

## RESEARCH ARTICLE

# Healthier Students Are Better Learners: A Missing Link in School Reforms to Close the Achievement Gap

CHARLES E. BASCH, PhD

---

**ABSTRACT**

---

**OBJECTIVES:** This article provides an introduction to the October 2011 special issue of the *Journal of School Health* on “Healthier Students Are Better Learners.”

**METHODS:** Literature was reviewed and synthesized to identify health problems affecting school-aged youth that are highly prevalent, disproportionately affect urban minority youth, directly and indirectly causally affect academic achievement, and can be feasibly and effectively addressed through school health programs and services.

**RESULTS:** Based on these criteria, 7 educationally relevant health disparities were selected as strategic priorities to help close the achievement gap: (1) vision, (2) asthma, (3) teen pregnancy, (4) aggression and violence, (5) physical activity, (6) breakfast, and (7) inattention and hyperactivity. Research clearly shows that these health problems influence students’ motivation and ability to learn. Disparities among urban minority youth are outlined, along with the causal pathways through which each adversely affects academic achievement, including sensory perceptions, cognition, school connectedness, absenteeism, and dropping out. Evidence-based approaches that schools can implement to address these problems are presented. These health problems and the causal pathways they influence have interactive and a synergistic effect, which is why they must be addressed collectively using a coordinated approach.

**CONCLUSIONS:** No matter how well teachers are prepared to teach, no matter what accountability measures are put in place, no matter what governing structures are established for schools, educational progress will be profoundly limited if students are not motivated and able to learn. Particular health problems play a major role in limiting the motivation and ability to learn of urban minority youth. This is why reducing these disparities through a coordinated approach warrants validation as a cohesive school improvement initiative to close the achievement gap. Local, state, and national policies for implementing this recommendation are suggested.

**Keywords:** child and adolescent health; coordinated school health programs; academic achievement; achievement gap; socioeconomic factors; school reform.

**Citation:** Basch CE. Healthier students are better learners: a missing link in school reforms to close the achievement gap. *J Sch Health*. 2011; 81: 593-598.

---

Low levels of academic achievement and educational attainment among low-income and minority youth, particularly in urban areas, undermine the quality of individual, family, and community life, threatening the very integrity of American society. Educationally relevant health disparities exert a powerful, but generally overlooked, influence on the achievement gap. Disparities in this context are health problems that disproportionately affect low-income urban minority youth as measured by incidence, prevalence, and educationally relevant consequences. Health factors have direct and indirect effects on

educational outcomes, including standardized test scores. To date, school reform efforts to close the achievement gap have not targeted reduction of educationally relevant health disparities.

To great extent, the educational achievement gap and health disparities affect the same population subgroups of American youth and are caused by a common set of social-environmental factors; it is increasingly clear that both education and health can also exert strong, reciprocal effects. The familial, social, physical, and economic environment in which youth live<sup>1</sup> is strongly associated with academic achievement

---

Richard March Hoe Professor of Health and Education, (ceb35@columbia.edu), Department of Health and Behavior Studies, Teachers College, Columbia University, 525 West 120th Street, New York, NY 10027.

Address correspondence to: Charles E. Basch, Richard March Hoe Professor of Health and Education at Teachers College, (ceb35@columbia.edu), Columbia University, Department of Health and Behavior Studies, Teachers College, Columbia University, Columbia University, 525 West 120th Street, New York, NY 10027.

and educational attainment<sup>2-4</sup> with childhood and adolescent health,<sup>5-14</sup> and with social mobility.<sup>9,15-17</sup> The strong association between social class and health persists throughout the lifespan.<sup>13,14,16,18-20</sup>

