

Why Start School Later?



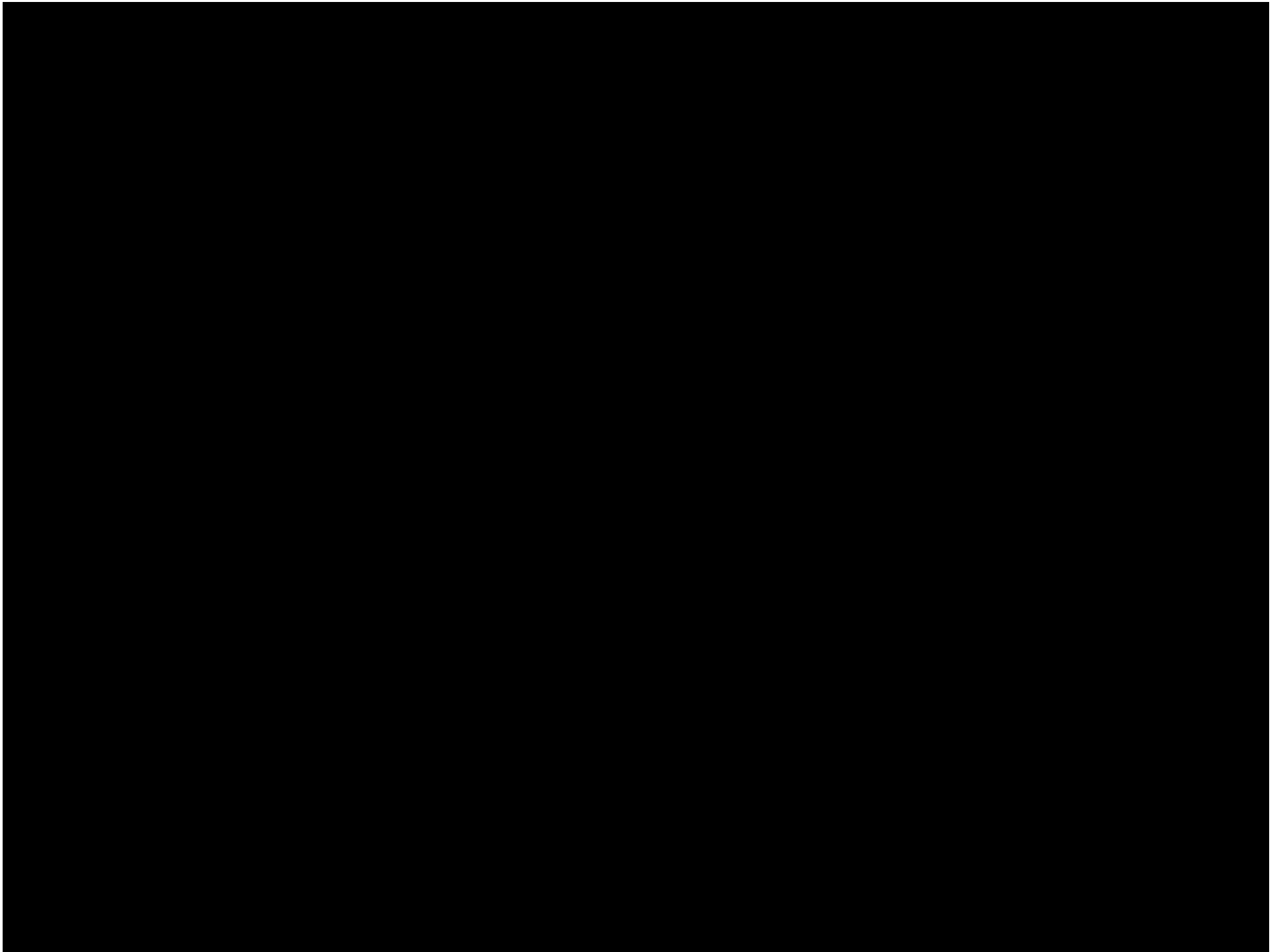
