Financial Education and Financial Literacy by Income and Education Groups

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This study examines associations between financial education and financial literacy among people with different levels of education and income using a large, national data set, the 2015 National Financial Capability Study. This study estimates whether financial education in high school, college, or through an employer, is associated with a person's financial literacy score. Results show that people who received any financial education are likely to have higher financial literacy scores compared to those without financial education. Financial education has larger predicted probabilities for those with lower education and income, suggesting that financial education is especially important for this demographic group. This research emphasizes a need to teach financial education to people whom previous research suggests lacks financial literacy the most.

Keywords: education, financial education, financial literacy, income

Financial literacy is as important a skill as reading, writing, and math skills are, and thus everyone should have knowledge about it in order to survive the complex financial world. However, research shows that the United States has low levels of financial literacy, especially for people with lower education and incomes (Lusardi & Mitchell, 2014). Lusardi, Mitchell, and Curto (2012) found that college students were more financially knowledgeable compared with high school students. Furthermore, Monticone (2010) found that people with higher incomes were more likely to acquire financial knowledge on their own while those with lower incomes found it too costly or did not have the same incentives to do so. Therefore, as a way to mitigate long-term financial problems, it is especially important to estimate the effects of financial education on groups that research suggests have low levels of financial literacy.

Problems resulting from not being financially literate include difficulty managing personal debt and student loans (Council for Economic Education, 2016; Lusardi & Mitchell, 2014), having low saving rates (Bernheim, Garrett, & Maki, 2001; Lusardi & Mitchell, 2014), and engaging in poor credit card behaviors leading to lasting negative effects (Borden, Lee, Serido, & Collins, 2008). Lusardi and Mitchell (2014) suggested that financial problems could be avoided if people were more financially literate. Because of widespread personal finance problems and the importance placed on financial literacy, numerous education programs have been developed to increase financial literacy. McCormick (2009) noted in her review that prior to 2004, limited studies were done for younger kids but that during 2004–2008 (the study's focus) many programs were created. This study also notes that adult and community-based financial education was too new and there was limited data available. Since 2008, even more emphasis has been made for financial education at all levels. For example, high schools in many states incorporate personal finance standards, courses, or exams (Council for Economic Education, 2016), colleges offer seminars for students to help them manage credit (Borden et al., 2008), and employers offer workshops for employees (Clark, Morrill, & Allen, 2012; Kim, 2016).

Previous studies have looked at the effects of financial education on financial literacy. One recent study done by Xiao and O'Neill (2016) found that financial education improved several different measures of financial literacy (a subjective measure, an objective measure, financial behaviors, perceived financial literacy, and an index

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measure). The main difference between past studies and this current study is the emphasis of studying how financial education is related to financial literacy for people with lower education and income. Focusing on people with lower education and income levels, this study supports existing literature by estimating how financial education offered in high school, college, through an employer, or any combination of the three, has an impact on a person's financial literacy score. In this article, a person's financial literacy score is the dependent variable, while demographic characteristics and financial education are independent variables. The main results suggest that financial education is positively correlated with higher financial literacy scores. Results also show that financial education has a stronger impact on people with lower education levels and income.

Literature Review and Hypotheses

Many people understand that financial education is needed at all ages in order to avoid costly mistakes that can lead to long-term impacts on younger people. Some literature about high school financial education examines how specific curriculums affect financial knowledge and behaviors. Walstad, Rebeck, and MacDonald (2010) found that the financial curriculum, *Financing Your Future* (FYF), increased student knowledge of personal finance. Another study by Asarta, Hill, and Meszaros (2014) used the *Keys to Financial Success* curriculum and found that the curriculum increased high school students' financial knowledge by 61% between the pretest and posttest. The most significant change came from the most difficult topics: credit history and records, and the rights and responsibilities of buyers, sellers, and creditors. Another study, estimated the effects of the *High School Financial Planning Program* (HSFPP) and found that the curriculum had positive effects on financial knowledge and financial behaviors (Danes, Rodriguez, & Brewton, 2013).