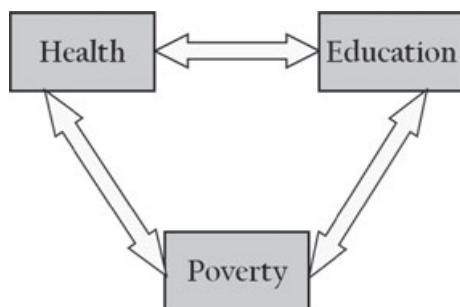
An important emerging literature implicates children's health factors as causal mechanisms through which low socioeconomic status influences academic achievement and educational attainment.<sup>16-18,20-23</sup> The direction of causality, effect sizes, and hypothesized causal mechanisms mediating relationships among social-environmental factors (eg, poverty), education, and health has been explored from multiple perspectives. It seems likely that these 3 factors—(1) familial, social, physical, and economic environment, (2) academic achievement and educational attainment, and (3) health—are causally related in reciprocal ways (Figure 1). The focus of this special issue is the influence of selected health factors on educational outcomes.

### THE ROLE OF SCHOOLS

It is neither reasonable nor realistic to expect that, on their own, schools can close the gaps in education or eliminate health disparities among the nation's youth. Schools should not be solely responsible for addressing these complex and recalcitrant problems. There are essential roles to be played by families, communities, health care systems, legislators, media, and by economic policy. All these (and other) social institutions should, and must, contribute to solving these problems. There are no simple solutions.

However, with more than 50 million students spending a significant portion of their daily lives in school, this social context is surely one of the most powerful social institutions shaping the next generation of youth. By systematically addressing educationally relevant health disparities, schools can reduce both educational and health disparities. But this will not occur efficiently with the current strategy of investment in school health programs.

Figure 1. Reciprocal Causal Relationship Between Poverty, Health, and Education



School health programs have a long history in the United States<sup>24</sup> but have never been fully embraced. To date, reducing health disparities as a strategy to help close the achievement gap has lacked financial investment, has not had a prominent role in school reform movements, and has not occupied a central place within the educational mission of American schools. Consequently, high-quality, strategically planned, and effectively coordinated school health programs and policies have not been widely implemented, and leaders and educators in urban public schools, serving minority youth from low-income families who are disproportionately affected by both educational and health disparities, face particular challenging contexts for developing, implementing and sustaining such school health programs.

Recently, the important role of schools in addressing health issues has been recognized by leading educational professional organizations, policy making, and interstitial groups. For example, policies or guidelines have been identified or proposed by the National Association of State Boards of Education,<sup>25</sup> National School Boards Association,<sup>26</sup> Council of Chief State School Officers,<sup>27</sup> Association for Supervision and Curriculum Development<sup>28</sup> and their "New Compact to Educate the Whole Child," American Academy of Pediatrics and National Association of School Nurses,<sup>29</sup> and A Broader, Bolder Approach to Education,<sup>30</sup> and by leading governmental agencies such as the Centers for Disease Control and Prevention.<sup>31-33</sup>

### AN OPPORTUNE TIME FOR CHANGE

In the past, the US Department of Education has provided resources to assist schools in addressing some health topics such as safety and drug use prevention, but it has not provided leadership for integrating school health into the fundamental mission of schools and supporting the widespread development and implementation of high-quality, strategically planned, and effectively coordinated approaches that address a variety of health-related barriers to teaching and learning. Now is an opportune time for change. Many schools in the United States provide some health programs or services; however, the quality of school health programs and services vary greatly.

Most schools implement some programs or policies that address health<sup>34</sup> through activities such as physical education, breakfast and lunch meals, health services to provide acute care and administration of medications, health-related counseling, and curricula addressing tobacco, alcohol and drugs, nutrition, teen pregnancy and sexually transmitted disease (including HIV/AIDS), and violence. In addition, most schools offer some health care services, and some schools offer more extensive on-site health care services provided by nurses and school-based clinics. Some also

offer a variety of health-related after-school programs. Community and full service schools offer in-school programs and services, including health and mental health programs and services to support youth before and after school and during the summer as well as during the typical school day.<sup>35</sup> Although published data do not as yet exist, school health programs and services are likely inequitably distributed as are most other school resources—that is, there are both fewer and lower quality resources available in schools that serve low-income minority youth.