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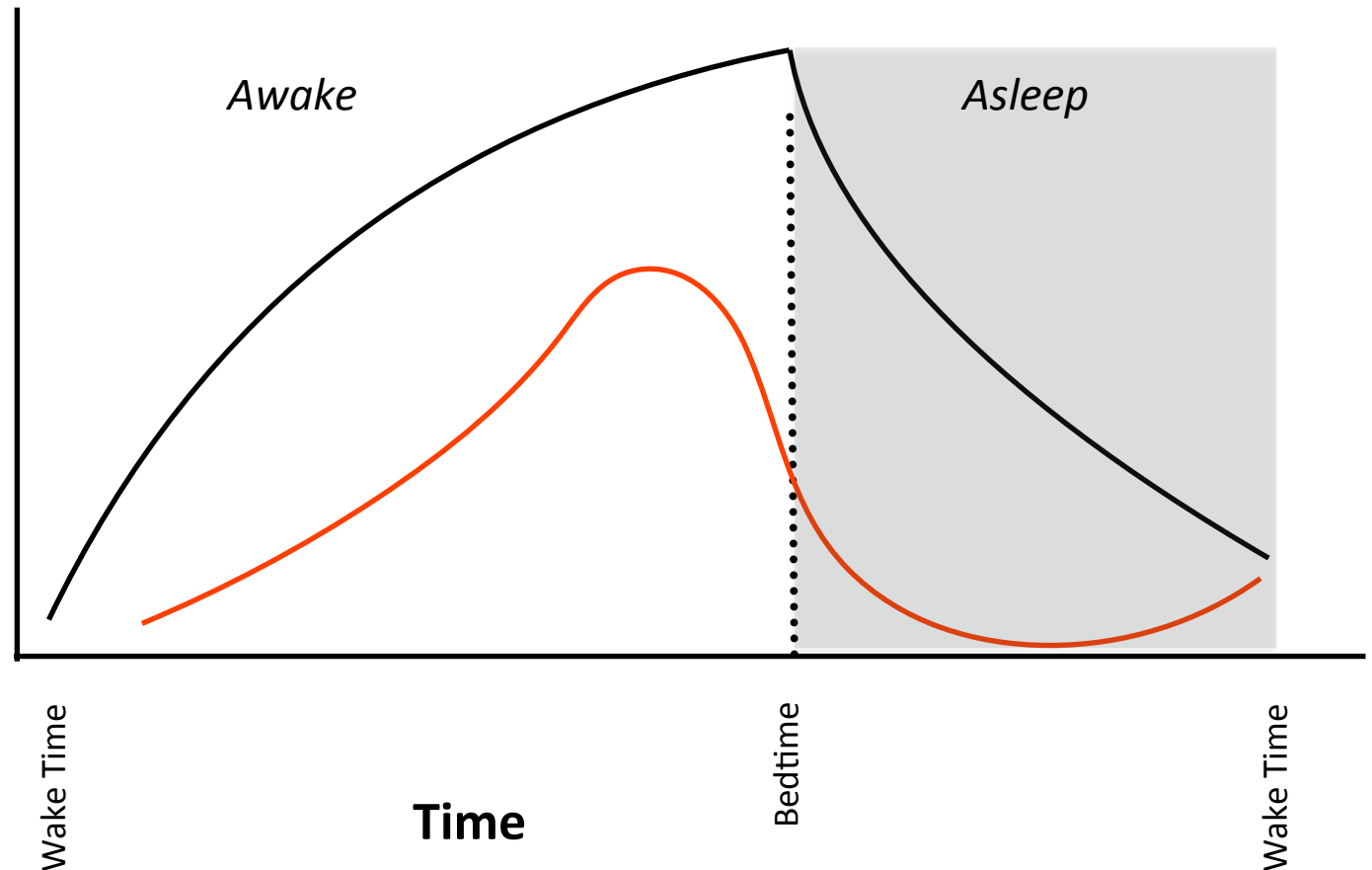




