

Teenage Sleep Deprivation – A Multifactorial Issue

- Social media
- Increased homework load
- Increased extracurricular demands
- Earlier school hours
- Age-Related changes
- Personal Factors (e.g., sleep hygiene, sleep disorders, chronotypes)
- Changes in work and business hours
- A culture that de-values sleep

Structural vs. Individual Roots of the Adolescent Sleep Epidemic

<p>Individual Roots (Fix the person)</p> <ul style="list-style-type: none"> • Sleep Hygiene • Sleep Disorders 	<p>Structural Roots (Fix the society)</p> <ul style="list-style-type: none"> • Institutions (e.g., school hours, homework, extracurricular demands) • Environment (e.g., ban use of electric lighting!) • Social norms/attitudes (e.g., celebrating sleep deprivation)
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Addressing individual roots will have limited impact if structural roots remain unaddressed

So, why focus on school hours?

**Of all these factors, only school start time
has been shown to play both a major—and remediable—role**

Let Them Sleep: AAP Recommends Delaying Start Times of Middle and High Schools to Combat Teen Sleep Deprivation

USA TODAY
High schools, wake up to later start times: Our view

The Post's View
Doctors' orders: Start school days later

ameduncan
9:15pm via HootSuite
Would love to see more districts consider later starting times, particularly for high school students: bit.ly/1Kj-cQM

Arne Duncan
Comments aimed to improve student achievement that also have implemented let teens sleep more, start school later: [http://bit.ly/1Kj-cQM](#)
A smarter way to start high schoolers' days
A later start could make them more productive.
Investigate Post: @investigatpost

How Did We Get Here?

A Short History of Bell Times



Decentralized education



We don't measure what we don't think matters

Shifting Sands

Whatever we do now, we haven't always done.

And we haven't done it very long.

Until the mid-20th century, most schools started at about the same time, and rarely before 9 a.m.

The Time's Are Always "A-Changin"

responsibility, in the place of the parents or guardians, for such reasonable discipline, morals and health.

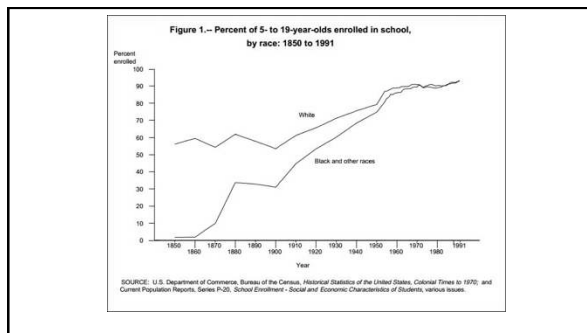
2.—**The Principals** in their respective districts, under the direction of and in cooperation with the Superintendent, shall devote so much of their time as may be necessary **to insure a strict observance and enforcement of the rules and regulations of the school.**

3.—**All teachers** are required to be at their respective school rooms at the beginning of their school hours (viz.), at 20 minutes before 9 o'clock a.m., and 15 minutes before 2 o'clock p.m.; and in case of failure, **they shall report themselves without delay, in writing, to the Principal, or tardy, stating the cause and number of minutes they are late, and the Principal shall forward such reports to the Superintendent, at the end of each week. To secure uniformity and avoid doubt in relation to time, the Principal shall decide, for the signing of a teacher's roll last 20**

* Source: New Haven Public Schools. Annual report of the Board of Education of the New Haven City School District. New Haven [CT]: City of New Haven, August 31, 1898, p. 117.

Free, compulsory education is relatively new, and even newer when it comes to high school

Not all states had compulsory elementary school attendance until 1917	In 1900 an estimated 6-11% of teenagers attended high school.	By the early 1970s high school enrollment rates were about 90%



School Hours and Sleep Research: A Disconnect

<p>SCHOOLS</p> <p>1900-1940: Growth in compulsory schooling, school buses, hour counting</p> <p>1940-1970: More students, fewer schools, longer commutes</p> <p>1970-1990: Recession, fuel costs, desegregation, suburbanization, budget cuts lead to recycling buses, staggered bell times</p> <p>1990s: Continued moves to earlier hours</p>	<p>SLEEP RESEARCH</p> <p>1928: 1st human EEG</p> <p>1953: REM sleep discovered; Dement describes "cyclical nature" of sleep</p> <p>1970: Dement founds the first sleep research center, Stanford</p> <p>1970-1990: Carskadon et al. conduct initial research on teen sleep; early research on sleep's role in learning, memory</p> <p>1990s: Early reports of delayed phase preference in teens and impact of school schedules on sleep, health, learning</p> <p>1993 First call for later start times by Minnesota Medical Association</p>
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The Minnesota Medical Association was one of the first groups to publicly address the issue. In 1993 the MMA issue a public resolution to educate the public on:

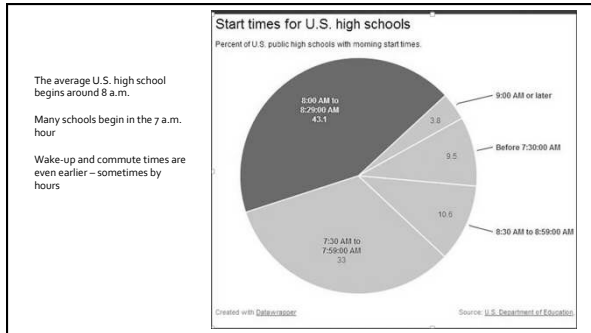
- The need for more sleep during adolescence than during childhood
- The biological shift to a later sleep pattern in adolescence
- The impact of inadequate sleep on driving safety and school performance
- The recommendation for schools to eliminate early starting times for adolescents

(Minnesota Medical Association, mmm.org)

KEY LESSONS FROM HISTORY

- Everyone hasn't "always" started school so early.
- The shift to early hours occurred before we knew about teen sleep needs and patterns.
- Moves to earlier hours primarily reflected budgetary considerations, not sleep, health, or well-being, or even adult convenience.

So, where are we now?



The Impact of Later School Start Times

- Health
- Safety
- Learning
- Equity
- Economics

When School Starts Later, Teens Get More Total Sleep

CAREI Findings (2001)

Note: When students get more sleep, homework takes less time

- Reduction in dropout rates
- Less depression
- Fewer disciplinary referrals
- Improved attendance
- Improved academic performance
- Fewer tardies
- Less sleeping in class
- Homework completed in less time due to alertness & efficiency
- Increased total sleep
- 92% of parents preferred later times after one year despite earlier concerns of busing, athletics, child care

Source: Moore, Start School Later, Inc.

What We Know Now That We Didn't Know Then

- More sleep
- Fewer mood swings
- Increased alertness
- Lower rates of depression
- Less use of caffeine and energy drinks
- Reduced use of illegal drugs, cigarettes, and alcohol
- Fewer teen car crashes
- Reduced tardiness and truancy
- Fewer school suspensions and drop-outs
- Better grades and test scores (particularly in disadvantaged populations)

Sources: Owens, J. et al., 2014; Wahlstrom, K., 2014

Equity

"...[S]chool start times shifted one hour later increase reading test scores by 0.03 to 0.10 standard deviations and math test scores by 0.06 to 0.09 standard deviations. Disadvantaged students benefited the most, with effects roughly twice as large as advantaged students; the effects persisted into high school."

Jacob and Rockoff, 2011



CHANGE IS COST-EFFECTIVE

"For schools with scheduling flexibility, starting class later can be an inexpensive way to boost achievement; even for schools where changes will be costly, we argue that investing the resources to alter busing schedules and accommodate later after-school activities can be a worthwhile investment... We conservatively estimate that the ratio of benefits to costs is 9 to 1 for later [high] school start times and 40 to 1 for middle school reform..."

Jacob and Rockoff, 2011.



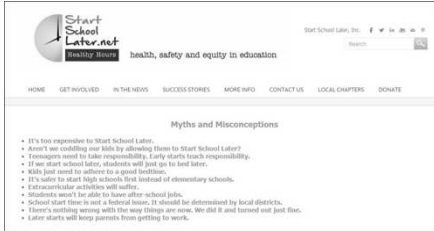
This is a fixable problem.
So, why aren't we fixing it?

"All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident."

--Arthur Schopenhauer

It Isn't About the Science

Sleep is for the weak and unmotivated
(Besides, teenagers are lazy)



Fear and Intimidation

- Perceived "Obstacles"
 - After-school jobs
 - Sports and other extracurricular activities
 - Childcare
 - Traffic Patterns
 - Bus costs
 - Teacher commutes and commitments
 - Fears about safety of younger children
- Speculation/Extrapolation
- Fueled by fear of change and failure of imagination
- All turn out to be unfounded or resolvable but politically powerful

"Having been a superintendent, I know that one of the hardest things you can ever do is to begin to tinker with the bell schedule. People go absolutely bananas over that."