Despite the widespread and substantial investment in school health programs and services, current investments are likely to yield only limited educational benefits to students for several reasons. First, current financial investments are not sufficient to address the magnitude and severity of health problems affecting urban minority youth. Second, in too many cases the programs being implemented are not high quality. Third, existing efforts are not strategically planned to influence educational outcomes. Fourth, existing efforts are not effectively coordinated to capitalize on potential linkages between efforts. Although rhetorical support is increasing, school health is currently not a central part of the fundamental mission of schools in America nor has it been well integrated into the broader national strategy to reduce the gaps in educational opportunity and outcomes.

For public schools serving urban minority youth, a strategic approach is essential. Schools facing the greatest and most urgent challenges also have the least human and other resources, even before they attempt to deal with health factors. To make best use of scarce resources, priorities for dealing with health factors must be established. A public-health oriented strategic plan would focus on key health risk behaviors (those linked to leading causes of death in childhood and adolescence and those that are established in youth and contribute to the leading causes of death in adulthood), including unintentional injuries and violence, alcohol and drug use, sexual risk behavior, tobacco use, physical inactivity, and poor eating habits.<sup>36</sup>

## STRATEGIC PRIORITIES

The current analysis establishes strategic priorities based on their relevance to educational outcomes and to closing the achievement gap. Three criteria were considered: (1) prevalence and extent of health disparities, (2) evidence of causal effects on educational outcomes, and (3) feasibility of implementing proven or promising school-based programs and policies. Prevalence and extent of health disparities was used based on the premise that, if a health problem is the cause of an educational disparity, the health problem must affect a large proportion of youth and be more prevalent

or have more deleterious effects on urban minority youth. Disparities are described in terms of descriptive epidemiology indices (eg, prevalence estimates) using data describing nationally representative samples, when available. Local data were used to highlight geographical variation.

If a health problem is the cause of an educational disparity, the health problem must be statistically and temporally associated with the unfavorable educational outcomes. Beyond a temporal statistical association, the case for causation is strengthened by a plausible explanation for why a particular health problem would cause a negative educational outcome: “What are the causal pathways?” Prioritizing health factors in terms of causal links to educational outcomes may enhance their perceived importance and acceptability to policy makers, school leaders and teachers, and other educational stakeholders. The specific health factors selected by a given school or school system are less important than the fact that multiple educationally relevant health factors are prioritized and addressed collectively through a single set of high-quality, strategically planned, and effectively coordinated programs and policies.

The third criterion used in the current analysis was feasibility of implementing proven or promising school health approaches. This criterion focuses on 2 issues, feasibility and effectiveness. Feasibility is based, in part, on the observation that some health programs and services are already being implemented in many schools and that guidelines and recommendations summarizing what schools can do to address the respective health problems are already available from credible sources. Effectiveness is based on the availability of proven or promising approaches from a large body of evaluative research demonstrating that particular approaches can influence the acquisition and practice of various health-related behaviors.

There are different degrees of evidence concerning the likelihood of influencing particular health behaviors and health status indices. The overwhelming majority of evaluative research on disease prevention and health promotion for children and adolescents has not, however, measured educational outcomes. Another weakness in our current knowledge is that evaluative research has focused on the effects of interventions on individual health problems rather than efforts to address multiple health problems. Several national databases describing school health approaches with proven or promising results are available but apparently not used by many schools in their decision making about which school health programs to adopt and implement.

