea, Spence, & McGannon, 2005), the original nine NLSCY SES categories were collapsed into three categories representing participants in the lowest, middle, and highest SES distribution ranges, respectively.

Weight status was determined based on body mass index (BMI) scores derived from the adolescents' self-reported weight and height using the formula: $BMI = (\text{weight in kilograms}) / (\text{height in meters squared})$. Participants were identified as having normal weight, being overweight, or being obese according to the International Obesity Task Force age- and sex-specific BMI cut points defined by Cole, Bellizzi, Flegal, and Dietz (2000). For the purposes of this study, the label "normal weight" was assigned to participants whose BMI fell below the overweight cut point.

Physical education enjoyment was assessed by the item "How do you like the following subjects—gym/physical ed.," rated on a 4-point Likert-type scale with the following response options: I hate it, I don't like it very much, I like it a bit, and I like it a lot. Youth who answered "I like it a lot" were considered to have high physical education enjoyment. Cases ($n = 385$) with missing data for unknown reasons were coded as "not stated" and excluded from the analyses.

Participation in unorganized physical activity was assessed using one item for the 12–13-year-old age group and two items for the 14–15-year-old age group. For the former, youth were asked to report on the item: In the last 12 months, how often have you played sports or done physical activities WITHOUT a coach or instructor (biking, skateboarding, etc.)? There was no distinction between unorganized activity at school or outside of school for this group. The older adolescent group was asked: (a) outside of school, in the last 12 months, how often have you played sports or done physical activities WITHOUT a coach or instructor (biking, skateboarding, etc.), and (b) in the last 3 months, how often have you taken part in the following school-based activities (other than in class): played sports, or done physical activities WITHOUT a coach or an instructor (e.g., softball during recess)? This distinction enabled us to explore unorganized physical activity both outside of school and at school for the older

adolescents. The response categories for all items were: never, less than once a week, one–three times a week, and four or more times a week. Based on previous research (Pérez, 2003), participants who reported participating in unorganized physical activity at least one–three times a week were considered regular participants.

Participation in organized physical activity was also assessed by age-specific items. Younger adolescents were asked: In the last 12 months, how often have you played sports WITH a coach or instructor (swimming lessons, baseball, hockey, etc.)? Again, there was no distinction between the at-school and outside-of-school contexts. The older adolescents (14–15-year-olds) were asked: (a) outside of school, in the last 12 months, how often have you played sports WITH a coach or instructor (swimming lessons, baseball, hockey, etc.), and (b) in the last 3 months, how often have you taken part in the following school-based activities (other than in class): played sports WITH a coach or an instructor other than for gym class (e.g., school teams)? These questions enabled us to run separate analyses for at-school and outside-of-school contexts for the 14–15-year-olds. The response categories for all the items were: never, less than once a week, one–three times a week, and four or more times a week. Participants who reported organized physical activity at least one–three times a week were considered regular participants.

Data Analyses

Following descriptive analyses, we performed a series of logistic regression analyses to model the association among gender, SES, weight status, physical education enjoyment, and participation in organized and unorganized physical activity. Because the variables the NLSCY used to estimate physical activity participation varied slightly for the age range considered, we analyzed the data separately for younger (12–13 years) and older (14–15 years) adolescents. For the preliminary analyses, we used chi-square analyses to look at the independence of the proportions of younger and older adolescents represented in each category. If dependence was noted, we conducted post hoc tests to identify the significant differences. Because the main analyses focused on identifying correlates of physical activity, we calculated the adjusted odds ratios (AOR) and the 95% confidence intervals (CI) using a stepwise procedure guided by ecological perspectives (Sallis et al., 2000, Van der Horst et al., 2007). We regressed each physical activity variable on the biological and demographic variables of gender, SES, and weight status. We then entered the social-psychological variable of physical education enjoyment in the logistic model. As recommended by Statistics Canada (2001), we calculated and used a rescaled sample weight. Rescaling avoids an overestimation of significance due to sample size while maintaining the same distributions as those using the NLSCY population weight.

