Stanford cepa | Center for Education Policy Analysis

CEPA Working Paper No. 16-15

Understanding Loan Aversion in Education: Evidence from High School Seniors, Community College Students, and Adults

AUTHORS

Angela Boatman
Vanderbilt University

Brent Evans
Vanderbilt University

Adela Soliz
Vanderbilt University

ABSTRACT

Student loans are a crucial aspect of financing a college education for millions of Americans, yet we have surprisingly little empirical evidence concerning individuals' unwillingness to borrow money for educational purposes. This study provides the first large-scale quantitative evidence of levels of loan aversion in the United States. Using survey data collected on more than 6,000 individuals, we examine the frequency of loan aversion in three distinct populations. Depending on the measure, between 20 to 40 percent of high school seniors exhibit loan aversion with lower rates among community college students and adults not in college. Women are less likely to express loan averse attitudes than men, and Hispanic respondents are more likely to be loan averse than white respondents.

VERSION

August 2016

Suggested citation: Boatman, A., Evans, B., & Soliz, A. (2016). Understanding Loan Aversion in Education: Evidence from High School Seniors, Community College Students, and Adults (CEPA Working Paper No.16-15). Retrieved from Stanford Center for Education Policy Analysis: http://cepa.stanford.edu/wp16-15

Understanding Loan Aversion in Education: Evidence from High School Seniors, Community College Students, and Adults

Angela Boatman, Brent Evans, Adela Soliz

Abstract

Student loans are a crucial aspect of financing a college education for millions of Americans, yet we have surprisingly little empirical evidence concerning individuals' unwillingness to borrow money for educational purposes. This study provides the first large-scale quantitative evidence of levels of loan aversion in the United States. Using survey data collected on more than 6,000 individuals, we examine the frequency of loan aversion in three distinct populations. Depending on the measure, between 20 to 40 percent of high school seniors exhibit loan aversion with lower rates among community college students and adults not in college. Women are less likely to express loan averse attitudes than men, and Hispanic respondents are more likely to be loan averse than white respondents.

Keywords: student loans, higher education, loan aversion, financial aid

As the college-going population becomes increasingly diverse and the cost of college continues to rise, it is critical that we better understand the underlying mechanisms by which prospective students make decisions about whether and how to finance their education beyond high school. Student loans are an increasingly necessary tool to help students pay for postsecondary education. Though thirty-five percent of all undergraduate students and 55 percent of all graduate students receive some type of federal loan to help finance their college education (Snyder & Dillow, 2015), a subset of students appear to be averse to taking out loans, and, thus will choose not to borrow money to finance their college education (Callendar & Jackson, 2005; Cunningham & Santiago, 2008).

While loan aversion (sometimes called debt aversion) can apply to any form of financial debt, this paper focuses on its application to student loans. Loan aversion, as it applies to postsecondary education, is commonly defined as "an unwillingness to take a loan to pay for college, even when that loan would likely offer a positive long-term return" (Cunningham & Santiago, 2008, p. 10). Loan averse students are those willing to invest in higher education but not willing to take out loans to do so (Palameta & Voyer, 2010).

Evidence of the existence of loan aversion has been found among students in several contexts (Burdman, 2005; Caetano, Palacios, & Patrinos, 2011; Callendar & Jackson, 2005; Cunningham & Santiago, 2008; Goldrick-Rab & Kelchen, 2013; Palameta & Voyer, 2010), but much of the empirical work has been done outside the United States. Furthermore, little quantitative evidence exists to identify how loan aversion varies by demographic characteristics. Cunningham and Santiago (2008) suggest Asian and Hispanic students are less likely to borrow, but it is not clear if those preferences are a result of loan aversion.

Loan aversion can, in some cases, lead to negative outcomes for students. Given that student loans are the primary policy mechanism by which to relieve credit constraints, a

reluctance to borrow implies loan averse students will underinvest in higher education. This underinvestment could manifest itself in a variety of ways: working more hours while enrolled, enrolling in two-year instead of four-year colleges, enrolling part-time instead of full-time, delaying college enrollment after high school, or forgoing college altogether. These decisions may adversely affect enrollment, persistence, and success in college. For example, research suggests that additional hours of work may have a negative effect on students' college GPAs (Scott-Clayton, 2011; Soliz & Long, 2016; Stinebrickner & Stinebrickner, 2003), and lower and middle-income students engage in this behavior at higher rates than their upper-income peers (Educational Longitudinal Study (ELS):2002). Moreover, delaying enrollment, enrolling less than full-time, or enrolling in a two-year college rather than a four-year college has also been shown to have a negative effect on students' probability of persistence and degree completion (Attewell, Heil, & Reisel, 2012; DesJardins, Ahlburg, & McCall, 2006; Long & Kurleander, 2009; Monaghan & Attewell, 2014).

This study seeks to better understand loan aversion among students in the United States, drawing upon economic and sociological theory to describe why loan aversion may exist. Through the collection and analysis of a unique dataset of over 6,000 high school seniors, community college students, and adults without a degree who are not enrolled in college, we measure the extent of loan aversion among a diverse population in an effort to assess differences in loan aversion by gender, race, income, and first-generation college status. Within our survey, we replicate the questions of past studies in order to compare different measures of loan aversion used in the previous literature (Callendar & Jackson, 2005; Palameta & Voyer, 2010). Our three research questions are:

1. To what extent is loan aversion present among high school students, community college students and adults not enrolled in college?

2. What is the relationship between different measures of loan aversion?

3. Does loan aversion vary by individual characteristics?

Understanding the extent to which loan aversion is present across different populations is important if people are underinvesting in higher education because they are unwilling to borrow. This underinvestment has negative implications for individuals as higher education leads to higher earnings, on average, but it also has negative implications for society as higher education is strongly correlated with healthier, more engaged citizens and provides a greater tax base for government funding. If loan aversion exists, our second research question addresses how to measure it. Finally, loan aversion may affect some potential students more than others. If, for example, loan aversion affects the college investment decisions of females more than males, this has implications for policy interventions designed to ameliorate this problem.

In this paper, we measure loan aversion in three ways based on: 1) respondents' attitudes towards borrowing money generally; 2) respondents' attitudes toward borrowing money for education specifically; and 3) respondents' preferences for cash, grants, or grants plus loans in hypothetical financial aid packages. Although we find substantial evidence of loan aversion in all three populations, we do not find a strong correlation among our three definitions of loan aversion, suggesting that different definitions pick up different dimensions of loan aversion. Subgroup analyses reveal that women are less loan averse than men on two measures but might be more loan averse than men on another measure. Across all measures, Hispanic respondents are more loan averse than white respondents. If loan aversion affects students' decisions about college enrollment and persistence, our results suggest that some students may make less than optimal decisions about college enrollment in order to avoid taking out student loans, and that this may be particularly true for Hispanic students.

Our study contributes to the extant literature in several ways. First, we replicate the survey questions of Callendar and Jackson (2005) and Palameta and Voyer (2010), who conducted their studies in England and Canada, respectively, in the context of the United States among three separate populations: high school seniors, community college students, and adults without a college degree who are not enrolled in higher education. Second, by surveying populations who are not currently enrolled in higher education, we improve upon the existing literature. Studies limited to samples already enrolled in higher education may underestimate the effects of loan aversion if students who were averse did not initially enroll, and for this reason, we sample two groups (high school seniors and adults) prior to enrolling in college. Third, we demonstrate how three distinct measures of loan aversion, all of which exist in the literature, compare to each other within the same sample. Finally, we provide evidence of how the various definitions of loan aversion vary by respondent characteristics, which is notably absent in the literature.

Theory and Literature on Loan Aversion

Rational Economic Theory on Borrowing for Higher Education

According to standard economic theory, a student decides whether or not to enroll in college using a standard cost benefit analysis. A potential college student assesses the cost of enrolling by factoring in tuition and fees, room and board, and available financial aid. The student weighs those costs against the discounted future benefits associated with the degree, including greater earnings. Economic theory would suggest that a rational student will enroll in college when the benefits outweigh the costs (Avery & Hoxby, 2004).

Given the evidence on the significant financial returns to college credentials, investing in higher education is, on average, a smart economic decision for students (Avery and Turner, 2012; Carnevale, Strohl, & Melton, 2011; Hoekstra, 2009; Kane & Rouse, 1995). However, not all

students can afford the direct costs even if they want to enter college. Student loans are available to resolve this credit constraint. Individuals must decide how much debt to take on relative to the potential payoffs in future earnings.

