

# Can financial literacy education reduce the use of Medicaid and SNAP?

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## Abstract

In recent decades, we have seen an increase in both the complexity of financial markets and the expectations of individual responsibility for people's financial decision-making. Policies supporting financial literacy education are promoted as a way to decrease reliance on social safety nets. The assumption is that low levels of financial literacy translate to lower economic outcomes and, thus, increased dependence on social programs. We use the 2018 National Financial Capabilities Study to investigate the possible relationship between high school mandated financial literacy education and social program participation and find no evidence of such a relationship. © 2020 Academy of Financial Services. All rights reserved.

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## 1. Introduction

The relationship between financial literacy and financial outcomes has been a topic of interest in recent decades. Studies examining this relationship have focused on financial behaviors such as retirement planning (Lusardi, 1999; Lusardi & Mitchell, 2011b), savings (Lusardi, 2008), student loan consumption (Stoddard & Urban, 2020), and the utilization of high-cost borrowing (Harvey, 2019). The evidence consistently indicates that an increase in

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financial literacy is associated with an increase in the quality of financial decision-making and, consequently, better financial and economic outcomes. This has led to the presumption that mandating financial literacy education will reduce dependence on social safety net programs.

State and federal officials have proposed high school financial literacy education mandates as a policy tool to help increase financial well-being, which encompasses a range of financial behaviors, including potential reliance on social programs. As of 2017, 25 states had mandated some form of financial literacy education in high school (Stoddard & Urban, 2020) and this focus on providing personal finance instruction continues to evolve. In 2018, 29 states and Puerto Rico introduced new or modified legislation concerning financial literacy education.<sup>1</sup> In 2019, this number grew to 42 states plus the District of Columbia and Puerto Rico.<sup>2</sup> Our objective is to examine the impact of financial literacy education mandates in high school on social program participation.

We are able to reduce the selection issues typical in this research because individuals required to participate in financial literacy education do not select into their programs. Our methodology relies on the assumption that these individuals are required to participate in high school. This is similar to the approach taken by Stoddard and Urban (2020), though our approach differs in that we do not rely on state mandates to determine participation in financial literacy education, because high school requirements are possible even when the state does not mandate it.<sup>3</sup> We are able to identify participation in mandated financial literacy education at the individual level. We estimate social program participation rates of those required to participate in financial literacy education, and compare them to those who choose to participate, and to those who do not receive financial literacy education.

We find no evidence of a relationship between mandated financial literacy courses and participation in social programs. Individuals mandated to participate in financial literacy education are as likely to receive social assistance as those who choose to take a course, and those who do not participate at all. However, we do find that financial literacy levels in the top quintile are less likely to participate in social programs. Our control variables are strong predictors of social program participation, and include demographic variables such as age, income, and state of residency. Our findings support the results of previous studies examining Earned Income Tax Credit participation and financial knowledge (Chetty, 2015; Chetty, Friedman, & Saez, 2013).

## **2. Financial education, literacy, and behaviors**

The shift toward individual responsibility in financial decision-making, coupled with the increased complexity of financial tools, has increased awareness of the role that financial literacy plays in determining optimal financial outcomes. Further, an established positive relationship between financial literacy and financial behaviors has prompted increased advocacy for financial literacy education that focuses on personal finance. Researchers are evaluating state mandates to measure their efficacy in changing financial behaviors. While the quality of these evaluations can suffer from endogeneity, some do indicate causal links between financial education and outcomes.

Using a synthetic control, Brown et al. (2014) find increased credit scores in states that mandate financial literacy education. Similarly, using a difference-in-difference methodology, Stoddard and Urban (2020) find that students who graduate from high schools in states with financial literacy mandates, while no more likely to attend college, make better choices when taking out student loans and other low-cost debt.<sup>4</sup> Harvey (2019) demonstrates that individuals residing in states that mandate financial literacy education are less likely to use alternative financial services (AFS) such as check-cashing, rent-to-own financing, pawn shop services, auto title loans, tax refund anticipation loans, and payday loans. Additional evidence indicates that formal financial education results in positive long-term financial behaviors as well (Wagner & Walstad, 2019).

