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Sociocultural Determinants of Physical Activity among Children[1]

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Background. **This study explores underresearched sociocultural predictors of children's physical activity and fitness, with particular attention paid to the influence of ethnicity independent from potential confounders such as social class.**

Methods. **Utilizing a 1997/1998 cross-sectional sample of 107 children (ranging in age from 6.5 to 13 years, mean = 10 years) participating in a longitudinal study of childhood obesity in Birmingham, Alabama, predictors of television viewing, vigorous exercise, habitual physical activity, exercise in school P.E. classes, sports team participation, and maximal aerobic capacity were identified, utilizing multiple regression analyses.**

Results. **The results indicated few ethnic differences in childhood physical activity once characteristics such as social class and single vs dual parent family background were controlled for. Specific multivariate findings included higher levels of television viewing and vigorous exercise among children from single parent homes; lower habitual physical activity among girls; less P.E. exercise among African Americans and children from single parent homes; higher sports team participation among older yet physically immature children; and higher physical fitness among boys, Caucasians, physically mature children, and children from single parent homes.**

Conclusions. **This study illustrates the multidimensional nature of childhood physical activity and the influence of sociocultural factors on children's activity patterns.**

Key Words: **physical activity; physical fitness; exercise; television; children.**

INTRODUCTION

Levels of physical activity among children are highly variable, and few consistent correlates have been identified. The lack of identification of predictors of childhood activity is alarming, given the argument that childhood exercise patterns extend into adulthood [*1*,*2*] and, subsequently, exert a strong influence on disease risk later in life. Even in childhood, linkages between physical activity and early disease indicators such as obesity [*3*,*4*], cardiorespiratory fitness [*5*], and blood pressure [*5*] have been identified. The short- and long-term relationships between activity and health suggest the necessity of identifying determinants of physical activity among children in order to better inform current research on children's physical activity patterns and to guide intervention programs directed at activity promotion.

A typology useful in understanding the multitude of factors which may influence children's physical activity patterns, modified from Kohl and Hobbs' classification [*6*], considers determinants at four levels: the physiological level, including factors such as maturation and growth, the psychological level, including motivation, self-efficacy, and sense of control, the sociocultural level, including family characteristics, sociodemographics, and role models, and the ecological level, including the availability of facilities for activity, physical safety, and climate. Interestingly, the majority of previous research exploring determinants of physical activity among children has focused on the psychological factors [*7–10*], while broader sociocultural or ecological determinants have received little attention, despite their potential to influence children's activity patterns through the provision of opportunities for exercise. With the exception of gender, age, and ethnicity, few sociocultural determinants of children's activity patterns or levels of aerobic fitness have been identified.

Regardless of the measurement, previous research typically demonstrates higher activity levels [*3*,*5*,*11–*

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16], sports team participation [*5,17*], and physical fitness [*16*] for boys. In addition, older children consistently report less physical activity than younger children [*5,18,19*] although this relationship may be more pronounced among females, suggesting an interaction between age and gender [*18–20*]. However, few previous studies have examined the effects of age independent from puberty, suggesting a need for further research on the behavioral impact of both puberty and age.

Ethnicity is an additional factor presumed to influence physical activity among children, with levels being higher among Caucasian than African American or Hispanic children in terms of self-reported activity [*13,14,17,21*] and physical fitness [*22,23*]. However, the potentially confounding influence of social class is an important caveat in the relationship between ethnicity and physical activity. It is likely that much of the statistical influence of ethnicity on physical activity is actually due to the disproportionately lower socioeconomic status of racial and ethnic minorities. The possibly underlying influence of social class is suggested by several studies reporting an inverse relationship between socioeconomic background and physical activity and fitness [*24–27*].

In short, the influence of broad sociocultural factors on children's levels of physical activity and fitness has been underresearched, despite their potential to impact a number of dimensions of physical activity. Thus, the goal of the current study is to identify sociocultural determinants of physical activity and fitness among children. In addition to exploring underresearched sociocultural factors and considering physical activity a multidimensional concept with various components, unique contributions of this study include addressing the impact of ethnicity independent from social class background and distinguishing the separate effects of age and pubertal development on aspects of childhood physical activity.

