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Alternative High School Students' Physical Activity: Role of Self-efficacy

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Abstract

Objective—To examine physical activity self-efficacy as a mediator of the association between perceived barriers to PA and moderate-to-vigorous physical activity (MVPA) among alternative high school (AHS) students.

Methods—Students (N=145) from 6 AHS completed self-report questionnaires.

Results—Mediation analyses revealed partial mediation of PA self-efficacy on relationships between general barriers to PA and MVPA (b= −.39 reduced b= −.33) among females (47.6% of sample).

Conclusions—Interventions with female AHS students should include a component on building PA self-efficacy. However, results suggest the broader environment may have greater impact on MVPA than individual-level psycho-social factors.

Keywords

adolescents; at-risk youth; moderate-to-vigorous physical activity

Physical activity is a main protective factor against health problems such as obesity, hypertension, and hyperlipidemia among youth.[1] Accordingly, much attention has been focused on examining factors that predict physical activity, which include both individual and environmental determinants.[2] Correlates of physical activity have been identified and

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include biological, psychological, social/cultural, and physical environmental factors.[3,4] To increase physical activity levels, researchers and practitioners are particularly interested in identifying which factors are the most modifiable and responsive to intervention. These interventions are critical if the physical activity habits of young people are to be positively influenced and a healthy change achieved and maintained into adulthood.

High-Risk Youth

Some groups of youth are at an increased risk for low levels of physical activity. Research has demonstrated that girls are less active than boys.[5,6] Other demographic risk factors for low physical activity levels include being an ethnic minority and having low socioeconomic status (SES). For example, research has demonstrated that sedentary behavior was greater and moderate-to-vigorous physical activity levels were lower in ethnic minority adolescents.[7,8] Miech and colleagues (2006) examined a nationally representative sample of adolescents and found that adolescents from poor families had about twice the level of sedentary behavior as those from nonpoor families and the disparity increased as adolescent age increased.[9] Indeed, 2009 national surveillance data demonstrated that overall, 23% of high school students did not participate in any vigorous exercise in the past week and revealed that minority students had lower levels of physical activity.[6]

In the United States, a disproportionate number of minority and low-income youth attend alternative high schools, which are public and private and serve students at risk of academic failure, such as dropouts, expelled students, and truants.[10] Students attending alternative high schools have been found to have higher rates of health-risk behaviors, such as substance use, sexual behaviors that contribute to sexually transmitted disease, and unhealthy dieting practices; they also report low levels of physical activity.[11] Alternative high school girls in particular report levels of physical activity lower than those of alternative high school boys, and lower than those of boys and girls attending regular high schools.[11]

Alternative high schools provide access to minority and low-income youth at risk for low levels of physical activity and subsequent negative health consequences and could serve as key settings to deliver interventions to positively affect students' activity levels. Approximately 1.3% of high school students attend alternative high schools.[12,13] Effective interventions require a focus on factors associated with physical activity that are amenable to change. Although a considerable literature exists describing these factors,[5,14] fewer studies have examined the integration of individual and environmental correlates,[15,16] and to our knowledge, none have examined such associations among populations of mostly high-risk youth, such as those attending alternative high schools.

Theoretical Framework

One of the foci of social cognitive theory is people's cognitions and recognizes that behavior is a result of a reciprocal relationship between personal and environmental factors.[17] One prominent construct within social cognitive theory is self-efficacy, or one's capacity to perform a behavior to bring about a desired outcome. Self-efficacy measures one's judgment

of the *capability* to perform a health behavior versus actually measuring one's *intention* to engage in the health behavior.[18]

Social cognitive theory recognizes that self-efficacy acts upon other determinants of health behavior, such as environmental and individual factors.[19] Environmental and personal factors can be barriers that hinder the performance of a health behavior and can be cognitive, situational, or structural.[19] If these barriers and challenges did not exist, a person would be completely efficacious and able to easily and consistently perform the behavior, such as physical activity.[19]

Present Study

With the present study, we use social cognitive theory to build upon previous research[20-29] by examining an individual-level factor, self-efficacy, as a mediator of the association between an environmental-related factor, perceived barriers to physical activity, and moderate-to-vigorous physical activity among a sample of adolescent males and females attending alternative high schools. By identifying mediators, researchers and practitioners can develop and implement more targeted and ideally effective approaches to influence healthy behavior change.[30] Social cognitive theory postulates that self-efficacy is a cognitive mechanism that can function as a mediator in health behaviors.[17] Additionally, previous research has found evidence for self-efficacy mediating the association between environmental factors and physical activity.[29,31,32] We hypothesize that self-efficacy for being physically active will mediate the association between perceived barriers to physical activity and moderate-to-vigorous physical activity. In other words, the process by which an adolescent has an association between perceived barriers to physical activity and moderate-to-vigorous physical activity is explained by one's self-efficacy for being physically active.