Results

The significant chi-square statistics presented in Table 1 revealed age-dependence in relation to SES and physical education enjoyment. Post hoc analyses revealed the proportion of middle SES adolescents in the younger age category was significantly higher compared to the older age category ($z = 2.44, p < .05$). Also, a greater proportion of younger adolescents reported that they enjoyed physical education, as compared to the older age group ($z = 19.35, p = .05$). Direct comparison between the younger and older groups regarding physical activity was not possible due to the inconsistent questions used for each group. Nevertheless, the percentages showed in Table 1 suggest that participation in unorganized physical activity was more frequent than participation in organized physical activity for both age groups. Correlations among physical activity variables revealed a range of significant ($p < .01$) associations from $r = .20$ – $.52$.

For the main analyses, we first ran logistic regressions with the demographic and biological variables. The association patterns between the demographic and biological variables and the physical activity variables were substantively similar both in younger and older adolescents, after adjusting for physical education enjoyment in the second step. The results from the full model are presented in Tables 2 and 3.¹ In both age groups, girls participated less frequently in unorganized physical activities than boys but not in organized physical activities. Specifically, the adjusted odds of participating in unorganized physical activity were 43% lower among younger girls compared with younger boys ($p < .01$), whereas the adjusted odds of participating in unorganized physical activity at school (AOR = 0.65) and outside of school (AOR = 0.60) were also lower for older girls than for older boys.

SES was related to participation in organized physical activities in both age groups but not to participation in unorganized physical activities. Younger adolescents in the middle and high SES categories participated in more organized physical activity than their peers in the low SES category (AOR = 1.73 and 1.74, respectively). In addition, older adolescents in the middle and high SES groups participated more frequently in organized physical activity at school (AOR = 1.74 and AOR = 1.80, respectively). Older adolescents in the middle SES category were more frequent participants in organized physical activity outside of school than adolescents of low SES (AOR = 1.40). Last, the adjusted odds of participating in organized physical activity outside of school were 87% higher among older adolescents in the high SES range compared with older adolescents in the low SES group.

The analyses revealed several significant associations of weight status. Younger obese adolescents participated less often in both organized and unorganized physical activity than their normal weight counterparts (AORs

= 0.67 and 0.63, respectively). Obese adolescents in the older age group participated less frequently in unorganized physical activity in and outside of school than older adolescents of normal weight (AORs = 0.66 and 0.63, respectively). However, this was not the case in the context of organized physical activity (AORs = 0.78 [in school], and 0.80 [out of school]).

Physical education enjoyment was significantly associated with participation in both organized and unorganized physical activity among younger and older adolescents. Specifically, higher levels of enjoyment were associated with more frequent participation in organized (AOR = 2.33) and unorganized (AOR = 1.58) physical activity in the younger group. Higher levels of enjoyment in older adolescents were also associated with higher

participation rates in organized physical activity in school (AOR = 3.54) and outside of school (AOR = 3.98) and with more frequent participation in unorganized physical activity in school (AOR = 3.90) and outside of school (AOR = 2.55).

Discussion

Due to the limited research addressing participation context when examining correlates of physical activity during adolescence, this study examined the association of gender, SES, weight status, and enjoyment of school-based physical education with participation in organized and unorganized physical activity. As hypothesized, find-

Table 1. Prevalence of individual characteristics among younger and older adolescents

	Ages 12–13 years ^a		Ages 14–15 years ^b		χ^2	(df, n)
	%	SE	%	SE		
Gender					0.32	1, 3,159
Girls	52.3	1.44	50.6	1.51		
Boys	47.7	1.44	49.4	1.51		
Socioeconomic status					8.77*	2, 3,159
Low	20.8	1.13	24.0	1.36		
Medium	43.2	1.43	38.3	1.42		
High	36.0	1.45	37.7	1.47		
Weight status					3.99	2, 3,159
Normal	77.8	1.19	80.6	1.18		
Overweight	12.6	0.94	10.6	0.92		
Obese	9.6	0.86	8.8	0.85		
Physical education enjoyment					59.00**	1, 3,159
Yes	78.9	1.17	66.8	1.42		
Regular participation organized physical activity						
Yes	66.3	1.39				
Regular participation unorganized physical activity						
Yes	73.4	1.26				
Regular participation organized school physical activity						
Yes			41.5	1.47		
Regular participation organized out-of-school physical activity						
Yes			51.4	1.52		
Regular participation unorganized school physical activity						
Yes			37.2	1.44		
Regular participation unorganized out-of-school physical activity						
Yes			65.6	1.43		

Note. SE = standard error; youth who reported taking part in physical activity at least one–three times a week were considered regular participants.

