

The effects of student loan debt on financial worry

by

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AN ABSTRACT OF A DISSERTATION

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Abstract

With the costs of higher education increasing, the need to search for alternative ways to fund these expenses has also increased. While grants, scholarships, personal savings, and financial assistance from parents, may be effective for some, this is not the case for all students as some are inclined to use student loans to fund their higher education journey. Though student loan debt is an issue globally, Americans in particular face an enormous student loan deficit—\$1.5 trillion, twice what it was a decade ago (Casey, 2020).

The problem is not that student loans exist, as they provide an avenue to complete a degree, the issue arises when someone cannot pay back these loans because they are stretched very thin financially when the payment period begins. This can cause individuals to worry about the future of their finances. Drawing from student loan debt and worry research, this study highlights the degree to which student loan debt influences financial worry and seeks to explain the magnitude (i.e., to what degree student loans are tied to worry) and the mechanism by which student loans influence financial worry. (i.e., how does this happen).

For the purpose of this study, financial worry was conceptualized as repetitive negative thoughts about uncertain future events, and a scale was created that encompasses retirement worry, personal finance anxiety, and physical and emotional financial stress. The study is guided by the Tallis and Eynseck model of worry. The model states that worry is activated when the severity of a perceived threat exceeds the estimated coping resources. Once a stressor is perceived, that stressor is then evaluated based on its severity. In this research, the stressor is student loan debt. Depending on the severity of the stressor, that stressor then influences an individual's perception of how threatening it is. These threats can be objective or subjective and can also influence financial worry.

The study used the 2018 National Financial Capability Study (NFCS) dataset. To take the model to data, student loans were categorized as two variables, student loans that are not delinquent and delinquent student loans. Results were then compared to individuals who do not have any student loans. Analyses showed a direct positive relationship between student loan debt delinquency and student loan debt non-delinquency to both objective and subjective financial threats. The magnitude of the student loan delinquency effect was greater than that of non-delinquency on both subjective and objective stressors. Furthermore, subjective and objective financial stress were both positively associated with financial worry. When objective and subjective threat stressors were included, student loan delinquency and student loan non-delinquency were not significant predictors of financial worry at the .05 level.

Results from the present study contribute to the literature on financial worry, financial stress, and student loan debt. Results also provide the foundation for understanding the influence of student loan debt on financial worry as well as understanding the influence of coping mechanisms to decrease such financial worry. The results of the present study should be of interest to policymakers, financial and mental health professionals, and students who may rely on debt for attending an institution of higher education.

Keywords: Financial worry, student loan debt, financial stress, coping mechanisms

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Dedication

I dedicate this work to my little family and including its newest member. Alexandra and Abigail, thank you for being the most important people in my life. When things got tough, you were always there to motivate and encourage me to keep on. Your endless support is one of the reasons why this journey is close to finished.

Preface

First-generation college students do not have many options when it comes to the financing of a higher education degree. Our parents, while well-intentioned, do not know how to help us navigate the ins and outs of college education, nor can they help supplement any costs. Therefore, student loans become not just a way, but the only way to attain the desired college degree. With the increasing number of first-generation college students, the need to educate them on the appropriate uses of student loan debt is more important now than it ever was. The goal of this research is that the findings here are used as a method to teach future college students the importance of borrowing responsibly.

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Chapter 1: Introduction

Student loan debt has been a trending topic over the past months. Often labeled the student loan debt crisis or student loan bubble, the amount of debt combined borrowers owe has surpassed \$1.68 trillion and grows over six times faster than the nation's economy (Bustamante, 2020). This is due in large part to the 44.7 million student borrowers who, on average, owe about \$37,584 each. The increasing inability of some to make their monthly payments coupled with the issue of a global pandemic urged the government to reduce loan balances as well as forgo payments and freeze interest rates until December 2022.

According to the Mind over Money survey by Capital One (2020), Americans are most worried about their financial future, which includes: not having enough money to retire (68%), keeping up with the cost of living (56%), and managing debt levels (45%). Because managing debt levels has been made known as an important factor to why individuals worry, the impact of student loan debt on individuals should not be taken lightly. Given that student loans play a role in the overall debt loads of almost 45 million Americans, the need to understand its contribution to worry regarding finances is crucial in delineating the short-term and long-term effects of student loan debt as a whole.

Worry has been defined as a commonly experienced sequence of unpleasant thoughts and has been shown to affect overall life satisfaction (Borkovec, 1985). The belief that life satisfaction is affected by worry stems from the idea that those who worry are concerned with issues that remove their favorable attitudes toward their own life. Still, it has been found that worry and life satisfaction are separate entities (Fakori & Lyon, 2005; Paolini et al., 2006, Rathi & Lee, 2018). One of the common reasons people worry involves their finances which introduces the concept of financial worry and is defined as repeated and negative thinking about

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the uncertainty of one's future financial situation (de Bruijn & Antonides, 2020). In simpler terms, worry can be defined as a state of uncertainty, which has yet to happen, but produces unpleasant thoughts about something, which may or may not occur. Magwegwe et al. (2022) established in their recent study of retirement that worry is more concerned with an individual's future.

Not to be confused with financial worry, financial stress has been referred to as economic stress, economic hardship, economic strain, and economic pressure (Voydanoff, 1984). Financial stress can be described as a situation in which individuals find themselves currently and may be produced by outside stimuli such as a job loss, debt, or simply being negligent with finances. It is also perceived to be one of the most important sources of psycho-social stress because so many of the basic activities of daily life are associated with personal financial resources and their management (Peirce et al., 1996). Financial stress has also been defined as the inability to meet one's economic responsibilities (e.g. paying bills) and is influenced by psychological factors (e.g., attitudes and beliefs) (Northern et al., 2010). The effect of such inability can be displayed as poor individual health caused by the accumulation of debt (Choi, 2016), lower subjective well-being (Robb, 2017), may cause depression or depression-like symptoms (Kim et al., 2019), and reduced individual psychological well-being and overall life satisfaction (Wang & Pullman, 2019).

Financial stress associated with student loans may act as a threat that leads to financial worry. A threat can be an outside stimulus that affects worry as a whole. The effect loans have on individuals' well-being has been a growing topic of study. Some research has indicated that student loans have no significant effect on financial satisfaction (Robb et al., 2018), but a recent study found loans decrease financial satisfaction for young adults (Joseph & MacDonald, 2021).

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Other research has suggested that only when moderated via financial education can student loans influence financial satisfaction (Kim et al., 2021). While financial satisfaction is a valid measure of financial wellness, it does not account as directly for the stress and worries having student loans pose for borrowers. This study is unique in the sense that it will assess the impact of student loans on financial worry by combining three distinct measures: a) retirement worry, b) personal finance anxiety, and c) physical and emotional financial stress.

To achieve these aims the following research questions will be a guide:

Research Questions

1. Do student loans and student loan delinquency increase financial threats?
2. Do student loans and student loan delinquency increase financial worry?
3. Do coping resources reduce financial worry?
4. Do financial threats mediate the relationships between student loans and student loan delinquency with financial worry?

Chapter 2: Literature Review

Student Loans

It is difficult to associate student loan debt accumulation with one specific factor. Some have made the case that race and socioeconomic status along with financial literacy are common factors associated with higher student loan debt burdens (Artavanis & Karra, 2020; Wilcox et al., 2021). Others have associated higher student loan debt burdens with the increased costs of higher education and not finishing the degree while still accumulating debt (Lusardi et al., 2016; Xiao, Porto, & McIvor-Mason, 2020). One recent study found that when holding the amount borrowed for completing higher education constant, college graduates with less educated parents hold a larger amount of educational debt in adulthood compared with their counterparts with more educated parents (Oh, 2022).

Although student loans have been shown to negatively influence various aspects of financial asset accumulation, for some borrowers they are necessary to obtain a higher education that they otherwise could not fund. Student loans also benefit the economy as a whole by facilitating more human capital growth and, in turn, providing higher individual output. When individuals are unable to front the costs of college tuition, they must rely on loans to aid with current costs, with the knowledge in mind that the use of student loans to pay college expenses comes with repayment obligations. Even though student loan users understand the need to pay back the amount borrowed, 17% of individuals with federal student debt were in default as of mid-2019 (Dyanan, 2020).

Student loans have an undisputed value as they provide an avenue to attend institutions of higher education. Greenstone and Looney (2011) showed that even considering the typically high cost of higher education, the lifetime yield on a college degree for the typical student could

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exceed that on other types of investments. According to these findings, using student loans should provide more benefits than burdens, but as previous studies have shown, that is not always the case for all borrowers.

Previous research has identified a positive association between college students and financial anxiety, which may increase as young debtors realize the extent of their debt and its effects on other areas of their life (Archuleta et al., 2013). Such effects may be long-term and may affect an individual's quality of life as debtors have been found less likely to be homeowners and less likely to save for retirement (Elliott et al., 2013; Mezza et al., 2016). To add to the stress of temporarily delaying buying a home or saving for retirement, student loan borrowers may also be required to begin paying off their loans before they find a career job. The six-month grace period may not be enough time to enter a competitive job market for some, which has caused nearly one-quarter of enrolled students to anticipate repayment difficulty after graduation (Fox et al., 2017).

Students may worry about these loans as they obtain them during school, as well as during the repayment period after graduation. Thus, these loans may confer some amount of psychosocial stress on student borrowers and their effects go beyond the tangible accumulation of assets. One study found that student loans were associated with poorer psychological functioning (Walsemann et al., 2015). Financial strains resulting from the higher debt burden presented by student loans can spill over to other aspects of individuals' lives, including health and psychological well-being (Kim & Chatterjee, 2019). Other studies have linked financial strain, the psychosocial stress related to financial strain, and mental health (Ferraro & Su, 1999; Kahn & Pearlin, 2006; Selenko & Batinic, 2011) and found that financial strain was associated with higher levels of depression symptoms (Kahn & Pearlin, 2006).

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Research has also indicated that student debt on the balance sheet of a household decreases the probability that the head of household is “completely satisfied” or “very satisfied” with life compared to the head of household without student debt (Konrankye & Kalenkoski, 2021). These findings suggest that while student loan debt can help households enhance their human capital skills, the debt also limits the ability of households to maximize their utility throughout the duration of the loan. Because households are having to allocate their resources to pay back student debt, there exists a disutility aspect of borrowing that lasts until the loan is paid in full. This disutility may prevent individuals from establishing short and/or long-term savings or may not allow them to build other tangible assets.