Mandated financial literacy programs oblige individuals to receive the education ostensibly necessary to improve financial decision-making. However, it is important to differentiate the effect of financial education on financial literacy from its effect on financial behaviors. Similarly, we must acknowledge the heterogeneity of financial education itself, as it can vary in quality, source, length, delivery method, scope, timing, and so forth. Kaiser and Menkhoff (2017) undertook a meta-analysis of 126 studies, which confirmed a strong positive impact of financial education on financial literacy, a much lesser (but also statistically significant) effect of financial education on financial behaviors, and a positive correlation between its effects on both financial literacy and financial behaviors. Thus, the link from financial education to improved financial behavior appears to be mediated by financial literacy.

Higher returns are expected of financially literate individuals due to superior financial decisions. For example, financial literacy is positively associated with both the ownership of stocks in asset portfolios (Christelis, Jappelli, & Padula, 2010; Van Rooij, Lusardi, & Alessie, 2011) and the selection of lower-cost funds (Hastings & Tejada-Ashton, 2008; Hastings & Mitchell, 2020; Hastings, Mitchell, & Chyn, 2011). Lusardi and Tufano (2015) partnered with a market research firm to design a survey, develop their own set of financial literacy questions, and collect data from 1,000 U.S. residents via telephone in 2007. They used data concerning debt from surveys such as the Health and Retirement Study (HRS), the Rand American Life Panel (ALP), and the Survey of Consumers, but no data regarding financial literacy existed at the time of their study. They find that an increase in financial literacy is inversely related to the use of high-cost debt and high fees. They attribute 30% of the fees collected by credit card companies to financial ignorance. Additionally, Lusardi and Mitchell (2011b) find that increased financial literacy is positively correlated with deliberate long-term planning and, consequently, higher retirement wealth. Overall, variations in financial literacy explain 30-40% of the inequality in retirement wealth (Lusardi, Michaud, & Mitchell, 2017).

Although there is consensus on the positive impact of financial education on financial literacy, Al-Bahrani, Weathers, and Patel (2019) find variation in returns to formal financial literacy education by race, whereby white individuals exhibit significantly higher financial literacy scores than minorities, all else being equal. Beyond potential curriculum bias, the scope and timing of financial education are crucial to its effectiveness. “Teachable moments,” or education aimed at altering a specific financial behavior, prove more effective than comprehensive financial education (e.g., Miller et al., 2015; Zhan, Anderson, & Scott,