The homeostatic sleep drive increases the longer you are awake

Sleep Drive

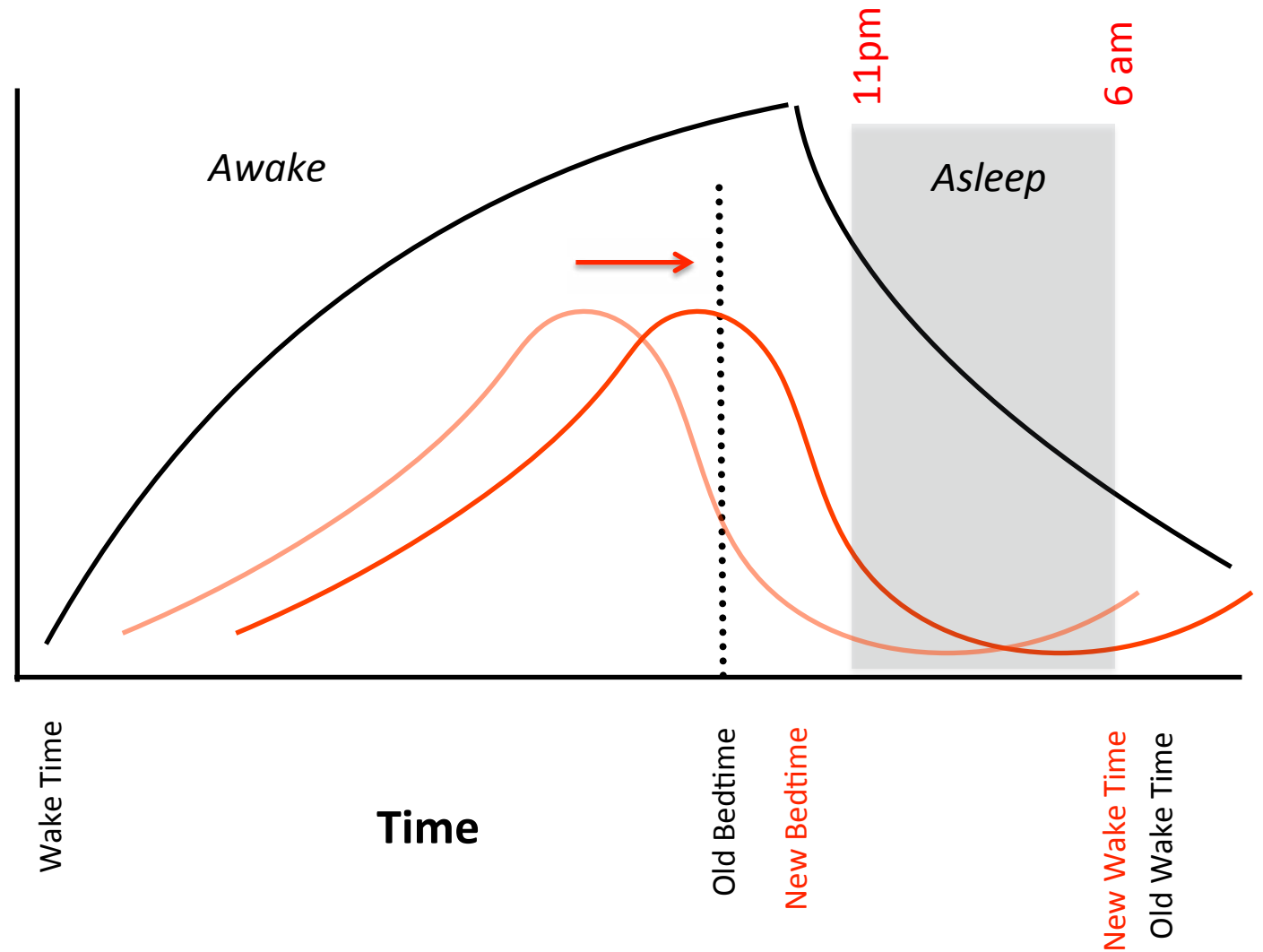
Wakefulness Drive



The circadian wakefulness drive keeps you awake in the late PM

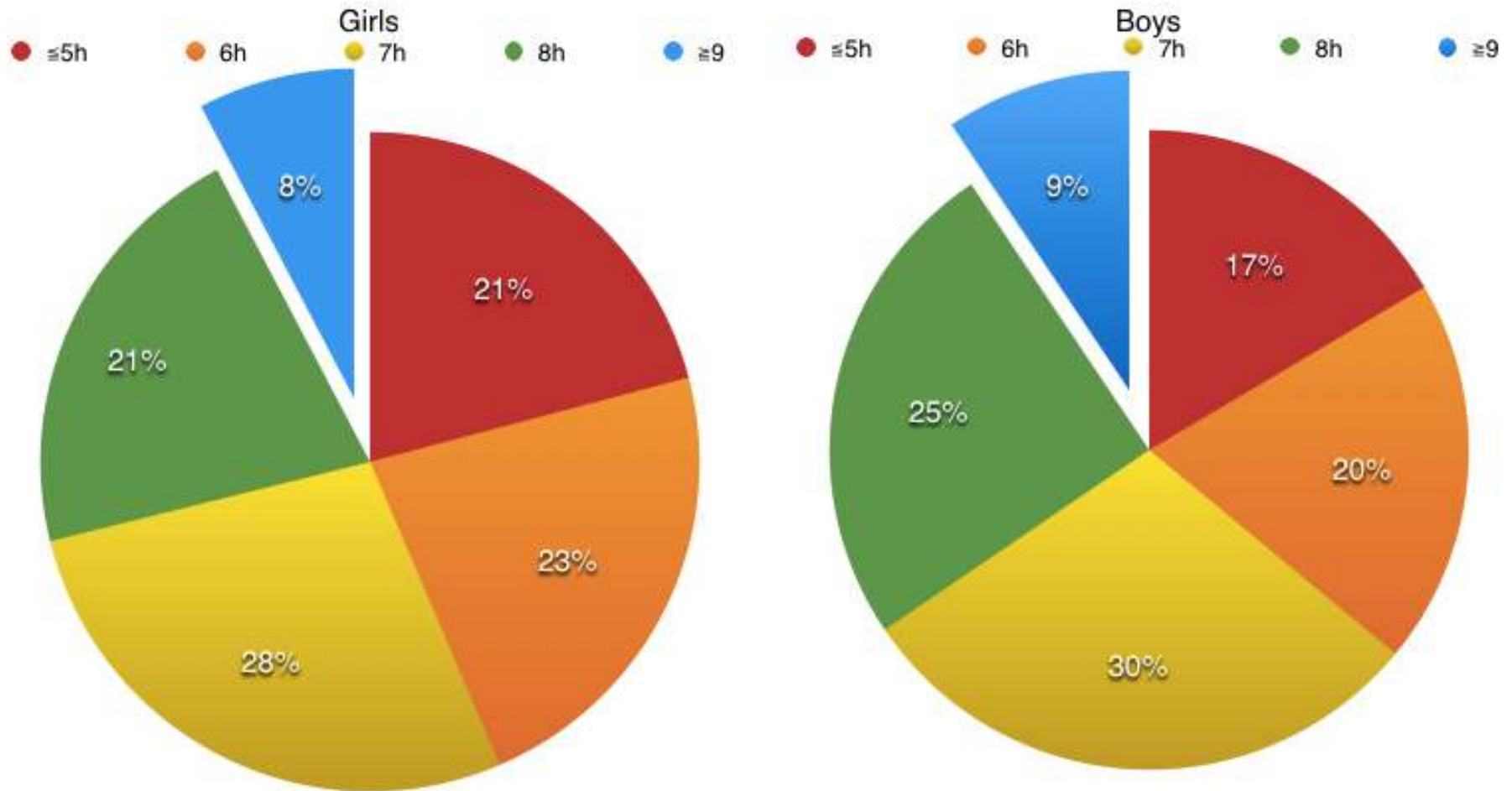
Sleep Drive

Wakefulness Drive



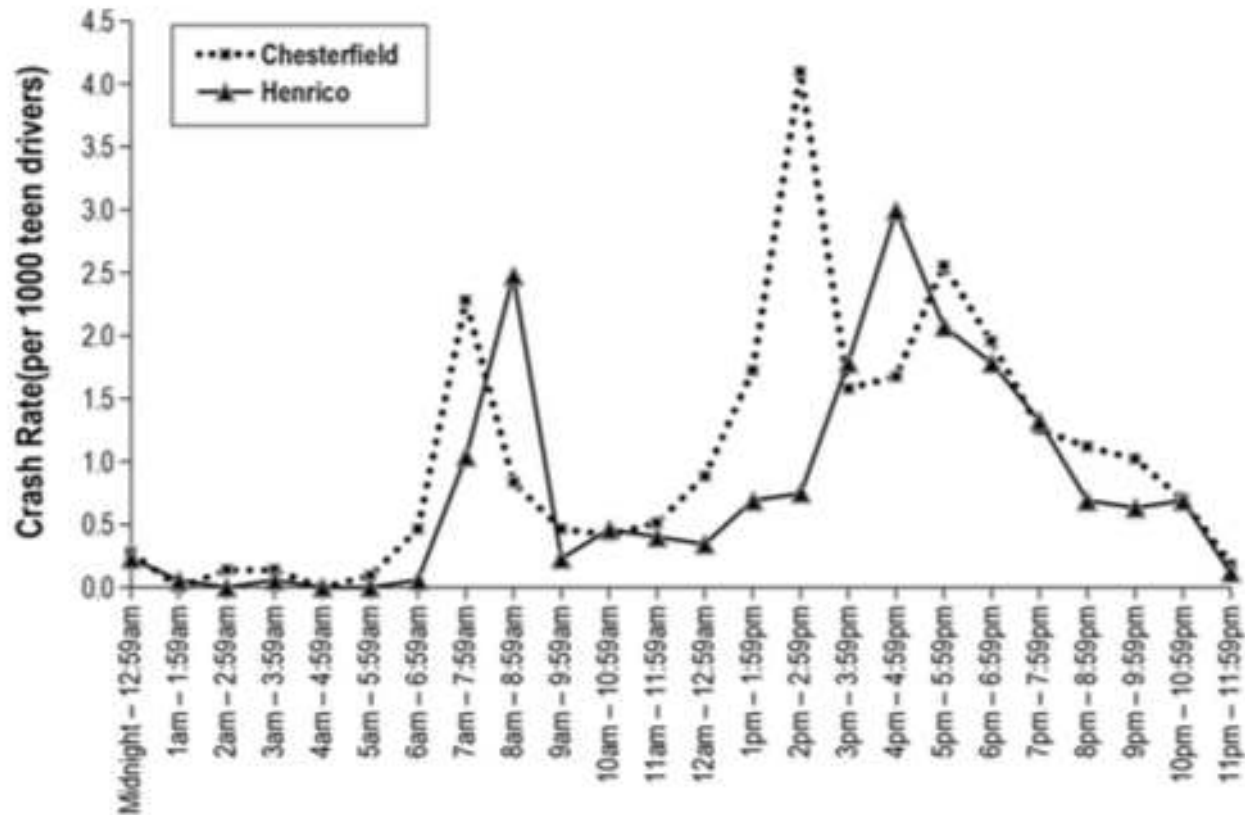
Teens have a physiologic delay in their circadian clocks even as school gets earlier

Less than 10% of teens get adequate sleep.



There are many serious consequences to chronic sleep deprivation

Figure 1—Weekday crash rate of 16 to 18-year age groups in Chesterfield County and Henrico County for School Year 2009–2010 (Sept. 2009–May 2010).



Early school start times impose 30-70% increase in rate of teen motor vehicle accidents

INCREASED RISK
OF ACCIDENT

ANXIETY,
DEPRESSION,
SUICIDALITY

POOR IMPULSE
CONTROL

EMOTIONAL
PROBLEMS

MENTAL/BEHAVIORAL
CONSEQUENCES

DECREASED
MOTIVATION

INCREASED
VULNERABILITY
TO STRESS

PROBLEMS WITH
COMPLEX TASKS

EXECUTIVE
FUNCTION
IMPAIRMENT

ATTENTION/
MEMORY
PROBLEMS

ACADEMIC
CONSEQUENCES

LOWER
ACHIEVEMENT

POOR
ATTENDANCE/
TARDINESS

INCREASED DROP
OUT RATES

In 2014, the American Academy of Pediatrics recommended that high school start times be no earlier than 8 AM

