

Patterns in Cognitive Distortions Among High School Students: An
Analysis of How Social and Achievement Situations Influence Types of
Thinking

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PERSONAL STATEMENT

Throughout Middle and High School, I have struggled with social and academic issues because of my diagnosis with Attention-Deficit/Hyperactivity Disorder (ADHD). My diagnosis of ADHD had never frightened me because so many kids and students around me had been undergoing the same thing. Although, when confronted with medical support, I was intimidated by the idea of being reliant on medication. In this case, it was methylphenidate: a drug used to control ADHD and its common symptoms such as limited attention and hyperactivity. As my parents and I had the dosage increased, my academic performance drastically improved. However, never would I have thought that simple side effects of a medical drug would affect me so profoundly: depression, appetite suppression, and negative self talk. The high school years that followed would bring some new struggles, but I could now strategize ways to demolish these roadblocks. I began to learn the importance of leaving the past behind and decided to discontinue the use of prescriptions that were causing me so much personal pain in my daily life. Despite the challenges of controlling my ADHD without it, I sought out alternate strategies to aid in my success. As I matured through this process, my interest in psychology and mental health grew.

To me, the idea that so many people “battle” themselves is incredibly fascinating, especially considering that these struggles are internal, invisible to the human eye. Human feelings are so profound yet they are often concealed beneath the surface of a smile on a face. Emotions and thought patterns were so fascinating to me that I eventually launched this study on negative self-talk and cognitive distortions in high school students. It is no surprise that my generation will need a great deal of mental health support. Research has shown that technology has directly increased the toxic social environments that generation Z teens are exposed to, settings that increase mental health struggles. Sadly, many teenagers aren’t able to find outlets and solutions to their personal struggles. So, I decided to give them an avenue for mental health support; that answer was Serene Falls.

Serene Falls is a Discord server I created in May 2020 which offers peer support to teenagers suffering from mental health issues across the Internet. Prior to its launch, I spent countless late nights researching ways to talk with others as a peer regarding mental health illnesses. I built a community of 400 members who openly connected with each other on mental health issues. I have been so moved and impressed by the stories of others and it definitely inspired me to continuously make changes to my own.

After conducting this research study, I feel much more determined and motivated to engage in future research further extending my knowledge on cognitive distortions and possibly other factors that impact the mental health of teenagers and other populations as well. Mental health continues to be a global issue and much attention is needed to control the severity of it.

ABSTRACT

Cognitive distortions are individually generated thoughts or feelings that are negative, persuasive, and usually inaccurately based in reality. Types of negative self-talk can be connected to stress and anxiety development in students. The purpose of this study was: 1. To determine which cognitive distortions affect high school students more frequently in achievement and social situations and whether it mirrors the college students found by Covin (2011). 2. To examine whether the students who reported higher GPAs and engaged in more rigorous academic courses reported higher frequencies of cognitive distortions. 43 high school students, aged 14-17, participated in the study. Students completed a survey that collected demographics and assessed frequency that they experienced cognitive distortions in achievement and social situations using a scale adapted by Dr. Roger Covin (2011). Major findings included that similar patterns in cognitive distortions were found in high school students as the college students in Covin (2011). Students were more likely to engage in catastrophizing and should statements in achievement situations ($p < .05$), and mindreading in social situations ($p < .05$). Students with higher GPAs and engagement in more rigorous coursework reported lower frequencies of cognitive distortions in both situations, however the results were not significant ($p > .05$). The similarity in data between these high school students and the college students in Covin (2011), supports that younger and older adolescents experience similar types of negative self-talk. Future research is needed to understand why students who chose less rigorous pathways in high school, experience higher levels of cognitive distortions.

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INTRODUCTION

Cognitive Distortions/Types of Thinking:

Cognitive distortions are individually generating thoughts or feelings that are negative, persuasive, and usually inaccurately based on reality. Cognitive distortions can also be referred to as types of thinking. Cognitive distortions all share the commonality of representing an individual's private negative thinking about themselves and could cause an individual to interact negatively with others. For example, one cognitive distortion type is mental filtering. Mental filtering is when an individual focuses on the negative instead of the positive in a specific current situation. In other words, they filter anything optimistic. Cognitive distortions are important to study because it relates to daily negative thinking that an individual can experience. It is important for mental health professionals to be able to identify cognitive distortions when treating depression, stress, and anxiety because it is essential to modify an individual's core beliefs in supporting their mental well-being.