METHODS

Sample

A cross-sectional design was used to study the association between self-efficacy, perceived barriers to physical activity, and moderate-to-vigorous physical activity among a convenience sample of students attending 6 alternative high schools (4 urban and 2 suburban) in the St Paul-Minneapolis, Minnesota, metropolitan area. Schools were participants in the Team COOL (Controlling Overweight and Obesity for Life) pilot study, a group-randomized trial that sought to evaluate the feasibility and acceptability of an alternative school-based intervention to prevent excess weight gain and/or promote healthy weight loss among students by promoting physical activity and healthy eating. See Kubik et al for detailed information about study design and procedures.[33]

Across the 6 schools, average enrollment was 102 students (range: 27 to 142); 53% were male, 64% (range: 31% to 96%) were racial/ethnic minorities, and 60.5% (range: 40% to 96%) qualified for free/reduced school meals. All enrolled students were eligible to participate in study measurements, which were conducted during a class period. The current study used baseline data collected in fall 2006, prior to implementation of the study

intervention. Students received a $5 gift card for completing measures. The study was approved by the University of Minnesota Human Subjects Research Committee.

Across schools, 145 students completed the survey and anthropometric measures. Because school attendance is a chronic problem for alternative high school students, the study participation rate was based on an adjusted enrollment calculated by multiplying each school's current year enrollment by the prior year's attendance rate. Based on an average adjusted enrollment of 68 students (range: 16 to 107), the participation rate across schools was 36%.

Measures

Physical activity barriers—Perceived barriers to physical activity were measured with a modified questionnaire used in prior research with adolescents.[21] For the current study, principal components factor analysis was used to identify the 3 subscales. The stem for all questions was "How often do these things keep you from being physically active?" General barriers were assessed with the following items: (1) physical activity is boring; (2) the weather is bad; (3) I don't know how to do the physical activity that I want to do; (4) I don't have a place to be physically active; (5) I don't have time; and (6) I don't have energy. Personal barriers were assessed with the following items: (1) my hair would get messed up; (2) I don't like to sweat; (3) it would take time away from my friends; (4) I might get hurt or be sore; (5) it would make me embarrassed; and (6) it would make me tired. School/neighborhood barriers were assessed with the following items: (1) my school doesn't have any sports teams; (2) there's no equipment (like balls, bikes, skates) to use for physical activity; (3) it's not safe to be physically active in my neighborhood; and (4) my school doesn't offer any physical activities. For all items, there were 5 responses, ranging from never = 1 to very often = 5, which were summed to create scale scores, with higher scores indicating more barriers.

Self-efficacy for being physically active—Self-efficacy for being physically active was measured with a 6-item scale adapted from a validated questionnaire used previously with adolescent girls.[34,35] Students were asked, "How strongly do you agree with the following statements?": "MOST DAYS I can…(1) be physically active no matter how busy my day is; (2) ask my parents or other adults to do physically active things with me; (3) be physically active instead of watching TV or playing video games; (4) be physically active even if it is very hot or cold outside; (5) ask a friend to be physically active with me; and (6) be physically active even if I have to stay at home." There were 5 responses for each item, ranging from strongly disagree = 1 to strongly agree = 5, which were summed to create the scale score, with higher scores indicating greater self-efficacy.

Moderate-to-vigorous physical activity—Hours per week of moderate-to-vigorous physical activity was measured with a modified version of the Leisure Time Exercise Questionnaire, which has been shown to be reliable and significantly correlated with other measures of physical activity among adolescents.[36,37] In a subsample of 65 students participating in the Team COOL baseline data collection, the correlation between hours per week of moderate-to-vigorous physical activity as measured by actigraph accelerometer and

the self-report measure was found to be significant (r= 0.49; P < .0001). Responses to 2 questions were summed to measure moderate-to-vigorous physical activity. Students were asked, “In a usual week, how many hours do you spend doing strenuous exercise (heart beat rapidly)? Examples: Biking fast, aerobic dancing, running, swimming laps, rollerblading, soccer, basketball, football.” They were also asked, “In a usual week, how many hours do you spend doing moderate exercise (not exhausting)? Examples: walking quickly, baseball, gymnastics, easy bicycling, volleyball, dancing, skate boarding.” There were 6 response categories for each question, ranging from none = 1 to 6+ hours/week = 6.