Table 1 Summary statistics

	Full sample		Social program participants		Non-participants		T stat
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	
Social program participation	0.34	0.47	1.00	0.00	0.00	0.00	
Required course	0.06	0.24	0.06	0.24	0.06	0.24	0.142
Optional course	0.03	0.17	0.03	0.17	0.03	0.17	0.015
Financial literacy score (%)	46.8	28.3	40.1	26.9	50.3	28.5	16.11
Age	45.6	17.5	43.4	15.2	46.7	18.4	8.386
<i>Financial literacy (#)</i>							
0 Correct	0.12	0.32	0.16	0.37	0.10	0.30	-8.963
1 Correct	0.18	0.38	0.21	0.41	0.16	0.37	-5.726
2 Correct	0.24	0.42	0.26	0.44	0.22	0.42	-3.271
3 Correct	0.24	0.43	0.23	0.42	0.24	0.43	1.590
4 Correct	0.16	0.37	0.11	0.31	0.19	0.39	9.653
5 Correct	0.06	0.24	0.03	0.17	0.08	0.27	9.235
<i>Race/ ethnicity</i>							
White	0.71	0.45	0.68	0.47	0.73	0.45	4.457
Black	0.12	0.32	0.15	0.35	0.10	0.30	-6.712
Hispanic	0.10	0.30	0.10	0.30	0.10	0.30	-0.614
Asian	0.03	0.18	0.02	0.15	0.04	0.19	3.578
Other	0.04	0.19	0.04	0.20	0.04	0.19	-1.642
<i>Number of dependents</i>							
No children	0.40	0.49	0.33	0.47	0.44	0.50	10.52
Children, no dependents	0.29	0.45	0.23	0.42	0.32	0.47	8.596
1 Child	0.14	0.35	0.18	0.38	0.13	0.33	-6.762
2 Children	0.09	0.29	0.14	0.34	0.07	0.26	-10.19
3 Children	0.04	0.21	0.07	0.26	0.03	0.17	-9.573
4 or more children	0.03	0.16	0.05	0.22	0.01	0.12	-10.70
<i>Income brackets</i>							
Income 0 to 15K	0.24	0.43	0.40	0.49	0.15	0.36	-27.13
Income 15 to 25K	0.22	0.42	0.28	0.45	0.20	0.40	-8.563
Income 25 to 35K	0.23	0.42	0.19	0.39	0.25	0.44	7.307
Income 35 to 50K	0.31	0.46	0.14	0.34	0.40	0.49	25.97
<i>Education level</i>							
< High school	0.05	0.22	0.09	0.29	0.03	0.18	-11.94
High school	0.27	0.44	0.28	0.45	0.27	0.44	-0.881
GED	0.12	0.32	0.14	0.35	0.10	0.30	-5.476
Some college	0.30	0.46	0.30	0.46	0.29	0.46	-0.320
Associates	0.10	0.30	0.09	0.29	0.10	0.31	1.808
Bachelors	0.13	0.33	0.08	0.27	0.15	0.36	9.943
Graduate/professional	0.04	0.19	0.02	0.15	0.05	0.21	5.688
<i>Employment</i>							
Self employed	0.07	0.25	0.07	0.26	0.07	0.25	-0.868
Full time employment	0.26	0.44	0.32	0.47	0.32	0.47	18.49
Part time employment	0.12	0.32	0.13	0.33	0.11	0.32	-1.434
Homemaker	0.10	0.30	0.16	0.36	0.07	0.26	-12.72
Student	0.05	0.21	0.03	0.18	0.06	0.23	5.143
Disabled	0.10	0.30	0.21	0.41	0.05	0.21	-24.92
Unemployed	0.09	0.28	0.12	0.32	0.07	0.25	-8.006
Retired	0.22	0.41	0.14	0.35	0.26	0.44	11.99
N		8,657		2,972		5,685	

2006). Further, Kaiser and Menkhoff (2017) report less beneficial outcomes from mandated financial education relative to optional financial education, even after controlling for teachable moments. These findings bring into question the equity of results from financial literacy program mandates (i.e., formal financial literacy education).

We use non-public use data from the 2018 National Financial Capability Study (NFCS) to examine the relationship between the use of social safety nets, financial literacy, and participation in mandatory financial education. The non-public use data set also provides useful information concerning control variables, including a continuous measure of age, racial/ethnic classification, number of dependents, income, education level, and employment status.

### 3. Data

The NFCS survey data includes the “Big Five” measure of financial literacy, which is a resource frequently used by researchers in this field (e.g., Al-Bahrani, Weathers, & Patel, 2019; Harvey, 2019; Lusardi, 2019). It also includes information as to whether participation in financial literacy education was required, giving us the ability to isolate the effect of mandated financial literacy education from financial literacy education that students have chosen to receive. Further, analysis of the high school data allows us to compare three possible participation categories: no exposure to financial literacy education in high school, chosen exposure in high school, and mandatory exposure in high school.

The non-public use dataset has 27,091 observations, with 500 respondents per state and oversampling in California, Illinois, New York, and Texas. Because social program participation has an income consideration, we further restrict our sample to those making \$50,000 or less per annum, and who are younger than 80 years of age. We also exclude individuals selected for financial education in college or through an employer, to mitigate measurement noise. Our final sample comprises 8,657 survey respondents. The social program participants comprise 34% of this sample.<sup>5</sup> Table 1 shows the summary statistics of the variables used in our analysis.

The historical national average proportion of correct responses to the Big Five questions in the United States is 60% (three correct answers). In the 2018 data, the national average score is a statistically significant three percentage points lower than the 2015 data, while our subsample has an average financial literacy score of 47% (approximately two correct answers).<sup>6</sup> Studies indicate a positive relationship between income and financial literacy; thus, we expect our restricted sample—in the lower part of the income distribution—to exhibit a lower score than the national average.