METHODS

Subjects

The data for this research were derived from an ongoing, longitudinal study of childhood obesity in Birmingham, Alabama. Approximately 120 healthy African American and Caucasian children, recruited through advertisements, flyers, and word of mouth, currently participate in the study. The average age at initial enrollment is 7 years, and the children are followed for 5 years. Most children are currently in year 2 or 3 of the study, with ages ranging from 6.5 to 13 years ($\bar{\times} = 10$ years). The children represent a wide range of body sizes and activity levels. The protocol includes a yearly overnight visit to the General Clinical Research Center (GCRC). Data are collected on anthropometrics, resting energy expenditure, sociodemographic background, dietary intake, and habitual physical activity. Two weeks after the GCRC visit, the children undergo further testing at the Department of Nutrition Science, at which time data on aerobic fitness and body composition are gathered. The analyses in the current study are cross-sectional, with the sample including children who participated in testing during the 1997/1998 school year and for whom complete data on all physical activity variables were obtained ($n = 107$). The study was approved by the University of Alabama at Birmingham Institutional Review Board for human use, and informed consent was obtained from all subjects before testing.

Measurement of Variables

Independent variables. Sociocultural and physiological predictors of activity considered in this analysis were gender (0 = males, 1 = females), ethnicity (0 = Caucasian, 1 = African American), age (measured in years), single parent home (0 = two parent family, 1 = single parent family), pubertal development, and social class. Pubertal development was measured by physical examination by a pediatrician and ranges from Tanner stage I (prepubertal) to V (although in our sample, the highest observed Tanner stage is IV). Family social class background was measured by the Hollingshead four-factor index of social class, which combines the educational attainment and occupational prestige for the number of working parents in the child's family [*28*]. This index ranges from 8 to 66, with higher values indicating higher social class background. Table 1 presents means and proportions for the physiological and sociocultural characteristics among the sample.

As shown in Table 1, the sample was evenly divided by gender and ethnic background. The average age of the children was 10 years, and most children were in Tanner stage I or II. However, there were significant ethnic and gender differences in physical maturation, with African American children and, although not shown Table 1, females having a higher stage of pubertal development. Table 1 also indicates ethnic differences regarding family background characteristics. African American children in the sample were more likely to reside in single parent families ($P < 0.05$) and had a lower mean Hollingshead social status score (53.1 for Caucasian children and 33.8 for African American children, $P < 0.001$).

Dependent variables. Six variables assessing various components of physical activity and fitness were included in the analysis. These outcomes were assessed separately (as opposed to being combined into a single index of activity) because they represent distinct aspects of activity, inactivity, and fitness. Television viewing, an indicator of inactivity, was measured in hours

TABLE 1

Background Characteristics for All Subjects (n = 107)

Background characteristics	Total sample (n = 107)	Caucasian (n = 55)	African American (n = 52)	Significant effects of gender and ethnicity
Ethnicity (% African American)	49%	—	—	—
Gender (% female)	55%	54%	56%	(None)
Age ($\bar{X}$ years ± SD)	10.0 (1.7)	10.0 (1.6)	9.9 (1.8)	(None)
Pubertal dev. ($\bar{X}$ Tanner stage ± SD)	1.6 (.8)	1.4 (.6)	1.9 (.9)	(Ethnicity, $P < 0.001$) (Gender, $P < 0.001$)
% Single parent home	46%	34%	58%	(Ethnicity, $P < 0.05$)
Social class ($\bar{X}$ Hollingshead score ± SD)	43.7 (14.6)	53.1 (8.0)	33.8 (13.6)	(Ethnicity, $P < 0.001$)