Other studies estimated how financial education affects college students. One study found that a college personal finance course increased a person's investment knowledge which then increased the likelihood of saving. In the same token, taking a high school, or both a high school and college, personal finance course did not increase the person's investment knowledge (Peng, Bartholomae, Fox, & Cravener, 2007). Information about investment knowledge may be more relevant for college students which explains why the college course was the only effective course. Another study used a sample from ten Midwest campuses and found that taking a personal finance course significantly reduced the likelihood that a college student engaged in risky financial credit card behaviors (Lyons, 2008).

As it becomes more expectant that employees exercise responsibility in making major financial decisions, including those about their retirement, workplace financial education has become more popular. Bernheim and Garrett (2003) estimated how workplace financial education affects employees' saving rates, with results suggesting that the availability of financial education had a positive effect on a person's saving behaviors. Another study used a national sample of 1,486 employees from a large insurance company and found that those who participated in the Financial Awareness Workshop had higher financial literacy levels (Hira & Loibl, 2005).

While research mostly focuses on one type of financial education (i.e., high school, college, or as an adult), few studies have looked at all three. One study, however, estimated the effects of high school, college, and adult financial education using the 2012 National Financial Capability Study (NFCS; Xiao & O'Neill, 2016). The authors found a positive relationship between financial education, financial knowledge (both objective and subjective), and financial behaviors. While this study used a similar data set and examined all three financial education types the article did not split the population by demographic groups as it was not the focus of their study.

Although previous studies mostly focus on the whole population, other studies estimate potential effects of financial education on those with lower education and income, which is what the focus of this study is. The studies that look at different subgroups in the population do not break down the effects of different types of financial education on financial literacy as this study does. Lusardi and Mitchell (2007, 2014) reviewed relevant research and found that financial literacy increases with more education. In other words, people who are more educated are more likely to be more financially knowledgeable. Similarly, Lusardi et al. (2012) found that people who are more educated have higher levels of financial literacy even when controlling for demographics. Other studies have found that people with lower incomes are less likely to be financially literate (Lyons, Chang, & Scherpf, 2006; Mauldin, Henager, Bowen, & Cheang, 2016; Monticone, 2010; Zhan, Anderson, & Scott, 2006).

Furthermore, people with lower income saw that a lack of financial knowledge to be a barrier to financial behaviors specifically saving (Mauldin, et al., 2016).

Lusardi (2003) studied the effects of retirement seminars offered to individuals age 51–61 and found that those with lower education and income benefit more from the financial education. The current study builds on existing research by using a large national data set to examine the effects of financial education, offered through high schools, colleges, employers, or some combination, on financial literacy for people with lower education and incomes. Previous research found that people with lower education and incomes have lower levels of financial literacy, accentuating the importance of this study, as it shows that financial education can be especially beneficial for these two population subgroups.

It is hypothesized that financial education would improve financial literacy which is consistent with much of previous research (Lusardi & Mitchell, 2014). Furthermore, Monticone (2010) found that people lower incomes found it too costly and with fewer incentives than wealthier people to acquire financial literacy on their own. Therefore, because those who have lower incomes are not going out and acquiring the information on their own, it would be expected that financial education would be especially beneficial to this group. While similar research has not been done specifically looking at the costs of acquiring financial knowledge for those with lower education it's expected to have a similar relationship with financial education—those with lower education would be more affected by financial education because they have fewer means of learning the information on their own and would need others and education to help.

Method

Data

The data set came from the 2015 NFCS, a nationally representative survey of people's financial knowledge, attitudes, and behaviors that was commissioned by the Investor Education Foundation of the Financial Industry Regulatory Authority (FINRA, 2016). The survey was largely developed from the 2012 to 2009 versions of the NFCS survey. The 2015 NFCS survey was administered online to 27,564 adult respondents in the United States.

Variables

The 2015 survey asked people about the financial education that they may have received. The questions asked whether or not financial education was offered by a school or college you attended, or a workplace that you were employed at. If they said yes, the next question asked if they received it through high school, college, an employer, or the military. People were only asked about financial education through college or the military if they were a current college student, college graduate, or if they responded that they were currently active in or retired from the military. For this analysis, employer and military financial education were combined, given that time spent in the military is another form of employment, revealing a small number of respondents who received military financial education.