Some students may decide not to borrow or borrow a small amount for rational reasons. For example, if students carefully consider their degree, major choice, and labor market prospects and decide that they are unlikely to earn enough to repay their loan, then avoiding borrowing may be completely rational. Our study is concerned with students who are loan averse and are unwilling to borrow in order to make the necessary investment in higher education even when that investment would provide positive economic returns. Traditional economics argues that these students are behaving irrationally, although a variety of non-economic explanations could also plausibly explain loan averse behavior.

Behavioral Economic and Sociological Explanations for Loan Aversion

Behavioral economics offers several potential explanations for loan aversion.[1] Previous literature has demonstrated that the complexity of the financial aid system prevents some prospective students from applying for aid (Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2012; Dynarski & Scott-Clayton, 2006), and this complexity may deter students from borrowing. Because the Free Application for Federal Student Aid (FAFSA) requires knowledge of prior year earnings and assets, individuals for whom this information is not readily understood or accessible may elect not to apply for financial aid, and thus, not attend college. Similarly, there is evidence that many people living in poverty do not open bank accounts because of small obstacles such as distance to the nearest bank (Bertrand, Mullainathan, & Shafir, 2006). Some prospective students may be highly risk averse to borrowing and, therefore, avoid any decision that could result in a negative outcome such as defaulting on their student loans if they fail to secure a job or end up

earning less than expected (Rabin & Thaler, 2001). This rationale is further supported by cumulative prospect theory (Tversky & Kahneman, 1992), which suggests people tend to overweight extreme events even when their likelihood of occurrence is quite low. Student loan default may be viewed as such an event, and students averse to borrowing may be overweighting the risk inherent in borrowing.

In addition, behavioral economics suggests that framing and labeling effects matter. Typically, people make decisions based around a reference point (Tversky & Kahneman, 1992*)*, and individuals may make different decisions depending on the frame or the label of the reference point. For example, Caetano, Palacios, and Patrinos (2011) demonstrate that students in Latin America differentially respond to financially equivalent contracts to finance education depending on whether the contract is labeled a "loan." In the United States, Field (2009) used an experimental design to explore the instances of loan aversion among law students at New York University. Students interested in careers in public service were randomly assigned to receive one of two financially equivalent aid offers: a loan to pay tuition that would be paid back by the school if the student ended up in public service, or tuition assistance in the form of grants which students would have to pay back if they did not end up in public service law. Students who were offered the grants were twice as likely to enroll as students who were offered the loans and were 36 percent more likely to enter public interest law within two years after graduation. Collectively, these findings suggest that a subset of prospective students is averse to borrowing due to framing and/or labeling effects.

In addition to behavioral economics, there are several sociological explanations for loan aversion. Prior negative experience in credit markets by students and their families could deter potential borrowers from taking on student debt. Although we are not aware of any evidence linking parental student loan debt with borrowing decisions, there is evidence that observed

negative experiences with parental credit card debt is linked to negative perceptions of credit card usage (Joo, Grable, & Bagwell, 2003). If students observed their family's struggles with debt, especially foreclosures during the 2007 housing market crash, they may wish to avoid future borrowing. This may also be true of adults who have had their own negative experiences in the credit market. Finally, is possible that cultural differences in the preference for debt explain some of this difference. Research has suggested that Asian and Hispanic students are less likely to borrow for college than white students suggesting possible racial differences in loan aversion (Cunningham & Santiago, 2008; ECMC Group Foundation, 2003; Hillman, 2015), although researchers continue to explore the reasons behind these trends. These preferences may be broader than student loan debt, and could apply to other forms of borrowing as well. Our study attempts to shed light on this proposition by measuring borrowing attitudes generally and specific to higher education across a racially and socioeconomically diverse population of respondents.

Loan Aversion in the Education Literature

Several studies have hypothesized that loan aversion may affect students' decisions about enrolling in college without providing empirical evidence that the phenomenon exists. St. John (1993) cites loan aversion as a possible explanation for why low-income students' college enrollment is not associated with borrowing, and Paulsen and St. John (2002) state "Latinos choose to attend colleges with lower costs and are more loan averse than other ethnic groups" (p. 211). Despite these arguments, neither paper offers evidence of loan aversion. Many other papers have also cited loan aversion as a potential explanation for student borrowing behavior (Avery & Turner, 2012; Dowd & Coury, 2006; Malcom & Dowd, 2012; Perna, 2008; Rothstein & Rouse, 2011), but none of these analyses have examined the extent of this phenomenon across different populations of respondents.

Only a handful of empirical studies help us understand how widespread the problem of loan aversion is, or how it affects students' decisions about college enrollment and financial aid. Qualitative studies have cited lower levels of borrowing among students as evidence of loan aversion (Burdman, 2005; Xue & Chao, 2015). This definition of loan aversion is unsatisfying as lower levels of borrowing could be explained by students attending lower-cost institutions or having unobserved resources used to finance higher education. Goldrick-Rab and Kelchen (2013) offer evidence that loan aversion exists among a specific population of college students in the United States by examining nearly 700 first-year Pell-grant recipients attending the public college system in Wisconsin. They identified students as loan averse if they either did not accept a loan offered in a financial aid package or responded on a survey question that they would not choose any loan aid if offered, and concluded that 48 percent of their sample is loan averse by these two definitions. Although these measures may capture some degree of loan aversion, they may be biased. The students surveyed may have other unobserved financial resources that obviate borrowing, in which case the students labeled loan averse might be willing to borrow but simply find it unnecessary, leading to estimates biased upward. On the other hand, because the study only samples students who have already applied for financial aid and enrolled in college, it may underestimate loan aversion if it prevents potential students from enrolling in college entirely.

The two studies we rely upon most heavily in this paper use survey methods to explore loan aversion for students outside the United States. Callendar and Jackson (2005) surveyed 1,954 prospective college students in England to explore the relationship between students' attitudes towards debt and their college enrollment decisions. They find that students from low socio-economic classes are more debt averse than those from other social classes and this aversion deters their pursuit of higher education. Palameta and Voyer (2010) present 1,248 Canadian students in their final year of high school or first year of college with the option of accepting

financial aid for college in the future versus accepting smaller amounts of cash in the present. Respondents chose between grants versus cash or combinations of grants and loans versus cash. The authors define loan aversion as the decision to take a grant only when it is stand-alone, and not when it is offered in combination with an optional loan. Palameta and Voyer (2010) find that between 5 and 20 percent of the sample is loan averse, with a higher propensity among underrepresented groups (aboriginals, boys, and students' whose parents are not college educated).

Collectively, the empirical evidence on loans suggests somewhere between 5 and 50 percent of students or prospective students are loan averse and that loan aversion varies by individual characteristics such as gender, race, and income, but not always in consistent ways. Furthermore, prior studies all use different measures of loan aversion and were either conducted outside the United States, only on traditional students, or only on a group of students who had already made the choice to enroll in higher education. Our paper addresses these limitations and makes important additional contributions to the literature on loan aversion. Using survey methods, we gather a unique dataset comprised of samples from three distinct populations (high school seniors, community college students, and adults without a degree who are not enrolled in college) and explore the concept of loan aversion using three different measures from the previous literature. By exploring respondents' attitudes and choices about borrowing money generally and specifically for education, our study is the first to examine multiple measures of loan aversion in a variety of contexts for three distinct populations of potential and current college students.

Conceptualizing & Operationalizing Loan Aversion

Unlike previous studies that rely on a single measure or a response to a single question, we assess loan aversion in three distinct ways, thereby enabling broader content validity across multiple dimensions of loan aversion. Our three measures of loan aversion are based on: 1) respondents' attitudes towards borrowing; 2) respondents' beliefs that it is acceptable to borrow money to pay for education; and 3) respondents' preferences between cash and hypothetical financial aid packages that include grants alone or grants and loans combined. Below we describe how we operationalize each of our three measures of loan aversion. For each measure of loan aversion, see Appendix A for the specific question asked on the survey. Additional details about the survey instruments are available in the Data Appendix.

