INVESTIGATING THE RELATIONSHIP BETWEEN STUDENT LOAN DEBT AND EMOTIONAL WELL-BEING

A Thesis

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Master of Science in Applied Economics and Management

by

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ABSTRACT

This research investigated the relationship between emotional metrics and student debt, particularly examining racial disparities. The findings showed that frequent happiness (1-3 times weekly) among Black individuals significantly lowered student debt levels. We also find that increasing confidence among Black individuals was associated with lower student debt. Additionally, we find that while individuals who worried about money had more student debt, this did not differ by race. However, Black individuals who worried about future jobs had higher student debt. No associations were observed between other emotional measures like interest, satisfaction, or discouragement about the future and their relationship with student debt. These findings highlight the importance of considering emotions in understanding student debt disparities. Further research is needed to develop interventions promoting financial well-being and addressing racial inequalities in student debt.

BIOGRAPHICAL SKETCH

Darien Kearney is a native of Houston, Texas. He holds a Bachelor of Business Administration in Finance and Banking Services (double major) and a Master of Business Administration in Finance from Sam Houston State University. While at Sam Houston State University, he was part of the student leadership boards for the National Association of Black Accountants (NABA) and the Beta Alpha Psi National Honor Society (Kappa Mu Chapter), where he helped develop fundraising opportunities to increase chapter revenue.

Additionally, he holds a Master of Science degree in Applied Psychology from the University of Southern California, where he studied consumer behavior and conducted a study on the behavior of Meme Stock investors. Currently, he is earning his Master of Science degree in Applied Economics from Cornell University, where his thesis focuses on the relationship between student loan debt and emotional well-being.

To: Mom, Dad, Brooke, Dustin, David, Deklen, and Ireland

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LIST OF ABBREVIATIONS

- *CFR – Council on Foreign Relations*
- *OLS – Ordinary Least Squares*
- *NLSY – National Longitudinal Survey of Youth - 1997*
- *IPEDS – The Integrated Postsecondary Education Data System*
- *HBCU – Historically Black Colleges and Universities*
- *NCES – National Center for Education Statistics*
- *NPSAS – The National Postsecondary Student Aid Study*
- *NSLDS – National Student Loan Data System*
- *NSFWS – National Student Financial Wellness Study*
- *SIPP – Survey of Income and Program Participation*
- *PSID – Panel Study of Income Dynamics*
- *IRA – Individual Retirement Account*

LIST OF SYMBOLS

- ϒ – *upsilon*
- *α* – *alpha*
- β – *beta*
- ς – *sigma*
- θ – *theta*
- λ – *lambda*
- ω – *omega*
- ε – *epsilon*

Introduction

Significant increases in student debt over the last two decades have raised concerns among academics about the factors contributing to the growth of student debt and its impact on students (Jedrych et al., 2022). ***Figures 1-3***[1] show this increase in student debt from 2005 – 2019. These concerns center on the rising costs of secondary education outpacing alternative forms of student aid (i.e., grants, scholarships, family network, employer tuition assistance) aside from student debt (Jedrych et al., 2022). Indeed, the share of education costs that Pell grants cover has significantly eroded since 1975 wherein they covered about 80 percent of attendance costs, down to 29 percent in 2016 (Protopsaltis & Parrott, 2017). As ***Figure 4***[2] shows, attendance costs covered by the Pell Grant have been hovering around 20 percent since 2005, while ***Figure 5*** shows the growth of attendance costs over time relative to the maximum Pell Grant. These two graphs emphasize that rising education costs have eroded the effect of Pell Grants since their inception and have made it more challenging for students to leave school with manageable debt levels.

[1] College Board and Institute for College Access & Success. (2023). Average financial aid amount per full-time equivalent (FTE) undergraduate student in the United States from 2001/2002 to 2021/2022 and average cost to attend university per year in the United States from the academic year 2000/01 to 2018/19 (in 2021 U.S. dollars) [Graph]. Average cost to attend university per year (when studying in-state and living on campus) in the United States. Total cost includes room and board, tuition and fees, books and supplies, personal and other transportation costs. Data retrieve does not parse between institution type (i.e., public, private, for profit). In Statista. Retrieved April 14, 2023, from https://www-statista-com.proxy.library.cornell.edu/statistics/784299/average-financial-aid-per-full-time-undergraduate-students-by-source-us/ and https://www-statista-com.proxy.library.cornell.edu/statistics/238112/university-attendance-costs-in-the-united-states/.

[2] Max Pell Grant Info sourced from annual Pell Grant Reports at https://fsapartners.ed.gov/knowledge-center/library. For Figure 4 and Figure 5.

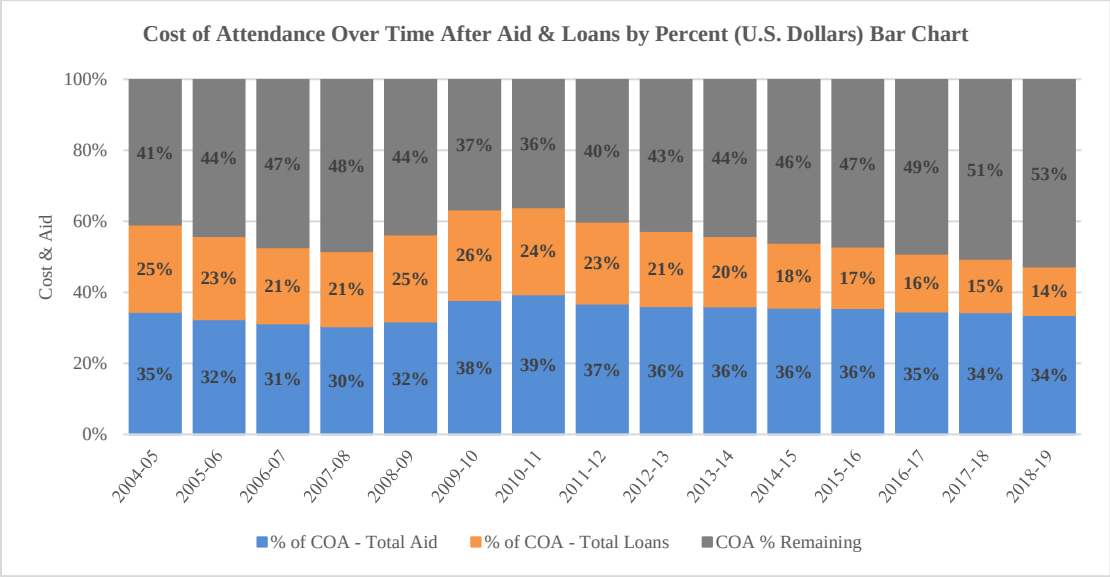

Figure 1: Rising Costs of Education Over Time vs. Total Aid/Loans (U.S. Dollars) Bar Chart. **At the Undergraduate Level**. Data source: College Board and Institute for College Access & Success, graph created by the author.

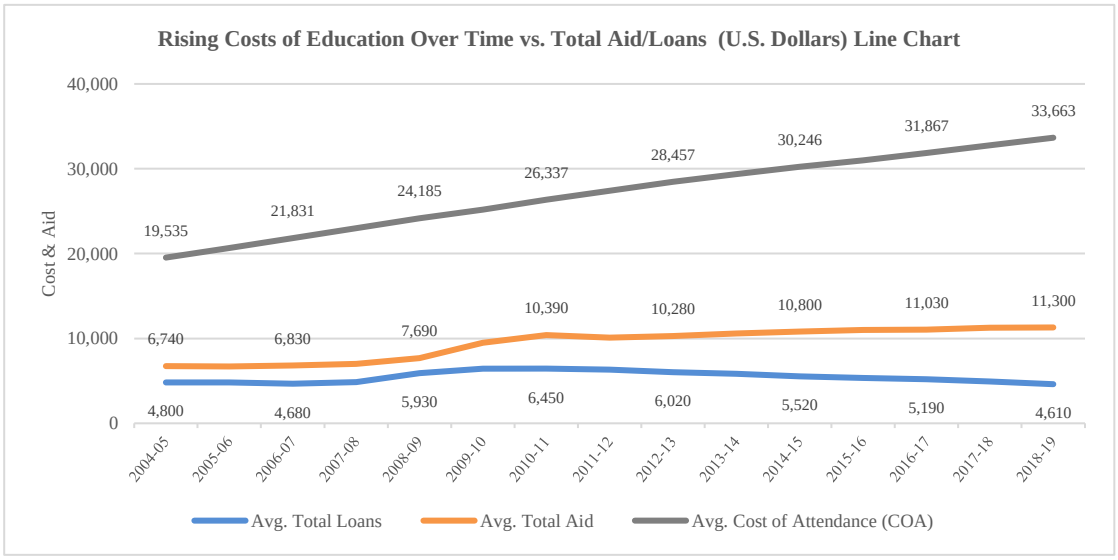

Figure 2: Rising Costs of Education Over Time vs. Total Aid/Loans (U.S. Dollars). **At the Undergraduate Level**. Data source: College Board and Institute for College Access & Success, graph created by the author.

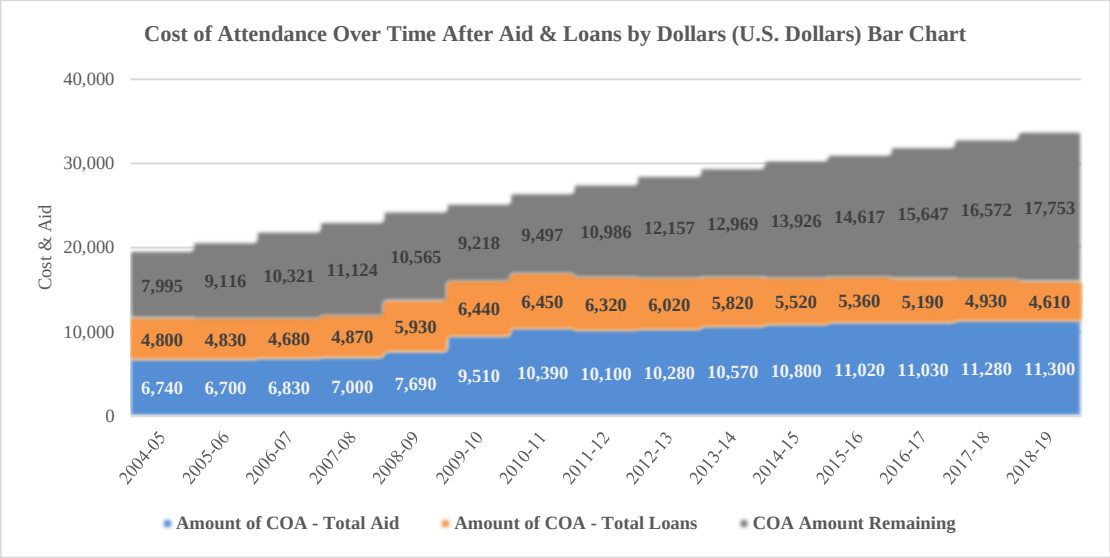

Figure 3: Rising Costs of Education Over Time vs. Total Aid/Loans by Percent. **At the Undergraduate Level**. Data source: College Board and Institute for College Access & Success, graph created by the author.

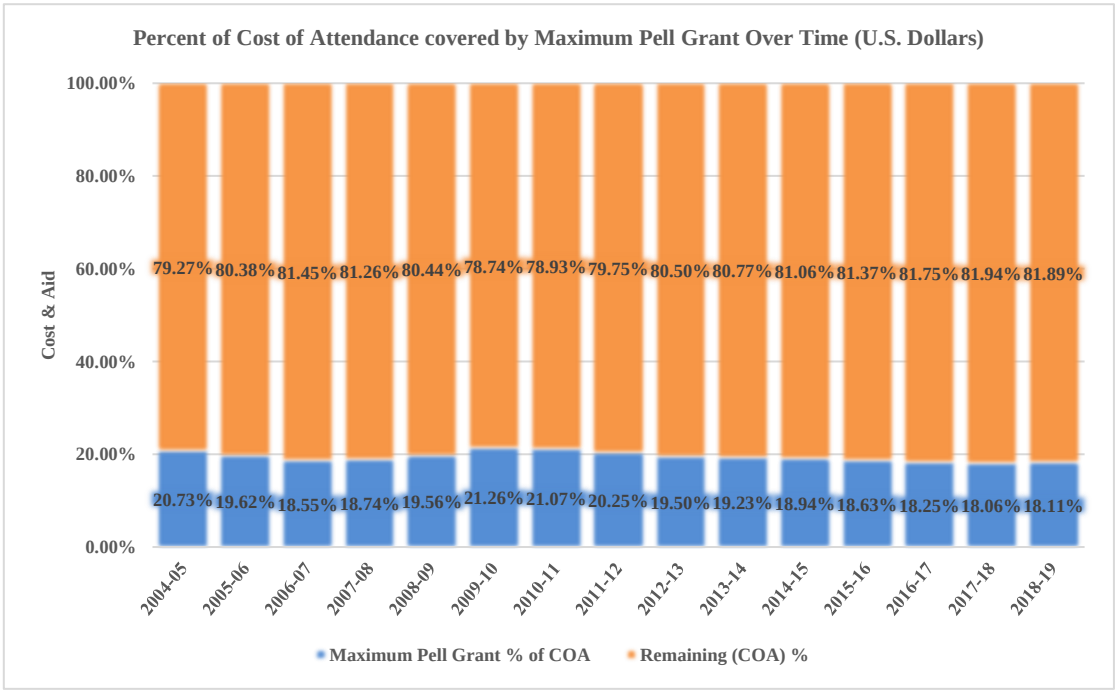

Figure 4: Percent of Cost of Attendance covered by Maximum Pell Grant Over Time. **At the Undergraduate Level**. Data source: US Department of Education Federal Student Aid and Institute for College Access & Success, graph created by the author.

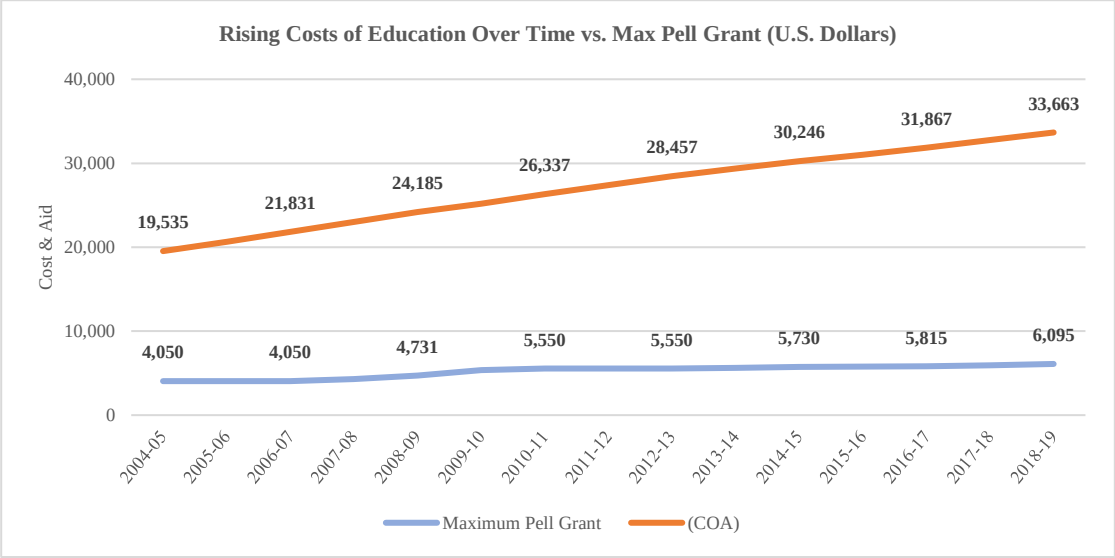

Figure 5: Rising Costs of Education Over Time vs. Max Pell Grant Growth. **At the Undergraduate Level**. Data source: US Department of Education Federal Student Aid and Institute for College Access & Success, graph created by the author.

