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The Real Cost of a College Education

MARISSA MORGANELLI

Introduction

Increasing college costs are contributing to a myriad of deleterious issues for college students. Of the top five stressors experienced by college students, four are related to financial stress (Heckman, Lim, & Montalto, 2014). The financial learning curve associated with managing a budget while striving to meet educational goals (Britt, Mendiola, Schink, Tibbetts, & Jones, 2016) can be overwhelming in the best of circumstances. Yet, a college education, on average, leads to nearly twice as much in annual income. According to the 2005 census, members of the workforce who had completed a bachelor’s degree earned an average salary of $51,206 per year, while workers with only a high school diploma earned an average of $27,915 per year (Joo et al., 2008). But this comes at a cost. Over the 11 year period leading up to 2006, the cost of tuition and fees had risen more rapidly than both average family income and economic inflation (Joo, Durband, & Grable, 2008). Given the ever-increasing cost of a college education, practical considerations may make the completion of a degree impossible, creating the following no-win situation: according to Bousquet (2008) & Britt et al. (2016), in order for a student to be able to pay the average public college tuition fee, he or she must work at least 55 hours per week, but students working more than 20 hours per week are at a greater risk of dropping out of college (Joo et al., 2008).

Students with insufficient means to afford a college education not only work, but also take out loans. Students are relying on loans more frequently now than in previous generations as a means to finish their education (Heckman et al., 2014). By the mid-2015, the average amount of student loan debt climbed higher than ever before, reaching approximately $35,051 per college student. Nearly 70% of graduating students were found to be carrying some level of debt. Despite their education, new college graduates are struggling to pay off these debts due to a decline in their average income, causing one in four of these graduates to be behind in their payments or to default on their student loans entirely (Robb, 2017). Thus, the increased financial pressure students feel is partly fueled by the growing debt that students accumulate.

1.1 Financial Burden and Physical, Mental, and Social-Emotional Health

Financial stress on present-day college students has an adverse impact on nearly every domain of their lives. Poor physical health, depression, and anxiety are associated with greater financial stress (Heckman et al., 2014). Self-reports show that college students under financial stress experience below average physical health as well as more psychological issues and a greater need to access mental health resources (Britt et al., 2016). Underscoring the negative impact of college debt is the finding that the relationship between financial stress and poor mental health is observed at an even higher rate for seniors as opposed to underclassmen. (Guo, Wang, Johnson, & Diaz, 2011).

Students under great financial stress are also not participating in school events and activities as frequently as their less-stressed peers, affecting their ability to integrate into their campus community (Adams, Meyers, & Beidas, 2016). Emotional well-being is also impacted as many of these students have reported participating in unhealthy coping behaviors (Britt et al., 2016), have lower levels of satisfaction in areas of their lives that are connected with self-esteem (Joo et al., 2008), and report higher level of dissatisfaction with interpersonal relationships (Britt et al., 2016).

1.2 Financial Burden, Academic Achievement, and Retention

It has become more financially difficult to be an unemployed full-time student considering the dramatic increase in cost of attending. Most students need to dedicate at least part
of their week to earning income in order to cover college costs. Between 2003 and 2004, more than three-fourths of college students earned some sort of income and approximately one-fourth of students were working full-time hours (Joo et al., 2008).

The number of hours that students are working obviously takes away from the number of hours they are available to complete coursework. College students experiencing financial stress display lower levels of academic performance and increased difficulty in completing degree requirements (Heckman et al., 2014). Due to time constraints, this may cause them to enroll in fewer courses than average per semester which exacerbates the issue by slowing the pace at which they are able to complete their degree requirements (Joo et al., 2008).

In addition to these academic struggles, college students experiencing high financial stress often report that they have considered withdrawing from school (Britt et al., 2016). Some students may need to earn an income to remain enrolled, but employment often interferes with student success and can influence drop-out rates. Students who are employed are, on average, working nearly 30 hours per week. Research indicates that students working more than 20 hours per week are at a greater risk of attrition (Joo et al., 2008). Roughly one-half of students who start a college program do not complete it in a traditional time frame. About 15% of these students drop out of college and only one-third of those who drop out never re-enroll. Students who drop out often cite the inability to cope with stress as a significant factor involved in their decision (Joo et al., 2008).

When students experience significant financial burden, cognitive attention otherwise allocated for academic pursuits shifts into managing financial stress instead. Success in academics is in part based on fluid components of cognition including overlapping aspects of executive function and working memory (Best et al., 2011; Lawson et al., 2017; Borragán et al., 2017). Simple reaction time tests can be indicative of performance on generalized intelligence tests as well as more complex cognitive processes (Deary et al., 2001; Jakobsen et al, 2011). In this study, we used a reaction time measure as an indicator of overall cognitive function.