Stress and Anxiety for Adolescents in Academic Environments:

Negative self-talk can be connected to the development of stress and anxiety in students. A major source of stress and anxiety for adolescents is academics. Gyadz (2015) found that students with relatively high academic performance reported that grades were a major source of stress for juniors in high school. The study also found that nearly 49% of students experienced the majority of stress throughout the school day, while 31% portrayed feeling somewhat stressed. In addition, females generally reported higher stress levels than male students, and that a substantial minority of 26% portrayed symptoms of depression at a significant clinical level (Gyadz, 2015). In addition to GPA, a student's stress emanates from engaging in more difficult courses with the desire to get into a prestigious university of the students choosing.

Stress and Anxiety for Adolescents in Social Environments:

Stress and anxiety for adolescents can also be highly impacted by social-environmental consequences. Sigfusdottir, Kristjansson, Thorlindsson, and Allegrante (2016), investigated three paradigms of adolescent stress including how physiology impacts stress, how emotions influence stress, and what factors in the social structure/environment contribute to stress. They found that social conflict arising from family or peer groups can negatively impact the mental health of children and adolescents which can lead to feelings of anger, depression, anxiety, and fear in adolescents. Therefore, it can be

interpreted that adolescent stress can be related to negative self-talk and other harmful behavior derived from stress. Furthermore, high achieving students may feel pressure to be perfect. This could lead to social anxieties because of their inability to see themselves as anything other than the “smart kid in the class” (Davidson Institute, 2021).

Types of Cognitive Distortion

Types of cognitive distortions present differently in diverse academic and social situations. Table 1 lists 10 common cognitive distortions including their definitions. Cognitive distortions affect people differently depending on the types of situations they encounter. Covin (2011) studied the frequency of the cognitive distortions identified in Table 1 on college students in various academic and social situations. He was not surprised when he found that all-or-nothing thinking and should statements were rated as occurring more frequently in achievement situations because they reflected “aspects of perfectionism” that could be indicative of academic situations. Alternatively, mindreading and personalization were more prevalent in social situations due to how they relate to the way a person feels about themselves during interactions with others.

Table 1: Types of Cognitive Distortions

	<i>Cognitive Distortion</i>	<i>Definition</i>
1	Mind Reading	To infer that another person is thinking negatively of you
2	Catastrophizing	Tendency to exaggerate certain situations
3	All or Nothing Thinking	To envision things as either good or bad, or right or wrong
4	Emotional Reasoning	Tendency to interpret experiences with your current feeling
5	Labeling	Tendency to self-create statements based on specific behaviors
6	Mental Filter	Tendency to focus on the negative events, whilst disregarding the positives
7	Overgeneralization	Tendency to make broad and over-exaggerated observations based on small events
8	Personalization	Tendency to subsequently blame yourself
9	Should Statements	Tendency to make unrealistic demands for yourself (Should or should not be)
10	Minimizing the Positive	Tendency to filter out all the positive factors in your life

In addition, Coban (2013) examined the relationship between stress, coping strategies, and cognitive distortions in late adolescents. In contrast to Covin (2011), Coban found that the university students in this study were able to use problem-solving skills and seek social support rather than engaging in self-blame (cognitive distortions).

Gap in the Knowledge

Multiple studies have focused on university students and the frequency with which they experience cognitive distortions. However, few known studies have explored this phenomenon with younger age groups. As high school students experience high levels of stress and anxiety as a result of academic rigor and social pressures, this is an important age group to consider. Understanding the frequency of cognitive distortions experienced by younger students might also help inform future studies with college students.

