

THE RELATIONSHIP BETWEEN EXPOSURE TO FINANCIAL EDUCATION AND
USAGE OF PAYDAY LOANS

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ABSTRACT

Each year, approximately 12 million Americans use payday loans, which are short-term, high-interest loans that frequently trap low-income borrowers in cyclical debt. Payday loans are often predatory in nature, and policymakers in the United States have expressed a growing desire to enhance citizens' – particularly economically vulnerable citizens' – financial decision-making capabilities. In 2003, the U.S. Department of the Treasury established the Financial Literacy and Education Commission (FLEC) to set national guidelines for addressing financial literacy shortcomings with the goal of educating the public to better manage its personal finances. This paper examines the extent to which the provision of financial education reduces individuals' usage of payday lending. Using individual-level data from the Financial Industry Regulatory Authority's 2018 National Financial Capability Study, I find – contrary to my predictions – that financial education is positively associated with payday loan usage. My results call into question whether financial education can help to improve the outcomes that policymakers intend to address. The results suggest the need for a richer understanding of the factors that influence the demand for these high-interest rate, short-term loans.

The completion of my thesis would not have been possible without the ongoing support and valuable guidance that my advisor, Adam Thomas, provided throughout this project.

Many thanks,
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INTRODUCTION

Generally used by a subset of the population with few financial alternatives, payday loans offer relatively small amounts of short-term, immediate credit at high fixed interest rates (CFPB 2013). In the United States, the average payday loan incurs \$520 in fees on an initial principal of \$375, with the borrower, on average, earning \$30,000 per year (Burke et al. 2014; Ali 2016). These figures suggest that a typical low-income borrower may spend approximately 20 percent of her pre-tax monthly paycheck on payday loan fees alone. According to the Consumer Financial Protection Bureau, a common fee rate is \$15 per \$100 borrowed, which suggests an annual percentage rate of approximately 360 percent for a two-week loan (CFPB 2017). In comparison, the average annual percentage rate on a two-year personal loan was 10.3 percent in 2018 (Federal Reserve 2019). Because payday lenders typically require borrowers to repay the full loan amount on the borrower's first payday following the transaction, most loans are offered for two-week periods (CFPB 2013). Eighty percent of payday loans, however, are pursued within two weeks of the borrower's repayment of a previous payday loan (Ali 2016).

The payday lending industry has expanded dramatically over the last 30 years, emerging in the 1980s and growing to offer more than \$50 billion in short-term loans by 2010 (Morse 2010). Proponents of payday lending assert that the practice offers low-income individuals who may struggle to obtain more borrower-friendly loans the opportunity to gain quick access to credit, which can be particularly useful when one faces unexpected financial challenges. A majority (at least 75 percent) of the United States' 12 million payday loan users, however, are repeat borrowers (Ali 2016). Further, approximately 58 percent of those borrowers regularly struggle to pay their monthly expenses, suggesting that payday loans are more frequently used to cover normal living expenses than to help with occasional financial emergencies (Ali 2016). Due

to the high fees and recurring nature of payday lending, many states impose restrictions on fee amounts and rollover limits, and twelve states ban payday lending entirely (Gomory 2019).¹ In 2016, the Consumer Financial Protection Bureau proposed a rule that would reduce payday “debt traps” by requiring lenders to perform credit-worthiness checks in order to ensure that borrowers can repay their loans without renewing or extending them for additional fees (CFPB 2016). The Trump administration reversed this rule before it went into effect in 2018, and many states have instead pursued state-level containment measures (Ibid.).

Payday borrowing is often concentrated within low-income or minority communities where the general population tends to be less educated about risky financial choices and predatory lending (Apgar and Herbert 2006). Some studies suggest that there is a strongly negative relationship between an area’s rates of financial literacy and the usage of high-risk financial tools (Kim and Lee 2018; Lusardi and Scheresberg 2013; Robb et al. 2015). Consequently, researchers have called for expanding access to financial education programs in order to improve the financial decision-making practices of vulnerable populations (Kim and Lee 2018).

Using survey data from the Financial Industry Regulatory Authority’s 2018 National Financial Capability Study, this paper contributes to the literature by evaluating the relationship between participation in financial education programs and usage of payday loans. Though a body of literature exists on the relationship between participating in financial education programs and financial literacy (Danes et al. 1999; Varcoe et al. 2005; Hathaway and Khatiwada 2008; Sherraden et al. 2011; Go et al. 2012) and between financial literacy and risky borrowing (Kim and Lee 2018; Lusardi and Scheresberg 2013; Robb et al. 2015), I am unaware of any study that

¹ As of 2019, Arkansas, Arizona, Connecticut, Georgia, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, North Carolina, Vermont, and West Virginia have outlawed payday lending (Gomory 2019).

directly examines the effect of completion of a financial education program on payday loan usage. This gap likely exists because formal financial education programs are relatively new, though an increasing number of high school students are required to complete such programs before they graduate (Council for Economic Education 2014). Thus, the impact of financial education on payday loan usage has important policy implications as states consider implementation of financial education requirements in public high schools. I expect the relationship between these two variables (financial education and payday loan usage) to be negative, supporting the hypothesis that financial education can reduce risky financial behavior.

BACKGROUND

Ranking fourteenth in a worldwide survey, the United States has comparatively low rates of financial literacy among advanced economies (Klapper et al. 2016). According to a 2014 Standard & Poor's Global Financial Literacy Survey, only 57 percent of adults in the United States are financially literate (Ibid.). These results are based on respondents' demonstration of basic knowledge of the concepts of risk diversification, inflation, interest rates, and compound interest. Some policymakers and advocates for financial education programs fear that American adults are ill-equipped to manage their assets in an increasingly complex market (Urban et al. 2015).

Recognizing the challenges posed by a population struggling with an often rudimentary understanding of financial concepts, the United States Department of the Treasury created a Financial Literacy and Education Commission (FLEC) in 2003. FLEC sets national strategy guidelines for financial literacy improvement efforts. In its 2016 update to the national strategy, FLEC acknowledged recent evidence that the relatively new field of formal financial education has the potential to boost Americans' financial well-being (FLEC 2016). Since 2014, 17 states

have added personal finance course requirements to their high school curricula (Council for Economic Education 2018).² Though FLEC does not require states to mandate personal finance programs in schools, the relevant literature presents a compelling case for state-level policymakers to consider implementing these strategies. Studies reveal that graduates of schools with personal finance programs have higher credit scores and lower delinquency rates (Brown et al. 2013), and they engage in more prudent borrowing behaviors (Xiao et al. 2011).

Though some researchers find that financial education is associated with responsible financial decision-making (Brown et al. 2013; Xiao et al. 2011), others do not (Fernandes et al. 2014; Willis 2011). The Federal Reserve points out that many studies conduct their analyses by comparing states that offer financial education to those that do not with little attention given to the significant variation in program intensity (Brown et al. 2013). States' approaches to financial education vary from light-touch marketing efforts – such as Delaware's creation of a "Teach Children to Save Week" and Rhode Island's "Financial Literacy Month" – to stringent graduation requirements, such as Kentucky and Illinois' mandated personal finance coursework in public high schools (Morton 2018). By grouping these states together, researchers may underestimate the effect of personal finance education. In my analysis, the treatment group will include only respondents who were required to take a financial education class.