^a*n* = 1,641.

^b*n* = 1,518.

**p* < .05.

***p* < .001.

ings illustrated the importance of context by showing how participation in physical activity in organized versus unorganized settings varied.

Girls participated less frequently than boys in unorganized physical activity in and outside of school. This apparent disparity is important to address, considering that unorganized physical activities represent an important physical activity opportunity for children and youth (Active Healthy Kids Canada, 2008). For example, findings from the U.S. National Longitudinal Study of Adolescent Health (Menshik, Ahmed, Alexander, & Blum, 2008) suggested that the likelihood of becoming an overweight adult was reduced most (i.e., 48%) by participating more than four times per week in wheel-related physical activities (i.e., rollerblading, roller skating, skateboarding, or bicycling), which are often performed in unorganized settings with little or no adult supervision. Based on these results and our findings, it seems important to enhance girls' levels of unorganized physical activities. Conversely, because participation rates in organized physical activities were similar among boys and girls in this study, it could be argued that it is important to promote girls' participation in organized physical activity to compensate for their lower levels of participation in unorganized activity. Our results contrast findings from a representative national survey of Icelandic adolescents (Vilhjalmsson & Kristjansdottir, 2003). Girls' lower enrollment in organized sport clubs accounted for gender differences in overall physical activity frequency once factors such as sport and exercise-related instruction, physical education experiences, and social modeling were taken into account. Both our Canadian study and that of Icelandic youth not only highlight the importance of considering different types of physical activity experiences (e.g., organized vs. unorganized) but also of being sensitive to geographic, social, and cultural contexts when attempting to understand the factors influencing the gender gap in physical activity participation during adolescence. Thus, future research could attempt to further elucidate some of the cultural and societal factors underlying the observed gender differences in organized physical activity participation patterns.

In line with other available research from Canada (Active Healthy Kids Canada, 2008, CFLRI, 2007), and Portugal (Santos, Esculcas, & Mota, 2004), our results indicate that participation in organized physical activity in and outside of school during adolescence follows a gradient that is a function of SES. This gradient may be due to lack of appropriate and/or affordable organized physical activity opportunities in underprivileged areas (CFLRI, 2005). For example, parents in underprivileged areas may not be able to afford to enroll their children in some organized physical activity programs, or the programs may not appeal to the specific needs and interests of their children. Our data revealed that adolescents with low SES participated less frequently in organized

physical activity both outside and in school. The latter circumstance echoes findings from a recent Australian study showing that inequities in availability of organized activity programs may also exist in schools in relation to the SES of their location (Salmon et al., 2005). Both sets of findings are of concern, because it is a commonly accepted principle in democratic societies that schools should provide an environment offering equal opportunities to all students regardless of their personal and/or social characteristics and circumstances. Gauvin (2003) reviewed literature indicating that individuals of lower SES are less likely to gravitate toward, sign up for, and persist in a variety of health promotion programs. Our results indicate this phenomenon may actually include organized physical activity and sport programs for adolescents as well. Our findings also imply that the association between SES and adolescents' physical activity levels observed in other studies (Gordon-Larsen et al., 2000; LaTorre et al. 2003) may be mostly due to lower levels of participation in *organized* physical activities among adolescents of lower SES. It is therefore important to take into account the context of physical activity participation

Table 2. Logistic regression models examining correlates of physical activity as a function of participation context among younger adolescents ($N = 1,641$)

	Organized PA OR (95% CI)	Unorganized PA OR (95% CI)
Gender		
Girls	0.96 (0.78–1.19)	0.57 (0.46–0.72)***
Boys	1.00	1.00
Socioeconomic status		
Low	1.00	1.00
Medium	1.73 (1.32–2.27)**	1.07 (0.80–1.44)
High	1.74 (1.31–2.30)**	1.19 (0.88–1.62)
Weight status		
Normal	1.00	1.00
Overweight	1.02 (0.74–1.41)	0.98 (0.70–1.39)
Obese	0.67 (0.48–0.96)*	0.63 (0.44–0.90)**
Physical education enjoyment		
Yes	2.33 (1.81–2.98)***	1.58 (1.22–2.05)***
No	1.00	1.00

Note. OR = odds ratio; CI = confidence interval; results are based on a weighted sample.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

(e.g., organized vs. unorganized) in studies summarizing research on physical activity in adolescence.

