

Sleep Deprivation in High School Students

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Introduction

Over a fifth of high school students in California lack a minimum of eight hours of sleep (Villano). This circumstance is labeled as sleep deprivation, which is the situation or condition of suffering from a lack of sleep. Sleep is the basis of human function, without sleep, humans become more susceptible to mental and physical complications. An education where sleep is not lost would allow for exponential growth in learning retention and would benefit the health of all students. An article by Kaylee Dusang, a writer for the Baylor College of Medicine, reports that “high levels of stress impair sleep by prolonging how long it takes to fall asleep and fragmenting sleep”(Dusang). Dusang’s research identifies stress to be directly correlated to sleep deprivation, therefore whatever causes stress also directly causes sleep deprivation. This article will serve to validate certain articles and their evidence in the literature review. Although the major stressors of sleep deprivation have been identified there is a lack of scholarly literature connecting a root issue to these stressors. To identify this root issue one must look at it from the perspective of a high school student. This method allows one to hypothesize goals for college as the most probable cause of the major stressors of high school sleep deprivation. With this information, it begs the question: what is the impact of goals for college on student sleep deprivation in the high schools of a suburban area of Los Angeles?

Literature Review

Academic Overwork

To answer the research question presented above, one must first look at the current scholarly literature on the topic of high school sleep deprivation identifying its major stressors. The first major stressor of high school sleep deprivation that will be looked at is academic overwork. It is general knowledge that, to get into one's dream college one must work rigorously

in their high school academics to attain a high GPA and be involved in several extracurriculars. These goals cause students to fall victim to increased amounts of workload—taking time away from their daily schedules, which directly contributes to sleep deprivation. For example, Cathay Vatterott, former professor of education at the University of Missouri–St. Louis discusses the prevalent issue of student stress in high schools caused by academic overwork. Teachers and administrators in these schools have noted an increase in student stress and anxiety, a tendency to overschedule themselves, and a drive for perfection (Vatterott). Vatterott reports the observations of teachers, where students are overscheduling themselves, leading them to stress out as they cannot manage their workload. This is significant as this circumstance emphasizes how the combination of homework and extracurriculars physically takes away time to sleep and increases stress levels, intensifying sleep deprivation in students. In support of Vatterott’s observation, Hilary Phan, former Research assistant at the Center for Mental Health in Schools at UCLA, states, “Whatever their motivation and capabilities, school assignments, schedules, and accountabilities can be highly demanding and lead to making adequate sleep a lower priority”(Phan, H.). In this statement, Phan converses about the situation where students are forced to deprioritize their sleep in order to accomplish other tasks that seem more important, such as academics. This is significant as Phan’s research is in direct correlation with Vatterott’s research when she reports how teens overloading themselves directly causes students to view their sleep as less important, leading to sleep deprivation. In addition to Vatterott and Phan’s research, Ethan Brodie, a student writer for The West Potomac Wire, provides the perspective of sophomore student Dylan Black and his view on the impact of academics on his schedule when stating, “Extracurricular activities [doesn’t] make me get home until like six [o’clock], and by that point, I have so much homework that’s already been piled up over the week, so I have to

work on it until like 10 [o'clock], at least, and then I wanna have at least some amount of relaxation time” (Brodie). In reporting this statement, Brodie aims to provide the perspective of a student who directly faces academic overwork as a high school student. In doing so Brodie’s observation validates Vatterott and Phan’s research by providing primary source evidence that shows that teens do overburden themselves, which leads them to stay up later at night, resulting in sleep deprivation. Although this evidence is provided by a journalistic source it is effective as its purpose is to provide the primary perspective of a high school student. In conclusion, when looking at the evidence above, it is clear that academic overwork is a major factor in causing high school sleep deprivation.

Parental Expectations

In addition to academic overwork being a main stressor of high school sleep deprivation, parental expectations have also been seen to intensify high school sleep deprivation. For example, the Bay Atlantic University published an article on their blog, in which it stated, “Kids who feel continuous pressure to do well in school might stay up late studying and struggle to get enough sleep”(“Negative Effects...”). In this statement, the Bay Atlantic University is shining a light on how students who feel continuous pressure from their parents to do well in school may stay up later at night to satisfy their parents’ ideals, resulting in sleep deprivation. By addressing this circumstance, the Bay Atlantic University provides important information on how parental pressures can lead to students studying for longer, physically cutting into their time to sleep. In support of the Bay Atlantic University, Embark Behavioral Health, a nationwide network of mental health centers (accredited by Cognia and Psychology Today) reports that parental pressure can become the, “...source of school stress... leading to higher levels of anxiety, [and] insomnia...”(School Stress: How...). With this report, Embark Behavioral Health states how

parents' expectations of their children's academic performance can lead to a build-up of stress causing anxiety and insomnia. By reporting this Embark Behavioral Health further validates the Bay Atlantic University's research and emphasizes the issue of parental expectations on students. Along the same lines as the Bay Atlantic University and Embark Behavioral Health, the Adelphi Medicine Clinic reports how when parents prioritize good grades over their child's mental state, "...they're causing high-stress levels and anxiety..." ("Pressure For High Grades..."). In this article, the Adelphi Medicine Clinic further elaborates on the issue of parents prioritizing their child's academic success over their child's mental state, which leads to detrimental conditions such as increased stress levels and anxiety. This is significant as this piece of evidence further validates the Bay Atlantic University's and Phan's research, in which all three sources shine a light on how parents put too much focus on good grades in school leading to students having to battle with mental health issues. To sum up the information above, it is clear that like academic overwork, parental expectations are also a major stressor of high school sleep deprivation.

Procrastination of Time to Sleep

Along with academic overwork and parental expectations, the procrastination of sleep has also been seen to aggravate sleep deprivation in high school students. For example, Stanford University published an article in which they shined a light on how students like to take part in leisurely time before bed leading them to, "procrastinate falling asleep because [they]... feel like [they]... need to compensate for that day's leisure time" (Phan, M.). In this statement Phan is addressing a common behavior most high school students take part in due to the circumstance of academics occupying an abundance of time. This behavior is addressed as revenge bedtime procrastination, in which an individual part-takes in leisurely activities later in the day due to the lack of free time earlier in the day, this in turn leads to procrastination of sleep, leading to sleep

deprivation. Along the same lines as Phan's research, Zhe Zhao, a doctorate student and research assistant at Kunsan National University, and his colleague published a paper on *Frontiers in* which they emphasized the growing issue of social media addiction stating, "The higher the degree of short-video addiction among college students... the worse the sleep quality"(Zhao). In this article, Zhao and his colleague emphasize the issue of social media addiction among college students, which leads to poorer sleep quality. Although Zhao and his colleague state this about college students the same applies to high school students. This is significant evidence as it shows how once students start using social media in the form of relaxation they become addicted leading to them being distracted for periods of time, which results in sleep deprivation. Zhao and his colleague's report directly converse with M. Phan's research as social media addiction can also work with revenge bedtime procrastination to further aggravate high school sleep deprivation. To conclude along the same lines as academic overwork and parental expectations, procrastination of sleep is also a major stressor of high school sleep deprivation.

