

Do Perceived Cues, Benefits, and Barriers to Physical Activity Differ Between Male and Female Adolescents?

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ABSTRACT: A four-page survey was administered to 535 adolescents at two single-sex (one male, one female) high schools in Cincinnati, Ohio, to examine whether perceptions of physical activity differed by gender. More specifically, the survey assessed perceived cues, benefits, and barriers to exercising. Results indicated that the most helpful cue to physical activity for both female and male students was "having a friend to exercise with." The most commonly reported benefit of exercising among females was "to stay in shape," whereas the most commonly reported benefit to exercising among males was "to become strong." Among females, the most common barrier to exercising was "having no time to exercise," whereas males were most likely to report "wanting to do other things with my time." Multivariate analyses of covariance revealed that perceived cues, benefits, and barriers to physical activity differed significantly based on gender. Recommendations on specific strategies to increasing male and female adolescent physical activity levels are offered. (*J Sch Health.* 2002;72(9):374-380)

The three leading causes of death in the United States are coronary heart disease (CHD), cancer, and stroke.¹ Many behavioral risk factors associated with these diseases develop in childhood and persist into adolescence and adulthood.^{2,3} Fortunately, a sizeable percentage of premature deaths in these areas can be averted through healthy lifestyle changes, such as adoption of regular physical activity.^{4,5} Unfortunately, despite numerous awareness campaigns highlighting the benefits of regular physical activity, data suggest most adults and children are not active enough to positively affect their health.⁶ Nearly one-half of American youth aged 12 to 21 years are not vigorously active on a regular basis, meaning they do not engage in physical activity at least three times each week for at least 20 minutes per session which makes them sweat and breathe hard.⁷

Various studies demonstrate that promoting physical activity in children and adolescents increases youth activity and facilitates a carryover effect into adulthood.^{8,9} Adolescence is the period of development when the introduction of physical activity programs is most likely to be successful and sustained into adulthood.¹⁰ Therefore, efforts to increase physical activity have targeted this age group.^{5,7} Such strategies include school intervention, noncompetitive physical activity opportunities, and parental support.¹¹ Nevertheless, physical activity levels decline from childhood into adolescence. Decreases in physical activity occur during grades 9 through 12. In 1999, only 29% of students in grades 9 through 12 participated in daily school physical education.¹¹ To increase physical activity levels, it is important to determine adolescents' perceived benefits, barriers, and cues to engaging in physical activity.

Research has found that the most common reason for adolescent physical activity is enjoyment,¹² whereas the most common barrier is "wanting to do other things with one's time."¹³ Family members, peers, school programs, mass media, and organizational activities have been identified as common cues to engaging in physical activity.¹⁴ As adolescents get older, their amount of time spent in physical activity declines, especially among females.^{5,15} Such a

decline is significantly more profound among female than male adolescents regardless of whether the measure involves physical activity achieved through team sports, physical education class, or leisure time.¹¹ Studies are needed to identify potential reasons for differences in physical activity based on gender. This study was conducted to examine if perceived cues, benefits, and barriers to physical activity differed between male and female adolescents.

METHODS

Participants

A total of 249 male students from a private, all male school and 291 female students from a private, all female school served as participants in the study. Of these students, 245 males and 290 females completed usable surveys (N = 535; 99% response rate). The two schools chosen were private, single-sex high schools in Cincinnati, Ohio. Both schools had student populations mostly Caucasian and middle class.

Instrumentation

A four-page, 49-item questionnaire was developed using components of the Health Belief Model (HBM) to examine adolescents' perceptions of and involvement in physical activity. Three components of the HBM were used to develop three subscales (perceived cues to action, perceived benefits, perceived barriers) on the survey instrument. Each subscale consisted of 12 items that required students to respond by using a seven-point Likert-type scale (1 = strongly disagree, 7 = strongly agree). The final section of the survey contained 14 demographic and background questions. Two of the 14 background items assessed vigorous physical activity and moderate physical activity.

