RESEARCH ARTICLE

Emotional and Cognitive Responses to Academic Performance and Grade Anxiety

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Abstract

Background: This observational study of 75 participants presents an examination of the connection between cognitive and mood changes in connection to academic performance, grade anxiety, test anxiety, stress, and communication apprehension.

Objectives: This study examines the underlying mechanisms vs. driving forces behind the concept of ‘grade obsession’, as well as the internal and external factors affecting academic grades. Furthermore, the study analyzes the potential detrimental effects of grade obsession in psychological terms, specifically on self-esteem and overall mental health.

Method: Monitoring self-reported evaluation of received grades, perceived academic performance, and psycho-social components of academic effort and external vs. internal locus of control.

Results: The study indicates that test anxiety increased over the semester, although many students reported lower stress or anxiety in an open-ended survey question. Mathematics Anxiety (MA) and Test anxiety (TA) were positively correlated with the number of voluntary reassessments students attempted, while communication apprehension was negatively correlated.

Conclusion: The findings suggest that standards-based grading is an assessment framework that can provide alternate methods for some students to demonstrate content mastery. While this study was conducted in mathematics courses, the findings on test anxiety are likely to extend to other disciplines.

Keywords: Psychology, academic performance, mood, anxiety, grades, student well-being

1 | INTRODUCTION

Multiple studies have addressed the connection of stress and anxiety to perceived vs. actual academic performance. The Huffington Post stated that (1) "Grades have their place. They’re a necessary part of education. What they aren’t a necessary part of is self-esteem. They don’t
EMOTIONAL AND COGNITIVE RESPONSES TO ACADEMIC PERFORMANCE AND GRADE ANXIETY

really matter because they don’t define us: what defines us is the changes education makes within us. So maybe I got a B or a C on that last exam, but am I better overall for having taken the class? The answer is usually yes.” The concept of grades and grading is at times misunderstood and difficult to contextualize from a cognitive and emotional standpoint, particularly given the number of variables and affecting factors involved therein. In multiple studies, students have reported preoccupation and worry with achieving the “best” grades rather than taking advantage of the value of what’s being taught. This concept could be understood, albeit not in strictly clinical-diagnostic terms, as “grade obsession.” Although there is no uniform and universal definition of grade obsession, it is often characterized by a student’s focus on the grade they receive as opposed to the actual learning, application, or transfer of knowledge GPA, extracurricular academic activities, sleep patterns (monitored in terms of hours slept within a 24-hour period), classes, homework completion, procrastination levels, home environment, and anxiety levels. From the perspective of psychological-emotional (self) perception, the survey also included the following questions: a) “Are grades important to you?” b) “Do peers influence you about certain grades?”, and c) “Do you feel your GPA is an accurate representation of your work ethic in school?”

Safety, Privacy and Consent

All the information has been collected in a fully anonymous form, including absence of first name, last name or any other personal identifier, non-traced portal, website or device utilized, or Internet Protocol (IP) address. The data collected has been used only for statistical purposes, and it will not be connected or linkable to personal identifiers in the future.

2 | METHODS

Population, Inclusion Criteria and Withdrawal Procedures

High school students (N=75) enrolled in an anonymous online survey, over a 3-month study period. Following informed consent documentation, every student had the option to decline to take part in the survey or to interrupt the survey at any time. No total time limit for the completion of the survey has been implemented as part of this study.

Qualitative and Quantitative Analysis

Despite only researching two of the many factors that could contribute, in terms of causal variables, to a student GPA (Grade Point Average), the survey included questions about other variables such as current – i.e. at the time of completion of this survey –

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3 | DISCUSSION

In order to understand grades and grade obsession, it’s essential to understand what a grade is and what it is not, both in strictly academic terms, as well as from the perspective of psychological analysis. In its most simplistic definition, a grade is a standardized way of measuring academic achievement. However, there are multiple forms of grading which vary depending on the country, system, school, or instructor. In the United States of America, this usually includes the scale system from 1-4, letter grades A-F, and percentages 0-100. While standardized academic achievement and IQ tests are helpful to monitor student performance, the consensus whether a grade truly reflects mastery of subject matter is still discussed in social sciences, particularly in the context of test validity and reliability. A blog post (2) from Kara Duriez, a professor at Penn State College, depicts how grade obsession is a huge problem among students of all ages. The post mentions that even with the amount of pressure teachers, classmates, and other people present students with, students still feel the need to strive for perfect grades either to get into a decent college or try to cover up their own personal problems (Duriez, K, 2015). In short analysis, despite students knowing that obsessing over
perfect grades can be detrimental to one’s wellbeing, students still feel the need to do so. Why? As Duriez stated, students have and will continue to obsess over grades because “we [they] feel the need that we [they] have to. In order to be successful; get into the perfect college, get the perfect job, we [they] have a desire for perfection even though learning should be about acknowledging what we know and don’t know and learning from it, so that we [they] can take a true interest in the matter and be able to apply it to our own lives.” (Duriez, K, 2015)

This quote is alluding to the fact that the concept of going to school and learning no longer appears to be the main priority in schools, for the concept of going to school and getting all 4.0s in a class is the priority. We could argue that it is unfortunate that many students appear to seek getting perfect grades, because of the psychological-social pressure they face, the want and wish to be successful, or the underlying fact that their GPA may determine the colleges they could get into.