The inconsistent results reported in the literature regarding the role of weight status in overall levels of physical activity during adolescence make it difficult to interpret our findings (e.g., Levin et al., 2003; Taylor et al., 2002; Trost, Kerr, Ward, & Pate, 2001). However, past research focused on general physical activity levels with little regard of differentiating contexts. Based on our results, and the work of Levin and colleagues (2003) showing that weight status among high school students is associated with selected physical activity behavior, it is important to distinguish between different contexts of physical activity participation to identify individuals at risk of inactivity. Taking context into account allowed us to see differences between younger and older adolescents regarding the role of weight status in physical activity participation. Specifically, younger obese adolescents participated less in both organized and unorganized activity settings than adolescents of normal weight. This suggests a need to target intervention strategies at promoting physical activity in general for younger obese individuals. Obese older adolescents participated less frequently than adolescents

of normal weight only in unorganized physical activity in and outside of school. Given the known health and weight management benefits of physical activity (e.g., Levin et al., 2003; Taylor et al., 2002; Trost et al., 2001) and the importance of unstructured activity for lifelong health benefits (Menshik et al., 2008), it makes sense in light of our results to suggest that we need to focus on getting obese youth to participate in more unorganized physical activity in and outside of school. However, we maintain caution in this interpretation, because it is possible organized physical activity settings provide a favorable/preferable participation environment for obese adolescents. Thus, we may want to continue to promote organized physical activity yet also highlight the opportunities provided in unstructured environments. Providing more opportunities to “play” may be effective, because there are no chosen members of teams and limited possibilities for differentiation based on skill or experience.

Most participants in the current study reported high levels of physical education enjoyment; this is encouraging given that positive feelings associated with physical education activities likely determine intentions to be active (Biddle & Chatzisarantis, 1999). Consistent with previous

Table 3. Logistic regression models examining correlates of physical activity as a function of participation context among older adolescents ($N = 1,518$)

	Organized school PA OR (95% CI)	Unorganized school PA OR (95% CI)	Organized out-of-school PA OR (95% CI)	Unorganized out-of-school PA OR (95% CI)
Gender				
Girls	1.00 (0.80–1.24)	0.65 (0.52–0.81)***	1.00 (0.80–1.24)	0.60 (0.48–0.75)***
Boys	1.00	1.00	1.00	1.00
Socioeconomic status				
Low	1.00	1.00	1.00	1.00
Medium	1.74 (1.31–2.32)*	1.08 (0.81–1.44)	1.40 (1.06–1.84)*	0.86 (0.65–1.14)
High	1.80 (1.31–2.41)**	1.16 (0.87–1.55)	1.87 (1.41–2.47)***	1.11 (0.83–1.47)
Weight status				
Normal	1.00	1.00	1.00	1.00
Overweight	0.79 (0.55–1.12)	1.03 (0.72–1.48)	1.06 (0.75–1.51)	1.33 (0.92–1.92)
Obese	0.78 (0.53–1.16)	0.60 (0.44–0.99)*	0.80 (0.55–1.18)	0.63 (0.43–0.92)**
Physical education enjoyment				
Yes	3.54 (2.76–4.52)***	3.90 (3.00–5.06)***	3.98 (3.14–5.03)*	2.55 (2.03–3.21)***
No	1.00	1.00	1.00	1.00

Note. PA = physical activity; OR = odds ratio; CI = confidence interval; results are based on a weighted sample.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

research (Prochaska, Sallis, Slymen, & McKenzie, 2003; Trudeau & Shephard, 2005), we found that physical education enjoyment was higher among younger than older adolescents and that higher enjoyment levels related to greater leisure-time physical activity participation. Echoing past research (e.g., Gordon-Larsen et al., 2000; Van der Horst et al., 2007), physical education enjoyment was consistently and positively correlated with participation in organized and unorganized physical activity in and outside of school, regardless of gender, SES, and weight status. These findings suggest physical education enjoyment may have a protective effect against circumstances and situations that place adolescents at risk of becoming physically inactive. Specifically, previous research has shown that girls, older children, and those in disadvantaged socioeconomic conditions are more likely to be inactive (e.g., Gordon-Larsen et al., 2000; Pate et al., 2007; Prochaska et al., 2003; Sallis et al., 2000). Our findings suggest that enhancing adolescents' enjoyment of physical education may generally offset the low levels of physical activity often reported for youth at risk. It is promising that the older age group had a stronger association of enjoyment with organized and unorganized physical activity (AORs ranging from 2.55 to 3.98 vs. 1.58 to 2.33 in the younger group), because physical activity levels and participation rates generally decline rapidly with age throughout adolescence (Troiano et al., 2008; Trost et al., 2002). Once again, caution is required in interpreting these findings, as the cross-sectional nature of the data does not rule out the possibility that participation in extracurricular organized and/or unorganized physical activity, and the skills and attitudes thus developed, leads adolescents to enjoy physical education classes. Future research using longitudinal designs should determine how the associations found in this study vary over time. Likewise, future research using longitudinal designs could help clarify the relationship between enjoying physical education and physical activity and the degree of overlap between these two variables.