Topic of Inquiry

With the information above it is clear that academic overwork, parental expectations, and procrastination of sleep are major stressors of high school sleep deprivation. However current scholarly literature on this topic does not address the root issue from which these three primary stressors of high school sleep deprivation came. To figure out this root issue one must look at the issue from the perspective of a high school student. In doing so it can be hypothesized that the root issue of these three stressors of high school sleep deprivation is goals for college. With the preliminary research and a hypothesized root issue in hand, the goal of my research will be to make the connection between goals for college and the major stressors of high school sleep deprivation, in turn proving high school sleep deprivation to be caused by goals for college. To effectively conduct research on this topic of inquiry, possible methods must be identified.

Throughout my research on possible methods, I identified two popular methods researchers in my field used when conducting research on my topic. The first method identified was interviewing, as shown by Brodie's research when he interviewed a high school student who was suffering from academic overwork. The second research method I came across was the use of surveys in an article written by Clifton B. Parker, a Stanford researcher, who reported Denise Pope's survey findings that identified that "56% of students considered homework a primary source of stress..."(Parker). When comparing the two methods I identified interviewing as a method that efficiently gained descriptive results, constrained results to a small area, and led to a higher likelihood of responses. When looking at the use of surveys I identified this method to gain less descriptive responses, not be constrained by area, and have a somewhat lower likelihood of responses. When looking at the previous analysis I decided to go with a survey method, as my research will include a qualitative analysis that doesn't need descriptive responses and also is the most efficient for reaching nearby high schools to get more and better random sampling. Therefore, a survey will be conducted in a suburban area of Los Angeles to gather responses from high school students. These results will put the primary stressors of high school sleep deprivation in conversation with each other and will address the connection between these stressors and their hypothesized root issue: goals for college.

Methodology

This study explores the impact of goals for college on high school students' sleep deprivation. The primary goal of this study is to conduct research on this topic and conclude whether goals for college have an impact on high school students' sleep deprivation and to answer the inquired research question. This is an important study as it would clarify the effects of goals for college on high school sleep deprivation, allowing for a better understanding of the

issue, and closing a gap in the scholarly literature regarding whether goals for college are the root issue of high school sleep deprivation.

This is an extensive study using a qualitative approach. The data collection consisted of four steps. First, I acknowledged the circumstance that I needed access to a wide range of high school students and a means to gather information from them. I took inspiration from Clifton B. Parker and created a survey for high school participants as shown in Appendix A. Next, I contacted teachers from my high school and nearby high schools through email, asking them if they were interested in giving my survey on sleep deprivation in high school students to high school students in their classes. After I gathered my responses I analyzed all the information I had gathered from my surveys to find patterns within lenses and between lenses to pull out the most valuable findings. Lastly, I emailed out the results of my findings to the teachers to possibly bring awareness to the issue, and add to their understanding of the issue.

The state in which this study is conducted is California, which is a southern state of the United States of America. The setting of this study is three high schools in a suburban area of Los Angeles. Participants include grades ninth through twelfth. Targeted participants were involved in differing amounts of extracurriculars and differing amounts of course load. Within this study, I used Google Forms in order to create three equivalent surveys that I sent to three different schools. In the surveys I presented 6 close-ended questions to gauge the participants' circumstances, followed by 18 more close-ended questions which were categorized by relation to the major stressors of high school sleep deprivation. I used the Likert scale for the answering option in my survey. I used email to send out my survey (Appendix A) to teachers in my high school and nearby high schools. I used Google Sheets to compile all my results into one spreadsheet and create charts (Appendix B). I developed a Python script (Appendix C) that

assisted me in my cross-data analysis, by using the code to set independent and dependent variables, which allowed me to see how different lenses affected each other, allowing me to put them in conversation with each other. As a result of the limited time I had available for this research project and limited reach, this research approach proved to be the most effective and replicable.

Data Collection

All students were asked to participate in the data collection process through a Google Forms survey (Appendix A). I aimed for at least 300 responses; I had received a total of 221 responses, however, the students who participated in the study provided sufficient qualitative data. The survey included an informed consent form option at the beginning (Appendix D). I deployed the survey electronically to teachers, due to limited resources that restricted me from directly contacting students. Students who took part in the survey were asked to genuinely respond to questions. Students were also assured that their responses would be exclusively confidential to encourage them to answer more truthfully.