Six percent of our sample was required to take a financial literacy course in high school. However, financial literacy mandates are relatively new, with most states introducing requirements only after 2000 (Stoddard & Urban, 2020). Fig. 1 shows the proportion of people required to participate in financial literacy education by birth year. Required high school financial literacy courses are most commonly undertaken by those aged 18–23. This is a limitation of the data, because the mandate measure is correlated with age and, if age is correlated with participation in social programs, our results may be biased.

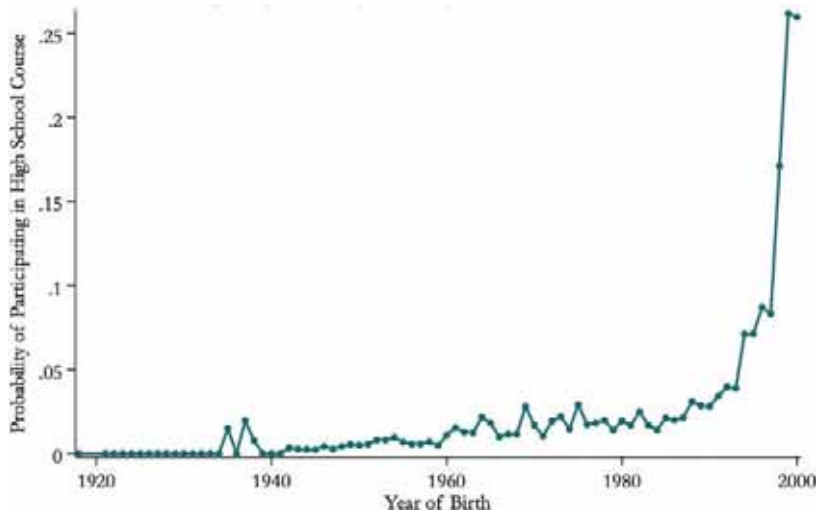


Fig. 1. Participation rate in required high school financial literacy course by year of birth.

We find no statistical difference in the mandated financial education rates between the social program participant and non-participant samples. However, the samples differed in almost all other categories. Social program participants are more likely to have more children, lower income levels, and be disabled or unemployed. Additionally, social program participants had lower financial literacy scores (see Fig. 2). There is evidence that financial education provides fewer benefits to the less advantaged (e.g., Fernandes et al., 2014; Kaiser & Menkhoff, 2017) and, more recently, a meta-analysis solely using randomized control trials (RCTs), finds no difference in outcomes arising from financial education interventions for low-income individuals (Kaiser et al., 2020). However, none of these studies examined social program participation as an outcome.

Fig. 3 shows financial literacy scores across the age distribution by financial education type. As expected, the sample required to take a financial literacy course scores highest;

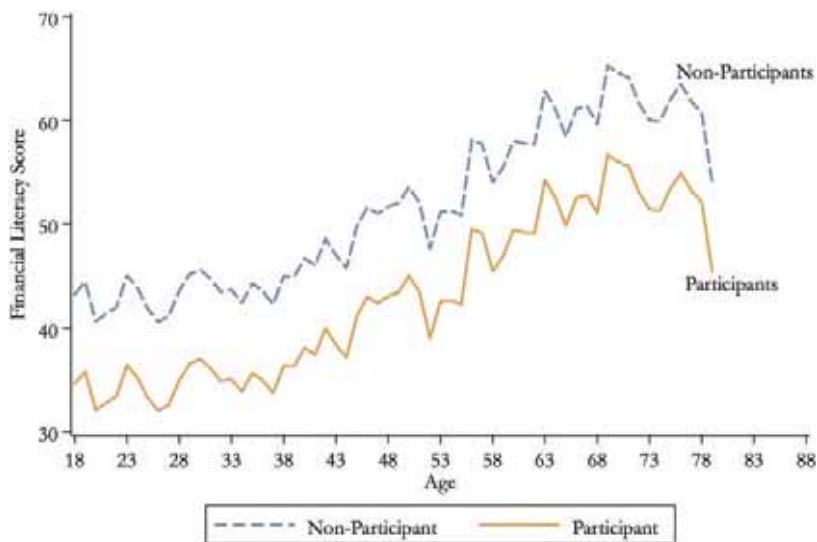


Fig. 2. The average financial literacy score plot across the age distribution, comparing participants and non-participants in social programs.