Vigorous physical activity was assessed by asking students to report how many of the past seven days they exercised for at least 20 minutes, causing them to sweat or breathe hard. Students were instructed to exclude any activity from physical education class. Moderate physical activity was defined on the survey instrument as physical activities such as fast walking, slow bicycling, skating, or pushing a lawn mower for at least 30 minutes each session. This activity should not make one sweat or breathe hard. After this operational definition, students then were asked to report how many of the past seven days they participated in moderate physical activity. The remaining 12 demo-

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graphic/background items required students to check the appropriate boxes or provide yes/no responses.

To establish content validity, the survey was sent to a panel of four experts in survey research and school health. Experts' comments were reviewed and incorporated into the final instrument. To ensure stability reliability, the survey instrument was administered to a convenience sample of 18 students on two separate occasions, seven days apart. Pearson-r correlation coefficients for individual subscales were .621 (cues), .744 (benefits), and .770 (barriers). To ensure internal consistency of the instrument, Cronbach alphas were determined for each of the three subscales: .803 (cues), .846 (benefits), and .900 (barriers).

Procedures

School board and school administration consent were each obtained for the study. Parental consent forms were distributed to students at each of the two schools. Students who returned signed forms before or on the day of the survey were permitted to participate. Teachers distributed surveys at the beginning of the class period in randomly selected homerooms. Each teacher read the same instructions to students on how to properly complete the survey. Confidentiality was ensured. Students signed a detachable consent form on the first page. Teachers placed completed surveys in a sealed envelope. All envelopes were subsequently distributed to the primary investigator. Once data were collected, analyses were performed using the SPSS statistical software package. To minimize the likelihood of a Type I error, the alpha level of significance was set at .05.

RESULTS

Approximately one-half the students were female (54%) and one-half were freshmen (49%) (Table 1). Most students (87%) had a friend who exercised, had a parent who exercised (59%), and had parental encouragement to exercise (62%). Almost one-half of the students surveyed (47%) were currently trying to lose weight or were currently enrolled in physical education classes (51%). Forty-five percent of students were members of school sports, and 53% were members of community sports.

Cues to Physical Activity

In response to the survey item, "What helps you (or would help you) to exercise?" both female and male high school students reported "having a friend to exercise with" as the most helpful cue to physical activity (Table 2). Other leading cues to physical activity among female high school students were "having a friend encourage me to exercise" and "seeing spring/summer clothes that you would like to buy." Other leading cues to physical activity among male high school students were "having organized physical activities outside of school" and "having a friend encourage me to exercise." Both female and male high school students reported "watching exercise on TV" as the least helpful cue to physical activity.

Multivariate analyses of covariance (MANCOVAs) were conducted to examine the effect of gender on respondents' scores for each cue to action. Results showed that perceived cues to physical activity differed significantly based on whether the respondent was male or female, $F(12, 508) = 10.17, p = .000$. Univariate F-tests conducted on individual

subscale items found females significantly more likely than males to feel that "having my parent(s) encourage me to exercise" $F(1, 519) = 9.92, p = .002$, "having a parent who exercises" $F(1, 519) = 23.05, p = .000$, "having a friend encourage me to exercise" $F(1, 519) = 13.51, p = .000$, "having a friend to exercise with" $F(1, 519) = 14.95, p = .000$, "being reminded of the health benefits of physical activity" $F(1, 519) = 6.24, p = .013$, and "seeing

Table 1
Demographic and Background
Characteristics of High School Students

Items	n ^a	(%) ^b
Gender		
Female	290	54
Male	245	46
Grade Level		
Freshman	264	49
Sophomore	75	14
Junior	46	9
Senior	147	28
Do you have a friend that exercises?		
Yes	465	87
No	66	12
Do you have a parent that exercises?		
Yes	313	59
No	218	41
Do you have a parent that encourages you to exercise?		
Yes	331	62
No	200	37
Are you currently trying to lose weight?		
Yes	247	46
No	284	53
Are you currently enrolled in a PE class?		
Yes	270	51
No	261	49
Are you a member of any school-sponsored sports teams?		
Yes	242	45
No	289	54
Are you a member of any community-sponsored sports teams?		
Yes	281	53
No	249	47

Data reflect those who responded to the items (missing values were excluded from the descriptive statistics).