LITERATURE REVIEW

The existing literature on financial education, financial literacy, and financial behavior suggests the existence of an association between these three elements. While the impacts of financial education are difficult to measure due to variation in program design and evaluation

² As of 2018, the states requiring high school students to take a personal finance course are Alabama, Arizona, Arkansas, Florida, Georgia, Idaho, Michigan, Missouri, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Tennessee, Texas, Utah, and Virginia (Council for Economic Education 2018).

techniques, some research suggests that financial education is positively associated with financial literacy (Sherraden et al. 2011; Go et al. 2012; Varcoe et al. 2005). The positive correlation between financial literacy and prudent financial decision-making is more well-established (Hilgert 2003; Lusardi and Mitchell 2006; 2007; Gathergood 2012; Behrman et al. 2012; van Rooij 2012; Kim and Lee 2018). Relatively few studies, however, directly examine the relationship between financial education and high-cost borrowing practices, such as payday lending.

The relationship between financial education and financial literacy

Though a substantial body of research focuses on the relationship between adults' participation in financial education programs and their retirement preparedness, there is also some evidence of a short-term linkage between participation in a financial knowledge program and increased financial literacy among youth and teenagers. Analyzing data from a randomized controlled trial of a four-year financial education program offered in elementary schools in the midwestern United States, Sherraden et al. (2011) find a positive relationship between participating in the program and financial knowledge. A similar study in Oakland, California measures the effects of participation in the Money Savvy Youth program for fourth- and fifth-grade students (Go et al. 2012). Go et al. (2012) find a significant positive relationship between program participation and financial knowledge. Specifically, the program group's financial literacy post-intervention test scores rose by five times more than did the control group's scores (Go et al. 2012).

Other studies report similar results for high school students (Danes et al. 1999; Varcoe et al. 2005). Varcoe et al. (2005) study the effects of a program called *Money Talks: Should I be Listening?*, which consists of a series of newsletters sent to high school students in four

California counties. Participants scored 16 percentage points higher than a randomly assigned control group on a financial literacy exam after the program's implementation. Treatment group members also had more responsible saving habits (Varcoe et al. 2005). Similarly, a randomized controlled trial evaluating the effects of the *Financing Your Future* curriculum implemented in 15 high schools throughout the United States finds that financial training improves financial literacy test scores by 19.7 percentage points (Walstad et al. 2010).

Conversely, some literature finds limited or no evidence of a relationship between financial education and financial literacy (Hathaway and Khatiwada 2008; Mandell 2008). Conducting a randomized trial of 1,200 individuals, Carpena et al. (2011) find that financial education improves financial decision-making confidence levels and knowledge of the financial vehicles available, but that it has no significant impact on numeracy-related financial behaviors.³ This study, however, focuses on adults in India and thus faces a potential challenge to external validity in the context of this analysis. Hathaway and Khatiwada (2008) review the previous literature on a group of financial education programs and find no concrete evidence that participation in these programs is associated with increased financial literacy. However, not all of the studies included in Hathaway and Khatiwada's review are randomized controlled trials. The authors point to the need for programs to incorporate robust program evaluation components so that researchers can better assess programmatic effects.

The relationship between financial literacy and financial behavior

A large body of literature finds evidence of an association between financial literacy and a variety of outcomes, including debt delinquency (Gerardi et al. 2010), mortgage foreclosure rates (Gathergood 2012), and high-cost borrowing (Lusardi and Mitchell 2007; Lusardi et al.

³ Numeracy is the ability to use numbers and understand basic mathematical concepts.

2008; 2011). Using individual-level survey data collected during the subprime mortgage crisis in 2008, Gerardi et al. (2010) find that borrowers in the lowest quartile of the financial literacy distribution spend approximately 15 percent more time in debt delinquency than do borrowers in the highest quartile. Individuals in the bottom quartile are also 18 percentage points more likely to have their homes foreclosed on than individuals in the top quartile (Gerardi et al. 2010). Further, financial literacy rates tend to be lower among minority groups, women, the elderly, and those without college degrees, suggesting that the most vulnerable members of society are more likely to be caught in cycles of poor financial decision-making (Lusardi and Mitchell 2006; Lusardi and Mitchell 2007).

Though issues of reverse causality may exist (Hilgert et al. 2003), there is evidence suggesting that lack of financial knowledge is related to risky financial behavior (Agarwal et al. 2009; Lusardi and Tufano 2009). Lusardi and Tufano's (2009) field survey found that individuals with low financial literacy are more likely to engage in high-cost borrowing, and they estimated that approximately a third of the fees and charges these individuals pay are associated with their lack of knowledge. Lusardi et al. (2013) also find evidence of a significant relationship between financial knowledge, wealth accumulation, and long-term welfare. The authors use panel data to estimate that a high school dropout with limited financial knowledge would need 82 percent more initial wealth to be as well-situated as a high school dropout with high financial capability (Lusardi et al. 2013). The association between financial knowledge and financial well-being diminishes only slightly at higher education levels: college graduates with low financial literacy rates are 56 percent less well-off than their more knowledgeable counterparts (Lusardi et al. 2013).

Unlike the literature on the relationship between financial education and financial literacy, where there is a lack of consensus as to whether the two are significantly related, most researchers agree that there is an association between financial literacy and sound financial behavior (Gathergood 2012; Behrman et al. 2012). There is a general consensus that higher rates of financial literacy are associated with paying bills on time, paying credit card balances each month, diversifying investments, investing in the stock market, accumulating wealth, and saving for retirement.⁴ The results of Kim and Lee's 2018 study, which uses 2012 National Financial Capability Study data, indicate that financial literacy is also negatively associated with reliance on payday lending (Kim and Lee, 2018).

The relationship between financial education and financial behavior

Fewer studies examine the explicit link between financial education and financial behavior than focus on either of the relationships explored above. Nevertheless, some evidence suggests that there is a positive association between receipt of financial education and the likelihood of making prudent financial choices (Gutter et al. 2010; Lusardi et al., 2011; Lusardi and Scheresberg 2013). Using individual-level survey data on more than 15,000 college students, Gutter et al. (2010) find that students from states that have implemented a financial education requirement are more likely to budget and save and are less likely to default on credit card payments. Consistent with these findings, Lusardi et al. (2011) find, based on a survey of 2,000 households, that people who receive financial education in school are ten percent more likely to report that they are capable of responding to a minor financial shock. However, more than a quarter of survey respondents who felt they could cope with a \$2,000 financial emergency

⁴ With respect to the literature on paying bills on time and credit card balances each month, see Hilgert (2003); with respect to investing in the stock market and accumulating wealth, see van Rooij (2012); and with respect to saving for retirement, see Lusardi and Mitchell (2006, 2007).

believed that they might need to resort to extreme measures, such as taking out a payday loan, to shoulder the financial burden (Lusardi et al., 2011).

The present study

The present study expands on the existing literature by exploring the explicit link between completion of a financial education program and usage of payday loans. Though research links financial education to financial literacy (to some extent) and financial literacy to prudent financial behavior (to a greater extent), few studies connect financial education directly to high-cost borrowing practices. I fill this gap in the literature by using individual-level data from the 2018 National Financial Capability Study to estimate the relationship between participation in a financial education program and usage of payday loans.

CONCEPTUAL FRAMEWORK

The strong presumption of a negative relationship between completion of a financial education program and usage of payday loans is based on the literature explored above. The literature indicates that financial literacy is positively associated with financial education (as the dependent variable) and negatively associated with reliance on risky financial behavior (as the independent variable). It follows that completion of a financial education program is negatively associated with reliance on risky lending practices because of increased financial literacy. However, I suspect that a variety of other factors, perhaps most importantly whether someone comes from a disadvantaged socioeconomic background, are likely to be more strongly predictive of the probability of taking out a payday loan than whether or not someone enrolled in financial education. Therefore, to reduce bias in estimating of the effect of financial education on payday loan usage, I control for the demographic, socioeconomic, and financial capability factors as detailed in Figure 1 below.