Student Loan Debt Delinquency

Debt delinquency refers to being late in debt repayment (Xiao & Yao, 2014). The ramifications of being delinquent on debt are important, as previous research has shown a positive association between debt and distress, financially or non-financially (Tay et al., 2017). Overall debt is a burden on individuals, but student loan debt has also posed unique challenges as a positive relationship between debt delinquency and student loans has been identified (Lee et al., 2019). This is even more important as, over the past decade, the percentage of student loan borrowers who are not making their debt payments on time has increased significantly and surpassed other manageable debts (LeBeau, 2018; Sanchez & Zhu, 2015). For example, among debt delinquencies, the student loan debt delinquency rate was the highest at 8.6%, with credit card debt next at 4.8%. Auto loan debt delinquency was next at 2.3%, and mortgage debt delinquency was 1.2% (Lee et al., 2019).

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Perceived Threat

Financial Stress

Financial stress is perceived to be one of the most important sources of psycho-social stress because so many of the basic activities of daily life are associated with personal financial resources and their management (Peirce et al., 1996). College students are more likely to experience financial stress when they have student loan debt as compared to those without student loan debt (Britt et al., 2015). Studies of debt loads and other financial problems that negatively affect student wellness are a growing area. In their research, Heckman, et al. (2014) found that two of the most important financial stressors of college students were not having enough money to participate in the same activities as peers and expecting to have higher amounts of student loan debt at graduation.

In ranking stressors, college students identified the need to repay loans as one of their top five concerns for financial stress (Trombitas, 2012). Given its importance among college attendees, it is no surprise that financial stress has been linked to student academic performance (Joo et al., 2009), university retention (Britt et al., 2017), anxiety and depression among college students, and with having student loans and other forms of debt (Choi et al., 2016). The presence and amount of federal student loans have also been associated with self-reported (subjective) financial stress, and the validated stress measure has also been linked to students' self-reported health (Poplaski et al., 2019).

In a study underlining the effects of student loans, Nuckols et al. (2020) found that participants agreed that the ability to take on student loans to fund their education was worth it, but felt overburdened with the cost of paying back their loans. Given the role student loans play in total household debt accumulation, this is an important finding as a recent study found that the

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average U.S. household with student debt owes close to \$47,671 in total debt (NerdWallet, 2018). Such effects of debt are important as individuals who are unable to manage their financial stressors face consequences of negative physical and psychological health and diminished personal functioning (Lazarus & Folkman, 1984).

Coping Resources

This section is organized according to concepts that were measured and used in this study based on the theoretical framework discussion below. These concepts are financial self-efficacy, objective financial knowledge, subjective financial knowledge, math ability, financial education, and short- and long-term savings.

Financial Self-Efficacy

Research has shown that self-efficacy is associated with a reduced likelihood of stress (Zajacova, Lynch, & Espenshade, 2005). An individual's financial self-efficacy is positively associated with subjective well-being (Robb, 2017). When applied to student loans, self-efficacy has been shown to have positive associations in a couple of domains. For example, in their study, Shim et al. (2019) found that individuals with greater financial self-efficacy perceived less difficulty in paying off their loans, while those with a more negative problem-solving orientation perceived more difficulty in paying off their loans.

Self-efficacy has also been found to have a significant negative relationship to worry (Tahmassian & Moghadam, 2011). This may be related to the fact that high self-efficacy helps individuals achieve positive financial behaviors and cope with challenges, especially in terms of financial matters (Ismail et al., 2017). In addition, self-efficacy has also been linked with higher personal finance knowledge (Heckman & Grable, 2011), savings behavior (Asebedo & Seay,

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2018), greater motivation and success (Varghese et al., 2015), as well as general life satisfaction (Hu et al., 2021).

Objective Financial Knowledge

Providing relevant information regarding student loans may affect the financial and academic behaviors of loan users. Research shows that student loan users rely heavily on advice from parents, guidance counselors, and friends, and that they know very little about the loans they will be responsible for repaying (Johnson et al., 2016). Their lack of knowledge imposes a heavy burden to carry as objective general financial knowledge and financial resources are highly related to financial stress (Britt et al., 2015). The financial stress, which may be due to a lack of financial knowledge, can transform to worry and in turn, may affect the well-being of individuals. Research has shown that students rank finances as a major source of stress (Archer & Lamnin, 1985; Murphy & Archer, 1996). A lack of personal finance knowledge may lead to financial crises and financial crises can lead to poor credit ratings, bankruptcy, and unanticipated money shortages (Gutter & Copur, 2011). Although financial knowledge has been shown to positively influence financial behaviors, it was also shown to have a significant negative association with financial worry (Kiso & Hershey, 2016).

Subjective Financial Knowledge

While subjective financial knowledge (SFK) may be based on the assumption of one's knowledge, it still plays a vital part in feelings of stress. Robb (2017) found that subjective financial knowledge had a significant effect on feeling burdened, while Robb and Woodyard (2011) identified subjective financial knowledge as having a larger relative impact and influence on financial behaviors than objective financial knowledge. Lind et al. (2020), have also studied the effect of subjective financial knowledge on financial behaviors and well-being, where they

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find that SFK may have served as a buffer against financial anxiety. Robb et al. (2015) became interested in disentangling the objective and subjective aspects of knowledge in their research on the characteristics of those who use alternative financial services, which showed that some users may be overconfident about their knowledge and thus potentially their actual ability to handle the consequences.

Math Ability

Stress levels have also been linked to mathematical ability. Researchers have found that objective financial knowledge does not influence self-reported financial stress but believing one has strong mathematical abilities lowers stress levels (Peach & Yuan, 2017). This is in contrast to Lind et al. (2020) who argued that cognitive abilities could not be associated with stress or financial behaviors. Nonetheless, research stresses the importance of numeracy in financial planning, as financial decisions require the capacity to do calculations. Lusardi (2012) stated that a lack of numeracy is widespread and particularly severe among some demographic groups, such as women, the elderly, and those with low educational attainment. She goes on to stress the issue could cause potential consequences for individuals and society as a whole because numeracy was found to be linked to many financial decisions. Furthermore, Huston (2010) argued that financial literacy requires an application dimension and that it consists of both knowledge and application of human capital specific to personal finance where the level of overall endowed and attained human capital influences a person's financial literacy and that if an individual struggles with arithmetic skills, this will certainly impact his/her financial literacy.

Financial Education

Financial education has also been linked to financial stress and personal finance behaviors. An analysis of the 2015 National Financial Capability Study dataset found that

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individuals who received financial education in an academic or professional setting were less likely to be late on student loan payments or worry about their student loan debt (Fan & Chatterjee, 2019). Furthermore, Kaiser et al. (2020) observed that financial education programs have, on average, a positive causal treatment on financial knowledge and downstream financial behaviors. Financial education programs have also been shown to positively affect retirement planning preparation (Ntalianis & Wise, 2011), savings behaviors (Clancy et al., 2001), financial satisfaction (Xiao & Porto, 2017), and debt management (Brown et al., 2016). Access to financial education may help improve knowledge and understanding of personal finances, and in turn, reduce the negative thoughts of uncertainty.

Short-Term and Long-Term Savings

Savings and investments by individuals enhance their financial security while also supporting growth and financial development. Previous research has also suggested that financial resources such as savings and investments may help reduce financial stress (Dew & Yorgason, 2010). The peace of mind provided by savings and investments may reduce the stress posed by student loans. It has been shown that short-term savings and long-term savings account ownership are negatively associated with retirement worry (Magwegwe et al., 2022).

Financial Worry

Financial worry is one of the domains of the general construct of worry. The importance of a worry domain (financial, health, etc.) is predicated on its relevance to an individual's well-being (Tallis et al., 1992). Worry is broadly defined as repetitive negative thoughts about uncertain future events (Borkovec et al., 1983) and can either be high or low (Olatunji et al., 2010). To add to Borkovec et al.'s (1983) conceptualization of worry, de Bruijn and Antonides (2020) defined financial worry as negative repetitive thoughts that deal with the uncertainty of

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one's financial situation. This series of negative thoughts have been shown to negatively affect an individual's well-being (Vlaev & Elliott, 2014), influence retirement preparation (Kiso et al., 2019), and affect perceived income adequacy (Litwin & Meir, 2013).

Litwin and Meir (2013) examined associations between financial worry and economic status, lifestyle, social network, concerns about functional health, long-term care needs and cognition, and population group. In their research, the main financial worry was that pension funds will not suffice for one's entire life. In their journey to gain an understanding of how individuals form their expectations about the future, Owen and Wu (2007), examined the effect of unexpected financial shocks on the degree to which individuals worry about having sufficient retirement income. Other factors found to be contributing elements of financial worry were the number of dependents and employment status (Berstein et al., 2020).

Furthermore, Fan and Chatterjee (2019) performed a study that addressed worry about student loans. They measured student loan worry with one question, are you concerned that you might not be able to pay off your student loans? If respondents selected yes, they were coded as feeling worried. In their study, they found that concerning debt-related characteristics, having both federal and private student loans was found to be positively associated with worrying about student loans. Additionally, Fan and Chatterjee (2019) found that financial knowledge and socialization-related characteristics such as receiving a financial education were negatively associated with student loan worry.

Magwegwe et al. (2022) found that subjective financial stress and financial and personal resources were all key determinants of financial worry. Furthermore, the researchers also found that both short-term savings and calculating retirement savings need to moderate the relationship between financial strain and retirement worry. Magwegwe et al. (2022) used the interaction of

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the short-term savings index with financial strain and found that the relationship between financial strain and retirement worry differed between individuals with high or low short-term savings index scores. Additionally, the researchers also used the interaction of calculating retirement savings needs and financial strain; they found that the relationship between financial strain and retirement worry differed depending on whether an individual had calculated retirement savings needs or not.

While studies have been performed regarding the elements of worry, other than Fan and Chatterjee (2019), there is not much literature that associates worry with the stress placed by student loans on the individual. Because financial worry has been conceptualized as concerns about the future, most studies have opted to associate worry with retirement. This study is unique because it seeks to understand the stress caused by student loans, which, in turn, may affect financial worry more broadly defined. It also uses a much more comprehensive measurement of a worry than the response to a single question Fan and Chatterjee used.

Separating stress as an influence on worry from worry itself has the advantage of considering how individuals may cope with stress by relying on their resources and thus moderate the expected negative influence of stressors on worry. Xiao and Kim (2020) examined the association between debt payment delinquency and financial stress, explored the moderating role of a financial capability index, and found that the largest effect was for a mortgage, followed by a credit card, then student loan delinquency. As expected, there was a positive relationship between student loan delinquencies to financial stress. Surprisingly, they found that among consumers with debt delinquencies, the financial capability may increase financial stress. However, their financial capability index included both objective and subjective financial knowledge. Combining those knowledge measures may have created some kind of confounding

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situation as there is evidence that subjective knowledge may not be as influential as it seems and could capture overconfidence. For example, Robb et al. (2015) found that consumers who had high subjective knowledge (but low objective knowledge) were more likely to use alternative financial services. That research suggests that separating subjective and objective knowledge may avoid the puzzling positive effect Xiao found for the financial capability moderator.