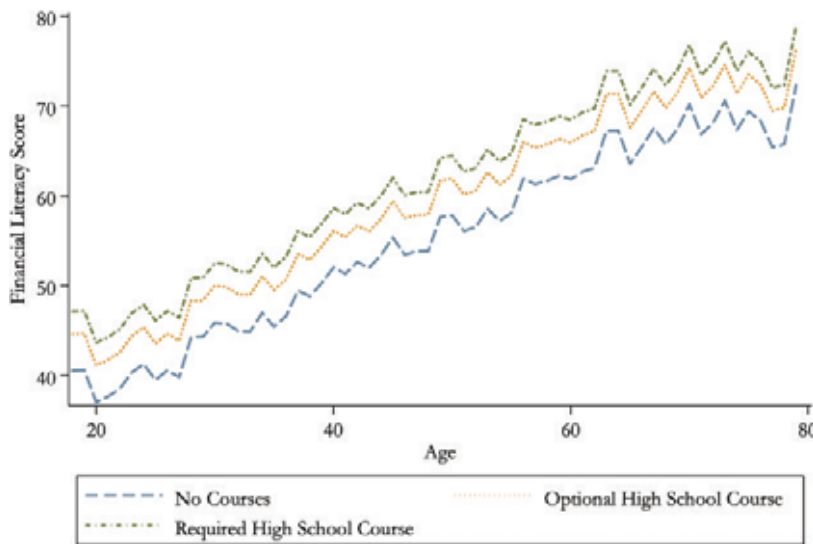


Fig. 3. Illustrated plot of the mean financial literacy score across the age distribution for each of the financial literacy education options. Financial literacy scores are positively related to exposure to financial literacy education. Required participation in financial education is associated with higher financial literacy scores relative to optional participation.

second highest are those enrolled in an optional course, and the lowest scores are exhibited by those with no formal financial education. Thus, there is a correlation between financial education and exhibited financial literacy. This relationship is also observed across the age distribution; however, we do see that financial literacy scores increase with age for all financial education types.

While non-participants in social programs have higher financial literacy scores (see Fig. 2), we find no differences in social program participation rates across the age distribution when we compare those required to complete a financial literacy course, those who chose to complete a

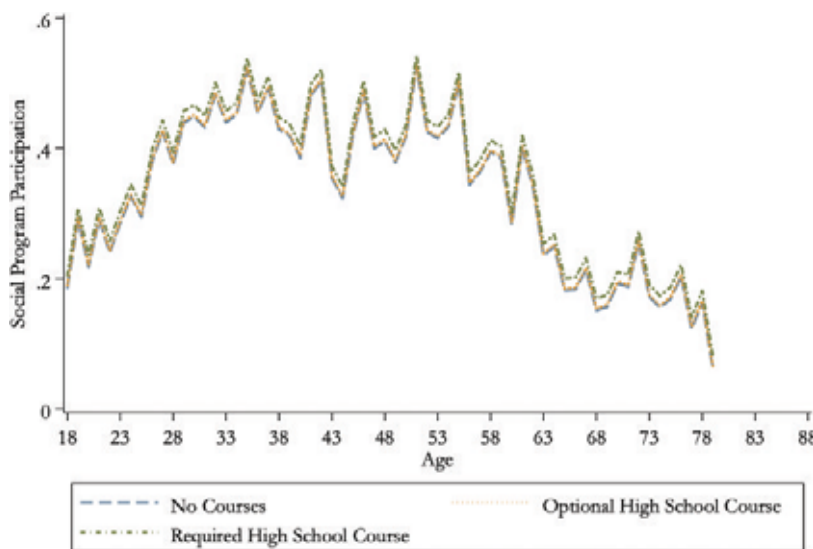


Fig. 4. Plot illustration of the marginals of predicted probability of participating in social programs across the age distribution for each of the financial literacy education options.

financial literacy course, and those who did not participate at all (see Fig. 4). In summary, there are many identifiable differences between social program participants and non-participants, but participation in high school financial education does not appear to be one of them.