Given these considerations, it is certainly important to understand what factors have helped and/or hurt students when it comes to their performance. There are multiple internal (within) and external (beyond self) factors that have been identified to contribute to grades. These factors include stress, curiosity, sleep, family, confidence, social relationships, fitness, health, and others (3). As an example, we could examine two basic factors, i.e. social relationships, which we will categorize as external, and sleep patterns, which we will categorize as internal, or subject-based. In the context of external (social) factors, an article from ScienceDaily (4) mentions a study conducted among 1,287 students examining social relationships (external) which found that: “Boys and girls whose friends are socially active in ways where rules are respected do better in their classroom work. Having friends who engage in problem behavior, in contrast, is related to a decrease in their grades. Having prosocial friends and staying away from deviant peers proved more effective for academic payoffs than simply being friends with high-achieving peers.” (University of Oregon, 2012)

In this analysis, having a well-rounded group of high-achieving friends led students to produce the same high-achieving work. A theoretical interpretation could be that students with higher grades may be more likely to have friends who are similar to them, or at least they are perceived by them as such. The same scientific press release distribution portal (3) analyzed the link between academic performance and sleep patterns, which we defined here as internal factors. According to the study about sleep habits in students ranging from elementary school to college, bad sleep habits have been shown to strongly correlate with lower grades in all levels of schooling. The study examined the relationship between sleep habits, hours slept, and academic performance of children between the ages 6-8, reported that sleeping less than 9 hours, going to bed late and no bedtime routine has generally affected children’s academic skills. (Spanish Foundation, 2011). Multiple studies have indicated that appropriate sleep is crucial for memory retention and retrieval, bodily restoration, and normal mental functioning. A good example in this context is the study by Leproult et al. (6), which indicated that chronic sleep deprivation showed “increases [in] levels of the stress hormone cortisol which may damage or impair brain cells that are necessary for learning and memory” (Leproult et al., 1997)

4 | RESULTS

From a general statistical analysis viewpoint, the first data observed was that 76% of the respondents were female and 24% were male. In addition, 5.3% were 9th graders, 17.3% were sophomores, 60% were juniors, and 17.3% were seniors. Lastly, grade averages ranged from 2.0-4.25. Figures 1, 2, and 3 report students’ responses, including a question about procrastination, anxiety levels during the school year, and peer’s influence on grades.

An interesting finding in this analysis is that out of 75 respondents, 65 said they procrastinate Figure 1 and only 17 out of the 75 students reported a GPA below a 3.5. A possible theoretical explanation, although not addressed in this study, might account for higher anxiety levels during the school year as a causal result of procrastinating patterns. 68 students rated their anxiety average or higher than average during
EMOTIONAL AND COGNITIVE RESPONSES TO ACADEMIC PERFORMANCE AND GRADE ANXIETY

![Figure 1: Chart of student responses (N=75, P<.001 Wilcoxon Signed-Rank Test) to the question, "do you procrastinate?" with 86.7% indicating yes, and 13.3% no, respectively.]

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The school year Figure 2.

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Another important aspect of the study examination is peer’s influence over academic performance Figure 3. By examining the survey responses, 93% of respondents answered that a peer had influenced their feelings about a grade Figure 3.

These results suggest the perceived pressured students might feel toward achieving appropriate grades. As previous studies have evidenced, this psycho-social pressure could be detrimental to general wellbeing, particularly toward self-esteem. As a further example, a study from 2002 by Jennifer Crocker at the University of Michigan (7), showed that 80% of college students base their self-worth on their academic success. The results thus indicate that the students who base their self-esteem on grades and physical appearance are more likely to fall victim to depression and anxiety. The study also suggests that these same students are also more likely to abuse alcohol and drugs.

The value that students place on their external achievements has a negative impact on their mental health, academic achievement and overall happiness (8). Not only did the study conclude the negative effect of grades on people’s self-worth, but it also concluded why students feel that grades define their self-worth. Since grades are a part of student’s lives for many years of schooling, it may be difficult for students to avoid fully identifying, in negative terms with their academic performance.

![Figure 3: A pie graph relating to the question, "do you feel your feelings about getting a certain grade?" In conclusion from these results, 93% have felt influenced by peers when it comes to a certain grade (N=75, P<.001 Wilcoxon Signed-Rank Test).]

