Education's Impact on Financial Literacy

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Abstract

In this study, I investigate the relationship between education and financial literacy using 2018 National Financial Capability Study survey data. I look at the relationship between educational attainment and performance on financial literacy questions given. The findings suggest that those with higher levels of education such as a postgraduate degree are more likely to answer correctly, thus resulting in increased financial literacy.

Introduction

Financial literacy is the understanding of basic financial concepts and products that enable an individual to make smart short-term and long-term financial decisions for themselves and their families. Financial education could potentially help to enable people to be more aware when making decisions about their finances. It could also help change negative financial behaviors into more positive ones. Financial literacy is predicted to increase over an individual's lifespan based on increased experience. Those who are required to take a financial education course are more informed about their financial decisions and can positively change their previous financial behaviors (Lusardi and Mitchell, 2014). These factors of financial literacy include debt, savings, investing, and retirement planning. This study focuses on the impact that financial education has on an individual's financial literacy. For this study I ran seven regressions. Six of these regressions are based on questions that measure the different factors of financial literacy. For the regressions I was able to find that education was an important factor for answering the questions correctly. Those with bachelor's or postgraduate degrees did significantly better on the questions than those without a high school degree. Overall, the results show that females and non-white individuals do worse on every question at a significant level. These results show the importance of education for individuals.

Literature Review

The recent need for financial literacy has increased due to the change from defined benefit pension plans to defined contribution plans and individual retirement accounts (IRAs) (Thorp et al., 2020). Previous defined benefit pension plans were seen as guaranteed payouts, regardless of market performance. The switch to defined contribution plans

and IRAs has now given individuals more of the responsibility to save, invest, and spend their money wisely to prepare for retirement. The 2008 market crash also exposed the need for financial literacy.

The difference between short-term and long-term behaviors tests the different facets of financial literacy an individual may have. Short-term behaviors consist of covering bills each month, having a checking account, paying credit card bills in full, and having no late mortgage payments. Long-term behaviors include having an emergency fund, having a savings account, having non-retirement investments, figuring out how much they need for retirement, having non-employer retirement accounts and obtaining a credit report. These long-term financial behaviors are influenced by the level of financial education adults have received. They did not find that short-term behaviors were changed or influenced by additional financial education. Short-term behaviors are easier to learn and provide immediate or regular feedback and penalties. This feedback makes it easier for an individual to manage and correct problems when they arise (Wagner & Walstad, 2019). For example, when an individual uses their credit card, they receive monthly interest statements. Therefore, they are able to self-correct behaviors sooner. Long-term behaviors lack this immediacy and are much harder to correct when done wrong. For instance, if an individual waits until later in their life to begin investing in an IRA, they will reap less of a benefit. Additionally, if they wait too long then this error may be unfixable. Long-term behaviors are less likely to be learned by doing or through experience. However, if that same individual opens their first checking account later, the consequences will not be as severe if at all.

It is important to understand the motivations that individuals have when controlling their own finances. An individual consumer will invest in their personal financial literacy up until the time lost and the marginal costs equal to their marginal benefit of financial literacy (Lusardi &

Mitchell, 2014). This amount of knowledge is found to be different among different educational groups. People who believe that Social Security will be their safety net in retirement are less likely to be financial literate because there is no incentive to invest for themselves. The misconception of a safety net impacts their long-term financial behavior.

Financial literacy is important when making decisions about employer retirement plans. The different behaviors that employees have under opt-in and opt-out plans have been researched using employee data from the U.S Office of Personnel Management (OPM). Goda et al. (2019) found evidence that financial literacy has a statistically positive relationship with an individual opting-in to a retirement plan. Those who lack financial education are more likely to believe that whichever contribution plan is recommended is a form of implicit financial advice (Yao et al., 2020). In a study of U.S federal government employees, Goldin et al. (2020) found that highlighting specific contribution rates raised enrollment in Thrift Savings Plans (TSP). Crawford & O'Dea (2020) found that when individuals are left to make their own financial decisions, they will not save enough for retirement. When individuals are left to decide their contribution rate, many will not participate in funding their retirement entirely (Goldin et al., 2020). Research conducted by Thorp et al. (2020) shows that by providing transparency to financial plans and contribution rates, an individual is more likely to invest in a retirement plan.

Past research shows lower levels of financial education for females, those under 30, and those with little work experience. (Chen & Volpe, 1998). A survey conducted by the NFCS found that 78% of respondents had not received financial education at all. Many investors have a limited understanding of undertaken risk when investing. An individual investor with low financial knowledge is often overwhelmed with choices and is likely to opt for the default allocation (Yao et al., 2020). Opting for a default plan shows that an individual is passive in their

investment strategy since they are still not able to make the correct financial decision for themselves. Wagner and Walstad (2019) have found that those who make less than $25,000 annually are 24-30% less likely to engage in any long-term financial behaviors. Individuals who do not have a high school degree are 7-16% less likely to engage in long-term behaviors compared to college graduates (Wagner & Walstad, 2019). Over half of Americans surveyed feel that their personal finances are a source of anxiety and 19% of those who responded to the 2018 NFCS survey reported occasionally overdrawing their checking accounts (NFCS, 2018).

A common survey used to measure financial literacy is the National Financial Capability Study (NFCS). The survey contains 120 questions ranging from demographic factors to a financial self-assessment. This survey is conducted every three years, with the most recent survey having been conducted in 2018. The data provided by the NFCS has been used to differentiate long-term and short-term behaviors.