Statement of Purpose

The purpose of this study was twofold: first to determine which cognitive distortions affect high school students more frequently in academic and social situations (and whether these mirror those of college students). Second, to analyze whether a correlation exists between reported GPA and reported cognitive distortions in social and academic situations in high school students. And, whether students enrolled in higher-level academic courses such as IB and AP level classes report experiencing higher frequencies of cognitive distortions.

Research Question

How do social and achievement situations influence patterns of cognitive distortions in adolescents?

Hypotheses

Hypothesis 1: High School students will experience similar patterns of cognitive distortions to the college students studied by Covin (2011). The cognitive distortion that will score highest will be “Should Statements” in achievement situations and “Mind Reading” in social situations.

Hypothesis 2: There will be a positive correlation between the reported frequency of cognitive distortions and GPA because higher achievers experience more academic pressure and because their tendency towards perfectionism will influence social stress.

Hypothesis 3: There will be a positive correlation between reported frequency of cognitive distortions and course level because higher achievers experience more academic pressure. and because their tendency towards perfectionism will influence social stress.

METHODOLOGY

Participants

43 High School students from suburban and urban High Schools in the Northeastern United States participated in this study. 55.8% of participants were male, and 44.2% were female. 81.4% of participants were of Caucasian background, 14% were Hispanic or Latinx, 18.6% were Asian, and 2.3% were Middle Eastern. All participants were between 13-17 years old: 2.4% of participants were 14, 28.6% were 15, 33.3% were 16, and 35.7% were 17. 16.3% of participants were in 9th grade, 20.9% in 10th grade, 48.8% in 11th grade, and 14% in 12th grade. 18.6% of participants were enrolled in 0 AP/IB courses, 23.3% were in 1-2, 4.7% were in 3-4, 37.2% were in 5-6, 11.5% were in greater than 6, and 4.7% attended a school not offering AP/IB courses.

Measures: Types of Thinking Scale

An adapted version of the Types of Thinking Scale developed by Dr. Roger Covin C.Psych., was used for this study (Covin, 2011). Covin is an independently licensed clinical psychologist administering a private practice in Ottawa, Canada. Dr. Covin consented to the use of the scale for the purposes of this study. The Types of Thinking Scale is a questionnaire that analyzes 10 common cognitive distortions including all or nothing thinking, overgeneralization, mental filters, discounting the positive, jumping to conclusions, magnification, emotional reasoning, should statements, labeling, and personalization. Each question on the scale included a type of cognitive distortion, its definition, and two possible real-life scenarios evaluating the frequency with which a participant experienced that particular cognitive distortion in social and achievement situations. Participants were asked to rate the frequency they experience a particular cognitive distortion on a 5 point scale (1 = never, 5 = all the time) in a similar scenario to the one depicted in the possible real-life scenario. Covin (2011) found that The Types of Thinking Scale was a valid measure to assess errors in thinking (Cognitive Distortions). Since the questionnaire was originally designed for college students, the Flesch-Kincaid Readability Scale was used in order to make sure that all of the languages in the scale were at an 8th-grade level or below.

Survey Construction

The survey consisted of two sections. The first section asked for demographic information including gender, ethnicity, age, and current grade level. Questions then followed asking for academic information including approximate GPA, the number of AP/IB classes the participant was currently enrolled in, and the participant's general stress level in school. Section two of the survey consisted of the Types of Thinking Scale as discussed in the previous section. The survey was administered via a google form and was designed to take approximately 15 minutes and to be completed in one sitting.

Procedure

After IRB approval was obtained, students were recruited by an email sent to parents from the Director of Science at the local High School. This message included a brief statement regarding the purpose of the study and asked for parent/guardian consent via a google form. Parent consent was required for student participation. Participants were also recruited via social media platforms (Instagram, Discord, and Snapchat) and text messaging. Students were messaged asking whether they would be interested in participating in the study. If they agreed to participate, they were to provide a parent email address and an email was sent directly to parents. To ensure the privacy of participants, student names and email addresses were only used for distribution purposes and were not collected on the survey. No other identifying information was collected.

