



Ask A REL

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Date: October 5, 2015

Thank you for your request to Ask A REL. The information below represents the most rigorous research available. Researchers consider the type of methodology used and give priority to research reports that employ well-described and thorough methods. *(NOTE: Abstracts and executive summaries are copied directly from the reports when possible to ensure accuracy)*

Question #2275:

Is there an academic effect on later start times for schools (elementary, middle, and high school)? What is the recommend school start time at each level? What are some of the issues that arise with later start times?

Our Response:

We always approach questions by examining resources of the U.S. Department of Education's Institute of Education Sciences (IES), an organization that adheres to rigorous research standards — <http://ies.ed.gov/>. In this case, we consulted IES's ERIC database — <http://eric.ed.gov/> — using the search term "school start time." Here, in reverse chronological order, are the most pertinent articles we found there:

Earlier School Start Times as a Risk Factor for Poor School Performance: An Examination of Public Elementary Schools in the Commonwealth of Kentucky

Keller, Peggy S.; Smith, Olivia A.; Gilbert, Lauren.; Bi, Shuang; Haak, Eric A.; Buckhalt, Joseph A. Journal of Educational Psychology, v107 n1 p236-245 Feb 2015 —

<http://psycnet.apa.org/?fa=main.doiLanding&doi=10.1037/a0037195>

Adequate sleep is essential for child learning. However, school systems may inadvertently be promoting sleep deprivation through early school start times. The current study examines the potential implications of early school start times for standardized test scores in public elementary schools in Kentucky. Associations between early school start time and poorer school performance were observed primarily for schools serving few students who qualify for free or reduced-cost lunches. Associations were controlled for teacher-student ratio, racial

composition, and whether the school was in the Appalachian region. Findings support the growing body of research showing that early school start times may influence student learning but offer some of the first evidence that this influence may occur for elementary school children and depend on school characteristics.

School Start Time Change: An In-Depth Examination of School Districts in the United States

Owens, Judith; Droblich, Darrel; Baylor, Allison; Lewin, Daniel

Mind, Brain, and Education, v8 n4 p182-213 Dec 2014 — [Direct link](#)

In response to the scientific evidence documenting both profound developmental changes in sleep and circadian biology during adolescence and the myriad of negative health, performance, and safety outcomes risks associated with chronic sleep loss, at least 70 public school districts in the United States, representing approximately 1,000 schools, have successfully implemented a delay in high school start times. However, despite the compelling evidence supporting school start time change as a key strategy in addressing the epidemic of adolescent sleep loss, many school districts across the country with early high school start times have not considered the option to implement later bell schedules for adolescents. Moreover, while the current scientific literature has clearly documented the positive "outcomes" associated with delayed high school start times, these studies contain limited information regarding the "process" by which school districts consider, approve and implement bell schedule changes. Thus, this in-depth examination of those school districts that have been successful in changing their bell schedules is intended to support the efforts of other districts in various stages of contemplating this measure. We utilized a multi-pronged approach (literature review, case studies, telephone interviews, online survey) to summarize the experiences of school districts across the United States in regard to challenges faced, strategies employed, and lessons learned in the hope that this information will be a useful tool for other school districts looking to chart a course forward to promote the health, safety, and academic opportunities of their students.

Sleep Duration, Positive Attitude toward Life, and Academic Achievement: The Role of Daytime Tiredness, Behavioral Persistence, and School Start Times

Perkinson-Gloor, Nadine; Lemola, Sakari; Grob, Alexander

Journal of Adolescence, v36 n2 p311-318 Apr 2013 —

<http://www.sciencedirect.com/science/article/pii/S0140197112001832>

Sleep timing undergoes profound changes during adolescence, often resulting in inadequate sleep duration. The present study examines the relationship of sleep duration with positive attitude toward life and academic achievement in a sample of 2716 adolescents in Switzerland (mean age: 15.4 years, SD = 0.8), and whether this relationship is mediated by increased daytime tiredness and lower self-discipline/behavioral persistence. Further, we address the question whether adolescents who start school modestly later (20 min; n = 343) receive more sleep and report better functioning. Sleeping less than an average of 8 h per night was related to more tiredness, inferior behavioral persistence, less positive attitude toward life, and lower school grades, as compared to longer sleep duration. Daytime tiredness and behavioral persistence mediated the relationship between short sleep duration and positive attitude toward life and school grades. Students who started school 20 min later received reliably more sleep and reported less tiredness.

Do Schools Begin Too Early?