Recent research has shown that increases in the cost of attendance compared to student aid can have short- and long-term effects (Addo et al., 2016; Chan et al., 2019). In the short term, access to education becomes increasingly more challenging, especially for lower-income families with little internal financial assistance (Addo et al., 2016). Students then face the challenge of taking out more student loans, which can hinder economic stability in the future. In the long term, it can slow the upward mobility of future generations and lead to lower workforce productivity if the working population becomes less educated over time due to hesitancy of wanting to take on increasing education costs (Addo et al., 2016; Chan et al., 2019; Darity et al., 2020; Jedrych et al., 2022).

However, it is also vital to realize that the impact of student debt is not felt equally across all racial groups. Furthermore, it is essential to acknowledge that many complex factors contribute to the racial disparities in student debt. Research has shown that Black students are disproportionately affected by student debt, holding significantly more debt than their White peers at graduation (Scott-Clayton & Li, 2016).

Scott-Clayton & Li (2016) noted that Black students hold an average of $7,400 in student debt over their White peers at the time of graduation with their bachelor's. This average triples for Black students enrolling in graduate school in hopes of increasing earning potential (Scott-Clayton & Li, 2016). However, lower levels of access to other sources of funding aside from student debt such as family wealth or other financial resources makes student debt the primary option for Black individuals (Scott-Clayton & Li, 2016). Below, we show how Black individuals average higher levels of student debt relative to their White peers and slightly lower grant funding (***Figure 6*** ***&*** ***Figure 7***).

Figure 6 *and* ***Figure 7*** stress a critical point that while Black individuals have slightly higher levels of student debt, they also have lower levels of alternative funding to support their education, which is why they would need additional loans to cover the cost of unawarded grants. Therefore, it is equally important for the alternative funding (grants, scholarships) that Black individuals receive for college to keep pace with the rising cost of attendance.

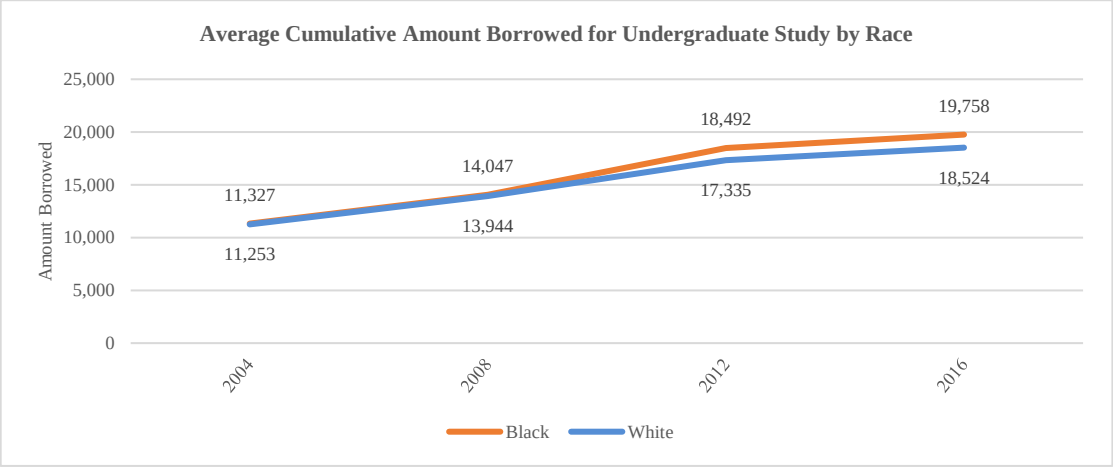

Figure 6: Average Cumulative Amount Borrowed for Undergraduate Study by Race. **At the Undergraduate Level**. Data source: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study: 2004 – 2016 Undergraduates (NPSAS:UG), graph created by the author.

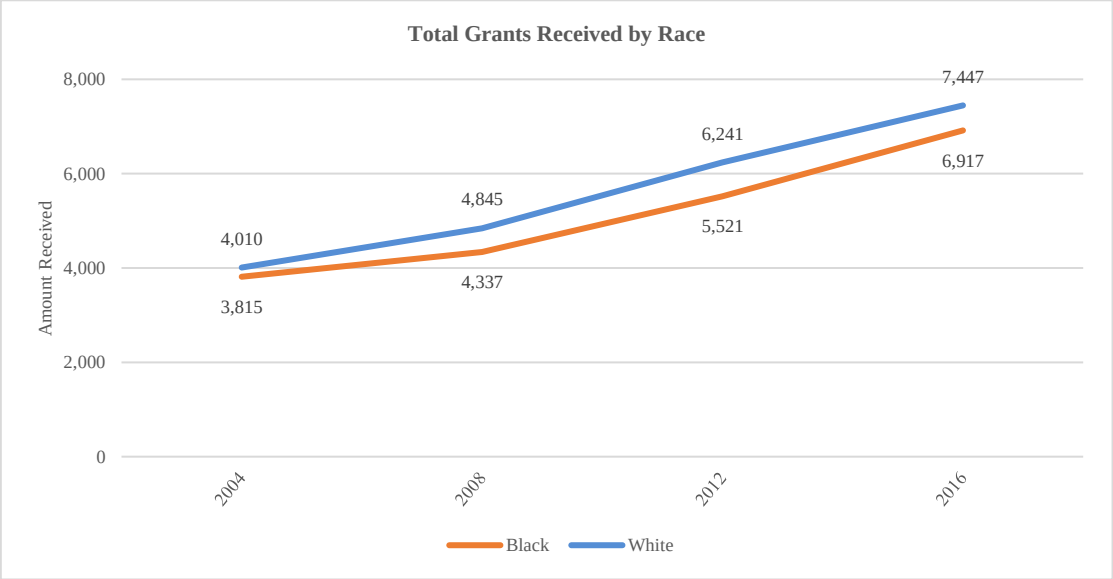

Figure 7: Total Grants Received by Race. **At the Undergraduate Level**. Data source: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study: 2004 – 2016 Undergraduates (NPSAS:UG), graph created by the author.

Total Grants – Equal to the sum of all federal grants, state grants, institutional grants, and outside grants. Includes employer tuition reimbursements and grants from private sources.

Typical factors that impact student debt are race, the types of school a student attends, parental wealth, financial literacy levels, intersectionality, socioeconomic status, and various types of student aid (Addo & Hernández Kent, 2022; Addo et al., 2016; Andrews, 2010; Baker et al., 2017; Chan et al., 2019; Chen & Volpe, 1998; Hastings et al., 2013). When considering factors that impact student debt by race, there are several reasons why Black students would have higher levels of student debt:

First, *lower amounts of alternative forms of student aid (i.e., grants, scholarships, family network, employer tuition assistance)*: Black students are less likely to receive family financial support for college than their White peers. Moreover, most Black students receive lower alternative funding sources like scholarships, grants, and fellowships relative to White students (The JBHE Foundation, Inc, 2006; Scott-Clayton & Li, 2016). Thus, they turn to student loans to primarily fund their education (Addo et al., 2016; Chan et al., 2019; Hamilton et al., 2015; Looney & Yannelis, 2019).

Secondly, *labor market discrimination*: Black individuals have historically faced significant barriers regarding labor market discrimination. Though discrimination persists regardless of Black individuals' degree attainment, a degree facilitates access to higher-paying jobs and can sometimes help mitigate some of the effects of discrimination Black individuals face (The JBHE Foundation, Inc, 1996).

Third, *leaving without a degree*: Black students are among those who are more likely to drop out of school without a degree (Baker et al., 2017).

Fourth, *higher cost of debt*: Black students are more likely to use private loans to finance their education. These loans are known to have higher interest rates for Black students compared to White students (Goldrick-Rab et al., 2014).

Lastly, *lower financial literacy levels*: We know that Black individuals have lower levels of financial literacy than White individuals due to disparities in access to financial education and resources, among other things (Chen & Volpe, 1998; Panos & Wilson, 2020).

Previous research by Loewenstein (2000), Bechara & Damasio (2005), and Loewenstein et al. (2001) have explored the broader impact of emotions on economic behavior. Nissen (2015) and White (2020) aim to understand how financial decisions influence an individual's emotional well-being and mental health. However, our study is differentiated by seeking to identify and compare the differential effects of emotional well-being on student debt for Black and White individuals and how emotions may be related to an individual's ability to manage and pay off debt.

Thus, this paper delves into the connection between emotional well-being and student loan debt among Black and White individuals. It seeks to shed light on potential variations by race in how these factors relate to student debt. To enhance our understanding, we present three hypotheses that further contribute to this exploration.

Our first hypothesis (*1a*) suggests that the relationship between individual emotional well-being and student debt differs by race.

Hypothesis two (*1b*) posits that the relationship between individual confidence and student debt differs by race.

Finally, Hypothesis three (*1c*) suggests that the relationship between individual worry and student debt differs by race.

Literature Review

Student Debt

According to the National Center for Education Statistics (NCES) data, 76.1 percent of Black individuals received federal loans compared to 57.2 percent of White individuals[3] in the 2017-2018 academic year. Addo et al. (2016) found that young Black individuals have higher student debt than young White individuals, partially due to differences in personal wealth, parental wealth, and family contributions to college. They used OLS regressions and controlled for parental income and net worth, degree, and enrollment status, analyzing the National Longitudinal Survey of Youth - 1997 (NLSY97) data set. The study also examined the cost of attending an HBCU or for-profit institution and family contributions on student debt, using the Integrated Postsecondary Education Data System (IPEDS) dataset. These findings suggest that for-profit institutions likely contribute to higher student debt among Black individuals, given that Black individuals attend for-profit institutions at a higher rate than White individuals. This finding further emphasizes that Black individuals rely mainly on student debt to overcome the challenge of rising education costs for upward mobility.

Chan et al. (2019) found that Black students enroll in college at lower rates than White students but graduate with higher debt levels. The study analyzed the National

[3] Undergraduate degree completers. https://nces.ed.gov/programs/digest/d21/tables/dt21_331.95.asp?current=yes

Postsecondary Student Aid Study (NPSAS) using logit regressions to examine the impact of race on student borrowing, controlling for family income levels, type of institution, and student dependency status. This research highlights the short-term impacts and strategies used to finance education but needs to discuss the long-term effects.

Likewise, Looney & Yannelis (2019) conducted a study using the National Student Loan Data System (NSLDS) data set to analyze the distribution of student loan balances and repayment rates. They found that lack of access to alternative aid drives students to rely heavily on student debt. Thus, alternative funding sources are needed to help mitigate the adverse effects of student debt on upward mobility. The study extends the work of Chan et al. (2019) by emphasizing the negative long-term impacts of student debt and how those adverse effects can be overcome with better financial planning.

Building on the work of Addo et al. (2016), Baker et al. (2017) further investigated student debt among first-time undergraduate students and found that low-income and students of color borrow higher amounts of student debt, attend institutions with negative placement rates, and drop out with debt.

The relationship between student debt and emotional well-being

White (2020) examined the relationship between financial decisions and well-being by looking at the impact of the relative income hypothesis on the financial stress experienced by Black students. Using a linear model, they analyzed the National Student Financial Wellness Study (NSFWS) dataset, controlling for socioeconomic status, academic performance, demographics, and employment status. The study

revealed that Black students experience more financial stress than White students, which is associated with increasing debt levels. The research confirms the connection between well-being and economic behavior, demonstrating that negative emotions experienced by Black students can lead to higher debt levels.

Panos & Wilson (2020) found a relationship between economic behavior and well-being by synthesizing previous literature. Specifically, their conclusions showed that financial literacy is significantly associated with well-being. They highlighted that individuals with higher financial literacy are better equipped to make well-informed financial decisions. Alternatively, individuals who are driven by emotionally impulsive behaviors tend to experience negative outcomes related to financial decisions.

Previous research suggested that emotions are essential in decision-making, including financial decisions. Bechara & Damasio's (2005) study showed that emotions are a crucial factor in decision-making, where emotions are involved in decisions at a conscious and subconscious level. They found that individuals who lack emotional competency due to brain damage make less advantageous decisions because they do not experience the pain associated with decisions. These findings highlight the importance of considering emotions in educational decision-making, especially with respect to student debt and its impact on well-being.

Loewenstein (2000) further explored the relationship between financial decisions and emotions and identified visceral factors as emotions that impact decision-making in the present and future. Moreover, they label visceral factors as unfavorable drive states and feelings. These factors are modeled as state-dependent preferences affecting short-

term and forward-looking decisions. The study suggested that visceral factors' influence on decision-making should be considered more, despite the difficulty in analyzing their marginal utility. The research supports the idea that emotions are part of an individual's utility and aligns with Jeremy Bentham's *Principles and Morals of Legislation* (1789).

Naqvi et al. (2006) also discussed the crucial relationship between emotions and decision-making, noting that emotions can impact decision-making at different levels of consciousness. They found that emotions often aided decision-making implicitly, and the exclusion of emotions in decision-making violated normative rationality in expected utility theory.

Loewenstein et al. (2001) proposed the risk-as-feelings hypothesis, which suggests that emotions play a significant role in decision-making, especially in uncertain situations. The authors noted that emotions implicitly influence immediate decisions and respond to factors not typically factored into cognitive deliberations. To test this hypothesis, the authors surveyed 115 students, asking them to compare themselves to the average person in a risky situation. Their study confirms that emotions are influential in current decisions and future reevaluations. The risk-as-feelings hypothesis is an alternative to traditional rational utility, highlighting the importance of emotions in decision-making, and can help improve understanding of the relationship between financial decisions and well-being.

Levy & Glimcher (2012) conducted a neuroimaging study and identified significant activity in the ventromedial prefrontal cortex and the orbital frontal cortex when comparing different rewards, indicating emotional resonance and decision-making.

This work aligns with Paul Samuelson's seminal work in *Foundations of Economic Analysis* (1947). The study highlights the importance of understanding how the brain encodes information in financial decisions with emotional involvement. However, further research is needed to narrow down the specific subregions of the brain involved in emotions, decision-making, and common currency evaluations.

Nissen's (2015) qualitative study revealed that high levels of student debt can negatively impact college students' social relationships and well-being. Based on focus group interviews with 70 students from eight universities in New Zealand, the study suggests that students who rely on grants, scholarships, or family support to finance their education have lower debt levels and stronger social networks. In contrast, students relying heavily on student loans have higher debt levels, less support from external sources, and increased stress and emotional strain.

In summary, there is a great deal of literature on the impact of emotion on educational decision-making. This study supports previous research in solidifying the link between emotion and economic behavior by highlighting the inclusion of emotion in student debt decisions (Loewenstein, 2000; Loewenstein et al., 2001; Nissen, 2015; White, 2020). While we do not determine causality, we look to learn more about which well-being factors are associated with student debt.

Data

Overview

The data covers the years 2005 to 2015 using the PSID[4] longitudinal dataset. The primary subsets used in this analysis were the PSID family level data, more specifically the main family data, the individual level data by years, and the Transition into Adulthood Supplement. From the Main Family data, we used school expenses, the labor income of the head and spouse, and imputed wealth without equity[5] (proxy for parental wealth). Imputed wealth includes, the value of a farm or business, the value of checking/savings, real estate, stocks, vehicles, annuities/IRAs[6], and other assets less debt related to credit cards, student loans, medical, legal, and other family loans). From the Transition into Adulthood Supplement, we used confidence compared with others, the respondent's age when first becoming a parent, the respondent's employment status, whether they were given a house/condo, whether a parent covered their rent or mortgage, whether they were given a vehicle by a parent, if tuition or bills were covered by a parent, whether they received a loan from a parent or family member, variables related to their time enrolled in college, their race, whether they had a checking/savings account (as a proxy for financial literacy), the value of all of their accounts (as a proxy for personal wealth), information on their money market and bond accounts (as a proxy for financial literacy), the amount they owe in student loans, their level of financial responsibility, information related to their level of worry, emotional well-being, risk related behaviors, their current enrollment status, the completed level of education obtained by their mother or father, and their

[4] Panel Study of Income Dynamics, public use dataset. Produced and distributed by the Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, MI (2023). The collection of data used in this study was partly supported by the National Institutes of Health under grant number R01 HD069609 and R01 AG040213, and the National Science Foundation under award numbers SES 1157698 and 1623684.
[5] Exclusion of home equity from the calculation of parental wealth is justified due to its illiquid nature, as it is uncommon for parents to liquidate their homes as a means to support their children's college expenses.
[6] Individual Retirement Account

income (based on prior years earnings). Lastly, from the individual data set we pulled the individual's age.