#### 4. Methodology

To identify the consequences of mandated financial literacy education on social program participation, we specify a linear probability model:

$$Y_{i,s} = \beta_0 + \lambda'X_i + \delta'F_i + \varphi'L_i + \gamma_s + \varepsilon_i$$

Our dependent variable  $Y_{i,s}$  is the social program participation of individual  $i$  in state  $s$ . We include the demographics and predictors of social program participation (identified in Table 1) in vector  $X_i$ . The variables of interest are  $F_i$  and  $L_i$ . Variable  $F_i$  is a vector of dummy variables that identify whether the respondent received (a) mandatory financial literacy education, (b) optional financial literacy education, or (c) no financial literacy education. Variable  $L_i$  is a vector of dummy variables indicating the financial literacy of individual  $i$  based on his or her responses to the Big Five financial literacy questions. This allows us to hold financial literacy constant and separate it from the impact of mandatory financial education. Previous studies measuring the impact of financial education mandates neglect to control for financial literacy and include only variable  $F$ .<sup>7</sup> Our approach allows us to isolate the impact of mandatory financial education and reduce selection bias in financial literacy education.

We include a state fixed effects model to control for state-level variation in social program participation using  $\gamma$ . Chetty et al. (2013) document that participation in the Earned Income Tax Credit (EITC) varies by state and zip code and find that variation is due to differences in knowledge about social programs. However, Chetty (2015) documents observed participation rates approaching eligibility rates in 2008, as more people became aware of the programs. We limit our analysis to participation in the Supplemental Nutrition Assistance Program (SNAP) and Medicaid, because we found that EITC participation rates are equal to eligibility rates in 2018. Both SNAP and Medicaid are federal programs, but their eligibility is determined by state-level requirements. Therefore, variations in program participation rates could be due to state-level differences.

#### 5. Results

The results of the linear probability model are presented in Table 2. Although all variables identified in Table 1 are included in our regressions, we report only the coefficients for the financial education types, age, race/ethnicity, and financial literacy scores for brevity.

Regressions (1) and (2) use our full sample, and provide results on the probability of social program participation without inclusion of financial literacy scoring ( $L_i$ ) (left-hand



Table 2 Linear probability model estimating the participation in social programs

	Full sample		Sub-sample (18–25 years)	
	(1)	(2)	(3)	(4)
Did not take a financial literacy course	Omitted		Omitted	
Took an optional financial literacy course	−0.015 [0.027]	−0.011 [0.027]	−0.034 [0.052]	−0.030 [0.052]
Took a required financial literacy course	−0.015 [0.019]	−0.008 [0.019]	0.041 [0.030]	0.042 [0.031]
Age	−0.001* [0.000]	−0.000 [0.000]	0.015** [0.006]	0.014** [0.006]
White	Omitted		Omitted	
Black	0.052*** [0.015]	0.044*** [0.015]	0.020 [0.036]	0.018 [0.037]
Hispanic	−0.021 [0.016]	−0.027* [0.016]	0.006 [0.034]	0.007 [0.034]
Asian	−0.080*** [0.027]	−0.084*** [0.026]	−0.013 [0.057]	−0.017 [0.057]
Other	0.001 [0.024]	−0.001 [0.023]	−0.079 [0.053]	−0.077 [0.053]
0 Correct		Omitted		Omitted
1 Correct		−0.002 [0.016]		−0.002 [0.037]
2 Correct		−0.005 [0.016]		0.066* [0.035]
3 Correct		−0.014 [0.016]		−0.005 [0.039]
4 Correct		−0.060*** [0.018]		−0.027 [0.045]
5 Correct		−0.088*** [0.023]		0.010 [0.064]
Controls included <sup>a</sup>	Yes	Yes	Yes	Yes
State fixed effect	Yes	Yes	Yes	Yes
Observations	8,657	8,657	1,369	1,369
Adjusted R <sup>2</sup>	0.27	0.27	0.19	0.19

\* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .001$ . Standard errors in brackets.

<sup>a</sup> Controls included, but not reported for brevity, are number of dependents, income, and employment status.

column of each panel) and with inclusion of financial literacy scoring (right-hand column), respectively. We find no difference in the significance of financial education in relation to participation in social programs when the purported confounder, financial literacy, is included. Further, in model (2), we find that answering four and five of the Big Five financial literacy questions correctly is associated with a 6.0% and 8.8% decrease, respectively, in the probability of participation in social programs. Therefore, policymakers' assumption that individuals with higher financial literacy scores are less likely to participate in social programs is supported. However, this result is not causal.