Change is happening

- Over 1,000 schools in the USA have started later, with nearly all staying with the change
- In May 2014, Education Commission of the States analyzed research data and concluded :
 - *“agreement in the research community that later start times in adolescent education would produce a positive change in adolescent learning, health and safety”*
 - *“few, if any, educational interventions are so strongly supported by research evidence from so many different disciplines and experts in the field.”*
- In August 2014, American Academy of Pediatrics recommended changing to later start times based on studies *“showing significant improvements in benchmarks of health and academic success”*
- Fairfax, VA commissioned a large research study and will move high school start times later in 2015

Sources : Children’s National Medical Center (2014), Education Commission of the States (2014), American Academy of Pediatrics (2014)

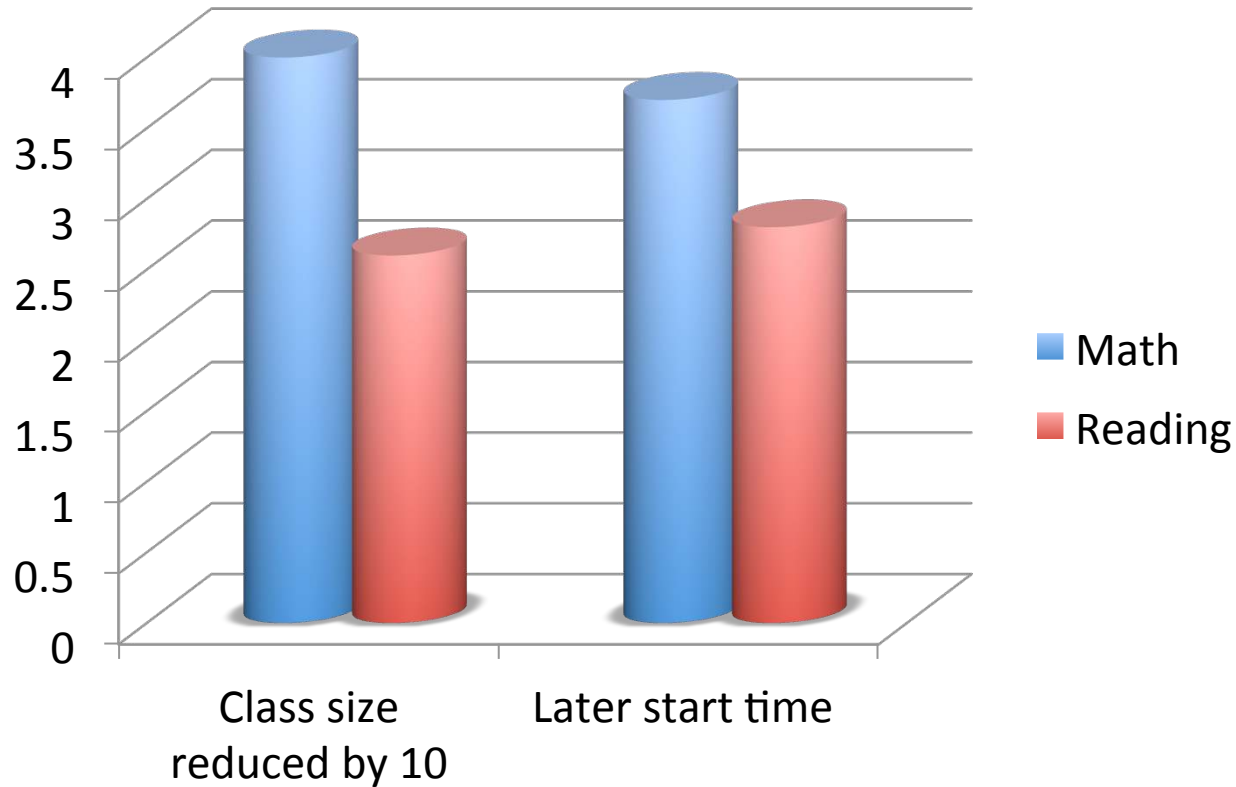
Positive Results From Later Starts

- Some results from schools that have moved school start times later :
 - 92% of parents in favor after changes
 - 70% decrease in teen auto accidents
 - Increased academic performance on standardized tests
 - 3.7 percentile increase for Math (99% confidence level)
 - 2.8 percentile increase for Reading (99% confidence level)
 - 25% less absenteeism
 - 25 minutes delay results in 29 minutes more average daily sleep for students
- Delaying start times is an effective countermeasure (multiplier effects : 30 minutes x 5 = 2.5 hours/week)