Respondents' Attitudes towards Borrowing

A common hypothesis is that aversion to borrowing varies across race in large part due to cultural differences in the perception and value of money (Cunningham & Santiago, 2008; Lynn, 1991). If variation in attitudes is explained by demographic characteristics, it lends support to this hypothesis. To measure these attitudes, we borrow directly from a survey used by Callendar and Jackson (2005) to assess students' debt attitudes in England. We include survey items that ask students to respond on a five-value Likert scale (Strongly Agree to Strong Disagree) the extent to which they agree or disagree with three statements: "You should always save up first before buying something," "Owing money is basically wrong," and "There is no excuse for borrowing money." These three statements vary in their severity, with the first allowing for a less aggressive stance on borrowing compared to the second, and especially compared to the third. Therefore, answering Strongly Agree or Agree for the last question should imply agreement with the earlier two. Indeed, we see a pattern of responses for these three questions that strongly suggest an ordered scale, with the coefficient of reproducibility for all three samples greater than 98 percent.

As a result, we use Guttman scaling to create a debt averse scale based upon the binary measures of answering strongly agree or agree on these three questions (hereafter termed *Attitudes Scale*). Responses are measured on a scale that ranges from 0 to 3, in which respondents that received a 0 displayed no loan averse attitudes and respondents that received a 3 answered they agree or strong agree with "There is no excuse for borrowing money", the most severe answer.

A primary advantage of this measure is that it assesses general attitudes towards borrowing that can apply regardless of the scenario. This allows for a more holistic definition of loan aversion that is not specific to any one item or purchase. We also use a scaling technique to weight respondents' answers, thus acknowledging the nuance in borrowing attitudes that may exist. A downside of this measure is that it is not directly related to a specific borrowing decision. As we are especially interested in borrowing money for education, our second measure provides a more direct test of this particular decision.

Respondents' Beliefs that it is Acceptable to Borrow Money to Pay for Education

To further gauge respondents' attitudes toward borrowing money, we supplement Callendar and Jackson's (2005) debt attitude questions with questions similar to those the Federal Reserve has used to collect data on consumer behavior. Mortenson (1988) conducted an analysis of willingness to borrow for educational expenses using borrowing questions from a nationally representative sample conducted by the Federal Reserve. Specifically, we ask "Do you think it is okay to borrow for education?" To test loan aversion for educational expenses, we define a respondent as loan averse if he or she did not answer "yes" to this question, a measure similar to the one Mortenson (1988) uses to identify loan averse students (hereafter termed *Borrow for Education*).

An advantage of this measure is that it provides a direct assessment of a respondent's attitudes toward borrowing money for education; however, it does not capture attitudes toward borrowing more broadly. Since aversion to borrowing money for education is the specific phenomenon we strive to define and understand, the *Borrow for Education* definition is an important complement to *Attitudes Scale*.

Cash vs. Loans in Financial Aid Packages

Finally, we measure whether students avoid loans in financial aid packages. This measure has the advantage of identifying loan aversion specifically in the context of borrowing for college. Instead of simply asking respondents their attitudes about borrowing money generally (*Attitudes Scale*) or borrowing money for college (*Borrow for Education*), we asked respondents to make a series of choices between taking different amounts of cash or various financial aid packages. Following Palameta and Voyer (2010), survey respondents were asked, for instance, to choose whether they would prefer $300 in cash or a $1,000 grant when they enroll in college. Some of the financial aid packages include only grants, while others are a combination of grants and loans. We identify loan averse respondents as those who chose financial aid offers over cash when the financial aid package consisted only of grants, but accepted cash over financial aid when the financial aid package included loans (hereafter termed *Avoid Loan Packages*). For example, we define a respondents as loan averse if he or she prefers $1,000 in grants over $300 in cash, but prefers $300 in cash over a financial aid package of $1,000 grants and $1,000 in loans. If the respondent did not need the additional loan money, she could immediately repay the loan and still have the $1,000 in grant aid. Therefore, there must be a characteristic of her preference that makes the financial aid package with a loan less desirable than one with the same amount of grant

aid but without the loan. If respondents change their preferences due to the inclusion of a loan, we define them as loan averse.

The advantage of this measure is that it is contextually situated in an actual decision students face when making choices about financial aid. The downside of this measure is that the question may be difficult to understand, casting doubt on its reliability. We observed 9.4 percent of the sample making choices that suggest that they did not understand this question. These respondents prefer a lower amount of cash over an aid package but then prefer the same aid package over a higher cash amount. We check the robustness of our findings by excluding these people as noted in the Results section below.

Methods & Data

Sample Selection & Data

We collected survey data from three different populations: high school seniors, community college students, and adults age 20 to 39, without a college degree, who were not currently enrolled in higher education. We include high school students because we are interested in how attitudes about borrowing money for college might shape the decision to borrow and enroll in higher education. Community college students have already made a decision about borrowing money for college, and, as a result, may have attitudes about borrowing that differ from those of high school students. In addition, community college students constitute an important population of students in higher education as almost 50 percent of undergraduates are enrolled in a public community college (College Board, 2011). Finally, adults who have not attended college provide another, unique perspective into attitudes about borrowing given their experience in the labor market and managing their own finances. The high schools were selected randomly across all racially diverse public high schools in Texas, Kentucky, Tennessee, and Massachusetts, supplemented with a diverse sample of community college students and adults.

Ultimately, we surveyed 2,140 high school students, 4,278 community college students and 843 adults. Additional details about the sampling methodology are available in the Data Appendix (including an analysis of missing data).

Descriptive Statistics

Descriptive statistics for each of our three analytic samples are displayed in Table 1. Our primary sampling goal was to reach a racially diverse set of respondents, as well as a diverse sample based on gender, age, and other demographics. While our high school sample includes an even distribution of male and female students, we had many more women complete the survey in the community college and adult samples (over 70 percent female for both). Our community college sample is also disproportionally white (45 percent compared to 35 percent for the high school students and 28 percent for the adults). This is not surprising since, though we chose community colleges that had diverse populations, we did not explicitly sample on race among community college sites. Despite not sampling on race, the racial demographics of our community college sample are representative of community colleges nationwide. Our community college sample includes 45 percent white respondents, 10 percent Black respondents, and 29 percent Hispanic respondents, compared to the national enrollment averages for American community colleges of 49 percent white, 14 percent Black, and 22 percent Hispanic (NCES, 2014).

A substantial portion of all three samples is low-income. Respondents in the high school sample are defined as low-income if they receive free or reduced-price lunch, and nearly 28 percent of them did. Respondents in the community college and adult samples are defined as low-income if they received any form of federal public assistance within the past two-years including the Pell grant, TANF, WIC or SNAP. Nearly 55 percent of community college

respondents were low-income, and approximately 42 percent of the adult sample. All three samples have high aspirations to obtain postsecondary degrees. Although adults who are not enrolled in college are less likely to aspire to obtain a degree than the other two samples, over 68 percent hope to earn at least an associate's degree. This indicates a high likelihood that some portion of this sample will face the future decision to borrow for education. Parental education is similar across the high school and community college samples (60-65 percent have a parent who attended college). The adult sample comes from families with noticeably less educational attainment.

Empirical Strategy

We first examine each of the above three measures of loan aversion (*Attitudes Scale*, *Borrow for Education*, and *Avoid Loan Packages*) individually across each of the three samples. We then explore the relationship across these measures to see if or how they might be related to one another by examining the correlation between each measure in each sample. We also explore whether the existence of loan aversion varies across student characteristics first by using t-tests to compare each of the loan aversion measures by student characteristics, and then by estimating the following regression model:

(1) $averse_{ij} = \beta_0 + \beta_1(student\_characteristics)_{ij} + \gamma_j + \epsilon_{ij}$

in which "averse" is one of our three measures of loan aversion for student *i* in institution (school or community college) *j* (adults are not indexed by *j*). "Student characteristics" include dummy variables for gender, race (with "white" as the omitted category in the regressions), citizenship, low-income status, whether the respondent's parents attended college, and whether their parents graduated from college. Models for the high school and community college samples also include the respondent's self-reported grade point average (GPA). Fixed effects for high school or

community college are included as γ_j. Regression standard errors are clustered at the high school level for the high school sample and the college level for the community college sample.

Results

To what extent is loan aversion present among high school students, community college students and adults not enrolled in college?

In Tables 2, 3 and 4, we present the proportion of respondents who are loan averse by our three measures across each of the three samples. Our first measure, *Attitudes Scale*, is derived from the survey responses to three statements about borrowing money generally. As shown in Table 2, the majority of respondents in all three samples believe one should always save up first before buying something, the weakest of the three statements. A smaller but still substantial number of respondents in each sample (between 8 and 12 percent) agrees with the most severe statement that "there is no excuse for borrowing money." When we use Guttman scaling to combine these three responses into a 0-3 scale score, we find that loan aversion, as defined by attitudes about borrowing money, exists for all three samples. By this definition, the adult sample is the most loan averse followed by the high school respondents and the community college respondents.