When we test for returns to financial education, we find no statistical evidence that those required to take a financial education course are less likely to rely on social

programs. Similarly, those choosing to take financial literacy education courses are as likely to participate in social programs as those who do not participate in any course. Therefore, we find no evidence that mandating financial literacy education at the high school level is related to financial behavior changes in the context of social program participation.

Given the relatively recent growth of financial education mandates, we test models (1) and (2) on the younger population (18–25 years old) in our sample in regressions (3) and (4), as shown in Table 2. We still find no statistical association of financial education courses with social program participation, but we do see significance appear on the age covariate. The probability of social program participation is associated with an approximate 1.5% increase as age increases from 18 to 25 years, whereas in the full sample—model (1)—an increase in age is associated with a decreased probability (0.1%) of social program participation. This is not a surprising result, given participants likely progress toward financial autonomy from the ages of 18 to 25. We also find a shift in significance when we include the financial literacy scores in regression (4), from a significantly smaller association with social program participation when four or five literacy questions are correctly answered to an increased association with social program participation when only two literacy questions are answered correctly. This may be a distribution effect in this age subsample since the number of our observations falls from 8,657 in models (1) and (2) to 1,369 in models (3) and (4).

## 6. Limitations

According to Fernandes et al. (2014), the impact of financial literacy education on financial behaviors has been inconclusive. Our research also finds no evidence supporting changes in financial behaviors via financial literacy education mandates. While those who score higher on financial literacy assessment are less likely to participate in social programs, it is important to note that their financial knowledge may be derived from places other than high school, including life experiences and informal education. The limitation of our research is that we rely on self-reported identification of class requirements. A common issue in this field of research is that there is no standard definition of financial literacy and financial literacy curriculum.

Additionally, the survey data we use classifies individuals as having experienced a required financial education course, a voluntary course, or no financial education course. Readers should be careful when interpreting the experiment, as these were not random assignments. This research would therefore be classified as a kind of “non-equivalent control group” quasi-experiment (Shadish, Cook, & Campbell, 2002). It is important, though, to distinguish this form of selection from “self-selection” whereby people self-select the treatment they receive. Our study used several controls to address the differences between the participants in the different groups that existed before their differential treatment. However, there is a possibility that the significance of social program participation could be impacted by these pre-existing differences that may have not been accounted for by the control variables.

## 7. Conclusion

Our research examines whether mandated financial literacy education is related to financial reliance on social programs such as Medicaid and SNAP. We use the 2018 iteration of the NFCS data, which includes information on individual social program participation, the circumstances of respondents' high school financial literacy education, and a measure of financial literacy via scoring on the Big Five questions. This data also allows us to differentiate between required financial education, optional selection of financial education, and those with no formal financial education at the high school level.

We find that high financial literacy scores are inversely related to participation in social programs. Scoring four or five out of five on the Big Five questions is associated with reduced participation in social programs. However, our results find no evidence that mandated financial literacy education is related to reduced social program participation. Given the expectation that financial literacy programs would prove a worthwhile investment, we encourage more research into the curriculum design, bias, timing, scope, and delivery method of financial education.

## Notes

- 1 <https://www.ncsl.org/research/financial-services-and-commerce/financial-literacy-2018-legislation.aspx>.
- 2 <https://www.ncsl.org/research/financial-services-and-commerce/financial-literacy-2019-legislation.aspx>.
- 3 School districts may identify their own graduation requirements beyond state minimums.
- 4 Student debt composition is measured using data from National Postsecondary Student Aid Study (NPSAS)—1999, 2003, 2007, and 2011.
- 5 They either received Medicaid and/or enrolled in SNAP in the prior 12 months. This data is only available as combined information and, therefore, cannot be disentangled.
- 6 In Table 1 we show summary statistics for both the percentage calculation and the number of correct responses.
- 7 We replicate this approach in regressions (1) and (3) in Table 2.

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## References

- Al-Bahrani, A., Weathers, J., & Patel, D. (2019). Racial differences in the returns to financial literacy education. *Journal of Consumer Affairs*, 53, 572–599.