Significant Findings

Figure 1

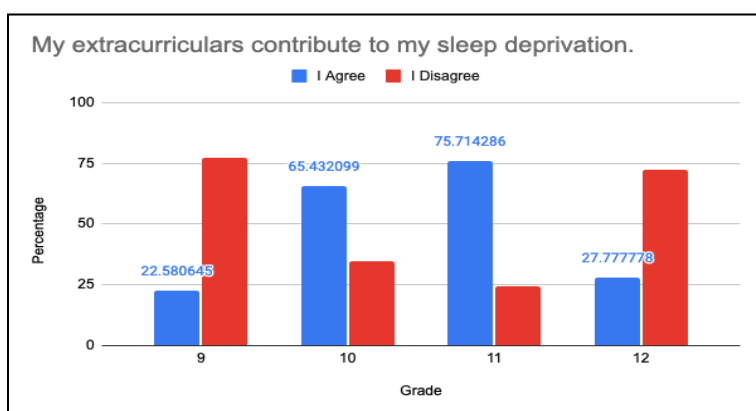


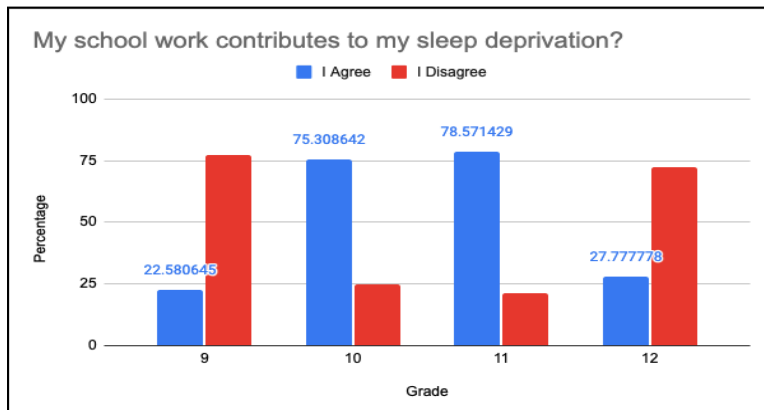
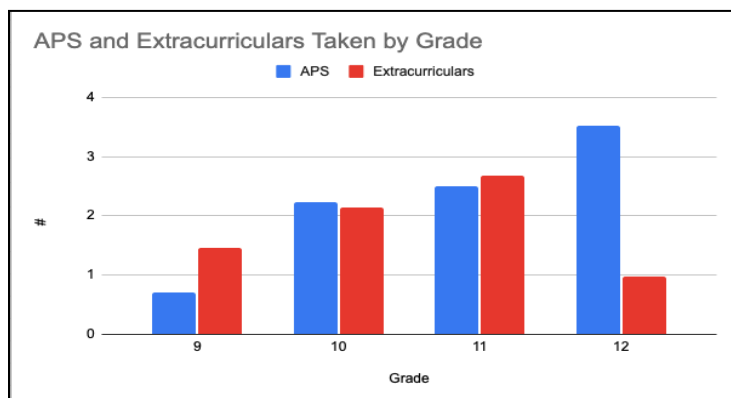
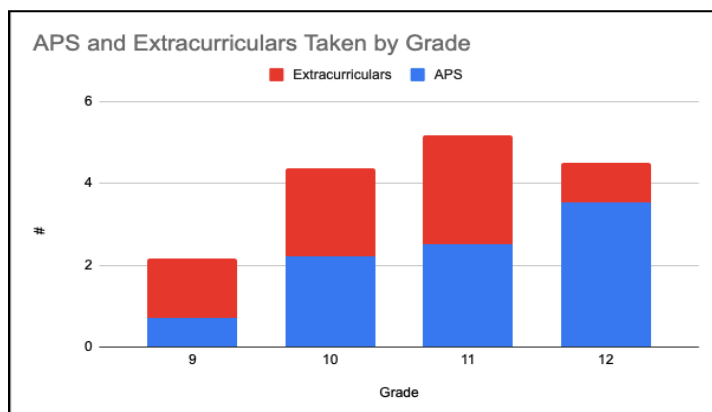
Figure 2**Figure 3****Figure 4**