^a N = 535 high school students

^b Some percentages do not total 100% due to rounding.

Table 2
High School Students'
Perceived Cues to Physical Activity^a

Female ^b M ^d (SD)	Male ^c M ^d (SD)
Having a friend to exercise with 6.36 (1.04)	Having a friend to exercise with 5.67 (1.58)
Having a friend encourages me to exercise 5.64 (1.15)	Having organized physical activities outside of school 5.41 (1.59)
Seeing spring/summer clothes that you would like to buy 5.50 (1.46)	Having a friend encourages me to exercise 4.83 (1.61)
Having organized physical activities outside of school 5.38 (1.31)	Having a parent who exercises 4.48 (1.76)
Having a parent who exercises 5.33 (1.26)	Being reminded of the health benefits of physical activity 4.43 (1.64)
Looking at myself in the mirror 4.90 (1.49)	Taking a physical education class in school 4.41 (1.90)
Having my parent(s) encourages me to exercise 4.67 (1.44)	Looking at myself in the mirror 4.35 (1.73)
Being reminded of the health benefits of physical activity 4.65 (1.35)	Seeing spring/summer clothes that you would like to buy 4.31 (1.95)
Reading about exercise in magazines 4.00 (1.52)	Having my parent(s) encourage me to exercise 4.30 (1.78)
Taking a physical education class in school 3.97 (1.57)	Seeing pictures of physically fit people in magazines or on TV 3.45 (1.94)
Seeing pictures of physically fit people in magazines or on TV 3.88 (1.76)	Reading about exercise in magazines 2.86 (1.67)
Watching exercise on TV 3.73 (1.51)	Watching exercise on TV 2.77 (1.65)

^a Participants were asked, "How strongly do you agree or disagree that each of the following is helpful in encouraging you to exercise outside of physical education class?"

^b N = 245 female high school students

^c N = 290 male high school students

^d Mean scores based on a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree)

spring/summer clothes that you would like to buy" $F(1, 519) = 45.42, p = .000$ were helpful cues to physical activity. Females also were significantly more likely than males to agree that "watching exercise on TV" $F(1, 519) = 41.00, p = .000$, "reading about exercise in magazines" $F(1, 519) = 47.76, p = .000$, and "seeing pictures of physically fit people in magazines or on TV" $F(1, 519) = 4.82, p = .029$, were helpful cues. Covariates controlled for included gender, grade level, days of vigorous activity per week, and days of moderate activity per week.

Benefits of Physical Activity

In response to the survey item, "What are the reasons you exercise or would consider exercising?" the three most likely benefits of physical activity among female high school students were "to stay in shape," "to lose weight," and "to increase my energy level" (Table 3). The three most likely benefits of physical activity among male high school students were "to become strong," "to stay in shape," and "to be competitive." Both female and male high school students reported "to be accepted by my friends" as the least likely benefit of physical activity.

MANCOVAs were conducted to examine the effect of gender on respondents' scores for each benefit of physical activity. Results showed that perceived benefits of physical activity differed significantly based on whether the respondent was male or female, $F(12, 508) = 16.81, p = .000$. Univariate F-tests on individual subscale items found females significantly more likely than males to view "to have fun" $F(1, 519) = 12.59, p = .000$, "to stay in shape" $F(1, 519) = 22.85, p = .000$, "to lose weight" $F(1, 519) = 65.40, p = .000$, "to improve my self-esteem (feel better about myself)" $F(1, 519) = 4.64, p = .032$, and "to reduce stress" $F(1, 519) = 9.88, p = .002$, as benefits of physical activity. Males were significantly more likely than females to view "to be competitive" $F(1, 519) = 6.03, p = .014$, "to become strong" $F(1, 519) = 24.37, p = .000$, and "to be accepted by my friends" $F(1, 519) = 6.72, p = .010$ as benefits of physical activity. Covariates controlled for included gender, grade level, days of vigorous activity per week, and days of moderate activity per week.