These questions were used to create the financial education variables for the analysis. There are multiple categories for coding an individual in the case that a person responds that they received more than one form of financial education. The omitted category is that a person received no financial education. The eight categories of financial education are: (a) high school only, (b) college only, (c) employer only, (d) high school and college, (e) high school and employer, (f) college and employer, (g) high school, college, and employer, and (h) no financial education.

The data set also provided a unique look at financial literacy by asking financial literacy questions in the survey. The 2015 survey included six questions, including one that is new to this survey. For the sake of comparability, this study focused on five of the financial literacy questions that have been used widely in the literature, in order to provide a general understanding of a person's financial literacy (Allgood & Walstad, 2016; Hastings, Madrian, & Skimmyhorn, 2013; Lusardi & Mitchell, 2014; Xiao & O'Neil, 2016). The questions test a respondent's knowledge of interest accrual, inflation, the relationship between bond prices and interest rates, mortgages, and the difference between stocks and stock mutual funds. All five questions assess general financial knowledge, the bond question, being the most difficult (Lusardi & Mitchell, 2014). See the FINRA (2016) report for information about the questions including wording and other variables of interest.

The questions are either multiple-choice or true–false style, giving the respondent the option to choose the correct answer rather than coming up with the correct answer on their own. The financial literacy questions are simply a proxy for evaluating people's financial literacy, and there are many topics that are not tested through the survey that may be covered through financial education.

Each financial literacy question was coded as a 1 if the respondent correctly answered the question. If the respondent gave an incorrect response, the variable was coded as a zero. If the respondent left it blank or said they did not know the answer, then it is assumed that they cannot answer the question correctly. The financial literacy measure for this article is the sum of correct responses with possible scores ranging from 0 to 5. Higher scores indicate that the respondent is more financially literate.

Other independent variables for the analysis include dummy variables for gender, ethnicity, age group, education level, marital status, having at least one child, income group, and employment status. These characteristics are used to control for variations of people that may affect their financial literacy level. For example, previous research has found that those who are older, more educated, have higher income (which also includes being employed) is related to higher levels of financial literacy (Lusardi & Mitchell, 2014). Marital status and number of children can affect income and therefore are also included as control variables. Finally, there are dummy variables for the state the individual lives in to control for geographical differences that previous research has noted (Bumcrot, Lin, & Lusardi, 2013).

Analytic Model

This study estimates the effects of financial education using the following ordered probit model:

$$\text{Fin.Lit.Score} = \beta_0 + \beta_i X + \beta_j \text{Fin.Ed.} + \beta_k Z$$

This model was used because the financial literacy score, the dependent variable, is a discrete, noncontinuous variable. The variable X is a vector of demographic characteristics including the person's gender, ethnicity, marital status, employment, age, income, education, and children. The demographic characteristics are all dummy variables. The variable Z is a vector of state dummy variables to control for differences across states. The variables for *Financial Education* are the financial education course combinations that apply to each group. For example, the regression for those with lower education included high school only, employer only, and a combination of high school and employer. The categories are all dummy variables equal to 1 if the respondent reported receiving that combination of financial education. The dependent variable, *Financial Literacy Score*, are whole values between 0 and 5.

Results

Descriptive Statistics

Table 1 reports the descriptive statistics for the 2015 sample. For this study, people with more than a bachelor's degree were eliminated in order to focus on subpopulations that would have the most potential policy implications. Past research also focuses on people with less than a postgraduate degree, indicating that research is limited regarding the effects of financial education on people with this level of education. However, for the purpose of checking robustness, those with postgraduate education were included and the results remained similar. The average financial literacy score was 2.74. The proportion of people that received each financial education combination is also reported in Table 1. The combinations are distinct. People cannot fall into more than one of the financial education combinations and therefore the combinations sum to 100%. About 5% of the sample received financial education in high school only, about 4% of the sample received it in college only, and about 2% only received employer financial education. Two to three percent of the sample received financial education from two sources. Finally, 3% of the sample received high school, college, and employer financial education. Almost 79% of the sample received no financial education.

