

## Early to bed, more organized to rise?

*Preliminary evidence shows that an earlier bedtime may be beneficial for teens' cognitive functioning*



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Most teenagers do not get enough sleep. We know that teens have many competing demands for their time and attention (e.g., school, family, peers), and many reasons to want to stay up late. Their evenings may be filled with school activities, homework, and hanging out or talking online with friends. Many teens also experience a shift in their biologically-driven circadian rhythm that spurs them to stay up later (Hagenauer, Perryman, Lee, & Carskadon, 2009)

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Parents often encourage their children, especially during the teenage years, to go to bed earlier—but does the time teens go to bed really matter? Some research says “yes,” but this has not been examined in relation to executive functioning. Executive functioning refers to a broad set of important skills, which include abilities like working memory, problem solving, and self-control.

## Highlights

Getting enough sleep is important for mood, physical functioning, and the brain's ability to function.

Teens with later bedtimes demonstrate lower overall executive functioning performance.

Some aspects of executive functioning may be more sensitive to sleep than others.

We know that sleep restriction (i.e., severely limiting the amount of sleep one gets), and self-reported sleepiness in adolescents are related to adverse outcomes, including worse academic performance, learning and memory, and mental and physical health ([Dewald, Meijer, Oort, Kerkhof, & Bögels, 2010](#)). There is also some preliminary evidence that going to bed earlier may help kids do better in school ([Asarnow, McGlinchey, & Harvey, 2014](#)), but we wanted to explore this issue further to determine whether there is a relationship between teens' bedtime and critical cognitive abilities.

## Methods

In our study, 65 Chicago-area teenagers (Mean: 14.5 years; range: 11-18 years) wore research-grade sleep watches for four days and nights to provide an objective measure of sleep quality and quantity. They also completed the Behavior Rating Inventory of Executive Function (BRIEF), in which they rated several aspects of their executive functioning abilities (i.e., task completion, organization, monitoring, emotional control, working memory, planning, inhibitory control, and cognitive shifting). For our statistical analysis, we conducted multiple linear regressions, controlling for a number of demographic variables, life stress, and total sleep hours.

## ***HOW DID A COMMUNITY PSYCHOLOGY PERSPECTIVE INFORM YOUR UNDERSTANDING OF THE ISSUES, RESULTS, AND IMPLICATIONS?***

Having a community psychology perspective informed our thinking on how students' systems (e.g., parents, schools, and the larger community; [Bronfenbrenner's 1979 ecological framework](#)) may be able to support adolescents with setting and maintaining a more consistent, earlier bedtime.

## Results

- Teenagers in the sample went to bed around 11 pm ( $M = 23.12$ ,  $SD = 1.07$ ) on average, and averaged 6.5 hours of sleep per night ( $M = 6.54$ ,  $SD = .87$ ).
- Teens who reported later bedtimes demonstrated significantly lower overall executive functioning ability.
- Some aspects of executive functioning may be more sensitive to sleep than others. Of the eight facets of executive functioning that were assessed, task completion (e.g., having trouble completing long-term projects), working memory (e.g., only remembering first or last items on a to-do list), planning (e.g., starting projects without the right materials), inhibitory control (e.g., having trouble sitting still), and shifting cognitive focus (e.g., getting upset by changes in plans) had the strongest relationship with bedtime.
- All findings remained consistent when accounting for age, race, gender, number of hours slept per night, and life stress. This suggests that there is a relationship between bedtime and executive functioning, despite differences in these demographic, psychological, and sleep characteristics.

## What Does This Mean For?

**Practice** — Community members who work with teens likely understand the role of positive health behaviors (e.g., healthy eating, physical activity, stress reduction) for teens' health and development. The importance of getting enough sleep-- especially during the teen years when biological and physical changers are prevalent-- is garnering more attention. Our study shows that an earlier bed time, over and above the total number of hours slept, is important for teens' cognitive functioning.

**Schools** — Schools may be able to play an important role to help students with their bedtimes. For example, schools may consider the potential benefit of integrating compensatory strategies into existing study skills curriculums offered by many schools (e.g., during an advisory period, study hall, or resource classroom), that help students develop routines and strategies not only for homework completion, but also for day-to-day managing their evening routines to help consistently set earlier bedtimes.

**Use of Technology** —With the advancement of technology and related phone apps that help manage weaknesses in executive functioning (e.g., alarms, reminders, calendar functions, etc.), students, parents, and school staff may further explore how the same technology may be useful to help students set and maintain earlier bedtime. Many smartphones now offer self-programmable “bedtime” features, to provide reminders at a specified time in the evening to begin wrapping up and enable getting ready for bed at a consistent time each night. In a study by Tavernier & Adam (2017), researchers tested whether sending out text message reminders to teens in the evening would help them get to sleep earlier. Results showed that the text messages were effective for non-Hispanic white teens, such that they went to bed one hour earlier on average, but had no effect for ethnic minority teens.

**Research and Evaluation** — In addition to often-studied sleep metrics, such as restriction and duration, bedtime should also be examined in future studies of the impact of sleep on academic and cognitive outcomes. Our study utilizes research-grade watches that continuously monitor participants' activity to provide sleep metrics, rather than relying self-report, which provides a more accurate measure of sleep. It is important to note that this research is correlational, thus an experimental research design is needed to determine the causal effect of sleep on cognitive functioning. Yet, our findings point to an important preliminary relationship between bedtime and executive functioning abilities for teenagers.

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