per day as reported by the subject's parent. Physical fitness was measured by maximal VO_2. As previously described in detail [*29*], this variable was assessed by an all-out, progressive treadmill test conducted while the children were in a fasted state. Oxygen consumption and carbon dioxide production were determined continuously using a SensorMedics 2900 metabolic monitor, and heart rate was measured by a Polar vantage heart rate monitor during the treadmill test. Achievement of VO_2 maximum was defined when the children reached two of the following three criteria: heart rate >195, a respiratory exchange ratio >1.0, or a plateau of VO_2. Based on these criteria, a total of 76 children achieved a maximal VO_2. In order to correct for the confounding influence of body composition on maximal VO_2, soft lean tissue mass and fat mass were included as control variables in the analyses. Fat mass and fat-free mass are measured through dual energy X-ray absorpiometry, using a Lunar DPX-L densitometer and pediatric software (for a more detailed description of this procedure, see [*30*]). The children's hours per week of exercise was derived from a modified version of the Kriska activity questionnaire [*31*]. A comprehensive list of physical activities was read by an interviewer, and the children and parents indicated how many months, weeks, days, and minutes the child spent on each activity outside of school during the previous 12 months. An average number of hours per week was calculated, which represents the child's habitual physical activity within the past year. Due to the highly skewed distribution of this variable, it was collapsed into 10 percentiles for use in the multivariate analyses. The children were also asked how many days per week of exercise they had engaged in within the previous week. Consistent with the use of this item on national epidemiologic surveys, such as the Youth Risk Behavior Survey and the National Health and Nutrition Examination Survey, children were asked to indicate how many days in the past week they had engaged in physical activity for at least 20 minutes, which resulted in breathing hard and sweating. Thus, this outcome was distinct from the previous outcome (hours per week of exercise) in that it measured only vigorous and recent physical activity. P.E. exercise measured the amount of exercise the children receive during school. This variable, which was expressed as hours per week spent exercising in physical education class, was derived by multiplying the number of days per week the children attend P.E. class at school by the number of minutes reportedly spent in actual exercise during the average P.E. class. Finally, participation in sports teams was measured by a dichotomous variable indicating whether the child had participated in at least one school or community sports team within the past year (0 = no sports team participation, 1 = participation on at least one sports team).

Statistical Analyses

All statistical analyses were performed using SPSS/PC+. First, in order to determine the associations between the various outcome measures, bivariate correlational analyses were conducted. Next, the influence of gender and ethnicity on the six activity outcomes was explored by employing a two-way analysis of variance design. Then, the influence of sociocultural and physiological factors on physical activity and fitness was determined through multiple regression analyses. Each activity outcome variable was regressed on the set of sociocultural variables using OLS regression with the exception of the dichotomous sports team participation outcome, which was analyzed using logistic regression.

RESULTS

Bivariate Correlations among Physical Activity and Fitness Variables

The correlations among the various dimensions of activity and fitness are presented in Table 2. The outcome of maximal aerobic capacity is presented both unadjusted and adjusted for fat mass and fat-free mass.

The correlations among the six outcome variables were relatively weak, illustrating the multidimensional nature of physical activity among children. As indicated in Table 2, television viewing (an indicator of inactivity) was not significantly associated with any of the physical fitness or activity variables. Interestingly, the strongest

TABLE 2

Correlations (P values) among Physical Activity, Inactivity, and Fitness Outcomes among Caucasian and African American Children (n = 107)

	1.	2.	3.	4.	5.	6.
1. TV viewing[a]	1.00					
2. Hours/week exercise[b]	−0.05 (P = 0.61)	1.00				
3. Days/week exercise[c]	0.04 (P = 0.69)	0.36 (P = 0.00)	1.00			
4. P.E. exercise (hours/week)[d]	−0.15 (P = 0.13)	−0.17 (P = 0.07)	0.14 (P = 0.14)	1.00		
5. Sports teams[e]	0.04 (P = 0.65)	0.17 (P = 0.09)	0.16 (P = 0.11)	0.19 (P = 0.05)	1.00	
6. VO_2 max (L/min)[f]	0.17 (P = 0.13)	0.07 (P = 0.54)	0.26 (P = 0.02)	0.16 (P = 0.15)	0.05 (P = 0.67)	1.00
7. Adjusted VO_2 max (L/min)[g]	−0.13 (P = 0.26)	0.20 (P = 0.09)	0.31 (P = 0.01)	0.15 (P = 0.22)	0.29 (P = 0.01)	—