Previous research has found that student loans have no significant effect on financial satisfaction (Robb et al., 2018). The authors indicated that results in their study provided mixed evidence of student loan debt serving as an influential factor in consumer financial satisfaction. Furthermore, the authors argued that student loan debt is unique from other forms of debt in that it is an investment in human capital and is associated with a steeper earnings path that should result in greater satisfaction overall. To add to the confusion of no significance, Robb et al. (2018) also reported that among respondents who had student loans, having private student loans alone was positively associated with financial satisfaction. While it may be that individuals who used private student loans were more affluent or they may have attained higher paying jobs after graduation, the direction of the relationship between accumulating higher interest debt to financial satisfaction is still puzzling.

Additionally, Joseph and MacDonald (2022) found that student loans have a negative association with financial satisfaction. This study was unique in that it turned its attention to emerging adults between the ages of 18-34. That same age selection may have contributed to the negative and more accurate relationship of student loan debt to financial satisfaction as individuals under 40 hold over half of the overall student loan debt (Hanson, 2022). In limiting the sample to a more burdened student loan debt population, Joseph and MacDonald (2022) highlighted the effect that having student loans has on an individual's overall well-being.

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A summary of the results of financial threats and well-being indicators using the National Financial Capability Survey (NFCS) is listed in Table 1 below.

Table 1

Summary of Previous NFCS Financial Threat and Well-Being Studies

Key Studies	Dependent Variable	Result	Unique Features
Fan & Chaterjee 2015 NFCS	Worry About Student Loans	Having both federal and private loans increased worry	Focused directly on student loan worry, and financial socialization
Xiao & Kim 2018 NFCS	Financial Worry	Financial capability interaction with delinquent student loans positively related to worry; having a student loan also positively related to worry	Financial capability <i>index</i> as a predictor; included other loan delinquency types as predictors
Magwegwe et al. 2018 NFCS	Financial Worry	No direct effect of student loans; subjective financial stress positively related to worry	Use of stress and coping predictors; focus on retirement worry
Gallardo 2018 NFCS (current study)	Financial Worry	<i>Expect</i> positive direct and indirect effects of delinquent and non-delinquent student loans	<i>Disaggregated</i> financial capability index; implemented stress and coping approach to study indirect and direct effects of delinquent and non-delinquent student loans

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Key Studies	Dependent Variable	Result	Unique Features
Robb et al. 2015 NFCS	Financial Satisfaction	Private student loans (only) increased financial satisfaction; Having both federal and private loans had no effect	Applied correction for selectivity about student loan status; included risk tolerance and an extensive list of financial behavior predictors
Joseph & MacDonald 2018 NFCS	Financial Satisfaction	Having a student loan reduced financial satisfaction	Focused on young adults (below age 45); emphasized financial capability predictors

Chapter 3: Theoretical Framework and Methodology

This study used the Tallis and Eysenck (1994) model of worry to guide the hypotheses and provide a foundation to investigate the predictors of worry. Their model states that worry is activated when the severity of a perceived threat exceeds the estimated coping resources. The model has three stages: threat appraisal, worry activation, and coping.

The theoretical approach to worry fulfills several major functions. First, worry serves an alarm function in that it introduces information concerning threat-related material into consciousness. Second, worry serves a "prompt function" in that threat-related information in memory is continually re-presented to awareness so that the cognitive system might resolve it in some way. Finally, worry serves a preparation function, in that it allows the worrier to anticipate future situations and conceptualize possible solutions and dangers involved in them (Power & Dagleish, 2015).

The Tallis & Eysenck model emphasizes that external stimuli are appraised in terms of their threat value, and the threat is seen as a function of the putative cost, imminent likelihood, and self-efficacy associated with the event (Tallish & Eysenck, 1994). Events that are appraised in this way as highly threatening initiate the process of worry, which serves to prompt the individual, ring alarm bells that something threatening is in the internal or external environment, and help to prepare the individual for possible future situations. Such worrying increases hyper-vigilant scanning of the environment and emotional sensitivity to worry-congruent material. The process in turn increases arousal and self-focused attention, which operate in a vicious circle. Becoming lost in a circle of worrying, increased arousal, and increased self-focused attention leads the individual to construct negative, catastrophic models of future events. The individual can then appropriately problem-solve the issue surrounding these events, in which case either the initial threat is diminished and the worry process recedes, or the individual can enter into

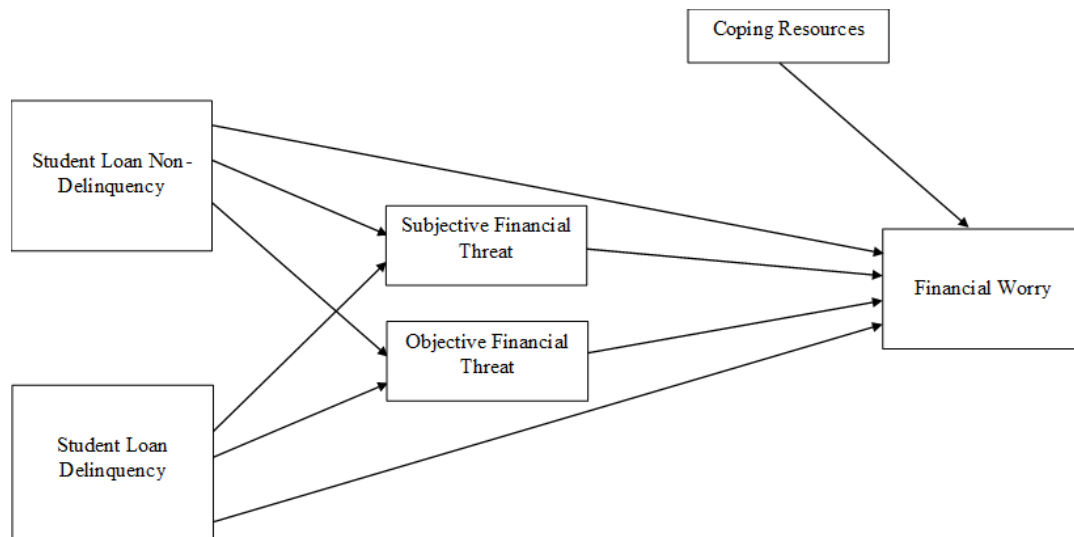
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inappropriate problem-solving strategies in which case the threat is preserved and the worry process maintained.

Using a similar approach, this study will analyze the effect of student loans and student loan delinquency on financial worry using the model framework illustrated in Figure 1. . The study will use various ordinary least squares (OLS) regressions that will identify the effect of student loan debt and student loan debt non-delinquency in a three-step OLS process. The direct effects will examine the effect of having student loans and being delinquent on student loans on financial worry. The indirect effects will be tested via the incorporation of financial threat variables that constitute subjective and objective financial stress, treating them as mediators. True to the theoretical approach, the influence of coping resources will be estimated.

Figure 1

Framework for Financial Worry (Adapted from Tallis and Eysenck, 1994)



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Hypotheses

H1a: Student loan delinquency will be positively associated with subjective financial threats.

H1b: Student loan delinquency will be positively associated with objective financial threats.

H2a: Subjective financial threats will be positively associated with financial worry

H2b: Objective financial threats will be positively associated with financial worry

H3a: Student loan delinquency will be positively associated with financial worry

H3b: Student loan non-delinquency will be negatively associated with financial worry

H4a: Personal resources will be negatively associated with financial worry

H4b: Financial resources will be negatively associated with financial worry

H5a: The relationship between student loan delinquency and financial worry is mediated by subjective financial threats.

H5b: The relationship between student loan delinquency and financial worry is mediated by objective financial threats.

Data

This study used the 2018 National Financial Capability Study (NFCS). The NFCS, funded by the Financial Industry Regulatory Authority (FINRA) Investor Education Foundation and conducted by Additional Regulatory Contact (ARC) Research aims to monitor and better understand the financial capability in the United States. It has been used extensively to study financial well-being (Robb et al., 2015; Robb, et al., 2011; Robb et al., 2019; Xiao & Porto 2017) and financial worry (Fan & Chatterjee, 2019; Magwegwe et al., 2022; Xiao & Kim, 2020).

Respondents to the survey were selected using non-probability quota sampling from established online panels. The 2018 NFCS comprised 27,091 adults aged 18 years or older. The survey was administered on a state-by-state basis, with approximately 500 observations from each state and the District of Columbia. National figures are weighted to be representative of the national

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population in terms of age, gender, ethnicity, education, and Census Division while state figures are weighted to be representative of each state in terms of age, gender, ethnicity, and education.

The NFCS provided respondents the option of selecting “Don’t know” or “Prefer not to say” in some of its questions. Such responses were treated as missing data to avoid the skew on descriptive means. Consequently, to control for the missing data, all “prefer not to say” and “don’t know” responses to all variables were excluded from the data, except for the questions used to measure objective financial knowledge where the “don’t know” and “prefer not to say” responses will reflect an incorrect answer. That is, only complete cases were included in the analytic sample. This approach to controlling for missing data was consistent with other researchers (e.g., Allgood & Walstad, 2016; Kim et al., 2019, Magwegwe et al., 2022) who used the NFCS dataset.

In this particular study, individuals who were over the age of 54 were excluded from the analysis. According to a preliminary descriptive analysis, as shown in Table 2, the majority of the student loan debt and student loan debt delinquency was found in individuals within the age range of ages of 18-54. Furthermore, older individuals carried less than 2% of the overall student loan debt amount, the most burdened student loans age groups were between the ages of 18-44 years of age at 64.76% while those in the age group of 45-59 hold a considerable 14.63% of the overall national student loan balance (Bustamante, 2020).

Table 2

Preliminary Descriptive Analysis NFCS 2018

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	Have Student Loan (%)	Have Student Loan Relative to Total Sample (%)	Have Student Loan Delinquency (%)	Have Student Loan Delinquency Relative to Total Sample (%)
N=	7,417	27,091	2,019	27,091
Less than HS	4.91%	1.34%	5.35%	0.40%
High School	24.28%	6.65%	23.13%	1.72%
Some College	21.99%	6.02%	28.53%	2.13%
Associates	10.66%	2.92%	11.24%	0.84%
Bachelor's	22.89%	6.27%	19.17%	1.43%
Post Grad	13.87%	3.80%	11.54%	0.86%
Age				
18 to 24	17.24%	4.72%	12.43%	0.93%
25 to 34	32.44%	8.88%	39.08%	2.91%
35 to 44	23.45%	6.42%	27.44%	2.04%
45 to 54	14.91%	4.08%	13.52%	1.01%
55 to 64	8.49%	2.33%	5.99%	0.45%
65 and above	3.47%	0.95%	1.54%	0.11%
Income				
Less than \$35k	32.30%	8.84%	34.22%	2.55%
\$35 to \$50k	14.70%	4.02%	15.30%	1.14%
\$50 to \$75k	18.74%	5.13%	17.88%	1.33%
\$75 to \$100k	16.48%	4.51%	19.96%	1.49%
\$100 to \$150k	12.61%	3.45%	10.25%	0.76%
\$150 k +	5.18%	1.42%	2.38%	0.18%
Employment Status				
Self-Employed	7.94%	2.17%	10.65%	0.79%
Full Time	45.72%	12.52%	56.27%	4.19%
Part-Time	10.13%	2.77%	9.11%	0.68%
Unemployed	4.61%	1.26%	5.10%	0.38%
Retired	4.53%	1.24%	2.33%	0.17%
Other	18.98%	5.20%	16.54%	1.23%

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Variables of Interest

An index utilizing retirement worry, personal finance anxiety, and physical and emotional financial stress was created to measure the dependent variable of financial worry. Below is the measurement for each of the variables. The highest attainable score was 21 which indicated most worried with the lowest attainable being 3 which indicated least worried. A Cronbach's alpha was calculated to measure the reliability of the index. The score on the scale was 0.85. A generally accepted rule is that α of 0.6-0.7 indicates an acceptable level of reliability, and 0.8 or greater is a very good level (Ursachi et al., 2015). The items used in the index are as follows.