Demographic characteristics—Gender and date of birth were obtained from school records. Race/ethnicity was measured with the item “Do you think of yourself as (You may chose more than one) … American Indian/Alaskan Native; Asian; Black or African American; Hispanic or Latino; White; Other?” and modeled as a 4-category variable (white, black, Hispanic, multi-ethnic/other). For most students, the socioeconomic (SES) variable was measured using free/reduced lunch (FRL) status, using the question “Do you get free or low-cost lunches at school?” (n = 130); if FRL was missing or reported as I don’t know, response to the question “Does your family get public assistance (welfare, food stamps, other assistance)? was used (n = 8). Responses to both items were yes, no, I don’t know. The SES variable was dichotomized as yes = low SES; no = high SES.

Analysis

Descriptive analyses were conducted for the demographic variables and variables of interest for the present study. T-tests were conducted to determine whether there was a significant gender difference on perceived general, personal, and school/neighborhood barriers, physical activity self-efficacy, and moderate-to-vigorous physical activity. Pearson correlation analyses were conducted separately for males and females to examine the associations between perceived barriers to physical activity (general, personal, school/neighborhood), physical activity self-efficacy, and hrs/week moderate-to-vigorous physical activity. The mediation analyses were stratified by gender, and the linear model was fit using PROC MIXED in SAS version 9.2,[38] controlling for clustering within schools because of nonindependence of students in the schools as well as student age, ethnicity, and SES level.

To determine if physical activity self-efficacy mediated the association between perceived barriers to physical activity and hrs/week of moderate-to-vigorous physical activity, linear regressions were conducted. Mediation analyses were conducted using linear regression following steps put forth by Baron and Kenny.[39] The first step in testing mediation is there must be a significant association between the predictor (perceived barriers to physical activity) and the outcome (hrs/week moderate-to-vigorous physical activity). Next, there must be a significant association between the predictor (perceived barriers to physical activity) and the mediator (physical activity self-efficacy). Third, there must be a significant association between the mediator (physical activity self-efficacy) and the outcome (hrs/week moderate-to-vigorous physical activity). Lastly, if all 3 of these associations are significant, a fourth regression analysis is conducted to test if the first association between the predictor (perceived barriers to physical activity) and the outcome (hrs/week moderate-to-vigorous physical activity) dropped in significance when the mediator was added to the model. If the

association between the predictor (perceived barriers to physical activity) and the outcome (hrs/week moderate-to-vigorous physical activity) is reduced or drops to nonsignificance, a follow-up Sobel test is performed to determine whether mediation is full or partial.[39,40] Full mediation occurs if the association between the predictor (perceived barriers to physical activity) and the outcome (hrs/week moderate-to-vigorous physical activity) is completely explained by the mediator (physical activity self-efficacy). Partial mediation occurs when the association between the predictor (perceived barriers to physical activity) and the outcome (hrs/week moderate-to-vigorous physical activity) is only partially explained by the mediator (physical activity self-efficacy).

RESULTS

Descriptives

Descriptive analyses were conducted for the demographic variables and variables of interest for the present study (Table 1). The sample included 145 alternative high school students, almost evenly split by gender (52% male). Students ranged in age from 14 to 19 years old (M = 17.3 yrs, SD = 1.2 yrs). The sample was 39% white, 32% African-American, 9% Hispanic/Latino, and 20% categorized as Other (eg, American Indian or Alaska Native, multi-ethnic). Sixty percent of adolescents in the sample were eligible for free/reduced school lunch.

T-tests—Females had higher mean scores than those of males on perceived general and personal barriers (Table 1). No significant gender difference was found for perceived school/neighborhood barriers or physical activity self-efficacy. For hours/week moderate-to-vigorous physical activity, males reported higher mean levels than did females.

Correlations—Pearson correlation analyses (Table 2) yielded results such that for females, there was a significant negative association found between general barriers to physical activity with self-efficacy (r = −.38) and hrs/week moderate-to-vigorous physical activity (r = −.51). There was also a significant negative association for females for the association between personal barriers to physical activity with self-efficacy (r = −.28) and hrs/week moderate-to-vigorous physical activity (r = −.25) and a significant positive association between physical activity self-efficacy and hrs/week moderate-to-vigorous physical activity (r = .42). For males, there was a significant negative association between general, personal, and school/neighborhood barriers to physical activity with hrs/week moderate-to-vigorous physical activity (r = −.33 through −.42) and general, personal, and school/neighborhood barriers to physical activity with physical activity self-efficacy (r = −.37 through −.47).

