



Published in final edited form as:

J Sch Health. 2008 June ; 78(6): 314–320. doi:10.1111/j.1746-1561.2008.00308.x.

Black, Hispanic, and White Girls' Perceptions of Environmental and Social Support and Enjoyment of Physical Activity

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Abstract

Background—This study examines the differences among black, Hispanic, and white adolescent girls in their perceptions surrounding physical activity (PA), including support within the school climate, friend and family social support, and personal enjoyment.

Methods—Participants included 1466 sixth-grade girls from 36 middle schools across the United States. Participants were 20% black, 21% Hispanic, 47% white, and 12% of other or mixed races. Multivariate analyses were performed on each scale, adjusting for body mass index and free and reduced-price lunch status.

Results—Results showed racial differences on several variables. Black girls, compared with white girls, perceived significantly lower PA enjoyment ($p < .001$) and teacher support for PA ($p = .004$). Hispanic girls experienced less PA enjoyment ($p = .003$) and perceived less support for PA from boys ($p = .001$) and their families ($p = .008$) than white girls. Black girls reported significantly higher levels of physical education (PE) enjoyment than did white girls ($p = .003$).

Conclusions—Differences in perceived PA support and enjoyment across race raise questions about why these differences exist and how best to address disparities within interventions.

Keywords

adolescent girls; ethnicity; physical activity; social support

Literature Review

Physical activity (PA) is important for obesity prevention and overall health promotion. According to data obtained in the 2003-2004 National Health and Nutrition Examination Survey, 32% of adolescent girls were overweight or at risk of overweight.¹ Only 28% of female high school students met the current recommended levels of PA (increased heart rate for a total of at least 60 minutes per day on at least 5 of the last 7 days).² A national study of sixth-grade girls found that only 24 minutes were spent daily in moderate to vigorous PA.³

While obesity and low levels of PA are problems affecting both adolescent girls and boys, there are gender-specific issues of great concern facing girls. During adolescence, girls experience higher levels of inactivity and a steeper decline in PA than boys do.^{4,5} Data from the 2003 Youth Risk Behavior Surveillance Survey found that vigorous PA in girls declined about 30% between 9th and 12th grades.⁶ Girls are less likely to participate on organized sports teams than boys, which may, in part, contribute to this decline.⁵ In addition, girls have lower self-esteem and view themselves as less athletic than boys.⁷ Activity levels of adolescent girls also vary with ethnicity. Moderate and vigorous PA is higher among white adolescent girls than Hispanic and black adolescent girls, and there is a greater prevalence of inactivity among black and Hispanic girls than among white girls.⁸⁻¹⁰ The decline in PA has been shown to be greater in black girls compared with white girls.¹¹ These data suggest the importance of learning more about factors correlated with PA among adolescent girls and possible differences across race.

The association of social support, particularly peer and family, and PA levels in adolescents is well established.¹²⁻¹⁸ Increased enjoyment has also been linked to increased PA levels in an intervention study of high school girls.¹⁹ Since there are differences in overall PA levels across ethnicities, it may also be that there are differences in relevant correlates of PA, such as social support and enjoyment of PA. Previous studies have lacked the large and diverse sample size needed to look at these differences.

Furthermore, adolescent girls' perceptions of support for PA in the school environment (ie, school climate) may be particularly important because most adolescents spend significant time at school and many opportunities for PA (such as physical education [PE] and school-based sports and activities) take place within the school setting. PE class in particular is an important contributor to total PA: a study found that PE accounts for 11% of the total daily steps taken for sixth-grade girls.²⁰ There is also some evidence that general school climate affects students' health behaviors in the areas of tobacco and alcohol use and violence.²¹⁻²³ However, there has been little research on student perceptions of school climate regarding PA. To address this gap, a PA school climate scale for adolescent girls was developed for this study.²⁴

The purpose of this investigation was to examine black, Hispanic, and white girls' perceptions of support for PA within the school (school climate), enjoyment of PA and PE, and social support for PA. Understanding these factors is important especially at the middle school level, which is a crucial habit- and perception-forming time, and will assist practitioners and interventionists in helping to meet the various needs of diverse groups of middle school girls. The identification of similarities or differences across race may help in designing PA interventions that are relevant for girls from different backgrounds.