Retirement Worry: "I worry about running out of money in retirement." Respondents rated their agreement on a 7-point scale (1 = strongly disagree to 7 = strongly agree).

Personal Finance Anxiety: "Thinking about my personal finances can make me feel anxious." Respondents rated their agreement on a 7-point scale (1 = strongly disagree to 7 = strongly agree).

Physical and emotional financial stress: "Discussing my finances can make my heart race or make me feel stressed." Respondents rated their agreement on a 7-point scale (1 = strongly disagree to 7 = strongly agree)

Independent Variables

Student Loans: "Do you currently have any student loans? If so, for whose education was this/were these loan(s) taken out?" Respondents had the option of selecting between any of the following. Yes, I have a student loan(s) for: Yourself (1), Your spouse/partner (2), Your child(ren) (3), Your grandchild(ren) (4), Other person (5), or No, do not currently have any student loans. The sample respondents were coded 1 if they reported a student loan and 0 if they

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did not. From there, those who indicated having student loans were categorized as having been delinquent and non-delinquent.

Student Loan Delinquency:

Student Loan Delinquency was obtained using the following question: “How many times have you been late with a student loan payment in the past 12 months? (If you have more than one student loan, please consider them all.)” Respondents are given the option to select Never, payments are not due at this time (1), Never, I have been repaying on time each month (2), Once (3), More than once (4), Don’t know (98), Prefer not to say (99). In this study respondents who have been late at least once were coded as 1 while all others were coded as 0.

Perceived Financial Threat:

The perceived threat was analyzed using scales. For Objective Financial Threat, the variable was created using the questions below. The questions were previously used in the Magwegwe et al., (2022) study and were tested for reliability. In total, the highest possible number attainable was six which indicated the highest objective financial threat with the lowest being one, showing a lower perceived objective financial threat. A Cronbach’s alpha was calculated to measure the reliability of the index. The score on the scale was 0.70. The scale items were:

1. “Have you been contacted by a debt collection agency in the past 12 months?”
2. “Do you currently have any unpaid bills from a healthcare or medical service provider (e.g., a hospital, a doctor’s office, or a testing lab) that are past due?”
3. “In the past 12 months, have you/your household experienced a large drop in income which you did not expect?” (Items 1-3 were coded with 1 for yes, otherwise 0.)

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4. “In a typical month, how difficult is it for you to cover your expenses and pay all your bills?” Respondents rated their level of difficulty on a three-point scale (1 = very difficult, 2 = somewhat difficult, and 3 = not at all difficult). Item 4 was reverse-coded so that a higher score reflected a higher level of difficulty.

Subjective Financial Threat

For Subjective Financial Threat, the variable was created using the questions below. In total, the highest possible number attainable was 16 which indicated a high subjective financial threat with the lowest being 3 which showed a lower perceived subjective financial threat. Just as it was done in previous scales, Cronbach’s alpha was calculated to measure the reliability of the index.

The score on the scale was 0.66. The scale items were:

1. “I have too much debt right now.” Respondents rated their agreement on a seven-point scale (1 = strongly disagree to 7 = strongly agree).
2. “I am just getting by financially.” Respondents rated their agreement on a five-point scale (1 = does not describe me at all to 5 = describes me completely).
3. “How confident are you that you could come up with \$2,000 if an unexpected need arose within the next month?” Respondents were asked to respond on a four-point scale. (1 = I am certain I could come up with the full \$2,000; 2= I could probably come up with \$2,000; 3 = I could probably not come up with \$2,000”; and 4 = I am certain I could not come up with \$2,000).

Coping Resources

Self-efficacy, subjective and objective financial knowledge, math ability, and financial education are important variables in the development of this study. Financial self-efficacy was measured with a single item using a 7-point scale. Respondents were asked the following

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question: “I am good at dealing with day-to-day financial matters, such as checking accounts, credit and debit cards, and tracking expenses.” Subjective financial knowledge was measured using the following question: “On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge?” Furthermore, objective financial knowledge was measured with a five-item summed objective financial knowledge index based on questions developed by Lusardi and Mitchell (2008) which include questions regarding compound interest, inflation, bond prices, mortgages, and portfolio diversification and are widely used as valid and reliable indicators of financial knowledge. The questions used for financial knowledge were:

- Interest: “Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?” (1) More than \$102, (2) Exactly \$102, (3) Less than \$102, (98) Do not know, and (99) Prefer not to say.
- Inflation: “Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?” (1) More than today, (2) Exactly the same, (3) Less than today, (98) Do not know, and (99) Prefer not to say.
- Bond Price: “If interest rates rise, what will typically happen to bond prices?” (1) They will rise, (2) They will fall, (3) They will stay the same, (4) There is no relationship between bond prices and the interest rates, (98) Do not know, and (99) Prefer not to say.
- Mortgage: “Please tell me whether this statement is true or false. A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest

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paid over the life of the loan will be less.” (1) True, (2) False, (98) Do not know, and (99) Prefer not to say.

- Portfolio: “Please tell me whether this statement is true or false. Buying a single company’s stock usually provides a safer return than a stock mutual fund.” (1) True, (2) False, (98) Do not know, and (99) Prefer not to say.

Financial education was measured with four items on a yes/no format according to whether or not the respondents had received financial education in high school or college, or from an employer or the military. If the respondent reported having received financial education in either of the previously noted options they were coded as 1, 0 otherwise. Perceived math ability was measured using the following question: On a scale from 1 to 7, where 1 means very low and 7 means very high answer the following question: I am pretty good at math.

Short and long-term savings were included to investigate the effect of financial resources on financial worry. The short-term savings variable was measured using the ensuing variables and a scale of 0-2 was created. The scale items were:

1. “Have you set aside emergency or rainy-day funds that would cover your expenses for 3 months, in case of sickness, job loss, economic downturn, or other emergencies?” The variable was coded with 1 for yes, otherwise 0.
2. “How often does this statement apply to you? I have money left over at the end of the month.” The response format was on a five-point Likert-type item where: 1 = “Never,” 3 = “Sometimes,” and 5 = “Always.” If the response was 4 or 5, the variable was coded with 1, otherwise 0.

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Additionally, long-term savings was measured using the following variables. Each was coded with 1 for yes and 0 otherwise, which allowed for a creation of a 0-4 scale. The scale items were:

1. “Do you or your spouse/partner have any other retirement accounts NOT through an employer, like an IRA, Keogh, SEP, or any other type of retirement account that you have set up yourself?”
2. “Not including retirement accounts, do you or your household have any investments in stocks, bonds, mutual funds, or other securities?”
3. “Do you or your spouse/partner have any retirement plans through a current or previous employer, like a pension plan or a 401(k)?”
4. “Do you or your household have a savings account, money market, or CDs?”

Table 3 displays Cronbach’s Alpha reliability values for the dependent and key independent variables.

Table 3

Cronbach’s Alpha Reliability Scales

Variable	Alpha
Worry	0.85
Objective Financial Threat	0.70
Subjective Financial Threat	0.66
Objective Financial Knowledge	0.60
Long-Term Savings	0.68
Short-Term Savings	0.62

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Control Variables

Respondent's Education was measured with the following question: "What was the highest level of education you completed?" Respondents could select from the following options: Did not complete high school, High school graduate/GED, Some College, Associates, Bachelor's degree, Postgraduate degree. Guardian education was also measured. The variable was conceptualized using the following question: "What was the highest level of education completed by the person or any of the people who raised you?" Respondents could select from the following options: Did not complete high school, High school graduate/GED, Some College, Associates, Bachelor's degree, Postgraduate degree.

Household income was identified utilizing the ensuing question: "What is your approximate annual income, including wages, tips, investment income, public assistance, income from retirement plans, etc.? Would you say it is...?" Respondents could select from the following options: Less than \$15,000 (1), At least \$15,000 but less than \$25,000 (2) At least \$25,000 but less than \$35,000 (3) At least \$35,000 but less than \$50,000 (4), At least \$50,000 but less than \$75,000 (5), At least \$75,000 but less than \$100,000 (6), At least \$100,000 but less than \$150,000 (7), \$150,000 or more (8). For this analysis categories will be as followed: 1) Less than \$35,000, 2) \$35,000-50,000, 3) \$50,000-75,000, 4) \$75,000-\$100,000, 5) \$100,000-\$150,000, 6) \$150,000 +.

Employment status was measured using the following question: "Which of the following best describes your current employment or work status?" Self-employed (1), Work full-time for an employer (2) Work part-time for an employer (3), Homemaker (4), Full-time student (5) Permanently sick, disabled, or unable to work (6) Unemployed or temporarily laid off (7),

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Retired (8), prefer not to say (99). For this analysis only self-employed, full-time employees, part-time employees, and unemployed, were coded, whereas the rest were designated as others.

Demographic Variables

This study was concentrated on differences based on marital status, age, gender, and race. Marital status was attained with the following question: “What is your marital status?” Individuals could either answer Married, Single, Separated, Divorced, Widowed, or prefer not to say. For this study, marital status was coded as Married, Single, and Other, which was composed of divorced, widowed, or separated. Age was ascertained using the question “What is your age?” Respondents selected their age category as either 18-24, 25-34, 35-44, 45-54, 55-64, or 65+. The question response also gave individuals the opportunity to state whether the respondent was male or female. The respondents were categorized by age according to their report for single years. For gender, individuals were asked “What is your gender?” The options provided for the response were male or female. Individuals were coded as 1 if they answered male, and 0 otherwise.

For Race, individuals were asked “Which of the following best describes your race or ethnicity?” Respondents could answer White or Caucasian, Black or African American, Hispanic or Latino/a, Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaska Native, or Other. The respondent who answered Native Hawaiian or other Pacific Islander, American Indian or Alaska Native, or Other were all assigned to the same category as Other given the small number in the representative sample.