Barriers to Exercise

Participants were asked the question: "What are the reasons you do not exercise or would not consider exercising?" The three most likely barriers to physical activity among female high school students were "I do not have the time to exercise," "I want to do other things with my time," and "I am too tired." (Table 4). The three most likely barriers to physical activity among male high school students were "I want to do other things with my time," "I do not have the time to exercise," and "I am too tired." The least likely barrier to physical activity among female high school students was "I do not think exercise is important," whereas the least likely barrier to physical activity among male high school students was "I do not know how to exercise."

MANCOVAs were conducted to examine the effect of gender on respondents' scores for each barrier to physical activity. Results showed that perceived barriers to physical activity differed significantly based on whether the respondent was male or female, $F(12, 508) = 3.94, p = .000$. Univariate F-tests on individual subscale items found females significantly more likely than males to view

“having no time to exercise” as a barrier to physical activity. Males were significantly more likely than females to feel that “having no interest in exercising” $F(1, 519) = 11.82, p = .001$, “getting no enjoyment from exercising”

$F(1, 519) = 3.88, p = .049$, and believing that “exercise is unimportant” $F(1, 519) = 17.48, p = .000$, were barriers to physical activity. Covariates controlled for included gender, grade level, days of vigorous activity per week, and days of moderate activity per week.

Table 3
High School Students’
Perceived Benefits of Physical Activity^a

Female ^b M ^d (SD)	Male ^c M ^d (SD)
To stay in shape 6.27 (0.87)	To become strong 6.11 (1.36)
To lose weight 6.02 (1.38)	To stay in shape 5.84 (1.36)
To increase my energy level 5.50 (1.23)	To be competitive (enjoy competing with others) 5.68 (1.63)
To reduce stress 5.36 (1.33)	To increase my energy level 5.52 (1.42)
To improve my self-esteem (feel better about myself) 5.31 (1.46)	To become more physically attractive to others 5.38 (1.72)
To become more physically attractive to others 5.31 (1.56)	To do something active with other people 5.09 (1.59)
To become strong 5.30 (1.39)	For cardiovascular fitness (to protect my heart) 4.96 (1.67)
To do something active with other people 5.20 (1.31)	To improve my self-esteem (feel better about myself) 4.96 (1.76)
To have fun 5.20 (1.42)	To reduce stress 4.83 (1.73)
For cardiovascular fitness (to protect my heart) 4.97 (1.42)	To have fun 4.78 (1.79)
To be competitive (enjoy competing with others) 4.93 (1.55)	To lose weight 4.60 (2.04)
To be accepted by my friends 2.75 (1.64)	To be accepted by my friends 3.33 (1.93)

^a Participants were asked, “How strongly do you agree or disagree that each of the following is a reason why you exercise or would consider exercising?”

^b N = 245 female high school students

^c N = 290 male high school students

^d Mean scores based on a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree)

DISCUSSION

This study found that “having a friend to exercise with” was the most helpful cue to becoming involved in physical activity for both males and females. Similarly, Anderssen and Wold¹⁴ found that peers were one of the most common cues to action for adolescent physical activity. Young people are concerned with making social connections with peers and the role of friends in their lives.¹⁶ Thus, activities which use social reinforcers to physical activity may help adolescents to begin and maintain programs.

This study also found that females felt more strongly than males that “encouragement from friends” was an important cue for physical activity. Not surprisingly, one of the strongest predictors for physical activity levels among girls is having a best friend who is physically active.¹⁴ To increase physical activity levels, females appear to more readily acknowledge needing a support system of peers their own age. A “buddy system” in which adolescents monitor one another’s progress and provide support and motivation for physical activity may be especially helpful for females.

