

# The Effects of Financial Literacy of Low-Income Females on Their Long-Term Financial Behaviors

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## Abstract

Much of modern education has focused on developing individuals' skills to be productive parts of society. The developed skills can become enablers of financial stability, independence and economic security. Yet, on a relative basis, considerably less effort is expended on building the financial skills for individuals to preserve their wealth and assets. As a result, for certain consumer segments, lack of financial education can become a source of hardship. In this study, we use data from the U.S. Financial Industry Regulatory Authority's (FINRA) 2021 *National Financial Capability Study*. The correlation between financial literacy and long-term financial behaviors is empirically examined and further dissected by gender and income, to identify population segments who may be vulnerable due to lack of adequate financial education. Significant patterns of financial literacy scores are identified, highlighting the need to enhance financial education offerings to vulnerable consumer segments.

**Keywords:** financial education, gender, financial literacy, financial behavior

## 1. Introduction

Personal finance is an important, yet often overlooked life skill that many seem to lack. From budgeting everyday expenses to saving for retirement, personal financial management proficiency can make or break both an individual's wealth as well as their family's financial wellbeing. While improvement in financial literacy will not single-handedly eliminate economic hardships, the provision of educational opportunities in personal finance may assist in reducing the gaps created by generational poverty, and perhaps gender imbalances as well.

While there has been a substantial amount of research conducted on the effects that a high school financial education has on downstream financial behaviors, many of the existing studies have achieved conflicting conclusions—some have deduced that there is a strong positive correlation, whilst others have failed to find a correlation between the two. Often, these conflicting conclusions are the consequence of extraneous variables – such as the quality of the financial education received and familial background of the students.

Much of this research has also neglected the vast gender disparities in financial proficiency. The possibility for imbalance in financial literacy may question historical inequities in the workforce, the remnants of prior injustices and can be detrimental to social and economic health of the nation. This study will therefore explore the correlation between financial literacy and long-term oriented financial behaviors, and examine potential gender-based differences. Data from the Financial Industry Regulatory Authority (FINRA) – a regulatory body mandated with the oversight of America's financial markets – is used to address the following questions:

- 1) *What is the influence of financial literacy scores on individuals' likelihood to participate in long-term oriented financial activities?*
- 2) *How does gender relate to financial literacy levels and perceived financial literacy?*
- 3) *What influence does income have on financial literacy scores?*

Using FINRA's 2021 *National Financial Capability Study* data, the dynamics between financial literacy test scores and long-term financial decision making are empirically examined using a national dataset. In the next section, a review of the relevant research is provided. Following that, the empirical study is presented. The paper concludes with a

discussion of the findings and implications on public education initiatives.

## 2. Literature Review

With America's longstanding focus on its primary educational system and the heightened emphasis on outcomes in underserved communities, one might be led to believe that public school systems would have provided students with financial education programs that prepare them with immediate financial literacy skills; and thus the ability to properly manage their finances right out of high school. As will be seen below, one commonality which is apparent in the existing research is that a high school financial management education course alone provides no discernable advantages in terms of short-term financial behavior, let alone financial literacy.

### 2.1 *The Impact of High School Education on Financial Behavior*

Both Mandell and Klein (2013) and Wagner and Walstad (2019) tested the short-term financial behaviors of students who had taken a high school level financial management course as compared to students who had not. The former study measured both the financial literacy and financial behaviors of 400 graduates of the same high school – half of whom had taken a financial management course whilst the other half had not. The study measured the financial literacy of these students through a questionnaire that asked “basic age-relevant questions” covering four key areas: income, money management, savings & investing, and spending & credit. The study also measured the financial behaviors of the students through a series of dichotomous questions. Of note is the fact that Mandell and Klein (2013) found no discernable differences between those students who had taken a financial management course and those that had not.