Methods

This is a cross-sectional examination of data from girls recruited from 36 schools participating in the Trial of Activity for Adolescent Girls (TAAG), a multicenter group-randomized trial designed to test an intervention to reduce the usual decline in moderate to vigorous PA in

middle school girls.²⁵ TAAG has 6 field centers (at the Universities of Arizona, Maryland, Minnesota, and South Carolina; San Diego State University; and Tulane University), a coordinating center (at the University of North Carolina, Chapel Hill), and a project office at the National Heart, Lung, and Blood Institute.

Each field center recruited 6 TAAG schools (n = 36) according to the following criteria: (1) public schools with the majority of the student population living in the surrounding community, (2) yearly withdrawal rates of less than 28%, (3) at least 90 eighth-grade girls, and (4) requirement of at least 1 semester of PE for each grade.²⁶ Total enrollment of TAAG schools ranged from 613 to 1777. Percent of nonwhite students ranged from 5% to 99%.

Subjects

At each of the 36 TAAG middle schools, 60 girls were randomly selected and recruited to participate in TAAG baseline measures. A girl was ineligible to participate if (1) she could not read or speak English, (2) a doctor had told her to avoid exercise for health reasons, or (3) she had a medical condition that could cause her to have an adverse reaction to a fitness test. An ineligible girl was replaced with another randomly chosen girl. All girls were in sixth grade during the 2002-2003 school year. Institutional Review Board approval was obtained at each field center.

Of the 2160 girls invited to participate in TAAG, 1721 (80%) returned written parental consent and student assent. A total of 1466 (68%) had complete data that were used in these analyses. Consent return rates varied by school from 58% to 93%. Data were collected at the beginning of the study (January to May 2003) when participants were in sixth grade and prior to randomization of the schools into intervention and control groups.

Instruments and Procedures

Data collectors from each field site were trained on the TAAG measurement protocol at a centralized training location. To collect data, personnel needed to demonstrate correct data collection procedures in a certification process. These centrally trained personnel also were able to train and certify other data collectors at their field sites. Certification on height and weight required agreement of less than 0.5 kg for weight and 1 cm for height on 5 of 6 individuals measured by the data collector and the trainer “expert.” Interobserver reliability was ensured during the data collection by having 2 data collectors measure every 20th girl. If the agreement was not in the above parameters, retraining and recertification were required to continue to collect data.

Body Mass Index—Height and weight were each taken twice and averaged to calculate body mass index (BMI) (kg/m²). Weight was measured to the nearest 0.1 kg on an electronic scale (model 770; Seca, Hamburg, Germany). Height was measured to the nearest 0.1 cm using a portable height board (Shorr Height Measuring Board, Olney, MD). Participants were considered at risk for overweight or overweight if their BMI was equal to or greater than age- and sex-specific 85th percentiles determined by Centers for Disease Control and Prevention growth charts.²⁷

Demographic Variables—Each participant completed a self-report questionnaire that included items on race/ethnicity, parental education levels, and participation in the school free or reduced-price lunch program. From a list including white, black, Hispanic, Asian/Pacific Islander, American Indian, and other, participants were asked to check as many categories as applied. For this analysis, participants were grouped into black, white, Hispanic, and other. Due to the small sample size, “other” includes Asian/Pacific Islander, American Indian, and participants who indicated more than 1 race.

Perceived School Climate for Girls' PA—Girls' perceptions of support (from teachers and peers) for PA were measured using a scale adapted from the Physical Education Program Improvement and Self-Study²⁸ and TAAG formative assessment. Confirmatory factor analyses using structural equation modeling indicated 2 distinct subscales: perceived support for girls' PA from teachers (n = 2 items, reliability = 0.59) and from boys (n = 3 items, reliability = 0.56).²⁴ Perceived support from other girls was assessed by an additional item (kappa = .34). Participants rated each item on a 5-point Likert-type scale ranging from disagree a lot (1) to agree a lot (5). Scales were scored by computing the weighted sum of greater than 75% nonmissing scale items. This scale is shown in Table 1.