Analysis

To assess the direct and indirect effects of student loans and student loan delinquency on financial worry, various OLS regressions were conducted. . These regressions obtained estimates

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to determine effects corresponding to the paths outlined in Figure 2. Doing so in this manner allowed for the calculation of the indirect effects with the use of standardized betas from the regressions for either objective or subjective threats and the final regressions that included those threats. The first regression had subjective financial threats as the dependent variable with student loan delinquency and student loan non-delinquency as key predictors. The second regression had objective financial threats as the dependent variable with student loan delinquency and student loan non-delinquency as key predictors. The final regression specified financial worry as the dependent variable with student loan delinquency, student loan non-delinquency, objective financial threats, and subjective financial threats as key predictors. Additionally, the final regression on worry includes personal and financial coping mechanisms to be consistent with the theoretical framework. One would expect that each of the coping resources would be negatively associated with worry, as hypothesized.

In this study, direct effects dealt with the direct impact of one independent variable on its dependent variable. Indirect effects can be defined as the impact of one variable on another, mediated or transmitted by a third variable. For this purpose, the relevant standardized betas were multiplied to estimate the indirect effect magnitudes. The use of a mediator variable explains the how or why of an observed relationship between an independent variable and its dependent variable (Hefner, 2017).

Full mediation occurs when the entire relationship between the dependent and independent variables occurs via the mediating variable. In other words, when the independent variable no longer influences the dependent variable after the mediator has been controlled for and all of the above conditions are met complete mediation is present. If the mediating variable was removed, the relationship between the dependent and independent variables would no longer

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exists. Partial mediation happens when the mediating variable is only responsible for part of the relationship between the dependent and independent variables. If the mediating variable were removed, there would still a relationship between the dependent and independent variables; it would just not be as strong (Baron & Kenny, 1986).

Chapter 4: Results

Descriptive Statistics

A complete descriptive statistics table is shown in Table 4. A preliminary descriptive analysis utilizing the entire population of the study, shown in Table 2, indicated that student loan debt and student loan debt delinquency were not prevalent in older individuals, henceforth, the final analysis incorporates responses from individuals who are under the age of 54 for a total N of 14,542. As the demographics are introduced, it is important to state their relevance to the whole U. S. population. According to the Census in 2018, 63% of the population was White while 16% identified as Hispanic, and 12% identified as Black (U.S. Census Bureau, 2018)

In terms of race, in this study, 74.34% of respondents identified as white while the remaining 25.66% identified as either Black, Hispanic, Asian, or other with 12.57%, 11.22%, 6.23%, and 2.81% respectively. Age categories are well represented in this study as, of the selected respondents, 15.75% are between the ages of 18-24. Furthermore, 27.67% are between the ages of 25-34, 27.63% represent respondents between the ages 35-44, and 28.95% are within the age range of 45-54.

In 2018, about 90% of individuals over 18 had at least a high school education while 35% had a college degree. In this study, over 97% of respondents had at least a high school education. Of the respondents, 22.93% had a high school diploma, 28.08% had some college, 10.92% had an associate degree, 23.11% had a bachelor's, and 12.21% had a post-graduate degree. About

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one-third of respondents earned less than \$35,000 annually with 32.19% of them doing so. In addition, 14.51% earned between \$35,001 – \$50,000, 19.10% earned between \$50,001 – \$75,000, 14.80% had wages of \$75,001 – \$100,000, 12.85% earned more than \$100,000 but less than \$150,000, and 6.55% of respondents reported wages of over \$150,000.

Over half of the respondents in this study had full-time jobs at the time of recording their responses. In terms of employment, 54.55% of respondents had a full-time job, 8.21% were self-employed, 9.60% worked half-time while 1.67% were retired and 5.43% reported as unemployed. In addition, 20.54% of respondents were classified as other which constituted identifying themselves as full-time students, disabled, or homemaker. When analyzing parent or guardian education, 5.64% had a response that indicated less than high school while 28.59% reported their parents to have completed high school. Furthermore, 19.78% of parents of respondents had some college, 9.97% possessed an associate degree, 22.05% had a bachelor's degree, and 12.66% possessed a post-graduate degree.

Almost half of the respondents reported they were as married {49.25%}. In addition, 40.18% of respondents were single at the time of their answers while 10.57% indicated they were no longer married or widowed. Additionally, 43.37% of respondents were male while 56.63% were female.

When analyzing continuous variables in the study, worry had a mean of 14.36. In addition, the objective financial threat and the subjective financial threat variables had a mean of 2.45 and 9.48, respectively. When looking at personal characteristics, self-efficacy had a mean value of 5.56. Objective financial knowledge had a mean value of 2.62, the subjective financial knowledge mean value was 4.87, and math ability had a mean value of 5.49. Lastly, when

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analyzing financial characteristics, long-term savings had a mean value of 1.86 while short-term savings had an average of .83.

Table 4

Descriptive Statistics

N = 14,542

Variable	%	Mean
Student Loan		
Student Loan Delinquent	12.12	
Student Loan Non-Delinquent	24.74	
No Student Loan	63.15	
Worry (3-21)		14.36
Stress		
Objective Financial Threat (0-6)		2.45
Subjective Financial Threat (2-16)		9.48
Coping Mechanisms: Personal		
Self-Efficacy (1-7)		5.56
Objective Financial Knowledge (0-5)		2.62
Subjective Financial Knowledge (1-7)		4.98
Math Ability (1-7)		5.49
Coping Mechanisms: Financial		
Long-term Savings (0-4)		1.86
Short-term Savings (0-2)		0.83
Financial Education		
Yes	23.68	
No	76.32	
Age		

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18-24	15.75
25-34	27.67
35-44	27.63
45-54	28.95
Race	
White	74.34
Black	12.57
Hispanic	11.22
Asian	6.23
Other	2.81
Education	
Less Than High School	2.74
High School Graduate	22.93
Some College	28.08
Associates	10.92
Bachelor's	23.11
Post Graduate	12.21
Income	
Less than 35,000	32.19
35,001 - 50,000	14.51
50,001 - 75,000	19.10
75,001 - 100,000	14.80
100,001 - 150,000	12.85
150,000 Plus	6.55
Employment	
Self-Employed	8.21
Part-Time	9.60
Full Time	54.55
Retired	1.67
Unemployed	5.43
Other	20.54
Parent or Education	
Less Than High School	5.64
High School Graduate	28.59

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Some College	19.78
Associates	9.97
Bachelor's	22.05
Post Graduate	12.66
Marital Status (Reference: Married)	
Single	40.18
Married	49.25
Other	10.57
Gender	
Male	43.37
Female	56.63

Model 1: Subjective Financial Threats

Table 5 contains the first multivariate analysis, an Ordinary Least Square (OLS) regression, which investigated the aspects of subjective financial threat and its relationship to student loan delinquency. When compared to individuals who do not have student loans, individuals who were delinquent on their student loans experienced a higher subjective financial threat. A one-unit change in the score for student loan delinquency was associated with a 3.245-point increase in subjective financial threat score as compared to someone without student loans, all else equal. This supported hypothesis 1a as the relationship between student loan delinquency and subjective financial threats was positive. Furthermore, a one-unit change in being student loan non-delinquent was associated with a 1.783 increase in subjective financial threat as compared to someone without student loans, all else equal.

In addition, compared to those who are in the age ranges of 25-34, individuals between the ages of 18-24 experienced less subjective financial stress while those between the ages of 35-44 experienced higher financial stress, all else equal. Interestingly, compared to White

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individuals, Black, Hispanic, and Asian respondents all reported a lower level of subjective financial threats, all else equal. Additionally, there seemed to be an income cut-off to subjective financial threats. Compared to those earning between \$50,001 – 75,000, individuals who earned less reported a higher subjective financial threat with a 1.188 increase for those earning less than \$35,000 and a .648 increase for individuals who earned between \$35,001 and 50,000, respectively. Furthermore, individuals who earned over \$75,000 were associated with negative scores in subjective financial threats. Compared to respondents earning between \$50,001 – 75,000, respondents who earned between \$75, 00 - 100,000 are associated with a 0.477 decrease in financial threat, all else equal. A one-unit change among those who earned between \$100,001 – and 150,000 were associated with a 1.115 reduction while those who earned over \$150,000 was associated with a 2.451 reduction in subjective financial threat, all else equal.

Compared to full-time employees, those who were self-employed or retired experienced lower levels of subjective financial threat. In contrast, unemployed individuals experienced a higher subjective financial threat score compared to those employed full-time. When considering parent education and considering parents with a bachelor’s degree, respondents whose parents were high school graduates or had some college experience higher levels of subjective financial stress with 0.399 and 0.462, respectively, all else equal. Lastly, being male was also associated with lower levels of subjective financial threats than being female.

Table 5

Dependent Variable – Subjective Financial Threats

Variable	Estimate	P-Value	β
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Student Loan (Reference: No Student Loans)			
Student Loan Delinquent	3.245	<.0001	0.290
Student Loan Non-Delinquent	1.783	<.0001	0.203
Age (Reference: 25-34)			
18-24	-1.182	<.0001	-0.120
35-44	0.247	0.001	0.029
45-54	-0.041	0.605	-0.005
Race (Reference: White)			
Black	-0.237	0.003	-0.023
Hispanic	-0.416	<.0001	-0.045
Asian	-0.772	<.0001	-0.054
Other	0.316	0.066	0.013
Education (Reference: Bachelor's)			
Less Than High School	0.927	<.0001	0.042
High School Graduate	0.708	<.0001	0.082
Some College	0.709	<.0001	0.087
Associates	0.275	0.017	0.023
Post Graduate	0.200	0.087	0.017
Income (Reference: 50,001 - 75,000)			
Less than 35,000	1.188	<.0001	0.151
35,001 - 50,000	0.648	<.0001	0.061
75,001 - 100,000	-0.477	<.0001	-0.045
100,001 - 150,000	-1.115	<.0001	-0.099
150,000 Plus	-2.451	<.0001	-0.158
Employment (Reference: Full Time)			
Self-Employed	-0.361	0.000	-0.027
Part-Time	-0.046	0.642	-0.004
Retired	-1.058	<.0001	-0.036
Unemployed	0.343	0.006	0.022
Other	-0.023	0.762	-0.002
Parent Education (Reference: Bachelor's)			
Less Than High School	0.267	0.055	0.018

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High School Graduate	0.399	<.0001	0.049
Some College	0.462	<.0001	0.050
Associates	0.171	0.146	0.014
Post Graduate	-0.183	0.100	-0.016
Marital Status (Reference: Married)			
Single	-0.070	0.293	-0.009
Other	0.377	0.000	0.030
Gender (Reference: Female)			
Male	-0.680	<.0001	-0.091

Model 2: Objective Financial Threats

The second multivariate analysis, reported in Table 6, investigated the aspects of objective financial threats and their relationship to student loan delinquency. When compared to individuals who did not have student loans, individuals who were delinquent on their student loans experienced a higher level of objective financial threat. A one-unit change in student loan delinquency was associated with a 1.603-point increase in objective financial threat as compared to someone without student loans, all else equal. This supported hypothesis 1b as the relationship between student loan delinquency and objective financial threats was positive. Furthermore, a one-unit increase in having student loans and not being delinquent was associated with a 0.368 point increase in subjective financial threat as compared to someone without student loans, all else equal.