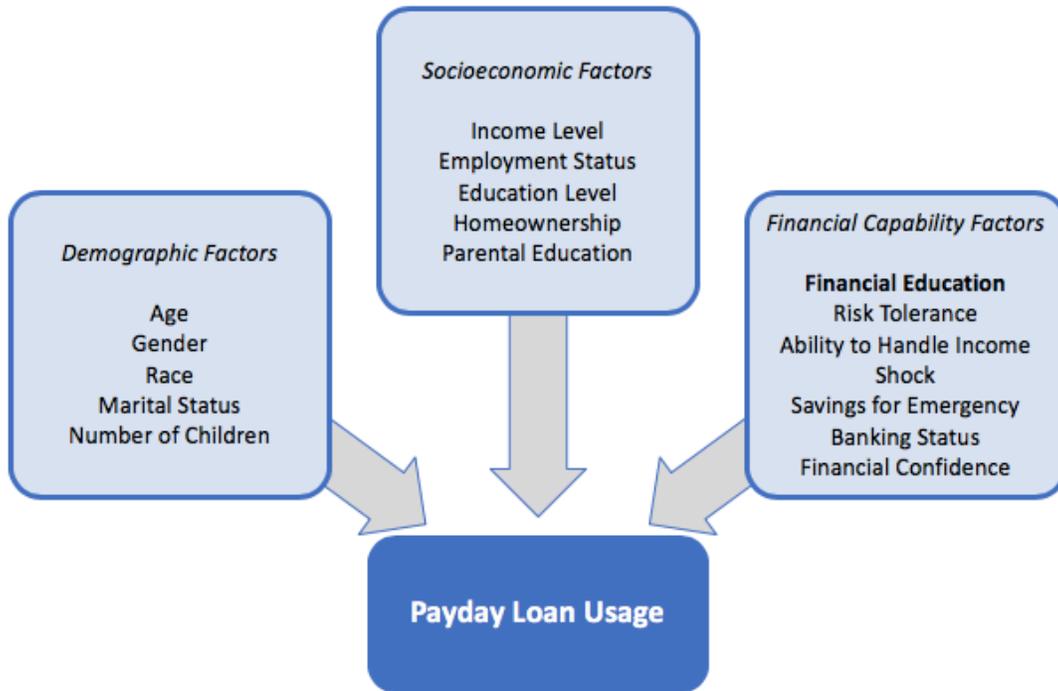


Figure 1 Factors associated with payday loan usage

Demographic factors

A variety of demographic factors may impact the likelihood that one pursues a payday lending arrangement. Though there are relatively few barriers to taking out a payday loan, borrowers are required to confirm that they are at least 18 years old (CFPB 2017). In addition to age, empirical studies have demonstrated links between gender, race, marital status, and the number of children one supports to one’s likelihood of taking out a payday loan (Kim and Lee 2017). For example, although most payday borrowers in the United States are white, black or Hispanic adults are more likely to use payday loans than their white counterparts (Urahn et al. 2012). Urahn et al. (2012) also finds that the probability that a divorced or separated person will use a payday loan is 103 percent higher than for single, married, or widowed individuals. This large discrepancy is likely due to the financial burden and decreased spending power associated

with divorce (Ross and Mirowsky 1999). Similarly, the potential for sudden financial problems is higher for households with additional dependents (Kim and Lee 2017).

Socioeconomic factors

Payday borrowing is concentrated among individuals of low socioeconomic status. Individuals with higher incomes and more assets are generally able to obtain loans at more favorable interest rates (CFPB 2013). Thus, household income and education level are each negatively associated with payday loan usage (Kim and Lee, 2017). According to a 2012 Pew Charitable Trusts survey, individuals with annual incomes of between \$15,000 and \$25,000 used payday loans at the highest rates, while individuals earning more than \$100,000 were the least likely to pursue payday lending (Urahn et al., 2017). Owning one's home (as opposed to renting) is also negatively associated with payday borrowing (Urahn et al., 2017). Proof of income, however, is generally a condition of payday borrowing, so employment status is positively associated with payday loan usage (CFPB 2017). In their evaluation of the school-based *I Can Save* program, Sherraden et al. (2011) control for parental education and parental income levels to account for the cyclical nature of poverty and low financial capability in the United States.

Financial capability factors

As demonstrated in the literature, financial literacy is correlated with both financial education and prudent financial decision-making. To avoid the influence of confounding factors, I control for a number of financial capability metrics that may be independently associated with both the dependent and independent variables in my model. Based on Kim and Lee's (2017) study of the relationship between financial literacy and payday loan usage, these factors include individuals' risk tolerance, ability to handle an income shock, possession of savings for an

emergency, and banking status.⁵ Financial literacy also has a positive correlation with confidence in one's financial capability, which is defined as financial confidence, and has been found to be associated with improvements in financial decision-making (Tokar Assad 2015). The model used in this study includes each of these controls.

DATA AND METHODS

This study relies on 2018 survey data from the Financial Industry Regulatory Authority's (FINRA) National Financial Capability Study (NFCS). The survey sample consists of 27,091 adults in the United States, and contains approximately 500 respondents per state, including the District of Columbia.⁶ Based on data from the Census Bureau's American Community Survey, FINRA set quotas for age, gender, ethnicity, education level, and income within each state and drew NFCS respondents using non-probability quota sampling. In 2018, FINRA partnered with Survey Sampling International, EMI Online Research Solutions, and Research Now to collect online responses between June and October of that year.

The unit of measure for this cross-sectional study is a person-level analysis. A dichotomous dependent variable is set equal to one if the respondent indicates that she took out a short-term payday loan at least once in the five years prior to completing the survey. The primary independent variable is also dichotomous, and it is set equal to one if the respondent reports being required to take a financial education course. Because the survey only asks respondents to indicate whether they were required to take a financial education course, a respondent is

⁵ It is possible that enrolling in financial education affects some of these financial capability metrics which could, in turn, affect the probability that one uses a payday loan. In such a case, it would be improper to include the financial capability controls in my regression because they could deprive the financial education variable of some of its explanatory power. Therefore, in some specifications, I exclude the financial capability controls because of their possible endogeneity to the relationship between financial education and the probability of taking out a payday loan.

⁶ The survey oversampled Oregon and Washington; there are approximately 1,250 NFCS respondents from each of these states. Oregon and Washington were oversampled to enable evaluation of state-sponsored retirement plans that they created between 2015 and 2018. Due to delays in their implementation, however, these programs have yet to be evaluated (Mottola, email message to Sarah Barrese, November 1, 2019).

considered not to have taken such a course if she took financial education but was not *required* to do so. I discuss the implications of this limitation further in my conclusion.