— Deb Delisle, Assistant Secretary, U.S. Department of Education

Source: 51st Annual Cooperative Conference for School Administrators, Aug. 13, 2013.

A Political "Hot Potato"

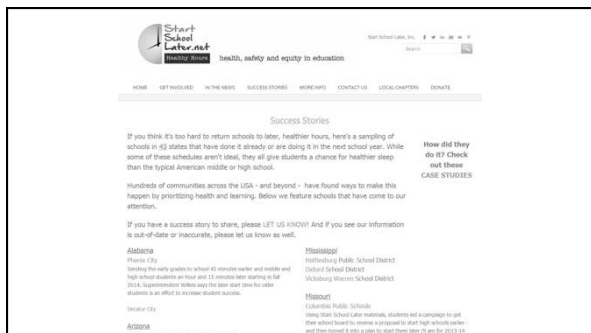
- Communities adapt to public school hours and fear impact of change
- Pushback when anyone proposes a change to the status quo – a political "hot potato"
- Superintendents have even lost their jobs over this issue

"It's hard to get a man to understand evidence when his job depends on his not understanding it." – Upton Sinclair

Many schools have managed to change

- 1996: Edina, MN
- 1997: Minneapolis Public Schools
- 2003: Wilton, CT.
- 2015: Approximately 1,000 schools in 70 districts

Wahlstrom, 2014; Owens et al., 2014



Blueprint for Change

Critical Components of Change

- Leadership: necessary but not sufficient
- Education of the Entire Community (e.g., students, parents, teachers, school nurses) about justification for healthy school start times and approaches to optimizing healthy sleep
- Consensus Building Among Stakeholders
 - Early in process to understand potential concerns and seek potential solutions
 - Includes community members or organizations that use school district fields and facilities
 - Include school staff and teachers in decision-making about implementation and developing flexible policies
 - Face-to-face meetings with community groups to build trust
 - Monitor Outcomes and communicate positive results to the community
 - Seek ways to mitigate or address negative or unforeseen impacts.
- Ideally work with county health professionals or local university or medical centers to design pre-and post-surveys and other methods to measure impact on student health, safety, and academics

Blueprint for Change (cont.)

- Lessons Learned
 - Transportation is often a major logistical and cost factor
 - Most concerns (including impact on athletics and after-school programs) prove unfounded
 - One size does not fit all
 - Prioritizing sleep health goes hand-in-hand with school start time change
 - Adjustments take time
 - Sustained grassroots efforts can facilitate consensus-building
 - Anticipation is often worse than reality
 - Monitoring

• Source: Owens JA et al. *Mind, Brain, and Education*, 2014.

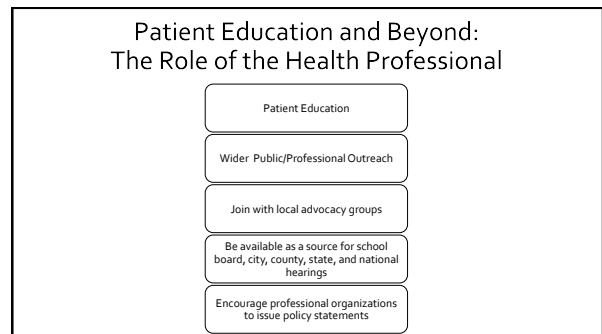
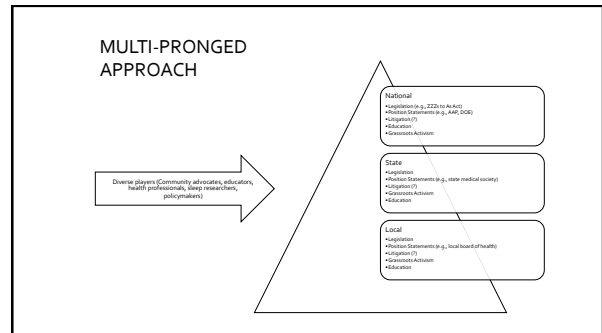
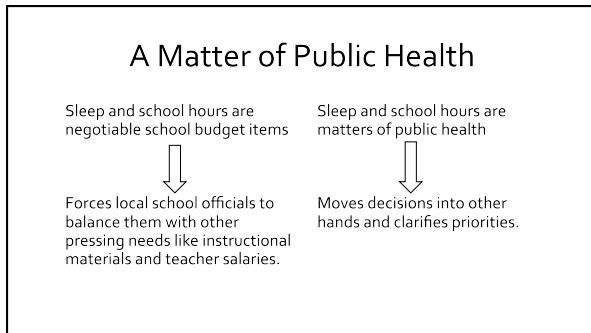
WHERE THERE'S A WILL, THERE'S A WAY