PE and PA Enjoyment—Enjoyment of PE was assessed by a 5-point Likert-type item anchored by 1 (disagree a lot) to 5 (agree a lot). The specific wording was used in a previous study with adolescent girls.²⁹ PA enjoyment was assessed by 7 items on a 5-point Likert-type scale ranging from 1 (disagree a lot) to 5 (agree a lot) as shown in Table 1 ($\alpha = 0.84$).³⁰

Social Support for PA—Friend support during a typical week was measured by a 3 item 5-point Likert-type scale ranging from 1 (none) to 5 (every day) ($\alpha = .79$). Family support for PA in a typical week was assessed using a 5 item 5-point Likert-type scale ($\alpha = .81$) as shown in Table 1.

Data Analysis

Descriptive statistics were calculated for sociodemographic variables, BMI, perceived school environmental factors, enjoyment of PE and PA, and social support. Negatively phrased items were reverse scored so that a higher score reflects a more positive perception. Data were analyzed using the general linear mixed model with random effects for school and site to account for the correlation of responses among girls attending the same school and the aggregate response among schools in the same geographic region. In univariate analyses, each of perceived environmental and social support scores was regressed separately on each potential independent variable. In multivariate analysis, the perceived environmental and social support scores were regressed simultaneously on the set of potential predictor variables judged to be potentially important in univariate analyses (BMI, race, and girl-level free-reduced lunch). BMI was treated as a continuous variable. Analyses were done with free-reduced lunch as a 3-level variable (yes, no, don't know); however, since there were no significant differences between "no" and "don't know," items were collapsed into 2 levels (yes, no/don't know). We report overall test results at a significance level of $p \leq .05$. We report multiple tests (comparing the white group to the black, Hispanic, and other groups) with a Bonferroni correction of $\alpha = .05/3 = .017$. All data were analyzed using the SAS version 8.2 (SAS Institute, Cary, NC).

Results

Demographics

The mean age of participants was 12.0 years (SD = 0.52). The racial/ethnic breakdown of the sample was 46.6% white, 21.2% Hispanic, 20.4% black, and 11.8% mixed or other races. Forty-one percent reported receiving free or reduced-price lunch.

BMI and receipt of free and reduced lunch differed across race/ethnic group ($p < .001$), as shown in Table 2. Black and Hispanic girls had significantly higher BMI than did white girls. Forty-three percent of black girls and 40% of Hispanic girls were at risk of overweight or overweight, compared with 25% of white girls. Black and Hispanic girls were also more likely to be receiving free or reduced lunch. Therefore, further analyses were adjusted for BMI and receipt of free and reduced lunch.

Perceived School Climate for Girls' PA, PA and PE Enjoyment, and Social Support—Overall, this sample of sixth-grade girls responded positively when asked about support for PA from teachers and boys in the school, PA and PE enjoyment, and friend and family support (Table 1). In all these items, the mean score was higher than the midpoint (neutral) of the scales. However, support from other girls was slightly below the midpoint (2.4 on a 5-point scale).

Table 3 shows items adjusted for BMI, free and reduced-price lunch status, school, and site. Unadjusted means are not shown here because they are statistically similar to the adjusted means.

When compared with white girls, black girls perceived significantly lower levels of teacher support and PA enjoyment ($\alpha = .017$, $p = .004$ and $p < .001$, respectively). However, black girls reported significantly higher levels of PE enjoyment than did white girls ($\alpha = .017$, $p = .003$). Hispanic girls perceived lower levels of boy support, PA enjoyment, and family support than did white girls ($\alpha = .017$, $p = .001$, $.003$, and $.008$ respectively).

There were no significant differences between racial groups in perceptions of other girls' support of PA or in friend support of PA. In addition, there were no interactions between race and BMI (analysis not shown) on any of these items.