Moving to a definition of loan aversion that centers on education (*Borrow for Education*), Table 3 demonstrates that loan aversion exists in all three samples, but to varying degrees. Twenty-one percent of high school students do not think it is ok to borrow money to pay for education, compared to 20 percent of adults, and nine percent of community college students. We expected community college students to exhibit less loan aversion when asked explicitly about borrowing for education given that over half of the respondents (55 percent) reported on a separate survey question that they had borrowed some amount of money to attend. Approximately one in every five high school seniors and adults who are not in college do not believe it is ok to

borrow for education. The results of this question suggest that a substantial number of high school seniors and adults not in college may be deterred from investing in higher education because of their desire to avoid borrowing.

Table 4 demonstrates that an even larger percentage of each sample may be defined as loan averse when loan aversion is defined by their choices between various financial aid packages and cash (*Avoid Loans Packages*). Over 41 percent of the high school sample, nearly 35 percent of the community college sample, and over 27 percent of the adult sample preferred a financial aid package to cash when the package included only a grant but switched to preferring the cash when a loan was added to the aid package. Given the complexity of this question, we examined whether any students made sets of decisions that would suggest they did not understand the prompt. We examined how many students stated they preferred a smaller amount of cash to an aid package but that same aid package to a larger amount of cash. There were 175 high school seniors, 138 community college students, and 72 adults that made these types of errors. As a robustness check, if we exclude the respondents who made unreasonable answers, the percent of respondents in each sample that are labeled loan averse by this measure drop between 1.4 to 3.9 percentage points, depending on the sample. We continue to use the full analytic sample to maintain consistency of sample throughout the analysis.

By all three measures, loan aversion appears to exist and at quite high rates across all three samples of respondents.

What is the relationship between different measures of loan aversion?

For this research question we aim to demonstrate whether our various measures of loan aversion are related to one another. Table 5 shows the correlations across the three different measures of loan aversion for each of the three samples. In general, our measures of loan aversion are only weakly correlated with one another. *Attitudes Scale* and *Borrowing for Education* are

correlated with ρ of between 0.23-0.25 for the high school and community college samples, but only at a value of 0.09 for the adult sample. *Avoid loan packages* is poorly correlated with both other measures across all three samples.

We hypothesize that the three measures of loan aversion that we describe are not highly correlated because they measure different dimensions of loan aversion in different contexts. For example, the *Attitudes Scale* combines attitudes towards borrowing for multiple types of purchases including borrowing to buy a home and borrowing for education. Some respondents may be averse to borrowing to finance higher education (as captured in the *Borrow for Education* measure) but may not be concerned about taking out a mortgage in order to purchase a home. Finally, for the third measure (*Avoid Loan Packages*), survey respondents who did not appear to be loan averse when asked in the abstract about their attitudes towards borrowing in the *Attitudes Scale* or *Borrow for Education*, may be loan averse when faced with the actual prospect of taking out a loan. We discuss this phenomenon in greater detail in the discussion section.

Does loan aversion vary by demographic characteristics?

In Table 6, we examine the heterogeneity of our three loan aversion measures across demographic characteristics for each sample using t-tests to compare the conditional means. The top panel of Table 6 shows the difference in means from tests of the hypothesis that there is no difference across these student characteristics for each of our three measures of loan aversion for the high school sample. The sign of the mean difference indicates the direction of loan aversion for the named category. The middle panel displays the results for the community college sample, and the bottom panel displays the results for the adult sample. These hypothesis tests suggest that there are differences in loan aversion across student characteristics and that these differences are not necessarily consistent across measures. For example, in the high school and community college samples, the t-tests suggest that females are less loan averse by the *Attitudes Scale* and

Borrow for Education measures, but more loan averse by the *Avoid Loan Packages* measure. In the high school and community college samples, respondents who report having parents that attended college are less loan averse than those who do not by the *Attitudes Scale* and the *Borrow for Education* measure. White students are notably less loan averse than Hispanic students across all three scales in both the high school and community college samples, but in the adult sample, White respondents are less loan averse than Hispanic respondents only on the *Avoid Loan Packages* measure.

In Table 7 we build on the hypothesis tests by comparing our loan aversion measures across student characteristics in a regression framework. This analysis enables us to determine which characteristics are associated with loan aversion while controlling for all other observed characteristics. This may be important if, for instance, the Hispanic differences are driven by citizenship status, for which the regression adds a control. Results largely hold with our findings from the t-tests, with female respondents less loan averse than males on the *Attitudes Scale*, those whose parents attended college appear less loan averse on the *Borrow for Education* measure in the high school and community college samples, and Hispanic respondents are generally more loan averse than white students. In the high school sample, respondents who report having parents who attended college are approximately 7 percentage points less likely to be loan averse, on average, by the *Borrow for Education* measure, and in the community college sample, they are approximately 3 percentage points less likely to be loan averse, on average. This makes sense if respondents learn about financial aid for college from their parents' experiences. In the high school and adult samples, we find that Black respondents are approximately 9 percent more likely to be loan averse, on average, by the *Avoid Loan Packages* measure than white students.

Hispanic respondents are more loan averse by the *Avoid Loan Packages* measure across all three of our samples. In the high school sample, Hispanic respondents are also more loan

averse by the *Borrow for Education* measure, while in the community college sample, Hispanic students are also more likely to be loan averse by the *Attitudes Scale*. There is no difference in the *Borrow for Education* measure in the community college sample, which seems sensible given all of these students enrolled in college. In the adult sample, Hispanic respondents are only more loan averse than white students by the *Avoid Loan Packages* measure. Across our samples, Hispanic students are between 9 and 12 percentage points more likely to be loan averse by the *Avoid Loan Packages* measure than white students on average.

Across samples, females exhibit less loan aversion on the *Attitudes Scale* than male students. In the high school sample, females are also slightly less loan averse on the *Borrow for Education* measure but more loan averse on the *Avoid Loan Packages* measure. These collective findings suggest women may have less loan averse attitudes, but those do not play out in measures more closely related to actual borrowing (*Avoid Loan Packages*).

Discussion & Conclusion

Although policy makers and researchers speak of the existence of loan aversion and its variation across racial groups (Cunningham & Santiago, 2008), there is little quantitative research on the topic of loan aversion in the United States. In this study, we provide the first large scale quantitative evidence of domestic levels of loan aversion in three different populations. We rely on three different measures of loan aversion to assess how measures previously used in the literature relate to one another. We find that loan aversion is prevalent and varies by population and race with Hispanic respondents more likely to exhibit loan aversion than white respondents. We also find that the three different measures of loan aversion that we examined were not highly correlated with one other, suggesting that loan aversion is a complex construct with multiple dimensions that varies by context.

Our findings both extend and add to those in the extant literature. Because we replicated survey questions from Callender and Jackson (2005) our definitions of loan aversion are directly comparable to prior research, albeit in a different context (the U.S. vs. U.K.). The main finding of their study is that students from lower socio-economic groups in the U.K. are more loan averse than middle and upper class students. In the United States, we find no evidence that low-income respondents express greater loan averse attitudes. This remains true on both of the other measures of loan aversion we employ, as well across all three of our samples.

Directly replicating the *Avoid Loan Packages* questions that Palameta and Voyer (2010) used to explore loan aversion among a sample of study participants in Canada allows for another direct comparison. These authors found between 5 to 20 percent of their sample (Canadian high school students likely to enroll in college) was loan averse. We find a much larger portion of all three populations in our study is loan averse by this same measure (between 27 and 42 percent). This difference could be attributable to higher loan aversion rates in the United States or higher loan aversion rates among people less likely to enroll in college, although we find high rates among community college students who are already enrolled in college. It is important to recognize the radically different cost and financing structure of attending postsecondary education in the United States relative to both the U.K. and Canada, which may explain why American respondents are more loan averse. In addition, for Canadian respondents the survey was attached to actual financial outcomes, which presumably elicits more accurate responses. However, we think it is unlikely that respondents have an incentive to overestimate their true avoidance of loan packages in our survey.

The domestic study most similar to ours relies on a sample of students currently enrolled in college and measures loan aversion by assessing whether students did not accept a loan offered to them either on a survey or in an actual financial aid package (Goldrick-Rab & Kelchen, 2013).