In addition to the inherent limitations of the cross-sectional and self-report research design, this study has a few shortcomings. The physical activity variables included in the NLSCY do not account for factors such as activity duration or intensity. Furthermore, only one item assessed physical education enjoyment. Given the likely variation in enjoyment, it would be best to examine this construct with multiple items and a range of possible scores. Besides this limitation, the NLSCY does not explicitly address the question of whether or not respondents actually participate in a physical education class. In some Canadian provinces, physical education is not a required subject in grades 10–12, and surveys indicate a decrease in the percentage of students enrolled in physical education (Faulkner et al., 2007). This may have accounted for, at least in part, the circumstance that adolescents not reporting data on physical education were overrepresented in the older age

group. The measure of physical activity context for older adolescents is also a limitation, because one question (outside of school) sought responses about the past 12 months whereas the other item (at school) asked about sport and physical activity engagement in the previous 3 months. The different reference points may have confounded some responses and underestimated the possible effect of seasonal variability in participation in school-based physical activity. Nevertheless, the range of correlations among the physical activity variables suggested they were measuring unique facets. The lack of validity and reliability data available on the NLSCY physical education and physical activity variables is another inherent limitation of the current study. However, the rigorous methods to develop and test the survey for both research and practice are actually strengths of the assessment tool. Furthermore, the findings are drawn from a representative sample of Canadian youth for whom a comprehensive measure of SES was available and provide implications for future research and practice targeting important correlates of leisure-time physical activity during adolescence.

In conclusion, the results from this study exposed gender and SES gaps in relation to participation in unorganized and organized physical activity, respectively, in a representative sample of Canadian adolescents. The results also indicate that obese adolescents are at risk of inactivity, and this risk may be higher for unorganized physical activity as they age. Finally, the findings suggest physical education enjoyment is important for leisure-time physical activity. As Van der Horst et al. (2007) noted, several correlates of physical activity, such as gender, age, and SES, cannot be modified and should be used to target at-risk groups requiring special attention. Physical education enjoyment is a *modifiable* correlate of both organized and unorganized physical activity that can be promoted in school-based curricular interventions to benefit adolescents, regardless of important demographic and biological characteristics.

References

- Active Healthy Kids Canada. (2008). *Canada's report card on physical activity for children & youth 2008*. Retrieved October 12, 2008, from http://www.activehealthykids.ca/Ophea/ActiveHealthyKids_v2/programs_2008reportcard.cfm
- Biddle, S., & Chatzisarantis, N. (1999). Motivation for a physically active lifestyle through physical education. In Y. Vanden Auweele, F. Bakker, S. Biddle, M. Durand, & R. Seiler (Eds.), *Psychology for physical educators* (pp. 5–27). Champaign, IL: Human Kinetics.
- Bronfenbrenner, U. (1999). Environments in developmental perspective: Theoretical and operational models. In S. L. Friedland & T. D. Wachs (Eds.), *Measuring environment across the life span* (pp. 3–28). Washington, DC: APA.

