4 Benefits of Later School Start Times

Later school start times bring more sleep and improved health and academic success for teens.

By Anayat Durrani

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Getting back on a school schedule can be a difficult adjustment after the lazy days of summer, especially for teens.

Experts say adolescents are biologically wired to stay up later than younger kids, and having to get up early for school contributes to them being chronically short on sleep. But delaying school start times can help.

The American Academy of Pediatrics has called insufficient sleep in adolescents a public health issue and recommends that middle and high schools start no earlier than 8:30 a.m. But as of 2017, the average start time for public high schools nationwide was 8 a.m., and 10% of schools started before 7:30.

This fall, California became the first state to mandate delayed school start times, with public high schools required to start classes no earlier than 8:30 a.m., and middle schools not before 8 a.m. Supporters say the change will not only let California teens and tweens catch a few extra Z's, but will bring many other important benefits.

"There are resulting improvements across the board: grades improve, attendance goes up and graduation rates go up fairly significantly," says Lisa L. Lewis, a parenting journalist and the author of "The Sleep-Deprived Teen: Why Our Teenagers Are So Tired, And How Parents And Schools Can Help Them Thrive."

Opponents to later start times say they can cause significant logistical issues with bus routes, parent work schedules and extracurriculars like after-school sports.

But advocates say the benefits are worth the cost. States like New York, New Jersey and Massachusetts are considering also making the change.

"Studies have shown over and over that teens get more sleep when school starts later, with research-based benefits to their physical and mental health, academic performance and beyond," says Elinore Boeke, communications director for Start School Later, a nonprofit organization that lobbied for California's new law.

California's implementation of the new rules comes at a time when many teens' sleep habits have changed for the worse due to the pandemic.

Here are some of the benefits of later school start times:

- Better mental and physical health.
- Improved academic outcomes.
- Reduced risk of car accidents and injuries.
- Less tardiness.

[**READ:** Understanding School-Based Mental Health Services.]

Better Mental and Physical Health

Teenagers need eight to 10 hours of sleep per night, but almost 60% of middle schoolers and more than 70% of high schoolers don't get enough sleep on school nights, according to the Centers for Disease Control and Prevention.

In adolescence, changes to the body's "sleep drive" and a delayed release of the sleep hormone melatonin make it more difficult for teens to fall asleep early.

Research shows that when school starts later, teens get more sleep, says Shelby Harris, a sleep psychologist and clinical associate professor at the Albert Einstein College of Medicine, with "many adolescents able to obtain at least eight hours of sleep per night." That leads to better physical and mental health, including decreased rates of depression and anxiety and less caffeine use, Harris says.

Teens who reported they got at least eight hours of sleep per night were more likely to say they have good overall health and less likely to report being depressed or using caffeine and other substances, per a study by the Center for Applied Research and Educational Improvement at the University of Minnesota.

“Kids are more likely to eat breakfast, and teachers find kids smiling and awake to learn in first period,” Boeke says.

Improved Academic Outcomes

When school starts later, "mood, academics, attendance and graduation rates all improve,” says Harris.

For instance, one study by the National Sleep Foundation found that both attendance and graduation rates "significantly improved" in schools that delayed their start times to 8:30 a.m. or later.

Studying middle schools in Wake County, North Carolina, with variable start times, economics professor Finley Edwards found that starting school an hour later would raise test scores an average of 2 percentile points in math and 1.5 points in English. Effects were larger for lower-performing students.

Using Edwards' methodology, but on a national scale, the authors of another study estimated that National Assessment of Educational Progress math scores for eighth graders would increase as much as 8 points if schools started one hour later, which many experts say is equivalent to almost a full grade-level increase.

Jessica Baltaxe, an 11th grader at Angelo Rodriguez High School in Fairfield, California, is starting school a half-hour later this year, and says students like being able to sleep in.

"A half-hour doesn't seem like a lot of time, but it makes a big difference," she says.

"Many students go to bed late because of the demands of their coursework and extracurriculars, so by providing extra time in the morning it sets them up to have a more productive day."

[**READ:** Tackling Math Anxiety.]

Reduced Risk of Car Accidents and Injuries

Multiple studies have shown that both overall car crash and distracted driving crash rates drop significantly with delayed school start times, which can reduce mortality and morbidity in adolescents.

