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The Importance of Physical Activity in Closing the Achievement Gap

Laura J. Burton and Jaci L. VanHeest

The most significant concern within the US educational community is the academic achievement gap. Investigation of the achievement gap reveals that minority students across all levels of education are not meeting the same academic measures as their non-Hispanic White peers. In addition, a disproportionate number of minority children are identified as overweight. Physical activity has been identified as an influence on the reduction and prevention of overweight and obesity. In addition, physical activity has been recognized as beneficial to cognitive performance in children. The current review provides a stimulus to recognize the links between overweight and academic achievement in minority youth and the importance of physical activity in addressing these issues.

> As a nation, we cannot afford another generation of students of color and low income who are ill prepared for full citizenship. Students of every race, ethnicity, language, and income need the skills and tools to compute, critique, and create at high levels. We must agree to identify and employ initiatives that hold the greatest promise for moving all students—including students of color, poor students, rural and urban students, and second-language learners—to high levels of achievement (Gina Burkhard, CEO, Learning Points Associates).

The achievement gap, defined as the persistent gap in academic performance of African American and Hispanic students when compared to White and Asian American students, has been characterized as the most perplexing issue currently confronting American schools (Evans, 2005). Addressing this persistent gap has been cited as a significant driving force for development and implementation of the federal mandates put forward in the legislation known as "No Child Left Behind" (NCLB, 2007). Simultaneously, we continue to witness the rapid development of the obesity epidemic within the US. Results of the 2003–2004 National Health and Nutrition Examination Surveys (NHANES) reported that overweight (greater than or equal to 95th percentile of the age- and sex-specific BMI) increased from 11 to 19% among children age 6–11 from 1988–1994 and 2003–2004. For children age 9–11, the rate of overweight increased from 11–17% during that same period (National Health and Nutrition Examination Surveys, 2004).

Overweight is disproportionately more prevalent in minority children. Sixteen percent of non-Hispanic White children were classified as overweight between 2003–2004, compared to 20% of Non-Hispanic Black children and 19% of His-

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panic children (Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006). When examining this data based on children's sex, Mexican American male children were significantly more overweight when compared to non-Hispanic White male children, yet non-Hispanic Black males did not differ significantly from non-Hispanic White males (Ogden et al., 2006). Female minority children appear to be at greater risk for obesity, as Mexican American and non-Hispanic Black female children were significantly more likely to be overweight than non-Hispanic White female children (Ogden et al., 2006). This trend continues for minority females into adulthood, with non-Hispanic Black women and Mexican American women significantly more likely to be obese compared to non-Hispanic White women (Ogden et al., 2006).

Physical activity behavior has been demonstrated to be a key contributor to the prevention of and reduction in overweight and obesity for both children and adults. Overweight youth who participated in vigorous physical activity obtained favorable effects on cardiovascular fitness, percent body fat, visceral adiposity, and some risk factors of cardiovascular disease and type 2 diabetes (Gutin, Barbeau, & Yin, 2004). In addition, physical activity has been linked to positive cognitive outcomes for children in elementary and middle school (Coe, Pivarnik, Womack, Reeves, & Malina, 2006; Sibley & Etnier, 2003). The purpose of this article is to address the link between obesity rates and the academic achievement gap among minority children, and to recognize that physical activity behaviors can provide positive benefits to both academic achievement and reduction in overweight for these at-risk children.

As researchers have noted the increasing trends in overweight and obesity within minority communities (e.g., Mexican American, Native American, and non-Hispanic Black children), they have sought to better understand why there is a higher prevalence of overweight in these populations. Several significant factors have been examined as possibly contributing to the growing obesity epidemic in minority children, including, but not limited to: (a) the built environment; (b) media exposure and usage; (c) food access and availability; (d) school settings; and (e) home and family settings (Kumanyika & Grier, 2006). This article will review factors contributing to higher overweight in minority populations, specifically the built environment and media usage, which have implications on the amount of physical activity behavior that minority children engage in.

Minority Children and Physical Activity Behavior

Many children engage in less physical activity than the recommended minimum of 60 min per day (Gordon-Larsen, Nelson, & Popkin, 2004; Pate, Davis, Robinson, Stone, McKenzie, & Young, 2006). Non-Hispanic Black and Hispanic girls engaged in significantly less vigorous physical activity when compared to non-Hispanic White boys (Gordon-Larsen et al., 2004). These levels of inactivity continue for non-Hispanic Black and Hispanic girls as they move from adolescence into adulthood (Gordon-Larsen et al., 2004). When physical activity increased, overweight decreased for non-Hispanic Black boys and girls, and Hispanic boys and girls (Gordon-Larsen, Adair, & Popkin, 2002).