Edwards, Finley

Education Next, v12 n3 p52-57 Sum 2012 — <http://educationnext.org/do-schools-begin-too-early/>

School start times vary considerably, both across the nation and within individual communities, with some schools beginning earlier than 7:30 a.m. and others after 9:00 a.m. Proponents of later start times, who have received considerable media attention in recent years, argue that many students who have to wake up early for school do not get enough sleep and that beginning the school day at a later time would boost their achievement. A number of school districts have responded by delaying the start of their school day, and a 2005 congressional resolution introduced by Rep. Zoe Lofgren (D-CA) recommended that secondary schools nationwide start at 9:00 or later. Despite this attention, there is little rigorous evidence directly linking school start times and academic performance. In this study, the author uses data from Wake County, North Carolina, to examine how start times affect the performance of middle school students on standardized tests. The author finds that delaying school start times by one hour, from roughly 7:30 to 8:30, increases standardized test scores by at least 2 percentile points in math and 1 percentile point in reading. The effect is largest for students with below-average test scores, suggesting that later start times would narrow gaps in student achievement.

Reviews/Essays: School Start Times and the Sleep-Wake Cycle of Adolescents--A Review and Critical Evaluation of Available Evidence

Kirby, Matthew; Maggi, Stefania; D'Angiulli, Amedeo

Educational Researcher, v40 n2 p56-61 Mar 2011 — <http://edr.sagepub.com/content/40/2/56>

The authors have integrated the major findings on the sleep-wake cycle and its performance correlates in adolescents. Basic research shows that lack of synchronicity between early school start times and the circadian rhythm of adolescents (and the sleep debt accumulated as a result) involves several cognitive correlates that may harm the academic performance of adolescent students. The authors therefore examined findings from pilot interventions in which schools delayed their start times; specifically, they examined the effects on students, including potential pitfalls and strategies to consider for effective scheduling change. There is sufficient evidence that adolescent students would benefit from delaying school start times and that this change can be implemented with tolerable consequences if adequately strategized by school districts and communities.

Organizing Schools to Improve Student Achievement: Start Times, Grade Configurations, and Teacher Assignments. Discussion Paper 2011-08

Jacob, Brian A.; Rockoff, Jonah E.

Brookings Institution, 2011 —

<http://www.brookings.edu/research/papers/2011/09/organization-jacob-rockoff>

Education reform proposals are often based on high-profile or dramatic policy changes, many of which are expensive, politically controversial, or both. In this paper, we argue that the debates over these "flashy" policies have obscured a potentially important direction for raising student performance--namely, reforms to the management or organization of schools. By making sure the "trains run on time" and focusing on the day-to-day decisions involved in managing the instructional process, school and district administrators may be able to substantially increase student learning at modest cost. In this paper, we describe three organizational reforms that recent evidence suggests have the potential to increase K-12 student performance at modest costs: (1) Starting school later in the day for middle and high school students; (2) Shifting from a system with separate elementary and middle schools to one with schools that serve students in

kindergarten through grade eight; (3) Managing teacher assignments with an eye toward maximizing student achievement (e.g. allowing teachers to gain experience by teaching the same grade level for multiple years or having teachers specializing in the subject where they appear most effective). We conservatively estimate that the ratio of benefits to costs is 9 to 1 for later school start times and 40 to 1 for middle school reform. A precise benefit-cost calculation is not feasible for the set of teacher assignment reforms we describe, but we argue that the cost of such proposals is likely to be quite small relative to the benefits for students. While we recognize that these specific reforms may not be appropriate or feasible for every district, we encourage school, district, and state education leaders to make the management, organization, and operation of schools a more prominent part of the conversation on how to raise student achievement.

A Survey of Factors Influencing High School Start Times

Wolfson, Amy R.; Carskadon, Mary A.

NASSP Bulletin, v89 n642 p47-66 2005 — <http://bul.sagepub.com/content/89/642/47>

The present study surveyed high school personnel regarding high school start times, factors influencing school start times, and decision making around school schedules. Surveys were analyzed from 345 secondary schools selected at random from the National Center for Educational Statistics database. Factors affecting reported start times included economic background of the students, number of bus tiers, and school size. Most schools had not contemplated changing or changed their school start times. Of those schools in which changes were contemplated, 32% noted concerns about teenagers' sleep needs and about 50% of the respondents endorsed possible positive outcomes, such as lower tardiness and absenteeism rates. Perceived barriers to changing school schedules commonly endorsed included sports practices, after-school activities, and the transportation system. Approximately 50% of respondents indicated that sleep is included in their district's high school health or biology course offerings.

Please note that we cannot attest to the quality of resources in the ERIC database; our practice is to look first to IES or other Department of Education publications, then to peer-reviewed articles.

You may also wish to review the resources of the advocacy organization, Start School Later — <http://www.startschoollater.net> — though, here too, we cannot attest to the quality of research underlying the content.

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