Survey data is mostly utilized to measure financial literacy. These surveys ask questions specifically focused on financial behaviors and individual viewpoints. These questions are written to be simplistic, relevant, differentiable, and concise. The questions measure numeracy or the capacity to do a simple calculation related to compound interest rates, understanding of inflation, and knowledge of risk diversification in terms of stocks and mutual funds. The demographics used in these surveys are age, income, financial literacy score (based on questionaries), gender, race, ethnicity, marital status, parental status, employment status, educational attainment, previous financial education, and geographical region. By understanding which of these factors are significant, additional education can be correctly focused on those who are financial illiterate.

Previous research by Wagner and Walstad (2019) has found financial education to be significant in making short-term and long-term financial behaviors. Chen and Volpe (1998) have also researched the relationship between financial literacy and college students. Former research has failed to show a significant relationship between full-time high school or college personal finance classes and increased financial literacy (Mandell & Klein, 2009). Education programs can be suggested to improve these literacy rates for the uneducated demographics by conducting more studies to see who is financially literate. Additionally, there may be a relationship between short-term and long-term behaviors that has not been studied yet. Wagner and Walstad (2020) concluded that employer-based education programs have been found to be statistically significant in their financial literacy score.

Data and Methodology

My research question for this project is: will financial education improve financial literacy? Financial literacy is the ability to understand and use financial skills such as budgeting, personal financial management, and investing. This includes the understanding of compound and simple interest, inflation, mortgage rates, bonds, and investment risk. I hypothesize that financial education will have an impact on financial literacy until an individual becomes close to retirement age.

I am using survey data from the National Financial Capability Study (NFCS). The NFCS survey is funded by the Financial Industry Regulatory Authority (FINRA) Investor Education Foundation and is conducted by ARC research (formerly known as Applied Research & Consulting). This data were collected in 2018 between June and October. The final data consists of responses from 27,091 individuals, all of which are 18 or older. There are 500 responses per U.S state, including District of Columbia. The survey includes oversamples in Washington (WA)

and Oregon (OR) for a total of 1,250 responses per state. Head of households or primary financial decision-makers were not the specific target of this survey. In order to sample all populations, quotas were set to approximate Census distributions for gender, age, ethnicity, education level, and income level. This survey was self-administered by respondents online. To assure that everyone answered all six questions, all nonresponses were dropped. This brought the total observations down to 17,502 individuals. Additionally, I tested for heteroskedasticity, which was present. To account for this, robust standard errors are used.

I will test my hypothesis by running seven separate regressions. The first six regressions will be based on six financial questions that measure knowledge in budgeting, simple interest, compound interest, etc. The correct answer for each of the six questions will be used as dependent variables. The respondent will receive a 1 if the question was answered correctly and a 0 if incorrect. I will also include a seventh dependent variable which would be if an individual correctly answered half or less of the questions. These six questions are what I will use to measure financial literacy. I assume that a higher score on these questions indicates a higher level of financial literacy. These questions are structured in such a way that they measure different aspects of financial education. They measure simple interest, inflation, mortgages, bonds, investment choice, and compound interest. The six questions can be found in appendix A below. Therefore, I can feel confident that they measure overall financial literacy.

I have four financial education variables which will act as independent variables of interest these will all be represented as dummy variables. My first independent variable is financial education. I will use the data of those who were offered financial education and participated, those who were offered and did not participate, and those who were not offered at all. The omitted group was those who were not offered financial education. I am expecting that

those who participated in required financial education will do better than those who were not required. My next independent variable is educational attainment. Educational attainment is the level of education the individual has completed. The dropped variable for this category will be respondents that did not graduate high school. I will be comparing this to those who graduated high school, those who had some college education, and those with either a bachelor's or postgraduate degree. My third variable of interest is guardian's education level. A guardian would be defined as a parent or an individual who is legally responsible for the welfare of the child. The dropped variable will be respondents whose guardian did not graduate from high school. Much like educational attainment the categories will be those whose parent graduated from high school, those whose parent attended some college, and those whose parent had received a bachelor's or postgraduate degree. I am unsure if this variable will show a significance, but if it does, I believe that a guardian with high levels of education will have a positive significance on an individual's own financial literacy. My last variable of interest will be self-accessed financial knowledge. The 2018 NFCS survey asks each individual respondent to rate their financial knowledge on a scale from 1 to 7, where 1 is very low and 7 is very high. I plan on splitting this into those who have scored themselves between 1-4 to be the lower financial knowledge group and those who scored 5-7 to have higher financial knowledge. I will be comparing those with higher self-scored financial knowledge to those who responded that they have low financial knowledge. I believe that someone who scores themselves to have very high financial knowledge may be overestimating their personal financial knowledge. I believe that this would lead to individuals who elected to have high financial knowledge to actually get more questions incorrect.

I have four additional independent financial variables. The first variable is income. I think high income will have a positive correlation to financial literacy. This may be because those with more money have a greater ability to invest, budget, and save which are financial literacy measures. It also gives someone greater motivation to learn how to handle their money. The dropped category for this group with be those whose income is less than $15,000. The other categories being compared would be those whose income is at least $15,000 but less than $25,000, at least $25,000 but less than $35,000, at least $35,000 but less than $50,000, at least $50,000 but less than $75,000, at least $75,000 but less than $100,000, those who make at least $100,000 but less than $150,000, and those who make $150,000 or more. The second financial variable is financially dependent children. The group I dropped are those who have no children at all. I hypothesize that those with any number of financially dependent children will be more financially literate than those who have no children. I believe this is due to the increase in responsibility that one undertakes with children. The other categories will be those with 0, 1, 2 3, or 4 or more financially dependent children.