The Wagner and Walstad (2019) study researched the same effects as Mandell and Klein's (2013) inquiry, by examining the role that education has on financial behavior, but using a different approach. It utilized FINRA data to discern between students who had received high school-level financial education and those who had not using four behaviorally-oriented dependent variables related to their later stages in life: whether a respondent covered expenses and paid all their bills each month, managed their checking account and did not overdraw it, paid off credit card balances in full each month, and made monthly mortgage payments on time. Although it used different methods than the former study, it reached the same conclusion: that a high school financial education has no significant effect on short-term financial behavior.

What distinguishes the Wagner and Walstad (2019) study from Mandell and Klein (2013), however, is its inclusion of effects on long-term financial planning. It collected statistics from the same database, researching financial education's impact on whether a respondent has: (1) a three-month emergency fund to pay for unexpected future expenses, (2) a savings account to save for a future purchase, (3) owns financial investments to accumulate wealth, and (4) has a plan to determine how much money is needed for retirement. While the study found that short-term effects of a financial education program were negligible, the long-term impact was stark, with double digit increases in three of the four variables when comparing those who had received a financial education with those who had not.

The above results are corroborated by Henager and Cude (2019), who also used FINRA data to study the short-term dependent variables of whether an individual: (1) has an emergency fund, (2) spends less than or equal to their income, (3) does not regularly overdraw from their checking account, and (4) uses a budget. While this study used similar data to the preceding study, it differentiated itself in that it focuses only on students who did not attend college. Of note is the finding that, similar to the other two studies, there were no statistically significant differences in any area between the group that had taken a high school financial management course and the group that had not. However, the authors found a significant impact on long-term financial behaviors among those who did not attend college but had taken a financial management course in high school. Utilizing long-term measures on whether an individual has a retirement account, has a plan to determine how much money is needed for retirement, owns any investments or securities, and has set any long-term goals, it found significant life-long improvements in all four categories amongst graduates of a high school financial management program.

### 2.2 *Effects on Financial Capability*

Xiao and O'Neill (2016), used FINRA data, researching the financial capabilities (which they defined as “financial knowledge and the performance of desirable financial behaviors for achieving financial well-being”) of graduates of a financial management program at different educational levels (high school, college, and workplace). They utilized four dependent variables: objective financial literacy, subjective financial literacy, desirable financial behavior, and perceived financial capability. Using the sum of the Z-scores from each variable, the study was able to calculate a “financial capability index,” which it used to compare different samples. The results showed improvement at all three educational levels, but significantly higher improvements at the college and workplace levels, as compared to the high

school level. This can be primarily attributed to the differences in prior knowledge and motivation; college students and white-collar workers will typically be more knowledgeable and motivated in learning how to properly manage finances than the typical high-school student.

Similarly, Fernandes, Lynch, and Netemeyer (2014) researched the correlation between financial education and financial actions taken later in life. The authors conducted a qualitative literature review of 201 non-redundant studies in order to measure the financial literacy of those who had received a financial education at any level (high school, college, workplace) and those who had not. They measured behaviors related to savings, planning for retirement, absence of debt, stock ownership and investment decisions, cash flow management, activity in retirement plans, and financial inertia such as choice of default options and payment of unnecessary fees. After measuring the partial  $r$  for each group, the study concluded that there was only a 0.1% difference in financial behavior measures between the two groups – a variance that was even weaker when using a low-income sample. Their finding was not entirely unexpected, considering other environmental factors presented to low-income students, such as a lack of community guidance (peer, parental, etc.) in terms of financial management, whereas higher income students may have been subjected to a financial education outside of school.

### *2.3 Effects of Mandated Financial Curriculum on Personal Finances*

One of the more enlightening studies on the impact of financial education is Bernheim, Garrett, and Maki's (2001) comparison of the finances of former students in states that had a financial curriculum mandate versus graduates in states that had not. It found that students in states that had the mandate saved an average of 1.5% more than students in states that had not. While this data is not adjusted for extraneous variables, such as the wealth and culture of each state, the effects on personal net-worth of those studied is startling. Graduates in a state with a mandate have a 9% advantage in their average net-worth-to-earnings ratio, thereby highlighting the increase in savings and investment which is proportional to overall wealth. These findings are similar to those of Bayer, Bernheim, and Scholz (2009), which used data from 1,100 employers to study the correlation between employees' financial education and retirement savings participation rate. The study found that employees who had participated in a workplace financial management program were 7.7% more likely to subscribe to a 401(k) plan, underscoring the impact of a financial management education on the likelihood of having a savings plan.