Regressions—The linear regression analyses revealed that physical activity self-efficacy partially mediated the association between general barriers to physical activity and moderate-to-vigorous physical activity (b = −.41, P <.0001 reduced to b = −.35, P <.001) for the female subsample only (Figure 1). The Sobel test statistic was significant (−2.29, P <. 05), which indicated self-efficacy partially mediated the association between general barriers to physical activity and moderate-to-vigorous physical activity. Physical activity self-efficacy did not mediate the association between personal or school/neighborhood barriers

and hrs/week in the female subsample as regression models for personal or school/neighborhood barriers and hrs/week moderate-to-vigorous physical activity were not significant.

For boys, the linear regression analyses demonstrated that the association between general and personal barriers to physical activity and moderate-to-vigorous physical activity dropped in significance when physical activity self-efficacy was in the model (b = −.33, P <.01 reduced to b = −.29, P <.05 for general barriers; b = −.26, P <.01 reduced b = −.22, P <.05 for personal barriers). The linear regression analyses demonstrated that the association between school/neighborhood barriers to physical activity and moderate-to-vigorous physical activity dropped to nonsignificance when physical activity self-efficacy was in the model (b = −.28, P <.05 reduced b = −.21, P >.10). However, the follow-up Sobel tests were found to be only at a trend-level significance (t = −1.95, P <.10, t = −1.95, P <.10, t = −1.82, P <.10, for general, personal, and school/neighborhood barriers, respectively), designating no significant mediation, partial or full, had occurred.

Discussion

The present study adds to the literature examining the role of self-efficacy as a mediator of the association between perceived barriers to physical activity and physical activity levels.[27-29] To our knowledge, this is the first study to examine this association in a sample of adolescent males and females attending alternative high schools, a population of mostly low-income, minority youth known to have very low levels of physical activity, particularly among female students.[11]

As indicated by social cognitive theory, the present study revealed that physical activity self-efficacy explained part of the association between perceived general barriers to physical activity and moderate-to-vigorous physical activity, but only among females. For the male subsample, although the associations between perceived barriers and moderate-to-vigorous physical activity and perceived barriers and physical activity self-efficacy were moderate (r = −.33 through −.47), self-efficacy did not explain the association between perceived barriers and moderate-to-vigorous physical activity. Although the nonsignificant findings for males were not what we hypothesized in applying social cognitive theory, it did inform our other results. For example, our descriptive findings revealed that perception of barriers to physical activity differed by gender, with female adolescents perceiving higher general and personal barriers than males. Social cognitive theory would support that finding, recognizing that as a group, females would perceive higher barriers to physical activity due to differing social norms surrounding physical activity for males and females.[19] This finding is also consistent with previous research that demonstrated a gender difference in how barriers to physical activity impact physical activity levels.[41] Indeed, focus groups conducted with alternative high school students have found that girls specifically mentioned barriers of not knowing how to use equipment (eg, exercise ball) and concerns about embarrassment when working out in front of others.[42]

The findings from the correlation analyses also suggested possible interesting differences between males and females. Although a moderate association between self-efficacy to be physically active and moderate-to-vigorous physical activity was found for girls (r =.42, P <.

001), only a trend-level effect was found for boys (r =.21, P <.10). Also, when examining the correlations between the barrier subscales, all 3 of the subscales were highly correlated for males (r = .53 through .62), yet for females, only one strong correlation was found between general barriers to physical activity and personal barriers to physical activity (r = .54, P <. 001). Although there is no mean difference by gender for the school/neighborhood barriers to physical activity, for girls, the school/neighborhood barriers measure does not seem to be strongly associated with the other 2 barrier subscales (r = .19, ns; r = .21, P < .10). Social cognitive theory supports the position that the strength of the barriers could differ by gender (eg, teen girls could be more worried about getting their hair messy). It is also possible that the demographics of the sample may have contributed to these findings. Further study in this area is merited.

Although we were not surprised to find higher levels of physical activity in boys than girls, the outcome of the mediation analyses was very interesting and informative. For the girls, self-efficacy explained part of the association between perceived general barriers to physical activity and moderate-to-vigorous physical activity, suggesting that both self-efficacy and the environment appear are important in determining physical activity level. Therefore, interventions that aim to increase girls' physical activity levels should incorporate strategies to enhance both, such as improving access to exercise equipment while also teaching girls to use it and ensuring they feel efficacious in using it properly.