The built environment consists of roads, neighborhoods, buildings, food sources, and recreational facilities in which people are educated, live, work, eat, and play (Sallis & Glanz, 2006). Understanding the relationship between the built

environment and physical activity behavior can assist in understanding the increase in overweight and obesity in the US population. Children with access to recreational facilities and programs tend to be more physically active than those without access (Sallis & Glanz, 2006). Availability of environments that are conducive to physical activity, such as sports areas, parks and green spaces, public pools and beaches, and the presence of bike paths/lanes are significantly associated with race, ethnicity, and socioeconomic status (Powell, Slater, & Chaloupka, 2004).

Minority communities and low-educated neighborhoods tend to have fewer physical activity settings (Gordon-Larsen, Nelson, Page, & Popkin, 2006; Powell et al., 2004). Public physical activity facilities (e.g., youth organizations, parks, YMCAs, and schools) are unequally distributed toward higher income, lower minority communities (Gordon-Larsen et al., 2006). Access is linked to physical activity behavior; adolescents with access to more types of physical activity facilities engage in more physical activity during a week when compared to individuals who live in areas with fewer facilities available to them (Gordon-Larsen et al., 2006). In addition to engaging in more physical activity, adolescents with access to more physical activity facilities are also 32% less likely to be overweight when compared with those who live in areas with no physical activity facilities (Gordon-Larsen et al., 2006).

Compared to non-Hispanic White children, minority children spend more time watching TV and movies and playing video games. Non-Hispanic Black children consume more media (e.g., TV, DVDs, videos, movies) than Hispanic and non-Hispanic White children (Gordon-Larsen et al., 2002). Television viewing has been linked with decreased physical activity behavior (Crespo, Smit, Troiano, Barlett, Macera, & Andersen, 2001; Gordon-Larsen et al., 2006; Lowry, Wechsler, Galuska, Fulton, & Kann, 2002) and an increased prevalence of obesity (Gordon-Larsen et al., 2002). In addition, because minority children are watching more television, they are exposed to a greater number of commercials advertising energy-dense foods (e.g., sugar cereals, high-sugar snack foods, sugar sodas). The advertisements for these foods have been linked to an increase in children's caloric consumption (Kumanyika & Grier, 2006).

Academic Achievement Gap

A persistent academic achievement gap exists between non-Hispanic White students and non-Hispanic Black and Hispanic students. These disparities have been noted in all student age groups for mathematics and for non-Hispanic Black students ages 9 to 13 in reading. Disparities exist for both mathematics and reading at all ages for Hispanic students (Lee, 2002). Overall, the achievement gaps between non-Hispanic White students and non-Hispanic Black and Hispanic students have remained substantially large over the past three decades (Lee, 2002). As researchers continue to examine the multiple factors that may influence these continued inequities, it is necessary to investigate "simultaneous changes across a broad range of factors from multiple data sources and to examine their interactive, joint influences on the achievement gap" (Lee, 2002, p. 10).

The correlates associated with understanding the achievement gap include issues around family income (Taylor, 2005). Students who live in poverty are more likely to underachieve academically when compared to students living in

high-income and middle-income families (Taylor, 2005). Because non-Hispanic Black and Hispanic students come from disproportionately lower income families when compared with non-Hispanic White students, income must be examined as a factor influencing this persistent achievement gap (Evans, 2005). Another non-school related area thought to impact this disparity in achievement involves children's readiness for school. Lower income children enter school with a smaller vocabulary compared to other children their age which can have a negative impact on their academic achievement (Evans, 2005). However, it is important to note that students living in poverty are not the only ones identified in the achievement gap; minority children living in middle-class suburban communities are also caught in this gap (Evans, 2005).

A higher proportion of schools in urban districts have been affected by NCLB; 54% of schools identified for improvement are in urban districts (Center on Education Policy, 2006). When faced with the challenges of meeting all curricular requirements and testing mandates of NCLB, pressure on educators can become overwhelming. In an effort to overcome this challenge, a common response has been to "narrow the curriculum." Seventy percent of schools have indicated a narrowing of the curriculum by at least one course, and in many cases reported that students struggling to reach academic standards are receiving double reading and math periods at the expense of other activities (Center on Education Policy, 2006). When narrowing curriculum requirements, reading, mathematics, and science are given priority over other areas such as physical education, social studies, foreign languages, and the arts (King & Zucker, 2005). In an effort to maximize the learning opportunities for their students, teachers have developed strategies to focus their teaching around material that is tested, and remove from their lesson plans any material that is not tested (King & Zucker, 2005).