My third variable is the spending of income. This is measured by an individual's spending habits in conjunction with their income. This is if they spend more than, less than, or equal to their income. I will be omitting those who spend less than their income. As collected in the NFCS survey, 18.5% of individuals report spending more than their income. I think that those who spend more than their income will be less financially literate than those who spend less than their income. Spending less gives them more of an opportunity to budget and save since they have money left over. My last independent financial variable is personal financial satisfaction. Like financial knowledge, this question is based on the respondent's opinion. This is measured on a scale of 1 to 10. Where 1 is very low satisfaction and 10 is very high satisfaction. I will

group this into two categories, those who responded 1-5 and those who responded 6-10. The omitted group would be those with low satisfaction who answered between 1-5. I hypothesize that those with low satisfaction will be less financially literate than those who scored themselves 6-10.

Finally, I am using six demographic variables as my control variables. I will be using age, sex, ethnicity, marital status, geographical region, and military status. Just like my independent variables these will be represented as dummy variables. Age is categorized as 18-24, 25-34, 35-44, 45-54, 55-64, and 65 plus. I will omit those who fall into the 18-24 age category. I hypothesize that when compared to the age category of 18-24, every other age category will have higher financial literacy due to increased life experience.

Sex is measured as male or female with those who are male receiving a 0 and those who are female receive a 1. I will omit those who responded female for my regressions. Based on previous studies by Wagner and Walstad (2019) I predict that females will have lower financial literacy when compared to males. This could be due to gender bias, lack of education available for females, or traditional values where males take care of finances. Ethnicity is measured as white or non-white. I will omit non-white individuals. Those who selected their ethnicity as white will receive a 1 and those who selected non-white will receive a 0. I predict that white individuals will have higher financial literacy when compared to the non-white category.

The categories of marital status are married, single, divorced, separated, and widow/widower. I will omit those who responded single in my regressions. I predict that when compared to single individuals those who are married, divorced, separated, and widow/widower will have higher financial literacy. The geographical regions are Midwest, West, South, and Northeast. I will omit individuals who live in Northeast. I am unsure of the relationship that

regional data will provide, but I am expecting the West to have higher financial literacy since they typically have higher costs of living. My next control variable is military status. This is either a member of the military currently or previously and nonmember. I will drop individuals who responded as nonmembers. I predict that current or former military members will have less financial literacy when compared to non-military members.

Results

In total I ran seven separate regressions. The first six regressions were based on the six questions at the end of the National Financial Capability Survey (NFCS). These were each dummy variables where a 1 indicates that the question was answered correct and a 0 indicates that the question was answered incorrect. These questions can be found in Appendix A. The seventh regression was based on if half or less of the questions were answered correctly. A 1 signifies that that they answered half or less correct and a 0 indicates that they answered more than half correct. My hypothesis is that financial education will increase financial literacy.

For financial education those who were offered and participated overall were more likely to get each question correct compared to those who were never offered. They are 5.52 percentage points more likely to score more than half correct. For those who participated, they were 2.01 percentage points less likely to answer more than half correct. Financial education could have been received in high school, college, or by an employer. Next, for educational attainment those who have graduated high school are 10.41 percentage points more likely to answer more than half of the questions correct when compared to someone who did not graduate high school. This is true for all education levels such as some college, bachelor's degree, or postgraduate degree. In all instances, those with higher education were more likely to answer more than half of the questions correctly than someone who never graduated from high school. My third financial

education variable is guardian education level. This was significant for those whose guardian graduated high school, had a bachelor's degree, or had a postgraduate degree. If an individual's guardian fell into the above categories, they were more likely to answer over half of the questions correct. For example, those whose guardian had a post graduate degree were 6.53 percentage points more likely to answer over 3 questions correct than someone whose guardian did not graduate high school. The last financial education variable is self-scored financial knowledge. For those who answered 5-7 electing high financial education, were 6.75 percentage points less likely to answer below 3 compared to individuals who responded 1-4. My main variables of interest show the importance of education. Those with increased education, are more likely to be financial literate. This is based on their increased likelihood of answering more questions correct.

The other independent variables are financial variables. Those who spend equal to their income are 1.31 percentage points more likely to answer half or less questions correct than someone who spends less than their income. Additionally, those who spend more than their income are 2.97 percentage points less likely to answer a question on inflation correctly. I predicted that those who spent less than their income would be in a better spot financially, and therefore more likely to have better financial behavior. The second financial variable is income. In all instances, when income is above $15,000, an individual is more likely to answer more than half of the questions correctly. For the question on mortgages, those at all income levels above $15,000 are more likely to answer correctly. Specifically, those who make more than $75,000 but less than $100,000 are 11.74 percentage points more likely to answer this question correctly compared to an individual whose income in below $15,000. For those with an income of over $150,000, they are 13.40 percentage less likely to get less than half of the questions correct when

compared to those who make less than $15,000. For my regressions, financially dependent children were significant for 0, 1, 2, or 3 financially dependent children. Respondents with 1 financially child are 3.25 percentage points less likely to answer 4 or more questions correct than someone without children. However, this relationship changes when they have no current financially dependent children. Those with no financially dependent children are 1.90 percentage points more likely to answer 4 or more questions correct than someone without children. I expected those with 3 or more financially dependent children to be more significant, however, it was only significant for inflation and investment choice. For those with 3 or more children, they are 6.22 percentage points less likely to answer the question on inflation correct compared to someone without children. The final financial variable is financial satisfaction. Much like the financial education category, those who responded to have high financial satisfaction were also more likely to get 4 or more questions correct but 6.53 percentage points. Those with high financial satisfaction are 7.55 percentage points more likely to answer the question on inflation correctly compared to someone with low financial satisfaction. The question for inflation is significant at the 1% level.