Merging Data Process

The data used in this study is based on a biennial longitudinal survey conducted at the individual level. The survey is an unbalanced panel, as not all individuals participated in every survey year or were eligible for inclusion due to changes in their circumstances. To account for this unbalanced panel, we used OLS regression models clustered at the person id level rather than at the year level. By accounting for each individual by *person id*, we can observe individual effects in a way that helps us understand the differential effects of emotion, confidence, and worry by race, how these factors relate to student debt, and analyze these effects in aggregate. The merging of the data across these waves and data subsets was done through the PSIDs automated data center and individuals were tracked through a unique id ("1968 interview number"*1000 + "1968 person number"). This method is identical to how PSID moderators track individuals across waves and subsets.

Variable Generation

For the years 2005 to 2011, student debt was a single variable that was inclusive of every kind of student loan (Stafford, Perkins, federal, state, college/university, employer-related, and other miscellaneous types). However, for the years 2013 and 2015, student debt was a composite of several variables. These variables consisted of questions related to the student's Stafford Loan values, Perkins loans values, federal loan values, state loan values, college or university specific loans, school loans received from the employer, and the other types of miscellaneous school related loans. For 2013 and 2015, we simply created a variable as the sum of all of these loans and combined it under the heading of student debt so that we would have one continuous

variable to represent all of student debt in each year. In order to interpret our results in percent terms, we took the natural log of the combined student debt variable, and this is what we use as the outcome variable in all of our regressions.

To ascertain time spent in college, we looked at four variables. We took the variable identifying the year that a respondent enrolled at an earlier college and subtracted it from the last year they attended that college. Similarly, we took the variable identifying the year that a respondent enrolled at their most recent college and subtracted it from the last year they attended their most recent college. Finally, we added the sum of those years together to create the total time that they spent in college. This is our years enrolled variable.

For the issue of race, we wanted to investigate the experience of the Black individuals relative to the experience of White individuals. Therefore, we created a dummy variable identifying every mention of an individual being Black in the original race variable, and zero everywhere the respondent did not self-report as being a Black individual. The Transition into Adulthood subset of the PSID allows respondents to affirm their race over three different questions on a biennial basis (Race Mention #1, Race Mention #2, Race Mention #3). Therefore, we determine an individual's primary race by their chosen race at first mention (Race Mention #1).

In similar fashion, we also created a race dummy variable in order to compare the impact of Black parents in certain instances of our analysis to that of White parents. Like Addo et al. (2016), we wanted to investigate the impact of Black parental wealth on student debt in contrast with the impact of White parental wealth on student debt. To understand the differentiating impacts of parental wealth for individuals having at

least one Black parent, we used our dummy variable where either parent one or parent two identified as Black and multiplied the result by parental wealth, creating an interaction for Black parent wealth. We include parental wealth as a control because we know it has a differential impact on student debt, but our focus differs. We are focusing on emotion, confidence, and worry by race. Previous studies have demonstrated that the control variables we use in our analysis impact student debt, as discussed in the literature. However, our study focuses on emotion, confidence, and worry to understand how they are related to student debt in the context of race.

To assess the relationship of emotion in Black individuals and student debt relative to White individuals, we multiply our dummy variable for Black individuals (*raceBlack*) by emotional well-being. The same process is followed for creating our interactions for confidence and worry in Black individuals.

Because we know that financial literacy influences student debt, we are going to control for financial literacy in our models as well. Previous literature identifies knowledge of a savings, checking, or investment account as evidence of financial literacy (Chen & Volpe, 1998; Hastings et al., 2013; Huston, 2010). For our analysis, we create a dummy variable that pulls from two different measures in the PSID data set. Those measures simply ask whether the individual has a checking/savings account or has investments in stocks or bonds. If individuals answered yes to anyone of these measures, they receive a one for financial literacy and a zero otherwise.

We also control for financial responsibility in respondents. Four measures of the PSID data set are merged into one average under the heading of financial responsibility. The measures contained within this heading are related to the individual's ability to make

their own living, pay their own bills, manage their own money, and pay their own rent. We separated the variable into five dummy variables, identified by response. The responses were claims of responsibility were someone else all of the time, someone else most of the time, me half of the time, me most of the time, and me all of the time.

In controlling for the impact of respondent's employment on student debt, we separated enrollment status into several dummy variables based on the response of the individual. The range of responses were employed, laid off, unemployed, retired, disabled, working domestically in the home, classified as a student, or other. Individuals classified as anything other than employed were combined under the variable student not working. In this way, we hoped to capture the impact of students who were employed on student debt relative to the impact of students not employed.

To control for parental assistance, we looked at individuals receiving assistance from their parents for rent, the mortgage, or their dorm and combined the responses of those individuals who receive assistance into one variable. Thus, we have parent paid housing as a binary variable. We followed a similar identification pattern for individuals receiving assistance in other areas that are vehicle, tuition, and loan related.

To control by region, we created dummy variables from the responses of the original variable which were northeast, northcentral, south, west, Alaska-Hawaiian, and foreign. Our hope was to test the impact of each region on student debt to understand if region played an important factor in student debt levels.

Lastly, in our sample, participants provided information about their educational journey, including various degrees ranging from some college to two-year, four-year, and graduate programs. To capture the distinct impact of each level of education on student debt, we created separate dummy variables for each enrollment category. Additionally, we incorporated the 'years enrolled' variable to examine how the duration of enrollment relates to student debt levels. This approach allows us to explore the unique influences of specific educational classifications and the length of time individuals spend pursuing their education on their experiences with student debt.

Data Cleaning Process

In terms of data cleaning, we started with 17,358 observations and 2,893 *unique person ids*. We excluded individuals who had not yet accumulated any time in college after generating the variable for years enrolled, this left us with 14,032 observations and 2,893 *unique person ids*. We dropped individuals from our study who were under the age of 17, this left us with 8,557 observations and 2,614 *unique person ids*. We dropped students who did not record personal wealth for the survey and did not have a checking or saving account to verify wealth, (wealth for our purposes is considered as what is contained in the checking or savings account). After this drop, we were left with 5,219 observations and 2,283 *unique person ids*. After dropping individuals who did not record a response for financial responsibility, we were left with 5,159 observations and 2,272 *unique person ids*.

After dropping individuals with missing values as it relates to becoming a parent for the first time, we were left with 5,154 observations and 2,272 *unique person ids*. After removing missing values for mother's education, we were left with 4,826 observations and 2,184 *unique person ids*. After removing missing values for father's education, we

were left with 3,411 observations and 1,618 *unique person ids*. After removing missing values for personal earnings, we were left with 2,926 observations and 1,512 *unique person ids*. After dropping missing values for student debt, we were left with 2,893 observations and 1,495 *unique person ids*. After dropping missing values for respondent employment status, we were left with 2,892 observations and 1,495 *unique person ids*. After dropping missing values for individuals who did not record an answer to the survey question for sex, our data remained unchanged at 2,892 observations and 1,495 *unique person ids*. After dropping individuals who were not White or Black, we were left with 2,692 observations and 1,414 *unique person ids*. After dropping the first parent who was not White or Black, we were left with 2,651 observations and 1,389 *unique person ids*. After dropping the second parent who was not White or Black, we were left with 2,627 observations and 1,376 *unique person ids*. After dropping individuals with no prior college experience, we were left with 1,555 observations and 923 *unique person ids*. For our years enrolled variable, we had two outliers (7,987 and 7,989) that were the result of miscalculations where individuals did not fill in information on times they attended or left a specific college. After dropping these two outliers, we were left with 1,553 observations and 923 *unique person ids*. After dropping missing values for respondent region, we were left with 1,551 observations and 922 *unique person ids*.

Thus, we are left with 1,551 observations and 922 *unique person ids* for our main study, and our sample is restricted to non-missing observations after data cleaning.

Distributions

Emotional Well-being: Happiness

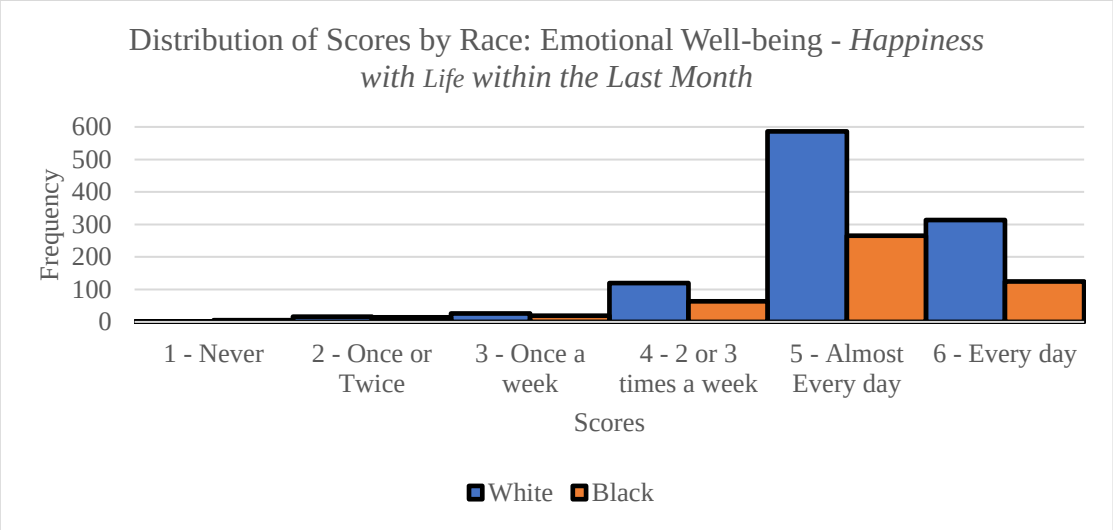

Figure 8.1: Distribution of Scores by Race: Emotional Well-being - Happiness with Life within the Last Month, graph created by the author.

Emotional Well-being: Interest

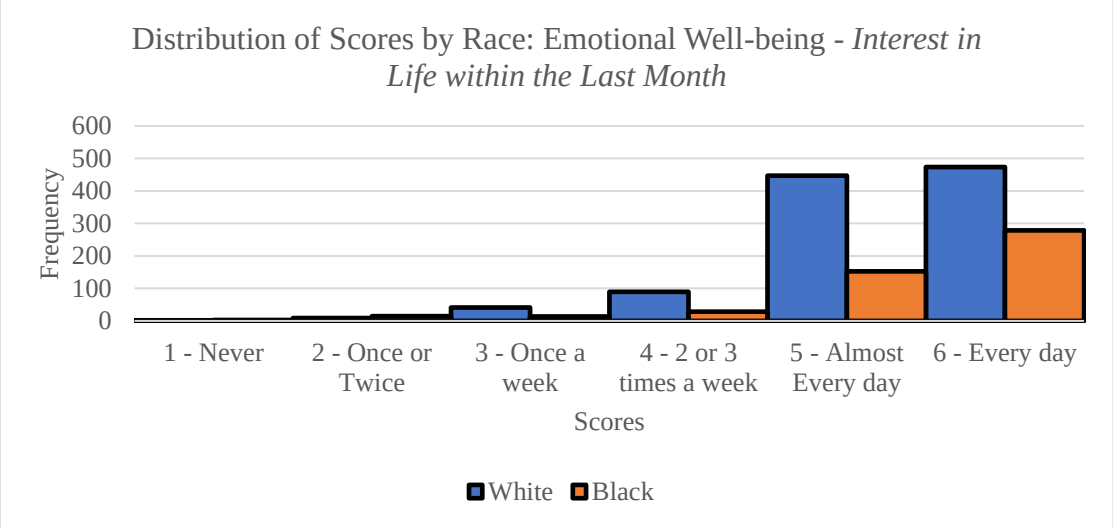

Figure 8.2: Distribution of Scores by Race: Emotional Well-being - Interest in Life within the Last Month, graph created by the author.

Emotional Well-being: Satisfied

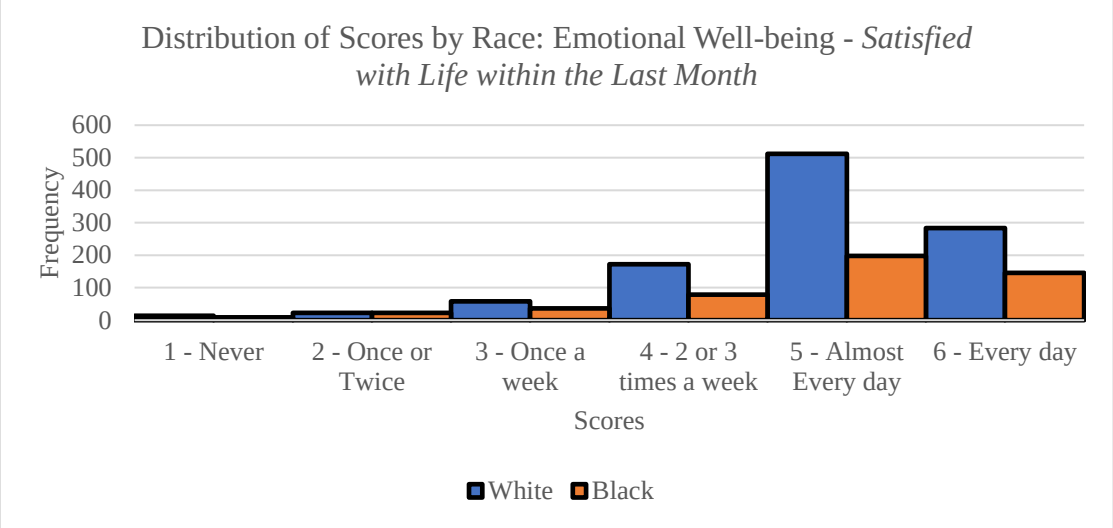

Figure 8.3: Distribution of Scores by Race: Emotional Well-being - Satisfied with Life within the Last Month, graph created by the author.

Emotional Well-being (Happiness, Interest, and Satisfaction)

For each measure of emotional well-being (***Figure 8.1***, ***Figure 8.2***, ***Figure 8.3***), individuals could respond by choosing a score of 1, 2, 3, 4, 5, or 6. For both races, most individuals fall into positive emotional well-being, indicating that they were happy, interested, or satisfied with life every day or almost every day within the last month at the time of each survey from 2005 – 2015.

Confidence

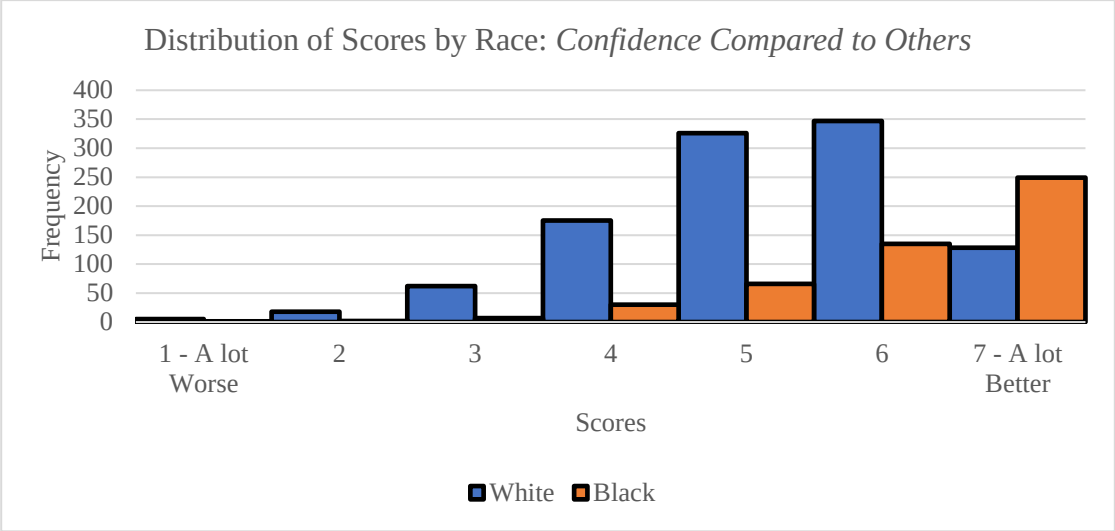

Figure 8.4: Distribution of Scores by Race: Confidence Compared to Others, graph created by the author.