Discussion

The current study examined and compared black, Hispanic, and white girls' perceptions of support for PA within the school (school climate), enjoyment of PA and PE, and social support for PA. The analysis shows some racial/ethnic differences in girls' perceptions of support and enjoyment of PA. These findings raise questions about the reasons for these differences and have implications for the development of PA interventions that are relevant to middle school girls from different backgrounds.

We controlled for school and site in all analyses, which eliminates structural differences that may be a result of school demographics. Therefore, according to this investigation, even within a school, black and Hispanic girls perceive less social support for PA from within their environments—specifically from teachers and boys—than white girls do. There are 2 possible explanations for the racial differences regarding support: (1) within a school, black and Hispanic girls are actually encouraged less regarding PA than white girls are or (2) there are no actual differences within a school, but black and Hispanic girls perceive less support for PA than white girls do. In the first scenario, there could be differences in how teachers and boys relate to students of different backgrounds, while the second scenario could indicate some general cultural differences in how girls view or relate to teachers and boys, with white girls perceiving more support. Interestingly, there were no racial/ethnic differences in how girls perceived support for PA from their friends or from other girls within the school, which may indicate fewer cultural differences when relating to other girls.

It seems contradictory that black girls report lower PA enjoyment, yet greater enjoyment from PE classes than white girls. These results concur with a study in South Carolina which found that black eighth-grade girls reported greater PE enjoyment than their white counterparts, even though they had higher BMIs.³¹ Perhaps PE enjoyment is less about the enjoyment of PA than about the fun of being with friends in a less structured atmosphere. Or perhaps there is something about the social interaction or curriculum of PE class—rather than PA in general—that has a greater appeal to black girls than to girls of other racial groups. Black girls also perceived lower teacher support for PA than did white girls. Another analysis using TAAG data found that perceived support for girls' PA from teachers and peers was associated with

girls' enjoyment of PE.³² While the current study did not look at the relationship between support and PE enjoyment, it seems contradictory that black girls would report greater PE enjoyment while perceiving lower support for PA within the school environment. Perhaps African American girls find PE to be a more supportive place regarding PA, when compared with the general school environment, which may include after school programs.

Strengths of this study include the large and diverse sample from different regions across the country. This study also looks at different measures of social support for PA, including perceived support from groups within the school setting (ie, teachers and peers), in addition to friend and family support. Another study found that perceived support of teachers, friends, and peers was a strong predictor of change in PA levels among inactive adolescent girls.¹⁷

Study limitations include the use of self-report data. Participants were aware that researchers were interested in PA and as a result might have responded more positively than they otherwise would have. In addition, some measures used in this study were less extensive than others. For example, PE enjoyment and girls' support of PA were each measured with 1-item scales.

Conclusions

Findings from the current study indicate that, when compared with white girls, black and Hispanic girls report lower levels of support for PA within the school setting and PA enjoyment, although black girls report greater PE enjoyment than white girls. In addition, black and Hispanic girls perceived lower levels of school environmental support for PA than did white girls. Because girls spend much of their time in the school setting, attention should be given to encourage individuals there to be more supportive of girls' PA—particularly for black and Hispanic girls. These results indicate that black and Hispanic girls may need additional encouragement and modeling of PA, particularly in the school setting, whether or not these differences are based on reality. Since social support is a key predictor of activity levels, it is important to better understand how to create environments that girls of all races will perceive as supportive, in order to, ultimately, address disparities in PA.

Acknowledgments

Supported by National Heart, Lung, and Blood Institute (NHLBI) grants U01HL66845, U01HL66852, U01HL66853, U01HL66855, U01HL66856, U01HL66857, and U01HL66858: TAAG.