Because girls are less likely to be physically active and may be more susceptible to the negative effects of barriers to physical activity, our findings suggest that one way to lessen the impact of barriers is to increase self-efficacy to engage in physical activity. This recommendation is in line with other intervention research that supports targeting physical activity self-efficacy when intervening with girls to increase physical activity levels.[43] One way in which social cognitive theory can be applied to increase self-efficacy would be in the use of social modeling techniques.[44] For example, a hip-hop dance intervention could break the teens into 2 groups to learn different routines, and then having one group take the lead on teaching the routine to the other group.

Particularly considering the high-risk health behaviors of alternative high school girls,[11] interventions with alternative high school students are critical and should include a component to build physical activity self-efficacy by engaging them in different types of physical activity to help them see how they can overcome common barriers of feeling that they do not have the time or the energy to engage in physical activity.[42] Sessions could include a focus on teaching adolescents a variety of simple exercises to perform at convenient places as a strategy to build self-efficacy and overcome perceptions of major barriers by helping adolescents realize that they can find different places to exercise and make time to engage in physical activity.[42] Accordingly, to achieve long-lasting effects of a physical activity intervention, it would be critical to use these tactics to bolster female adolescents' sense of self-efficacy.

Self-efficacy was not found as a mediator to explain the negative association between perceived general barriers to physical activity and moderate-to-vigorous physical activity for the boys' subsample. Interventions for boys may best be implemented at the broader

environmental level. This is also supported by our results that showed a high correlation between boys' perceived general barriers and environmental barriers. Indeed, alternative high schools have varying degrees of resources that are dedicated to physical activity classes, athletic facilities, and physical activity equipment. Interventions that target the environment could include support from schools and other youth-serving organizations in the community. Given concerns about neighborhood safety, these school and community-based (eg, Boys and Girls Club) interventions are imperative to offer relevant activities where boys and girls are easily able to participate in separate activities that appeal to them.[45] Therefore, interventions should focus on both changing the school and community-level environments, while still paying heed to building youths' self-efficacy in engaging in physical activity.

It is very important to consider alternative high school youth for physical activity interventions because youth attending alternative high schools are known to be disproportionately minority, of lower SES, and dealing with higher crime and resource-poor neighborhoods. Because it is known that low-income youth are more likely to have low levels of physical activity and more likely to be overweight and obese, it is essential that we target alternative high school settings for physical activity-enhancing interventions. In short, alternative high school youth would likely benefit considerably from accessible and affordable physical activity programs.

Limitations and Future Directions

The present study makes an important addition to the literature because it examined both male and female adolescents who were attending alternative high schools, a population of adolescents at high risk for low levels of physical activity.[11] The present study participants were representative of the study schools and consistent with descriptions of alternative high school students nationally.[11,46] Other positive aspects of our study were that scales had acceptable to good reliability and the moderate-to-vigorous physical activity self-report measure was validated against accelerometer data.

However, the results must be viewed in light of the limitations. Our study was limited to a few schools in one metro/suburban area in the upper Midwest. Consequently, the results may not be generalizable to all alternative high school students in the United States. Only adolescent self-report was used, which may introduce shared method variance and social desirability.[47] A cross-sectional design does not allow for causal inferences or for an estimation of the test-retest reliability. In addition, our sample size was too small to conduct analyses to examine differences by ethnicity. The limited sample size may have masked our ability to find statistical significance.

In summary, partial mediation of the association between perceived barriers to physical activity and physical activity levels for girls suggests that in addition to individual-level psycho-social factors, the broader environment (eg, neighborhood safety, school physical activity resources) has an impact on moderate-to-vigorous physical activity. Given that for males, self-efficacy was not found to be a significant mediator for the association between perceived barriers to physical activity and physical activity underscores the importance of policies and programs to focus on broader environmental change to make engaging in

physical activity less difficult. Our study suggests that interventions should consider an ecological approach and focus on changing the school and community-level environments, while still paying heed to building youths' self-efficacy for engaging in physical activity.