Data Analysis

A google spreadsheet of all data collected was automatically assembled by the google form. Reported cognitive distortion scores were totaled for scores in both achievement and social situations for each individual. In addition, average scores across all participants were calculated for the frequency of each type of cognitive distortion experienced. GraphPad Prism Version 9.2.0 (2021) was used to construct all graphs and to run all data analyses. Simple Linear Regressions were run to compare continuous variables and r and r^2 values were calculated to determine how correlated the variables were and the degree of variability within the data. In addition, one-way ANOVA was run to determine whether there was a significant difference between the means groups of data; and Tukey analysis of multiple measures was used to determine significance between the means within the groups. A Welch's t-test was used to determine significance between the means of two groups.

As soon as the data analysis was completed, all electronic files were destroyed and deleted in order to maintain privacy of all participants.

RESULTS

Patterns in Cognitive Distortions in Achievement & Social Situations

Figs. 1.1 and 1.2 portray the mean differences between the frequency of specific cognitive distortions in the scenarios presented. In achievement situations, the highest-scoring cognitive distortions were catastrophizing and should statements which each scored significantly higher than labeling and overgeneralization which were the highest and lowest scoring cognitive distortions in the Covin (2011) study on college students ($p < .01$). In social situations, the highest-scoring cognitive distortion was mindreading which scored significantly higher than all or nothing thinking and labeling which was again the highest and lowest scoring social cognitive distortions in the Covin (2011) study ($p < .01$). Interestingly, catastrophizing was reported with significantly more frequency in achievement situations than social situations ($p < .05$), should statements were reported with more frequency in achievement situations than social situations although the difference between the means was approaching significance ($p < 1.0$). There was no significant difference between the means of the reported data for mindreading between the two types of situations.

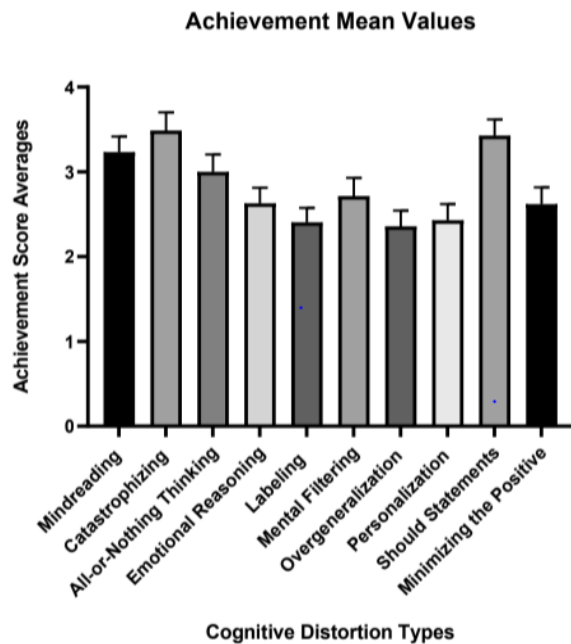


Figure 1.1: Relationship between cognitive distortion types and achievement average cognitive distortions score. Error bars = SEM (Vaswani, 2021).

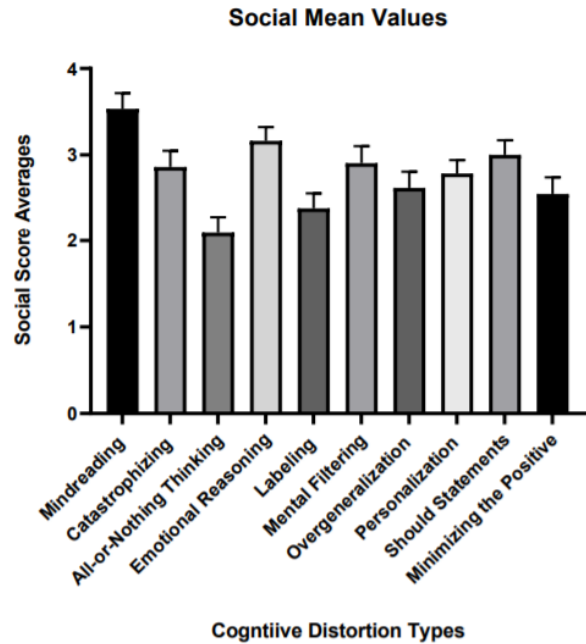


Figure 1.2: Relationship between cognitive distortion types and social average cognitive distortions score. Error bars = SEM (Vaswani, 2021).