On the basis of these criteria, the following educationally relevant health disparities were selected as priorities: (1) vision, (2) asthma, (3) teen pregnancy, (4) aggression and violence, (5) physical activity,

(6) breakfast, and (7) inattention and hyperactivity. The omission of other health topics should not be taken to suggest that they are unimportant. Tobacco, alcohol and drug use, dental problems, ear infections, obesity, accidental injuries, among others, are pervasive problems affecting youth and depending on the local context also warrant consideration. Indeed, all these problems are rightly priorities of the US Public Health Service. The 7 specified priorities are intended to illustrate the effect that addressing particular health disparities can have on educational opportunity and the achievement gap. They illustrate a reasonable set of “starting points” through which school policies and programs might influence the achievement gap among urban minority youth. Schools in different social and economic contexts will have lesser or greater propensity to include various health factors as a priority; this is not problematic as long as problems are addressed with proven or promising approaches, are selected strategically, and are addressed through an effectively coordinated effort.

### CAUSAL PATHWAYS

One or more of 5 causal pathways—the mechanisms by which health factors influence motivation and ability to learn—are identified and described for each health factor: (1) sensory perceptions, (2) cognition, (3) school connectedness and engagement, (4) absenteeism, and (5) temporary or permanent dropping out. It is axiomatic that sensory perception (eg, seeing and hearing well) and cognition (executive functioning, memory, maintaining attention) have powerful effects on learning opportunities; that student absenteeism adversely affects opportunities to learn academically and to grow socially; and that dropping out adversely affects life course trajectories.

Until recently, what has been less clear, or at least less well documented empirically, is the importance of connectedness and engagement with school. Connectedness is essentially about interpersonal relationships, both with peers and school staff. It is the extent to which students perceive that adults and peers in the school community care about them as students and as individuals. A compelling body of research demonstrates that connectedness and engagement with school is a key determinant of academic achievement and educational attainment<sup>37-43</sup> as well as child and adolescent health (eg, reduced risk of substance use, teen pregnancy, aggressive behaviors, and mental/emotional health problems).<sup>38,44-51</sup> There is general consensus that connectedness and engagement in learning are important for success in school.<sup>41</sup>

Because educational outcomes are influenced by many forces differentially across various contexts, each health factor, addressed separately, should not be expected to have large or consistent effects on

educational outcomes. For example, the effects of diet on the brain are integrated with effects of other factors such as exercise and sleep.<sup>52</sup> The child who is well nourished, physically active, and well rested is likely to have advantages regarding cognition compared with the child with deficits in any of these areas. The child who has difficulty seeing, difficulty paying attention, or is bullied at school will struggle to succeed academically and will feel less connected and engaged with school. In turn, the child who is less connected and engaged with school will be less motivated to attend. Thus, beyond their individual effects, educationally relevant health disparities, collectively, can have an influential role in shaping the educational and social lives of the nation’s urban minority youth. Furthermore, there are synergistic effects of acquiring skills at earlier stages in life whereby capabilities beget capabilities and influence long-term health.<sup>53</sup>

### A COORDINATED APPROACH

A coordinated approach is characterized by programs and services involving different groups of people, playing different roles, but forming a team and working toward a common set of priority goals, namely improving students’ motivation and ability to learn. Once school health priorities are established, limited resources are used to support integrated efforts to achieve them. This helps to optimize the value of existing resources.

Linkages between teachers and health service personnel are essential in helping to ensure that identified problems (eg, with vision, asthma, or attention deficit/hyperactivity disorder) receive indicated follow-up care. Linkages between categorical health curricula (eg, dealing with violence and teen pregnancy prevention) can optimize the use of curricular time by recognizing that reducing susceptibility to these different problems requires learning and practicing the same set of mental and social-emotional skills (eg, self-regulation, dealing with social pressures, communicating assertively but not aggressively). Effective coordination requires a school health coordinator who is cognizant of the different programs, services, and policies and how they can be linked together to use limited resources effectively and efficiently.

Selection of program components can, at least in part, be based on the ability of distinct program or service components to influence the same set of priority outcomes. Thus coordination applies to planning as well as implementing school health efforts. Programs intended to ensure that youth eat breakfast, have daily physical activity, and arrive at school well rested would be addressed through different school health efforts, but could collectively affect cognition to a greater extent than any of the individual efforts.