In addition, compared to those who were in the age ranges of 25-34, individuals between the ages of 18-24, 35-44, and 45-54 experienced less objective financial threat, $-.406$, $-.073$, and $-.192$ respectively, all else equal. Interestingly, compared to White, individuals who identified as Black was associated with higher levels of objective financial threat while, Hispanics and Asian all were associated with a lower level of objective financial threat, all else equal. Consistent with

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the previous finding related to subjective financial threats, there seemed to be an income cut-off to objective financial threats. Compared to those earning between \$50,001 – 75,000, individuals who earned less reported a higher objective financial threat with 0.434 for those who earned less than \$35,000, and 0.144 for individuals who earned between \$35,001 and 50,000, respectively, all else equal. Furthermore, individuals earning over \$100,000 was associated with negative scores in objective financial threats. Compared to respondents earning between \$50,001 – 75,000, respondents who earned between \$100,001 - 150,000 were associated with a 0.333 decrease in objective financial threat, all else equal. Those who earned over \$150,000 were associated with a .581 decrease in objective financial threat, all else equal.

In comparison to full-time employees, those who were self-employed or unemployed experienced higher levels of objective financial threat. Retired individuals reported lower objective financial threat scores compared to those employed full-time. When considering parent education and considering parents with a bachelor's degree, respondents whose parents had less than high school or had some college experienced higher levels of objective financial stress with 0.148 and 0.183, respectively, all else equal. Married individuals experienced higher levels of an objective financial threat than single, but less than those who were divorced or widowed. Lastly, being male was also associated with lower levels of objective financial threats than being female.

Table 6

Dependent Variable – Objective Financial Threats

N = 14,542			
Variable	Estimate	P-Value	β

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Student Loan (Reference: No Student Loans)

Student Loan Delinquent	1.603	<.0001	0.354
Student Loan Non-Delinquent	0.368	<.0001	0.104

Age (Reference: 25-34)

18-24	-0.406	<.0001	-0.102
35-44	-0.073	0.014	-0.021
45-54	-0.192	<.0001	-0.057

Race (Reference: White)

Black	0.235	<.0001	0.056
Hispanic	-0.123	<.0001	-0.033
Asian	-0.217	<.0001	-0.038
Other	0.069	0.317	0.007

Education (Reference: Bachelor's)

Less Than High School	0.539	<.0001	0.061
High School Graduate	0.474	<.0001	0.137
Some College	0.445	<.0001	0.135
Associates	0.201	<.0001	0.042
Post Graduate	0.042	0.369	0.009

Income (Reference: 50,001 - 75,000)

Less than 35,000	0.434	<.0001	0.136
35,001 - 50,000	0.144	0.000	0.034
75,001 - 100,000	0.065	0.092	0.015
100,001 - 150,000	-0.333	<.0001	-0.073
150,000 Plus	-0.581	<.0001	-0.093

Employment (Reference: Full Time)

Self-Employed	0.207	<.0001	0.038
Part-Time	0.059	0.131	0.012
Retired	-0.283	0.001	-0.024
Unemployed	0.260	<.0001	0.041
Other	-0.016	0.613	-0.004

Parent Education (Reference: Bachelor's)

Less Than High School	0.148	0.007	0.024
High School Graduate	0.067	0.072	0.020

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Some College	0.183	<.0001	0.049
Associates	0.021	0.650	0.004
Post Graduate	-0.050	0.255	-0.011
Marital Status (Reference: Married)			
Single	-0.131	<.0001	-0.043
Other	0.197	<.0001	0.039
Gender (Reference: Female)			
Male	-0.179	<.0001	-0.059

Model 3: Financial Worry

The third multivariate analysis, an Ordinary Least Square (OLS) regression, investigated the aspects of financial worry and its relationship to student loan delinquency, subjective financial threat, and objective financial threat while considering personal and financial coping resources and the same set of control variables as for the threat regressions. The coping resources included in the model were self-efficacy, objective financial knowledge, subjective financial knowledge, math ability, financial education, and the existence of long and short-term savings. The results are shown in Table 7.

After considering personal and financial coping resources in the model, hypotheses 3a and 3b were supported as neither student loan debt delinquency nor student loan debt non-delinquency are significant predictors of financial worry. However, subjective and objective financial threats were significant predictors of financial worry. A one-unit change in subjective financial threat was associated with a 0.629 increase in financial worry, all else equal. This aligned with hypothesis 2a as the relationship between the two variables was positive and significant. Furthermore, a one-unit change in objective financial threat was associated with a

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0.675 increase in financial worry, all else equal. This supported hypothesis 2b as the relationship between the two variables was also significant.

Coping Resources

The final regression also allows for testing hypotheses 4a and 4b, which address coping via personal and financial resources. Three out of the five measures of personal resources were significant at the .05 level. A one-unit change in objective financial knowledge was associated with a 0.153 point reduction in financial worry, all else equal. Furthermore, a one unit change in subjective financial knowledge was associated with a 0.133 point reduction in financial worry, all else equal. Having financial education was also a significant factor in reducing financial worry. A one-unit change in financial education was associated with a 0.210 point reduction in financial worry, all else equal.

Hypothesis 4b considered financial resources as coping mechanisms for financial worry. These coping mechanisms were identified as having short and/or long-term savings. Only the existence of long-term savings was significantly associated with financial worry. A one-unit change in long-term savings was associated with a 0.146 increase in financial worry, all else equal. In this case, the existence of short-term savings was not a significant predictor of financial worry.

Control Variables in the Final Model

Age, ethnicity, education, income, employment, marital status, and gender were used as control variables in the final model. Age, education, employment status, and marital status were not significant predictors of financial worry. Compared to Whites, Black individuals were associated with less financial worry while Asians had higher. About education, only those who possessed less than high school were significant predictors of financial worry as compared to

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individuals who have a bachelor's degree. When considering income, compared to individuals who earned between \$50,001 – 75,000, those earning between \$75,001 – 100,000 were associated with higher levels of financial worry, while individuals earning \$150,000 or more were associated with lower financial worry, all else equal. Males also exhibited less financial worry than females, all else equal.

Table 7

Dependent Variable – Financial Worry

N = 14,542

Variable	Estimate	P-Value	β
Student Loan (Reference: No Student Loans)			
Student Loan Delinquent	0.144	0.222	0.009
Student Loan Non-Delinquent	-0.145	0.099	-0.012
Threat			
Subjective Financial Threat	0.629	<.0001	0.455
Objective Financial Threat	0.675	<.0001	0.197
Coping Mechanisms: Personal			
Self-Efficacy	-0.010	0.716	-0.003
Objective Financial Knowledge	-0.153	<.0001	-0.042
Subjective Financial Knowledge	-0.133	<.0001	-0.036
Math Ability	0.000	0.989	0.000
Financial Education (Yes)	-0.210	0.012	-0.017
Coping Mechanisms: Financial			
Long-term Savings	0.146	<.0001	0.037
Short-term Savings	-0.072	0.182	-0.012
Age (Reference: 25-34)			
18-24	0.061	0.584	0.004

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35-44	-0.163	0.081	-0.014
45-54	-0.189	0.057	-0.016
 Race (Reference: White)			
Black	-1.069	<.0001	-0.075
Hispanic	0.163	0.065	0.013
Asian	0.799	<.0001	0.041
Other	-0.239	0.263	-0.007
 Education (Reference: Bachelor's)			
Less Than High School	-0.852	0.001	-0.028
High School Graduate	-0.169	0.201	-0.014
Some College	-0.192	0.105	-0.017
Associates	-0.024	0.868	-0.001
Post Graduate	-0.269	0.064	-0.016
 Income (Reference: 50,001 - 75,000)			
Less than 35,000	-0.106	0.330	-0.010
35,001 - 50,000	0.043	0.721	0.003
75,001 - 100,000	0.403	0.001	0.027
100,001 - 150,000	0.189	0.140	0.012
150,000 Plus	-0.518	0.002	-0.024
 Employment (Reference: Full Time)			
Self-Employed	-0.128	0.315	-0.007
Part-Time	-0.096	0.434	-0.006
Retired	-0.475	0.077	-0.012
Unemployed	-0.139	0.372	-0.006
Other	-0.187	0.060	-0.014
 Parent Education (Reference: Bachelor's)			
Less Than High School	-0.642	0.000	-0.031
High School Graduate	-0.249	0.032	-0.022
Some College	0.082	0.505	0.006
Associates	0.113	0.441	0.006
Post Graduate	0.205	0.136	0.013
 Marital Status (Reference: Married)			
Single	0.113	0.171	0.011

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Other	0.068	0.588	0.004
Gender (Reference: Female)			
Male	-0.580	<.0001	-0.056

Indirect Effects

It is important to understand that there are two types of effects, indirect and direct, reflected in the model. To test for indirect effects, a multiplication of the significant standardized effect of the variable in the finalized model by the standardized significant effect of the labeled variable in the intervening models was completed. When the effects of student loan status on financial worry were analyzed student loan delinquency had indirect effects but no direct effect at the 0.05 significance level. However, when analyzed at the .10 significance level, student loan non-delinquency status would have a significant direct effect. Table 8 shows significant direct, indirect, combined, and net total effects using 0.10 as the significance level. (The decision to consider and report effects using the 0.10 significance level was motivated as much by a desire to track all the hypothesized paths in the theoretical diagram as by any stance about whether it would be more appropriate to rely on the standard, 0.05 significance level.)

Table 8

Dependent Variable – Financial Worry

	Student Loan Delinquent	Student Loan Non- Delinquent
Direct Effects	Not Significant	-0.012

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Indirect via Objective Financial Threat	0.070	0.020
Indirect via Subjective Financial Threat	0.133	0.092
<i>Net Total</i>	<i>0.203</i>	<i>0.100</i>

As measured in this study, student loan delinquency has the highest total magnitude of influence on financial worry ($\beta = .203$). Student loan non-delinquency has a negative direct effect on financial worry at the .10 significance level. When considering indirect effects via objective and subjective financial threats, for those with non-delinquent loans the total net effect is ($\beta = .100$). This difference in magnitude, when compared to the total effect of having delinquent loans, results in part from the negative relationship between student loan non-delinquency and financial worry at the .10 significance level.