Respondents who were required to take financial education answered a series of sub-questions in which they could indicate whether they received the training in high school, in college, from an employer, or in the military. For purposes of simplicity, I rely on the overarching question about whether the respondent ever met a requirement to complete financial education prior to completing the survey as the independent variable. As discussed in the Conceptual Framework, the model controls for respondents' demographic characteristics, socioeconomic characteristics, and financial capabilities in order to reduce bias in my estimate of the effect of financial education on taking out a payday loan. The model also includes a series of state fixed effects dummies. These dummies allow me to control for the unmeasured characteristics of a respondent's state of residence that relate to both financial education and payday loan usage. Specifically, I estimate the following regression model with state fixed effects:

$$\begin{aligned}
 \text{payday}_i = & \beta_0 + \beta_1 \text{fineduc}_i + \beta_2 \text{income}_i + \beta_3 \text{employment}_i + \beta_4 \text{education}_i + \\
 & \beta_5 \text{homeownership}_i + \beta_6 \text{parentaleduc}_i + \beta_7 \text{tolerance}_i + \beta_8 \text{incomeshock}_i + \\
 & \beta_9 \text{savings}_i + \beta_{10} \text{banked}_i + \beta_{11} \text{confidence}_i + \beta_{12} \text{age}_i + \beta_{13} \text{female}_i + \beta_{14} \text{white}_i + \\
 & \beta_{15} \text{marriage}_i + \beta_{16} \text{children}_i + \alpha + \mu_i,
 \end{aligned}$$

where i is a subscript that represents the individual-level unit of analysis, α represents state fixed effects, and μ_i is the error term. Table 1 describes the variables included in the analysis.

Table 1 Model variables and definitions

Variable	Definition
Dependent Variable	
Payday Loan Usage	<i>A dichotomous variable set equal to one if the respondent took out a short-term payday loan at least once in the last five years.</i>
Independent Variable	
Financial Education	<i>A dichotomous variable set equal to one if the respondent has ever been required to take financial education.</i>
Socioeconomic Characteristics	
Income Level	<i>A series of dummy variables measuring the respondent's approximate household income, including wages, tips, investment income, public assistance, and income from retirement plans, in approximately \$25,000 increments.</i>
Employment Status	<i>A series of dummy variables describing the respondent's current employment status (employed, unemployed, or not seeking employment).</i>
Education Level	<i>A series of dummy variables describing the respondent's highest level of education completed (less than high school, high school, some college, or Bachelor's degree and higher).</i>
Homeownership	<i>A dichotomous variable set equal to one if the respondent or a spouse/partner currently owns her home.</i>
Parental Education	<i>A series of dummy variables describing the highest level of education completed by the person/people who raised the respondent (less than high school, high school, some college, or Bachelor's degree and higher).</i>
Financial Capability Characteristics	
Risk Attitude	<i>A dichotomous variable set equal to one if the respondent is risk-seeking based on the respondent's self-assessed willingness to take risks on her financial investments.</i>
Ability to Handle an Income Shock	<i>A dichotomous variable set equal to one if the respondent is confident or fairly confident that she could come up with \$2,000 if an unexpected need arose within the next month.</i>
Savings for an Emergency	<i>A dichotomous variable set equal to one if the respondent has set aside emergency or rainy-day funds that would cover her expenses for three months in case of sickness, job loss, economic downturn, or other emergencies.</i>
Banking Status	<i>A dichotomous variable set equal to one if the respondent has a checking and/or savings account, money market account, or CDs.</i>
Financial Confidence	<i>A dichotomous variable set equal to one if the respondent is confident in her financial knowledge based on a self-assessment on a scale of one to seven. Respondents answering 5 to 7 are set equal to 1.⁷</i>

⁷ I chose to dichotomize the variable in this way because it produces the most even distribution between individuals falling into low and high financial confidence categories.

Table 1 continued

Variable	Definition
Demographic Characteristics	
Age	<i>A series of dummy variables describing the respondent's age (under 35, between 35 and 55, and over 55).</i>
Female	<i>A dichotomous variable set equal to one if the respondent is female.</i>
White	<i>A dichotomous variable set equal to one if the respondent is white.</i>
Marital Status	<i>A series of variables describing the respondent's marital status (married, single, and once married).</i>
Dependent Children	<i>A dichotomous variable set equal to one if the respondent has at least one financially dependent child.</i>

DESCRIPTIVE STATISTICS

All results are weighted using a weight variable created by the survey's administrators. The survey weight is designed to ensure that the sample is representative of each state's population based on age, gender, ethnicity, and education. For purposes of simplicity, I refer henceforth to respondents who have been required to take financial education simply as having received financial education, and I refer to respondents who did not face such a requirement as not having received financial education.⁸ Table 2 displays descriptive statistics for the dependent and key independent variables and for the socioeconomic, financial capability, and demographic controls.⁹ In 2018, the weighted percentage of individuals who used at least one payday loan within the last five years is 13.7 percent, which corresponds to an unweighted count of 2,779

⁸ The conclusion of my thesis addresses the implications of this variable's lack of precision.

⁹ For my dependent variable, key independent variable, and six of my control variables, the survey allowed respondents to answer "I don't know" or "Prefer not to say" to the relevant questions. Responses falling into these two categories were coded as missing. No other data are missing from the database. After having performed these recodes, the values for the dependent variable, *payday*, were missing for 503 observations; the values for the key independent variable, *financial education*, were missing for 999 observations; the values for two socioeconomic controls, *homeownership* and *parental education*, were missing for 476 and 2,120 observations, respectively; and the values for four financial capability controls, *ability to handle an income shock*, *savings for an emergency*, *banking status*, and *financial confidence*, were missing for 1,071, 1,233, 757, and 742 observations, respectively. In total, the dataset has 7,901 missing values. My dataset contains 31 variables and 22,856 individual observations, for a total of 708,536 data points. The missing values described here comprise just over one percent of the total data points in my dataset.

respondents. Of the 22,856 individuals surveyed, 3,782 completed financial education training, which corresponds to a weighted percentage of 16.7 percent.

Table 2 Descriptive statistics for dependent, key independent, and control variables

Variable	Mean	SD	Min	Max
Dependent Variable				
Payday loan	0.137	0.344	0	1
Key Independent Variable				
Financial Education	0.167	0.373	0	1
Socioeconomic Characteristics				
<i>Household income</i>				
Less than \$35,000 per year	0.235	0.424	0	1
Between \$35,000 and \$75,000 per year	0.381	0.486	0	1
More than \$75,000 per year	0.384	0.486	0	1
<i>Employment status</i>				
Employed	0.580	0.494	0	1
Unemployed	0.093	0.291	0	1
Not seeking employment	0.327	0.469	0	1
Homeowner	0.618	0.486	0	1
<i>Highest education level completed</i>				
Less than High School	0.022	0.146	0	1
High School	0.266	0.442	0	1
Some College	0.398	0.489	0	1
Bachelors or more advanced degree	0.315	0.464	0	1
<i>Highest parental education level completed</i>				
Less than High School	0.086	0.280	0	1
High School	0.337	0.473	0	1
Some College	0.285	0.451	0	1
Bachelors or more advanced degree	0.292	0.455	0	1
Financial Capability Characteristics				
Risk seeking	0.578	0.494	0	1
Able to handle an income shock	0.695	0.460	0	1
Possesses savings for an emergency	0.533	0.499	0	1
Bank account holder	0.761	0.426	0	1
Confident in level of financial knowledge	0.750	0.433	0	1

Table 2 continued

Variable	Mean	SD	Min	Max
Demographic Characteristics				
<i>Age</i>				
Under 35 years old	0.284	0.451	0	1
Between 35 and 55 years old	0.332	0.471	0	1
Over 55 years old	0.385	0.487	0	1
Female	0.506	0.450	0	1
White	0.654	0.476	0	1
<i>Marital Status</i>				
Married	0.527	0.499	0	1
Once married	0.164	0.370	0	1
Single	0.309	0.462	0	1
Financially dependent children	0.358	0.479	0	1

The sample size is 22,856, with 3,783 respondents who were required to take financial training and 19,073 who were not required to do so.