### *2.4 Effects on Soft Skills*

The effects of a financial education are not limited to an improvement in technical skills. ElShaabany (2021) found that accounting and finance courses at the university level strongly impacted students' soft skills. This study found that the self-reported educational/professional background, readiness, and technical learning of respondents all had significant and positive regression coefficients with soft skills (communication and analytical skills). Notably, the only independent variable in this study which did not have a positive regression coefficient with soft skill learning was the interest level of the student. This signals that students, regardless of their desire to study accounting and finance, may benefit professionally and interpersonally from learning the subjects.

### *2.5 Gender Effects*

One of the most alarming findings in existing studies has been the substantial gap between the financial literacy scores of men and women, even before receiving a financial education. Bannier and Schwartz (2018) tested the financial literacy levels of both men and women with high and low levels of financial education by means of a nine-question quiz. They tested respondents on financial management areas such as risk diversification and inflation. Interestingly, the study found a significantly wider gap between the scores of women with low and high-levels of financial education as opposed to men, using the same metrics. Scoring results on a 0 to 4 scale, women with a low-level of financial education scored an average of 2.17 on the test, while women with a high-level of financial education scored an average of 2.81. For men the gap was noticeably smaller, as the scores for these two groups were 2.53 and 2.93, respectively.

Possibly the most substantial takeaway from these results surprisingly has nothing to do with participation in a financial education program: it is the scores of those who have not received any financial education, especially among women. The stark difference between those who had received financial education and those who had not highlights the importance of delivering effective female financial education. Gender disparities in personal finance does not stop at the educational level but was also found for financial confidence. Yasar and Turgut (2020) studied the financial status of college students in Turkey and found no significant difference by gender. They did find, however, that female participants viewed their financial situation as being much worse than their male counterparts. This lack of confidence in personal finance may have a significant impact on young women's interest in educating themselves about personal

finance.

### 3. Method

In order to address the above research questions, this study utilizes data from FINRA's 2021 *National Financial Capability Study* (NFCS), which provides extensive data on 27,118 Americans of all backgrounds. The study asked respondents 119 questions pertaining to many different areas, some of which include financial literacy, banking habits, and financial confidence, as well as demographic measures such as gender and education level. The sample consisted of 54.03% females and 45.97% males. The average annual household income of the respondents was \$67,316.

#### 3.1 Measurement

Utilizing the *M* section of the FINRA dataset, which asks participants to answer several critical financial questions, each respondent received a financial literacy score calculated based on the number of questions they answered correctly. The six financial literacy questions, which are all either multiple choice or true/false, are listed in the Appendix. Each respondent was assigned a financial literacy score between zero and six based on the number of questions which they answer correctly, with missing answers counted as incorrect. This approach to quantifying financial literacy is consistent with a long stream of research on consumer financial education, such as Xiao and O'Neill (2016) as well as Wagner and Walstad (2019). Also consistent with these studies, financial behavior was calculated using a similar methodology. The financial behaviors score was determined by a respondent's reported behaviors in twelve specific areas, listed in the Appendix.

#### 3.2 Results and Analysis

In order to address the first research question, we tested the correlation between the financial literacy score received by participants in the survey and their corresponding financial behavior score. Based on the existing literature, one might expect that those with higher financial literacy scores will be more likely to be engaged in long-term financial behaviors, such as paying off credit card debt and possessing a retirement savings account. The Pearson correlation coefficient was found to be 0.385, which is significant at the  $p < .01$  level. The positive sign and magnitude of the correlation indicates a moderately strong relationship between financial literacy and long-term financial behaviors. This expected result confirms the view that improved financial literacy leads to enhanced long-term financial decision making, emphasizing the importance of financial education initiatives.