Forty-eight percent of their sample exhibited loan aversion by their measures, whereas we find high but somewhat lower percentages using a more diverse sample. Thirty-five percent of our sample of enrolled community college students are loan averse by the *Avoid Loan Packages* measure. This difference could be attributable to regional variation (Wisconsin versus Tennessee and Texas), four-year versus two-year enrollees, low-income versus middle- and upper-income students (although we find no evidence of differences by income), or the slight difference in measures. Regardless, our findings suggest that only focusing on enrolled students underestimates loan aversion. Using our most direct measure, *Borrow for Education*, about twenty percent of high school seniors and adults who have not attended college do not believe it is ok to borrow money for education, a rate double that of students already enrolled in community colleges. This attitude likely contributes to some students avoiding borrowing and, in some instances, underinvesting in higher education by not enrolling at all.

Although the goal of this paper is not to explain why respondents are loan averse, we can explore a few rationales offered in the prior literature. First, we provide empirical evidence that Hispanic respondents are more likely to be loan averse than white respondents, even after controlling for a host of other observed characteristics. As cited above, the prior literature has frequently hinted that the observed differences in borrowing by race is due to loan aversion, but our study is the first to document this empirically. This finding suggests there is a cultural component to the borrowing decision that deserves further exploration.

One of our most interesting findings is that measures of loan aversion used in previous literature are not highly correlated with one another. One potential explanation for this finding is that these different measures of loan aversion may be picking up a different dimension of the construct of loan aversion or a different construct altogether. The *Attitudes Scale* is measuring a broader dimension of borrowing to purchase goods in general while the *Borrow for Education*

question narrows the focus on education specifically. The *Avoid Loan Package* questions may be assessing a different construct because it incorporates an additional decision about whether the student will enroll in higher education in the next term. Our finding that these measures of loan aversion are not well correlated has implications for loan aversion research. First, it suggests the loan aversion papers in the existing literature may not be directly comparable to one another. It also suggests that future loan aversion studies should assess loan aversion through multiple measures in an effort to sort out the distinctions between this construct's dimensions and capture the full extent of the phenomenon.

Though this study contributes to our understanding of loan aversion among three populations of students or potential students in the United States, we acknowledge several limitations. First, there were no stakes attached to our survey. As a result, respondents may not have considered each question as carefully as they would have in a high stakes situation. Although this may incorporate some error into our measures, it is unlikely that it systematically biases any of our estimates. Additionally, our survey may be subject to sources of bias that affect its reliability. For example, students may not have understood all the questions, although we did try to ameliorate this problem with the pilot tests. Another important limitation of this study is that we do not observe actual higher education outcomes for our survey respondents. A promising avenue for future research is to connect loan aversion measures with college outcomes such as debt load and college enrollment and persistence. Such data would allow researchers to determine whether student loan aversion affects college enrollment and persistence. We also acknowledge that although the community college and adult samples are diverse, they were not randomly selected and may not generalize to the larger population of community college and adults across the United States.

Despite these limitations, our findings have important implications for policies related to financing higher education. To the extent that loan aversion is driven by excessive risk aversion, it may be alleviated by educating students about forms of income-based repayment. Income-based loan repayment programs dramatically reduce the risk of student loan default by limiting the repayment amount to a small portion of disposal income. Although more students are enrolling in forms of income-based repayment such as the federal government's Pay as You Earn program, information about these forms of repayment must be presented at the time students are considering the borrowing decision, not only at the time of repayment. Knowing that loan aversion exists among Hispanic respondents, focusing communication efforts on income-based repayment programs could help these prospective student populations make more informed decisions regarding borrowing money for college, potentially leading to higher rates of college-going and degree attainment. Additionally, policymakers and administrators may consider adjusting the framing of student loans by, for instance, removing the principal balance of the loan and relying on Income Share Agreements such as Oregon's proposed Pay It Forward plan. Because it no longer requires borrowing in the traditional sense, loan averse students may prefer Income Share Agreements as a way to finance higher education.

Finally, policymakers may wish to consider alternatives to the growing reliance on student debt to finance higher education. One avenue to reducing the need to borrow is increasing public expenditures on education either through tuition subsidies or grant aid so that a greater proportion of students can finance higher education without needing to borrow. Several wealthy institutions such as Princeton and Vanderbilt Universities have endeavored to minimize borrowing through no loan policies that commit large sums of institutional grant aid to replace loans in financial aid packages. An expansion of this commitment through either public or private financing would simultaneously relieve the growing debt burden and resolve loan aversion.

Notes

1. We offer several potential behavioral economics explanations in this paper but acknowledge that others, such as cognitive overload or hyperbolic discounting, may also play a role in the borrowing and repayment decision process. See Boatman, Evans & Soliz (2014) for further application of behavioral economics to student loans.

References

Boatman, Evans, & Soliz (2014). Applying the lessons of behavioral economics to improve the federal student loan programs: Six policy recommendations. Policy Report written for the Lumina Foundation.

Avery, C. & Hoxby, C. (2004). Do and should financial aid packages affect students' college choices? In C. Hoxby (Ed.), *College choices: The economics of where to go, when to go, and how to pay for it* (239-299). Chicago, IL: University of Chicago Press.

Avery, C., & Turner, S. (2012). Student loans: Do college students borrow too much-or not enough? *Journal of Economic Perspectives*, 26, 165-192.

Attewell, P., Heil, S., and Reisel, L. (2012). What is academic momentum? And does it matter? *Educational Evaluation and Policy Analysis* 34(1): 27-44.

Bertrand, M., Mullainathan, S., and Shafir, E. (2006). Behavioral economics and marketing in aid of decision making among the poor. *Journal of Public Policy & Marketing* 25(1): 8-23.

Bettinger, E., Long, B., Oreopoulos, P., and Sanbonmatsu, L. (2012). The role of application assistance and information in college decisions: Results from the H&R Block FAFSA experiment. *Quarterly Journal of Economics* 127(3): 1-38.

Burdman, P. (2005). *The student debt dilemma: Debt aversion as a barrier to college access*. Research and Occasional Paper Series, Center for Studies in Higher Education, UC Berkeley.

Caetano, G., Palacios, M., & Patrinos, H.A. (2011). Measuring aversion to debt: An experiment among student loan candidates. World Bank Working Paper.

Callender, C., & Jackson, J. (2005). Does the fear of debt deter students from higher education? *Journal of Social Policy*, 34, 509-540.

Carnevale, A., Rose, S., and Cheah, B. (2011). *The college payoff: Education, occupations, lifetime earnings*. Washington, DC: The Georgetown University Center on Education and the Workforce.

College Board. (2011). Trends in community college education: Enrollment, prices, student aid and debt levels. Washington, D.C.: The College Board.

Cunningham, A. & Santiago, D. (2008). *Student aversion to borrowing: Who borrows and who doesn't*. Washington DC: Institute for Higher Education Policy.

DesJardins, S.L., Ahlburg, D.A., & McCall, B.P. (2006). The effects of interrupted enrollment on graduation from college: Racial, income, and ability differences. *Economics of Education Review*, 25, 575-590.

Dowd, A.C. & Coury, T. (2006). The effect of loans on the persistence and attainment of community college students. *Research in Higher Education*, 47, 33-62.

Dynarski, S. & Scott-Clayton, J. (2006). *The cost of complexity in federal student aid: Lessons from optimal tax theory and Behavioral Economics*. (No. w12227). National Bureau of Economic Research.

Education Longitudinal Study (ELS): 2002. Authors' calculations. U.S. Department of Education. Washington, DC: National Center for Education Statistics.

ECMC Group Foundation. 2003. *Cultural barriers to incurring debt: An exploration of borrowing and impact on access to postsecondary education*. Caliber Associates.

Field, E. (2009). Educational debt burden and career choice: Evidence from a financial aid experiment at NYU Law school. *American Economic Journal: Applied Economics*, 1, 1-21.

Goldrick-Rab, S. & Kelchen, R. (2013). *Making sense of loan aversion: Evidence from Wisconsin*. Paper prepared for the University of Michigan Conference on Student Loans.

Hillman, N. W. (2015). Borrowing and repaying student loans. *Journal of Student Financial Aid*, 45(3), Article 5.

Hoekstra, M. (2009). The affect of attending the flagship state university on earnings: A discontinuity based approach. *The Review of Economics and Statistics* 91(4): 717-724.

Joo, S., Grable, E., & Bagwell, D. (2003). Credit card attitudes and behavior of college students. *College Student Journal*, 37: 405-419.

Kane, T. & Rouse, C. (1995). Labor-market returns to two- and four-year college. *The American Economic Review* 85(3): 600-614.