Figure 5

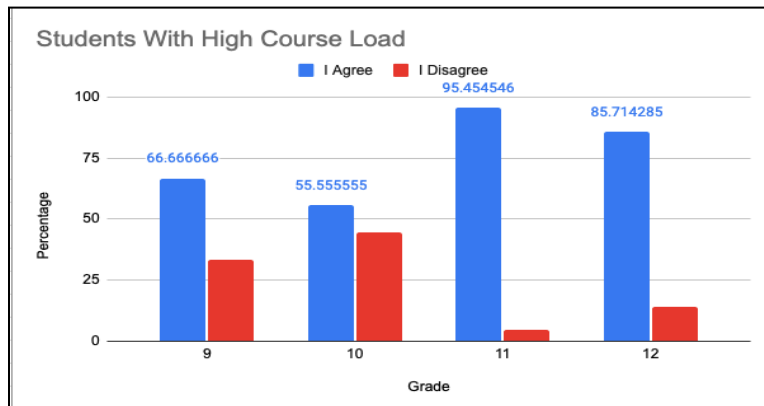


Figure 6

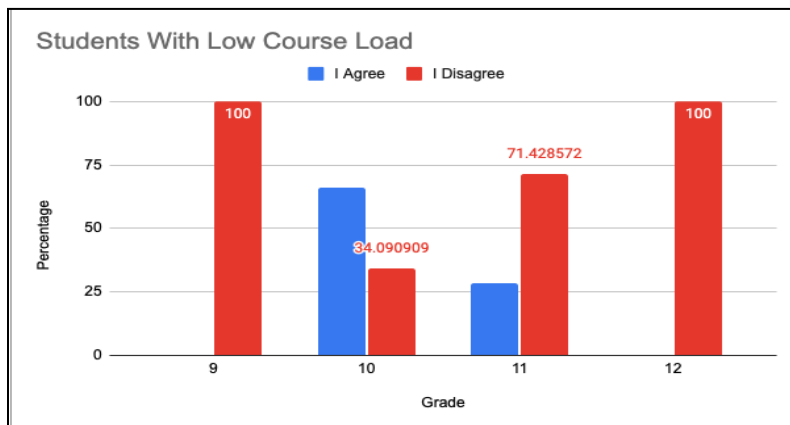


Figure 7

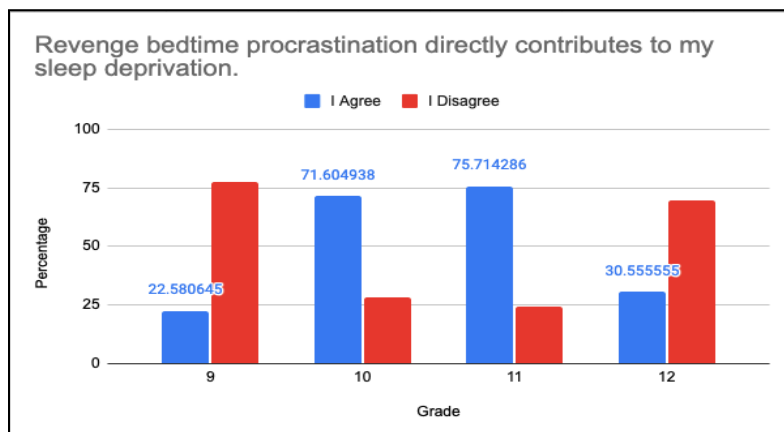


Figure 8

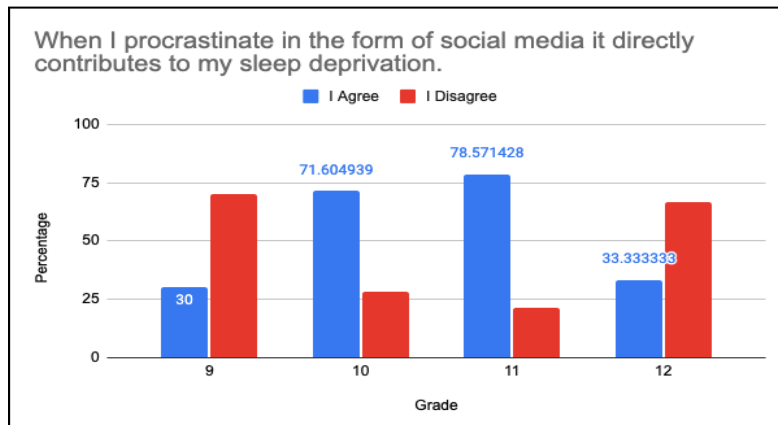


Figure 9

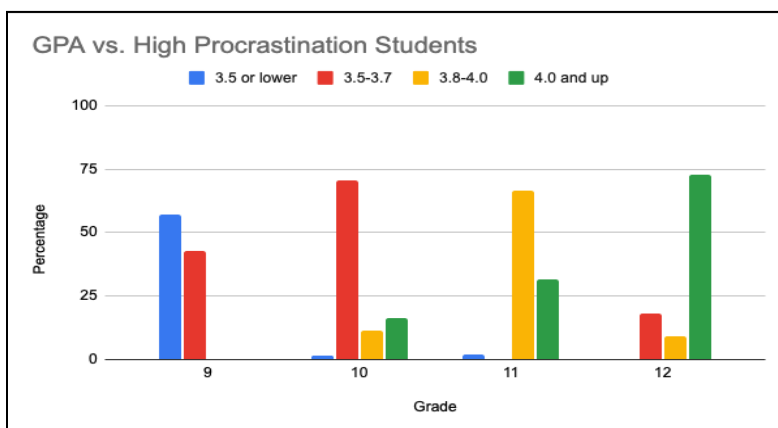


Figure 10

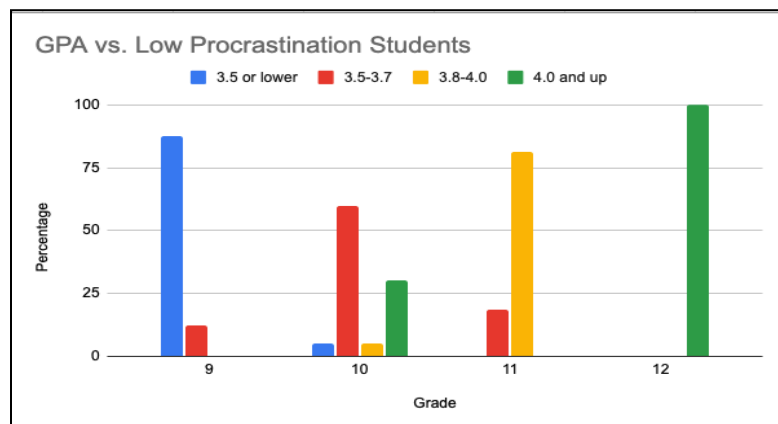


Figure 11

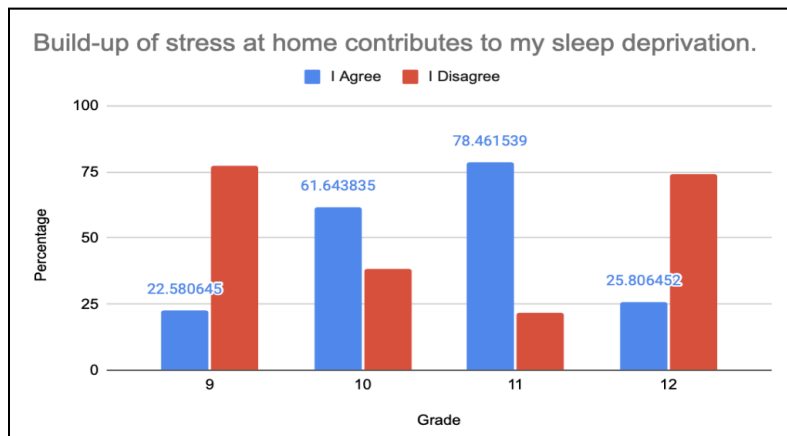


Figure 12

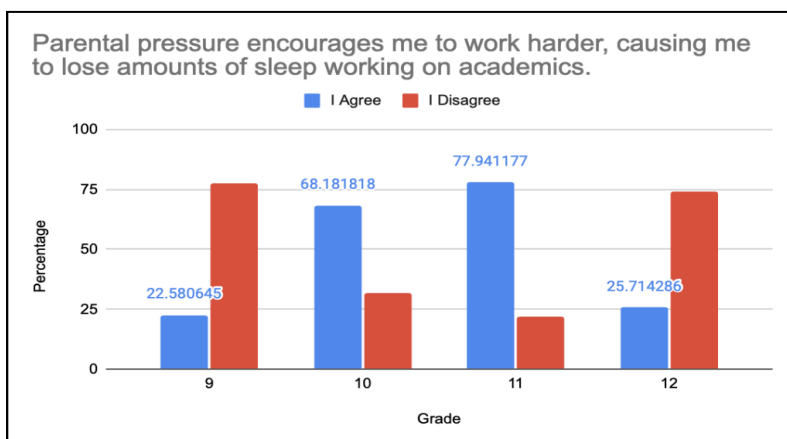


Figure 13

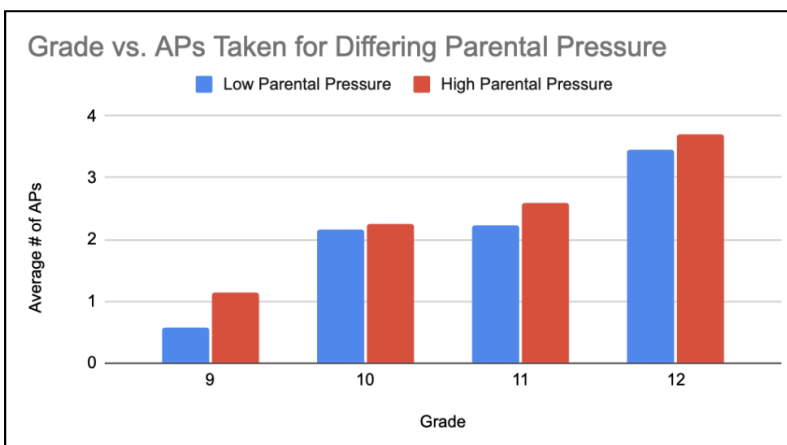


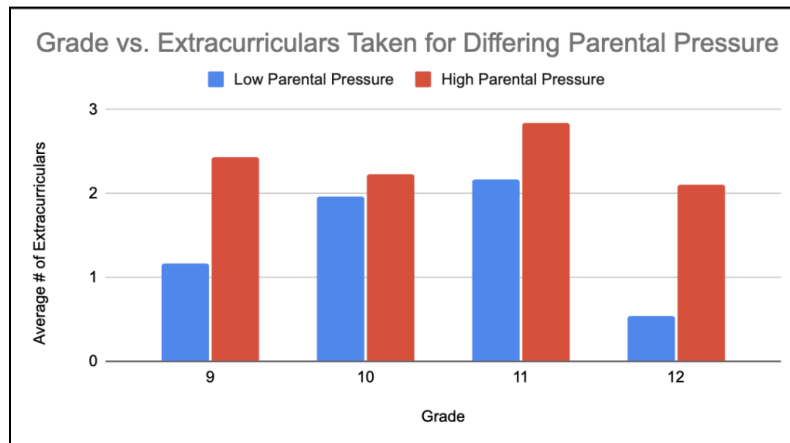
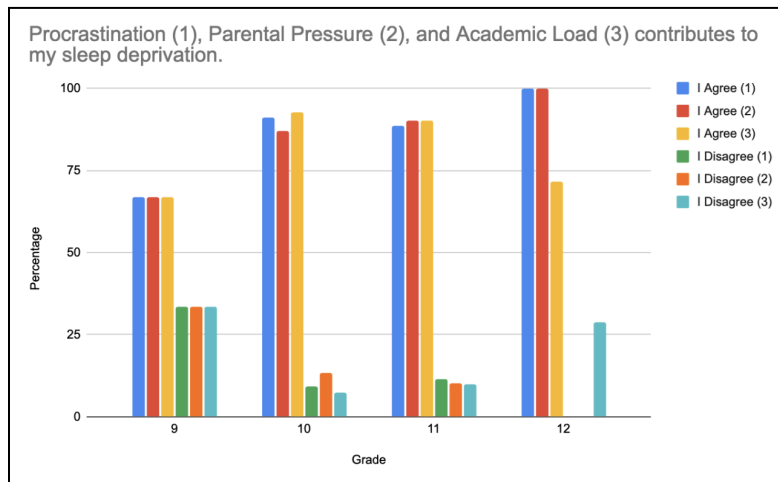
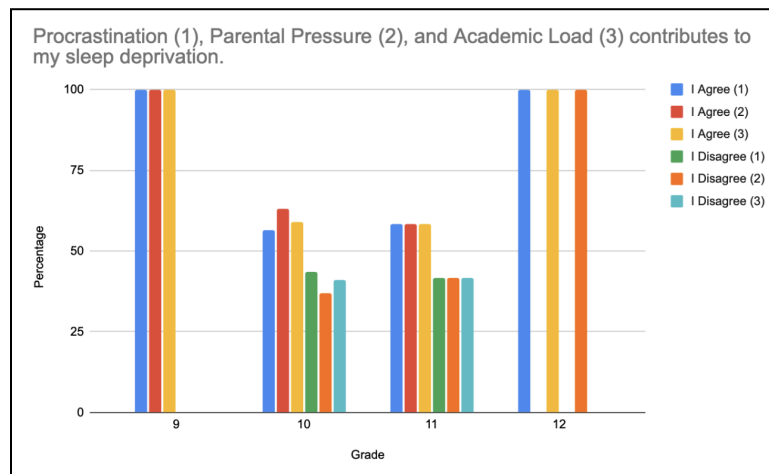
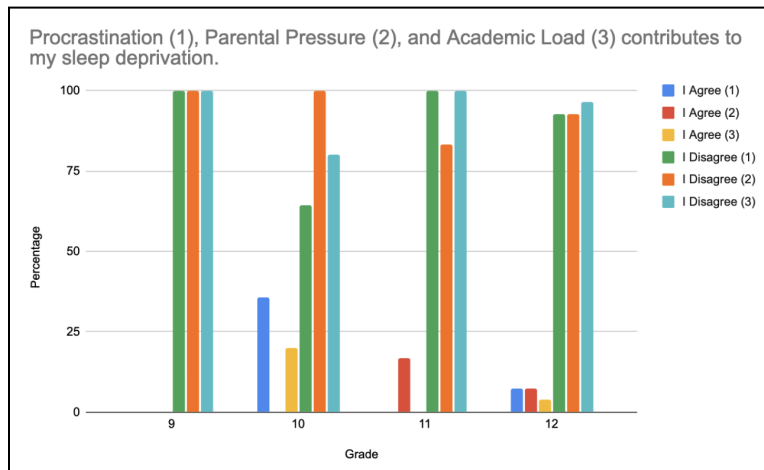
Figure 14**Figure 15****Figure 16**

Figure 17

Data Analysis and Discussion

In order to analyze this data I created graphs in Google Sheets based on my cross-data analysis. The analysis included comparing data and graphs to put different lenses in conversation. The analyses will be categorized by lens as the survey questions were also categorized by lens.

Academic Overwork Data Analyses

The first analysis that will be looked at is in the academic overwork category, looking at whether students believe that academic overwork directly contributes to their sleep deprivation. When comparing Figure 1 to Figure 2 both tenth and eleventh graders majorly agree that there is a direct link between their academic work and sleep deprivation, whereas in contrast ninth and twelfth graders majorly disagree. These results could be attributed to the fact that tenth and eleventh graders are in the middle of their college preparation, whereas most ninth graders haven't thought far enough into the future, and at the time of this survey, all twelfth graders had completed their college applications.

In addition to my previous analysis of whether students in different grades believe that

their academic work affects their sleep deprivation, I also analyzed the average amount of AP classes and extracurriculars taken by each grade. This analysis was the first piece of data to help me look at multiple lenses as I aimed to see if there was a difference in the amount of overwork between each grade. As seen in Figure 3, the data collected shows how course load increases as each grade moves higher. In Figure 4 the same data is presented, but Figure 4 further shows the ratio of AP classes to extracurriculars in each grade. It can be seen that ninth graders have a low course load compared to all other grades. It can also be seen that tenth and eleventh graders have a similar course load and ratio of AP classes to extracurriculars. In addition, it can also be seen that twelfth graders have a very low amount