For the six control variables, ethnicity and sex were statistically significant for all questions. Females were 9.61 percentage points more likely to get less than half of the questions correct than males. For the question on compound interest females were almost 12 percentage points less likely to answer correctly than males. These results are supported by previous literature conducted by Lusardi and Mitchell (2014). Similarly, those who are non-white are also 5.48 percentage points more likely to get less than 3 questions correct when compared to white respondents. For the questions on inflation and mortgages, nonwhite individuals are over 7 percentage points less likely to answer these correct compared to white respondents. This is also

supported by research done by Lusardi and Mitchell (2014). Marital status was significant for half or less of correct answers for those who are separated or divorced. In both instances, they are more likely to answer more than 4 of the questions correct. Married couples did better on inflation and mortgage questions than single individuals. This is supported by Chen and Volpe (1998) who say that married couples are generally more knowledgeable on financial topics. Widowed individuals did better on inflation and investment questions but worse on the question related to bonds. Those who are divorced are over 6 percentage points more likely to answer the questions on inflation and mortgages correctly compared to a single individual. Separated individuals also were more likely to answer the question on mortgages and investment choice correct. Age is also significant, with those aged 25 to 34 more likely to answer below 3 questions correct by 7.17 percentage points when compared the age group of 18 to 24. Those 35 to 44 were also less likely to answer a question about inflation correct when compared to those 18 to 24 years old. In the age category of 45 to 54 there was no significant findings. When they were above 65 years of age, they became more likely to answer correctly for questions on simple interest, inflation, and bond pricing. Geographical region was significant for the question of inflation and investment choice, where those from the Midwest or West were more likely to answer correctly than someone from the Northeast. Those in the South were less likely to answer a question on bond pricing correct. This may be due to educational differences or different racial groupings.

Employment status was significant for retired individuals who did better on questions related to inflation, mortgages, and investment choice than those unemployed. Permanently sick or disabled individuals are more likely to answer the question on inflation correct than unemployed respondents. Surprisingly, those who work part-time were less likely to answer the

question on bond pricing correct than someone who is unemployed. Those who are self-employed are more likely to answer the questions on mortgages and investment choice correctly than someone who is unemployed. Finally, military status had unexpected results. Those who are current military members were less likely to answer questions on simple interest, inflation, and bond pricing correctly when compared to nonmilitary members. Overall, they are 25.71 percentage points more likely to answer less than half of the questions correct. Specifically, those who are current military members are over 14 percentage points less likely to answer the questions on simple interest and bond pricing correctly. They are also over 27 percentage points less likely to answer questions on inflation and investment choice correctly. This could be due to the government plans they are issued and the limited control they may have over their finances while stationed. Former military members are less likely to answer questions on simple interest, inflation, mortgages, and compound interest correct but by a lower percentage at just over 1.8 percentage points than someone who was never in the military.

Table 1: Regression

	Simple Interest	Inflation	Bond pricing	Mortgages	Investment Choice	Compound Interest	Half or less correct
Midwest	.0077 (.0095)	.0209** (.0105)	-.1020 (.0109)	.0113 (.0088)	.0261** (.0110)	.0013 (.0113)	-.0095 (.0101)
South	-.0054 (.0090)	-.0052 (.0100)	-.0280*** (.0102)	-.0072 (.0085)	.0008 (.0102)	-.0029 (.0106)	.0034 (.0095)
West	.0147* (.0089)	.0278*** (.0100)	-.0175* (.0104)	.0113 (.0084)	.0250** (.0104)	.0169 (.0107)	-.0136 (.0095)
Female	-.0676*** (.0066)	-.1109*** (.0074)	-.0760*** (.0075)	-.0204*** (.0062)	-.1315*** (.0077)	-.1195*** (.0080)	.0961*** (.0069)
Age25to34	-.0261*** (.0096)	-.1184*** (.0105)	-.0668*** (.0095)	-.0256*** (.0093)	-.0966*** (.0103)	.0255** (.0106)	.0717*** (.0103)
Age35to44	-.0090 (.0109)	-.0358*** (.0117)	-.0124 (.0113)	.0068 (.0101)	-.0195 (.0120)	-.0053 (.0119)	.0109 (.0114)
Age45to54	.0148 (.0105)	-.0106 .0118	-.0175 (.0114)	-.0003 (.0101)	-.0050 (.0120)	.0103 (.0120)	.0019 (.0114)
Age55to64	-.0112 (.0110)	-.0156 (.0117)	-.0292*** (.0113)	-.0103 (.0103)	-.0158 (.0121)	-.0002 (.0121)	.0218* (.0116)
Age65plus	.0354*** (.0099)	.0480*** (.0105)	.0410*** (.0121)	.0121 (.0084)	.0153 (.0116)	.0132 (.0122)	-.0327*** (.0097)