The mean financial literacy score by course combination split by education and income is shown in Table 2. People who reported having less than a high school degree or a high school (or equivalent) degree were considered part of the lower education group. Income recording for the survey was done categorically, where a person could answer whether or not their income was less than $25,000, $25,000–50,000, $50,000–75,000, $75,000–150,000, or greater than $150,000. For this study, income was split at the median —those who make less than $50,000 were considered low income while those who make more than $50,000 were considered high income. For the robustness check, other

TABLE 1. Descriptive Statistics

	Count	*M*	*SD*
Financial literacy score	23,817	2.7356	1.4643
HS only	21,291	.0531	.2242
College only	21,291	.0449	.2070
Employer only	21,291	.0223	.1476
HS and college only	21,291	.0274	.1633
HS and employer only	21,291	.0181	.1332
College and employer Only	21,291	.0201	.1402
HS, college, and employer	21,291	.0288	.1672
No Fin. Lit.	21,291	.7854	.4106
Male	23,817	.4773	.4995
White	23,817	.6503	.4769
25–34	23,817	.1758	.3807
35–44	23,817	.1579	.3647
45–54	23,817	.1813	.3853
55–64	23,817	.1748	.3798
65+	23,817	.1732	.3785
Less than high school	23,817	.0288	.1674
High school	23,817	.2957	.4564
Some college	23,817	.3494	.4768
College—Associates or bachelors	23,817	.3261	.4688
Married	23,817	.5059	.5000
Single	23,817	.3271	.4692
Divorced/separated	23,817	.1231	.3285
Widowed/widower	23,817	.0439	.2048
Has children	23,817	.3563	.4789
Less than $25k	23,817	.2689	.4434
$25–50k	23,817	.2798	.4489
$50–75k	23,817	.2003	.4003
$75–150k	23,817	.2138	.4100
$150k+	23,817	.0372	.1891
Self employed	23,817	.0699	.2551
Employed	23,817	.4564	.4981
Not in labor force	23,817	.2062	.4046
Unemployed	23,817	.0705	.2560
Retired	23,817	.1970	.3977
Observations	23,817		

Note. *HS* = high school.

income differentiation points were estimated and results remained similar. The general population, who received any of the financial education combinations, answered statistically more questions than those who did not take any financial education. This is especially true for those who have lower education and incomes. Results in Table 2 also show that people with higher education and incomes have higher levels of financial literacy as indicated by answering more questions correctly (Lusardi et al., 2012; Lusardi & Mitchell, 2014; Lyons et al., 2006; Monticone, 2010; Zhan et al., 2006).

Financial Education and Financial Literacy

In order to maintain simplicity, only the financial education results are presented in Tables 3 and 4. All the results are compared to people with no financial education. Financial education is correlated to financial literacy. Those who had financial education were less likely to have lower financial literacy scores and more likely to have high financial literacy scores. The ordered probit predicted probabilities for people with lower education, are shown in Panel A in Table 3. Receiving a high school, employer, or both, decreased the probability of answering 0, 1, and 2 questions correctly by 2%–7% points, compared to people who did not have any financial education. The financial education combinations, however, increased the likelihood of answering 3, 4, and 5 financial literacy questions correctly by 2%–8% points.

Ordered probit results for people with higher education levels are shown in Panel B in Table 3. Having financial education decreased the probability of answering 0, 1, 2, and 3 questions by 1%–6% points. People with higher education levels, who received financial education, were 2%–5 % points more likely to answer 4 questions correctly and 3%–9% points more likely to answer 5 questions correctly.

These results are as expected—people with lower and higher education levels were more likely to have higher financial literacy scores if they received financial education from one or more sources. This suggests that there is a positive correlation with financial education and increased financial literacy as measure by answering more financial literacy questions correctly. Another noteworthy result, from Table 3, is that in many cases, financial education is more related to financial literacy for people with lower education levels—the predicted probabilities are larger than the corresponding classes for people with higher education levels. For example, in Panel A those who took a high school course were almost 7% points more likely to answer four questions correctly compared to those with higher education in panel