Figs. 1.3 and 1.4 portray the relationship between the student's academic stress score and cognitive distortion score for overgeneralization and catastrophizing. Comparing academic stress and catastrophizing, there was a significant difference between these variables ($p < .05$). In addition, the

increasing slope of the simple linear regression also showed that the higher academic stress the student reported, the higher the reported score of catastrophizing for students in achievement situations; $r=0.45$ indicates a large effect size. Comparing academic stress and overgeneralization, there was no significant difference between these variables ($p>.05$). In addition, the increased slope of the simple linear regression showed that the higher academic stress the student reported, the higher the reported score of overgeneralization in achievement situations for students. Although, $r=.18$ indicated a small effect size.

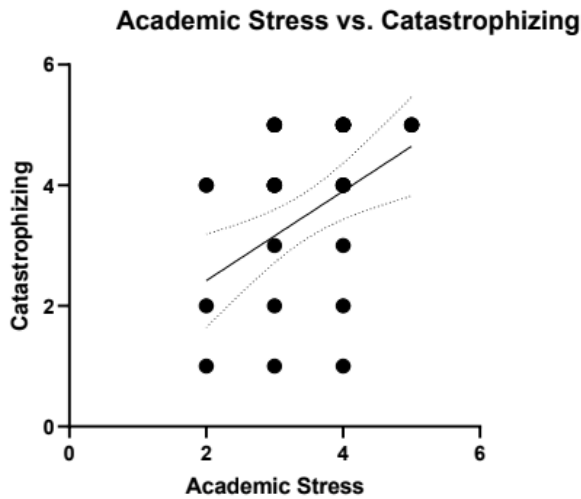


Figure 1.3: Relationship between academic stress and catastrophizing. $r = 0.4515$. $r^2 = 0.2039$. Vaswani (2021)

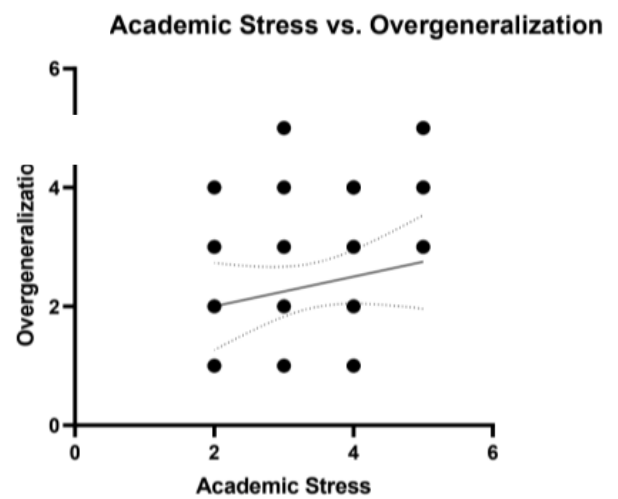


Figure 1.4: Relationship between academic stress and overgeneralization. $r = 0.1781$. $r^2 = 0.03174$. Vaswani (2021)

Relationship between Indicators of Academic Achievement & Reported Frequency of Cognitive Distortions

Figs. 2.1 and 2.2 portray the relationship between average GPA and total cognitive distortion scores in the scenarios presented. A Welch’s t-test was used to compare the mean GPAs of the two groups: 90%-100% and 70%-89% with the mean total reported cognitive distortions in achievement situations and mean total cognitive distortions in social situations. There were no significant differences between means in either group or in either situation ($p>.05$).