Confidence Compared to Others

For confidence (**Figure 8.4**), individuals could respond by choosing a score of 1, 2, 3, 4, 5, 6, or 7. For White individuals, most respondents rise and fall between scores of 4 and 7. For Black individuals, we see a steady increase of respondents from scores 4 to 7. These results indicate that both Black and White individuals perceived that their confidence levels were higher than others at the time of each survey from 2005 – 2015.

Worry: Money

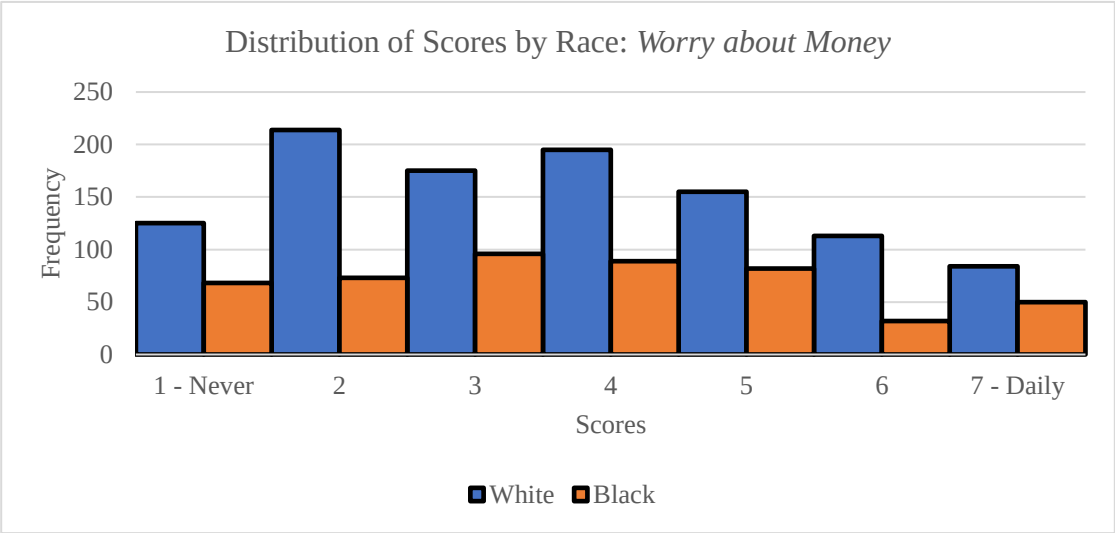

Figure 8.5: Distribution of Scores by Race: Worry about Money, graph created by the author.

Worry: Future

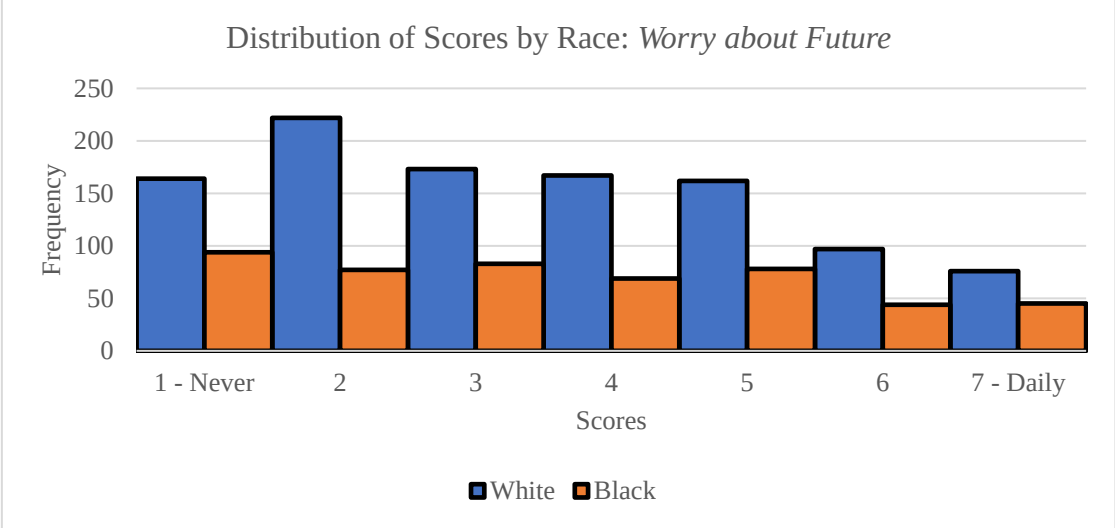

Figure 8.6: Distribution of Scores by Race: Worry about Future, graph created by the author.

Worry: Discouraged

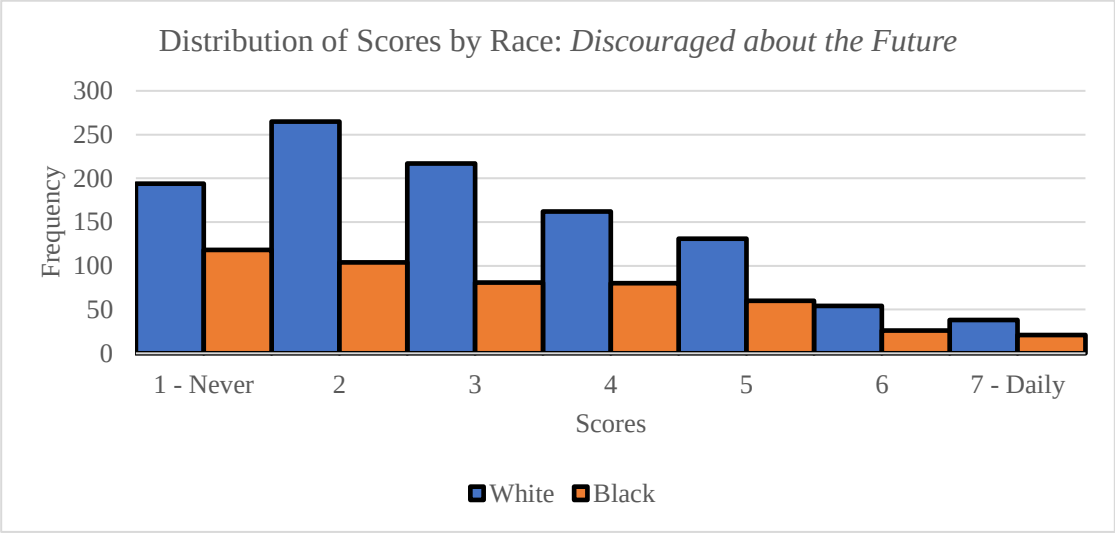

Figure 8.7: Distribution of Scores by Race: Discouraged about the Future, graph created by the author.

Worry (Money, Future, Discouraged about Future)

For worry about money (***Figure 8.5***), individuals could respond by choosing a score of 1, 2, 3, 4, 5, 6, or 7. For both races, most of the distribution falls between 1 and 5, indicating that both Black and White individuals generally spent a low to moderately high amount of time worrying about money. Black individuals seem to be evenly distributed in this instance for scores 1 to 5, whereas the scores for White individuals are generally decreasing from 2 to 7.

For worry about the future (***Figure 8.6***), individuals could respond by choosing a score of 1, 2, 3, 4, 5, 6, or 7. We see again, that the scores of Black individuals are generally steady between scores 1 and 5, indicating that Black individuals are somewhat equally worried about the future. For White individuals, the scores are somewhat steady between scores 1 and 5 and generally decreasing after score 2,

indicating a constant amount of worry about the future among White individuals as well.

For those discouraged about the future (***Figure 8.7***), individuals could respond by choosing a score of 1, 2, 3, 4, 5, 6, or 7. For both Black and White individuals we see higher scores toward the lower end of the distribution, indicating lower levels of discouragement about the future, with scores generally decreasing for responses at the higher end of the distribution.

Summary Statistics

Summary Statistics by Race (Table 1)

	White	Black	White	Black	White	Black	White	Black	White	Black
	N		*Mean*		*sd*		*Min*		*Max*	
Outcome										
Student debt	1,061	490	9,478	10,360	21,007	18,343	0	0	200,000	140,000
Interests										
Emotion										
Happiness	1,061	490	5.08	4.92	0.81	0.98	1.00	1.00	6.00	6.00
Interest	1,061	490	5.25	5.34	0.85	1.00	1.00	1.00	6.00	6.00
Satisfaction	1,061	490	4.88	4.78	1.02	1.19	1.00	1.00	6.00	6.00
Confidence	1,061	490	5.22	6.18	1.18	1.05	1.00	1.00	7.00	7.00
Worry										
Money	1,061	490	3.67	3.69	1.79	1.82	1.00	1.00	6.00	6.00
Future	1,061	490	3.51	3.56	1.82	1.92	1.00	1.00	6.00	6.00
Discouraged	1,061	490	3.08	3.04	1.63	1.73	1.00	1.00	6.00	6.00
Demographics										
Respondent age	1,061	490	23.12	22.78	2.28	2.27	17.00	18.00	27.00	27.00
Respondent sex										
Black Males		281								
White Males	791									
Black Females		209								
White Females	270									
Mom's education	1,061	490	11.02	10.88	6.10	5.43	0.00	0.00	17.00	17.00
Dad's education	1,061	490	11.24	10.79	5.94	4.79	0.00	0.00	17.00	17.00
Age at First Becoming a Parent	173	162	21.44	20.15	2.54	2.30	14.00	15.00	27.00	27.00
Risk tendency	1,061	490	1.37	1.36	0.65	0.63	1.00	1.00	5.00	4.00
Monetary										
Personal wealth	1,061	490	6,891	1,566	15,722	3,658	-900	0	210,000	35,000

Personal earnings (previous year)	1,061	490	21,121	14,813	21,060	16,476	0	0	170,000	165,000
Parental wealth	1,061	490	153,197	23,541	601,906	106,030	-479,000	-189,000	9,900,000	1,117,000
Parent 1 income	1,061	490	50,151	27,611	93,014	25,087	0	0	1,980,000	165,000
Parent 2 income	1,061	490	16,670	10,999	26,170	18,962	0	0	180,000	95,068
Financial Literacy										
Financially responsible	1,061	490	4.48	4.43	0.80	0.77	1.00	1.00	5.00	5.00
Enrollment Status										
# of Years enrolled	1,061	490	2.86	2.06	1.86	1.75	0.00	0.00	9.00	13.00
Clusters by id	615	309								

Outcome and Interests

Looking at **Table 1**, we see that, on average, Black individuals reported higher levels of student debt than White individuals. In terms of emotional-wellbeing measures, we see that White individuals reported slightly higher levels of happiness and satisfaction within the last month than Black individuals. On the other hand, Black individuals reported slightly higher levels of interest in life within the last month than White individuals. Additionally, we can see that, on average, White individuals have higher levels of emotional well-being than Black individuals and have similar levels of worry to Black individuals. Black individuals also reported higher levels of confidence compared to others than did White individuals. In terms worry measures, Black individuals reported slightly higher levels of worry about money and the future than White individuals. Alternatively, White individuals reported slightly higher levels of discouragement about the future than Black individuals.

Parental Education

For mothers' education, **Table 1** shows that White mothers have slightly higher levels of education than Black mothers, and White fathers have higher levels of education than Black fathers.

Personal Wealth and Earnings

For personal wealth, **Table 1** shows that White individuals have over four times more wealth than Black individuals. Additionally, **Table 1** shows that the earnings of White individuals are about 1.43 times higher than Black individuals.

Parental Wealth and Income

For parental wealth, **Table 1** shows that White parents have wealth about 6.5 times higher than Black parents. Regarding parental income, the summary statistics show that White parent number one has an income about 1.82 times higher than Black parent number one, and the income of White parent number two is 1.52 times higher than Black parent number two.

Financial Responsibility

For financial responsibility, **Table 1** shows that White individuals have slightly higher average financial responsibility scores than Black individuals.

Years Enrolled

For years enrolled, **Table 1** shows that, on average, White individuals are enrolled in school for nearly a year longer than Black individuals.

Empirical Methodology

Empirical Framework

We hypothesize that the variables of interest (emotional well-being, confidence, and worry) will be significantly associated with student debt while controlling for race, age, net worth, parental income, parent's education, respondent's education, years enrolled, enrollment status, respondent's employment status, respondent's reported

total earnings from the previous year, respondent's financial responsibility, siblings, age at the first time of becoming a parent, family contribution, personal net worth, student's risky behaviors, respondent's measure of financial literacy, Black parents and net worth interaction, White parents and net worth interaction, and the respondent's region as supported by Addo et al. (2016)[7].

Our goal is not to explain all the factors involved in student debt outcomes, but rather to argue that emotional well-being, confidence, and worry are significant factors that should be considered. Specifically, we are examining how these factors relate to Black individual's student debt levels.

Hypothesis by Race

We are hypothesizing that there is a relationship between well-being and student debt that differs by race. Thus, our hypotheses are as follows:

Hypothesis 1a

There is a relationship between emotional well-being and student debt that differs by race. When measuring emotional well-being in the PSID data set, emotional well-being is a composite of the average of three variables: happiness in life within the last month, interest in life within the last month, and satisfaction with life within the last month. Instead of using the composite variable, we draw from the three variables (happiness, interest, and satisfaction) as separate measures of emotional well-being. Each measure of emotional well-being is defined by a Likert scale from 1 to 6 where:

[7] We should note that due to differences in the PSID data set, which we used, and the NLSY97, which Addo et al. (2016), used, there are certain limitations in our study. Our intent in this analysis was to control for the same variables as Addo et al. (2016), but we could not account for the type of institution as they do in their analysis because this data is restricted in the PSID. We also chose a different measure of risk (i.e., risky behaviors) to capture the impact of risk-seeking behavior on student debt. Addo et al. (2016) use the reported results of a gambling experiment to model risk-related behavior instead. While the PSID has a similar metric, the data collection for this metric did not extend to the years of our analysis.

- 1 = Never feeling happy, interested, or satisfied with life within the last month
- 2 = feeling happy, interested, or satisfied with life once or twice within the last month
- 3 = feeling happy, interested, or satisfied with life about once a week within the last month
- 4 = feeling happy, interested, or satisfied with life 2 or 3 times a week within the last month
- 5 = feeling happy, interested, or satisfied with life almost every day within the last month
- 6 = feeling happy, interested, or satisfied with life every day within the last month.

Hypothesis 1b

There is a relationship between confidence and student debt that differs by race.