TABLE 2. Mean Financial Literacy Scores by Course

	Course		No Course			
Type of Course	***n***	***M***	***n***	***M***	**Total *n***	**Significance**
Low education (Less than HS or HS Degree)						
HS only	505	2.5475	5,315	2.2785	5,820	***
Employer only	91	2.9333	5,315	2.2785	5,406	***
HS and employer	145	2.6631	5,315	2.2785	5,460	***
High education (some college or college degree)						
HS only	563	3.0184	11,195	2.9392	11,758	
College only	1,055	2.9664	11,195	2.9392	12,250	
Employer only	409	3.5097	11,195	2.9392	11,604	***
HS and college	668	3.2530	11,195	2.9392	11,863	***
HS and employer	219	3.1599	11,195	2.9392	11,414	**
College and employer	472	3.5818	11,195	2.9392	11,667	***
HS, college, employer	654	3.3477	11,195	2.9392	11,849	***
Low income (<$50,000)						
HS only	665	2.5843	8,839	2.3739	9,504	***
College only	567	2.6993	8,839	2.3739	9,406	***
Employer only	166	2.9439	8,839	2.3739	9,005	***
HS and college	324	2.9907	8,839	2.3739	9,163	***
HS and employer	144	2.5523	8,839	2.3739	8,983	*
College and employer	133	3.0041	8,839	2.3739	8,972	***
HS, college, employer	216	3.0393	8,839	2.3739	9,055	***
High income (>$50,000)						
HS only	403	3.0733	7,671	3.1095	8,074	
College only	488	3.3093	7,671	3.1095	8,159	**
Employer only	334	3.6041	7,671	3.1095	8,005	***
HS and college	344	3.5329	7,671	3.1095	8,015	***
HS and employer	220	3.2097	7,671	3.1095	7,891	
College and employer	339	3.8567	7,671	3.1095	8,010	***
HS, college, employer	438	3.5175	7,671	3.1095	8,109	***

Note. HS = high school.
$^{*}p < .1$. $^{**}p < .05$. $^{***}p < .01$.

B who are 3% points more likely to answer four questions correctly. This result suggests that financial literacy is positively associated with financial education but more so for people with lower education levels.

Table 4 shows the ordered probit predicted probabilities by income groups. Results for people with low income are shown in Panel A. People who received any financial education courses were 2%–6% points less likely to answer 0, 1, or 2 questions correctly compared to people with no financial education. People who received financial education were 1%–7% points more likely to answer 3, 4, and 5 questions correctly. Therefore, people who received financial education were more likely to have higher financial literacy scores and less likely to have lower financial literacy scores.

The ordered probit results for people with higher income are shown in Panel B in Table 4. People with higher incomes were less likely to answer 0, 1, 2, or 3 questions correctly

TABLE 3. Ordered Probit Predicted Probabilities Split by Education (Omitted Category: No Financial Education Course)

	0 Correct	1 Correct	2 Correct	3 Correct	4 Correct	5 Correct
Panel A: Low education						
HS only	-0.0494***	-0.0590***	-0.0348***	0.0331***	0.0675***	0.0427***
	(0.006)	(0.009)	(0.007)	(0.003)	(0.010)	(0.008)
Employer only	-0.0522**	-0.0658****	-0.0430**	0.0325***	0.0765***	0.0519**
	(0.014)	(0.023)	(0.021)	(0.005)	(0.028)	(0.026)
HS and employer only	-0.0339***	-0.0388***	-0.0209**	0.0238***	0.0438***	0.0261**
	(0.011)	(0.014)	(0.010)	(0.007)	(0.017)	(0.011)
Pseudo R^2	.0547	.0547	.0547	.0547	.0547	.0547
Observations	6,056	6,056	6,056	6,056	6,056	6,056
Panel B: High education						
HS only	-0.0132***	-0.0250***	-0.0308***	-0.0103***	0.0327***	0.0466***
	(0.003)	(0.006)	(0.008)	(0.004)	(0.008)	(0.014)
College only	-0.0120***	-0.0223***	-0.0270***	-0.0084***	0.0293***	0.0403***
	(0.002)	(0.005)	(0.006)	(0.003)	(0.006)	(0.010)
Employer only	-0.0185***	-0.0367**	-0.0479***	-0.0198***	0.0469***	0.0760***
	(0.003)	(0.007)	(0.010)	(0.006)	(0.008)	(0.019)
HS and college only	-0.0188***	-0.0371***	-0.0483***	-0.0197***	0.0476***	0.0765***
	(0.002)	(0.005)	(0.007)	(0.005)	(0.006)	(0.013)
HS and employer only	-0.0039	-0.0069	-0.0079	-0.0018	0.0091	0.0113
	(0.006)	(0.011)	(0.013)	(0.003)	(0.014)	(0.019)
College and employer only	-0.0207***	-0.0418***	-0.0559***	-0.0250***	0.0528***	0.0907***
	(0.002)	(0.006)	(0.009)	(0.006)	(0.006)	(0.017)
HS, college, and employer	-0.0155***	-0.0296***	-0.0373***	-0.0135***	0.0386***	0.0573***
	(0.003)	(0.006)	(0.008)	(0.004)	(0.007)	(0.014)
Pseudo R^2	.0703	.0703	.0703	.0703	.0703	.0703
Observations	15,235	15,235	15,235	15,235	15,235	15,235