Figure 2 depicts the rates of payday loan usage within each state where green is low, yellow intermediate, and red represents high use of payday loans. The highest rates of payday loan usage in this sample are concentrated in the southern United States. Mississippi has the highest rates of payday loan usage, with 22.2 percent of individuals surveyed reporting that they used a payday loan at least once in the last five years. Mississippi is followed closely by Alabama (19.9 percent), Louisiana (19.6 percent), and Texas (19.1 percent). States with low rates of payday loan usage are less geographically concentrated. New Hampshire has the lowest number (4.8 percent), followed by Arizona (5.5 percent) and Arkansas (6.1 percent).¹⁰

¹⁰ Arizona and Arkansas prohibit payday loans (Payday Loan Consumer Information, n.d.). The low but non-zero use levels in these states may reflect cross-border travel or moves by people who took out a payday loan in another state within the past five years.

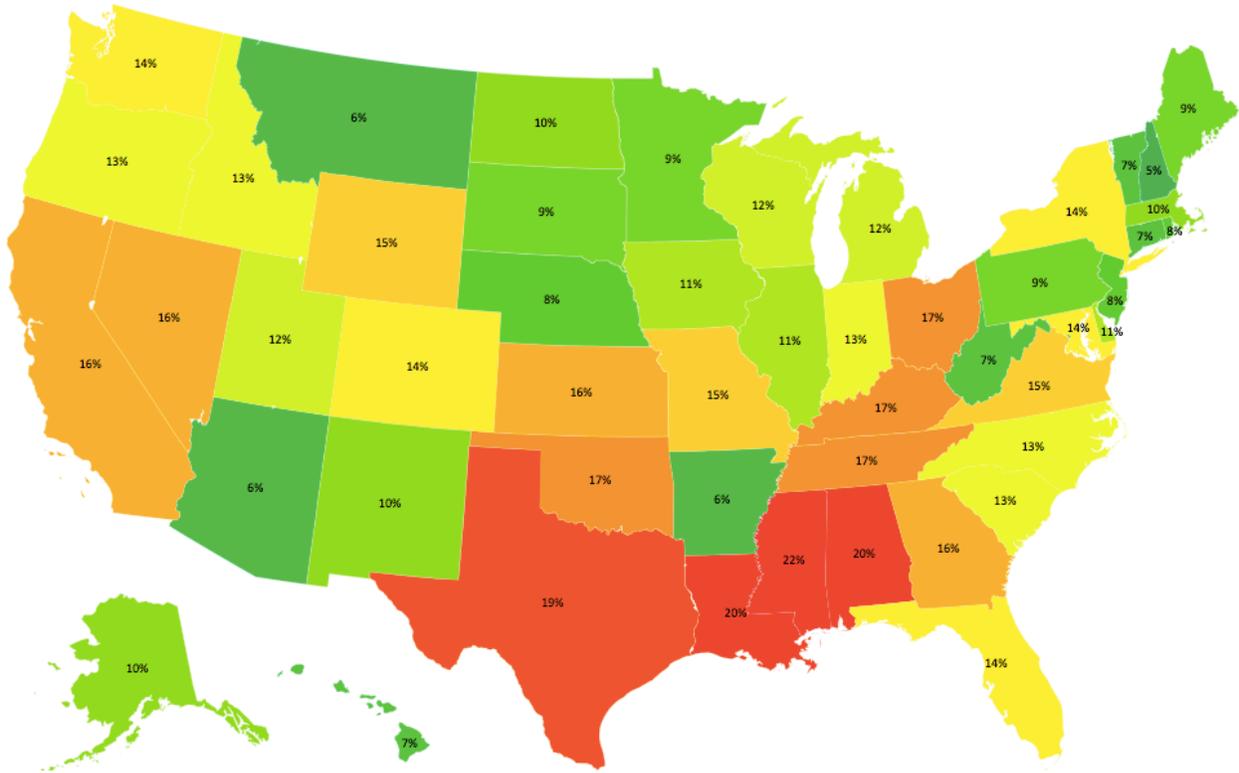


Figure 2 Payday loan usage by state

Table 3 reports separate descriptives for respondents who did and did not receive financial education. Just under 30 percent of sample members who took financial education have used a payday loan within the last five years. Among individuals who did not complete financial education training, payday loan usage within the last five years averages approximately ten percent. This unexpected finding is discussed further in the next section.

Incomes skew higher for individuals who received financial education than for those who did not, with 40.2 percent of individuals who received financial education earning more than \$75,000 per year and only a third of individuals who did not earning more than this amount. Further, the group receiving financial education has a 13.8 percent higher employment rate than the group that did not. For each of the financial capability characteristics, the average for financial education recipients is modestly higher than for the non-recipients. Members of the

financial education group are slightly less risk averse, are more likely to report that they are able to handle an income shock or financial emergency, are more likely to participate in the formal banking system, and are more confident in their financial abilities than members of the group not receiving financial education. Based on these data, the group receiving financial education appears to be more prone to payday loan usage but also more advantaged than the group not receiving financial education.

Given the fact that people receiving financial education are more prone to payday loan usage, one might hypothesize that both financial education completion and payday loan usage are markers of disadvantage. The findings reported here, however, indicate that people who have taken out payday loans are more advantaged. I explore this surprising finding further in the discussion of my regression results. I also explore specifications in which I limit my sample to those with less than a college degree in order to enhance the homogeneity of my sample in terms of socioeconomic status.

Table 3 Key characteristics of treatment and control groups

Variable	Financial Education Not Required	Financial Education Required	Difference	Robust SE
Dependent Variable				
Payday loan	0.105	0.299	0.194***	0.010
Socioeconomic Characteristics				
<i>Household income</i>				
Less than \$35,000 per year	0.316	0.299	-0.017*	0.010
Between \$35,000 and \$75,000 per year	0.351	0.299	-0.066***	0.010
More than \$75,000 per year	0.333	0.402	0.069***	0.010
<i>Employment status</i>				
Employed	0.556	0.694	0.138***	0.010
Unemployed	0.099	0.067	-0.032 ***	0.005
Not seeking employment	0.345	0.238	-0.107***	0.009
Homeowner	0.617	0.625	0.008ns	0.010

Table 3 continued

Variable	Financial Education Not Required	Financial Education Required	Difference	Robust SE
<i>Highest education level completed</i>				
Less than High School	0.024	0.011	-0.013***	0.003
High School	0.282	0.182	-0.100***	0.009
Some College	0.389	0.441	0.043***	0.011
Bachelors or more advanced degree	0.305	0.366	0.061***	0.010
<i>Highest parental education level completed</i>				
Less than High School	0.092	0.054	-0.038***	0.005
High School	0.354	0.251	-0.103***	0.010
Some College	0.273	0.340	0.067***	0.010
Bachelors or more advanced degree	0.280	0.354	0.074***	0.010
Financial Capability Characteristics				
Risk seeking	0.556	0.687	0.131***	0.010
Able to handle an income shock	0.691	0.714	0.023**	0.010
Possesses savings for an emergency	0.523	0.583	0.060***	0.011
Bank account holder	0.752	0.806	0.054***	0.009
Confident in level of financial knowledge	0.738	0.809	0.071***	0.009
Demographic Characteristics				
<i>Age</i>				
Under 35 years old	0.244	0.480	0.236***	0.011
Between 35 and 55 years old	0.336	0.312	-0.240**	0.010
Over 55 years old	0.420	0.208	-0.212***	0.009
Female	0.524	0.414	-0.110***	0.010
White	0.668	0.580	-0.088***	0.011
<i>Marital Status</i>				
Married	0.533	0.492	-0.041***	0.011
Once married	0.175	0.108	-0.067***	0.007
Single	0.291	0.399	0.108***	0.010
Financially dependent children	0.336	0.463	0.127***	0.011

Total sample size is 22,856, with 3,783 observations who were required to take financial education and 19,073 who were not required to do so.