A study by Van Biesen, McCulloch, Janssens, and Vanlandewijck (2017) explored the relationship between reaction time and general intelligence. Response times of participants diagnosed with mild to moderate intellectual impairment (II), meaning they possessed an IQ between 40 and 75, were measured in response to a single visual stimulus. The comparison group data were taken from participants of average intelligence that had completed their secondary education and were enrolled in higher education using the same method for response time as the II group. Simple reaction times of the II group were found to be significantly slower than the response times of the comparison group, establishing a moderate negative correlation between IQ, as a measure of intelligence, and reaction time (Van Biesen et al., 2017). According to another study done by Taskin (2016), a significant correlation was found between reaction times and academic achievement. Participants with lower levels of academic achievement, as represented by grades, had longer reaction times in response to both visual and auditory stimuli while students who fell within the highest bracket of academic achievement had faster reaction times in response to the same stimuli. These correlations were consistent regardless of whether the participant was using their right or left hand (Taskin, 2016).

It may be assumed that students who receive financial aid have less financial worry because they are not paying out-of-pocket at the same rate as those who do not receive financial aid. However, this misses the point regarding its necessity. Simply put, students who receive financial aid would be unable to attend college without it. In this study we use financial aid as proxy for financial burden. Nationally, students who may need aid complete a Free Application for Federal Student Aid (FAFSA). A complex formula incorporating an expected family contribution (EFC), among other numbers, is then calculated to derive the level of legal federally funded financial aid a student receives. The EFC calculation includes an allowance for the cost of living, and, for 2017-2018, for a family of 4, the so-called income protection allowance was determined to be $28,170.
which makes it about $3,000 higher than the current poverty level for a family of four. It is worth noting that the living wage calculator published by MIT (http://livingwage.mit.edu/counties/25023) shows that a family of four living in Plymouth County, MA, requires a net, not gross, annual income of $56,368 to cover annual basic cost of living expenses. The number changes annually, so using financial aid, rather than household income or another number, provides a window into the financial burden experienced by the student.

Given these findings, we hypothesized that students at a public university in Massachusetts, which has one of the highest costs of living—ranking as the 4th most expensive state to live (https://www.usnews.com/news/best-states/rankings/opportunity/affordability)—would acutely experience the relationship between financial burden and negative outcomes. A second novel component of this work was to assess physiological measures of stress and determine whether they were related to financial burden.

Method

Design

Several measures were used to operationalize “stress” levels in college students. We collected both physiological and self-report data. A blood pressure cuff was used to measure both pulse and blood pressure as physiological measures of stress. The other measure was a self-report survey, the Perceived Stress Survey, or PSS (Cohen, Kamarck, & Mermelstein, 1983). To determine if personality impacts stress, we administered the Ten-Item Personality Inventory (TIPI) and acquired scores for the Big Five personality domains; extraversion, agreeableness, conscientiousness, emotional stability, and openness to new experiences (Boston, Homola, Sinclair, Torres, & Tucker, 2014). To address financial burden, we designed a demographic questionnaire regarding educational and financial circumstances. In this questionnaire, we also included questions regarding college life and coping strategies. Finally, reaction time to an auditory stimulus was used as a correlate of academic performance.

Participants

Participants were college students enrolled in a Research Methods for Psychology course during the Spring 2018 semester. Students participated in these procedures during class time throughout the semester. This work did not require IRB approval because it is an in-class study involving students in the course. Furthermore, all students were required to complete the online NIH ethics training as a course requirement: https://phrp.nihtraining.com/users/login.php. There were 16 participants, all of whom were female. Data was collected and immediately coded. All identifying information was removed from participant files which were kept in a locked cabinet in a locked room.

Materials and Apparatus

The blood pressure cuff is a device used to measure both the participants’ pulse and systolic and diastolic blood pressure values.

The PSS is a 10-item self-report survey consisting of questions regarding emotion such as “how often have you felt stressed” or “how often have you felt confident to handle things.” All questions begin with “In the last month.” The PSS uses a Likert 0-4 rating scale. The published norm for 18-29 year-olds is X=14.2, +/- 6.2 (Cohen et al., 1983).

The TIPI evaluates participants on five major personality traits using two question items per trait. The personality traits that the TIPI scores for are extraversion, agreeableness, conscientiousness, emotional stability, and openness to experiences. Participants rank themselves on a 1-7 Likert-type scale, with 1 representing “Disagree Strongly” and 7 representing “Agree Strongly” (Boston, Homola, Sinclair, Torres, & Tucker, 2014).

We compiled a questionnaire that asked participants to provide information about their education, finances, and health. The questions surveyed participants about number of hours
worked per week, student loans, and other methods for funding their education, as well as college habits.