Confidence is measured on a Likert scale from 1 to 7, where:

- 1 = I rate my self-confidence "A lot worse than other people"
- 7 = I rate my self-confidence "A lot better than other people"

Hypothesis 1c

There is a relationship between worry and student debt that differs by race. When measuring worry in the PSID data set, worry is a composite of the average of three variables: worry about money, worry about the future, and discouraged about the future. Instead of using the composite variable, we draw from the three variables (worry about money, worry about a future job, and discouraged about the future) as separate measures of worry. Each measure of worry is defined by a Likert scale from 1 to 7 where:

- 1 = I am "Never" worried about money, a future job, and I am “Never” discouraged about the future
- 7 = I worry "Daily" about money, a future job, and I am discouraged “Daily” about the future

Empirical Model

Our analysis uses an OLS regression model clustered by the *person id*. We use OLS regression and cluster by the *person id* to show the results of our analysis on a collective basis. Stated differently, our OLS model looks at the variation between all individuals and not within individuals. Our analysis controls for underlying conditions such as personal net worth and earnings, parental net worth and earnings, risk related behavior (as a proxy for risk preferences), financial literacy (whether one has a checking/savings account or is invested in stocks/bonds), family contribution (education-related expenses), parental education, student enrollment status and degree attainment, and student employment status. Below is our model indicating the relationship between our input variables (Emotional well-being, Confidence, Worry) and our outcome variable (Student debt).

$$\Upsilon_i = \alpha + \beta_1 \varsigma(\text{sigma})_i + \beta_2 \theta(\text{theta})_i + \lambda\omega(\text{omega})_i + \varepsilon_i$$

Where:

- Υ_i – Where Υ represents our outcome variable, student debt. Where (i) represents the individual, clustered by *id*.
- $\varsigma(\text{sigma})_{it}$ – Well-Being Measures: Emotional Well-being (Happiness, Interest, Satisfaction), Confidence, Worry (Money, Future, Discouraged)

- $\beta_2\theta(\text{theta})_i$ – Interaction Variables (Happiness*Black, Interest*Black, Satisfaction*Black, Confidence*Black, Money*Black, Future*Black, Discouraged*Black, Parental Wealth*Black)
- $\omega(\text{omega})_i$ – Control Variables
- ε_i – Error Term

Again, we look at emotion, confidence, and worry in relation to student debt outcomes. Our regression tests all our hypotheses, which examine the association between emotional well-being, confidence, worry and student debt of Black students relative to White students.

Results

Baseline Models

This section discusses the results of our baseline models, comparing our single variable model to our dummy model. The baseline model captures the collective interaction between emotion, confidence, worry, and race as it relates to student debt, and the dummy model captures the parsed interaction between emotion, confidence, worry, and race as it relates to student debt. This analysis aims to see if there is another way we should be thinking about well-being and our approach to student debt. Stated differently, we model the relationship between well-being and student debt using aggregated scores (*single model*) compared to disaggregated scores (*dummy model*). Thus, the single variable baseline model assesses our variables of interest to see if there is a relationship between well-being and student debt in the aggregate. In contrast, our dummy model analyzes the relationship between well-being and student debt at a micro level. This initial baseline analysis sets the stage for our subsequent models, helping us understand the emotions that have a significant impact on student

debt levels and those that do not. It gives us clarity on which models to focus on moving forward in our analysis, ensuring we are on the right track.

Analysis of our hypotheses by Race

Hypothesis 1a

There is a relationship between emotional well-being and student debt that differs by race. When measuring emotional well-being in the PSID data set, emotional well-being is a composite of the average of three variables: happiness in life within the last month, interest in life within the last month, and satisfaction with life within the last month. Instead of using the composite variable, we draw from the three variables (happiness, interest, and satisfaction) as separate measures of emotional well-being.

Baseline & Dummy Baseline OLS Regression by Race – (Table 4.1) – Emotion – Happiness[8]

Responses to: Feeling happy in life within the last month?

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	-0.4391	4.2872
	(2.6979)	(3.8675)
Happiness*Black (2) – *Once or twice*		-3.0816
		(4.1929)
Happiness*Black (3) – *Once a week*		-4.3156
		(4.1080)
Happiness*Black (4) – *2 or 3 times a week*		-4.7116
		(3.8022)
Happiness*Black (5) – *Almost every day*		-0.9646
		(3.8778)
Happiness*Black (6) – *Every day*		-1.9993
		(3.9882)
Happiness*Black – *Black Collective*	0.5767	
	(0.5285)	
Happiness – *All Races Collective*	0.3274	0.3274
	(0.3544)	(0.3548)
_cons	-1.7924	-1.7924
	(1.8237)	(1.8261)

[8] One response was left out to serve as the reference category for the categorical variable, as is common practice in choice-based models. In our emotion models, our response "Never" (*Score (1)*) was omitted because it is used as the reference group for the dummy emotion models.

R^2	0.0224	0.0294
Clusters by id	922	922
N	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

Emotional Well-being: Happiness

Table 4.1 above compares the point estimates for our dummy baseline regression for emotion (without controls) to our single variable baseline regression (without controls). We do this to investigate the differences in overall emotion (*baseline model*) on student debt for Black individuals relative to the individual effects (*dummy baseline model*). When analyzing single and dummy models for happiness, we see that neither model has any statistical significance. Thus, at a base level, the emotion of happiness does not have a relationship with student debt that differs by race or in terms of all races combined.

Baseline & Dummy Baseline OLS Regression by Race – (Table 4.2) – Emotion – Interest[9]

Responses to: Feeling interested in life within the last month?

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	0.1992	0.3503
	(2.7219)	(5.0519)
Interest*Black (2) – *Once or twice*		-0.1109
		(5.2368)
Interest*Black (3) – *Once a week*		1.3137
		(5.3239)
Interest*Black (4) – *2 or 3 times a week*		1.3313
		(5.3062)
Interest*Black (5) – *Almost every day*		2.1224
		(5.0702)
Interest*Black (6) – *Every day*		2.1173
		(5.1461)
Interest*Black – *Black Collective*	0.3974	
	(0.5100)	

[9] In parsed models, one response was left out to serve as the reference category for the categorical variable, as is common practice in choice-based models. In our emotion models, our response "Never" (*Score (1)*) was omitted because it is used as the reference group for the dummy emotion models.

Interest – *All Races Collective*	0.2873	0.2873
	(0.3355)	(0.3359)
_cons	-1.6362	-1.6362
	(1.7793)	(1.7816)
R^2	0.0208	0.0211
Clusters by id	922	922
N	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

Emotional Well-being: Interest

Table 4.2 above compares the point estimates for our dummy baseline regression for emotion (without controls) to our single variable baseline regression (without controls). We do this to investigate the differences in overall emotion (*baseline model*) on student debt for Black individuals relative to the individual effects (*dummy baseline model*). When analyzing both single and dummy variables for interest, we see that neither model has any statistical significance. Thus, at a base level, the emotion of interest does not have a relationship with student debt that differs by race or in terms of all races combined.

Baseline & Dummy Baseline OLS Regression by Race – (Table 4.3) – Emotion – Satisfied[10]

Responses to: Feeling satisfied with life within the last month?

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	2.7432	2.3774
	(2.1614)	(2.6176)
Satisfied*Black (2) – *Once or twice*		-2.8400
		(2.9183)
Satisfied*Black (3) – *Once a week*		1.0551
		(2.7448)
Satisfied*Black (4) – *2 or 3 times a week*		-0.2080
		(2.6917)
Satisfied*Black (5) – *Almost every day*		1.0735
		(2.6827)

[10] One response was left out to serve as the reference category for the categorical variable, as is common practice in choice-based models. In our emotion models, our response "Never" (*Score (1)*) was omitted because it is used as the reference group for the dummy emotion models.

Satisfied*Black (6) – *Every day*		-1.2413
		(2.8459)
Satisfied*Black – *Black Collective*	-0.0806	
	(0.4353)	
Satisfied – *All Races Collective*	0.1336	0.1336
	(0.2907)	(0.2911)
_cons	-0.7797	-0.7797
	(1.4647)	(1.4666)
R^2	0.0182	0.0247
Clusters by id	922	922
N	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

Emotional Well-being: Satisfied

Table 4.3 above compares the point estimates for our dummy baseline regression for emotion (without controls) to our single variable baseline regression (without controls). We do this to investigate the differences in overall emotion (*baseline model*) on student debt for Black individuals relative to the individual effects (*dummy baseline model*). When analyzing both single and dummy variables for satisfaction, we can see that neither model has any statistical significance. Thus, at a base level, the emotion of satisfaction does not have a relationship with student debt that differs by race or in terms of all races combined.

Hypothesis 1b

There is a relationship between confidence and student debt that differs by race.

Confidence

Baseline & Dummy Baseline OLS Regression by Race – (Table 4.4) – Confidence[11]

Responses to: How would you rate your confidence as compared to others?

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	5.8950**	10.5568***
	(2.7951)	(1.0903)
Confidence*Black (2)		-17.1361***
		(0.2450)
Confidence*Black (3)		-8.9765***
		(2.3510)
Confidence*Black (4)		-6.8786***
		(1.5484)
Confidence*Black (5)		-7.6667***
		(1.5235)
Confidence*Black (6)		-7.0276***
		(1.4437)
Confidence*Black (7) – *"A lot better than other people"*		-9.2180***
		(1.5999)
Confidence – *Black Collective*	-0.5841	
	(0.4651)	
Confidence – *All Races Collective*	0.0625	0.0625
	(0.2446)	(0.2450)
_cons	-0.4534	-0.4534
	(1.3234)	(1.3255)
R^2	0.0194	0.0249
Clusters by id	922	922
N	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

Confidence Compared to Others

In ***Table 4.4*** above, we compare the point estimates for our dummy baseline regression for confidence compared to others (without controls) to our baseline

[11] In our confidence model, we left our response "A lot less than other people" out of the equation as the reference group.

regression (without controls). We do this to investigate the differences in overall confidence (*baseline model*) on student debt for Black individuals relative to the individual effects (*dummy baseline model*).

When we compare the collective confidence of Black individuals (*baseline model*) to the individualized confidence of Black individuals (*dummy baseline model*), we see that collective confidence plays a factor in reducing student debt for Black individuals. Nonetheless, the results of collective confidence are not significant. On the other hand, individualized confidence for Black individuals plays a factor in reducing student debt for Black individuals, and these results are significant. Looking at *our dummy model*, we can see that Black individuals with lower levels of confidence carry the least amount of student debt, followed by individuals with the highest amount of confidence relative to other people (score of 7), a score of (2), a score of (5), a score of (6), and a score of (4). Furthermore, when looking at race in both models, we can see that Black individuals have significantly higher levels of student debt based on their race alone. However, the individualized confidence composition increases the effect of the point estimate for race in *our dummy model*. Lastly, the point estimate for general confidence is positive in both models but slightly higher in *our dummy model*, though the relationship is insignificant.

Hypothesis 1c

There is a relationship between worry and student debt that differs by race. When measuring worry in the PSID data set, worry is a composite of the average of three variables: worry about money, worry about the future, and discouragement about the future. Instead of using the composite variable, we draw from the three variables (worry about money, worry about a future job, and discouragement about the future) as separate measures of worry.

Baseline & Dummy Baseline OLS Regression by Race – (Table 4.5) – Worry – Money[12]

Responses to: How worried are you about money?

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	2.9223**	1.4045
	(1.1761)	(1.2395)
Money*Black (2)		2.3803*
		(1.4235)
Money*Black (3)		0.7771
		(1.4425)
Money*Black (4)		1.3026
		(1.5067)
Money*Black (5)		1.1031
		(1.6249)
Money*Black (6)		2.2861
		(1.9532)
Money*Black (7) – *"Daily"*		-1.3975
		(1.9397)
Money*Black – *Black Collective*	-0.1578	
	(0.2822)	
Money – *All Races Collective*	0.2808*	0.2808*
	(0.1644)	(0.1647)
_cons	-1.1593*	-1.1593*
	(0.6724)	(0.6735)
R^2	0.0208	0.0259
Clusters by id	922	922
N	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

[12] In our worry model, we left our response "I worry Daily about money, a future job, and I am discouraged Daily about the future" out of the model as the reference group.

Worry: Money

When comparing the collective worry (about money – without controls) of Black individuals (*baseline model*) to the individualized worry (about money – without controls) of Black individuals (*dummy baseline model*) in ***Table 4.5***, we see that individualized worry (about money) ranges from negative to positive point estimates where, in most cases, worry (about money) is associated with increases in student debt levels, and in one case, worry (about money) is associated with lower student debt levels for Black individuals. Nonetheless, the results of worry (about money) for Black individuals are insignificant in either model, except for individuals with a *score of 2*. Moreover, a score of 2 indicates that Black individuals with lower worry about money tend to have higher levels of student debt than White individuals.

The point estimate for the relationship between worry (about money) as a collective of all races and student debt is consistent in both models (28.08%) and is significant at the 10 percent level, indicating that all individuals harbor some worry about money in relation to student debt.

In terms of the relationship between race and student debt in these models, we see that Black individuals have significantly higher levels of student debt based on their race alone in the single model but not the dummy model. Given that student debt is logged, we can obtain the factor for practical interpretation. To do this, we take the exponent of 2.9223, which gives us a factor of 18.584. Our realistic interpretation is that if the average student debt balance for White individuals was $1,000, we could expect Black individuals to have about $ $18,584 in student debt, which is significant at the 5 percent level.

Baseline & Dummy Baseline OLS Regression by Race – (Table 4.6) – Worry – Future[13]

Responses to: How worried are you about a future job?

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	1.8059	0.7008
	(1.1143)	(1.0805)
Future*Black (2)		2.8483**
		(1.2533)
Future*Black (3)		1.6772
		(1.3589)
Future*Black (4)		2.1281
		(1.4473)
Future*Black (5)		1.4710
		(1.4852)
Future*Black (6)		4.3150***
		(1.6338)
Future*Black (7) – *"Daily"*		0.0023
		(1.8850)
Future*Black – *Black Collective*	0.1541	
	(0.2696)	
Future – *All Races Collective*	-0.1866	-0.1866
	(0.1674)	(0.1677)
_cons	0.5265	0.5265
	(0.6713)	(0.6724)
R^2	0.0192	0.0267
Clusters by id	922	922
N	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

Worry: Future

Looking at Black individuals' collective worry (about the future – without controls) (*baseline model* – without controls – ***Table 4.6***), we see that the single variable for Black worry about the future has no significant relationship with student debt. However, the individualized worry (about the future) of Black individuals (*dummy baseline model*) in ***Table 4.6***, we see that individualized worry (about the future) is significant for score 2 (2.8483) and score 6 (4.3150). These scores are significant at

[13] In our worry model, we left our response "I worry Daily about money, a future job, and I am discouraged Daily about the future" out of the model as the reference group.

the 5 percent and one percent levels, respectively. These results indicate that Black individuals who are closer to never worrying about the future and those worrying about the future almost daily have significantly higher levels of debt than Black and White individuals. Moreover, Black individuals with a score of 6 have higher levels of student debt than Black individuals with a score of 2.

Baseline & Dummy Baseline OLS Regression by Race – (Table 4.7) – Worry – Discouraged[14]

Responses to: How often are you discouraged about the future?

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	2.9010***	1.9578*
	(1.0825)	(1.0071)
Discouraged*Black (2)		1.5813
		(1.1661)
Discouraged*Black (3)		0.2214
		(1.2813)
Discouraged*Black (4)		0.8220
		(1.4061)
Discouraged*Black (5)		-0.8605
		(1.5551)
Discouraged*Black (6)		1.0395
		(2.0414)
Discouraged*Black (7) – *"Daily"*		-1.6556
		(2.2363)
Discouraged*Black – *Black Collective*	-0.1832	
	(0.3005)	
Discouraged – *All Races Collective*	-0.0433	-0.0433
	(0.1817)	(0.1820)
_cons	0.0060	0.0060
	(0.6466)	(0.6476)
R^2	0.0187	0.0219
Clusters by id	922	922
N	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

[14] In our worry model, we left our response "I worry Daily about money, a future job, and I am discouraged Daily about the future" out of the model as the reference group.

Worry: Discouraged

In ***Table 4.7*** above, we compare the point estimates for our dummy baseline regression for worry (feeling discouraged about the future – without controls) to our single variable baseline regression (without controls). We do this to investigate the differences in overall worry (discouraged = baseline model) on student debt for Black individuals relative to the individual effects (discouraged = dummy baseline model). When analyzing single and dummy models for satisfaction, we can see that neither model has any statistical significance regarding our variable of interest. However, the race of Black individuals is a significant factor in higher levels of student debt in the single variable model (2.9010), and the dummy model (1.9578), and these scores are significant at the 10 percent level and the one percent level, respectively.