of extracurriculars in comparison to their AP classes, this could be attributed to the fact that at the time I sent my survey seniors had dropped most of their extracurriculars as they had already submitted their college applications. Also, a possible reason twelfth graders show the highest course load of AP classes compared to other grades is due to the fact that only most twelfth graders have the option of taking majority AP classes as they have progressed through easier classes throughout their high school career. I wanted to look at this piece of data as I hypothesized that a higher course load would lead to more sleep deprivation. This data also led me to establish a threshold of high overwork per grade by finding the average course load a student usually took in each grade.

In the previous analysis, in the academic overwork category, we had established the average course load. With this, we can set a high course load threshold as follows: a high threshold of course load for ninth-grade students includes one AP class and two extracurriculars, a high threshold of course load for tenth-grader students includes three AP classes and three extracurriculars, a high threshold of course load for eleventh-grade students includes three AP classes and three extracurriculars, and a high threshold of course load for twelfth-grade students

includes four AP classes and one extracurricular. With these established thresholds I moved on to my next analysis in which I searched to see if students with different course loads had different answers to questions related to the procrastination of sleep. This type of cross-analysis puts the academic overwork lens and procrastination of sleep lens in conversation with each other. When Figure 5 and Figure 6 were compared it showed that when students with different course loads were asked to agree or disagree with this statement, the results were indicative of sleep deprivation. In Figure 5 it shows that students with high course loads majorly agreed with this procrastination regardless of grade. In Figure 6 it shows that students with low course loads majorly disagreed with this procrastination, with the exception of tenth grade. Tenth grade being a possible outlier may be due to external factors that could keep a tenth grader busy. This data shows how there is a direct connection between academic overwork and procrastination of sleep, in the next analyses I will show how procrastination of sleep directly causes sleep deprivation, putting goals for college and sleep deprivation in conversation with each other through the academic overwork lens and the procrastination of sleep lens.