Research on delayed school start times also show that there are fewer sports-related injuries, Harris says.

Several"Getting a good night's sleep and getting it at the right time has been shown to improve student athletes' accuracy and reaction time and significantly lessen their risk of injury," Boeke says.

Hansika Daggolu is in 11th grade at Mission San Jose High School in Fremont, California, where the start of the school day has moved from 8 a.m. to 8:30. She's looking forward to the change.

"I think having later school start times would be especially beneficial for me and other kids who have after-school commitments like sports. We will be getting more sleep, so we will be able to perform better," Daggolu says.

studies show the importance of adequate sleep for student athletes.

Less Tardiness

Regular tardiness can be an issue for sleep-deprived teens. But starting school later makes it easier for students to arrive on time.

“Repeated studies show that starting secondary schools at 8:30 a.m. or later significantly boosts on-time attendance,” says Joy Wake, advocacy director for Start School Later.

She notes this is especially so for financially disadvantaged or lower-performing students who already face obstacles in getting enough sleep and getting to school on time.

“Being well-rested boosts emotional resiliency,” Lewis says. “When teens get more sleep, they’re better equipped emotionally to deal with all of the daily stressors.”

While tardiness may not have been an issue for Baltaxe, she says the later start times make a big difference for busy students like herself.

“Before, I was still waking up during class, but now I feel more prepared to take on the day,” Baltaxe says.

Schools Start Too Early

Updated October 5, 2022

Learn how starting school later can help adolescents get enough sleep and improve their health, academic performance, and quality of life.

Not getting enough sleep is common among high school students and is associated with several health risks including being overweight, drinking alcohol, smoking tobacco, and using drugs, as well as poor academic performance. One of the reasons adolescents do not get enough sleep is early school start times. The American Academy of PediatricsExternalexternal icon has recommended that middle and high schools start at 8:30 a.m. or later to give students the opportunity to get the amount of sleep they need, but most American adolescents start school too early.

According to the 2014 School Health Policies and Practices Study [PDF 1,944 KB], 93% of high schools and 83% of middle schools in the U.S. started before 8:30 a.m.

According to an earlier CDC study that analyzed US Department of Education data from the 2011-2012 school year:

- 42 states reported that most (75%-100%) public middle and high schools started before 8:30 a.m.
- The percentage of schools starting at 8:30 a.m. or later varied greatly by state. For example,
    - No schools in Hawaii, Mississippi, and Wyoming started after 8:30 a.m.
    - Most schools in North Dakota (78%) and Alaska (76%) started after 8:30 a.m.

Adolescents and Sleep

The American Academy of Sleep Medicine [PDF 221KB] recommends that teenagers aged 13 to 18 years should regularly sleep 8 to 10 hours per day for good health. Adolescents who do not get enough sleep are more likely to

- Be overweight.
- Not engage in daily physical activity.
- Suffer from symptoms of depression.

- Engage in unhealthy risk behaviors such as drinking, smoking tobacco, and using illicit drugs.
- Perform poorly in school.

During puberty, adolescents become sleepy later at night and need to sleep later in the morning as a result in shifts in biological rhythms.[1] These biological changes are often combined with poor sleep habits (including irregular bedtimes and the presence of electronics in the bedroom).[2] During the school week, school start times are the main reason students wake up when they do.[3] The combination of late bedtimes and early school start times results in most adolescents not getting enough sleep.

Everyone Can Play an Important Role

Parents

- Model and encourage habits that help promote good sleep:
  - Set a regular bedtime and rise time, including on weekends. This is recommended for everyone— children, adolescents, and adults alike. Adolescents with parent-set bedtimes usually get more sleep than those whose parents do not set bedtimes.
  - Dim the lighting. Adolescents who are exposed to more light (such as room lighting or from electronics) in the evening are less likely to get enough sleep.
  - Start a “media curfew”. Technology use (computers, video gaming, or mobile phones) may also contribute to late bedtimes. Parents should consider banning technology use after a certain time or removing these technologies from the bedroom.
- Contact local school officials about later school start times. Some commonly mentioned barriers to keep in mind are potential increases in transportation costs and scheduling difficulties.

Health care professionals

- Educate adolescent patients and their parents about the importance of adequate sleep and factors that contribute to insufficient sleep among adolescents.