	Simple Interest	Inflation	Bond pricing	Mortgages	Investment Choice	Compound Interest	Half or less correct
Nonwhite	-.0272***	-.0766***	-.0154*	-.0720***	-.0556***	-.0216**	.0548***
	(.0077)	(.0084)	(.0081)	(.0075)	(.0084)	(.0086)	(.0082)
High School Graduate or GED	.0667**	.0952***	-.0059	.1346***	.0273	.0050	-.1041***
	(.0291)	(.0273)	(.0235)	(.0282)	(.0248)	(.0246)	.0278
Some College or Associate degree	.1354***	.1941***	.0289	.1952***	.1155***	.0668***	-.2151***
	(.0291)	(.0275)	(.0239)	(.0283)	(.0251)	(.0250)	(.0279)
Bachelor's Degree	.1688***	.2605***	.0913***	.2013***	.2025***	.1139***	-.2656***
	(.0296)	(.0283)	(.0252)	(.0288)	(.0263)	(.0263)	(.0285)
Postgraduate Degree	.1687***	.2739***	.1167***	.1858***	.2311***	.1287***	-.2612***
	(.0301)	(.0289)	(.0265)	(.0291)	(.0271)	(.0276)	(.0290)
Married	.0028	.0422***	-.0114	.0220**	-.0044	-.0365***	.0016
	(.0119)	(.0126)	(.0122)	(.0120)	(.0128)	(.0128)	(.0124)
Separated	.0377	.0551*	.0479*	.0900***	.0600**	-.0218	-.0626**
	(.0289)	(.0304)	(.0282)	(.0272)	(.0300)	(.0287)	(.0298)
Divorced	.0138	.0715***	-.0064	.0603***	.0280**	-.0140	-.0358***
	(.0119)	(.0128)	(.0124)	(.0110)	(.0131)	(.0129)	(.0123)
Widow	-.0111	.0624***	-.0472***	.0551***	-.0220	-.0175	-.0190
	(.0175)	(.0184)	(.0180)	(.0154)	(.0189)	(.0182)	(.0174)
1 Financially Dependent Child	-.0268***	-.0499***	-.0325***	-.0020	-.0337***	.0090	.0294***
	(.0102)	(.0112)	(.0108)	(.0095)	(.0114)	(.0116)	(.0108)
2 Financially Dependent Children	-.0241**	-.0552***	-.0106	.0059	-.0406***	.0041	.0213*
	(.0111)	(.0124)	(.0123)	(.0103)	(.0126)	(.0128)	(.0119)
3 Financially Dependent Children	-.0048	-.0642***	-.0369**	.0032	-.0344**	.0309*	.0330**
	(.0159)	(.0172)	(.0161)	(.0146)	(.0172)	(.0178)	(.0168)
3 or more Financially Dependent Children	.0016	-.0622***	-.0082	-.0003	-.0415*	.0376	.0211
	(.0206)	(.0225)	(.0220)	(.0193)	(.0227)	(.0235)	(.0223)
No Financially Dependent Children	-.0020	.0340***	.0095	.0213***	.0267***	.0124	-.0190**
	(.0086)	(.0094)	(.0099)	(.0079)	(.0100)	(.0101)	(.0089)
Income $15,000 to $25,000	.0085	.0122	.0068	.0468***	-.0050	.0071	-.0325*
	(.0165)	(.0169)	(.0142)	(.0165)	(.0161)	(.0154)	(.0169)
Income $25,000 to $35,000	.0406**	.0004	.0183	.0699***	.0145	-.0023	-.0436**
	(.0165)	(.0171)	(.0147)	(.0164)	(.0167)	(.0158)	(.0172)
Income $35,000 to $50,000	.0375**	.0304*	.0183	.0876***	.0282*	.0043	-.0865***
	(.0160)	(.0168)	(.0147)	(.0159)	(.0163)	(.0157)	(.0166)
Income $50,000 to $75,000	.0715***	.0519***	.0364**	.1080***	.0682***	.0152	-.1180***
	(.0160)	(.0169)	(.0150)	(.0159)	(.0165)	(.0159)	(.0167)
Income $75,000 to $100,000	.0738***	.0370**	.0465***	.1174***	.0509***	.0196	-.1049***
	(.0171)	(.0180)	(.0169)	(.0166)	(.0179)	(.0177)	(.0178)
Income $100,000 to $150,000	.0855***	.0682***	.0723***	.1218***	.0978***	.0545***	-.1321***
	(.0175)	(.0186)	(.0177)	(.0170)	(.0186)	(.0186)	(.0181)
Income $150,000 or more	.0887***	.0863***	.1056***	.1064***	.0927***	.0709***	-.1340***
	(.0187)	(.0204)	.0206	(.0185)	(.0205)	(.0215)	(.0196)
Current Military Member	-.1446***	-.3193***	-.1458***	.0325*	-.2755***	.0048	.2571***
	(.0231)	(.0205)	(.0222)	(.0190)	(.0227)	(.0241)	(.0232)
Former Military Member	-.0206**	-.0221**	.0130	-.0182**	.0039	-.0235**	.0059
	(.0088)	(.0100)	(.0116)	(.0084)	(.0109)	(.0118)	(.0091)
Self-Employed	-.0110	.1080	-.0056	.0532**	.0399*	.0071	-.0257
	(.0210)	(.0219)	(.0203)	(.0208)	(.0216)	(.0217)	(.0217)
Full-time	-.0223	-.0151	-.0268	.0175	.0205	-.0063	.0021
	(.0189)	(.0198)	(.0175)	(.0191)	(.0192)	(.0190)	(.0197)
Part-time	-.0260	-.0349	-.0382**	.0133	.0088	.0010	.0127
	(.0210)	(.0219)	(.0194)	(.0210)	(.0213)	(.0211)	(.0218)
Homemaker	.0067	-.0013	.0123	.0347	.0295	.0232	-.0251
	(.0224)	(.0236)	(.0208)	(.0221)	(.0226)	(.0222)	(.0234)
Full-time Student	.0012	.0046	-.0041	.0333	-.0007	.0301	-.0149
	(.0267)	(.0291)	(.0254)	(.0274)	(.0275)	(.0273)	(.0288)
Permanently sick or disabled	-.0096	.0404*	-.0175	.0256	.0114	.0024	-.0278
	(.0230)	(.0241)	(.0204)	(.0231)	(.0230)	(.0222)	(.0238)