Procrastination of Sleep Data Analyses

In order to prove the hypothesis that was mentioned previously, we need to take a look at Figure 7 and Figure 8 to see whether students in different grades believe that procrastination of sleep directly affects their sleep deprivation. When looking at both Figure 8 and Figure 9, both figures show how tenth and eleventh-graders agree with the two statements, “Revenge bedtime procrastination directly contributes to my sleep deprivation” and “When I procrastinate in the form of social media it directly contributes to my sleep deprivation.” However, both figures also show how ninth and twelfth graders both majorly disagree with the two previous statements. This is in line with our earlier data, showing a pattern between ninth and twelfth graders and

tenth and eleventh graders. Additionally, we can see that procrastination of sleep does indeed directly affect students' sleep deprivation—proving our earlier hypothesis showcasing how academic overwork and procrastination affect sleep deprivation together. This information creates a link from college goals to academic overwork, academic overwork to procrastination of sleep, and procrastination of sleep to sleep deprivation.

In addition to the previous piece of analysis, this next piece will focus on putting the procrastination of sleep lenses and academic lenses into conversation. In this analysis, we need to look at some data to see if more correlations between lenses cause sleep deprivation. The findings shown in Figure 9 and Figure 10 were compared to see whether there was any correlation between the GPA of a student and the procrastination of their sleep. When the figures were compared it showed that regardless of procrastination levels, the GPA ranges per grade seem to be about the same. Although this data doesn't show a correlation, it tells us that these two variables don't affect each other much. This is important because it helps us conclude that the GPA of the student doesn't matter too much when looking at procrastination and its effects on sleep deprivation.

Parental Expectations Data Analyses

In this section, we will analyze the data generated from the parental expectations questions in my survey. In Figure 11 and Figure 12, it can be seen once again that both charts show how tenth and eleventh-graders agree with the two above statements. They state, “Build-up of stress at home contributes to my sleep deprivation” and “Parental pressure encourages me to work harder, causing me to lose amounts of sleep working on academics.” The results showed that tenth and eleventh graders majorly agreed with both statements, while the responses of ninth and twelfth graders majorly disagreed with the previous two statements. This is in line with all of

our earlier data showing an even stronger pattern between ninth and twelfth graders and tenth and eleventh graders. Furthermore, we can see that our research does indeed indicate a high causation between parental expectations and sleep deprivation, further proving our initial hypothesis that the three major causes of high school sleep deprivation stem from goals for college.

Moreover, to further build upon our proof, we can also show how major stressors of sleep deprivation stemming from goals for college also work together to cause sleep deprivation. In the data in Figure 13 and Figure 14, one can see how there is a consistent increase in extracurriculars and AP classes taken if there is high parental pressure present. Regardless of the grade, those students who claimed to have high parental pressure, also said they were taking on average greater amounts of AP courses and extracurriculars. Furthermore, those students who claimed that there was low parental pressure present, were taking lower amounts of course load than those students who had claimed high parental pressure was present. This directly connects the academic overwork lens and parental expectations lens. This correlation also directly links to high sleep deprivation as validated in previous analyses, where students claimed both that parental pressures and academic overwork individually increase sleep deprivation.

Dream Colleges v. Sleep Deprivation Holistic Analyses

In this section, we will compare the responses of students who have different dream colleges or no dream colleges, on whether they believe that the three major stressors of sleep deprivation have effects on their sleep deprivation. In order to do this first we will take a look at students with elite dream colleges. In this study's survey, students were specifically asked if they had a dream college and if they would rank their dream college as an elite school. For those students who have elite dream schools, an overwhelming majority of them agreed to all three

effects of college goals contributing to their sleep deprivation as shown in Figure 15, directly stemming from this dream. In Figure 15 it is shown that regardless of their grade, the majority of the students with elite dream colleges agree to the statement that procrastination, parental pressures, and academic overwork, contribute to their sleep deprivation.

Similarly to the previous analysis, students who had dream schools but didn't classify them as elite colleges had a similar response in comparison to elite dream school respondents. Still, a majority of them agreed that all three main causes of sleep deprivation contributing to their sleep deprivation as shown in Figure 16, directly stemming from their goals for college, except for twelfth graders. Twelfth graders representing a possible outlier could be due to the circumstance in which, students that don't have elite dream colleges and have completed their college applications, don't lose much sleep over the process of working towards their dream college anymore. In a holistic sense, Figure 16 shows that a slight majority of the students with non-elite dream colleges agree with the statement that the procrastination of sleep, parental pressures, and academic overwork, cohesively contribute to their sleep deprivation.

In contrast to the previous two pieces of analysis, students who had no dream schools had a completely different response in comparison to students with non-elite and elite dream schools. An overwhelming majority of them disagreed with all three stressors for sleep deprivation. This is very interesting because as seen in the previous two pieces of analysis, it seems that goals for college are positively correlated with sleep deprivation and from looking at all three types of students, we can say it could be a causation as well. In other words, the more prestigious your dream college is, the more sleep deprivation you will potentially face.

Limitations

During this research process, I faced three main limitations that limited me from gathering the most accurate responses I could have gathered and providing the most value to the current scholarly literature on the topic. The first major limitation that held my research back was the plethora of questions my survey included, although every question was vital to my analysis, this plethora of questions could have discouraged possible respondents from responding as it would have been inconvenient to fill out all questions. The second major limitation was the ratio of total respondents between all four grades. I had a majority of tenth and eleventh grader respondents with a lesser amount of ninth and twelfth grader respondents. This limitation could have skewed my data slightly and also given me less accurate results for ninth and twelfth graders. The third major limitation of my research process was my geographic location, due to the fact that I live in a middle-class suburb in an area near Los Angeles resulting in the schools I gathered data from being all middle-class schools. I believe that if I were to have included other income-class schools I could have provided more in-depth analysis on the topic and more value to the current literature on the topic.

Conclusion

With my preliminary research and my previous data analysis, I have made a conclusion to answer the inquiry question: what is the impact of goals for college on student sleep deprivation in the high schools of a suburban area of Los Angeles? My findings have concluded that goals for college are in fact the root issue of the three major stressors of high school sleep deprivation, the procrastination of sleep, academic overwork, and parental expectations. I have also concluded that each of these major stressors work together to contribute to sleep deprivation.

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Appendix A

Survey Questions

What grade are you in?

- ☐ 9th
- ☐ 10th
- ☐ 11th
- ☐ 12th

What is your Weighted GPA range?

- ☐ 3.5 or lower
- ☐ 3.5 - 3.7
- ☐ 3.8 - 4.0
- ☐ 4.0 and up

Do you have a dream college you are currently working towards?