REGRESSION RESULTS

Regression results are presented in Tables 4 and 5, with Table 4 summarizing the main findings and Table 5 reporting subgroup results. In Table 4, Model 1 is a bivariate linear probability model (LPM) regression without controls or state fixed effects. Model 2 introduces covariates that control for the individual socioeconomic, demographic, and financial capability characteristics discussed in earlier sections. As previously discussed, it is likely that relevant unobservable characteristics, such as stigma associated with government financial assistance and cultural values, vary across states. Therefore, in Model 3, I add state fixed effects to the regression. In Table 5, I expand on my fully specified regression by interacting my key independent variable with some of my controls in order to perform subgroup analysis. I weight each regression using a weight variable provided in the survey and report robust standard errors beneath each coefficient estimate.¹¹

Regression results

The results in Table 4 refute the hypothesis that financial education exposure has a negative association with payday loan usage. In Model 1, which includes no control variables, the estimated financial education coefficient is positive and large in magnitude; this result is consistent with the comparison of means presented in Table 3. More specifically, the data show that people who receive financial education are about 19 percentage points more likely to take out a payday loan than those who do not. The introduction of controls (Model 2) somewhat moderates the magnitude of the relationship, reducing it by approximately five percentage points.

¹¹ There are three weight variables available in the survey. One is designed to ensure that the characteristics of the weighted sample are representative of the characteristics of the adult U.S. population; another weights respondents such that their demographic characteristics are representative of the characteristics of the adults in the applicable Census Division; and a third weights respondents such that their demographic characteristics are representative of the adults in a given state. I use the first of these weights to ensure that my sample is nationally representative.

When state fixed effects are added to the regression (Model 3), the financial education coefficient is essentially unchanged. All financial education coefficients are statistically significant at a one percent level. I further discuss the unexpected nature of these findings in the concluding section of my paper.

Although I report LPM results in Tables 4 and 5, I also estimated logit and probit specifications for each of these regressions, and the average marginal effects estimates from both sets of regressions were similar to the results reported here. See the Appendix for unweighted LPM, probit, and logit results for Model 3.

Table 4 LPM regression results

Dependent Variable	Payday loan usage		
	(1)	(2)	(3)
	Bivariate	Multivariate	State FE
Key Independent Variable			
Financial education	0.194*** (0.010)	0.146*** (0.009)	0.144*** (0.009)
Socioeconomic Variables			
Household income < \$35,000 per year		0.009 (0.008)	0.008 (0.008)
Household income > \$75,000 per year		-0.009 (0.006)	-0.006 (0.006)
Employed		0.023*** (0.006)	0.024*** (0.006)
Unemployed		-0.003 (0.011)	-0.004 (0.011)
Homeowner		-0.011 (0.007)	-0.014* (0.007)
Completion of high school or less		0.026*** (0.008)	0.023*** (0.008)
Completion of college or a more advanced degree		-0.036*** (0.007)	-0.033*** (0.007)
Parental completion of high school or less		-0.037*** (0.008)	-0.036*** (0.008)
Parental completion of college or a more advanced degree		-0.053*** (0.008)	-0.051*** (0.008)

Table 4 continued

Dependent Variable	Payday loan usage		
	(1)	(2)	(3)
	Bivariate	Multivariate	State FE
Financial Capability Variables			
Risk seeking		0.051*** (0.005)	0.052*** (0.005)
Able to handle an income shock		-0.051*** (0.009)	-0.049*** (0.009)
Possesses savings for an emergency		-0.009 (0.007)	-0.009 (0.007)
Bank account holder		-0.019** (0.008)	-0.018** (0.008)
Confident in level of financial knowledge		0.013* (0.007)	0.012* (0.007)
Demographic Variables			
Under 35 years old		0.078*** (0.009)	0.076*** (0.009)
Over 55 years old		-0.018*** (0.007)	-0.017** (0.007)
Female		-0.045*** (0.005)	-0.043*** (0.005)
White		-0.055*** (0.006)	-0.057*** (0.007)
Married		-0.031*** (0.008)	-0.030*** (0.007)
Single		-0.024*** (0.009)	-0.023** (0.009)
Financially dependent children		0.106*** (0.007)	0.103*** (0.007)
State FE	No	No	Yes
Constant	0.105*** (0.003)	0.186*** (0.016)	0.248*** (0.024)
Observations	22,856	22,856	22,856
R-Squared	0.044	0.142	0.151
Robust standard errors are given in parentheses under coefficients. *** p<0.01, ** p<0.05, * p<0.1			

Subgroup analysis

Table 5 introduces interaction terms to the fully specified regression (Model 3) in order to explore variation in the association between exposure to financial education and payday loan usage among various subgroups of interest. Model 4 examines whether or not this relationship varies according to income. Model 5 considers whether the relationship between financial education and payday loan usage differs according to employment status. In Model 6, I assess the relationship between exposure to financial education and payday loan usage among individuals who have completed high school or less versus those who have completed more than high school. It is possible, however, that education increases the likelihood of receiving personal finance training because there are more opportunities for exposure. Model 7 explores this possibility through an interaction between financial education exposure and individuals with a Bachelor's or a more advanced degree. Finally, Model 8 evaluates whether there is a difference in the relationship between financial education and payday loan usage for individuals whose parents have completed high school or less as compared to those whose parents have more education.

The regressions whose results are reported in Table 4 set forth a basic model for estimating the relationship between financial education exposure and payday loan usage. It is possible that the association between exposure to financial education and payday loan usage differs for low-income versus higher income individuals. For example, I initially hypothesized that there would be a weak relationship between financial education and payday loan usage for people who are not low income but that there could be a stronger relationship among people with low earnings.¹² Model 4 contradicts this prediction. Exposure to financial education is associated

¹² Recall that respondents are placed into one of three income categories: those making less than \$35,000 per year; those making between \$35,000 and \$75,000 per year; and those making more than \$75,000 per year. I allocated

with a 17 percentage point increase in payday loan usage among respondents with household earnings of more than \$35,000 and only an 8.4 (0.170 – 0.086) percentage point increase in payday loan usage among respondents with household earnings of less than \$35,000 annually.¹³ This unexpected result could be due to a number of factors, including barriers to entry for obtaining a payday loan, which, though fairly low, may prove insurmountable to a person without at least somewhat steady employment.

Model 5, which considers employment status, somewhat supports this theory. The association between financial education exposure and payday loan usage remains positive and statistically significant at the one percent level for both employed and unemployed individuals, and a joint significance test indicates that the relationship is statistically different for each group. The magnitude of this association is just under five percentage points for unemployed people, but it is strong—approximately 19 (0.046 + 0.145) percentage points—for employed individuals. Model 6 studies whether or not the relationship between financial education and payday loan usage differs according to education. Among individuals who have completed no more than high school, financial education has a positive, strong (0.124 + 0.098 = 22.2 percentage points), and significant association with payday loan usage. Among those with a higher level of education, this relationship is smaller by almost ten percentage points but remains positive and statistically significant. As reflected in the F-test results shown at the bottom of the table, the relationship is statistically significant for this group as well.

respondents to these groupings in order to achieve an even distribution across categories. In this regression, I compare the relationship between financial education exposure and payday loan usage among those in the bottom third of the income distribution to those in the top two thirds of the distribution.