School communities that have prioritized health and learning have found creative, affordable, ways to run schools at safe, healthy hours

What Is To Be Done?

Goal: Building Political Will

<p style="text-align: center;">Strategy</p> <ul style="list-style-type: none"> • Reframe sleep and school hours as public health problems, not negotiable school budget items 	<p style="text-align: center;">Tactics</p> <ul style="list-style-type: none"> • Multi-level, push-pull approach including grassroots activism, education, research, position statements, legislation, and litigation at local, state, and federal levels
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For More Information

- Start School Later, Inc. (startschoollater.net)
- The Impact of School Start Times on Adolescent Health and Academic Performance (schoolstarttime.org)
- Smart School Start Website (smartschoolstart.org)

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Questions?

Appendix

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1940-1970: MORE STUDENTS, FEWER SCHOOLS, LONGER COMMUTES

- Increasing school district consolidation
 - 127,000 local districts in 1940 shrink to just over 15,000 by 1980
- Students commute longer distances
- 78 million baby boomers are born from 1946-1964 - unprecedented growth in school population.
- Longer commute times from suburbs to urban jobs make 9-5 increasingly standard business hours for white collar jobs.

Year	Schools	Sleep Research	Society
1953		Kleitman and graduate student Eugene Aserinsky make landmark discovery of REM sleep. Their student William Dement describes the "typical" nature of sleep and relationship between REM and dreaming.	Calls from improved transportation to help suburbanites commute into urban areas to work
1954	Brown vs. the Board of Education creates "white flight," leading to rapid development of suburban schools districts, as well as increased busing to help integrate schools.		
1956			Eisenhower's Interstate and Defense Highway Act accelerates suburbanization, growth of highways
1957	Federal troops enforce school integration at Little Rock, Arkansas' Central High School		
1960s	Increasing consolidated schools explore new ways to control overcrowding and operating costs, including staggering start times, often putting high schools first.		
1970		William Dement, father of sleep medicine, founds the first sleep research center at Stanford University	

1971-1993: ENERGY COSTS, BUDGET WOES, AND BUSES
 Recession, fuel costs, desegregation, suburbanization & budget cuts mean recycling buses & staggering bell times

Year	Schools	Sleep Research	Society
1971	Court ordered busing to integrate schools soon evolves to suburbs, continuing consolidation of schools creates larger districts and still longer commutes.		
1972		Discovery of the suprachiasmatic nuclei in the hypothalamus as center circadian rhythms in the mammalian brain.	
1973-4	Schools look for ways to save fuel costs		Stock market crash leads to recession, inflation and dollar devaluation. Oil boycott prompts energy crisis.
1974	Concerns about sending young children to school in the dark lead to earlier high school openings.		Daylight Saving Time expanded to more states and for a longer time period.
1975	Education of All Handicapped Children Act		
1976		Mary Carsadon establishes sleep latency as a physiologic measure, allowing quantification of daytime sleepiness and its impact on performance.	
1978	Increased pressure on school districts to lower bus costs		Second energy crisis following Iranian Revolution
1979		Researchers develop hypothesis about sleep's key role in learning and memory consolidation.	
1986	Publication of <i>A Matter of Risk</i>		
Late 1980s-1990s	Districts keep moving start times incrementally to save fuel and lengthen school day.	Carballo et al. conduct initial research on adolescent sleep needs & circadian changes.	
1980s-early 1990s	Districts continue moving high school start times earlier	US Congress appoints Committee to share National Commission on Sleep Disorders Research to study prevalence/impact of sleep deprivation and sleep disorders on all Americans by 1990.	
1990s		Sleep researchers begin describing delayed phase preference in terms of impact of school schedules on sleep, health, learning	
1993		Minnesota Medical Association urges resolution calling on local school districts to minimize early start times for adolescents.	