Note. Standard errors in parentheses.
** $p < .05$. *** $p < .01$.

by 1%–6% points. People with financial education were 1%–2% points and 2%–11% points more likely to answer 4 and 5 financial literacy questions correctly.

According to the ordered probit results by education groups, the predicted probabilities are larger for people with lower income than for higher income in all cases except in the last column, which predicted 5 as being correct. Comparing Panel A and B in Table 4, people with lower income who received financial education in high school were 6% points more likely to answer 4 questions correctly while those with higher income who received financial education in high school were 3% points more likely to answer four questions correctly. Financial education has a larger positive correlation with financial literacy for people who have lower income. The findings from Tables 3 and 4 strengthen the argument and previous research, indicating that financial education is highly correlated with financial literacy, especially for people who have lower financial literacy scores and may need financial education the most (Lusardi, 2003).

As an extension and robustness check, each question was estimated to examine how financial education affects each financial literacy question separately. The five questions that comprise the financial literacy score cover a range

TABLE 4. Ordered Probit Predicted Probabilities Split by Income (Omitted Category: No Financial Education Course)

	0 Correct	1 Correct	2 Correct	3 Correct	4 Correct	5 Correct
Panel A: Low income						
HS only	-0.0401***	-0.0516***	-0.0357***	0.0195***	0.0643***	0.0436***
	(0.005)	(0.008)	(0.007)	(0.002)	(0.010)	(0.008)
College only	-0.0242***	-0.0291***	-0.0179***	0.0136***	0.0356***	0.0219***
	(0.006)	(0.008)	(0.006)	(0.003)	(0.011)	(0.007)
Employer only	-0.0380***	-0.0495***	-0.0349**	0.0181***	0.0618***	0.0425**
	(0.010)	(0.015)	(0.014)	(0.002)	(0.020)	(0.017)
HS and college only	-0.0415***	-0.0549***	-0.0395***	0.0189***	0.0687**	0.0483****
	(0.006)	(0.009)	(0.009)	(0.001)	(0.012)	(0.011)
HS and employer only	-0.0231**	-0.0279*	-0.0173	0.0130***	0.0342*	0.0212*
	(0.011)	(0.014)	(0.011)	(0.005)	(0.018)	(0.013)
College and employer only	-0.0349***	-0.0448***	-0.0307**	0.0173***	0.0557***	0.0374**
	(0.010)	(0.016)	(0.014)	(0.003)	(0.021)	(0.017)
HS, college, and employer	-0.0414***	-0.0549***	-0.0397***	0.0187***	0.0687***	0.0485***
	(0.008)	(0.013)	(0.012)	(0.001)	(0.017)	(0.015)
Pseudo R^2	.0522	.0522	.0522	.0522	.0522	.0522
Observations	11,054	11,054	11,054	11,054	11,054	11,054
Panel B: High income						
HS only	-0.0114***	-0.0250***	-0.0386***	-0.0211***	0.0304***	0.0656***
	(0.002)	(0.005)	(0.009)	(0.007)	(0.006)	(0.018)
College only	-0.0084***	-0.0179***	-0.0266***	-0.0133**	0.0224***	0.0439***
	(0.003)	(0.006)	(0.010)	(0.006)	(0.007)	(0.017)
Employer only	-0.0154***	-0.0357***	-0.0582***	-0.0366***	0.0403***	0.1056***
	(0.002)	(0.006)	(0.012)	(0.010)	(0.005)	(0.026)
HS and college only	-0.0129***	-0.0290***	-0.0459***	-0.0267***	0.0344***	0.0801***
	(0.003)	(0.006)	(0.011)	(0.009)	(0.006)	(0.022)
HS and employer only	-0.0061	-0.0128	-0.0187	-0.0088	0.0162	0.0302
	(0.004)	(0.008)	(0.013)	(0.007)	(0.010)	(0.022)
College and employer only	-0.0160***	-0.0372***	-0.0613***	-0.0394***	0.0414***	0.1124***
	(0.002)	(0.006)	(0.011)	(0.010)	(0.004)	(0.023)
HS, college, and employer	-0.0089***	-0.0192***	-0.0288***	-0.0147**	0.0239***	0.0477**
	(0.003)	(0.006)	(0.011)	(0.007)	(0.007)	(0.019)
Pseudo R^2	.0725	.0725	.0725	.0725	.0725	.0725
Observations	10,237	10,237	10,237	10,237	10,237	10,237