## DELIMITATIONS AND OVERALL INTENT

Several delimitations narrow the scope of this analysis. First, the emphasis is on urban minority youth. Urban minority youth represent a large and growing segment of the US population. The percentage of students comprising all public school students enrolled in kindergarten through 12th grade who were White declined from 77.8% in 1972 to 56.9% in 2006.<sup>54</sup> Improved health status for all children is a worthy goal, but need is particularly urgent among urban minority youth who, as with adults, have great intergenerational educational and health disparities. There are, of course, other subpopulations (eg, Native American and poor rural youth) facing extremely challenging educational and health contexts, which can and should be addressed. Second, although health may influence educational outcomes across the lifespan, attention is limited to health factors that influence school-aged youth. Again, this is in no way intended to minimize the important causal role of intrauterine, neonatal, infant and toddler health on motivation and ability to learn. Indeed, programs aimed at reducing health disparities among infants, toddlers, and children under 5 should be a top priority. A third delimitation is that health factors were selected based, in part, on feasibility of implementing proven or promising school-based programs and services. Clearly, the achievement gap cannot be closed without extensive involvement from other social institutions, but, at the same time, school health efforts that are high quality, strategically planned, and effectively coordinated are one of the best investments for influencing the health, as well as the minds, of the nation's youth.

This special issue fills a significant gap in the current literature. In the following articles, each of the educationally relevant health disparities is described with respect to nature and scope of the problem, prevalence and disparities affecting urban minority youth, causal pathways by which the respective health disparity adversely affects motivation or ability to learn, ways that school programs and policies can address the problem, and evidence supporting proven or promising approaches. The overall intent of this special issue is to make the case for high-quality, strategically planned, and effectively coordinated school health initiatives as part of a national strategy to close the achievement gap by presenting the evidence regarding 4 main points: (1) urban minority youth are disproportionately affected by both educational and health disparities, (2) healthier students are better learners, (3) school programs and policies can favorably influence educationally relevant health disparities affecting youth, and (4) now is an opportune time for change. Initiatives to move this agenda forward at the national, state, and local levels are proposed.