The Biopac Physiological System measures reaction times of the participant in response to an auditory stimulus. The Biopac Physiological System requires a set of headphones through which auditory stimuli are presented as well as a pushbutton hand switch which is used by the participants to respond, all of which is connected to a computer that both administers the trials and collects the data (BIOPAC Systems Inc., Goleta, CA). Four data points were derived for auditory testing. Each data point corresponded to a different condition: dominant hand, non-dominant hand, fixed interval, random interval. Each condition consisted of ten trials. An average was then derived, yielding one data point for each condition.

**Procedure**

The demographic questionnaire, the PSS, and the TIPI were distributed and administered during class time. Upon completion, the demographic questionnaire, the PSS, and the TIPI surveys were placed in individual participant folders. Folders were then stored in a locked room until analysis.

The physiological data, including blood pressure, pulse, and reaction time were conducted in separate testing rooms.

Reaction time tests involved a response to an auditory stimulus. Briefly, (more detail can be found at BSL PRO Lesson H11, https://www.biopac.com/curriculum/l11-reaction-time-i-auditory-stimulus/) participants entered a testing room, placed headphones on, and sat in a chair facing away from the computer. A push button hand switch (MP3X/45, Biopac Systems Inc, Goleta, CA) was first placed in the participant’s dominant hand and the participant was given the following instruction: “First, we will make sure everything is working. You will hear a click. When you hear it, please press the button.” This was done to provide individual baseline calibration.

If the participant understood and followed these directions, the experimenter could verify this from the calibration spike on the computer screen. Once calibration was verified, the experimental session commenced. Each series of trials began with the participant’s dominant hand; the auditory stimulus was presented at fixed intervals, every 4 seconds. Following the first set of 10 trials, an average reaction time for that condition was derived. Next, the auditory stimulus was presented at random intervals, ranging from 1 to 10 seconds between presentations for ten trials, after which an average was derived for that condition. Upon the completion of dominant hand testing, the participants completed a third and fourth series of trials in their non-dominant hands at fixed and random intervals, just as described for their dominant hand. This order was the same for all participants.

Upon completion of testing, data were entered into SPSS and analyzed for correlations via Pearson’s r. Correlations were considered significant at the 0.05 level.

**Results**

Descriptive statistics for psychological and physiological stress are listed in Table 1. As expected, we found several important findings regarding physiological and psychological measures of stress and variables indicating financial burden. Please see Table 2. There is a strong positive correlation between taking out loans and systolic blood pressure, $r = 0.557, p < 0.05$. Diastolic blood pressure is also strongly and positively correlated with receiving financial aid and scholarships, $r = 0.597, p < 0.05$. When considering financial burden and psychological stress, a strong positive correlation between if a student relied on financial aid or scholarships and their PSS score is observed: $r = 0.539, p < 0.05$. Students who relied on financial aid and scholarships to fund their education self-reported higher scores for perceived stress on the PSS.
Table 1

Descriptive Statistics: Mean and Standard Deviations for Pulse, Blood Pressure, and PSS

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse</td>
<td>86.0</td>
<td>10.23</td>
</tr>
<tr>
<td>Systolic Blood Pressure</td>
<td>117.4</td>
<td>9.52</td>
</tr>
<tr>
<td>Diastolic Blood Pressure</td>
<td>71.4</td>
<td>7.22</td>
</tr>
<tr>
<td>PSS</td>
<td>21.8</td>
<td>5.32</td>
</tr>
</tbody>
</table>

Reaction time to an auditory stimulus was used as an indicator of cognitive load and academic performance. Please see Table 3. A strong positive correlation was observed between receiving financial aid and scholarships and the reaction time in the participants’ dominant at fixed intervals, r = 0.538, p < 0.05. There was also a strong positive correlation between receiving financial aid and scholarships and the reaction time in the participants’ non-dominant at random intervals, r = 0.555, p < 0.05. Students who rely on financial aid and scholarships displayed slower reaction times to the auditory stimulus, which may indicate an increased cognitive load and decreased academic performance abilities.

Additional correlations associate financial stress with negative indicators of overall health. Please see Table 4. There is a strong positive correlation between the number of hours per week a student is working and alcohol use, r = 0.581, p < 0.05. This correlation associates an increase in the number of work hours per week with an increase in the number of nights per week that students are consuming alcoholic beverages. In addition to the increase in negative health behaviors, we also noted a decrease in positive health behaviors. There was a strong negative correlation between the number of work hours per week and hours of exercise per week, r = -0.586, p < 0.05. As students are working more hours per week, they are also spending less time exercising. In addition, the number of hours worked per week was negatively associated with Emotional Stability as measured via the TIPI, r = -0.624, p < 0.05.