Consistent with previous studies^{12,14} “parental encouragement” and “having a parent who exercises” were cited as helpful cues for physical activity in this study. Parents need to become aware of the activity levels of their children and support their desire to be active. Many adolescents wish to become physically active but do not have a safe place to go to become physically active or lack the means to get to a safe place such as a Boys and Girls Club, YMCA, or local recreation center. Parents can provide their children with increased opportunities for activity by going to these facilities with their children. In so doing, the child would benefit from enhanced social support and positive parental role modeling while parents could benefit from their own involvement in physical activity. Parental involvement in children’s lives tends to correlate directly with an increase in positive health behavior by the child.¹⁷

According to Garcia and colleagues,¹⁸ exposure to role models who are physically active helps to establish positive social norms for exercise and provides support in remaining active. This effective strategy encourages increased exercise among both females and males throughout adolescence. Youth tend to view parents and peers as role models and sources of support and encouragement for physical activity.^{19,20} School programs may help to enhance positive parental role modeling by offering after-school physical activity programs for adults. Activities may include group walks before or after school, aerobics classes, building an exercise video library, or bringing in speakers to discuss physical activity and test indices.

According to a study conducted by the President’s Council on Physical Fitness and Sports,¹⁰ adolescent motivation to be physically active is shaped by many factors, including physical capabilities and sexual attractiveness. This finding was consistent with the current study’s finding that physical appearance was the primary adolescent motivation to exercise. Females in this study cited “staying in

Table 4
High School Students'
Perceived Barriers to Physical Activity^a

Female ^b M ^d (SD)	Male ^c M ^d (SD)
I do not have time to exercise 4.87 (1.72)	I want to do other things with my time 3.94 (1.93)
I want to do other things with my time 4.17 (1.81)	I do not have time to exercise 3.56 (1.86)
I am too tired 3.99 (1.80)	I am too tired 3.31 (1.96)
I am not motivated to exercise 3.60 (1.92)	I am not motivated to exercise 3.16 (2.06)
I do not have a place to go and exercise 3.44 (1.85)	I am not interested in exercising 2.97 (1.97)
I do not think that exercise will give me the results that I want 2.69 (1.60)	I do not enjoy exercising 2.86 (2.01)
I do not enjoy exercising 2.65 (1.67)	I do not think that exercise will give me the results that I want 2.81 (1.93)
I am not interested in exercising 2.55 (1.62)	I do not have a place to go and exercise 2.74 (1.85)
I think that exercise is too hard 2.42 (1.42)	I think that exercise is too hard 2.59 (1.81)
I do not know how to exercise 2.27 (1.44)	I do not think that exercise is important 2.53 (1.77)
I do not have a safe environment in which to exercise 2.25 (1.45)	I do not have a safe environment in which to exercise 2.53 (1.88)
I do not think exercise is important 1.86 (1.24)	I do not know how to exercise 2.16 (1.63)

^a Participants were asked, "How strongly do you agree or disagree that each of the following is a reason why you do not exercise or would not consider exercising?"

^b N = 245 female high school students

^c N = 290 male high school students

^d Mean scores based on a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree)

shape" and "weight loss" as the top two benefits of physical activity. According to Healthy People 2010,¹¹ weight management was the main benefit and reason for female involvement in physical activity. Data from the 1999 Youth Risk Behavior Surveillance Survey²¹ revealed that 67% of high school females exercised to lose weight or to avoid gaining weight, while only 8% were considered overweight (BMI > 95th percentile by age and gender). This finding compares to 50% of males who exercised to lose weight or avoid gaining weight and 12% of males who were considered overweight. Based on such findings, the need for extensive health education on body image, healthy dietary intake, and safe and appropriate weight loss strategies is needed. Programs underscoring the importance of maintaining a well-balanced and well-varied diet are encouraged. In a culture that daily promotes "quick fixes" and "magic bullets," accurate health information must be delivered. Consumer health information on how to make informed health decisions should be provided to adolescents.

Males in this study cited "becoming strong" and "staying in shape" as the top two benefits of physical activity. Prevalence of adolescent male strength training has increased in recent years.²¹ A sizeable percentage of high school males are taking nutrition supplements to increase lifting capabilities, strength, and size. This could be a reason why boys in this study perceived strength as the greatest benefit of physical activity. Since adolescent males are concerned with this issue, the potential dangers of using nutrition supplements should be addressed appropriately. Programs presenting information on the proper and safe way to strength train should be advocated as opposed to programs that promote "short cuts" and quick ways to "bulk up."