Emotional Well-being: Happiness with Standard Model

Baseline & Standard OLS Regression by Race – (Table 5.1) – Happiness within the past month

	Ln (student debt)	Ln (student debt)	Ln (student debt)
	Baseline	*Dummy Baseline*	*Standard*
	Happiness Model	*Happiness Model*	*Happiness Model*
Controls	*No*	*No*	*Yes*
Variables of Interest			
Race – Black	-0.4391	4.2872	5.7229
	(2.6979)	(3.8675)	(4.3293)
Happiness*Black	0.5767		-0.3584
	(0.5285)		(0.7341)
Happiness	0.3274	0.3274	-0.0338
	(0.3544)	(0.3548)	(0.3063)
Happiness*Black (2) – *Once or twice*		-3.0816	-3.2577
		(4.1929)	(3.4941)
Happiness*Black (3) – *Once a week*		-4.3156	-4.1921*
		(4.1080)	(2.5134)
Happiness*Black (4) – *2 or 3 times a week*		-4.7116	-4.2773***
		(3.8022)	(1.5606)
Happiness*Black (5) – *Almost every day*		-0.9646	0.3633
		(3.8778)	(1.0371)
Happiness*Black (6) – *Every day*[15]		-1.9993	

[15] Happiness*Black – Score of 1 "Never" is removed as reference group as is customary in choice models. Happiness*Black – Score of 6 "Every day" is removed due to multicollinearity.

	(3.9882)	
Demographics		
Student's age		-0.0171
		(0.1079)
Student's sex		0.9460*
		(0.5305)
Mom's education		-0.0020
		(0.0504)
Dad's education		-0.0333
		(0.0537)
Age at having first child,		0.0537**
or becoming parent first time (respondent)		(0.0271)
Student employment status		0.4892
		(0.5554)
Tendency toward risk (respondent)		0.5343
		(0.3413)
Enrollment Status & Degree Attainment		
Some college (respondent)		-5.0470***
		(1.4909)
2-year degree (respondent)		-3.1616**
		(1.5684)
4-year degree (respondent)		-0.1161
		(1.2316)
# Years enrolled (respondent)		0.7083***
		(0.2088)
Monetary		
Student's personal wealth		-0.0001***
		(0.0000)
Student's previous year's earnings		-0.0000***
		(0.0000)
Black parental wealth – *at least one Black parent*[16]		-0.0000
		(0.0000)
Income of parent #1		-0.0000**
		(0.0000)
Income of parent #2		0.0000***
		(0.0000)
Financial Literacy		
Financially responsible –		1.7973
someone else all of the time		(3.4751)
Financially responsible –		0.5612
someone else most of the time		(1.5009)
Financially responsible –		-1.4866**
half of the time		(0.7389)
Financially responsible –		-0.6265
most of the time		(0.4882)
Financial literacy		-0.2019
		(0.5008)
Parental Assistance		
Loan from parents		0.3481
		(0.6734)
Parents covering bills		1.0113**
		(0.4944)
Parents covering tuition		-1.8453***
		(0.6116)
Parents covering vehicle		0.2364
		(0.6308)

[16] Reference groups are Black parent wealth (both parents are Black), White parent wealth (both parents are White), White parent wealth (at least one parent is White), Parent wealth (One Black parent & One White parent).

Parents covering housing			0.0578 (0.6282)
Region			
Northeast[17]			4.9535*** (1.1391)
Northcentral[18]			5.5544*** (1.0689)
South[19]			3.9239*** (1.0017)
West[20]			2.8911*** (1.0374)
Alaska/Hawaii			0.7951 (1.2509)
cons	-1.7924 (1.8237)	-1.7924 (1.8261)	-3.9754 (3.7644)
R^2	0.0224	0.0294	0.2149
Cluster by id	922	922	922
N	1,551	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$
OLS regression model estimated with panel data, clustered by person id
Standard errors in parentheses

Our baseline and dummy model results for all emotional well-being variables were insignificant. Additionally, we ran standard models for each emotional well-being variable, and the results for Interest and Satisfaction remained insignificant (results in ***Appendix B***). However, adding controlling factors for Happiness shows some significant associations with student debt, as shown in ***Table 5.1*** below. Our analysis for Happiness shows that individuals with scores of 3 "Once a week" and 4 "2 or 3 times a week" have significantly lower student debt levels than other Black subgroups and White individuals.

Regarding controlling factors, our findings are consistent with previous literature regarding their significance in student debt. These factors, including demographics, enrollment status and degree attainment, financial literacy and parental assistance, and

[17] Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont
[18] Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin
[19] Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, Washington DC, West Virginia
[20] Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming

region of residence, have been widely acknowledged as important considerations in understanding student debt outcomes. Our test of parental wealth was differentiated by race, focusing on households with at least one Black parent relative to other household compositions (one Black and one White parent, Two Black parents, Two White parents, and one White parent). The results did not find any significant association between having at least one Black parent and higher levels of student debt.

Confidence Compared to Others with Standard Model

Baseline & Standard OLS Regression by Race – (Table 5.2) – Confidence

	Ln (student debt)	Ln (student debt)	Ln (student debt)
	Baseline	*Dummy Baseline*	*Standard*
	Confidence Model	*Confidence Model*	*Confidence Model*
Controls	*No*	*No*	*Yes*
Variables of Interest			
Race – Black	5.8950**	10.5568***	11.1834***
	(2.7951)	(1.0903)	(1.1715)
Confidence*Black	-0.5841		
	(0.4651)		
Confidence	0.0625	0.0625	
	(0.2446)	(0.2450)	
Confidence*Black (2)[21]		-17.1361***	-16.1060***
		(0.2450)	(1.7942)
Confidence*Black (3)		-8.9765***	-8.8231***
		(2.3510)	(2.3588)
Confidence*Black (4)		-6.8786***	-6.8010***
		(1.5484)	(1.6498)
Confidence*Black (5)		-7.6667***	-7.5188***
		(1.5235)	(1.4252)
Confidence*Black (6)		-7.0276***	-7.2900***
		(1.4437)	(1.3157)
Confidence*Black (7) – "A lot better than other people"		-9.2180***	-8.2434***
		(1.5999)	(1.2260)
Demographics			*Controls – Yes*
Enrollment Status & Degree Attainment			*Controls – Yes*
Monetary			*Controls – Yes*
Financial Literacy			*Controls – Yes*
Parental Assistance			*Controls – Yes*
Region			*Controls – Yes*
cons	-0.4534	-0.4534	-3.8655
	(1.3234)	(1.3255)	(3.4858)

[21] Confidence*Black – Score of 1 where confidence of the Black individual is "A lot worse than other people" is not included in this analysis for reference group purposes as is customary in choice models.

R^2	0.0194	0.0249	0.2073
Cluster by id	922	922	922
N	1,551	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$
OLS regression model estimated with panel data, clustered by person id
Standard errors in parentheses

In *hypothesis 1b*, we expected to find a significant relationship between confidence and student debt that differed by race. Our results (***Table 5.2***) did not show a significant relationship between confidence and student debt by race in our single variable model. However, we did find significance in confidence when testing our dummy model and dummy variables in our standard model. The results suggest that the overall confidence level, when comparing Black individuals to White individuals and for both racial groups combined, has no significant relationship with student debt. However, when testing individual responses of Black individuals as dummy variables in our models, we find significant relationships in every category of confidence, where each of the seven responses is significant at the one percent level. In both the dummy and standard models, the coefficient of individual responses for score 2 was the highest, indicating that Black individuals experiencing nearly lower levels of confidence have higher levels of student debt than Black and White respondents. Furthermore, given that each score is significant at the one percent level, this indicates that a one-unit increase in confidence for Black individuals is associated with lower levels of student debt than White individuals across the board.

Looking at race specifically from ***Table 5.2***, we see that being Black is associated with higher levels of student debt in all three models. Considering the countering directions of the coefficients for race alone, and the interaction between race and confidence, these results suggest that while being a Black individual is generally associated with higher student debt compared to White individuals, within the Black population,

confidence may serve as a protective factor, leading to lower levels of student debt relative to White individuals.

Regarding controlling factors, our findings are consistent with previous literature regarding their significance in student debt. These factors, including demographics, enrollment status and degree attainment, financial literacy and parental assistance, and region of residence, have been widely acknowledged as important considerations in understanding student debt outcomes. Our test of parental wealth was differentiated by race, focusing on households with at least one Black parent relative to other household compositions (one Black and one White parent, Two Black parents, Two White parents, and one White parent). The results did not find any significant association between having at least one Black parent and higher levels of student debt.

In our single variable, dummy, and standard model, we did not find any significance between being discouraged about the future and Black individuals in relation to student debt. The results of the standard model are in ***Appendix B***.

Worry: About Money with Standard Model

In our single variable, dummy, and standard model, we did not find any significance between being discouraged about the future and Black individuals in relation to student debt. The results of the standard model are in ***Appendix B***.

Baseline & Standard OLS Regression by Race – (Table 5.3) – Worry About Money

	Ln (student debt)	Ln (student debt)	Ln (student debt)
	Baseline	*Dummy Baseline*	*Standard*[22]
	Money Model	*Money Model*	*Money Model*
Controls	*No*	*No*	*Yes*
Variables of Interest			
Race – Black	2.9223**	1.4045	2.7545**
	(1.1761)	(1.2395)	(1.2067)
Money*Black	-0.1578		
	(0.2822)		
Money	0.2808*	0.2808*	0.2534*
	(0.1644)	(0.1647)	(0.1461)
Money*Black (2)[23]		2.3803*	1.7162
		(1.4235)	(1.3131)
Money*Black (3)		0.7771	0.5222
		(1.4425)	(1.3186)
Money*Black (4)		1.3026	1.0751
		(1.5067)	(1.3862)
Money*Black (5)		1.1031	0.5630
		(1.6249)	(1.4885)
Money*Black (6)		2.2861	2.4583
		(1.9532)	(1.7453)
Money*Black (7) – "Daily"		-1.3975	-1.1385
		(1.9397)	(1.7198)
Demographics			*Controls – Yes*
Enrollment Status & Degree Attainment			*Controls – Yes*
Monetary			*Controls – Yes*
Financial Literacy			*Controls – Yes*
Parental Assistance			*Controls – Yes*
Region			*Controls – Yes*
cons	-1.1593*	-1.1593*	-4.4971
	(0.6724)	(0.6735)	(3.5260)
R^2	0.0208	0.0259	0.2101
Cluster by id	922	922	922
N	1,551	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$
OLS regression model estimated with panel data, clustered by person id
Standard errors in parentheses

In *hypothesis 1c*, we expected to find a significant relationship between worry and student debt that differed by race. Our results (***Table 5.3***) for our single variable model confirm a relationship between worry about money and student debt for both races. However, there is no significant relationship in terms of the interaction between worry

[22] Same controls as standard confidence model. Abbreviated model shown here as controls are consistent throughout all standard models.
[23] Money*Black – Score of 1 where the Black individual is "Never" worried about money is left out of the analysis for reference group purposes as is customary in choice models.

about money and race in relation to student debt. Additionally, Black individuals are shown to have significantly higher levels of student debt relative to their White peers.

Our dummy model does not confirm a relationship between student debt and race alone but continues to affirm the relationship between worry about money and student debt for both races. Moreover, the dummy model shows that individuals with a score of 3 are likely to have significantly higher student debt levels than other Black subgroups and White individuals.

As we move into our full standard model with controls, we see that the relationship between worry about money and student debt for both races had an enduring effect. We also see that Black individuals have significantly higher student debt levels than their White peers.

Regarding controlling factors, our findings are consistent with previous literature regarding their significance in student debt. These factors, including demographics, enrollment status and degree attainment, financial literacy and parental assistance, and region of residence, have been widely acknowledged as important considerations in understanding student debt outcomes. Our test of parental wealth was differentiated by race, focusing on households with at least one Black parent relative to other household compositions (one Black and one White parent, Two Black parents, Two White parents, and one White parent). The results did not find any significant association between having at least one Black parent and higher levels of student debt.

Worry: About Future Job with Standard Model

Baseline & Standard OLS Regression by Race – (Table 5.4) – Worry About Future Job

	Ln (student debt)	Ln (student debt)	Ln (student debt)
	Baseline	*Dummy Baseline*	*Standard*
	Future Model	*Future Model*	*Future Model*
Controls	*No*	*No*	*Yes*
Variables of Interest			
Race – Black	1.8059	0.7008	2.4687**
	(1.1143)	(1.0805)	(0.9941)
Future*Black	0.1541		
	(0.2696)		
Future	-0.1866	-0.1866	
	(0.1674)	(0.1677)	
Future*Black (2)[24]		2.8483**	1.5959
		(1.2533)	(1.1428)
Future*Black (3)		1.6772	0.8708
		(1.3589)	(1.2032)
Future*Black (4)		2.1281	1.0603
		(1.4473)	(1.2245)
Future*Black (5)		1.4710	0.8262
		(1.4852)	(1.2814)
Future*Black (6)		4.3150***	3.3963***
		(1.6338)	(1.2623)
Future*Black (7) – "Daily"		0.0023	-0.9128
		(1.8850)	(1.5610)
Demographics			*Controls – Yes*
Enrollment Status & Degree Attainment			*Controls – Yes*
Monetary			*Controls – Yes*
Financial Literacy			*Controls – Yes*
Parental Assistance			*Controls – Yes*
Region			*Controls – Yes*
cons	0.5265	0.5265	-4.0287
	(0.6713)	(0.6724)	(3.5047)
R^2	0.0192	0.0267	0.2093
Cluster by id	922	922	922
N	1,551	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$
OLS regression model estimated with panel data, clustered by person id
Standard errors in parentheses

In ***Table 5.4***, our single variable baseline model rendered no significance. However, our dummy model showed that Black individuals with scores of 2 and 6 have

[24] Future*Black – Score of 1 where the Black individual is "Never" worried about future job is left out of the analysis for reference group purposes as is customary in choice models.

significantly higher student debt levels than other Black subgroups in this analysis and their White peers. The higher coefficient for individuals with a score of 6 shows that Black individuals who worry about future job opportunities have significantly higher student debt levels than other Black subgroups and their White peers. Practically speaking, this means that Black individuals who almost worry about future jobs daily have higher levels of student debt than any other subgroup in our analysis. A score of 2 for Black individuals in this analysis indicates that individuals who seldom worry about future jobs have the second highest student debt levels of this subgroup and their White peers.

In our full model, only the score of 6 remains significant, but race is now associated with higher student debt levels for Black individuals. Regarding controlling factors, our findings are consistent with previous literature regarding their significance in student debt. These factors, including demographics, enrollment status and degree attainment, financial literacy and parental assistance, and region of residence, have been widely acknowledged as important considerations in understanding student debt outcomes. Our test of parental wealth was differentiated by race, focusing on households with at least one Black parent relative to other household compositions (one Black and one White parent, Two Black parents, Two White parents, and one White parent). The results did not find any significant association between having at least one Black parent and higher levels of student debt.

Robustness Checks

While our analysis aims to delve into the relationship between emotions and changes in debt levels, we recognize that establishing a definitive causal link requires further investigation. By exploring the lagged connection between emotions and debt levels,

we gain valuable insights into the intricate dynamics of debt repayment and potential associations.

Our focus on how past emotions influence current debt levels provides valuable insights into the complex interplay between emotions and debt dynamics. While we cannot establish causality with certainty, this analysis contributes to our understanding of how emotions may impact changes in debt over time.

It's important to note that our analysis does not offer definitive proof of causality. However, by examining the influence of emotions on debt levels, we uncover patterns and associations that contribute to a broader understanding of the factors influencing debt repayment behaviors.

To establish a more robust causal relationship between emotions and debt repayment, further research and refined methodologies will be necessary. Our findings lay the groundwork for future investigations in this area, guiding the exploration of potential causal mechanisms and deepening our understanding of the role of emotions in debt dynamics.