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References

1. Yancey AK, Kumanyika SK. Bridging the gap. Understanding the structure of social inequities in childhood obesity. Am J Prev Med. 2007; 33:S172–S174. [PubMed: 17884564]
2. Giles-Corti B, Donovan RJ. The relative influence of individual, social and physical environment determinants of physical activity. Soc Sci Med. 2002; 54:1793–1812. [PubMed: 12113436]
3. Sallis JF, Simons-Morton BG, Stone EJ, Corbin CB. Determinants of physical activity and interventions in youth. Med Sci Sports Exerc. 1992; 24:S248–S257. [PubMed: 1625550]
4. Van Der Horst K, Paw MJ, Twisk JW, Van Mechelen W. A brief review on correlates of physical activity and sedentariness in youth. Med Sci Sports Exerc. 2007; 39:1241–1250. [PubMed: 17762356]
5. Zakarian JM, Hovell MF, Hofstetter CR, et al. Correlates of vigorous exercise in a predominantly low SES and minority high school population. Prev Med. 1994; 23:314–321. [PubMed: 8078852]
6. Eaton DK, Kann L, Kinchen S, et al. Youth risk behavior surveillance—United States, 2009. Morbidity and Mortality Weekly Report, CDC Surveillance Summaries. 2010; 59:1–142.
7. Brodersen NH, Steptoe A, Williamson S, Wardle J. Sociodemographic, developmental, environmental, and psychological correlates of physical activity and sedentary behavior at age 11 to 12. Ann Behav Med. 2005; 29:2–11. [PubMed: 15677295]
8. Gordon-Larsen P, McMurray RG, Popkin BM. Determinants of adolescent physical activity and inactivity patterns. Pediatrics. 2000; 105:E83. [PubMed: 10835096]
9. Miech RA, Kumanyika SK, Stettler N, et al. Trends in the association of poverty with overweight among US adolescents, 1971-2004. JAMA. 2006; 295:2385–2393. [PubMed: 16720824]
10. Kleiner, B., Porch, R., Farris, E. US Department of Education. Washington, DC: National Center for Education Statistics; 2002. Public alternative schools and programs for students at risk of education failure: 2000-01 (NCES 2002-004).
11. Grunbaum JA, Lowry R, Kann L. Prevalence of health-related behaviors among alternative high school students as compared with students attending regular high schools. J Adolesc Health. 2001; 29:337–343. [PubMed: 11691595]
12. Carver, PR., Lewis, L. US Department of Education, National Center for Education Statistics. Washington, DC: Government Printing Office; 2010. Alternative Schools and Programs for Public School Students At Risk of Educational Failure: 2007-08 (NCES 2010-026).
13. U.S. Department of Education, National Center for Education Statistics. Digest of Educa tion Statistics: 2010 (NCES 2011-015). 2001. Available at: http://nces.ed.gov/programs/digest/d10/tables/dt10_002.asp. Accessed April 20, 2011.
14. Sallis JF, Prochaska JJ, Taylor WC. A review of correlates of physical activity of children and adolescents. Med Sci Sports Exerc. 2000; 32:963–975. [PubMed: 10795788]
15. Bauman AE, Sallis JF, Dzewaltowski DA, Owen N. Toward a better understanding of the influences of physical activity. Am J Prev Med. 2002; 23:5–14. [PubMed: 12133733]
16. Brug J, Van Lenthe FJ, Kremers S. Revisiting Kurt Lewin. How to gain insight into environmental correlates of obesogenic behaviors. Am J Prev Med. 2006; 31:525–529. [PubMed: 17169715]

