



Relationship Between Adolescent Sleep Schedules and School Start Times



Melody Xu¹
¹Palo Alto High School

INTRODUCTION

The average Palo Alto Unified School District (PAUSD) high school student receives 7.1 hours of sleep per typical weeknight; only 8.7% reach the recommended 9 or more hours. Post-puberty, teens are prone to sleep more than 9 hours if left undisturbed (Wolfson & Carskadon, 1998). Adding school schedules into the mix means imposing a mandatory wake-up schedule in misalignment with the teenage circadian rhythm. There is an established problem in high schoolers' sleep habits that may be a contributor to chronic absenteeism; sleep troubles are a factor in absenteeism and falling back on schoolwork (Eide & Showalter, 2012). An identified gap in the existing literature is a report with as narrow and local of a scope as focusing on PAUSD. This study aimed to identify the relationship between adolescent sleep schedules and school attendance through an analysis of existing PAUSD attendance and sleep data in relation to each year's high school start time, to ultimately determine how the possible correlation could factor into start time decisions.

CONCLUSIONS AND ANALYSIS

Analysis of all findings ultimately fell inconclusive due to three main factors: discovered constancy in annual bell schedules, limited margins of change in sleep habits, and spring 2020 to spring 2021 being an unprecedented pandemic year in PAUSD. Gunn bell schedules indicated no start time change between the years of 2016 and 2020; class remained at 8:25 am in the mornings for all four years. Thus for the Gunn site specifically, discrepancies in chronic absenteeism between 2016 and 2020, shown in Figure 1, would not have a direct correlation to start time. The second limitation was that analyzing district-provided findings, most changes shown in upticks or downticks in attendance or healthy sleep levels had extremely marginal rates of change, if any. The third limitation was the COVID-19 pandemic. 2021 findings were deemed unusable due to the year's record-late school start times and lockdown mandates that essentially confined students to their houses, much unlike a typical year, which had effects on sleep habits and attendance. The pandemic was a third major factor in the inconclusivity of data analysis. All three limitations inhibited the definitive link between start times and attendance discrepancies throughout the years.

DATA AND FINDINGS

School Year	Paly Start Time	Gunn Start Time	Absence status	Percentage
2017-18	8:15 am	8:25 am	At-Risk	12.79%
2017-18	8:15 am	8:25 am	Moderate chronic	3.02%
2017-18	8:15 am	8:25 am	Severe chronic	0.97%
2017-18	8:15 am	8:25 am	Satisfactory	83.23%
2018-19	8:20 am	8:25 am	At-Risk	13.56%
2018-19	8:20 am	8:25 am	Moderate chronic	3.09%
2018-19	8:20 am	8:25 am	Severe chronic	1.00%
2018-19	8:20 am	8:25 am	Satisfactory	82.34%
2019-20	8:20 am	8:25 am	At-Risk	10.43%
2019-20	8:20 am	8:25 am	Moderate chronic	3.56%
2019-20	8:20 am	8:25 am	Severe chronic	0.70%
2019-20	8:20 am	8:25 am	Satisfactory	85.31%

Figure 1. 2017-2019 attendance levels and respective percentages are adapted from PAUSD attendance data and compared against start time. Severe chronic absence peaked in 2018-19, but the constancy in start times at both high schools ruled start time out as a direct correlator.

IMPLICATIONS & NEXT STEPS

The inconclusive research question shows the importance of future district-led research reports justifying its bell schedule decisions with both general and local data. It would be of interest to all local students, parents and teacher, for whom the schedules dictate a year's worth of daily scheduling and commuting. This report was unable to find a place in context of previous literature on the subject of school start times because of its inconclusivity. There were a number of identified weaknesses in the research; the research could have been more thorough and focused on raw data, rather than accepting only the processed data that was offered upon first try from district administration. PAUSD is recommended to come up with its own thorough attendance report to the community using firsthand data such as raw attendance, specifically in the season of drafting the next year's bell schedule while placing an emphasis on accessing its years of raw attendance data in Infinite Campus. It would allow the district to scientifically reinforce its commitment to a thoroughly beneficial bell schedule for student health and attendance.

RESEARCH METHODOLOGIES

Anonymous attendance statistics from PAUSD's 2017-18, 2018-19, 2019-20, 2020-21, and 2021-22 school years were collected through email. Initial data was obtained in early January through the virtual help of PAUSD Mental Health and Wellness Specialist Genavae Dixon. An email was sent to Paly Assistant Principal Jerry Berkson, who provided hard copies of bell schedules of each school year between 2017 and 2021. Gunn Vice Principal Courtney Carlomagno did so similarly for Gunn. Historical research was appropriate for synthesizing these past district attendance and sleep data points. Correlative research, the determination of the existence of a relationship between two variables through research, was similarly appropriate when searching for a correlation between the variables. In this experiment, the variables included the chronic absenteeism rates for each school year, quantitative self-reported sleep data, and the start time of that school year. Whether or not there was an identified correlation confirmed a possible relationship between school start times and sleep that leads to absenteeism.

REFERENCES

- Wolfson, A. R., & Carskadon, M. A. (1998). Sleep schedules and daytime functioning in adolescents. *Child Development, 69*(4), 875-887.
- Eide, E. R., & Showalter, M. H. (2012). Sleep and student achievement. *Eastern Economic Journal, 38*(4), 512-524.