[a] Reported by the subjects' parents.
[b] Derived from the Kriska activity questionnaire.
[c] Vigorous physical activity for ≥20 minutes in duration.
[d] Hours/week spent exercising in school physical education class.
[e] Participation in at least one school or community sports team (0 = no, 1 = yes).
[f] Maximal aerobic capacity during treadmill test; n = 76.
[g] Adjusted for fat mass and fat-free mass; n = 76.

correlation (r = 0.36) observed among the various physical activity outcomes was between the number of hours per week spent exercising (a habitual measure encompassing all physical activity) and days per week exercising (a recent measure encompassing only vigorous activity). Physical fitness, measured by VO_2 max, was significantly, although weakly, correlated with days per week spent exercising, and, when adjusted for body composition, sports team participation. Previous studies have also reported rather modest associations between fitness and activity [*32*]. However, the correlations indicated in these analyses do suggest that aerobic capacity is at least partially related to training (i.e., time spent engaging in physical activity).

ANOVA Models

Table 3 presents descriptive information on the six physical activity and fitness outcomes. As indicated in Table 3, the children in our sample spent an average of 2 h per day viewing television, 7.3 h each week in exercise, and participated in vigorous exercise an average of 3.5 days a week. In addition, 48% of the children were involved in at least one sports team, and they received an average of slightly under 2 h of exercise in school physical education classes weekly. Finally, the mean aerobic capacity of our sample was 1.5 liters of oxygen per minute of exercise.

Also presented in Table 3 is the influence of ethnicity and gender on physical activity and fitness. Interestingly, significant gender differences were only evident for two outcomes, reported hours per week of exercise and maximal aerobic capacity. Consistent with previous studies examining gender differences in exercise and fitness, males reported significantly higher levels of exercise (almost 2 h more per week) and greater aerobic capacity (by 100 ml) than females ($P < 0.01$). Previously reported gender differences in sports team participation were not supported in the current analyses (at the bivariate level), although they were approaching statistical significance. Several ethnic differences were also evident. Among our sample, African American children reported significantly more television viewing (~24 minutes per day), less time exercising in P.E. class (1/2 h each week), lower participation on sports teams (58% of Caucasian children reported sports team participation compared with only 38% of African American children), and lower VO_2 max (~200 ml).

Multivariate Analyses

Although numerous ethnic and gender differences were apparent at the bivariate level, an important goal of this research was to determine whether such differences remained once potential confounding variables were controlled for. Thus, the final series of analyses explored the influence of several salient sociocultural and physiological variables on each of the dimensions of physical activity and fitness. In addition, age by gender interactions were tested for each outcome, given the previously reported pattern of physical activity being particularly low for older females. However, no significant interactions were found in the current analyses and therefore the results of the multiplicative models are not presented. Thus, Table 4 includes only the results of the additive multivariate analyses.

Television viewing. The first outcome, television viewing, revealed an interesting pattern. Although ethnic differences in television viewing were evident at the bivariate level (see Table 3), these differences were not significant in the multivariate analyses. The only significant predictor of television viewing was single parent home status, with children from single parent homes reporting more time spent watching television.

TABLE 3

Means (±SD) for Physical Activity, Inactivity, and Fitness Outcomes by Gender and Ethnicity (n = 107)