¹³ The relationship between financial education exposure and payday loan usage is statistically significant for those with high incomes, as reflected in the significance level of the financial education variable, and for those with low incomes, as reflected in the results of the F-test shown at the bottom of the table.

The results of Model 7 are largely consistent with the results of Model 6. Exposure to financial education is associated with an increase of approximately 18 percentage points in payday loan usage for individuals who have less than a Bachelor's degree. Obtaining a higher level of education dampens the predictive power associated with financial education. Among individuals with a Bachelor's or more advanced degree, financial education training is associated with an 8.5 (0.178 – 0.093) percentage point increase in payday loan usage. In Model 8, completion of financial education is associated with a 15.2 percentage point increase in the likelihood of payday loan usage among individuals whose parents progressed beyond high school. However, there is no significant difference in the relationship based on parental educational achievement.

Overall, these findings contradict my hypothesis that there is a negative association between financial education and payday loan usage. In fact, I find that this surprisingly positive relationship is stronger for employed people with moderately higher incomes and lower education levels. In the next section, I discuss possible reasons for these unexpected findings and their implications for policy and future research.

Table 5 Sub-group regression results

Dependent Variable	Payday loan usage				
	(4)	(5)	(6)	(7)	(8)
	Interaction (Low Income)	Interaction (Employed)	Interaction (< high sch.)	Interaction (BA+)	Interaction (P < high sch.)
Key Independent Variables					
Financial education	0.170*** (0.010)	0.046*** (0.014)	0.124*** (0.009)	0.178*** (0.012)	0.152*** (0.011)
Financial education*Income less than \$35,000 per year	-0.086*** (0.020)				
Financial education*Employed		0.145*** (0.018)			
Financial education*Completed high school or less			0.098*** (0.025)		
Financial education*Completed college or a more advanced degree				-0.093*** (0.017)	
Financial education*Parent completed high school or less					-0.026 (0.019)
Socioeconomic Variables					
Household income < \$35,000 per year	0.022*** (0.008)	0.008 (0.008)	0.007 (0.008)	0.007 (0.008)	0.008 (0.008)
Household income > \$75,000 per year	-0.007 (0.006)	-0.006 (0.006)	-0.005 (0.006)	-0.006 (0.006)	-0.006 (0.006)
Employed	0.024*** (0.006)	0.002 (0.006)	0.024*** (0.006)	0.025*** (0.006)	0.024*** (0.006)
Unemployed	-0.005 (0.011)	-0.006 (0.011)	-0.004 (0.011)	-0.002 (0.011)	-0.004 (0.011)
Homeowner	-0.015** (0.007)	-0.016** (0.007)	-0.015** (0.007)	-0.015** (0.007)	-0.014* (0.007)

Table 5 continued

Dependent Variable	Payday loan usage				
	(4)	(5)	(6)	(7)	(8)
	Interaction (Low Income)	Interaction (Employed)	Interaction (< high sch.)	Interaction (BA+)	Interaction (P < high sch.)
Completion of high school or less	0.023*** (0.008)	0.022*** (0.008)	0.011 (0.008)	0.025*** (0.008)	0.023*** (0.008)
Completion of college or a more advanced degree	-0.034*** (0.007)	-0.034*** (0.007)	-0.034*** (0.007)	-0.016** (0.007)	-0.033*** (0.007)
Parental completion of high school or less	-0.035*** (0.008)	-0.036*** (0.0008)	0.035*** (0.008)	-0.034*** (0.008)	-0.031*** (0.008)
Parental completion of college or a more advanced degree	-0.051*** (0.008)	-0.050*** (0.008)	-0.051*** (0.008)	-0.050*** (0.008)	-0.051*** (0.008)
Financial Capability Variables					
Risk seeking	0.052*** (0.005)	0.052*** (0.005)	0.052*** (0.005)	0.051*** (0.005)	0.052*** (0.005)
Able to handle an income shock	-0.049*** (0.009)	-0.049*** (0.009)	-0.050*** (0.008)	-0.050*** (0.009)	-0.049*** (0.009)
Possesses savings for an emergency	-0.008 (0.007)	-0.011 (0.007)	-0.009 (0.007)	-0.010 (0.007)	-0.009 (0.007)
Bank account holder	-0.017** (0.008)	-0.018** (0.008)	-0.019** (0.008)	-0.018** (0.008)	-0.018** (0.008)
Confident in level of financial knowledge	0.011 (0.007)	0.011 (0.007)	0.012* (0.007)	0.012* (0.007)	0.012* (0.007)

Table 5 continued

Dependent Variable	Payday loan usage				
	(4)	(5)	(6)	(7)	(8)
	Interaction (Low Income)	Interaction (Employed)	Interaction (< high sch.)	Interaction (BA+)	Interaction (P < high sch.)
Demographic Variables					
Under 35 years old	0.077*** (0.009)	0.075*** (0.009)	0.074*** (0.009)	0.075*** (0.009)	0.076*** (0.009)
Over 55 years old	-0.016** (0.007)	-0.019*** (0.007)	-0.016** (0.007)	-0.016** (0.007)	-0.017** (0.007)
Female	-0.042*** (0.005)	-0.041*** (0.005)	-0.042*** (0.005)	-0.043*** (0.005)	-0.042*** (0.005)
White	-0.057*** (0.007)	-0.057*** (0.007)	-0.056*** (0.007)	-0.055*** (0.007)	-0.057*** (0.007)
Married	-0.028*** (0.007)	-0.028*** (0.008)	-0.030*** (0.007)	-0.030*** (0.007)	-0.030*** (0.007)
Single	-0.022** (0.009)	-0.022** (0.009)	-0.022** (0.009)	-0.024** (0.009)	-0.023** (0.009)
Financially dependent children	0.101*** (0.007)	0.101*** (0.007)	0.103*** (0.007)	0.102*** (0.007)	0.102*** (0.007)
State FE	Yes	Yes	Yes	Yes	Yes
Constant	0.242*** (0.024)	0.265*** (0.024)	0.254*** (0.024)	0.241*** (0.024)	0.247*** (0.024)
Observations	22,856	22,856	22,856	22,856	22,856
R-Squared	0.153	0.156	0.152	0.153	0.151
F-statistics and p-values	197.12***	9.25***	107.01***	111.43***	76.01***
H₀: fineduc + interaction = 0	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)

DISCUSSION

Since 1980, payday lending has become substantially more common in the United States (Morse 2010), and lenders often target low-income and minority communities (Apgar and Herbert 2006). The predatory nature of these loans makes the concurrent decline in financial literacy levels in the United States particularly concerning. Though a wealth of research examines both of these issues (Sherraden et al. 2011; Go et al. 2012; Varcoe et al. 2005; Hilgert 2003; Lusardi and Mitchell 2006; 2007; Gathergood 2012; Behrman et al. 2012; van Rooij 2012; Kim and Lee 2018), few have explored the link between financial education and payday loan usage. My research seeks to determine whether or not financial education is successful in reducing individuals' reliance on payday loans.

The results of my fully specified model suggest that, contrary to my predictions, financial education is positively associated with payday loan usage. Specifically, I find that individuals who complete financial education are just over 14 percentage points more likely to use a payday loan at least once, holding all other factors in the model constant. In fact, my results indicate that completing financial education has a larger association with payday loan usage than does being low income or obtaining less than a high school education. Though I am unaware of research that specifically examines the effect of personal finance training on payday loan usage, my findings challenge previous research suggesting that financial education is associated with reductions in risky financial behavior (Gutter et al. 2010; Lusardi et al. 2011; Lusardi and Scheresberg 2013; Gutter, Copur, and Garrison 2010; Lusardi, Schneider, and Tufano 2011). Instead, it indicates that payday loan reliance is not necessarily among the financial behaviors that personal finance training can help to reduce.