	Simple Interest	Inflation	Bond pricing	Mortgages	Investment Choice	Compound Interest	Half or less correct
Retired	-.0122 (.0201)	.0608*** (.0209)	.0203 (.0196)	.0507** (.0199)	.0453** (.0208)	-.0158 (.0207)	-.0493** (.0206)
Respondent has the most household financial knowledge	.0320*** (.0107)	.0248** (.0115)	.0329*** (.0113)	.0332*** (.0097)	.0582*** (.0118)	.0469*** (.0119)	-.0523*** (.0113)
Respondent and someone else share household financial knowledge	.0237** (.0117)	-.0075 (.0127)	-.0260** (.0124)	.0188* (.0107)	.0003 (.0130)	.0079 (.0129)	-.0241* (.0124)
Guardian graduated High School or had GED	.0047 (.0126)	.1020 (.1385)	.0112 (.0137)	-.0004 (.0117)	.0131 (.0141)	.0099 (.0141)	-.0232* (.0133)
Guardian had some college or associate degree	-.0041 (.0132)	-.0265* (.0147)	.0214 (.0146)	-.0007 (.0123)	-.0083 (.0149)	.0051* (.0150)	-.0077 (.0140)
Guardian had bachelor's degree	.0019 (.0135)	.0127 (.0153)	.0201* (.0156)	.0011 (.0127)	.0237 (.0159)	.0389** (.0163)	-.0327** (.0144)
Guardian had postgraduate degree	.0271* (.0142)	.0215 (.0165)	.0156 (.0178)	.0146 (.0136)	.0434** (.0173)	.0331* (.0183)	-.0454*** (.0154)
Financial satisfaction is more than half	.0655*** (.0087)	.0755*** (.0095)	.0160* (.0090)	.0621*** (.0081)	.0542*** (.0097)	.0110 (.0096)	-.0653*** (.0092)
Spending is more than income	-.0257*** (.0097)	-.0297*** (.0102)	.0027 (.0100)	-.0160* (.0090)	.0066 (.0104)	.0168 (.0106)	.0050 (.0101)
Spending is equal to income	-.0075 (.0070)	-.0205*** (.0078)	-.0260*** (.0079)	-.0166** (.0066)	-.0177** (.0080)	-.0102 (.0082)	.0131* (.0074)
Somewhat difficult to come up with $2,000	-.0210** (.0085)	-.0497*** (.0093)	-.0193** (.0090)	-.0082 (.0080)	-.0389*** (.0095)	-.0186** (.0094)	.0302*** (.0089)
Very difficult to come up with $2,000	-.0322** (.0144)	-.0796*** (.01480	-.0389*** (.0133)	-.0137 (.0134)	-.0923*** (.0145)	-.0263* (.0143)	.0747*** (.0148)
Individual has high financial knowledge	.0397*** (.0087)	.0346*** (.0094)	.0497*** (.0083)	.0509*** (.0083)	.0725*** (.0094)	.0396*** (.0090)	-.0675*** (.0092)
Has an emergency fund	.0120 (.0081)	.0003 (.0090)	.0483*** (.0089)	-.0063 (.0077)	.0155 (.0094)	.0027 (.0092)	-.0020 (.0086)
Has a checking account	.1090*** (.0178)	.0654*** (.0176	-.0281* (.0150)	.1081*** (.0178)	.0330** (.0167)	.0241 (.0157)	-.0805*** (.0179)
Has a savings account	.0227** (.0092)	.0355*** (.0098)	-.0134 (.0091)	.0416*** (.0090)	.0142 (.0100)	.0070 (.0097)	-.0382*** (.0097)
Regularly overdrafts account	-.0627*** (.0099)	-.0760*** (.0107)	-.0116 (.0097)	-.0204 (.0092)	-.0590*** (.0106)	-.0288*** (.0103)	.0603*** (.0104)
Saves for a retirement plan not provided by an employer	.0349*** (.0080)	.0404*** (.0087)	-.0071 (.0086)	.0744 (.0075)	.0390*** (.0090)	.0132 (.0090)	-.0434*** (.0083)
Has other investments besides retirement	.0159** (.0068)	.0298*** .0079	.0987*** (.0086)	.0243 (.0075)	.1125*** (.0085)	.0350*** (.0088)	-.0467*** (.0072)
Financial course required in college	.0117 (.0117)	-.0109 (.0135)	.0198 (.0146)	.0065 (.0110)	.0201 (.0140)	.0122 (.0152)	.0004 (.0126)
Financial course required by employer	-.0083 (.0114)	.0014 (.0131)	.0037 (.0149)	.0014 (.0105)	.0021 (.0136)	.0189 (.0156)	.0141 (.0120)
Financial education offered and participated	-.0089 (.0105)	-.0325*** (.0115)	-.0080 (.0127)	.0071 (.0010)	-.0334*** (.0121)	.0160 (.0126)	.0201* (.0112)
Financial education offered and did not participate	.0289*** (.0112)	.0371*** (.0127)	.0434*** (.0127)	.0292*** (.0107)	.0470*** (.0325)	.0465*** (.0132)	-.0552*** (.0122)
Constant	.4791	.3255	.2424	.2660	.2206	.2058	.7673
Number of observations	17,502	17,502	17,502	17,502	17,502	17,502	17,502
R^2	.0905	.2058	.0111	.1206	.2101	.0696	.1884
F-stat	28.58	112.51	37.73	31.75	103.12	22.03	77.21