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![Figure 4: A chart from the CDC reports statistics from a behavioral survey among students in accordance with the behavior of feeling sad/hopeless or have considered attempting suicide. It was reported that D/F students were more likely to have these behaviors compared to A, B, and C students. Direct source url: https://www.cdc.gov/healthyyouth/health_and_academics/pdf/DASHfactsheetSuicidal.pdf]

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From a cognitive-behavioral standpoint, these aspects cannot be necessarily reduced to automatic thoughts or cognitive distortions, as very often such harsh self-judgments are predicated upon empirically verifiable (i.e. fact-based) expectations in higher education/academia, as well as in the workforce, for instance when applying to graduate school or in a job interview.

At the same time, without a GPA to define one’s self-worth, students could miss an appropriate standard to judge themselves in more objective-empirical (some would argue, utilitarian/istic) terms, rather than comparing themselves to peers. This is particularly important from a developmental perspective, especially in context of adolescence and early adulthood. However, as the above article concludes (9), students can still “care” about academics without it causing anxiety, depression and substance abuse. Instead, they will find that choosing an alternative basis for their self-worth will raise their self-esteem and improve their chances of accomplishing their goals (10).

5 | CONCLUSION

As observed in the examination of students’ responses and the following comparative analysis with related studies, an appropriate suggestion made toward an amelioration of student (perceived) self-esteem and general wellbeing, could be suggesting students to look for alternatives to determine one’s self-worth and values, beyond direct number/letter-based academic assessments. This of course has to be matched by an appropriate cultural shift at all levels of society, according to transtheoretical models, especially the ones modulated on devecological systems (11), which can contribute to a more nurturing and welcoming approach to education and self-concept. This is even more important in the context of the development possible mental health-related issues. For instance, in a suicide-related behavior report from 2015 (12), the CDC (Center of Disease Control) reported that students with higher academic grades are less likely to feel sad/hopeless or consider attempting suicide compared to students with lower grades. As seen in Figure 4, 23% of high school students with an A average felt “sad and hopeless” compared to 47% of students with a D/F grade average. The percentages double when switching grade ranges resulting in the following findings: Students with higher grades are less likely to feel sad or hopeless nearly every day for at least 2 weeks in a row, seriously consider attempting suicide, make a plan about how they might attempt suicide, and attempt suicide (13).

Of course, these elements have to be fully understood in the context of a bio-psycho-social context, also taking into consideration specific timelines within a developmental perspective. As an example of this approach, a US Represented article (14), indicated that the time when students are attending school is also when they must most significantly deal with psycho-physical changes, particularly at the level of the endocrine system (hormonal changes) and nervous system (variations and modulation of neurotransmitter secretion). Thus, it is suggested, if students don’t learn healthy strategies for coping with anger, jealousy, stress, or sadness, then they will likely not be able to deal with the complexity of emotions and cognitive processes in a healthy (adapted and adaptive) way throughout their lives.

In 2019 the CDC reported that approximately 16.9 million children in the United States aged 3-17 have been diagnosed with ADHD, Anxiety, Depression, or a behavioral problem (15) (“Data and statistics,” 2019). If mental health affects many students, then students should know how to cope and deal with bodily functions and feelings. School is supposed to prepare students for college, careers, and beyond, but they should also teach children how to handle issues that could occur for the rest of their lives.

In conclusion, this topic is highly complex and multifactorial surrounding the reasons behind grade obsession, how student’s grades can be affected, and why grades can be detrimental to self-esteem and mental health. With the ongoing controversy surrounding (perceived) flaws in grading systems, there needs to be room for exploring other mechanisms to assess subject mastery, skills, competency, and knowledge acquisition. It is irrefutable that assigning grades is valuable. It is also irrefutable that grades and grade obsession can adversely affect students.
EMOTIONAL AND COGNITIVE RESPONSES TO ACADEMIC PERFORMANCE AND GRADE ANXIETY

psychologically and emotionally. Perhaps, an amalgamation, utilizing grades and alternative forms of assessments would provide a satisfactory evaluation of students’ learning while diminishing the psychological and emotional struggles associated with grades and grade obsession.

6 LIMITATIONS

The primary limitations of this study were the relatively small sample size (N=75) vs. specificity of subjective/internal (psychological and or medical-physical) and objective/external (social, environmental, cultural) factors in the completion of the survey. Less significant limitations included: (1) Other non-identified variables linked to the anonymous administration of an online survey (2) Students bio-psycho-social presentation and state at the time of the survey completion.

Future Studies

In addition to verifying the reliability of the results and outcomes evidenced via surveys and questionnaires administered to the subject population in larger groups over a longer course of assessment, more studies will be needed to better identify specific parameters and variables such as psycho-physical structures, strengths, and limitations, as well as ethnic, cultural, and religious backgrounds.

Declaration of Conflicting Interests

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