17. Bandura, A. Social Foundations of Thought and Action: A Social Cognitive Theory. Englewood Cliffs, NJ: Prentice-Hall; 1986.
18. Bandura, A. Guide for constructing self-efficacy scales. In: Pajares, F., Urdan, TC., editors. Self-efficacy Beliefs of Adolescents. Greenwich, CT: Information Age Publishing, Inc; 2006. p. 307-337.
19. Bandura, A. Self-efficacy: The Exercise of Control. New York, NY: W.H. Freeman and Company; 1997.
20. Bungum T, Pate R, Dowda M, Vincent M. Correlates of physical activity among africanamerican and caucasian female adolescents. Am J Health Behav. 1999; 23:25–31.
21. Dishman RK, Motl RW, Sallis JF, et al. Self-management strategies mediate self-efficacy and physical activity. Am J Prev Med. 2005; 29:10–18. [PubMed: 15958246]
22. Dishman RK, Saunders RP, Felton G, et al. Goals and intentions mediate efficacy beliefs and declining physical activity in high school girls. Am J Prev Med. 2006; 31:475–483. [PubMed: 17110077]
23. Dowda M, Dishman RK, Pfeiffer KA, et al. Family support for physical activity in girls from 8th to 12th grade in South Carolina. Prev Med. 2007; 44:153–159. [PubMed: 17157371]
24. Kahn JA, Huang B, Gillman MW, et al. Patterns and determinants of physical activity in U.S. adolescents. J Adolesc Health. 2008; 42:369–377. [PubMed: 18346662]
25. Hofstetter CR, Hovell MF, Sallis JF. Social learning correlates of exercise self-efficacy: early experiences with physical activity. Soc Sci Med. 1990; 31:1169–1176. [PubMed: 2274805]
26. Motl RW, Dishman RK, Saunders RP, et al. Examining social-cognitive determinants of intention and physical activity among black and white adolescent girls using structural equation modeling. Health Psychol. 2002; 21:459–467. [PubMed: 12211513]
27. Motl RW, Dishman RK, Saunders RP, et al. Perceptions of physical and social environment variables and self-efficacy as correlates of self-reported physical activity among adolescent girls. J Pediatr Psychol. 2007; 32:6–12. [PubMed: 16707779]
28. Motl RW, Dishman RK, Ward DS, et al. Comparison of barriers self-efficacy and perceived behavioral control for explaining physical activity across 1 year among adolescent girls. Health Psychol. 2005; 24:106–111. [PubMed: 15631569]
29. Motl RW, Dishman RK, Ward DS, et al. Perceived physical environment and physical activity across one year among adolescent girls: self-efficacy as a possible mediator? J Adolesc Health. 2005; 37:403–408. [PubMed: 16227126]
30. Lewis BA, Marcus BH, Pate RR, Dunn AL. Psychosocial mediators of physical activity behavior among adults and children. Am J Prev Med. 2002; 23:26–35. [PubMed: 12133735]
31. Prodaniuk TR, Plotnikoff RC, Spence JC, Wilson PM. The influence of self-efficacy and outcome expectations on the relationship between perceived environment and physical activity in the workplace. Int J Behav Nutr Phys Act. 2004; 1(1):7. [PubMed: 15169560]
32. Spence JC, Lee RE. Toward a comprehensive model of physical activity. Psychol Sport Exerc. 2003; 4:7–24.
33. Kubik MY, Davey C, Fulkerson J, et al. Alternative high school students: prevalence and correlates of overweight. Am J Health Behav. 2009; 33:600–609. [PubMed: 19296750]
34. Dishman RK, Motl RW, Saunders RP, et al. Factorial invariance and latent mean structure of questionnaires measuring social-cognitive determinants of physical activity among black and white adolescent girls. Prev Med. 2002; 34:100–108. [PubMed: 11749102]
35. Motl RW, Dishman RK, Trost SG, et al. Factorial validity and invariance of questionnaires measuring social-cognitive determinants of physical activity in adolescent girls. Prev Med. 2000; 31:584–594. [PubMed: 11071840]
36. Godin G, Shephard RJ. A simple method to assess exercise behavior in the community. Can J Appl Sport Sci. 1985; 10:141–146. [PubMed: 4053261]
37. Sallis JF, Buono MJ, Roby JJ, et al. Seven day recall and other physical activity self-reports in children and adolescents. Med Sci Sports Exerc. 1993; 25:99–108. [PubMed: 8423762]
38. Murray, DM. Design and Analysis of Group Randomized Trials. New York, NY: Oxford University Press; 1998.

39. Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. J Pers Soc Psychol. 1986; 51:1173–1182. [PubMed: 3806354]
40. Preacher, KJ., Leonardelli, GJ. Calculation for the Sobel test: an interactive calculation tool for mediation tests [Computer software]. Available at: http://www.quantpsy.org. Accessed September 19, 2009
41. Kubik MY, Lytle L, Fulkerson JA. Fruits, vegetables, and football: findings from focus groups with alternative high school students regarding eating and physical activity. J Adolesc Health. 2005; 36:494–500. [PubMed: 15901514]
42. Tappe MK, Duda JL, Ehrnwald PM. Perceived barriers to exercise among adolescents. J Sch Health. 1989; 59:153–155. [PubMed: 2716290]
43. Dishman RK, Motl RW, Saunders R, et al. Self-efficacy partially mediates the effect of a school-based physical-activity intervention among adolescent girls. Prev Med. 2004; 38:628–636. [PubMed: 15066366]
44. McAlister, AL., Perry, CL., Parcel, GS. How individuals, environments, and health behaviors interact: Social Cognitive Theory. In: Glanz, K.Rimer, BK., Viswanath, K., editors. Health Behavior and Health Education. San Francisco, CA: Jossey-Bass; 2008. p. 169-188.
45. Kumanyika S, Grier S. Targeting interventions for ethnic minority and low-income populations. Future Child. 2006; 16(1):187–207. [PubMed: 16532664]
46. Lehr, CA., Moreau, RA., Lange, CM., Lanners, EJ. Alternative Schools, Findings from a National Survey of the States. Minneapolis, MN: University of Minnesota, Institute on Community Integration; Available at: http://ici.umn.edu/alternativeschools/publications/. Accessed June 7, 2010
47. Jago R, Baranowski T, Baranowski JC, et al. Social desirability is associated with some physical activity, psychosocial variables and sedentary behavior but not self-reported physical activity among adolescent males. Health Educ Res. 2007; 22:438–444. [PubMed: 16987942]