Lagged Variables

We run a separate analysis looking at the relationship between emotion measures and student debt by lagging the emotion measures. In that analysis, we run a single variable model, where the emotion measures are considered in their aggregate context, and a dummy model where the emotion measures are considered in their disaggregate context.

We create lagged variables by taking the value from the previous period for the variable of interest, for each individual, identified by their *unique person id*. Doing this helps us capture the emotion experienced by each person in the previous period. The resulting variables give us the collective emotion felt by both Black and White individuals. We then disaggregate the variable by generating a dummy variable for each score.

We further parse by race by interacting both the aggregate and disaggregate lagged variable with our race variable specifically identifying those individuals who recorded a response of being African American at first mention.

Lagged Variable Data Cleaning

As a sub-analysis, we looked at the relationship between lagged emotion measures and student debt differing by race. For that analysis, we dropped all responses of zero in our lagged happiness variable and were left with 629 observations and 438 *unique person ids*. Thus, our sub-analysis is restricted to non-missing observations for our lagged (robust) analysis as well. The results of our lagged models are discussed below.

Lagged Baseline OLS Regression by Race – (Table 6.1) – Emotion – Happiness[25]

Responses to: Feeling happy in life within the last month?

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	-0.1497	12.5133***
	(4.5311)	(1.9684)

[25] One response was left out to serve as the reference category for the categorical variable, as is common practice in choice-based models. In our emotion models, our response "Never" (*Score (1)*) was omitted because it is used as the reference group for the dummy emotion models.

Lagged Happiness*Black – *Black Collective*	0.6258	
	(0.8785)	
Lagged Happiness – *All Races Collective*	0.5399	0.5399
	(0.4740)	(0.4756)
Lagged Happiness*Black (2) – *Once or twice*		-17.1886***
		(0.4756)
Lagged Happiness*Black (3) – *Once a week*		-7.5370*
		(3.8718)
Lagged Happiness*Black (4) – *2 or 3 times a week*		-11.6062***
		(2.2450)
Lagged Happiness*Black (5) – *Almost every day*		-9.5251***
		(2.0894)
Lagged Happiness*Black (6) – *Every day*		-8.5865***
		(2.6616)
_cons	-3.3122	-3.3122
	(2.4255)	(2.4333)
R^2	0.0335	0.0411
Clusters by id	438	438
N	629	629

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

In ***Table 6.1***, lagging the feeling of happiness by one period does not render any significance in our single variable model. However, in our dummy model, lagging the feeling of happiness by one period shows that happiness at every level is significantly associated with student debt, and this relationship differs by race. Furthermore, Black individuals at all levels of happiness experience significantly lower student debt levels relative to their White peers, with those experiencing happiness once or twice a month and those experiencing happiness 2 or 3 times a week having the lowest levels of student debt relative to other Black subgroups and their White peers. Race also had a significant relationship with student debt in the dummy model, where Black individuals reported significantly higher levels of student debt than their White peers.

Lagged Baseline OLS Regression by Race – (Table 6.2) – Emotion – Interest[26]

Responses to: Feeling interested in life within the last month?

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	5.4390	14.0795***
	(4.4631)	(1.9635)
Lagged Interest*Black – *Black Collective*	-0.4942	
	(0.8176)	
Lagged Interest – *All Races Collective*	0.9681**	0.9681**
	(0.4565)	(0.4579)
Lagged Interest*Black (2) – *Once or twice*		-9.0271
		(5.9011)
Lagged Interest*Black (3) – *Once a week*		-12.8842***
		(4.5128)
Lagged Interest*Black (4) – *2 or 3 times a week*		-12.1579***
		(2.7293)
Lagged Interest*Black (5) – *Almost every day*		-11.8048***
		(2.1934)
Lagged Interest*Black (6) – *Every day*		-11.2134***
		(2.4558)
_cons	-5.6345**	-5.6345**
	(2.3981)	(2.4059)
R^2	0.0357	0.0420
Clusters by id	922	922
N	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

In ***Table 6.2***, lagging the emotion of interest by one period shows that interest in life, for both races, has a significantly positive relationship with student debt in our single variable model. In our dummy model, lagging worry about money by one period shows that Black individuals with a score of 3 "Once a week", a score of 4 "2 or 3 times a week", a score of 5 "Almost every day", and a score of 6 "Every day" had significantly higher student debt levels than other Black subgroups in this analysis and their White peers. Moreover, race had a significant relationship with student debt in our dummy model, where Black individuals reported significantly higher levels of student debt than their White peers.

[26] One response was left out to serve as the reference category for the categorical variable, as is common practice in choice-based models. In our emotion models, our response "Never" (*Score (1)*) was omitted because it is used as the reference group for the dummy emotion models.

Lagged Baseline OLS Regression by Race – (Table 6.3) – Emotion – Satisfied[27]

Responses to: Feeling satisfied with life within the last month?

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	0.3100	5.4521
	(3.2996)	(4.8021)
Lagged Satisfied*Black – *Black Collective*	0.5454	
	(0.6594)	
Lagged Satisfied – *All Races Collective*	0.2006	0.2006
	(0.3878)	(0.3891)
Lagged Satisfied*Black (2) – *Once or twice*		-8.9273*
		(5.0286)
Lagged Satisfied*Black (3) – *Once a week*		-3.0259
		(5.0918)
Lagged Satisfied*Black (4) – *2 or 3 times a week*		-2.3116
		(4.9786)
Lagged Satisfied*Black (5) – *Almost every day*		-2.2277
		(4.9128)
Lagged Satisfied*Black (6) – *Every day*		-2.1668
		(5.0224)
_cons	-1.5462	-1.5462
	(1.9434)	(1.9496)
R^2	0.0311	0.0372
Clusters by id	438	438
N	629	629

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

In ***Table 6.3***, in our single variable model, lagging satisfaction by one period does not render any statistically significant relationship with student debt. However, in our dummy model, lagging satisfaction by one period shows that Black individuals who felt satisfaction once or twice within the past month, at the time of response, had significantly lower student debt levels than other Black subgroups in this analysis and their White peers.

[27] One response was left out to serve as the reference category for the categorical variable, as is common practice in choice-based models. In our emotion models, our response "Never" (*Score (1)*) was omitted because it is used as the reference group for the dummy emotion models.

Lagged Baseline OLS Regression by Race – (Table 6.4) – Confidence[28]

Responses to: Confidence compared to others

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	5.5327	1.8799
	(4.7492)	(1.1974)
Lagged Confidence*Black – *Black Collective*	-0.4330	
	(0.7692)	
Lagged Confidence – *All Races Collective*	0.1326	0.1326
	(0.3506)	(0.3515)
Lagged Confidence*Black (3)		8.2124***
		(1.6948)
Lagged Confidence*Black (4)		-2.2962
		(2.7003)
Lagged Confidence*Black (5)		2.0858
		(1.9849)
Lagged Confidence*Black (6)		2.7923*
		(1.4940)
_cons	-1.2798	-1.2798
	(1.9410)	(1.9457)
R^2	0.0280	0.0382
Clusters by id	438	438
N	629	629

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

In ***Table 6.4***, in our single variable model, lagging confidence by one period renders no significant relationship between confidence and student debt. In our dummy model, lagging confidence by one period shows that Black individuals with a confidence score of 3 had significantly higher student debt levels than other Black subgroups in this analysis and their White peers. In this analysis, Black individuals with confidence "A lot better than others" had higher student debt levels than other Black subgroups and their White peers.

[28] One response was left out to serve as the reference category for the categorical variable, as is common practice in choice-based models. In this model, our response "A lot worse than others" (*Score (1)*) was omitted because it is used as the reference group. Score 2 was omitted to due to multicollinearity.

Lagged Baseline OLS Regression by Race – (Table 6.5) – Worry – Money[29]

Responses to: Worried about Money

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	2.2682	0.0099
	(1.8408)	(1.9001)
Lagged Money*Black – *Black Collective*	0.1769	
	(0.4168)	
Lagged Money – *All Races Collective*	0.0511	0.0511
	(0.2331)	(0.2340)
Lagged Money*Black (2)		5.2116**
		(2.4240)
Lagged Money*Black (3)		4.0068*
		(2.3567)
Lagged Money*Black (4)		0.3340
		(2.2430)
Lagged Money*Black (5)		5.7903**
		(2.3827)
Lagged Money*Black (6)		5.4529*
		(2.8598)
Lagged Money*Black (7) – *Daily*		1.3651
		(2.8821)
_cons	-0.7684	-0.7684
	(0.9828)	(0.9868)
R^2	0.0283	0.0518
Clusters by id	438	438
N	629	629

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

In ***Table 6.5***, lagging the feeling of worry about money by one period does not render any significance in our single variable model. In our dummy model, lagging worry about money by one period shows that Black individuals with a score of 2, score of 3, score of 5, and score of 6 had significantly higher student debt levels than other Black subgroups in this analysis and their White peers.

[29] One response was left out to serve as the reference category for the categorical variable, as is common practice in choice-based models. In this model, our response "Never" (*Score (1)*) was omitted because it is used as the reference group.

Lagged Baseline OLS Regression by Race – (Table 6.6) – Worry – Future[30]

Responses to: Worried about future jobs

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	2.0767	1.1409
	(1.7557)	(1.6809)
Lagged Future*Black – *Black Collective*	0.2416	
	(0.4204)	
Lagged Future – *All Races Collective*	-0.2226	-0.2226
	(0.2356)	(0.2365)
Lagged Future*Black (2)		1.4415
		(2.0531)
Lagged Future*Black (3)		2.0003
		(2.1669)
Lagged Future*Black (4)		3.6245*
		(2.0869)
Lagged Future*Black (5)		1.9694
		(2.2576)
Lagged Future*Black (6)		5.3350**
		(2.6909)
Lagged Future*Black (7) – *Daily*		-0.7828
		(3.0205)
_cons	0.2343	0.2343
	(0.9773)	(0.9812)
R^2	0.0292	0.0401
Clusters by id	438	438
N	629	629

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

In ***Table 6.6***, in our single variable model, lagging worry about future jobs by one period showed no significant relationship with student debt. In our dummy model, lagging worry about future jobs by one period shows that Black individuals with scores of 4 and 6 had significantly higher student debt levels than other Black subgroups in this analysis and their White peers.

[30] One response was left out to serve as the reference category for the categorical variable, as is common practice in choice-based models. In this model, our response "Never" (*Score (1)*) was omitted because it is used as the reference group.

Lagged Baseline OLS Regression by Race – (Table 6.7) – Worry – Discourage[31]

Responses to: Feeling discouraged about the future

	Ln (student debt)	Ln (student debt)
	Baseline – Single	*Dummy Baseline*
Controls	*No*	*No*
Race - *Black*	4.3365***	3.2124**
	(1.6652)	(1.4577)
Lagged Discourage*Black – *Black Collective*	-0.4699	
	(0.4901)	
Lagged Discourage – *All Races Collective*	0.1219	0.1219
	(0.2696)	(0.2707)
Lagged Discourage*Black (2)		0.7859
		(1.8427)
Lagged Discourage*Black (3)		-0.2060
		(2.1138)
Lagged Discourage*Black (4)		-0.7411
		(2.2330)
Lagged Discourage*Black (5)		0.0388
		(2.4433)
Lagged Discourage*Black (6)		-0.7409
		(3.3314)
Lagged Discourage*Black (7) – *Daily*		-10.0218***
		(2.0646)
_cons	-0.9516	-0.9516
	(0.9249)	(0.9287)
R^2	0.0293	0.0372
Clusters by id	438	438
N	629	629

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id, Standard errors in parentheses.

In ***Table 6.7***, lagging the feeling of discouragement about the future by one period does not render any significance in our single variable model. In our dummy model, Black individuals who were discouraged about the future "Daily" had significantly lower student debt levels than other Black subgroups and their White peers in this analysis. In both models, race had an enduring relationship with student debt, where Black individuals reported significantly higher levels of student debt than their White peers.

[31] One response was left out to serve as the reference category for the categorical variable, as is common practice in choice-based models. In this model, our response "Never" (*Score (1)*) was omitted because it is used as the reference group.

Though the analysis of lagged variables is not the focus of our study, there are some meaningful, significant relationships to move forward with in future research with control variables.

Implications

The research of Addo et al. (2016) shows that White individuals have lower levels of student debt than Black individuals and that parental wealth is a significant driver in allowing White individuals to have lower levels of student debt than Black individuals. While Addo et al. (2016) look at the relationship between parental wealth and student debt, our study looks at the relationship between emotion, confidence, worry, and student debt by race. Our OLS regression models with and without controls confirm statistically significant relationships between race and student debt, where Black individuals have significantly higher student debt levels than their White peers (***Table 5.2***, ***Table 5.3***, ***Table 5.4***). Through our *Standard Models*, we also confirm significant relationships between emotional measures and student debt when happiness, confidence, worry about money, and worry about a future job is the variable of interest. Of these results, worry about money is the only standard model that did not differ by race.

Loewenstein (2000) directly discusses the relationship between emotion and economic behavior when uncertainty is involved. Furthermore, Loewenstein et al. (2001) highlight that some of the decisions made in the current state of emotion might have consequences in the future. Elements of uncertainty play a factor in this study, as worry about the future, job opportunities, and discouragement regarding the future were tested as part of our regression analysis. When testing the association of emotional well-being, confidence, and worry with student debt, we found that

happiness, confidence, worry about money, and worry about a future job were significantly associated with student debt. These findings are consistent with White (2020) and Nissen (2015), who found associations between emotion measures and economic behavior related to financial decisions in their research.

Furthermore, the work of Nissen (2015), which is more qualitative, found that students associated increased debt levels with financial irresponsibility. Our study used a more quantitative approach and showed that financial responsibility is significantly related to student debt.

This study has implications for understanding how emotion plays a critical role in the educational decisions of individuals from marginalized communities. However, more research is needed into how emotional measures causally impact educational decisions related to student debt. Thus, there is still much work to be done in helping behavioral policymakers determine how to serve individuals best and develop helpful techniques for marginalized communities before the educational decision.

Limitations

Our analysis differs from that of Addo et al. (2016) as we cannot control for certain variables, leading to potentially different conclusions. Unlike Addo et al. (2016), we note that our measure for Black parental wealth is defined as individuals with at least one Black parent. This specification also includes individuals from households with one Black parent only, two Black parents, or one Black parent and one White parent. We acknowledge that defining Black parent wealth in this way introduces some non-exclusivity, but given the data set, we believe this is the best way to specify the measure. While our analysis does not show a significant relationship between Black

parent wealth and student debt, it is important to acknowledge the limitations of our data set and the need for further studies to validate our findings using different data sets.

We also needed access to definitive funding sources that could have addressed the sources of funding for student debt. For example, a variable that includes different types of aid (grants, loans, work-study) was not found in the PSID but may be available in data sets such as the NPSAS or IPEDS. We also did not have an accurate measure of risk preference. While we used risk-related behavior as a proxy for risk, a more direct approach, like the gambling tasks in Addo et al. (2016), would have benefited this study to a greater degree.

A better understanding of the relationship between emotion, confidence, worry, and student debt might come from more nuanced experimental studies. In this way, we could go beyond the limitations of the PSID as it falls short in measuring well-being-related measures in countless ways. For example, (Bogan & Fertig, 2018) discusses the idea that, while anxiety and depression are measured in the PSID, these measurements are clinical and do not necessarily consider individuals who have not been diagnosed with anxiety or depression.

Lastly, we were limited in analyzing an individual's information related to the transfer of resources to others. For example, Black individuals could be taking out higher levels of student debt for the benefit of others. A benefit to others could be classified as medical payments, housing payments, or other significant monetary contributions to parents. In the same way, the PSID lacks substantive data regarding contributions to friends and close associates. Other external issues could be the societal pressures of

attending college in the first place. Because college is held in high regard, Black students may see it as a necessary investment for their future, even enduring increasing levels of debt to attend schools with higher tuition even without the support of alternative aid.