School officials

- Learn more about the research connecting sleep and school start times. Good sleep hygiene in combination with later school times will enable adolescents to be healthier and better academic achievers.

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REPORT

Start high school later for better academic outcomes

David Figlio Thursday, May 25, 2017

Many proposals for improving student performance involve very costly interventions. And while quite a few of these costly interventions surely pass benefit-cost tests, they can be extremely challenging, politically or financially, to implement.

One possible source of "low-hanging fruit" involves changing the ways in which schools are organized. As one example, in a very useful recent policy proposal, Jacob and Rockoff propose three low-cost ways to organize schools to maximize student performance: combining elementary and middle schools into single buildings; optimizing teacher assignment policies; and starting school later in the day for middle and high school students.[1] Of Jacob and Rockoff's proposals, this third idea seems particularly actionable: New buildings need not be built or retrofitted, and the nature of teachers' jobs would not appreciably change. School districts that start elementary schools later and high schools earlier could potentially swap these schedules without major transportation disruptions. This would permit adolescents to sleep later and therefore arrive at school more ready to learn.

Why start school later for adolescents? The answer rests in our biology. Circadian rhythms influence our sleep patterns, and the degree of light on the outside of our eyelids affects our melatonin secretion and feelings of alertness or fatigue.[2] As children enter puberty, their nocturnal melatonin production shifts several hours later than what occurred when they were younger—or when they become adults.[3] As a consequence, the American Academy of Pediatrics suggests that adolescents sleep until at least 8:00 am.[4] But thanks to a wide range of factors, half of all U.S. high schools start by that time.[5] Given this discordance between natural sleep rhythms and school start times for adolescents, it's no surprise that students lose as much as two hours of sleep per night when they start school in the fall relative to the summer.[6]

It's difficult to know exactly how this disconnect between teenagers' optimal sleep times and school schedules affects their classroom performance because school districts that start high schools later might be better-resourced or otherwise support students better than do those that start high schools earlier in the day. One innovative study looks at U.S. Air Force Academy freshmen cadets who were randomly assigned to earlier or later start times (thanks to having a class in the first period or not) and shows that having a first period class substantially reduces achievement—both for the first period class and for the rest of the day.[7] And there exists some case study evidence from Wake County, NC, which changed middle school busing schedules, suggesting that later start times for adolescents improves test scores.[8] Other case study evidence from Minneapolis, which shifted start times later by an hour and a half, is more mixed, with increased teacher-assigned grades and other aspects of student well-being but no improvements in ACT scores.[9]
A major just-published study by Heissel and Norris[10] provides the first evidence using large-scale population-level data on this topic.[11] One way in which this paper represents a large step forward is that it is the first study, to my knowledge, to investigate this question using data from more than one institution or one school district—thereby substantially enhancing external validity. This new paper also has strong internal validity as well: The authors focus their attention on the relationship between sunlight and sleep, and take advantage of the fact that the state of Florida, where they conduct their research, is divided into two time zones. The sun comes up an hour later, on the clock, in the Eastern Time Zone than a few miles west in the Central Time Zone, but schools only partially account for this difference when setting their start times, so, on average, students in the Central Time Zone in Florida have more than half an hour more sunlight before school starts than do their counterparts in the Eastern Time Zone, and some have an hour or more additional sunlight, depending on when school starts.

One might be concerned that people living in different parts of Florida are somehow different in other ways as well, and Heissel and Norris are able to deal with this concern by concentrating on students who *moved between time zones*, while remaining in the northern part of Florida (typically called the Panhandle). Some students moved between the Eastern Time Zone and the Central Time Zone, thereby gaining extra sunlight in the morning before

school, while others moved from the Central Time Zone to the Eastern Time Zone, thereby losing some sunlight before school starts. Their strategy, therefore, is to compare the same students' test performance before versus after their cross-time zone moves. The authors found that people making these eastward and westward moves in the Florida Panhandle were similar across a large range of characteristics, and tended to follow similar over-time test score trends prior to their moves.