The standardized beta coefficients for the indirect effects of having delinquent student loans can be compared to those for coping mechanisms or selected demographic variables to indicate that those indirect effects are substantial and thus illustrate their importance for worry. For objective financial threat indirect effects, the estimated indirect effect is 0.07, compared to 0.13 for the path via subjective financial threat. For coping mechanisms, the relevant coefficients range from negative 0.05 to positive 0.4. For males, the coefficient was negative 0.06, and for Blacks, it was positive 0.08. Hence the indirect effects via subjective financial threats for worry are substantially larger than the effects of key demographics or coping variables like having short-term savings, and those comparison coefficients are roughly the same size or smaller than for the indirect influence of objective financial threats. In short, having a delinquent

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student loan is an important source of financial worry even accounting for coping mechanisms and important control variables such as gender and race.

Robustness Checks

To aid in the understanding of the main results, a set of additional analyses was completed to serve as robustness checks. Each analysis compares different versions to the main model which is outlined in Table 7 and provided results for this study's main findings. The purpose of these checks is to examine how certain core regression coefficient estimates behave when the regression specification is modified by grouping results or by adding and/or removing variables in the analyses. For that purpose, the tables for the additional analyses focus on the main predictors with the understanding that the control variable results are not shown for simplicity. The coefficients for the control variables were studied before deciding to exclude their results here.

Testing Full Mediation

Baron and Kenny (1986) dictate that a mediator variable is a variable that explains the relationship between a predictor variable and a criterion variable. The authors state that mediators tell us how or why something works and that the mediator is considered an intervening variable that explains the relationship between a predictor variable and a criterion variable. In this research, threats were treated as mediator variables between student loan debt and worry. Table 7 showed that a direct relationship between student loan debt and worry was not significant. However, Table 9 showed a direct significant predictor between student loan debt and financial worry after removing threat variables. This showed that complete mediation was present as the independent variable did not influence the dependent variable after the mediator was controlled in Table 7.

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Table 9

Dependent Variable - Financial Worry without Threats

N = 14,542

Variable	Estimate	P-Value	β
Student Loan (Reference: No Student Loans)			
Student Loan Delinquent	2.962	<.0001	0.191
Student Loan Non-Delinquent	1.021	<.0001	0.084
Coping Mechanisms: Personal			
Self-Efficacy	-0.099	0.001	-0.030
Objective Financial Knowledge	-0.310	<.0001	-0.085
Subjective Financial Knowledge	-0.146	<.0001	-0.040
Math Ability	0.076	0.005	0.025
Financial Education (Yes)	0.005	0.961	0.000
Coping Mechanisms: Financial			
Long-term Savings	0.149	0.000	0.038
Short-term Savings	-1.651	<.0001	-0.269

As explained in the literature review, this study benefitted from substantial prior research using the National Financial Capability Survey. The distinctive nature of this study required somewhat different empirical methods, and only one other study relied on stress and coping theory. The discussion that follows considered how well the main conclusions hold up when compared with alternative approaches used or suggested by other researchers. Of course, some changes in regression coefficients will occur so the issue is the extent to which differences undermine the validity of finding that student loans mediate between threats and worry and about the role of coping resource variables. The topics included mortgages and credit card debt, exploring age progression as a proxy for paying off student loans, and college degree completion. The last two involved specifying models that permit a test for interaction effects.

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Credit Card and Mortgage Debts

In prior NFCS 2018 research by Xiao and Kim (2020), the association of student loan delinquency was compared to associations of worry with delinquency for credit cards, and mortgages. Table 10 assessed whether the main results of this study would change by including credit card and mortgage delinquency in the list of other predictors used for Table 7.

Delinquent credit cards and delinquent mortgages were positively associated with financial worry, but there was no significant association for those who were not delinquent for either of those debt types. The objective and subjective financial threat variables still had significant negative coefficients, and there was no direct effect of student loans. Therefore, Table 10 demonstrated again that the threats mediate fully between loan status and worry. Interestingly, the financial coping coefficients showed essentially the same story when credit cards and mortgages were included. One could say that adding those other debts was a way to augment objective financial threats that were not included initially.

Table 10

Dependent Variable: Financial Worry Including Other Debts

N = 14,542			
Variable	Estimate	P-Value	β
Student Loan (Reference: No Student Loans)			
Student Loan Delinquent	0.005	0.969	0.000
Student Loan Non-Delinquent	-0.142	0.104	-0.012
Threat			
Subjective Financial Threat	0.602	<.0001	0.176
Objective Financial Threat	0.618	<.0001	0.447
Other Debt			
Credit Card Non-Delinquent	-0.020	0.829	-0.002

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Credit Card Delinquent	1.025	<.0001	0.056
Mortgage Non-Delinquent	0.082	0.301	0.008
Mortgage Delinquent	0.294	0.004	0.021
Coping Mechanisms: Personal			
Self-Efficacy	-0.007	0.804	-0.002
Objective Financial Knowledge	-0.132	<.0001	-0.036
Subjective Financial Knowledge	-0.155	<.0001	-0.042
Math Ability	0.002	0.930	0.001
Financial Education (Yes)	-0.237	0.005	-0.019
Coping Mechanisms: Financial			
Long-term Savings	0.099	0.006	0.025
Short-term Savings	-0.112	0.039	-0.018

Age Progression and Paid-Off Student Loans

A recent student loan study by Dettling, et al. (2022) considered the implications of using cross-section evidence from the Survey of Consumer Finances while ignoring that some of the respondents have had student loans that they paid off. Those authors demonstrated conclusively that having a student loan was highly conditioned on age, such that most with such loans were below age 40. Because the NFCS does not inquire whether respondents had a student loan that they paid off, this study's main findings could be misleading.

If the results for student loan status differed from the main findings because of failure to account for paying off loans, the differences should be concentrated among the older ages. Table 11 compared the Table 7 model specification across three age categories: 18-24, 25-34, and 35-54. Restriction to three sub-categories maximizes analysis subsample size, and the oldest category was the same as in Table 7. Comparing those subgroups examined age as a moderator. Table 11 showed that all the subgroups had no direct effects of loans on worry, threats of both kinds had negative associations with worry, and the findings regarding coping resources were

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mostly similar across age groups and much the same as in the model for the full sample. This was evidence that missing information about who has paid off their loans did not change this study's main results and that there was not much evidence that age interacted with other predictor variables as an influence on financial worry.

Table 11: Dependent Variable - Financial Worry with Age Sub-groups

Variable	AGE 18-24 N=2,290		AGE 25-34 N=4,024		AGE 35+ N=8,228	
	Estimate	P-Value	Estimate	P-Value	Estimate	P-Value
Student Loan (Reference: No Student Loans)						
Student Loan Delinquent	0.307	0.299	-0.105	0.596	0.121	0.482
Student Loan Non-Delinquent	-0.008	0.968	-0.552	0.000	0.080	0.526
Threat						
Subjective Financial Threat	0.610	<.0001	0.629	<.0001	0.628	<.0001
Objective Financial Threat	0.555	<.0001	0.784	<.0001	0.600	<.0001
Coping Mechanisms: Personal						
Self-Efficacy	0.005	0.937	0.021	0.660	-0.043	0.247
Objective Financial Knowledge	-0.164	0.017	-0.260	<.0001	-0.078	0.043
Subjective Financial Knowledge	-0.153	0.028	-0.039	0.472	-0.181	<.0001
Math Ability	0.025	0.639	0.069	0.108	-0.065	0.054
Financial Education (Yes)	-0.471	0.011	0.064	0.665	-0.322	0.008
Coping Mechanisms: Financial						
Long-term Savings	-0.046	0.622	0.093	0.140	0.173	0.000
Short-term Savings	-0.174	0.176	0.137	0.161	-0.217	0.005

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Degree Completion

Avery and Turner (2012) analyzed whether college students borrow too much or not enough, from a human capital investment perspective. They highlighted that returns from college education had been increasing over time and provide data about investment and returns separated by educational achievement, including degree completion as a category.

According to their Table 2 for 2009 (Expected Degree Completion, Realized Degree Completion, and Borrowing), 36 percent of students who attended college but received no degree had a student loan, compared to 55 percent if they received an AA and 66 percent for BA recipients. This suggested that those in the college category with loans may have borrowed less, which could be an advantage concerning financial worry. On the other hand, not completing a degree could imply a smaller college pay-off so obtaining some college but not completing the degree could cause more worry. Because the NFCS does not obtain the number of student loans, considering degree completion more intently may yield new insights.

Table 12 compared three subgroups for education: completion of any degree (including an Associate's, Bachelor's, or post-graduate degree); high school graduate or less; and some college. Table 7's results were for the full sample, with Bachelor's recipients as the reference group. There was no significant difference in worry there for Some College category. Table 12 tested whether educational achievement moderates the relationships of interest. That is whether the main results for important variables interacted with education by depending on the education category. Comparing Table 12, one can see that the findings about subjective and objective threats were similar and yielded the same conclusions as in Table 7. One difference in coping resources is that within the Some College group financial education was not associated with worry. Unlike Table 7, there were some direct effects of student loan status on worry for degree

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recipients and those who did not attend college. However, the absence of those direct effects for the Some College group does support this study's conclusion that there was full mediation by financial threats. In summary, there were discernible differences when education was treated as a moderator, but most of this study's main conclusions still hold.

Table 12: Dependent Variable- Financial Worry with Education Sub-groups

Variable	DEGREE N=6,724		HS OR LESS N=3,734		SOME COLLEGE N=4,084	
	Estimate	P-Value	Estimate	P-Value	Estimate	P-Value
Student Loan (Reference: No Student Loans)						
Student Loan Delinquent	-0.503	0.005	0.533	0.054	0.283	0.154
Student Loan Non-Delinquent	-0.665	<.0001	0.830	0.000	-0.058	0.722
Threat						
Subjective Financial Threat	0.674	<.0001	0.650	<.0001	0.562	<.0001
Objective Financial Threat	0.630	<.0001	0.553	<.0001	0.800	<.0001
Coping Mechanisms: Personal						
Self-Efficacy	-0.107	0.012	0.085	0.080	-0.007	0.889
Objective Financial Knowledge	-0.153	0.000	-0.093	0.109	-0.178	0.001
Subjective Financial Knowledge	-0.208	<.0001	-0.053	0.322	-0.170	0.003
Math Ability	0.006	0.879	0.008	0.852	-0.024	0.584
Financial Education (Yes)	-0.182	0.105	-0.735	0.000	0.087	0.569
Coping Mechanisms: Financial						
Long-term Savings	0.109	0.028	0.129	0.088	0.167	0.011
Short-term Savings	-0.023	0.769	-0.393	0.001	0.106	0.291

Chapter 5: Discussion and Implications

A positive significant association existed between student loan delinquency and subjective financial threat. A positive significant association also existed between student loan non-delinquency and subjective financial threat. It is important to note that the magnitude of the delinquency status effect was stronger for delinquent (3.245) than for non-delinquent (1.783). This is an important finding that is consistent with Xiao and Kim (2020) as they showed that payment delinquencies of mortgage, credit card, and student loans were positively associated with financial stress.