Note: Robust standard errors for independent variables are shown in parentheses. The symbols *,**,*** correspond to a 10% , 5%, and 1% level of significance.

Conclusion

The results from this study indicate that increased education has an impact on financial literacy. A likely reason for this outcome is that upper education allows people to be more knowledgeable overall and thus more likely to answer these questions correct. The results suggest that financial education may need to be targeted at those with lower educational attainment. This relies on the assumption that increased financial education at any education level will increase financial literacy. These results overall support my hypothesis that education will increase financial literacy. The results also show that it may not be all due to education. For the question on bond pricing the R^2 suggests that some knowledge may not be as easy, and therefore may be left out of financial education. For this reason, in future research I would like to see what educational background these individuals had. If someone was a business or finance major, they may be more likely to answer this question correctly due to education beyond financial education. These differences in education backgrounds may also help explain who was getting these questions correct. If the majority of individuals have jobs or prior information on financial topics, then overall it may be impacting the results. However, without employer or major information these results show that financial education does not necessarily increase financial literacy, but the level of education does. This is shown in those with postgraduate and bachelor's degrees doing better on each question compared to those with no high school diploma.

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Appendix A

National Financial Capability Study Survey Questions

M6) Simple interest

Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

More than $102, Exactly $102, Less than $102, Don't know, Prefer not to say

M7) Inflation

Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

More than today, Exactly the same, *Less than today*, Don't know, Prefer not to say

M8) Bond pricing

If interest rates rise, what will typically happen to bond prices?

They will rise, *They will fall*, They will stay the same, There is no relationship between bond prices and the interest rate, Don't know, Prefer not to say

M9) Mortgages

A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less.

True, False, Don't know, Prefer not to say

M10) Investment choice

Buying a single company's stock usually provides a safer return than a stock mutual fund.

True, *False*, Don't know, Prefer not to say

M31) Compound interest

Suppose you owe $1,000 on a loan and the interest rate you are charged is 20% per year compounded annually. If you didn't pay anything off, at this interest rate, how many years would it take for the amount you owe to double?

Less than 2 years, *At least 2 years but less than 5 years*, At least 5 years but less than 10 years, At least 10 years, Don't know, Prefer not to say

Table 2: Definition and Descriptive Statistics

Variable	Description	Mean	Standard Dev.	Min.	Max.
Northeast	The number of individuals who live in the Northeast census region.	0.1665	0.3725	0	1
Midwest	The number of individuals who live in the Midwest census region.	0.2233	0.4165	0	1
South	The number of individuals who live in the South census region.	0.3154	0.4647	0	1
West	The number of individuals who live in the West census region.	0.2948	0.4560	0	1
Male	The number of individuals whose sex is male.	0.4689	0.4990	0	1
Female	The number of individuals whose sex is female.	0.5311	0.4990	0	1
Age 18 to 24	The number of individuals who are 18 to 24 years of age.	0.0860	0.2804	0	1
Age 25 to 34	The number of individuals who are 25 to 34 years of age.	0.1581	0.3648	0	1
Age 35 to 44	The number of individuals who are 35 to 44 years of age.	0.0995	0.2994	0	1
Age 45 to 54	The number of individuals who are 45 to 54 years of age.	0.0987	0.2983	0	1
Age 55 to 64	The number of individuals who are 55 to 64 years of age.	0.0994	0.2992	0	1
Age 65 plus	The number of individuals who are older than 65 years of age.	0.2179	0.4128	0	1
White	The number of individuals whose ethnicity is white.	0.7556	0.4298	0	1
Nonwhite	The number of individuals whose ethnicity is something other than white.	0.2444	0.4298	0	1
No high school degree	An individual that did graduate high school.	0.0198	0.1394	0	1
High school graduate or GED	An individual that graduated high school or got their GED.	0.2361	0.4247	0	1
Some college or associate degree	An individual that completed some college or has an associate degree.	0.2651	0.4414	0	1
Bachelor's degree	An individual that has a bachelor's degree.	0.2270	0.4189	0	1
Postgraduate degree	An individual that has a postgraduate degree.	0.1470	0.3541	0	1