	TV viewing (hours/day)[a]	Hours/week exercise[b]	Days/week exercise[c]	P.E. exercise (hours/week)[d]	Sports teams (% involved)[e]	VO_2 max (L/min)[f]
Total sample	2.0 (1.2)	7.3 (6.1)	3.5 (2.1)	1.7 (.9)	48	1.5 (.4)
Gender						
Males	2.0 (1.2)	8.8 (6.2)	3.7 (2.0)	1.7 (.9)	58	1.5 (.4)
Females	2.0 (1.2)	6.0 (5.7)	3.3 (2.3)	1.6 (.9)	41	1.4 (.4)
Ethnicity						
Caucasian	1.8 (1.0)	6.3 (5.4)	3.6 (2.1)	1.9 (.8)	58	1.6 (.4)
African American	2.2 (1.3)	8.3 (6.7)	3.3 (2.2)	1.4 (.9)	38	1.4 (.5)
Gender ∗ Ethnicity						
Af-Am. males	2.3 (1.3)	9.9 (6.4)*	3.7 (2.3)	1.4 (.9)	48	1.4 (.4)
Caucasian males	1.8 (1.0)	7.9 (6.0)	3.7 (1.7)	1.9 (.9)	68*	1.7 (.4)
Af-Am. females	2.2 (1.4)	7.0 (6.7)	3.0 (2.2)	1.4 (.6)	31*	1.3 (.5)
Caucasian females	1.7 (1.0)	5.0 (4.4)*	3.6 (2.4)	1.9 (.8)	50	1.5 (.4)
Significant effects	Ethnicity ($P < 0.05$)	Gender ($P < 0.01$)	None	Ethnicity ($P < 0.01$)	Ethnicity ($P < 0.05$)	Gender ($P < 0.01$) Ethnicity ($P < 0.001$)

[a] Reported by the subjects' parents.
[b] Derived from the Kriska activity questionnaire.
[c] Vigorous physical activity for ≥20 minutes in duration.
[d] Hours/week spent exercising in school physical education class.
[e] Participation in at least one school or community sports team.
[f] Maximal aerobic capacity during treadmill test; n = 76.
* Indicates significant differences between means in post hoc testing (gender ∗ ethnicity).

In fact, children from single parent homes watched around 30 minutes more television per day than children residing with two parents. The set of sociocultural predictors explained around 12% of the variation in television viewing.

Hours per week of exercise. Consistent with the bivariate analyses, the number of hours spent on exercise outside of school was strongly influenced by gender. As shown in Table 4, girls reported fewer hours of exercise than boys. Since the skewed distribution of this variable necessitated the use of percentiles, rather than raw hours, the parameter estimate of −1.31 indicates that the females in our sample reported around 13% less time spent exercising than the males. None of the other variables were significantly associated with exercise, including factors relatively consistently associated with exercise in previous studies, such as age and ethnicity. The equation as a whole explained around 13% of the variation in exercise.

Days per week of exercise. The number of days per week spent engaging in vigorous exercise was relatively uninfluenced by sociocultural characteristics. In fact, the model tested to predict days/week of vigorous exercise did not achieve statistical significance, rendering individual associations difficult to interpret. As indicated in Table 4, only single parent home status emerged as a significant correlate. Interestingly, however, children from single parent homes reported more exercise than children residing with two parents (by almost 1 day per week). This finding was unexpected and merits further attention.

P.E. exercise. The fourth outcome variable presented in Table 4, hours per week spent exercising in school P.E. class, was also influenced by parental characteristics. Children who resided in single parent homes reported less time in P.E. exercise (~20 minutes per week) than children from two parent homes. In addition, African American children reported almost 40 minutes less per week exercising in school P.E. classes than Caucasian children. This finding is interesting since it suggests an ethnic effect independent of the influence of social class. The R^2 for the equation is 0.14.

VO_2 max. The children's level of physical fitness was strongly associated with several physiological and cultural factors. Gender, ethnicity, pubertal stage, and single parent home status were all significantly associated with aerobic fitness. Consistent with their high amount of vigorous exercise, children from single parent families had higher levels of aerobic fitness. In addition, males had higher aerobic capacity than females (by 150 ml/minute), and Caucasian children had higher VO_2 max than African American children (by 210 ml/minute), even when controlling for sociocultural differences. Finally, while there was no age effect on aerobic

TABLE 4

Parameter Estimates (*P* Values) for Physical Activity, Inactivity, and Fitness Outcomes Regressed on Sociocultural Variables among Caucasian and African American Children ($n = 107$)