- Canadian Fitness Lifestyle Research Institute. (2005). *Results of the 2005 Physical Activity Monitor*. Retrieved February 26, 2008, from http://www.cflri.ca/eng/provincial_data/pam2005/canada.php
- Canadian Fitness Lifestyle Research Institute. (2007). *CANPLAY Study: Participation in organized physical activity or sport and steps taken*. Retrieved January 16, 2008, from http://www.cflri.ca/eng/programs/canplay/documents/pam05_sec5.pdf
- Carroll, B., & Loumidis, J. (2001). Children's perceived competence and enjoyment in physical education and physical activity outside school. *European Physical Education Review*, 7(1), 24–43.
- Coalition for Active Living. (2004). *PAN-Canadian Physical Activity Strategy*. Retrieved February 2, 2008, from <http://www.activeliving.ca/pdf/PASstrategy%20Feb%202004.pdf>
- Cole T. J., Bellizzi, M. C., Flegal, K. M., & Dietz, W. H. (2000). Establishing a standard definition for child overweight and obesity worldwide: International survey. *British Medical Journal*, 320, 1–6.
- Cox, A. E., Williams, L., & Smith, A. L. (2007). Motivation in physical education and physical activity behavior outside of school. *Journal of Sport & Exercise Psychology*, 29(Suppl. S), S154–S155.
- Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research*. Rochester, NY: University of Rochester.
- Donatelle, R. (2007). *Health: The basics* (7th ed.). San Francisco: Pearson Education Inc.
- Faulkner, G., Goodman, E., Adlaf, H., Irving, K., Allison, K., & Dwyer, J. (2007, January 26). Participation in high school physical education—Ontario, Canada, 1999–2005. *Morbidity and Mortality Weekly Report*, 56(3), 52–54.
- García Bengoechea, E. (2002). Integrating knowledge and expanding horizons in developmental sport psychology: A bioecological perspective. *Quest*, 54, 1–20.
- García Bengoechea, E., & Johnson, G. M. (2001). Ecological systems theory and children's development in sport: Toward a process-person-context-time research paradigm. *Avante*, 7, 20–31.
- García Bengoechea, E., Spence, J. C., & McGannon, K. (2005). Gender differences in perceived environmental correlates of physical activity. *International Journal of Behavioral Nutrition and Physical Activity*, 2(12), 1–9.
- Gauvin, L. (2003). *Social disparities and involvement in physical activity: Shaping the policy agenda in healthy living to successfully influence population health*. Retrieved January 15, 2008, from <http://www.gris.umontreal.ca/rapportpdf/R03-02.pdf>
- Gordon-Larsen, P., McMurray, R. G., & Popkin, B. M. (2000). Determinants of adolescent physical activity and inactivity patterns. *Pediatrics*, 105, 63–70.
- Hagger, M. S., Chatzisarantis, N. L. D., Barkoukis, V., Wang, C. K. J., & Baranowski, J. (2005). Autonomy support in physical education and leisure-time physical activity: A cross-cultural evaluation of the trans-contextual model. *Journal of Educational Psychology*, 97, 376–390.
- Hagger, M. S., Chatzisarantis, N. L. D., Culverhouse, T., & Biddle, S. J. H. (2003). The processes by which perceived autonomy support in physical education promotes leisure-time physical activity intentions and behavior: A trans-contextual model. *Journal of Educational Psychology*, 95, 784–795.
- Kahn, E. B. L. T., Ramsey, R. C., Brownson, R. C., Heath, G. W., Howze, E. H., Powell, K. E., et al. (2002). The effectiveness of interventions to increase physical activity. A systematic review. *American Journal of Preventive Medicine*, 22, 73–107.
- LaTorre, G., Masala, D., DeVito, E., Arzano, I., Fargione, V., & Capelli, G. (2003). Physical activity and socio-economic status: Results of a pilot study. *Medicina Dello Sport*, 56, 175–183.
- Levin, S., Lowry, R., Brown, D. R., & Dietz, W. H. (2003). Physical activity and body mass index among U.S. adolescents—Youth risk behavior survey, 1999. *Pediatrics & Adolescent Medicine*, 157, 816–820.
- Lonsdale, C., Sabiston, C. M., Raedeke, T. D., Ha, A. S. C., & Sum, R. K. W. (2009). Self-determined motivation and students' physical activity during structured physical education lessons and free choice periods. *Preventive Medicine*, 48, 69–73.
- Menschik, D., Ahmed, S., Alexander, M. H., & Blum, R. W. (2008). Adolescent physical activities as predictors of young adult weight. *Archives of Pediatrics & Adolescent Medicine*, 162, 29–33.
- Myers, L., Strikmiller, P. K., Webber, L. S., & Berenson, G. S. (1996). Physical and sedentary activity in school children grades 5–8: The Bogalusa Heart Study. *Medicine & Science in Sports & Exercise*, 28, 852–859.
- O'Loughlin, J., Paradis, G., Kishchuk, N., Barnett, T., & Renaud, L. (1999). Prevalence and correlates of physical activity behaviors among elementary schoolchildren in multiethnic, low income, inner-city neighborhoods in Montreal, Canada. *Annals of Epidemiology*, 9, 397–407.
- Pate, R. R., Ward, D. S., O'Neill, J. R., & Dowda, M. (2007). Enrollment in physical education is associated with overall physical activity in adolescent girls. *Research Quarterly for Exercise and Sport*, 78, 265–270.
- Pérez, C. (2003). *Children who become active*. Retrieved March 4, 2008, from <http://www.statcan.ca/english/freepub/82-003-SIE/2003000/pdf/82-003-SIE2003004.pdf>
- Prochaska, J. J., Sallis, J. F., Slymen, D. J., & McKenzie, T. L. (2003). A longitudinal study of children's enjoyment of physical education. *Pediatric Exercise Science*, 15, 170–178.
- Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine & Science in Sports & Exercise*, 32, 963–975.
- Salmon, J., Booth, M. L., Phongsavan, P., Murphy, N., & Timperio, A. (2007). Promoting physical activity participation among children and adolescents. *Epidemiologic Reviews*, 29, 144–159.
- Salmon, J., Timperio, A., Cleland, V., & Venn, A. (2005). Trends in children's physical activity and weight status in high and low socio-economic status areas of Melbourne, Victoria, 1985–2001. *Australian and New Zealand Journal of Public Health*, 29, 337–342.
- Santos, M. P., Esculcas, C., & Mota, J. (2004). The relationship between socioeconomic status and adolescents' organized and nonorganized physical activities. *Pediatric Exercise Science*, 16, 210–218.
- Statistics Canada. (2001). *NLSY data users guide*. Ottawa, Ontario, Canada: Author.
- Taylor, W. C., Sallis, J. F., Dowda, M., Freedson, P. S., Eason, K., & Pate, R. R. (2002). Activity patterns and correlates