Based on this study, co-ed physical education classes should acknowledge the fact that males and females engage in physical activity for different reasons. It would be beneficial for physical education teachers to plan different activities for males and females, or plan activities for the entire class which will be positively received by both males and females. For example, students could spend the first half of the class engaged in competitive activities (to target male interests), and then pair off for the second part of the class to do activities with a classmate. Working in pairs would help to develop the network of social support ("having a friend to exercise with"), which is important for females. For example, one class period focuses on strength training (typically a male interest), while the next class period (the following day) focuses on how to use physical activity to reduce stress (typically a female interest).

Female physical education classes in private, single-sex schools should focus on activities to increase energy levels, reduce stress, and promote self-esteem. In this study, females cited these factors as some of the most likely benefits of physical activity. Male physical education classes in private, single-sex schools should focus on activities that are competitive, build strength, and increase energy. Males were least likely to agree that "I don't know how to exercise" was a reason they were not physically active. Therefore, male physical education classes should promote participation and play rather than focusing on the mechanics of activity. In short, a game of basketball or a lesson on power lifting may be interesting for males, but would not necessarily keep the interest of adolescent females.

Regarding barriers to exercise, Tappe and colleagues¹³ reported that the barrier most frequently cited by adolescents regarding physical activity was "wanting to do other things with their time." Females in this study perceived time as a significant barrier to physical activity. Physical education classes could be an effective way to reach and introduce a variety of activities to this age group. Since physical education class does not require any additional time out of the school day, it is an ideal forum to encourage physical activity. Students also cited "wanting to do other things with my time" as a barrier to physical activity. If physical education classes were created based on students' interests, as opposed to the interests of teachers and adults, students might be more willing to make time for physical activity.

Classes should focus on lifetime activities such as swimming, jogging, biking, or roller blading to establish a pattern of healthy behavior. Most high schools in the United States do not require students to take physical education for four years.²¹ In addition, only 5% of high schools nationwide require physical education classes to be taken in the junior or senior years.²² Physical education classes that meet daily throughout high school can help to establish a regular pattern of activity for the students. Meeting daily also may assist in introducing students to a wide range of activities, targeting varied interests and abilities.

Schools and local community centers are encouraged to offer programs after school and on weekends for students interested in becoming physically active, but not necessarily interested in playing only school sports. After-school and weekend activities could provide young people with alternatives to activities such as watching TV or playing video games. Males in this study cited "activities outside of school" as one of the most helpful cues to physical activity. This response likely includes organized team sports as well as more informal activities such as friends meeting to play football on Saturdays or starting a jogging club. Safe and easily-accessible places to engage in physical activities outside of the school sector are needed.

The limitations to this study should be noted. First, the sample of high school students was obtained from two private, single-sex schools in Cincinnati, Ohio. Caution should be exercised in making any attempts to extrapolate findings to individuals of other ages or students in other geographic settings. Second, the student population of each school was predominantly Caucasian. Thus, findings from this study may not be generalizable to students of different races or ethnicities. Third, all data were self-reported, thus the potential for socially desirable responses exists. Fourth, the monothematic nature of the survey may have caused a response set bias in some respondents.

RECOMMENDATIONS

The following recommendations are offered to assist school and community health professionals interested in increasing physical activity among adolescents.

1) Encourage adolescents to become involved in group activities and activities emphasizing the social benefits of physical activity.

2) Encourage adolescents, especially females, to develop a "buddy system" in which peers motivate, support, and encourage one another to remain physically active.

3) Encourage parents to serve as positive role models of

physical activity by becoming active.

4) Develop school physical activity programs that address adolescents' most strongly perceived benefits of physical activity, such as enhanced strength and safe and effective weight loss.

5) As a means to increase female physical activity levels, design strategies that focus on activities to increase energy levels, reduce stress, and promote self-esteem.

6) As a means to increase male physical activity levels, design strategies that focus on activities that are competitive, build strength, and increase energy.

7) Promote lifelong physical activities in physical education classes, thus helping to establish an early pattern of exercising behavior that can persist into the adult years.

8) Schools and community centers should offer programs after school and on weekends for students interested in becoming physically active, but not necessarily interested in participating solely in school sports.