One casualty of curriculum narrowing is the reduction in physical education opportunities for children in all grade levels. In 1991, 42% of students attended daily physical education classes; by 2003 that percentage dropped to 28% (National Association for Sport and Physical Education, 2006). In addition to the loss of content through the phenomenon of "narrowing the curriculum," children at the elementary school level have also experienced a reduction or elimination of daily recess (Gratz, 2000; "Recess is at Risk," 2006). Recess is separate from physical education and is defined as "unstructured playtime where children have choices; develop rules for play and release energy and stress." (National Association for Sport and Physical Education, 2001, p. 1). The National Association for Sport and Physical Education (2006) suggests that students in pre-kindergarten through sixth grade have daily opportunities for recess, separate from physical education classes.

Urban school districts, which are struggling to meet accountability standards of NCLB (Center on Education Policy, 2006), have a higher percentage of minority students, and these students may be disproportionately impacted by the narrowing of the curriculum. A greater percentage of minority students are now exposed to fewer subject matter areas, with a focus only on those areas that are required by standardized testing (King & Zucker, 2005). Also, as noted earlier, more minority children are identified as at risk for overweight or are overweight. Reduction in time for physical activity, through reduced physical education and recess, with the intention of helping children perform better in the classroom may inadvertently contribute to the problem of overweight in minority children.

Physical Activity, Fitness Level, and Academic Achievement

In a meta-analysis, Sibley and Etnier (2003) concluded that a significant positive relationship exists between physical activity and cognitive functioning in children. The greatest cognitive benefits from physical activity were evident in elementary school and middle school children (Sibley & Etnier, 2003). When examining children's levels of fitness, aerobic fitness was found to be positively associated with specific cognitive functioning associated with attention and working memory (Hillman, Castelli, & Buck, 2005). The California Department of Education (2002) matched fifth, seventh, and ninth grade students' scores on standardized tests of reading and mathematics to a state-mandated physical fitness test (California Department of Education, 2002). Key findings of the study indicated an association between higher levels of fitness and higher achievement at all grade levels examined. In addition, students who gained the greatest academic achievement were those who met minimum fitness levels in three or more physical fitness areas (California Department of Education, 2002).

Examination of the relationship between overweight and student academic performance is an emerging area of research. The first longitudinal study in this area followed the academic performance of overweight children from kindergarten through the end of first grade (Datar, Sturm, & Magnabosco, 2004). Overweight was identified as a marker, but not a causal factor, impacting academic performance. There were significant differences in test scores for both reading and math when overweight children were compared to non-overweight children but these differences were not evident when controlling for socioeconomic and behavioral variables (Datar et al., 2004). In another longitudinal study following children from entry into kindergarten through the end of third grade, changes in overweight status and impact on academic performance were examined (Datar & Strum, 2006). Moving into overweight status by third grade had a significant adverse impact on academic and social-behavioral outcomes among girls, but not among boys (Datar & Strum, 2006). The results from this study do not establish whether changes in overweight lead to worsening school performance or vice versa, but that becoming overweight was associated with poor academic outcomes for girls (Datar & Strum, 2006). As work in this area progresses, researchers will gain more knowledge regarding the impact of overweight on children's academic outcomes.

Linking Physical Activity to the Achievement Gap

When physical education and recess are reduced or eliminated in an effort to provide more academic instruction for students caught in the achievement gap, these measures may inadvertently contribute to a cycle of inactivity for a group that is significantly more at risk for overweight or is overweight. Increasing physical activity opportunities may provide a greater benefit for these students, even if this means taking time away from extra instruction to improve reading and math scores. Because minority children are caught in both a lower academic achievement gap and are disproportionately more overweight, educators, researchers, and policy makers must recognize the positive impacts physical activity behaviors have on academic achievement and provide those opportunities for these children.

Increasing physical activity is clearly not the only answer to solving the problems of overweight and academic achievement in minority communities, but it is a necessary part of the solution. Physical activity has been linked to reductions in overweight status, reduction in health risks associated with obesity, improved cognitive functioning, and potentially improved academic outcomes. There are no simple solutions, but narrowing the curriculum and reducing opportunities for children to engage in physical activity are counterproductive approaches to addressing these issues. The achievement gap is a serious issue facing American schools. Factors, both causal and associative, continue to be explored by educational scholars. The alarming trend of overweight and low fitness in American youth is also a major concern for educators. To date, most research in this area has focused on biomedical aspects with little attention to the academic implications of the obesity epidemic.

The current review has provided a stimulus to recognize the links between overweight and academic achievement in minority youth. When considering possible programs to address the academic achievement gap involving schools, communities, and home environments, opportunities to increase physical activity should be considered. The parallel negative trends influencing minority youth must be addressed with multidisciplinary approaches. A successful result would be minority youth fully capable to meet the challenges of tomorrow.

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