Long, B.T. and Kurlaender, M. (2009). Do community colleges provide a viable pathway to a baccalaureate degree? *Educational Evaluation and Policy Analysis, 31*(1), 30-53.

Lynn, R. (1991). *The secret of the miracle economy: Different national attitudes to competiveness and money*. London: Social Affairs Unit.

Malcom, L.E., & Dowd, A.C. (2012). The impact of undergraduate debt on the graduate school enrollment of STEM baccalaureates. *Review of Higher Education*, 35, 265-305.

Monaghan, D.B. & Attewell, P. (2014). The community college route to the bachelor's degree. *Educational Evaluation and Policy Analysis* 37(1): 70-91.

Mortenson, T. (1988). *Attitudes of Americans toward borrowing to finance educational expenses, 1959–1983.* Iowa City, IA: American College Testing Program.

NCES (National Center for Education Statistics) (2014). IPEDS Fall 2014 Enrollment Survey.

Palameta, B. & Voyer, J. (2010). *Willingness to pay for postsecondary education among under-represented groups*. Toronto: Higher Education Quality Council of Ontario.

Paulsen, M.B., & St. John, E.P. (2002). Social class and college costs: Examining the financial nexus between college choice and persistence. *Journal of Higher Education*, 73, 189-236.

Perna, L.W. (2008). Understanding high school students' willingness to borrow to pay college prices. *Research in Higher Education*, 49, 589-606.

Rabin, M., & Thaler, R. (2001). Anomalies: Risk aversion. *Journal of Economic Perspectives*, 15(1): 219–232.

Rothstein, J., & Rouse, C.E. (2011). Constrained after college: Student loans and early-career occupational choices. *Journal of Public Economics*, 95, 149-163.

Scott-Clayton, J. (2011). The causal effect of federal work-study participation: Quasi-experimental evidence from West Virginia. *Educational Evaluation and Policy Analysis, 33*(4), 506-527.

Snyder, T.D., and Dillow, S.A. (2015). *Digest of Education Statistics 2013* (NCES 2015-011). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Soliz, A., & Long, B. (2016). *Does working help or hurt students? The effect of Federal Work-Study participation on student outcomes*. Cambridge, MA: Harvard University. Unpublished manuscript.

Stinebrickner, R., & Stinebrickner, T.R. (2003). Working during school and academic performance. *Journal of Labor Economics*, 21, 473-491.

St. John, E.P. (1993). Untangling the web: Using price-response measures in enrollment projections. *Journal of Higher Education*, 46, 676-69.

Tversky, A. & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, 5: 297-323.

Wright, D. B. & Shakgerberg, E. M. (2012). Measuring empathizing and systemizing with a large US sample. *PLoS ONE* 7(2): e31661.

Xue, M. & Chao, X. (2015). Non-borrowing students' perceptions of student loans and strategies of paying for college. *Journal of Student Financial Aid* 45(2): 25-45.

Table 1: Sample Summary Statistics

	High School Sample	Community College Sample	Adult Sample
Female	0.5121	0.7210	0.7438
Transgender	---	0.0040	0.0059
White	0.3519	0.4476	0.2823
Black	0.2033	0.1021	0.2206
Hispanic	0.2221	0.2880	0.1934
Asian	0.0285	0.0481	0.1898
Multiple Races	0.1820	0.0670	0.1139
Other Race	0.0121	0.0471	0.0000
Age	18.3835 (0.5649)	26.3334 (9.5243)	29.5421 (5.3586)
Home Language English	0.8629	0.8178	0.9478
Home Language Spanish	0.1001	0.1226	0.0415
Low-income	0.2767	0.5497	0.4223
Financially dependent on parents	--	0.5761	--
Expect to get more advanced training	---	0.1343	0.1435
Expect to get a CC Certificate	---	0.0896	0.1791
Expect to get some college, but no degree	0.0152	0.0189	0.0937
Expect to get AA degree	0.1214	0.3875	0.2716
Expect to get BA degree	0.3174	0.6035	0.3060
Expect to get graduate degree	0.5012	0.2019	0.1198
High School GPA	3.1062 (0.7058)	--	--
Parent Attended College	0.6511	0.5968	0.4247
Parent Graduated College	0.5067	0.4035	0.2966
Citizen	0.9496	0.9178	0.9359
Household Size	---	3.590 (1.4164)	3.4377 (1.4431)
N	1,648	3,760	843

Notes: Sample size for high school borrowing for education loan aversion definition is 823. Standard deviations are reported in parentheses for non-binary variables. Low-income is defined for high school seniors as those who reported being eligible for Free or Reduced Price Lunch and for the community college and adult samples as having received a form of federal assistance within the last two years (Pell, TANF, WIC, or SNAP).

Table 2: Loan Aversion Measure: ***Attitudes Scale***

	High School Sample	Community College Sample	Adult Sample
You should always save up first before buying something.	0.8993	0.8777	0.8707
Owing money is basically wrong.	0.3198	0.2223	0.5896
There is no excuse for borrowing money.	0.1159	0.0798	0.1234
Attitudes scale	1.3890 (0.7960)	1.2250 (0.7406)	1.6180 (0.8420)
N	1,648	3,760	843

Notes: The first three rows report the proportion of each sample that agree or strongly agree with each statement. The Attitudes scale row provides the mean and standard deviation of the Guttman scale for the three attitudes questions.

Table 3: Loan Aversion Measure: ***Borrow for Education***

	High School Sample	Community College Sample	Adult Sample
Borrow for Education	0.2175	0.0915	0.1969
N	823	3,760	843

Notes: The table reports the proportion who did not answer "yes" to the question "Do you think it's okay to borrow money to pay for education?" This question was only posed to half of the high school sample, hence the lower sample size relative to Table 1.

Table 4: Loan Aversion Measure: ***Avoid Loan Packages***

		High School Sample	Community College Sample	Adult Sample
Choice 1	A: $25 Cash in One Week	0.1438	0.0306	0.1969
	B: $1000 Grant Once in College	0.8562	0.9694	0.8031
Choice 2	A: $300 Cash in One Week	0.3022	0.0918	0.3357
	B: $1000 Grant Once in College	0.6978	0.9082	0.6643
Choice 3	A: $700 Cash in One Week	0.4757	0.2412	0.5587
	B: $1000 Grant Once in College	0.5237	0.7588	0.4413
Choice 4	A: $25 Cash in One Week	0.3319	0.2436	0.3452
	B: $1000 Grant Plus $1000 Loan Once in College	0.6681	0.7564	0.6548
Choice 5	A: $300 Cash in One Week	0.4891	0.3237	0.4721
	B: $1000 Grant Plus $1000 Loan Once in College	0.5109	0.6763	0.5279
Choice 6	A: $700 Cash in One Week	0.6377	0.4519	0.6145
	B: $1000 Grant Plus $1000 Loan Once in College	0.3623	0.5481	0.3855
Avoid Loan Packages		0.4169	0.3479	0.2705
Number of Observations		1,648	3,760	843

Notes: Each row reports the proportion of the sample that preferred the cash or financial aid package for each choice. The Avoid Loan Packages measure reflects respondents' who chose financial aid offers over cash when the financial aid package consisted only of grants, but accepted cash over financial aid when the financial aid package included loans.

Table 5: Correlation across loan aversion measures

	High School Seniors		
	Attitudes Scale	Borrow for Education	Avoid Loan Packages
Attitudes Scale	**1** N = 1,648		
Borrow for Education	**0.2469** N=823	**1** N=823	
Avoid Loan Packages	**0.0739** N = 1,648	**0.0896** N = 823	**1** N = 1,648
	Community College Students		
	Attitudes Scale	Borrow for Education	Avoid Loan Packages
Attitudes Scale	**1** N=3,760		
Borrow for Education	**0.2275** N=3,760	**1** N=3,760	
Avoid Loan Packages	**0.1423** N=3,760	**0.1672** N=3,760	**1** N=3,760
	Adults		
	Attitudes Scale	Borrow for Education	Avoid Loan Packages
Attitudes Scale	**1** N=843		
Borrow for Education	**0.0901** N=843	**1** N=843	
Avoid Loan Packages	**0.0384** N=843	**0.0611** N=843	**1** N=843

Notes: Pairwise correlations are reported in bold for each measure in each sample.