## REFERENCES

1. Evans GW. The environment of childhood poverty. *Am Psychol.* 2004;59:77-92.
2. Evans GW, Schamberg MA. Childhood poverty, chronic stress, and adult working memory. *Proc Natl Acad Sci USA.* 2009;106:6545-6549.
3. Murnane RJ. Improving the education of children living in poverty. *Future Child.* 2007;17:161-182.
4. Rouse CE, Barrow L. U.S. elementary and secondary schools: equalizing opportunity or replicating the status quo? *Future Child.* 2006;16:99-123.
5. Chen E, Martin AD, Matthews KA. Trajectories of socioeconomic status across children's lifetimes predict health. *Pediatrics.* 2007;120:e297-e303.
6. Evans GW. Child development and the physical environment. *Annu Rev Psychol.* 2006;57:423-451.
7. Evans GW, Gonnella, C, Marcynszyn LA, Gentile L, Salpekar N. The role of chaos in poverty and children's socioemotional adjustment. *Psychol Sci.* 2005;16:560-565.
8. Evans GW, Kim P. Childhood poverty and health: cumulative risk exposure and stress deregulation. *Psychol Sci.* 2007;18:953-957.
9. Geronimus AT. To mitigate, resist, or undo: addressing structural influences on the health of urban populations. *Am J Public Health.* 2000;90:867-872.
10. Link BG, Phelan JC, Miech R, Westin EL. The resources that matter: fundamental social causes of health disparities and the challenge of intelligence. *J Health Soc Behav.* 2008;49:72-91.
11. Lynch JW, Kaplan GA, Shema SJ. Cumulative impact of sustained economic hardship on physical, cognitive, psychological, and social functioning. *New Engl J Med.* 1997;337:1889-1895.
12. Marmot M. The influence of income on health: views of an epidemiologist. *Health Affair.* 2002;21:31-46.
13. Melchior M, Moffitt TE, Milne BJ, Poulton R, Caspi A. Why do children from socioeconomically disadvantaged families suffer from poor health when they reach adulthood? A life course study. *Am J Epidemiol.* 2007;166:966-974.
14. Poulton R, Moffitt TE, Harrington H, Milne BJ, Caspi A. Association between children's experience of socioeconomic disadvantage and adult health: a life-course study. *Lancet.* 2002;360:1640-1645.
15. Case A, Fertig A, Paxson C. The lasting impact of childhood health and circumstance. *J Health Econ.* 2005;24:365-389.
16. Case A, Paxson C. Children's health and social mobility. *Future Child.* 2006;16:151-173.
17. Hass SA. Health selection and the process of social stratification: the effect of childhood health on socioeconomic attainment. *J Health Soc Behav.* 2006;47:339-354.
18. Koivusilta L, Arja R, Andres V. Health behaviors and health in adolescence as predictors of educational level in adulthood: a follow-up study from Finland. *Soc Sci Med.* 2003;57:577-593.
19. Link BG, Phelan JC. Social conditions as fundamental causes of disease. *J Health Soc Behav.* 1995;35:80-94.
20. Palloni A. Reproducing inequalities: luck, wallets, and the enduring effects of childhood health. *Demography.* 2006;43:587-615.
21. Crosnoe R. Health and the education of children from racial/ethnic minority and immigrant families. *J Health Soc Behav.* 2006;47:77-93.
22. Hass SA, Fosse NE. Health and the educational attainment of adolescents: evidence from the NLSY 97. *J Health Soc Behav.* 2008;49:178-192.
23. Heckman JJ. Role of income and family influence on child outcomes. *Ann NY Acad Sci.* 2008;1136:307-323.
24. Mann H, Mann MTP, Mann GC, Pécant F. Annual reports of the Secretary of the Board of Education of Massachusetts for the years 1839-1844 by Horace Mann. In: *Life and Works of Horace Mann, Vol. III.* Boston, MA: Lee and Shepard; 1891:229.