- ☐ yes
- ☐ no

If you answered yes to the question above, would you classify your dream college as an elite school?

- ☐ yes
- ☐ no

How many AP/Honors classes are you taking?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more

How many extracurriculars do you take part in? (clubs, teams, mentorships)

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ More than 4

I feel like my extracurriculars occupy a large chunk of my time?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

...

I feel like my extracurriculars contribute to my sleep deprivation?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

I participate in these extracurriculars to strengthen my chances of getting into my dream college?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

...

I feel like my school work occupies a large chunk of my time?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

I feel like my school work contributes to my sleep deprivation?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

...

I enrolled in certain AP courses and Honor courses to strengthen my chances of getting into my dream college?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

My parents expectations for my college career stress me out?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

...

This build-up of stress at home contributes to my sleep deprivation?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

This parental pressure encourages me to work harder, causing me to lose amounts of sleep working on academics?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

...

My parents' high expectations for my college career is a result of their goals for college for me?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

I push off academics when I am seeking a break from my goals for college?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

...

My procrastination directly contributes to my sleep deprivation?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

When I get home from school I like to use social media to relax?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

...

I use social media to take my mind off of grades and my goals for college?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

When I procrastinate in the form of social media it directly contributes to my sleep deprivation?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

...

After I finish my academics and extracurriculars for the day, I find myself engaging in activities such as: **gaming, watching videos, or scrolling through social media** to relax because I did not have time for them during the day (due to academics)?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

This behavior, revenge bedtime procrastination, directly contributes to my sleep deprivation?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

...

My procrastination is a result of my goals for college, which led me to choosing my academics and extracurriculars?

- ☐ I agree
- ☐ I somewhat agree
- ☐ I somewhat disagree
- ☐ I disagree

Appendix B

Google Sheets: Portion of Data

	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	
1	10th	3.5 or lower	yes	yes		3	0		somewhat agre	I agree	I agree	I agree	I agree	I agree	I agree		I agree	I agree	I agree
2	10th	3.5 - 4.0	yes	no		3	1	cheer	somewhat agre	somewhat agre	somewhat agre	I agree	I agree	I somewhat agre	somewhat disa	somewhat agree	I disagree	somewhat agre	I agree
3	10th	3.5 - 4.0	yes	yes		2	2	Speech and Deb	I agree	somewhat agre	I agree	I agree	I agree	I agree	I somewhat agre	I disagree	I agree	somewhat agre	I agree
4	10th	3.5 - 4.0	yes	yes		2	2	CSF, Girl Scouts	somewhat agre	somewhat disa	I agree	I agree	I agree	I agree	somewhat agre	somewhat disagree	I disagree	I agree	I agree
5	10th	4.0 and up	no		5 or more	4	4	Teaching kids in	I agree	I somewhat disa	I disagree	I agree	I somewhat agre	somewhat agre	I agree	I agree	I agree	I agree	I som
6	10th	4.0 and up	yes	yes		4	1	Speech and Deb	somewhat agre	somewhat agre	I agree	I somewhat agre	somewhat agre	I agree	I somewhat agre	I agree	I somewhat agre	I agree	I agree
7	10th	4.0 and up	no			4	More than 4	Swim, waterpolo	somewhat agre	somewhat disa	somewhat agre	I agree	I agree	I agree	I disagree	I somewhat disagree	I disagree	I disagree	I som
8	10th	4.0 and up	no			1	More than 4	Drama, pep squ	somewhat agre	somewhat agre	somewhat agre	I agree	I agree	I somewhat disa	somewhat agre	somewhat agree	I somewhat disa	somewhat disa	I som
9	10th	4.0 and up	yes	no		4	More than 4		I agree	I agree	somewhat agre	I agree	I agree	I somewhat agre	somewhat disa	somewhat disagree	I somewhat agre	somewhat agre	I som
10	10th	4.0 and up	no			2	2	Empowerment	I disagree	I disagree	somewhat agre	somewhat agre	somewhat agre	somewhat disa	I disagree	I disagree	I disagree	I disagree	I disa
11	10th	4.0 and up	yes	yes		4	3	I'm learning the	somewhat agre	somewhat disa	I agree	I agree	somewhat agre	I agree	I somewhat disa	somewhat disagree	somewhat agre	I disagree	I som
12	10th	4.0 and up	yes	no		3	3	TASSEL Cambi	somewhat disa	somewhat disa	I agree	somewhat agre	somewhat agre	somewhat agre	somewhat disa	somewhat disagree	somewhat agre	somewhat disa	I som
13	10th	4.0 and up	no		5 or more	3	3	Debate, tutoring	I agree	I disagree	I agree	somewhat disa	I disagree	I agree	somewhat agre	I disagree	I disagree	I agree	I disa
14	10th	4.0 and up	yes	yes		2			I disagree	I disagree	I disagree	somewhat agre	I agree	I agree	I somewhat agre	somewhat agree	somewhat agre	I agree	I agree
15	10th	4.0 and up	yes	no		2	More than 4		somewhat agre	somewhat agre	I agree	I agree	I agree	I agree	somewhat agre	somewhat disagree	I agree	somewhat agre	I som
16	10th	4.0 and up	yes	yes		3	More than 4	Academy, MedL	I agree	somewhat agre	I agree	I agree	I agree	I agree	somewhat disa	I disagree	I disagree	I disagree	I agree
17	10th	3.5 - 3.7	yes	no		1	2		somewhat agre	somewhat agre	I agree	somewhat agre	somewhat agre	I agree	somewhat agre	somewhat agre	somewhat agre	I agree	I som
18	10th	3.5 - 3.7	no	no		1	2		somewhat disa	somewhat disa	I disagree	I disagree	somewhat disa	I disagree	somewhat disa	I disagree	somewhat disa	somewhat disa	I som
19	10th	3.5 - 3.7	no	no		1	1		somewhat disa	somewhat disa	I disagree	somewhat disa	I disagree	I disagree	somewhat disa	somewhat disa	I disagree	somewhat disa	I som
20	10th	3.5 - 3.7	no	no		2	0		I disagree	I disagree	I disagree	somewhat disa	somewhat disa	somewhat disa	somewhat disa	somewhat disa	I disagree	somewhat disa	I som
21	10th	3.5 - 3.7	yes	yes		2	3		I agree	I agree	I agree	I agree	I agree	I agree	I agree	somewhat agre	I agree	I agree	I agree
22	10th	3.5 - 3.7	yes	yes		2	3		I agree	I agree	I agree	I agree	I agree	I agree	I agree	I agree	I agree	I agree	I agree
23	10th	3.5 - 3.7	yes	yes		2	4		I agree	I agree	I agree	somewhat agre	I agree	I agree	somewhat agre	somewhat agre	I agree	somewhat agre	I agree
24	10th	3.5 - 4.0	yes	yes		2	3		I agree	I agree	I agree	I agree	I agree	I agree	I agree	I agree	I agree	I agree	I agree
25	10th	3.5 - 3.7	yes	yes		2	2		somewhat agre	somewhat agre	I agree	somewhat agre	somewhat agre	I agree	somewhat agre	somewhat agre	somewhat agre	I agree	I som
26	10th	3.5 - 3.7	yes	yes		3	1		somewhat disa	somewhat agre	somewhat agre	I agree	I agree	I agree	somewhat agre	somewhat agre	somewhat agre	I agree	I som
27	10th	3.5 - 3.7	yes	yes		2	2		somewhat agre	somewhat agre	I agree	somewhat agre	somewhat agre	I agree	somewhat agre	somewhat agre	somewhat agre	I agree	I agree
28	10th	3.5 - 4.0	yes	yes		3	1		somewhat agre	somewhat agre	somewhat agre	I agree	I agree	I agree	I agree	I agree	somewhat agre	I agree	I agree
29	10th	3.5 - 4.0	yes	yes		3	2		somewhat agre	somewhat agre	somewhat agre	I agree	I agree	I agree	I agree	I agree	I agree	I agree	I agree
30	10th	3.5 - 3.7	yes	yes		2	3		I agree	I agree	I agree	somewhat agre	somewhat agre	I agree	somewhat agre	somewhat agre	somewhat agre	I agree	I agree
31	10th	3.5 - 3.7	yes	no		2	1		somewhat agre	somewhat disa	somewhat agre	somewhat agre	somewhat agre	somewhat agre	somewhat disa	somewhat agre	somewhat agre	I agree	I som
32	10th	3.5 - 3.7	yes	no		2	1		somewhat disa	somewhat disa	somewhat agre	somewhat agre	somewhat agre	somewhat agre	somewhat disa	somewhat disa	somewhat disa	somewhat agre	I som
33	10th	3.5 - 3.7	yes	no		2	1		somewhat disa	somewhat disa	somewhat agre	somewhat disa	somewhat agre	I agree	somewhat disa	somewhat disa	somewhat disa	I agree	I som
34	10th	3.5 - 3.7	yes	no		1	2		I agree	somewhat disa	I agree	somewhat agre	I disagree	I agree	somewhat agre	I disagree	somewhat agre	I agree	I som
35	10th	3.5 - 3.7	yes	no		2	2		somewhat agre	I disagree	I agree	I agree	somewhat disa	I agree	somewhat agre	I disagree	somewhat agre	somewhat agre	I disa
36	10th	3.5 - 3.7	yes	no		2	1		somewhat agre	somewhat agre	somewhat agre	somewhat agre	somewhat agre	I agree	somewhat agre	somewhat agre	somewhat agre	somewhat agre	I som