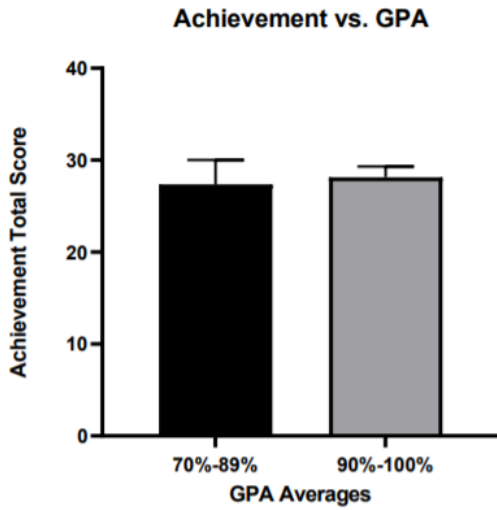


Figure 2.1: Relationship between gpa averages and achievement total cognitive distortions score. $r = -0.5412$. $r^2 = 0.2929$. Error bars = SEM (Vaswani, 2021)

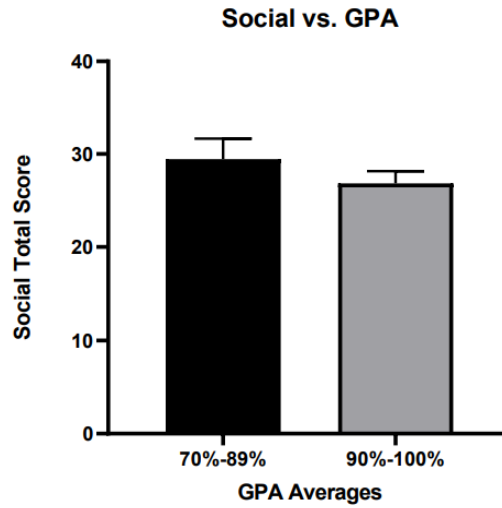


Figure 2.2: Relationship between gpa averages and social total cognitive distortions score. $r = -0.4651$. $r^2 = 0.2929$. Error bars = SEM (Vaswani, 2021)

Figs. 3.1 and 3.2 portray the relationship between the number of AP/IB courses that a student takes and total cognitive distortion scores in the scenarios presented. In achievement situations, there was no significant difference between the number of AP/IB courses a student takes and the total achievement score ($p > .05$). In addition, the decreasing slope of the simple linear regression showed that the more AP/IB courses the student enrolled in, the lower the mean total achievement scores. Although, $r = -.20$ indicated a small effect size. In social situations, there was also no significant difference between the number of AP/IB courses a student enrolled in and the total social score ($p > .05$). In addition, the decreasing slope of the simple linear regression showed that the more AP/IB courses a student takes, the lower the mean total social scores; $r = -.27$ indicated a medium effect size. In both cases, the low r^2 values indicated variability in the data.

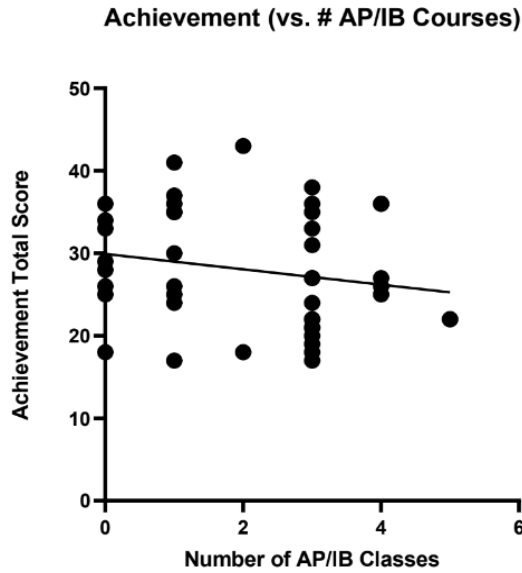


Figure 3.1: Relationship between number of AP and IB classes and total social cognitive distortions score. $r = -0.1961$. $r^2 = 0.03844$ (Vaswani, 2021)