25. State school health policy database. National Association of State Boards of Education. Available at: [http://nasbe.org/healthy\\_schools/hs](http://nasbe.org/healthy_schools/hs). Accessed February 20, 2010.
26. School health programs. National School Boards Association. Available at: <http://www.nsba.org/MainMenu/SchoolHealth>. Accessed February 20, 2010.
27. School health project. Council of Chief State School Officers. Available at: [http://www.ccsso.org/Projects/school\\_health\\_project](http://www.ccsso.org/Projects/school_health_project). 2008. Accessed February 20, 2010.
28. The learning compact redefined: A call to action. Association for Supervision and Curriculum Development. Available at: <http://www.ascd.org/ASCD/pdf/Whole%20Child/WCC%20Learning%20Compact.pdf>. 2007. Accessed February 20, 2010.
29. Health, mental health, and safety guidelines for schools. American Academy of Pediatrics & National Association of School Nurses. Available at: <http://www.nationalguidelines.org>. Accessed February 20, 2010.
30. Statement. A Broader, Bolder Approach to Education. Available at: <http://www.boldapproach.org/statement.html>. Accessed February 20, 2010.
31. CDC's school health education resources (SHER) national health education standards (NHES). Centers for Disease Control and Prevention. Available at: [http://www.cdc.gov/healthy\\_youth/sher/standards](http://www.cdc.gov/healthy_youth/sher/standards). Accessed February 20, 2010.
32. Coordinated school health program. Centers for Disease Control and Prevention. Available at: [http://www.cdc.gov/healthy\\_youth/CSHP](http://www.cdc.gov/healthy_youth/CSHP). Accessed February 20, 2010.
33. Healthy schools, healthy youth! Centers for Disease Control and Prevention. Available at: <http://www.cdc.gov/healthyyouth>. Accessed February 20, 2010.
34. Kann L, Telljohann SK, Wooley SF. Health education: results from the School Health Policies and Programs Study 2006. *J Sch Health*. 2007;77:408-434.
35. Coalition for Community Schools. Available at: <http://www.communityschools.org>. Accessed December 28, 2008.
36. Kolbe LJ, Kann L, Collins JL. The youth risk behavior surveillance System. *Public Health Rep*. 1993;108:2-10.
37. Battin-Pearson S, Newcomb MD, Abbot RD, Hill KG, Catalano RF, Hawkins JD. Predictors of early high school dropout: a test of five theories. *J Educ Psychol*. 2000;92:568-582.
38. Bond L, Butler H, Thomas L, Carlin J, Glover S, Bowes G, Patton G. Social and school connectedness in early secondary school as predictors of late teenage substance use, mental health, and academic outcomes. *J Adolesc Health*. 2007;40:357.e9-18.
39. Fleming CB, Haggerty KP, Catalano RF, Harachi TW, Mazza JJ, Gruman DH. Do social and behavioral characteristics targeted by preventive interventions predict standardized test scores and grades? *J Sch Health*. 2005;75:342-349.
40. Ladd GW, Birch SH, Buhs E. Children's social and scholastic lives in kindergarten: related spheres of influence? *Child Dev*. 1999;70:1373-1400.
41. Klem AM, Connell JP. Relationships matter: linking teacher support to student engagement and achievement. *J Sch Health*. 2004;74:262-273.
42. Nelson DW. *2004 KIDS COUNT data book: moving youth from risk to opportunity*. Baltimore, MD: Annie E. Casey Foundation; 2004.
43. Rosenfeld LB, Richman JM, Bowen GL. Low social support among at-risk adolescents. *Soc Work Educ*. 1998;20:245-260.
44. Bonny AE, Britto MT, Klostermann BK, Hornung RW, Slap GB. School disconnectedness: identifying adolescents at risk. *Pediatrics*. 2000;106:1017-1021.
45. Eccles JS, Early D, Fraser K, Belansky E, McCarthy K. The relation of connection, regulation, and support for autonomy to adolescents' functioning. *J Adolesc Res*. 1997;12:263-286.
46. Manlove J. The influence of high school dropout and school disengagement on the risk of school-age pregnancy. *J Res Adolesc*. 1998;8:187-220.
47. Mansour ME, Kotagal U, Rose B, et al. Health-related quality of life in urban elementary schoolchildren. *Pediatrics*. 2003;111:1372-1381.
48. McNeely C, Falci C. School connectedness and transition into and out of health-risk behavior among adolescents: a comparison of social belonging and teacher support. *J Sch Health*. 2004;74:284-292.
49. Resnick MD, Bearman PS, Blum RW, et al. Protecting adolescents from harm. *JAMA*. 1997;278:823-832.
50. Resnick MD, Harris LJ, Blum RW. The impact of caring and connectedness on adolescent health and wellbeing. *J Paediatr Child Health*. 1993;29:S3-S9.
51. Shochet IM, Dadds MR, Ham D, Montague R. School connectedness is an underemphasized parameter in adolescent mental health: results of a community prediction study. *J Clin Child Adolesc Psychol*. 2006;35:170-179.
52. Gomez-Pinilla F. Brain foods: The effects of nutrients on brain function. *Natl Rev Neurosci*. 2008;9:568-578.
53. Heckman JJ. The economics, technology, and neuroscience of human capability formation. *Proc Natl Acad Sci*. 2007;104:13250-13255.
54. Planty M, Hussar W, Snyder T, et al. *The condition of education 2008* (NCES 2008-031). Washington, DC: National Center of Educational Statistics, Institute of Educational Sciences, U.S. Department of Education; 2008.