What happens when children get an extra hour of sunlight before starting school? (The authors estimate the effect of each additional minute of pre-school sunlight, and I'm presenting the effects of a 60 minute difference for ease of explication.) If they are young, math scores are barely affected—the estimated score improvement is just one percent of a standard deviation—but reading scores increase by six percent of a standard deviation. But once they reach puberty (approximately at age 11 for girls and age 13 for boys) math scores improve by eight percent of a standard deviation and reading score improvements remain at six percent of a standard deviation. The increased amounts of sunlight prior to school start only modestly reduces absence rates—and more for young children than for teenagers—indicating that these improved student outcomes are probably due to increased alertness, rather than to more time in school.

The post-adolescent math performance bumps associated with more daylight prior to school are about the same for boys and girls alike. They are present for both white and non-white students (with slightly higher estimated effects for non-white students). They are present for both relatively affluent and relatively disadvantaged students (with somewhat higher estimated effects for students not eligible for free or reduced-price lunches). In sum, it appears that more daylight before school starts helps a wide range of adolescents better learn math. Moreover, the authors show that the benefits occur immediately and persist for years.

Do these results reflect the cumulative effect of more sunlight over the course of the entire school year, or do they just reflect alertness on the day of the exam? The answer to this question has important implications for whether it

makes sense to shift the school day back in general for adolescents, or whether this is really just a test-day phenomenon. To address this question, Heissel and Norris take advantage of the fact that Florida changed the timing of its high-stakes testing from year to year and the dates of the start of daylight savings time changed from year to year. As a consequence, in some years the high-stakes testing took place just before the start of daylight savings time, when pre-school daylight was highest; in other years, the high-stakes testing took place just after the start of daylight savings time, when pre-school daylight was nearly an hour less; and in still other years, the high-stakes testing took place a month after the start of daylight savings time, when pre-school daylight was somewhere in the middle.

When the authors make this comparison, they find that the amount of sunlight on the day of the test can explain a portion of the reading results—recall that they find that more sunlight in general helps pre-pubescent and adolescent children approximately equally in reading as well—but it doesn't explain much of the math results. Most of the boost in adolescent test performance that we observe when students have more daylight in the morning is due not to the amount of daylight before school on days when children take tests, but rather to the amount of daylight before school experienced across the school year. Daylight before school apparently boosts cumulative learning for adolescents—and not just test-day alertness.

What do these findings imply for optimal school schedules—at least, from the point of view of maximizing student math and reading achievement? Heissel and Norris carried out a thought exercise in which, for every Florida panhandle school district, they assigned the school district's earliest start times to elementary students, the middle start times to middle school students, and the latest start times to high school students. This calculation would move elementary school start times 22 minutes earlier, middle school start times 13 minutes earlier, and high school start times 44 minutes later, on average.

Heissel and Norris estimate that making these scheduling switches would raise average math performance by six percent of a standard deviation and

average reading performance by four percent of a standard deviation. While not earth-shattering performance changes, they are extremely impressive for a policy change that would cost school districts little to implement – and are approximately one-fourth the difference between an excellent-performing school and an average-performing school. (Recall, also, that most parts of the United States have less daylight between September and March than Florida does!)

There are, of course, potential costs associated with this type of schedule change. Parents might be more comfortable with high schoolers traveling to school in the dark than they are with elementary school-aged children doing the same. Starting elementary school relatively early could have implications for parents' after-school child care arrangements as well. High schoolers have more after-school activities, sports, and the like, and later school start times might put the squeeze on these types of activities. For instance, later school start times might mean that more students participating in after-school activities will arrive home after dark, which might also cause concern. And given a school start time, at least one study shows that students learn more in the morning than they do in the afternoon[12] (though a later start time can put adolescents in a better position to learn).
Nevertheless, there are few "quick wins" in education when it comes to boosting learning at a very low cost, and paying attention to—and scheduling school start times in line with—human biology seems to be one of them.

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FOOTNOTES

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10. **10**Jennifer Heissel and Samuel Norris, "Rise and Shine: The Effect of School Start Times on Academic Performance from Childhood through Puberty," *Journal of Human Resources*, published online before print, April 19, 2017.
11. **11**In the interest of full disclosure, I was Heissel's Ph.D. dissertation adviser and I am also editor-in-chief of the Journal of Human Resources, where this paper was published. However, the paper was handled from start to finish by a different Coeditor, and I had no influence over the publication process.
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The State Finally Letting Teens Sleep In

Adolescents in the U.S. are chronically sleep-deprived, in part because most schools start too early. This summer, California will become the first state in the nation to require later start times.