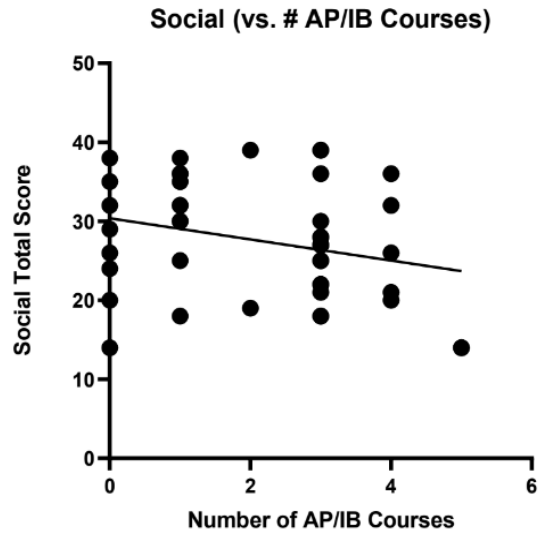


Figure 3.2: Relationship between number of AP/IB courses and total social cognitive distortions score. $r = -0.2713$. $r^2 = 0.07362$ (Vaswani, 2021)

Confounding Variables: Trends in Gender, Grade Level & Academic Stress

Figs. 4.1 and 4.2 portray the relationship between the gender of the student and total cognitive distortion scores in the scenarios presented. A Welch’s t-test was used to compare the student’s gender (male or female) with the student’s achievement and social total scores. In achievement situations, there was no significant difference between males and females and their respective achievement total scores ($p > .05$). In social situations, there was also no significant difference between males and females and their respective social total scores ($p > .05$).

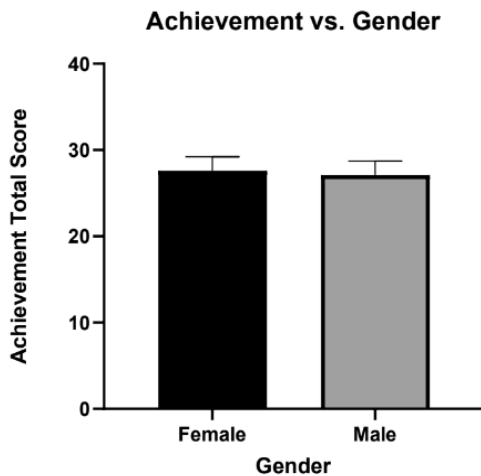


Figure 4.1: Relationship between gender and social total cognitive distortion score. T-test not significant ($p > 0.5$). Error bars = SEM. Vaswani (2021)

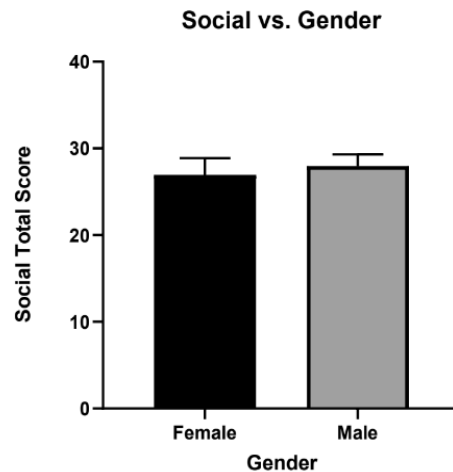


Figure 4.2: Relationship between gender and social total cognitive distortion score. T-test not significant ($p > 0.5$). Error bars = SEM. Vaswani (2021)

Figs. 5.1 and 5.2 portray the relationship between the grade level of the students and their total cognitive distortion scores in the scenarios presented. A one-way ANOVA was used to compare the student's grade level with their average achievement and social total scores. In both achievement and social scores reported, there was no significance. Although, the difference between grade level and achievement total score was approaching significance ($p = 0.08$) more than the difference between grade level and the social total score ($p = 0.09$).