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Table 1
School Climate, Enjoyment, and Social Support Items

| Scale | Mean (SD) | Range (Actual and Potential) |
|--|------------|------------------------------|
| Perceived School Climate for Girls' PA | | |
| Support from teachers* | 7.8 (2.4) | 2.0-10.0 |
| 1. In my school, PE teachers act like they think it is more important for boys to be physically active than girls | | |
| 2. In my school, most other teachers act like they think it is more important for boys to be physically active than girls | | |
| Support from boys* | 9.9 (3.3) | 3.0-15.0 |
| 1. In my school, boys make rude comments around girls who are being physically active | | |
| 2. In my school, being physically active around boys makes me uncomfortable | | |
| 3. In my school, boys stare too much at girls who are being physically active | | |
| Support from other girls* | 2.4 (1.2) | 1.0-5.0 |
| 1. In my school, most girls think it is important to be physically active | | |
| PE enjoyment | 4.1 (1.1) | 1.0-5.0 |
| 1. I enjoy PE | | |
| PA enjoyment* | 30.5 (5.6) | 7.0-35.0 |
| When I am active ... | | |
| 1. I feel bored | | |
| 2. I dislike it | | |
| 3. It's no fun at all | | |
| 4. It makes me depressed | | |
| 5. It frustrates me | | |
| 6. It's not at all interesting | | |
| 7. I feel as though I would rather be doing something else | | |
| Social support (friends) | 9.2 (2.8) | 3.0-15.0 |
| During a typical week, how often ... | | |
| 1. Do your friends encourage you to do physical activities or play sports? | | |
| 2. Do your friends do physical activity or play sports with you? | | |
| 3. Do your friends tell you that you are doing well at physical activities or sports? | | |
| Social support (family) | 17.0 (4.4) | 5.0-25.0 |
| During a typical week, how often has a member of your household (eg, your father, mother, brother, sister, grandparent, or other relative) ... | | |
| 1. Encouraged you to do physical activities or play sports? | | |
| 2. Done a physical activity or played sports with you? | | |
| 3. Provided transportation to a place where you can do physical activities or play sports? | | |
| 4. Watched you participate in physical activities or sports? | | |
| 5. Told you that you are doing well in physical activities or sports? | | |

* Items were reversed scored so that a higher score corresponds with a more positive perception.

Table 2

BMI and Free and Reduced-Price Lunch Status by Race

| | Overall Test of Equality for 4 Racial Groups (p Value) | White (n = 683) | Black (n = 299) | Hispanic (n = 311) | Other (n = 173) |
|---|--|-----------------|-----------------|--------------------|-----------------|
| Mean BMI (standard error) | <.001 | 19.7 (0.18) | 22.1* (0.27) | 21.6* (0.26) | 20.3 (0.35) |
| Receiving free or reduced-price lunch (% within racial group) | <.001 | 140 (20.5) | 202* (67.6) | 174* (56.0) | 88* (50.9) |

* Significantly different from white at $\alpha = .017$.

Table 3
Girls' Perceptions of PA Support and Enjoyment: Adjusted Means by Race*

| | Overall Test of Equality for 4 Race Groups (p Value) | White (n = 683), Mean (SE) | Black (n = 299), Mean (SE) | Hispanic (n = 311), Mean (SE) | Other (n = 173), Mean (SE) |
|----------------------|--|----------------------------|----------------------------|-------------------------------|----------------------------|
| Teachers' support | .015 | 8.0 (0.13) | 7.4 (0.18) [†] | 7.8 (0.17) | 8.1 (0.20) |
| Boys' support | .003 | 10.3 (0.27) | 9.7 (0.32) | 9.5 (0.31) [†] | 9.5 (0.34) [†] |
| Other girls' support | .803 | 2.4 (0.07) | 2.4 (0.09) | 2.4 (0.09) | 2.3 (0.11) |
| PA enjoyment | .002 | 31.2 (0.29) | 29.7 (0.39) [†] | 29.9 (0.37) [†] | 30.3 (0.46) |
| PE enjoyment | .019 | 4.1 (0.06) | 4.3 (0.09) [†] | 4.1 (0.08) | 4.1 (0.10) |
| Friend support | .075 | 9.3 (0.11) | 8.8 (0.17) | 9.3 (0.16) | 9.0 (0.22) |
| Family support | .001 | 17.4 (0.28) | 16.8 (0.36) | 16.6 (0.34) [†] | 16.0 (0.40) [†] |

SE, standard error.

* Within racial groups, means are adjusted for BMI and free and reduced lunch status.

[†] Significantly different from white at $\alpha = .017$ (Bonferroni correction).