Married	The number of individuals that are married.	0.5435	0.4981	0	1
Single	The number of individuals that are single.	0.2790	0.4485	0	1
Separated	The number of individuals that are separated.	0.0141	0.1177	0	1
Divorced	The number of individuals that are divorced.	0.1183	0.3230	0	1
Widow	The number of individuals that are widowed.	0.0451	0.2076	0	1
1 Financially Dependent Child	Individuals that have 1 financially dependent child.	0.1555	0.3624	0	1
2 Financially Dependent Children	Individuals that have 2 financially dependent children.	0.1206	0.3256	0	1
3 or more Financially Dependent Children	Individuals that have 3 or more financially dependent children.	0.0494	0.2168	0	1
No financially dependent children	Individuals that have no financially dependent children.	0.3305	0.4704	0	1
No children	Individuals that have no children.	0.3166	0.4652	0	1
Income less than $15,000	An individual whose income is less than $15,000.	0.0923	0.2894	0	1
Income between $15,000 to $25,000	An individual whose income is more than $15,000 but less than $25,000.	0.1036	0.3048	0	1
Income between $25,000 to $35,000	An individual whose income is more than $25,000 but less than $35,000.	0.1036	0.3048	0	1
Income between $35,000 to $50,000	An individual whose income is more than $35,000 but less than $50,000.	0.1443	0.3514	0	1
Income between $50,000 to $75,000	An individual whose income is more than $50,000 but less than $75,000.	0.1968	0.3976	0	1
Income between $75,000 to $100,000	An individual whose income is more than $75,000 but less than $100,000.	0.1489	0.3560	0	1
Income between $100,000 to $150,000	An individual whose income is more than $100,000 but less than $150,000.	0.1394	0.3464	0	1
Income above $150,000	An individual whose income is more than $150,000.	0.0785	0.2690	0	1
Current military member	An individual who is a current member of the military.	0.0325	0.1774	0	1
Former military member	An individual who was a member of the military but is currently not.	0.1238	0.3293	0	1
Never a military member	An individual who has never been a member of the military.	0.8437	0.3631	0	1
Self-employed	An individual who is self-employed.	0.0756	0.2644	0	1

Full-time worker	An individual who works full-time.	0.4237	0.4942	0	1
Part-time worker	An individual who works part-time.	0.0806	0.2723	0	1
Homemaker	An individual who is a homemaker	0.0633	0.2435	0	1
Full-time student	An individual who is full-time student.	0.0276	0.1638	0	1
Permanently sick or disabled	An individual who is permanently sick or disabled and unable to work.	0.0503	0.2186	0	1
Unemployed	An individual who is unemployed.	0.0398	0.1956	0	1
Retired	An individual who has retired.	0.2390	0.4265	0	1
Guardian did not graduate high school	An individual whose guardian did not graduate from high school.	0.0787	0.2693	0	1
Guardian graduated high school or has GED	An individual whose guardian graduated from high school or has their GED.	0.0787	0.2693	0	1
Guardian has some college or associate degree	An individual whose guardian had some college education or an associate degree.	0.2733	0.4457	0	1
Guardian has bachelor's degree	An individual whose guardian graduated with a bachelor's degree.	0.2027	0.4020	0	1
Guardian has postgraduate degree	An individual whose guardian graduated with a postgraduate degree.	0.1203	0.3254	0	1
Spending is equal to income	An individual that spends equal to their income.	0.3602	0.4801	0	1
Spending is more than income	An individual that spends more than their income.	0.1909	0.3930	0	1
Spending is less than income	An individual that spends less than their income.	0.4489	0.4974	0	1
Financial education was offered and participated in	An individual who was offered financial education in high school, college, or by their employer and participated in it.	0.1005	0.3007	0	1
Financial education was offered and not participated in	An individual who was offered financial education in high school, college, or by their employer and did not participate in it.	0.2439	0.4294	0	1
Financial education was not offered	An individual who was not offered financial education in high school, college, or by their employer.	0.6556	0.4752	0	1
Satisfaction is less than half (1-5)	An individual who stated that their financial satisfaction was a 1, 2, 3, 4 or 5.	0.3157	0.4648	0	1

Satisfaction is more than half (6-10)	An individual who stated that their financial satisfaction was a 6, 7, 8, 9, 10.	0.6843	0.4648	0	1
Low financial knowledge (1-4)	An individual who stated that their financial knowledge was 1, 2, 3, or 4.	0.2190	0.4136	0	1
High financial knowledge (5-7)	An individual who stated that their financial knowledge was 5, 6, or 7.	0.7810	0.4136	0	1
Checking account	An individual who has a checking account.	0.9447	0.2286	0	1
Savings account	An individual who has a savings account.	0.7857	0.4104	0	1
Regularly overdrafts account	An individual that regularly overdrafts their checking account.	0.1776	0.3822	0	1
Saves for a retirement plan not provided for by employer	An individual who saves for a retirement plan that is not provided for by their employer.	0.6076	0.4883	0	1
Has other investments besides retirement	An individual that has other investments not including a retirement account.	0.3851	0.4866	0	1
Question on simple interest	Individuals who answered the question on simple interest correct.	0.7912	0.4064	0	1
Question on inflation	Individuals who answered the question on inflation correct.	0.6351	0.4814	0	1
Question on bond pricing	Individuals who answered the question on bond pricing correct.	0.3120	0.4633	0	1
Question on mortgages	Individuals who answered the question on mortgages correct.	0.8178	0.3860	0	1
Question on investment choice	Individuals who answered the question on investment choice correct.	0.5209	0.5000	0	1
Question on compound interest	Individuals who answered the question on compound interest correct.	0.3417	0.4743	0	1
Half or more of questions correct	Individuals who answered 3 or more of the 6 questions correct.	0.2901	0.4538	0	1