9) Future studies should examine whether potential differences in benefits, barriers, and cues differ based on current exercise involvement. ■

References

- Centers for Disease Control and Prevention. Leading causes of death and numbers of deaths: United States, 1980 & 1998. *National Vital Statistics Reports*. 2000. Available at: <http://www.cdc.gov/nchs/data/nvsr>.
- Freedman DS, Dietz WH, Srinivasan SR, Berenson GS. The relation of overweight to cardiovascular risk factors among children and adolescents: The Bogalusa Heart Study. *Pediatrics*. 1999;103:1175-1182.
- Mahoney LT, Lauer RM, Lee J, Clarke WR. Factors affecting tracking of coronary heart disease risk factors in children: The Muscatine Study. *Ann NY Acad Sci*. 1991;623:120-132.
- National Center for Health Statistics. Prevalence of overweight and obesity among adults: United States, 1999. *National Health and Nutrition Examination Survey (NHANES)*. 2000. Available at: <http://www.cdc.gov/nchs/products/pubs/pubd/hestat/obese/obse99.htm>.
- Sallis JF, Patrick K. Physical activity guidelines for adolescents: consensus statement. *Pediatr Exerc Sci*. 1994;6:303-313.
- Biddle S, Goudas M. Analysis of children's physical activity and its association with adult encouragement and social cognitive variables. *J Sch Health*. 1996;66(2):75-81.
- US Dept of Health and Human Services. *Physical Activity and Health: A Report of the Surgeon General*. Atlanta, Ga: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion; 1996.
- Barnekow-Bergkvist M, Hedberg G, Janiert U, Jansson E. Physical activity patterns in men and women at the ages of 16 and 34 and development of physical activity from adolescence to adulthood. *Scand J Med Sci Sports*. 1998;6:359-370.
- Sallis JF, Simons-Morton BG, Stone EJ, et al. Determinants of physical activity and interventions in youth. *Med Sci Sports Exerc*. 1992;24:S248-S257.
- President's Council on Physical Fitness and Sports. Adolescence: A 'risk factor' for physical inactivity. *President's Council on Physical Fitness and Sports Research Digest*. 1999;3.
- US Dept of Health and Human Services. *Healthy People 2010*, conference edition. Washington, DC: January 2000.
- Stucky-Ropp MA, DiLorenzo TM. Determinants of exercise in children. *Prev Med*. 1993;22:880-889.
- Tappe MK, Duda JL, Ehrwald PM. Perceived barriers to exercise among adolescents. *J Sch Health*. 1989;59(4):153-155.
- Anderssen N, Wold B. Parental and peer influences on leisure-time physical activity in young adolescents. *Res Q Exerc Sport*. 1992;63:341-348.
- Sallis JF, Prochaska JJ, Taylor WC. A review of correlates of physical activity of children and adolescents. *Med Sci Exerc Sport*. 2000;32:963-975.
- Cotterell J. *Social Networks and Social Influences in Adolescence*. New York, NY: Routledge; 1996.
- Scales PC, Leffert N. *Developmental Assets. A Synthesis of the*

18. Garcia AW, Broda MN, Frenn M, Covial C, Pender NJ, Ronis DL. Gender and developmental differences in exercise beliefs among youth and prediction of their exercise behavior. *J Sch Health*. 1995;65(6):213-219.

19. Johnson J, Deshpande C. Health education and physical education: disciplines preparing students as productive, healthy citizens for the challenges of the 21st century. *J Sch Health*. 2000;70(2):66-68.

20. Vilhjalmsson R, Thorlindsson T. Factors related to physical activity: a study of adolescents. *Soc Sci Med*. 1998;47:665-675.

21. Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance - United States, 1999. *MMWR*. 2000;49(SS05):1-96.

22. Burgeson CR, Wechsler H, Brener ND, Young JC, Spain CG. Physical education and activity: Results from the School Health Policies and Programs Study 2000. *J Sch Health*. 2001;71(7):279-293.

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- ◆ The Rodwell Dart Memorial Foundation, Alpenblick B10, 747 Galena, Aspen, CO 81611

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