- Brown, A., Collins, J. M., Schmeiser, M. D., & Urban, C. (2014). *State mandated financial education and the credit behavior of young adults. FEDS Working Paper No. 2014-68*. Available at SSRN: <https://ssrn.com/abstract=2498087> or <http://dx.doi.org/>
- Chetty, R. (2015). Behavioral economics and public policy: A pragmatic perspective. *American Economic Review*, *105*, 1–33.
- Chetty, R., Friedman, J. N., & Saez, E. (2013). Using differences in knowledge across neighborhoods to uncover the impacts of the EITC on earnings. *American Economic Review*, *103*, 2683–2721.
- Christelis, D., Jappelli, T., & Padula, M. (2010). Cognitive abilities and portfolio choice. *European Economic Review*, *54*, 18–38.
- Fernandes, D., Lynch, J. G., Jr., & Netemeyer, R. G. (2014). Financial literacy, financial education, and downstream financial behaviors. *Management Science*, *60*, 1861–1883.
- Hastings, J., & Mitchell, O. S. (2020). How financial literacy and impatience shape retirement wealth and investment behaviors. *Journal of Pension Economics & Finance*, *19*, 1–20.
- Hastings, J., Mitchell, O. S., & Chyn, E. (2011). Fees, framing, and financial literacy in the choice of pension manager. In O. S. Mitchell & A. Lusardi (Eds.), *Financial Literacy: Implications for Retirement Security and the Financial Marketplace* (pp. 101–115). Oxford: Oxford University Press.
- Hastings, J. S., & Tejada-Ashton, L. (2008). *Financial literacy, information, and demand elasticity: Survey and experimental evidence from Mexico (NBER Working Papers 14538)*. National Bureau of Economic Research.
- Harvey, M. (2019). Impact of financial education mandates on younger consumers' use of alternative financial services. *Journal of Consumer Affairs*, *53*, 731–769.
- Kaiser, T., Lusardi, A., Menkhoff, L., & Urban, C. J. (2020). *Financial education affects financial knowledge and downstream behaviors (NBER Working Papers 27057)*. National Bureau of Economic Research.
- Kaiser, T., & Menkhoff, L. (2017). Does financial education impact financial literacy and financial behavior, and if so, when? *The World Bank Economic Review*, *31*, 611–630.
- Lusardi, A. (1999). Information, expectations, and savings for retirement. In H. Aaron (Ed.), *Behavioral Dimensions of Retirement Economics* (pp. 81–115). Washington, DC: Brookings Institution Press and Russell Sage Foundation.
- Lusardi, A. (2008). *Household Saving Behavior: The Role of Financial Literacy, Information, and Financial Education Programs (NBER Working Papers 13824)*. National Bureau of Economic Research.
- Lusardi, A. (2019). Financial literacy and the need for financial education: evidence and implications. *Swiss Journal of Economics and Statistics*, *155*, 1.
- Lusardi, A., Michaud, P. C., & Mitchell, O. S. (2017). Optimal financial knowledge and wealth inequality. *The Journal of Political Economy*, *125*, 431–477.
- Lusardi, A., & Mitchell, O. S. (2011b). *Financial Literacy and Planning: Implications for Retirement Wellbeing (NBER Working Papers 17078)*. National Bureau of Economic Research.
- Lusardi, A., & Tufano, P. (2015). Debt literacy, financial experiences, and overindebtedness. *Journal of Pension Economics & Finance*, *14*, 332–368.
- Miller, M., Reichelstein, J., Salas, C., & Zia, B. (2015). Can you help someone become financially capable? A meta-analysis of the literature. *The World Bank Research Observer*, *30*, 220–246.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Boston, MA: Houghton-Mifflin
- Stoddard, C., & Urban, C. (2020). The effects of state-mandated financial education on college financing behaviors. *Journal of Money, Credit and Banking*, *52*, 747–776.
- Wagner, J., & Walstad, W. B. (2019). The effects of financial education on short-term and long-term financial behaviors. *Journal of Consumer Affairs*, *53*, 234–259.
- Van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, *101*, 449–472.
- Zhan, M., Anderson, S. G., & Scott, J. (2006). Financial knowledge of the low-income population: Effects of a financial education program. *Journal of Sociology & Social Welfare*, *33*, 53.