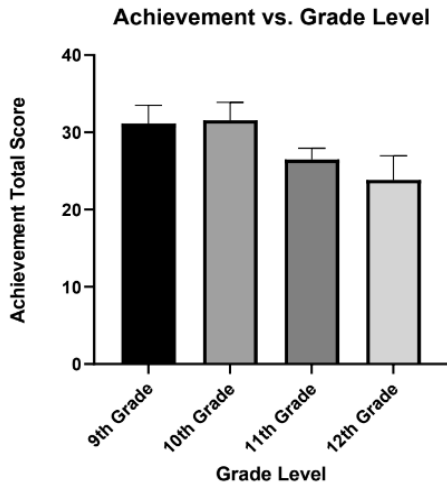


Figure 5.1: Relationship between grade level and total achievement cognitive distortion score. ANOVA not significant ($p = 0.08$). Error bars = SEM. Vaswani (2021)

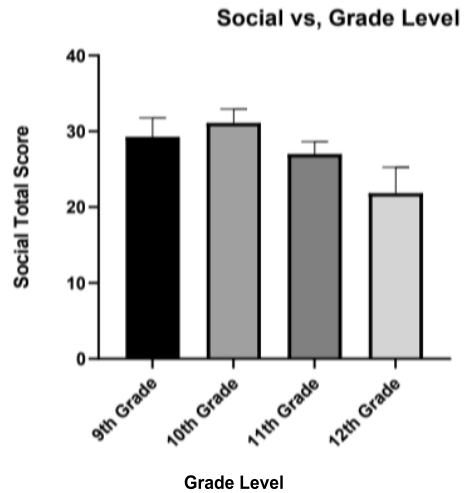


Figure 5.2: Relationship between grade level and total social cognitive distortion score. ANOVA not significant ($p = 0.09$). Error bars = SEM. Vaswani (2021)

DISCUSSION

The first hypothesis stating that high school students will experience similar patterns of cognitive distortions to the college students studied by Covin (2011) was supported because both studies reinforce that students would report that they engaged in catastrophizing most frequently in achievement situations and mindreading most frequently in social situations. Also, labeling and overgeneralization in achievement situations and all-or-nothing thinking in social situations were reported in both studies as being the lowest-rated cognitive distortions. It can be interpreted that throughout adolescence, specific cognitive distortions apply depending on the situations encountered. For example, mindreading is a cognitive distortion that causes people to think that another person is thinking negatively of them. It makes more sense for mindreading to be more frequent in social scenarios because it refers to insecure

feelings when people interact with each other rather than feelings of inadequacies when accomplishing tasks.

The second hypothesis stating that there will be a positive correlation between GPA and reported frequency of cognitive distortion, was not supported because there was no significant correlation found between the variables. In addition, the third hypothesis stating that there will be a positive correlation between the reported frequency of cognitive distortions and course level, was not supported as well because the analysis presented that there was a negative correlation between both variables. The simple linear regressions for both achievement and social situations portrayed that the more AP/IB courses the student enrolled in, the lower the mean total cognitive distortion achievement and social scores. Even though there was no significant difference, there was a small to moderate effect size indicating that further studies should be done to determine if students who select less rigorous courses experience more cognitive distortions.

Evaluation

This was the first known study to apply the Types of Thinking Scale to a high school population. It was interestingly revealed that adolescents of all ages seem to experience negative self-talk in a similar manner. However, Coban (2013) found that many college students were able to use problem solving and coping skills to avoid negative self talk and self-blame. Future research is needed to explore whether high school students are able to employ similar strategies.

In addition, the results of this study may not be generalizable to the population as a whole because opportunity sampling was employed to attract participants. Most of the participants were from a suburban town in the Northeastern United States and there was little ethnic diversity. Future research could explore the relationship between ethnic/cultural upbringing and the frequencies of cognitive distortions experienced by adolescents in achievement and social situations. Finally, due to the COVID-19 pandemic, this survey was conducted digitally and participants were unsupervised while taking the survey. In the future, interviewing participants may provide added insight into their experiences.

Implications

In conclusion, this study depicted that high school students experience similar patterns of negative self-talk as college students. This is a major finding because if these patterns are identified sooner, adolescents could learn problem solving and coping mechanisms at an earlier age. Further research could help support the mental well beings of adolescents. In addition, less achievement focused students who enroll in less rigorous courses seem to experience cognitive distortions in both achievement

and social situations at a higher rate than more academically oriented students. More care needs to be taken in order to focus on the mental health and well being of this population of high school students.

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