Note. Standard errors in parentheses.
*$p < .1$. **$p < .05$. ***$p < .01$.

of topics and vary in difficulty. Financial education was positively related to each of the financial literacy questions—those who took any financial education were more likely to have higher financial literacy scores as measured by the number of questions answered correctly. Therefore financial education is positively related to financial literacy scores for different subgroups of the population and different financial literacy topics. As an additional robustness check, these results were compared against the 2012 survey. Results remain similar and robust when splitting the

sample by education and income (results are not shown but available upon request).

Discussion

Results suggest that financial education is positively related to financial literacy scores regardless of how the sample was split. This result can be seen throughout the mean financial literacy scores. People who received financial education had statistically higher financial literacy scores compared to those who did not receive any financial education. Results from the ordered probit model show that people who received financial education tended to have higher financial literacy scores compared to people with no financial education which is consistent with previous research (Lusardi & Mitchell, 2014; Xiao & O'Neill, 2016). When comparing predicted probabilities for people with lower education and income to those with higher education and income, financial education had a larger positive correlation, as seen by larger coefficients, on sub groups of the population that research suggests may need more financial education.

There are some general limitations in this research. First, there is no information about the content or length of the financial education. For this study, all high school, college, and employer financial education are assumed to be comparable. However, they may have different lengths of time (a day, week, or an entire year) and also have a wide variety in the depth regarding the content that is covered. Another issue involves employer financial education that is specific only to one company and not comparable to other employer-related financial education. The survey does not go into detail about when the people received their education. It is unclear how long ago a person received college or employer financial education which would make this study more accurate. Also, there is no information about why the individual received the financial education which can upwardly bias the results. For instance, were respondents required to take the course or did they chose to do so?

Future research should focus on the value-added to each course—which course(s) seemed to have the most effect? Also, is there a difference in financial education affecting the objective and subjective measures of financial literacy? Another limitation is the difference between those who received financial education and those who did not (either because it was not offered or elected not to take it) which may have biased the results. As discussed, it is not clear exactly why a person received financial education. While these questions are beyond the scope of this study, they are important to study in the future to aid in the development and analysis of financial education programs. Finally, future research in this area should focus on the causal effects of financial education—does financial education improve financial decisions and outcomes for those who took it?

Despite the limitations of this study, financial education appears to be positively related to higher levels of financial literacy especially for those with lower education and income levels. While this study does not show a causal relationship, it does suggest that there is a correlation between taking any type of financial education and subsequent financial literacy as measured by five financial literacy questions. This research will aid those developing financial education programs as results suggest that financial education in high school, college, through an employer, or any combination of the three, is correlated with higher financial literacy scores even years after taking the course. This research also emphasizes a need to teach financial education to those who have lower education and income levels—people whom previous research suggests lacks financial literacy and may need the most help.

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