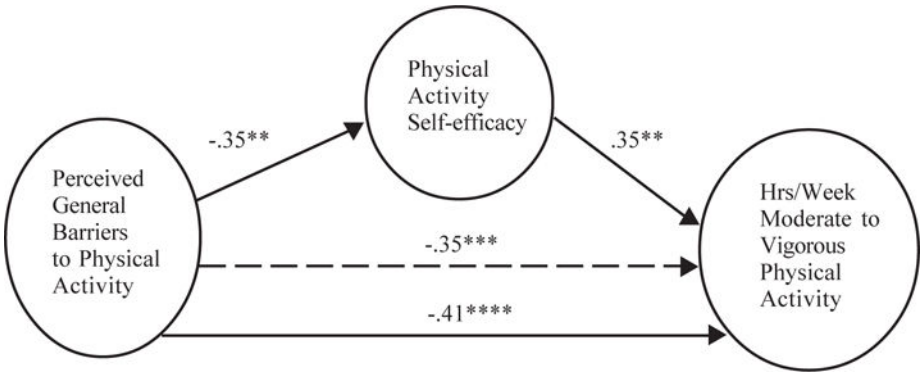

Figure 1.

Barriers to Physical Activity Predicting Physical Activity Mediated by Physical Activity Self-efficacy (Female Subsample)

**P <.01. ***P <.001. ****P <.0001

Note.

General Barriers scale included the following items: physical activity is boring; the weather is bad; I don't know how to do the physical activity that I want to do; I don't have a place to be physically active; I don't have time; and I don't have energy.

Table 1

Descriptive Statistics and T-test for the Variables of Interest, Whole Sample and by Gender (N = 145)

	Whole Sample (n = 145)				Females (n = 69)			Males (n = 76)			
Variables	**M**	**SD**	**Observed Range**	**Cronbach's Alpha**	**M**	**SD**	**Observed Range**	**M**	**SD**	**Observed Range**	**P**
General Barriers to PA	13.29	4.38	6-24	.79	14.52	4.26	6-23	12.17	4.22	6-24	.001
Personal Barriers to PA	11.53	4.75	5-26	.84	12.51	4.62	6-26	10.64	4.71	5-26	.018
School/Neighborhood Barriers to PA	8.19	3.72	4-17	.73	8.45	3.80	4-17	7.95	3.66	4-17	.419
PA Self-efficacy	21.44	4.00	6-30	.76	20.97	3.87	10-30	21.87	4.09	6-30	.178
Hrs/wk MVPA	5.99	4.06	0-12	.76	4.12	3.66	0-12	7.70	3.64	0-12	<.0001

Note.

M=mean; SD=standard deviation; PA=physical activity; MVPA=moderate-to-vigorous physical activity Possible range for the following variables: General Barriers to PA (6-30), Personal Barriers to PA (6-30), School/Neighborhood Barriers to PA (4-20), PA Self-efficacy (6-30), Hrs/wk MVPA (0-12).

Table 2

Correlations for the Variables of Interest, by Gender (N = 145)

	Correlations for Females				
	General Barriers to PA	**Personal Barriers to PA**	**School/Neighborhood Barriers**	**PA Self-efficacy**	**Hrs/wk MVPA**
General Barriers to PA	-.-	.54***	.21[a]	−.38**	−.51***
Personal Barriers to PA	.57***	-.-	.19	−.28*	−.25*
School/Neighborhood Barriers to PA	.62***	.53***	-.-	−.23[a]	−.18
PA Self-efficacy	−.47***	−.47***	−.37**	-.-	.42***
Hrs/wk MVPA	−.42***	−.37**	−.33**	.21[a]	-.-

[a] P < .10.

* P < .05.

** P < .01.

*** P < .001

Note.

Females are above, males are below.

PA=physical activity; MVPA=moderate-to-vigorous physical activity