Table 6: Differences in conditional means from test of the hypothesis that the difference is zero

	Attitudes Scale	Borrow for Education	Avoid Loan Packages
High School Sample			
Low-income	0.0504	0.0072	0.0088
Female	-0.2800***	-0.0712**	0.0514**
Citizen	-0.1867**	-0.2588***	-0.0812
Parents Attended College	-0.0731*	-0.0548*	-0.0355
Parents Graduated from College	-0.0334	-0.0046	-0.0490**
White compared to Black	-0.0166	-0.0269	-0.0958***
White compared to Hispanic	-0.2613***	-0.0903**	-0.1159***
White compared to Asian	0.0184	0.1024	0.0735
Community College Sample			
Low-income	-0.0140	-0.0109	-0.0065
Female	-0.1467***	-0.0291***	0.0052
Citizen	-0.2238***	-0.0202	-0.0265
Parents Attended College	-0.0739***	-0.0169*	0.0082
Parents Graduated from College	-0.0225	-0.0009	0.0169
White compared to Black	0.0355	0.0131	-0.0239
White compared to Hispanic	-0.2159***	-0.0245**	-0.1010***
White compared to Asian	-0.2416***	-0.0518**	0.0189
Adult Sample			
Low-income	-0.0682	-0.0151	0.0472
Female	-0.1401**	-0.0340	0.0524
Citizen	-0.0717	0.0323	0.0318
Parents Attended College	-0.0061	-0.0510*	0.0397
Parents Graduated from College	-0.0029	-0.0468	-0.0262
White compared to Black	0.0339	0.0473	-0.0985**
White compared to Hispanic	-0.0681	0.0413	-0.1113***
White compared to Asian	-0.1536*	0.0428	-0.0090

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The sign represents the direction of loan aversion for the named category.

Table 7: Heterogeneity of Loan Aversion Measures by Demographic Characteristics

	High School Sample			Community College Sample			Adult Sample		
	Attitudes Scale	Borrow for Education	Avoid Loan Packages	Attitudes Scale	Borrow for Education	Avoid Loan Packages	Attitudes Scale	Borrow for Education	Avoid Loan Packages
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Low-income	0.0139	-0.0229	-0.0167	-0.00428	-0.0104	-0.00852	-0.0328	-0.00847	0.0275
	(0.0745)	(0.0395)	(0.0316)	(0.0234)	(0.00894)	(0.0157)	(0.0609)	(0.0288)	(0.0319)
Female	-0.248***	-0.0504*	0.0464*	-0.131***	-0.0270	0.00457	-0.129*	-0.0370	0.0527
	(0.0227)	(0.0260)	(0.0233)	(0.0268)	(0.0232)	(0.0253)	(0.0679)	(0.0321)	(0.0356)
Citizen	-0.0381	-0.206***	-0.0209	-0.129**	-0.00241	-0.00685	-0.0261	0.0183	0.0258
	(0.0511)	(0.0569)	(0.0411)	(0.0380)	(0.0240)	(0.0278)	(0.123)	(0.0582)	(0.0644)
Parents Attended College	-0.0229	-0.0730**	0.00802	-0.0530	-0.0252**	0.0150	-0.0111	-0.0418	0.116***
	(0.0654)	(0.0255)	(0.0334)	(0.0284)	(0.00921)	(0.0293)	(0.0825)	(0.0391)	(0.0433)
Parents Graduated from College	0.0536	0.0766**	-0.0419	0.0360	0.0145	0.0283	-0.00545	-0.0163	-0.106**
	(0.0502)	(0.0299)	(0.0359)	(0.0291)	(0.0125)	(0.0166)	(0.0888)	(0.0420)	(0.0465)
Black	-0.00819	0.0322	0.0943**	-0.0419	-0.0118	0.0256	-0.0308	-0.0417	0.0905**
	(0.0558)	(0.0337)	(0.0360)	(0.0234)	(0.0154)	(0.0294)	(0.0809)	(0.0383)	(0.0424)
Asian	0.0161	-0.111**	-0.0628	0.157***	0.0417	-0.0350	0.141	-0.0367	0.0139
	(0.111)	(0.0378)	(0.0466)	(0.0378)	(0.0260)	(0.0385)	(0.0861)	(0.0408)	(0.0451)
Hispanic	0.215***	0.0744**	0.117***	0.143***	0.00659	0.0892***	0.0588	-0.0453	0.118***
	(0.0580)	(0.0316)	(0.0300)	(0.0154)	(0.00971)	(0.0208)	(0.0801)	(0.0379)	(0.0420)
Other Race	-0.000995	-0.112	-0.0818	0.197***	0.00947	0.00314	---	---	---
	(0.149)	(0.0800)	(0.0990)	(0.0278)	(0.0172)	(0.0606)			
High School GPA	0.0341**	0.0285*	-0.00943	---	---	---	---	---	---
	(0.0147)	(0.0154)	(0.00729)						
Constant	1.234***	0.186	0.375***	1.389***	0.130***	0.301***	1.721***	0.263***	0.122
	(0.113)	(0.116)	(0.0598)	(0.0541)	(0.0319)	(0.0404)	(0.150)	(0.0708)	(0.0784)
Observations	1,648	823	1,648	3,760	3,760	3,760	843	843	843
R-squared	0.069	0.069	0.029	0.033	0.007	0.017	0.012	0.009	0.026

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Transgender for the community college and adult populations are pooled with male students. Controls for gender, race, grades, free or reduced price lunch eligibility, citizenship status, and parental education, as well as high school/ community college fixed effects are included. Linear probability models are used for binary outcomes. Standard errors, included in parentheses, are clustered at the high school level for the high school sample and the college level for the community college sample. High school and community college fixed effects are included. Heteroskedastic robust standard errors are provided for the adult sample.

Appendix A: Loan Aversion Survey Questions

Attitudes toward Borrowing

1) To what extent do you agree with the following statements about borrowing money?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
You should always save up first before buying something	☐	☐	☐	☐	☐
Owing money is basically wrong	☐	☐	☐	☐	☐
There is no excuse for borrowing money	☐	☐	☐	☐	☐

Borrow for Education

2) Do you think it's okay to borrow money to buy or pay for . . .

	Yes	No	Don't know
Education	☐	☐	☐

Cash vs. Loans in Financial Aid Packages

3) In this section, suppose you were offered a series of choices between two options: a small amount of cash which you would receive in one week or a larger financial aid package which you would receive to pay for college expenses if you enroll in college full-time.

For example, in Choice #1 if you select Option A, you would get $25 in cash one week from today to save or spend on anything you like. If you select Option B, you would receive $1,000 of grant aid (money you do not have to pay back) to pay for college if you enroll in college full-time. Across the different choices, Option B consists of either a grant and/or a loan (money you do have to pay back after you leave college).

For each of the 9 choices below, select either Option A or Option B:

	Option A	Option B
Choice #1:	☐ $25 cash in one week	☐ $1,000 grant once in college
Choice #2:	☐ $300 cash in one week	☐ $1,000 grant once in college
Choice #3:	☐ $700 cash in one week	☐ $1,000 grant once in college
Choice #4:	☐ $25 cash in one week	☐ $1,000 grant + $1,000 loan once in college
Choice #5:	☐ $300 cash in one week	☐ $1,000 grant + $1,000 loan once in college
Choice #6:	☐ $700 cash in one week	☐ $1,000 grant + $1,000 loan once in college

Data Appendix

Survey Design

We used a survey instrument to gather data on demographic information and loan aversion measures. To enable comparisons to existing research, the questions on the survey directly related to loan aversion were identical to those asked in prior studies of loan aversion. For additional questions, we consulted with survey and loan experts in the field. We employed two slightly different forms of the survey, Survey A and Survey B, in order to limit the number of questions any one respondent faced and to limit each survey to a response time of approximately 15 minutes. Both surveys asked the same core questions about demographics. For the high school senior sample, both forms of the survey had two of the three loan aversion measures we employ in the analysis: attitudes about borrowing money and whether the respondent would prefer cash in the short term over a grant or loan once in college; however, only Survey B gathered responses on our third loan aversion measure, whether respondents believed it was ok to borrow money for education specifically. For the adult and community college samples, both forms of the survey captured all three loan aversion measures.

The high school senior survey was a paper survey conducted in class during the school day. The adult and community college samples responded to the survey online. Each respondent was randomly given either Survey A or Survey B. We pilot tested both versions of the survey with a class of high school seniors, and conducted a focus group at the end of the pilot to gather information on the timing and areas of confusion caused by any of the questions. The surveys were edited, with colleagues providing a second round of feedback. We describe the sampling and survey administration process in more detail below.