By Lisa L. Lewis

Terra Ziporyn Snider of Severna Park, Maryland, still remembers how difficult it was for her son to wake up for his 7:17 a.m. first-period class when he was in high school. There were times he'd turn on the shower, then head back to bed while waiting for the water to warm up, only to fall back asleep. One morning, he made it out the door but didn't get far: He backed the car into the garage door because he'd forgotten to open it.

That was in 2012. And though the morning travails of her kids' high-school years had prompted Ziporyn Snider to co-found the national nonprofit Start School Later around the same time, the school is only now set to shift to an 8:30 a.m. start time, effective this fall.

he American Academy of Pediatrics (AAP), which has called for later school start times since 2014, recommends that middle and high schools start no earlier than 8:30 a.m. But until recently, there's been a patchwork approach to meeting that recommendation. The result: While various districts, cities, and counties have opted to make changes, the majority of middle and high schools still start too early. These start times make it nearly impossible for teens, whose body clock tends to shift to a later schedule at the onset of puberty, to get the eight to 10 hours of sleep recommended for their health and well-being.

That's about to change in California, when a law—the first of its kind in the nation—goes into effect on July 1 requiring the state's public high schools to start no earlier than 8:30 a.m., and its middle schools no earlier than 8 a.m. Both New York and New Jersey also have similar bills under consideration.

Places that have already pushed back school start times have repeatedly seen positive results. When Seattle's public-school district shifted its start time in 2016 (from 7:50 a.m. to 8:45 a.m.), students got a median of an additional 34 minutes of sleep a night as a result. And in Cherry Creek, a Denver-area suburb, high schoolers slept about 45 minutes longer on average, and those improvements endured even two years after the change.

Despite success stories like these around the U.S., the national sleep statistics for teens remain dismal. In 2007, when the CDC first started asking about teen sleep in the national Youth Risk Behavior Survey, only 31 percent of high schoolers said they got at least eight hours of sleep on school nights. By 2019, that had slid to 22 percent.

That's quite concerning, given that eight hours is actually the *minimum* amount they need.

Teen sleep deprivation affects grades, attendance, and graduation rates. It leads to greater risk of injury for adolescent athletes, and more drowsy-driving crashes. And it worsens mental-health issues—including anxiety and suicidality. That's profoundly unsettling, particularly in light of data released by the CDC in April showing that 44 percent of high schoolers said they'd had "persistent feelings of sadness or hopelessness" during the past year, and 20 percent had seriously contemplated suicide.

Read: Why American teens are so sad

The circadian-rhythm shifts that happen in puberty are an important consideration. But societal factors also contribute to teens' chronic sleep deprivation. Teenagers are frequently overloaded, strapped for time, and asked to wake far too early for school. Most teens should still be sleeping *well* past when their alarm clocks ring in the morning in order to attain the recommended amount of sleep: A teen who must wake at 6 a.m. would need to fall asleep each night between 8 p.m. and 10 p.m., which runs counter to reality because of teen body clocks and the demands of homework, among other factors.

Improving the situation starts with valuing sleep. There are changes parents can make at home and in their teens' schedules to encourage sleep and to make it a priority, such as setting family rules for tech use. For example, charging all devices in a central location rather than in the bedroom can help curtail late-night use.

But families can do only so much, given school schedules. Unlike internal body clocks, school start times *can* be changed as a way to help teens get more sleep. Since the 2014 AAP recommendation, the consensus that later start times are better for adolescents has continued to grow.

The new law in California means that in the most populous state in the nation, the majority of students at public high schools and middle schools—about 3 million of them—will now have healthy start times. This is progress. Also promising are the schools that delayed their start times for remote instruction during the pandemic and kept that schedule in place even after returning to in-person instruction.

Although later start times are an essential step, more remains to be done to help teens get the rest they need. At the broader level, we need to

address the pressure-cooker environment teens face and take steps to lower their stress. It may mean reevaluating all of their commitments—and even paring those down—to ensure enough time for sleep. In their quest to meet all of the expectations that have been placed on them, our teens are shortchanging their sleep, and it's harming their well-being.

This article was partially adapted from Lisa L. Lewis's book The Sleep-Deprived Teen.