As previously noted, studies focus more often on the relationship between financial literacy and financial choices (e.g., Gerardi et al. 2010 and Lusardi and Mitchell 2007) than on the relationship between financial literacy and payday loan usage. However, Kim and Lee (2018) use 2012 National Financial Capability Study data to assess the latter association and find a moderate negative relationship between financial literacy and payday loan usage. My research, however, uses updated (2018) data from the same study and a different key independent variable (financial education) and arrives at the conclusion that financial education has a positive relationship with payday loan use. This divergence in findings could suggest that financial education falls short of its aim to improve Americans' financial knowledge. Though many studies find that financial education programs improve financial literacy (Walstad et al. 2010; Sherraden et al. 2011; Go et al. 2012), some previous research finds little or no association between the two (Hathaway and Khatiwada 2008; Mandell 2008). My findings are somewhat consistent with those of Carpena et al. (2011), who find that financial education improves confidence in financial abilities but has no significant relationship with financial behaviors.

Although I control for socioeconomic, demographic, and financial capability characteristics, omitted variable bias may have affected my results. There are a number of factors that may be related both to the likelihood that one receives financial education and to the likelihood that one pursues payday lending and that are not captured in the National Financial Capability Survey. These factors include parental income levels and incarceration history. Sherraden et al. (2011), in their assessment of the relationship between participation in a financial education program and financial knowledge, control for parental income and find that financial education is positively related to the latter. Parental income may be negatively

associated with payday loan usage: generational wealth tends to be hereditary, and wealthier individuals are less likely to rely on payday lending (Kim and Lee 2017). The correlation between parental income and financial education, however, is unclear, making the overall bias stemming from the omission of a control for parental income difficult to predict.

Many United States prisons offer personal finance training to inmates with the goal of reducing recidivism and preparing individuals to participate in the formal economy (Call et al. 2013). Incarcerated individuals also tend to be in more dire financial situations than the average population (Reiman 1996; Kirchner 2017). Based on these considerations, I believe that incarceration may be positively associated with both receipt of financial training and payday loan usage. Thus, my inability to control for whether or not an individual has been previously incarcerated may have upwardly biased the coefficient on my key independent variable. If I was able to control for these types of variables, it is possible that my coefficient may become less positive.

The potential for measurement error presents another limitation of my research. It is possible that respondents misreported either their receipt of financial education or usage of payday loans for a variety of reasons, including a lack of awareness that they received such training or the fear of stigma related to payday loan usage. Further, FINRA's wording of the question from which I drew my key independent variable could have distorted respondents' answers. It is plausible that individuals who opted to take financial education responded "no" to the question because it specifically asked whether the respondent was "required" to take financial education. This suggests a potential survey design issue: valuable data about the true number of individuals who receive financial training could be lost because of the way that the question was worded. As a result, my findings should be viewed with substantial caution.

My findings raise questions for policymakers seeking to adjust Americans' financial behaviors. Over the last three decades, 45 states have added personal finance guidance to their state standards, and 17 states have implemented high school course requirements (Kasman et al. 2018). My results suggest that these programs may be less effective in reducing reliance on payday loans than their implementers would hope. Thus, limited state resources may be better spent on other initiatives aimed at reducing payday loan dependence. A number of measures designed to protect borrowers have proven politically popular, including initiatives that cap interest rates or regulate payday lenders (Andricos and Wilson 2018).

In sum, my results call into question whether financial education achieves the outcomes that policymakers seek. Because of the limitations described above, however, policymakers should not consider these findings conclusive that financial education is ineffective in reducing dependence on payday loans. As previously stated, a substantial body of literature demonstrates financial education programs' success in raising financial literacy, which in turn is linked to the reduction of an array of risky financial behaviors – including, in some cases, payday loan usage. Further, because my research considered only whether an individual was required to take financial education, it does not capture the full extent and effectiveness of different personal finance programs. This consideration presents an opportunity for future research to determine the usefulness of individual financial education programs and to identify best practices. Additional in-depth research on this topic could enable policymakers to refine financial education programs so that they help empower individuals in at-risk communities to make sound financial choices.

APPENDIX: ALTERNATIVE REGRESSION RESULTS

Table 1A Alternative regression results

Dependent Variable	Payday loan usage		
	(1)	(2)	(3)
	Unweighted LPM	Probit	Logit
Key Independent Variable			
Financial education	0.117*** (0.007)	0.106*** (0.006)	0.103*** (0.005)
Socioeconomic Variables			
Household income < \$35,000 per year	-0.003 (0.006)	0.007 (0.007)	0.007 (0.007)
Household income > \$75,000 per year	-0.004 (0.005)	-0.009 (0.007)	-0.007 (0.007)
Employed	0.024*** (0.005)	0.036*** (0.007)	0.037*** (0.007)
Unemployed	0.011 (0.009)	0.017 (0.010)	0.016 (0.011)
Homeowner	-0.020*** (0.006)	-0.022*** (0.006)	-0.020*** (0.006)
Completion of high school or less	0.018*** (0.006)	0.016** (0.007)	0.017** (0.008)
Completion of college or a more advanced degree	-0.037*** (0.005)	-0.034*** (0.007)	-0.035*** (0.008)
Parental completion of high school or less	-0.027*** (0.006)	-0.030*** (0.007)	-0.031*** (0.007)
Parental completion of college or a more advanced degree	-0.033*** (0.006)	-0.039*** (0.008)	-0.040*** (0.008)
Financial Capability Variables			
Risk seeking	0.044*** (0.004)	0.051*** (0.006)	0.052*** (0.006)
Able to handle an income shock	-0.056*** (0.007)	-0.043*** (0.007)	-0.042*** (0.007)
Possesses savings for an emergency	-0.009* (0.005)	-0.027*** (0.006)	-0.023*** (0.006)
Bank account holder	-0.032*** (0.007)	-0.017*** (0.007)	-0.016** (0.007)

Table 1A continued

Dependent Variable	Payday loan usage		
	(1)	(2)	(3)
	Unweighted LPM	Probit	Logit
Confident in level of financial knowledge	0.004 (0.006)	0.007 (0.006)	0.008 (0.006)
Demographic Variables			
Under 35 years old	0.067*** (0.007)	0.040*** (0.006)	0.049*** (0.006)
Over 55 years old	-0.011** (0.005)	-0.046*** (0.008)	-0.053*** (0.009)
Female	-0.040*** (0.004)	-0.040*** (0.005)	-0.041*** (0.005)
White	-0.061*** (0.006)	-0.051*** (0.006)	-0.045*** (0.006)
Married	-0.026*** (0.006)	-0.033*** (0.008)	-0.036*** (0.008)
Single	-0.021*** (0.008)	-0.027*** (0.009)	-0.028*** (0.009)
Financially dependent children	0.098*** (0.005)	0.087*** (0.006)	0.089*** (0.006)
State FE	Yes	Yes	Yes
Constant	0.276*** (0.022)	N/A	N/A
Observations	22,856	22,856	22,856
R-Squared	0.138	N/A	N/A
Robust standard errors are given in parentheses under coefficients.			
*** p<0.01, ** p<0.05, * p<0.1			

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