Appendix C

Cross Analysis Python Script

```

1 import pandas as pd
2
3 # Read the CSV file into a pandas DataFrame
4 df = pd.read_csv('data.csv')
5 df = df.drop(columns=['Timestamp', 'Score', 'What extracurriculars do you take part in?'])
6 df.dropna(subset=['How many AP/Honors classes are you taking?', 'How many extracurriculars do you take part in? (clubs, teams, mentorships)'], inplace=True)
7
8 df.replace(to_replace='5 or more', value='5', inplace=True)
9 df.replace(to_replace='More than 4', value='5', inplace=True)
10 df.replace(to_replace='Too many', value='6', inplace=True)
11 # 3.5 or lower
12 # 3.5 - 3.7
13 # 3.8 - 4.0
14 # 4.0 and up
15
16
17 # df.replace(to_replace='3.5 or lower', value='5', inplace=True)
18 # df.replace(to_replace='3.5 - 3.7', value='5', inplace=True)
19 # df.replace(to_replace='3.8 - 4.0', value='6', inplace=True)
20 # df.replace(to_replace='4.0 and up', value='6', inplace=True)
21
22
23 df['How many AP/Honors classes are you taking?'] = df['How many AP/Honors classes are you taking?'].astype(int)
24 df['How many extracurriculars do you take part in? (clubs, teams, mentorships)'] = df['How many extracurriculars do you take part in? (clubs, teams, mentorships)'].astype(int)
25
26 # Filter the DataFrame
27 filtered_df = df [
28     (df['Do you have a dream college you are currently working towards?'] == 'yes') & \
29     (df['If you answered yes to the question above, would you classify your dream college as an elite school?'] == 'no')
30 ]
31
32 filtered_df.to_csv('new.csv')
33 # Calculate the percentages
34 total_count = len(filtered_df)
35 # agree_parental_pressure = len(filtered_df[(filtered_df['My parents expectations for my college career stress me out?'] == 'I agree')])
36 # agree_stress = len(filtered_df[(filtered_df['Stress'] == 'agree')])
37 # disagree_stress = len(filtered_df[(filtered_df['Stress'] == 'disagree')])
38
39 data_looking_for = 'This behavior, revenge bedtime procrastination, directly contributes to my sleep deprivation?'
40 percentages = filtered_df.groupby('What grade are you in?')[data_looking_for].value_counts(normalize=True) * 100
41 # average = filtered_df.groupby('What grade are you in?')[data_looking_for].mean()
42 # std = filtered_df.groupby('What grade are you in?')[data_looking_for].std()
43 print(percentages)
44 # print('Average: ', average)
45 # print('STD: ', std)
46

```


Appendix D

Informed Consent Form

The Impact of Goals for College on High School Sleep Deprivation Form A - An AP Capstone Research Study

B *I* U ↺ ✕

Hey my name is Tasha Shah, and I am an AP Capstone Research student at Crescenta Valley High School. I am inviting you to participate in a research study. Involvement in the study is voluntary, so you may choose to participate or not. I am now going to explain the study to you.

I am interested in learning more about the impact of goals for college on sleep deprivation in high school students. You will be asked to answer questions relating to your experience with academics, stress from parents, and habits of distraction affecting your sleep. This will take approximately 3-5 minutes of your time. **All information will be kept confidential and anonymous.** By confidential, it means all information linking you to your responses will be kept private from the research itself. In any articles I write or any presentations that I make, I will not mention any sort of information that could link your identity to your response. I will not reveal details about where you work, where you live, any personal information about you, and so forth. **Once collecting data is complete, all responses will be erased.**

The benefit of this research is that you will be helping me understand the impact of goals for college on sleep deprivation in high school students. With this information we can bring awareness to the ongoing issue of sleep deprivation in high school students and the difficulties high schoolers are faced with. This information should help us to bring awareness to the topic and possibly implement solutions to benefit students. If you do not wish to continue, you have the right to withdraw from the study, without penalty, at any time.