- among youth: Differences by weight status. *Pediatric Exercise Science*, 14, 418–431.
- Troiano, R., Berrigan, D., Dodd, K., Mâsse, L., Tilert, T., & McDowell, M. (2008). Physical activity in the United States measured by accelerometer. *Medicine & Science in Sports & Exercise*, 40, 181–188.
- Trost, S. G., Kerr, L. M., Ward, D. S., & Pate, R. R. (2001). Physical activity and determinants of physical activity in obese and non-obese children. *International Journal of Obesity*, 25, 822–829.
- Trost, S. G., Pate, R. R., Sallis, F., Freedson, P. S., Taylor, W. C., Dowda, et al. (2002). Age and gender differences in objectively measured physical activity in youth. *Medicine & Science in Sports & Exercise*, 34, 350–355.
- Trudeau, F., & Shephard, R. (2005). Contribution of school programmes to physical activity levels and attitudes in children and adults. *Sports Medicine*, 35, 89–105.
- Van der Horst, K., Paw, M., Twisk, J., & Van Mechelen, W. (2007). A brief review on correlates of physical activity and sedentariness in youth. *Medicine & Science in Sports & Exercise*, 39, 1241–1250.
- Vilhjalmsson, R., & Kristjansdottir, G. (2003). Gender differences in physical activity in older children and adolescents: The central role of organized sport. *Social Science and Medicine*, 56, 363–374.
- Wallhead, T. L., & Buckworth, J. (2004). The role of physical education in the promotion of youth physical activity. *Quest*, 56, 285–301.
- World Health Organization. (2008). *Benefits of physical activity*. Retrieved January 16, 2008, from http://www.who.int/dietphysicalactivity/factsheet_benefits/en/index.html
- Zwiren, L., & Hutchison, G. (2003). Keeping kids active, keeping kids healthy. In E. Weinstein & E. Rosen (Eds.), *Teaching children about health* (2nd ed., pp. 117–150). Belmont, CA: Thomson Learning Inc.

Note

1. The table with the reduced model is available from the first author upon request.

Authors' Note

Please address all correspondence concerning this article to Enrique García Bengoechea, McGill University, Department of Kinesiology and Physical Education, 475 Pine Avenue West, Montreal, Quebec, Canada, H2W 1S4.

E-mail: enrique.garcia@mcgill.ca