Predictor variables	TV viewing (hours/day)[a]	Hours/week exercise[b]	Days/week exercise[c]	P.E. exercise (hours/week)[d]	VO_2 max (L/min)[e]	Sports team participation[f] OR (*P* value)
	b (*P* value)					
Gender (1 = female)	−0.22 (.37)	−1.31 (.02)*	−0.23 (.60)	−0.11 (.54)	−0.15 (.00)***	0.63 (.30)
Ethnicity (1 = Af. Am.)	0.09 (.78)	1.33 (.09)	−0.18 (.77)	−0.65 (.01)**	−0.21 (.00)***	1.37 (.60)
Age (years)	0.07 (.45)	−0.16 (.49)	−0.06 (.75)	0.06 (.42)	−0.02 (.19)	1.42 (.05)*
Pubertal development	0.18 (.39)	−0.25 (.62)	−0.25 (.53)	0.08 (.60)	0.10 (.05)*	0.38 (.02)*
Single parent home (1 = yes)	0.50 (.03)*	0.43 (.44)	0.86 (.05)*	−0.34 (.05)*	0.09 (.05)*	0.74 (.49)
Social class	−0.01 (.36)	0.02 (.46)	0.01 (.50)	−0.01 (.28)	0.00 (.06)	1.03 (.10)
Intercept	1.24	6.54	3.68	1.86	0.18	−3.24
R^2	0.12	0.13	0.07	0.14	0.85	0.11
No. cases	107	107	107	107	76	107

[a] Reported by the subjects' parents.
[b] Derived from the Kriska activity questionnaire, and expressed in percentiles.
[c] Vigorous physical activity for ≥20 minutes in duration.
[d] Hours/week spent exercising in school physical education class.
[e] Maximal aerobic capacity during treadmill test; adjusted for fat mass and fat-free mass.
[f] Participation in at least one school or community sports team (0 = no, 1 = yes); analyzed using logistic regression analysis.
* $P < 0.5$.
** $P < 0.01$.
*** $P < 0.001$.

capacity, there was a maturation effect, as physical fitness increased by around 100 ml/minute for each increment in Tanner stage. The set of independent variables (including fat mass and fat-free mass as controls) explained 85% of the variation in VO_2 max.

Sports team participation. The final outcome variable explored in the analyses was participation on a sports team. Since this outcome was dichotomous, logistic regression analysis was employed, and odds ratios are presented in Table 4. An interesting pattern regarding the effects of age and physical maturation is evident. Although older children were more likely to participate on a school or community sports team, children in a higher stage of pubertal development were less likely to play on a sports team. As mentioned previously, very few previous studies have considered the independent effects of age and pubertal stage. The possibility of such divergent effects is suggestive and merits further investigation. Interestingly, none of the other independent variables were significant predictors of team sports. Once again, although ethnicity was associated with sports team participation at the bivariate level, this relationship was not significant once sociocultural differences between African American and Caucasian children were controlled for. In the multivariate analyses, neither ethnicity nor gender even approached significance as predictors of participation on a sports team, nor did social class background or number of parents.

DISCUSSION

Our study on the influence of sociocultural characteristics on children's levels of physical activity and fitness suggests several important contributions. First, the notion that physical activity is a multidimensional construct is clearly supported by the data. Not only were weak correlations demonstrated among the various activity and fitness dimensions, but the multivariate analyses also revealed distinct predictors for the activity and fitness outcomes. For example, exercise received in school physical education classes, exercise received outside of school, and participation on sports teams were each associated with a distinct set of predictors. Similarly, the single indicator of *inactivity* explored in this study, television viewing, was clearly shown to be a construct distinct from physical activity (or the absence of physical activity). Rather than emerging as an activity *competing* with exercise, as has been previously suggested [*6*,*34*], television viewing appears to be a behavior independent from exercise, since children who watch more television do not necessarily engage in less physical activity. In addition, physical fitness, while correlated with a few activity outcomes, represents a distinct attribute predicted partially by sociocultural factors but largely by physiological characteristics (e.g., body composition). The distinction between the physical activity outcomes explored in our research may be particularly important when determining the relationship between activity and health. That various aspects of

physical activity represent unique constructs necessitates a consideration of which components demonstrate an influence on health risk profile for children.