Table 2

Correlations between Stress and Financial Burden

<table>
<thead>
<tr>
<th>Stress Measures</th>
<th>Financial Measures</th>
<th>R value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSS</td>
<td>Financial Aid, Scholarship</td>
<td>0.539</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Systolic Blood Pressure</td>
<td>Having Loans</td>
<td>0.557</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Diastolic Blood Pressure</td>
<td>Financial Aid, Scholarships</td>
<td>0.597</td>
<td>p &lt; 0.05</td>
</tr>
</tbody>
</table>

Discussion

Through this study, we were able to establish several significant relationships between financial burden, stress, and other lifestyle factors. Our study replicates findings in regard to financial burden and stress, but additionally we show physiological measures of stress are also linked to financial burden. Further on a measure of cognitive load, we see that financial burden diminishes performance on two reaction time tests. Given the low number of participants, the relatively strong correlations, as conventionally accepted according to Cohen (Cohen et al., 1983), is noteworthy and concerning.

Our study replicates and extends findings showing the negative impact of financial burden on college students’ physical and mental health and academic performance. Financial factors not only correlate with a self-report measure of stress, the PSS, but also correlate with higher systolic and diastolic blood pressure highlighting the how financial burden impacts both mental and physical stress. Given that the financial burden, in terms of college debt, does not disappear after graduation, it is plausible that continued financial burden will lead to continued elevated blood
Table 3

Relationship between Stress and Reaction Time as an Indicator of Academic Performance

<table>
<thead>
<tr>
<th>Financial Burden</th>
<th>Indicators of Academic Performance</th>
<th>R value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Aid, Scholarship</td>
<td>RXN2DFI</td>
<td>0.538</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Financial Aid, Scholarship</td>
<td>RXN3NDRI</td>
<td>0.555</td>
<td>p &lt; 0.05</td>
</tr>
</tbody>
</table>

Table 4

Number of Hours Worked per Week Significantly Impacts Indicators of Overall Health

<table>
<thead>
<tr>
<th>Financial Burden</th>
<th>Indicators of Overall Health</th>
<th>R value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Hours Worked Per Week</td>
<td>Alcohol Use</td>
<td>0.581</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Number of Hours Worked Per Week</td>
<td>Hours of Exercise</td>
<td>-0.586</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Number of Hours Worked Per Week</td>
<td>Emotional Stability</td>
<td>-0.624</td>
<td>p &lt; 0.05</td>
</tr>
</tbody>
</table>

pressure, contributing to long-term health problems.

Negative physical health outcomes are not alone in their ability to have long-term effects on students. A decrease in academic performance due to an increased cognitive load could diminish a student’s academic achievements by prolonging their degree completion, lowering their grades, or even causing them to drop out of college entirely. Level of education completed will affect their income in the future and time lost to prolonged degree completion is also income lost for that individual. This contributes to the seemingly unbreakable cycle of losing income due to lack of education and not being able to complete educational goals due to lack of sufficient income.

Exacerbating the relationship between financial burden and stress are poor coping strategies. Students who work more tend to drink more and exercise less than students who are not working. If time were the only limiting factor we would expect to see a decrease in both time spent exercising as well as time spent drinking, but that is not the case. Instead the stress of financial burden leads to poor coping choices.

Overall, we find that the stress caused by financial burden can be measured in terms of perceived mental stress via the PSS, physical stress in terms of increased blood pressure. Financial burden lends itself to both the necessity of working to supplement college – and while surely some work is healthy, we do see a positive correlation between number of hours worked and poor coping strategies. These can contribute individually or synergistically to diminished academic performance, putting students at greater risk of attrition. Diminished academic performance and more time spent working, in turn, increase stress. Please see Figure 1 for a conceptual diagram.

By sharing our findings, we are hoping to draw attention to the need for financial education and intervention for college students. In order to prevent or decrease the impact of these negative outcomes, students need an outlet through which they can manage their stress caused by financial burden. Doing so should equip students with real-time strategies to assist while in college, but also help with managing college debt long after graduation. We suggest implementing financial awareness programming.
that is staged throughout the college experience and occurs in collaboration with alumni who have expertise in this area, the Financial Services Office and faculty from economics and business. With the assistance of such interventions students may see increased success in academic performance and better physical and mental health statuses as they learn how to manage their financial stress.

Acknowledgements

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References


About the Author

Marissa Morganelli is a graduating senior double majoring in Communication Sciences & Disorders and Psychology. Her research was mentored by Dr. Sharon Ramos Goyette (Psychology). Marissa presented this paper at the 2018 New England Undergraduate Sociological Research Conference (NEUSRC) and the 2018 Student Arts & Research Symposium (StARS), both held at Bridgewater State University. After graduation, Marissa hopes to gain employment in a setting that will allow her to further explore her interest in neurological rehabilitation.