Sources : American Academy of Pediatrics (2014)

Children's National Medical Center (2014), Boergers (2014), Edwards (2012)

Later school start times are as effective as smaller class sizes in improving test scores

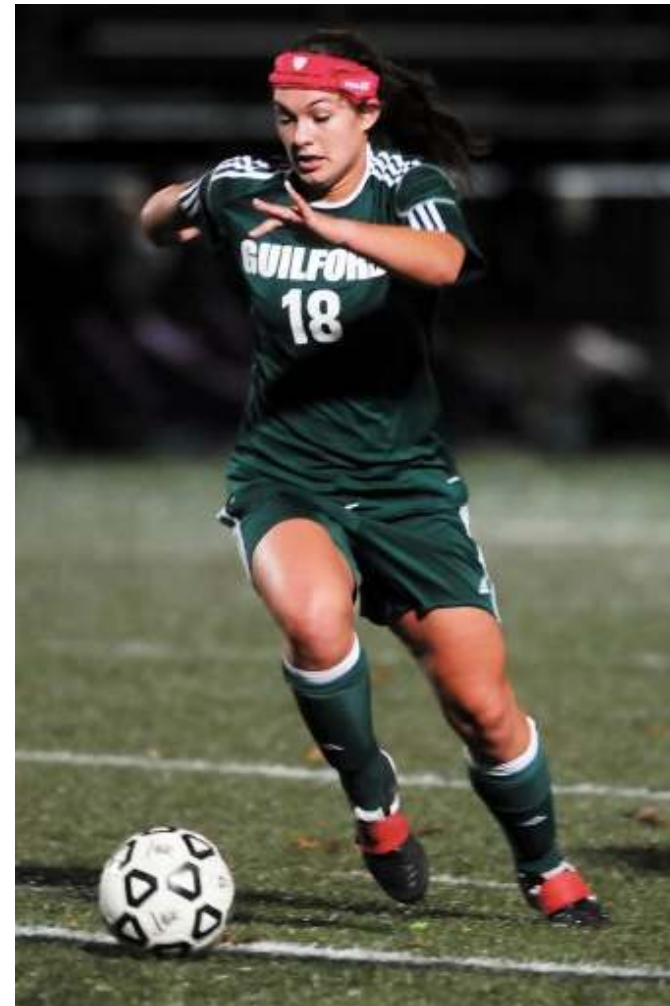


Sources : Jepsen (2002), Edwards (2012)

Sports/Extracurricular

- Athletic performance, including sprint and reaction time, increased with more sleep
- Improvements in specific measures of basketball performance in a study showed that optimal sleep is likely beneficial in reaching peak athletic performance
- 68% reduction in sports injuries among teens who slept at least 8 hours compared to teens who were chronically sleep deprived
- Participation by students in extracurricular activities does not decline when start times are delayed
- Wilton, CT reported it had no problems with adjusting high school sports schedules after moving to a later start time

Sources : Mah (2008, 2010), Milewski (2012), Owens & Moss (2010)



<http://bit.ly/1xr9zdb>

QUESTIONS?

- *“There's biological science to this that I think provides compelling evidence as to why this makes sense...if you knew that in your child's school there was a toxic substance that reduced the capacity to learn, increased chances of a car crash and made it likely that 20 years from now he would be obese and suffer from hypertension, you'd do everything possible to get rid of that substance and not worry about cost. Early start times are toxic.”*
Judith Owens, Dir of Sleep Med, Children's Nat'l Med Ctr, Wash D.C.
- *“Given that the primary focus of education is to maximize human potential, then a new task before us is to ensure that the conditions in which learning takes place address the very biology of our learners.”*
Mary Carskadon, Brown University School of Medicine
- *We are sending teens to school during the last third of their sleep cycle. In addition, not a single excuse we've heard {about changing school start times} relates to education. None of the excuses have the word “education” in them. We should send kids to high school in a condition that promotes learning rather than interfering with it.”*
Mark Mahowald, Prof of Neurology & Director of Minnesota Reg'l Sleep Disorders Center