

Continued Promise of School Breakfast Programs for Improving Academic Outcomes

Breakfast Is Still the Most Important Meal of the Day

Lindsey Turner, PhD; Frank J. Chaloupka, PhD

A groundbreaking study,¹ published in this journal nearly 25 years ago, documented improved academic outcomes among low-income schoolchildren who received school breakfast via the School Breakfast Program (SBP) vs those who did not, including



Related article page 71

significantly decreased tardiness and absences and improved performance on standardized tests of academic achievement. Since that time, the empirical study of school breakfast initiatives has increased substantially, with several literature reviews²⁻⁴ documenting the importance of breakfast for a variety of health and academic outcomes.

In this issue, Anzman-Frasca and colleagues⁵ at Tufts University provide even more evidence about the importance of school breakfasts. Their study used a large sample of elementary schools to examine outcomes of a Breakfast in the Classroom (BIC) intervention as a strategy to increase participation in the SBP and several key academic outcomes. They found that the BIC intervention significantly improved rates of participation in the SBP and student attendance. Although Anzman-Frasca and colleagues did not replicate previous findings that breakfast improved academic achievement, this should not be interpreted as a lack of benefit for breakfast programs. Indeed, a recent comprehensive review² found that 21 prior studies—many of which used high-quality experimental designs to evaluate breakfast interventions—reported that consumption of breakfast can significantly improve students' performance on standardized tests of mathematics and reading. Most important, these effects appear to be most reliable for *habitual* breakfast consumption, and breakfast interventions appear to require at least 1 month, but generally durations of several months, to produce significant improvements in students' grades and standardized achievement test scores.² This is not particularly surprising, considering that achievement tests assess the culmination of knowledge and skills acquired by students in the duration of a school year; therefore, the effect of a breakfast intervention on longer-term achievement outcomes is unlikely to be discernible before such programs are fully implemented.

In the current study, academic achievement was measured with standardized tests administered in spring 2013, which was concurrent with the time of year when participation in the SBP peaked.⁵ Given the likelihood that program implementation may need to be sustained for several months to affect achievement tests, another interesting approach would be to examine test scores during a subsequent school year when the SBP intervention is relatively mature, thus allowing the intervention dosage to be high and sustained during most of the school year.

The significant improvement in attendance rates in this study⁵ is consistent with many other studies showing improvements in proximal factors associated with academic success, such as attendance. Breakfast programs have also reduced tardiness,⁶ another key factor that improves academic outcomes by increasing students' readiness to learn. Other work has contributed to the understanding of mechanisms through which breakfast may ultimately benefit academic achievement, such as increasing on-task behavior while students are in the classroom.⁷ There is also some limited evidence of improvements in prosocial behavior among students as a result of participating in breakfast programs,⁸ but few studies have yet systematically examined the possible benefits of breakfast on the social and emotional development of children. Along these lines, there is also a plausible possibility that classroom breakfast provision models, in particular, could increase connectedness among students, as well as their teachers. Given that school connectedness is consistently associated with better outcomes,^{9,10} this possibility is significant and promising, but it has not yet been rigorously evaluated. Well-powered studies of these important student-level outcomes would be innovative and would improve our understanding of the variety of benefits of the SBP.

Given that breakfast can promote behavioral, cognitive, and physical benefits, resulting in improved health and academic outcomes for children and adolescents, a key question is how to improve the stubbornly low rates of student participation in the SBP. As of the 2012-2013 school year, on average only 52% of lower-income students (ie, those eligible for free or reduced-price meals) actually received breakfasts through the program.¹¹ Reasons that eligible students do not participate include issues such as stigma and the practical difficulty of getting to school in time for breakfast before classes begin (ie, due to bus schedules). Alternative delivery strategies, such as grab-and-go meals or BIC, have been increasing in popularity because of their ability to address these barriers. This is a substantial contribution of Anzman-Frasca and colleagues⁵ in demonstrating a large improvement in rates of participation in the SBP because of the BIC provision model. This difference is not only statistically significant but also practically significant and impressive in magnitude. By May of the school year, participation increased to more than 90% of students with the BIC program compared with fewer than half of students in schools with a traditional SBP provision strategy. This documentation of the improvement in participation rates for a large-scale program rollout is important in that it reveals that a classroom provision model actually improves participation.

Although substantial literature now documents the promise of school breakfast as a strategy for improving students' health and academic outcomes, all breakfasts are not built the same, and the nutritional quality of breakfast affects the ex-

tent to which cognitive outcomes are improved. For example, low-glycemic-load breakfasts increase time on task⁷ and cognitive performance while at school.^{12,13} This is particularly relevant given ongoing changes to school meals standards that aim to improve the nutritional characteristics of the meals, which have generally been too high in sugar and fat content.¹⁴ The US Department of Agriculture, the agency that sets requirements for meal patterns and nutritional content of foods and beverages provided via the SBP, issued new requirements for breakfasts beginning in the 2012-2013 school year, such as offering more fruit and only lower-fat milks.¹⁵ Additional requirements will be gradually phased in; for example, as students return to school this fall, all grain products must be whole-grain rich. The revised standards have the potential to increase health outcomes, as well as potentially improving academic outcomes, because breakfasts that comply with the new standards may have a lower glycemic index than did previous meals. Undoubtedly, more work is needed in this area, and detailed studies will be essential for understanding how the nutritional composition of school meals affects students' academic outcomes. In addition, gathering student-level data on consumption may help to develop a more nuanced understanding of how individual variations in breakfast habits might facilitate academic success. Although such data are expensive to collect, owing to the costs of collecting student-level

data while also implementing breakfast programs in a sufficient number of schools to allow for adequately powered analyses, the burden of such research studies is worthwhile because of the high value of the data to be obtained.