Future Research

Future analysis can go in various directions, such as looking at the relationship between these racial groups based on single-parent homes versus two-parent homes. A Pew Research study discussed the changing ideas around different family structures from 1968 until now and how those structures were perceived to impact children (Livingston, 2018). Thus, one possible direction would be to examine how the difference in family structures and parental influence are associated with student debt decisions. Moreover, one focus of such a study would be addressing the lack of mutual exclusivity in defining family structures, as was an issue in our study.

Another branch of research can examine intersectionality and how emotion, confidence, and worry impact student debt when parsed by race and sex. For example, Black females are more likely to be unbanked and underbanked than any other subgroup identified by race and gender (Addo & Hernández Kent, 2022; Bogan & Wolfolds, 2022). Their research shows that Black females feel financially excluded mainly because of their limited wealth (pp. 43, 47). In other areas of economic behavior, Goldsmith, Veum, and Darity Jr. (1997) find that Black women struggle when paying off student debt due to adverse labor and wage outcomes. Thus, a good amount of research suggests that parsing by race and sex might yield additional insights into the area of intersectionality.

As mentioned earlier, looking at factors that influence well-being using an experimental field study design can help to detangle some of the complexities of the relationships found in our analysis between emotion, confidence, worry, and student debt. Furthermore, as shown in our dummy baseline models, parsing emotional well-being scores could tell us something different about optimal levels of well-being in relation to student debt. Additionally, looking at the relationship between emotion measures and student debt in a pre-decision context might steer us toward the causal relationships between emotion and student debt levels. Given the questions around well-being and whether there is a contemporaneous relationship with debt choices, approaching the issue using lagged models and controlling factors might help us better address these questions.

Lastly, one could test how the past income of parents, grandparents, siblings, or associated networks (people from an individual's circle of associates) relate to their student debt levels. This approach would most likely address the relationship between intergenerational wealth transfers and the parsed contribution of each source of income to an individual's student debt levels.

Conclusion

This research sought to understand the relationship between emotional measures and economic behavior related to student debt. Furthermore, we sought to understand if these outcomes differed by race. We hypothesized that emotional well-being, confidence, and worry would have a significant relationship with student debt that differed by race. In this, we found some emotional measures significantly associated with student debt, while others were not significantly associated with student debt. Regarding our first hypothesis (1a), we confirmed that Black individuals who

experienced happiness between one and three times a week had significantly lower levels of student debt relative to other Black individuals and their White peers. However, we did not confirm significant relationships between interest, satisfaction, and student debt.

In hypothesis (1b), we confirmed that Black individuals had significantly lower levels of student debt for each level of confidence. Moreover, Black individuals with a confidence score of 2 had the lowest level of student debt relative to other Black individuals and their White peers. Hypothesis (1c) confirmed significant relationships between worry about money and student debt, where individuals worried about money had significantly higher student debt levels but did not differ by race. We also confirmed the relationship between worry about future jobs and student debt for Black individuals with a score of 6. These individuals had significantly higher levels of student debt relative to other Black individuals and their White peers. However, we did not confirm significant relationships between discouragement about the future and student debt.

A lack of data on funding sources, risk preference, and transfers to others also limited the study. However, nuanced experimental studies could be a better avenue to understanding the relationship between well-being-related measures and student debt. Lastly, societal pressures of attending college may be a factor for Black students taking out higher levels of student debt even without the support of alternative aid.

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Appendix A: Variable Definitions

Student Debt. This variable represents the amount of student loans reported by the individual. Logged student debt (*Ln (student debt)*) is accomplished by taking the natural log of the variable student debt. The purpose of taking the natural log was to allow us to discuss changes in student debt in terms of percentages.

Emotion. Emotion in our study is defined by three different variables of Happiness, Interest, and Satisfaction with life within the last month. These emotions are measured using a Likert scale which is described below.

Emotional well-being is measured on a Likert scale from 1 to 6, where:

- 1 = Never feeling happy, interested, or satisfied with life within the last month
- 2 = feeling happy, interested, or satisfied with life once or twice within the last month
- 3 = feeling happy, interested, or satisfied with life about once a week within the last month
- 4 = feeling happy, interested, or satisfied with life 2 or 3 times a week within the last month
- 5 = feeling happy, interested, or satisfied with life almost every day within the last month
- 6 = feeling happy, interested, or satisfied with life every day within the last month.

Confidence. This is a scale of self-reported ratings by individuals in relation to their perceived level of confidence relative to others.

Confidence is measured on a Likert scale from 1 to 7, where:

- 1 = I rate my self-confidence "A lot worse than other people"
- 7 = I rate my self-confidence "A lot better than other people"

In stating that this is a Likert scale, we mean to emphasis that individuals could choose only 1, 2, 3, 4, 5, 6, or 7. Respondents could not choose or write in any other number within this 1-7 interval.

Worry. Worry in our study is represented by the three variables of worry about money, worry about future jobs, and discouragement about the future. Worry is measured defined as follows.

Worried is determined on a Likert scale from 1 to 7, where:

- 1 = I am "Never" worried about money, a future job, and I am “Never” discouraged about the future
- 7 = I worry "Daily" about money, a future job, and I am discouraged “Daily” about the future

In stating that this is a Likert scale, we mean to emphasis that individuals could choose only 1, 2, 3, 4, 5, 6, or 7. Respondents could not choose or write in any other number within this 1-7 interval.

Respondent Age. Represents the actual reported age of the individual as of their most recent birthday.

Respondent Enrollment Status. This variable is a composite of several variables: 1) whether the individual graduate graduated from high school, 2) whether the individual ever attended college, 3) whether the individual is in college right now, 4) the degree received from the most recent college attended, 5) the degree received from the previous college attended. In terms of the scale ranges for this variable, individuals are place in one of the following categories: 1) No high school diploma and no GED, 2) No high school diploma but has GED, 3) Has high school diploma, 4) Not enrolled, some college, 5) Not enrolled, 2-yr college graduate, 6) Not enrolled, 4-yr college graduate, 7) Not enrolled, graduate degree, 9) Enrolled, has no prior degree, 10) Enrolled, has a prior degree, 11) Enrolled, graduate program.

Years Enrolled. This is a generated variable that is a composite of the difference between an individual's last year attended at an earlier college less the year they enrolled at that earlier college. Likewise, this generated variable considers the year an individual attended their most recent college less the year they enrolled in the most recent college. Taking the sum of their attendance at the earlier and recent colleges gives a proxy for the total years enrolled. With this, we are controlling for the time individuals spend in college as it relates to the amount of student debt that they consume.

Respondent Employment Status. This is categorical variable where students are placed into the following: 1) Working now, including military 2) Only

temporarily laid off; sick or maternity leave 3) Looking for work, unemployed 4) Retired 5) Disabled, permanently or temporarily 6) Keeping house 7) Student 8) Other.

Student Wealth. This variable is the total amount of money the individual has in checking/savings. It is not inclusive of any other assets such as the value of a farm or business.

Student Earnings. This measures the student's self-reported total earnings from the previous year.

Student Financial Responsibility. PSID constructed variable which averages four variables together related to financial responsibility. Those variables are as follows: 1) How Much Responsibility for Earning Own Living, 2) How Much Responsibility for Paying Own Rent, 3) How Much Responsibility for Paying Own Bills, 4) How much Responsibility for Managing Own Money.

Age at First Becoming a Parent. A scale that is representative of male or female and ranges between the ages of 10 and 30. For males, this scale represents the age of those individuals who first took on the parenting role. For females, this scale represents the age of those individuals who first had a child.

Risky Tendency. This scale comprises the averages of non-missing responses from five risk-related variables. Those variables are as follows: 1) How Often Did Something Dangerous, 2) How Often Damaged Public Property, 3) How Often Got into Physical Fight, 4) How Often Drove When Drunk or High, 5) How Often Rode with Drunk Driver. An increasing number represents an individual's propensity to engage in risky behavior as defined by the PSID data set. A score of seven indicates an individual engaged in one or more of these activities 21 times or more. A score of 1 represents an individual who has never engaged in one or more of these risky behaviors. This variable is used as a proxy for risk preference.

Parental Wealth. This is labeled as imputed wealth in the main family subset of PSID data set and is defined as the value of a farm or business, the value of checking/savings, real estate, stocks, vehicles, annuities/IRAs, and other assets less debt related to credit cards, student loans, medical, legal, and other family loans). In its various forms, we interact parental wealth with race (i.e., parental wealth of one black parent, two black parents, one white parents, one black parent and one white parent).

Parent 1 Income. This variable was pulled from the main family sub-data set and represents the previous year’s earnings for the head.

Parent 2 Income. This variable was pulled from the main family sub-data set and represents the previous year's earnings for the spouse.

Mom's Education. This represents the mother's actual years of education where 12 represents completion of high school, less than 12 represents the total years of school completed. The number of years spent in college is not obtained by this variable, but a selection of 17 indicates some postgraduate coursework.

Dad's Education. This represents the father's actual years of education where 12 represents completion of high school, less than 12 represents the total years of school completed. The number of years spent in college is not obtained by this variable, but a selection of 17 indicates some postgraduate coursework.

Parents covering housing. Categorical variable reflective of support received from parents or relatives in housing assistance. This is a generated variable looking at whether the individual was given a house or condo, whether they received assistance paying rent on their dorm, and whether they received assistance from their parents on their mortgage.

Parents covering vehicle. Categorical variable reflective of the support received from parents or relatives in vehicle receipt.

Parents covering tuition. Categorical variable reflective of the support received from parents or relatives in helping with tuition assistance for college.

Parents covering bills. Categorical variable reflective of support received from parents or relatives in paying bills or covering related utility expenses.

Loan from parents. Categorical variable reflective of receipt of a personal loan from parents or relatives.

Region. Likert variable from the Transition into Adulthood subset of the PSID where respondents identified their region using 1) Northeast, 2) North Central, 3) South, 4) West, 5) Alaska, Hawaii, 6) Foreign country. States were assigned to regions as follows:

- NORTHEAST: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont
- NORTH CENTRAL: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin
- SOUTH: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, Washington DC, West Virginia
- WEST: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

Appendix B: Other OLS Regressions

Baseline & Standard OLS Regression by Race – (Table 5.5) – Emotion – Interest

Responses to: How interested have you been in life within the past month?

	Ln (student debt)	Ln (student debt)	Ln (student debt)
	Baseline	*Dummy Baseline*	*Standard*
	Interest Model	*Interest Model*	*Interest Model*
Controls	*No*	*No*	*Yes*
Variables of Interest			
Race – Black	0.1992	0.3503	0.4840
	(2.7219)	(5.0519)	(6.6228)
Interest*Black	0.3974		0.5114
	(0.5100)		(1.1127)
Interest	0.2873	0.2873	0.0452
	(0.3355)	(0.3359)	(0.3101)
Interest*Black (2)[32] – *Once or twice*		-0.1109	-1.0945
		(5.2368)	(4.6772)
Interest*Black (3) – *Once a week*		1.3137	1.0709
		(5.3239)	(3.8074)
Interest*Black (4) – *2 or 3 times a week*		1.3313	-0.4966
		(5.3062)	(2.6335)
Interest*Black (5) – *Almost every day*		2.1224	0.6219
		(5.0702)	(1.2812)
Interest*Black (6) – *Every day*		2.1173	
		(5.1461)	
Demographics			*Controls – Yes*
Enrollment Status & Degree Attainment			*Controls – Yes*
Monetary			*Controls – Yes*
Financial Literacy			*Controls – Yes*
Parental Assistance			*Controls – Yes*
Region			*Controls – Yes*
cons	-1.6362	-1.6362	-4.4197
	(1.7793)	(1.7816)	(3.8178)
R^2	0.0208	0.0211	0.2065
Cluster by id	922	922	922
N	1,551	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$
OLS regression model estimated with panel data, clustered by person id
Standard errors in parentheses

[32] Interest*Black – Score of 1 where interest in life within the past month of the Black individual was labeled "Never" is not included in this analysis for reference group purposes as is customary in choice models. Score of 6 "every day" removed in standard model due to multicollinearity.

Baseline & Standard OLS Regression by Race – (Table 5.6) – Emotion – Satisfaction

Responses to: How satisfied have you been with life within the past month?

	Ln (student debt)	Ln (student debt)	Ln (student debt)
	Baseline	*Dummy Baseline*	*Standard*
	Satisfied Model	*Satisfied Model*	*Satisfied Model*
Controls	*No*	*No*	*Yes*
Variables of Interest			
Race – Black	2.7432	2.3774	4.5282
	(2.1614)	(2.6176)	(2.8361)
Satisfied*Black	-0.0806		-0.3072
	(0.4353)		(0.5114)
Satisfied	0.1336	0.1336	0.0466
	(0.2907)	(0.2911)	(0.2548)
Satisfied*Black (2)[33] – *Once or twice*		-2.8400	-3.5217
		(2.9183)	(2.3051)
Interest*Black (3) – *Once a week*		1.0551	1.1899
		(2.7448)	(1.7246)
Interest*Black (4) – *2 or 3 times a week*		-0.2080	0.0714
		(2.6917)	(1.2651)
Interest*Black (5) – *Almost every day*		1.0735	1.0255
		(2.6827)	(0.8473)
Interest*Black (6) – *Every day*		-1.2413	
		(2.8459)	
Demographics			*Controls – Yes*
Enrollment Status & Degree Attainment			*Controls – Yes*
Monetary			*Controls – Yes*
Financial Literacy			*Controls – Yes*
Parental Assistance			*Controls – Yes*
Region			*Controls – Yes*
cons	-0.7797	-0.7797	-4.1288
	(1.4647)	(1.4666)	(3.6249)
R^2	0.0182	0.0247	0.2082
Cluster by id	922	922	922
N	1,551	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id

Standard errors in parentheses

[33] Satisfied*Black – Score of 1 where interest in life within the past month of the Black individual was labeled "Never" is not included in this analysis for reference group purposes as is customary in choice models. Score of 6 "every day" removed in standard model due to multicollinearity.

Baseline & Standard OLS Regression by Race – (Table 5.7) – Discourage

Responses to: How Often Feel Discouraged About Future

	Ln (student debt)	Ln (student debt)	Ln (student debt)
	Baseline	*Dummy Baseline*	*Standard*
	Discourage Model	*Discourage Model*	*Discourage Model*
Controls	*No*	*No*	*Yes*
Variables of Interest			
Race – Black	2.9010***	1.9578*	3.6630***
	(1.0825)	(1.0071)	(1.1497)
Discourage*Black	-0.1832		-0.2907
	(0.3005)		(0.3372)
Discourage	-0.0433	-0.0433	-0.0191
	(0.1817)	(0.1820)	(0.1568)
Discourage*Black (2)[34]		1.5813	0.7580
		(1.1661)	(1.0016)
Discourage*Black (3)		0.2214	0.0766
		(1.2813)	(1.1115)
Discourage*Black (4)		0.8220	1.3282
		(1.4061)	(1.2350)
Discourage*Black (5)		-0.8605	0.5634
		(1.5551)	(1.4562)
Discourage*Black (6)		1.0395	2.0237
		(2.0414)	(1.9850)
Discourage*Black (7) – "Daily"		-1.6556	
		(2.2363)	
Demographics			*Controls – Yes*
Enrollment Status & Degree Attainment			*Controls – Yes*
Monetary			*Controls – Yes*
Financial Literacy			*Controls – Yes*
Parental Assistance			*Controls – Yes*
Region			*Controls – Yes*
cons	0.0060	0.0060	-4.2155
	(0.6466)	(0.6476)	(3.5456)
R^2	0.0187	0.0219	0.2057
Cluster by id	922	922	922
N	1,551	1,551	1,551

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

OLS regression model estimated with panel data, clustered by person id

Standard errors in parentheses

[34] Discourage*Black – Score of 1 where Black individuals "Never" feel discouraged about the future is not included in this analysis for reference group purposes as is customary in choice models.