The fact that no consistent pattern of determinants of children's activity levels emerged in the analyses, concerning age, gender, and race, seems contradictory to previous studies. The lack of support provided in these analyses for traditionally accepted activity patterns is a second major finding of this research. Unlike previous studies, females, African Americans, and older children in our sample did not consistently report lower levels of physical activity, although both females and African American children had significantly lower physical fitness. The relatively weak impact of gender, age, and ethnicity on childhood physical activity patterns can be understood by considering the potentially confounding influence of the other sociocultural (and physiological) variables explored in this paper. For example, the lack of gender differences observed among our sample may be due to the effects of controlling for pubertal development. The majority of previous studies reporting lower levels of activity among females have not considered the confounding influence of pubertal development, which typically occurs at an earlier age for females and may adversely affect levels of physical activity. This possibility was suggested in this paper by the negative relationship between pubertal development and sports team participation. The impact of pubertal development may also explain why older children did not report lower levels of activity (with the exception of sports team participation) in our sample. Identifying the effects of age independent from the influence of pubertal development may attenuate the statistical impact of age. This may be true when age and pubertal development have contradictory influences, evidenced by the negative association between Tanner stage and sports participation and positive association between age and sports participation. Once again, the failure of previous studies to consider the effects of pubertal development may be responsible for the consistent finding of older children reporting lower levels of activity. In reality, the true effects may be due to differences in physical maturation, rather than age. The social, psychological, and behavioral consequences of pubertal development may be more severe than those of age and may therefore exert a more influential impact on children's activity patterns.

A unique finding of our study is the lack of ethnic differences observed between African American and Caucasian children. Although numerous differences were found at the bivariate level, only the amount of exercise received while in school distinguished the two groups after controlling for the influence of other sociocultural variables. That African American children receive less exercise in school than Caucasian children, even at similar SES levels, may reflect the persisting racial segregation and poor quality of schools attended primarily by minority children common in Southern states. The lack of ethnic differences observed in this study clearly suggests the importance of considering family background characteristics which are likely to differ among Caucasian and African American children. A factor which appeared to strongly influence activity patterns in this study was residing in a single parent home—a characteristic more common among the minority children in our sample. Compared to children residing in two parent homes, children with single parents report more hours of television viewing, less exercise received in school P.E. classes, and, surprisingly, more days per week of exercise. Although this pattern is perplexing, it may reflect decreased amounts of parental supervision, which is likely to increase both play outside of the home and television viewing—activities which both may be associated with stronger barriers for children with two parents.

Although this study has revealed the influence of several underresearched sociocultural factors on children's activity patterns, methodological limitations must be considered when interpreting these findings. Clearly, the children in our study are highly active relative to previous reports of the activity patterns of nationally representative samples of children [*13*]. Limitations in the validity of our sample's estimates of physical activity may be responsible for some of the disproportionately high activity and unusual patterns evident in the analyses. It is thought that self-reported activity is overestimated among children [*33*], who face difficulties with memory recall. Although all self-reported physical activity indices in this study were completed jointly by the parent and child, bias resulting from child-reported estimates is likely. In addition, the small sample size and potential self-selectivity of the children participating in our study may limit the generalizability of these findings to other populations. Finally, it is important to point out that the predictors explored in this study are only responsible for a small amount of the variation in physical activity, as evidenced by the low R^2's achieved in the current analyses. The goal of achieving a more comprehensive description of children's activity patterns would perhaps be best accomplished by a hierarchical approach, in which determinants at various levels—physiological, psychological, sociocultural, and ecological—are considered, resulting in a complete profile of determinants of physical activity among children. A more comprehensive understanding of children's physical activity and fitness patterns could be used to guide intervention programs directed at activity promotion, encouraging an increase and enjoyment of activity among children and, subsequently, a reduction in disease risk later in life.

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