Finally, innovative breakfast programs, with their wide reach and high implementation rates, have the potential to address the achievement gap in the United States. The differences in academic achievement between white children and black and Latino peers are substantial and persistent.^{16,17} Although poverty and race/ethnicity overlap, with black and Latino children being disproportionately represented in disadvantaged neighborhoods and schools, the achievement gap reflects more than just the economic challenges facing children of color in this country. Simply providing universal-free breakfast at schools that serve primarily black and/or Latino children is unlikely to be a panacea, but if unique breakfast provision models are used, the availability of breakfast to all children could be an effective component of school reforms to level the academic playing field and address the achievement gap.¹⁸ Comprehensive school support systems, including financial and technical support for schools, communities, and families, will be needed to address this unacceptable societal inequity, but promoting a school culture that nourishes children physically has much promise for promoting equitable health and academic outcomes among all children.

ARTICLE INFORMATION

Author Affiliations: Initiative for Healthy Schools, College of Education, Boise State University, Boise, Idaho (Turner); Institute for Health Research and Policy, University of Illinois at Chicago (Chaloupka).

Corresponding Author: Lindsey Turner, PhD, College of Education, Boise State University, 1910 W University Dr, Boise, ID 83725 (lindseyturner1@boisestate.edu).

Published Online: November 24, 2014.
doi:10.1001/jamapediatrics.2014.2409.

Conflict of Interest Disclosures: None reported.

REFERENCES

- Meyers AF, Sampson AE, Weitzman M, Rogers BL, Kayne H. School Breakfast Program and school performance. *Am J Dis Child.* 1989;143(10):1234-1239.
- Adolphus K, Lawton CL, Dye L. The effects of breakfast on behavior and academic performance in children and adolescents. *Front Hum Neurosci.* 2013;7(425):425. doi:10.3389/fnhum.2013.00425.
- Rampersaud GC, Pereira MA, Girard BL, Adams J, Metz J. Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *J Am Diet Assoc.* 2005;105(5):743-760, quiz 761-762.
- Hoyland A, McWilliams KA, Duff RJ, Walton JL. Breakfast consumption in UK schoolchildren and provision of school breakfast clubs. *Nutr Bull.* 2012; 37:232-240.
- Anzman-Frasca S, Djang HC, Halmo MM, Dolan PR, Economos CD. Estimating impacts of a Breakfast in the Classroom program on school outcomes [published online November 24, 2014]. *JAMA Pediatr.* doi:10.1001/jamapediatrics.2014.2042.
- Murphy JM, Pagano ME, Nachmani J, Sperling P, Kane S, Kleinman RE. The relationship of school breakfast to psychosocial and academic functioning: cross-sectional and longitudinal observations in an inner-city school sample. *Arch Pediatr Adolesc Med.* 1998;152(9):899-907.
- Benton D, Maconie A, Williams C. The influence of the glycaemic load of breakfast on the behaviour of children in school. *Physiol Behav.* 2007;92(4): 717-724.
- Shemilt I, Harvey I, Shephstone L, et al. A national evaluation of school breakfast clubs: evidence from a cluster randomized controlled trial and an observational analysis. *Child Care Health Dev.* 2004;30(5):413-427.
- Bryk AS, Sebring PN, Allensworth E, Luppescu S, Easton JQ. *Organizing Schools for Improvement: Lessons From Chicago.* New York, NY: Russell Sage Foundation Publications; 2010.
- Thapa A, Cohen J, Guffey S, Higgins-D'Alessandro A. A review of school climate research. *Rev Educ Res.* 2013;83(3):357-385.
- Food Resource and Action Center. School Breakfast Scorecard: 2012-2013 School Year. January 2014. http://frac.org/pdf/School_Breakfast_Scorecard_SY_2012_2013.pdf. Accessed August 25, 2014.
- Micha R, Rogers PJ, Nelson M. Glycaemic index and glycaemic load of breakfast predict cognitive function and mood in school children: a randomised controlled trial. *Br J Nutr.* 2011;106(10):1552-1561.
- Ingwersen J, Defeyer MA, Kennedy DO, Wesnes KA, Scholey AB. A low glycaemic index breakfast cereal preferentially prevents children's cognitive performance from declining throughout the morning. *Appetite.* 2007;49(1):240-244.
- Fox MK, Condon E. School Nutrition Dietary Assessment IV: Summary of Findings. November 2012. http://www.mathematica-mpr.com/publications/PDFs/nutrition/snda-iv_findings.pdf. Accessed August 25, 2014.
- US Department of Agriculture. School Meals: Nutrition Standards for School Meals. July 2014. <http://www.fns.usda.gov/school-meals/nutrition-standards-school-meals>. Accessed August 25, 2014.
- Vanneman A, Hamilton L, Baldwin Anderson J, Rahman T. *Achievement Gaps: How Black and White Students in Public Schools Perform in Mathematics and Reading on the National Assessment of Educational Progress (NAEP).* Washington, DC: National Center for Education Statistics, Institute of Education Sciences, US Dept of Education; 2011: 2009-2455.
- Hemphill FC, Vanneman A. *Achievement Gaps: How Hispanic and White Students in Public Schools Perform in Mathematics and Reading on the National Assessment of Educational Progress (NAEP).* Washington, DC: National Center for Education Statistics, Institute of Education Sciences, US Dept of Education; 2011:2011-2459.
- Basch CE. Healthier students are better learners: a missing link in school reforms to close the achievement gap. *J Sch Health.* 2011;81(10):593-598.