Furthermore, a positive significant association existed between student loan delinquency and objective financial threat. A positive significant association also existed between student loan non-delinquencies and an objective financial threat. The magnitude of the effect for student loan delinquents (1.603) was higher than that of non-delinquent (.368) as well. The difference between non-delinquent and delinquents in both regressions regarding loan status highlighted the psychological importance of keeping up with payment deadlines when dealing with student loan repayment periods.

Student loan delinquency was positively associated with subjective and objective financial threats but not directly with financial worry at the .05 significance level. In addition, being non-delinquent was also positively associated with subjective and objective financial threats but not financial worry at the .05 significant level. Furthermore, the association between objective and subjective financial threats to financial worry was positive. Some personal resources, specifically variables that accounted for knowledge and education, were negatively associated with financial worry, while when accounting for financial resources, the existence of short-term savings was positively associated with financial worry.

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The surprise was that there were no direct effects of student loan status on financial worry unless one considers non-delinquency as significant at the .10 level. While it was anticipated that student loan delinquency would be positively associated with financial worry, this was not the case. It was hypothesized that if an individual was delinquent on their student loan payment, then their financial worries would increase given the stress associated with not being able to make payments on time. Also, student loan non-delinquency was expected to have a negative direct association with financial worry, but that was not supported here. Being able to make payments on time was believed to indicate financial stability and, henceforth, diminish worry.

While direct effects of student loan status on financial worry were non-existent at the .05 significance level, indirect effects were present and large relative to other key predictor and control variable effects estimated here. This result has not been found in any prior studies using the National Financial Capability Survey.

Research Implications

To consider this study's important contribution to the relevant literature, a review of prior research (summarized in the tabular form above in Table 1) findings will place results in context. The findings in this study were consistent with the previous findings in that they highlight the important associations of student loans, stress, and personal and financial coping resources to financial worry. As important as consistency is, this study also applied a unique approach that found some differences to provide new insights.

Xiao and Kim (2020) used a financial capability index that showed a negative association between the index and stress when it interacted with student loan delinquency. The authors also used the NFCS 2018 data set. Their financial capability index was estimated by summing Z

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scores of four financial capability measures; (1) objective financial knowledge (0–6), subjective financial knowledge (1–7), perceived financial capability (1–7), and desired financial behavior (0–6). One would assume that the more capable an individual is the less stress they experience. However, that was not the case when the index was interacted with student loan delinquency. Xiao and Kim’s index combined both objective and subjective knowledge in their examination which may have led to the puzzling association between capability and stress. This study separated subjective from objective threats, and other predictors that are conceptually in their index, and found that subjective financial knowledge has a negative association with financial worry as might be the case if overconfidence about finances diminishes financial worry. In essence, not treating subjective knowledge separately may have led to Xiao and Kim’s puzzling interaction result. Xiao and Kim also found student loan delinquency is positive on stress and this study found that is the case for objective and subjective financial threats. An implication for future research is that financial capability components must be analyzed separately for predicting stress, worry, and related financial behaviors.

Furthermore, Fan and Chatterjee (2019) found a direct relationship between the existence of private and federal student loans to student loan worry. Fan and Chatterjee (2019) used the 2015 NFCS, but limited their conceptualization of student loan worry to be concerned about the ability to pay off student loans and only focused on respondents who indicated that they had taken out a student loan for themselves, were between the ages of 24 and 65, were no longer a student, were employed, and were the primary decision-makers in their families which reduced the sample size to 2,662. This study used a more comprehensive measurement of financial worry and performed a comparative analysis between those who had student loans and were or were

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not delinquent on payment. Doing so expanded the population sample and allowed for a more thorough analysis.

In addition, Fan and Chatterjee found that those who received financial education were less likely to worry about their student loan debt. This is consistent with the findings in this study as financial education was negatively related to financial worry. This study differed in how financial education was conceptualized and sought to account for whether financial education was received while Fan and Chatterjee (2019) were concerned with the socialization aspect and asked respondents whether their parents or guardians taught them how to manage their finances. Financial education was identified as an important coping mechanism in this study and along with Fan and Chatterjee (2019) highlighted that education is an important tool to address concerns about student loans and financial worries.

Financial satisfaction and worry have been found to be negatively related as an increase in worry may decrease the overarching feeling of financial satisfaction (Robb et al., 2018). Robb et al. (2018) also found no effect of student loans that were not private loans on satisfaction using the 2015 NFCS, but this study found student loan debt increases worry through its indirect effect via financial threats. Similar to Robb et al., this study limited the sample to respondents between the ages of 18-54. One unique difference from their 2018 study is that this study's dependent variable accounts for three dimensions of worry including retirement while Robb et al. used a single measure of current financial satisfaction.

Along these lines, Joseph and MacDonald (2021) found that student loans decrease financial satisfaction. This study supports such findings as loans are likely associated indirectly with an increase in financial worry. Joseph and MacDonald also relied on the 2018 NFCS dataset but restricted their analysis to emerging adults (7,481 observations from respondents between the

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ages of 18-34). This study used a much larger sample size and accounted for older individuals who may still be paying off their debt because they attended college/university at a later stage in life.

Summing up, besides solidifying prior evidence that student loans increase worry and may detract from financial satisfaction, this study refined evidence that student loan delinquency had comparatively large indirect influences via both objective and subjective financial stress. This was an important finding because it highlighted the importance of staying current with payments to avoid future burdens

Policy and Practice Implications

The results of this study add to the evidence that student loans have negative psychological consequences and demonstrate the importance of treating coping aspects of financial capability separately. Given the introduction of coping resources in the model, such as personal and financial resources, where financial worry was the dependent variable, it is evident that coping resources influence the relationship between student loan debt and financial worry. Increasing objective financial knowledge can have a positive effect on an individual's assessment of financial worry, which in turn, may affect their overall psychological well-being.

From a policy perspective, policymakers must understand the effects of student loans on individuals' psychological well-being in the form of financial threats and potential for financial worry. Doing so would allow the inception of policies that reduce the psychological effects of worry and promote overall well-being. Research has pinpointed the effect of student loans on asset accumulation (Elliott et al., 2013; Mezza et al., 2016), and policymakers have addressed some concerns by adding financial planning courses in the high school curriculum to even discuss a student loan forgiveness amount. From a policy standpoint, little has been done to

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address the non-asset cumulative effects of borrowers, which could be more damaging to an individual's well-being.

Differentiating between student loan debt and student loan delinquency is an important aspect to understand the overall effect of student loan debt. This study showed that there is a larger effect on threats once delinquency is factored in. While student loans in general affect threats, being delinquent has a stronger association and should be considered when developing intervention strategies.

From a practice perspective, financial planners must understand the effects student loans and student loan delinquency have on financial threats, which in turn affect financial worry. Understanding the concept of financial worry may provide financial planning professionals with an avenue for interventions. In this study, it was found that student loans are associated with objective and subjective financial stress that in turn increases financial worry. However, the impact of both types of stress is mitigated by coping mechanisms. Therefore, financial professionals should focus on increasing solutions such as enhancing financial knowledge that will promote coping

Financial education is an important coping mechanism that may decrease the extent of financial worry. Financial professionals should work alongside financial aid offices in institutions of higher education to promote well-being and appropriate student loan borrowing. An introduction to a financial education curriculum that aims to increase subjective and objective financial knowledge would be ideal.

The incorporation of financial education centers in university campuses has developed student loan education workshops, but not many focus on the effect of student loans after

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graduation. Most tend to address student loan borrowing as a responsibility but have neglected to address one of the most important components of student loan borrowing, the repayment period.

Study Limitations

This study used a nationally representative sample to provide evidence about financial worry among individuals with student loan debt. It focused on highlighting the effects that student loans pose for borrowers and provided information about important coping resources for borrowers to deal with such debt. While the present study presented novel findings, it has limitations that warrant discussion.

First, the dataset does not allow for a more comprehensive observation of student loans. The balances on student loan debt are unavailable. Financial worry related to student loans may likely be decreased or magnified by the amount of student loan debt a borrower holds. Related to the number of student loans available, the NFCS does not permit designating whether individuals had student loans in the past and were able to liquidate the debt. The survey was for a 2018 sample and some individuals could have already paid off their student loans by the time the study took place, therefore, not being identified as student loan borrowers. Additionally, the study used information about whether the respondent had short-term and long-term savings, but having the amount of savings would aid in pinpointing the influence of savings on financial worry, however that was not the case. The NFCS does not obtain the amounts in various accounts, but rather only their existence.

Furthermore, having received financial education showed a negative association with financial worry as it was inserted as a coping mechanism. However, the NFCS does not expand on the degree of financial education received nor does it account for the curriculum used. The NFCS obtains whether or not an individual received financial education and attempts to expand

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on this by explaining where the financial education took place (e.g. college, high school, military). Having more information in the curriculum used would have been beneficial in understanding the extent to which being exposed to financial education affects financial worry.

The measurement of financial self-efficacy in the present study is another limitation. Consistent with previous research that has utilized the NFCS, financial self-efficacy was measured with a single item about the management of finances due to the unavailability of a standard scale such as the Lown (2011) financial self-efficacy scale. Related to measurement, math ability is only a subjective measure: individuals are asked if they are good at math and then advised to rate themselves from 1-7. Having a more objective measure of math ability could have a distinct effect on financial worry.

In addition, the usage of student loans may be affected by the support individuals received from their parents. The NFCS 2018 does not have a measurement for parent income or the amount if any, that they contributed to their children's education. While a direct correlation between income and education has been established (Wolla & Sullivan, 2017), we cannot determine if parents contributed to their child's education which would affect the amount of aid they would need to fund a higher education degree.

Despite these limitations, this research makes a solid contribution to the student loans and financial worry literature by highlighting the importance of outside stimuli or threats on financial worry. This study also demonstrated that coping resources such as financial knowledge and education are effective personal traits that provide an effective approach to decreasing financial worry.

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Future Research

Future research can construct a measure of student loan balances to understand the extent that amounts of student debt affect financial worry. Understanding the debt levels where financial worry is exhibited most would be beneficial for financial professionals as it may prove helpful when administering treatment. Furthermore, a path analysis could be performed using financial statistical software that allows for such a feat. A researcher could also perform a longitudinal analysis to follow individuals with student debt over time. It would be interesting to look at the moment in which financial worry peaks and begins its decline as the individual ages and continues to pay down debt.

Additionally, the dataset used did not ask respondents about the strategies they utilized to cope with financial worry, that is ask respondents to select the strategies they used to address financial stress in their daily lives. Financial education was an important variable in negatively associating with financial worry, future research could also look at the content of the education received to learn how variation is related to the amount of worry individuals feel.

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