Sample

The sample selection and survey administration differed for each population. For high school seniors, we aimed to obtain a random sample of diverse high schools in multiple states within which we could survey the majority of the senior class. Our sampling frame was comprised of all public high

schools in Texas, Kentucky, Tennessee, and Massachusetts that had at least 500 total students with at least 10 percent of the student body being white, 10 percent African American, 10 percent Hispanic, and 10 percent low-income as defined by free or reduced price lunch. Stratifying by state, we randomly ordered those high schools and contacted the first ten in each state through the guidance office and the principal's office.

We contacted each high school at least three separate times in an effort to obtain permission to administer the survey. If a school did not respond or agree to participate, we moved to the next high school on the randomly ordered school list for that state until either five high schools agreed to participate in the state or we exhausted all of the eligible schools in that state. This process garnered eight high schools that represent a random sample of racially and economically diverse high schools willing to participate in a loan survey in these four states. Five high schools in Texas agreed to participate, although data was not collected in one of them due to school being cancelled for a snow day on the day of survey administration. We exhausted the list of KY, TN, and MA schools with one, three and one participating respectively. For high schools that agreed to participate, we traveled to the schools and administered the survey to all of the seniors present on the day of administration during the spring semester of 2014, capturing at least 80 percent of the seniors in every school. To increase sample size and geographic diversity, we supplemented our randomly selected high schools with survey results from three additional schools that are part of the College Advising Corps (CAC) college access program. These three schools, which are located in Illinois and Michigan, provide additional geographic diversity, but they were not randomly selected. We also conducted an analysis that examined whether our final results hold with and without these three CAC schools. They do, with a maximum difference of one percentage point for any loan aversion measures. Results are qualitatively similar for the subgroup analysis as well. Results available upon request from the authors. Descriptive statistics for the high schools included in the sample can be found in Data Appendix Table 1.

The community college sample was selected to supplement the high school analysis. We reached out to community college contacts in several of the states that provided high school data and were able to obtain permission to administer our loan survey. Our community college sample is comprised of one college in Illinois, one in Tennessee, one in Michigan, and four in Texas. Because administering a paper survey to all the students in a community college is impractical, administrators emailed an electronic version of the survey to all enrolled students. We used a similar survey to those we developed for the high school sample, though several survey questions were slightly altered to reflect community college demographics. The central questions assessing loan aversion were worded identically to those on the high school survey allowing for direct comparisons. As an incentive, students at each community college were offered entry into a lottery for one of five $100 gift cards per institution if they completed the survey. Survey administration took place during the summer and fall of 2015. Descriptive statistics for the community colleges in the sample can be found in Data Appendix Table 2.

Due to the difficulty in identifying a population of adults not enrolled in college and who have not completed a college credential, we hired the survey firm Qualtrics to obtain a diverse sample of adults in their 20s and 30s, who fit these criteria, to complete the online version of our survey. Surveys completed by respondents obtained through Qualtics are present in published works in other disciplines such as psychology, see for example Wright and Skagerberg (2012).

We used the community college survey as a template, but some questions were adjusted to account for the fact that these respondents were not currently enrolled in an educational institution. The survey firm relied on marketing email lists to identify and obtain survey results for approximately 200 adults fitting the selection criteria in each of four racial categories: white, African-American, Hispanic, and Asian. These respondents are not a random sample of adults; however, we can still draw important conclusions about loan aversion variance across demographic characteristics within this sample. Although we can examine the similarity of responses across age, race, and education level when comparing these

adult respondents to community college students and high school seniors, we must acknowledge that a more representative sample of adults may lead to different conclusions.

Missing Data

The adult survey methodology required respondents to answer all questions, so missing data only exists for the high school and community college samples. Within these two samples, we exclude people with missing values for any of the variables used in our analysis. This casewise deletion allows us to maintain a consistent sample throughout the analysis, resulting in greater ease of interpretation. While pairwise deletion would have only deleted those people with missing data on the particular measure being examined, this would have resulted in different analytic samples across models making the interpretation challenging. One concern with missing data is whether the missingness occurs systematically, and if so, how it may bias the results. We examined the data for patterns of missingness within and across these two samples as well as within and across institutions, and did not find evidence of data missing in a systemic way. As shown in Data Appendix Table 3, the majority of data collected was missing from less than one percent of the sample. The predominant causes of missingness occur in only a few variables. For the high school sample, approximately five percent of respondents did not respond to questions about whether or not they receive free and reduced price lunch, their high school GPA, their citizenship, or their parents' levels of education. Additionally, 3.4 percent of high school students did not complete the *Attitudes Scale* questions, and 7.9 percent did not complete the *Avoid Loan Packages* questions. The *Borrow for Education* measure was only asked of half the sample. Less than two percent of those students did not respond. For the community college respondents, less than three percent of all respondents did not provide information on race, and approximately nine percent did not respond to their citizenship and household size. Less than five percent of the respondents did not complete the questions related to *Attitudes Scale* and *Avoid Loan Packages*, and seven percent did not respond to the questions for *Avoid Loan Packages*.

Data Appendix Table 1: Descriptive Statistics of High School Sample

School name	School District	City	State	% Black	% Hispanic	%White	% Free or Reduced lunch	Total Enrolled
Bryan Station High School	Fayette County SD	Fayette	KY	39.1	14.2	42.5	61.9	1,707
Crete-Monee High School	Crete-Monee SD	Crete	IL	59.5	11.3	24.0	68.0	1,698
Manual Academy	Peoria Public Schools	Peoria	IL	73.8	11.2	11.5	84.0	796
Smyrna High School	Rutherford County SD	Smyrna	TN	16.3	12.1	65.3	45.4	1,987
La Vergne High School	Rutherford County SD	La Vergne	TN	32.8	18.2	44.4	53.7	2,128
Springfield High School	Robertson County SD	Springfield	TN	25.3	12.6	61.4	58.6	1,099
Judson High School	Judson ISD	Converse	TX	25.3	46.7	21.7	49.8	3,429
Lamar Consolidated High School	Lamar CISD	Rosenberg	TX	25.7	51.4	16.8	62.5	1,481
McCallum High School	Austin ISD	Austin	TX	16.8	34	42.3	40.7	1,734
Sabis International High School	Springfield Public Schools	Springfield	MA	30.1	33.2	28.8	9.1	1,573
Waverly High School	Waverly Community Schools	Lansing	MI	39.2	14.2	37.3	43.0	1,060

Data Appendix Table 2: Descriptive Statistics for Community Colleges in the Sample

	State	% White	% Black	% Hispanic	Total enrollment
Columbia State Community College	TN	83	7	4	5,117
Harper Community College	IL	54	4	24	14,957
Henry Ford Community College	MI	45	24	2	13,790
Lone Star - CyFair	TX	29	15	39	19,376
Lone Star- North Harris	TX	18	32	36	16,951
El Paso	TX	8	2	85	1,584
Amarillo College	TX	52	5	38	10,336

Sources: IPEDS for all except Lone Star. Lone Star:
http://www.lonestar.edu/images/Student_Demographics_Official_Day_Spring_2014.pdf

Data Appendix Table 3: Missing Data by Sample

	High School Sample	Community College Sample	Adult Sample
Female	0.28%	0.02%	0%
Transgender	---	0.02%	0%
White	0.33%	2.55%	0%
Black	0.33%	2.55%	0%
Hispanic	0.33%	2.55%	0%
Multiple Races	0.33%	2.55%	0%
Other Race	0.33%	2.55%	0%
Age	3.36%	0.12%	0%
Home Language English	0.56%	0.28%	0%
Home Language Spanish	0.56%	0.28%	0%
Low-income	4.58%	0%	0%
Financially dependent on parents	----	0%	----
Expect to get more advanced training	----	0%	0%
Expect to get a CC Certificate	----	0%	0%
Expect to get some college, but no degree	0.98%	0%	0%
Expect to get AA degree	0.98%	0%	0%
Expect to get BA degree	0.98%	0%	0%
Expect to get graduate degree	0.98%	0%	0%
High School GPA	4.72%	----	----
Parent Attended College	4.72%	0%	0%
Parent Graduated College	4.95%	0%	0%
Citizen	4.67%	9.49%	0%
House Size	----	9.49%	0%
Attitudes Scale	3.41%	4.04%	0%
Borrow for Education	51.68%	4.04%	0%
Avoid Loan Packages	7.90%	7.08%	0%
N	2,140	4,278	843

Note: The "Borrow for Education" question was only given to half of all high school sample, which explains why 51.68% of the responses are missing