In order to address the second research question, the financial literacy and financial behavior means were computed for each gender. Results consistent with the Bannier and Schwartz (2018) study, conducted in Germany may be expected for the current study, conducted on the American population. The results of the current analysis found that female respondents had lower financial literacy scores than males, as shown in Table 1. The average financial literacy score for males was 2.69, while for females it was 1.97. This difference, tested using a t-test is significant at the  $p < .01$  level, indicating superior financial literacy skills for males.

**Table 1.** Gender-based Differences in Financial Literacy

Financial Literacy	Mean Score	N	Std. Deviation	Std. Error Mean
Male	2.685	12,465	1.469	0.013
Female	1.970	14,653	1.379	0.011

Note: Differences in means significant at the  $p < .01$  level  $t_{27116} = 1,703$

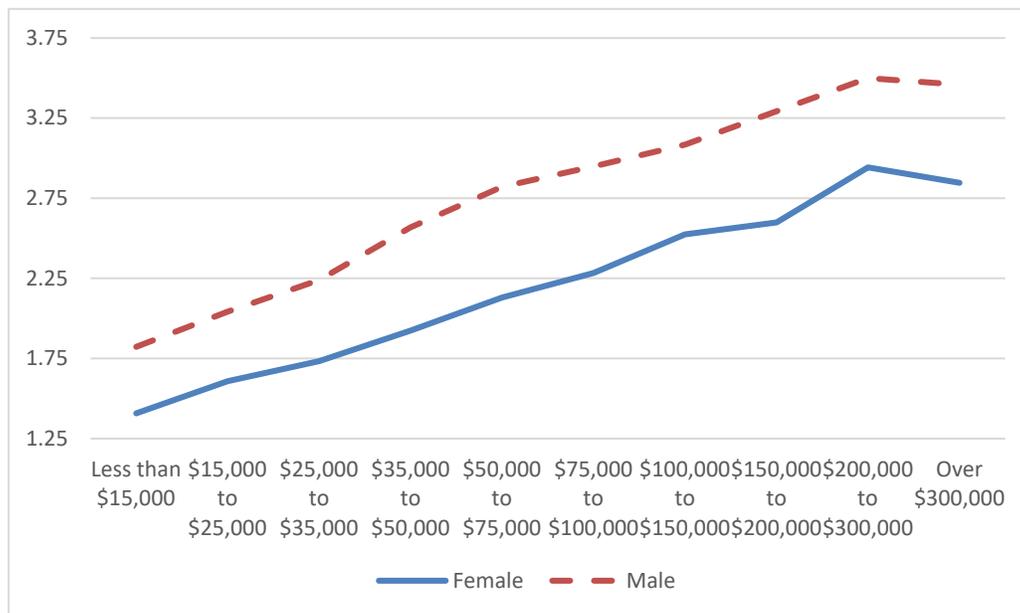
In order to address the second part of the second research question regarding perceived financial literacy, respondents' self-reported perceived financial literacy, measured on a one-to-seven response scale, was used. Respondents were asked "On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge?" As shown in Table 2, female participants in the 2021 NFCS showed lower average self-perception in their financial abilities, with a reported mean score of 4.74, compared to 5.19 for male participants. This difference in means, tested using a t-test, is statistically significant at the  $p < .01$  level. The gap between self-belief in financial capabilities by gender underlines the need for parents and educators to maintain a focused approach on personal finance training for young females, not only to improve objective financial literacy levels but also to enhance their confidence in their financial skills.

**Table 2.** Gender-based Differences in Perceived Financial Literacy

Perceived Financial Literacy	Mean Score	N	Std. Deviation	Std. Error Mean
Male	5.190	12,465	1.459	0.013
Female	4.740	14,653	1.572	0.013

Note: Differences in means significant at the  $p < .01$  level  $t_{27116} = 589$

In order to address the third research question of this study, we conducted a means comparison of the financial literacy scores by gender and each reported income range in the 2021 *NFCS* dataset. The expectation was that scores for lower income groups will be significantly lower than those in high income groups. The resulting factorial plot is shown in Figure 1, and the relevant Analysis of Variance (ANOVA) output can be found in Table 3. As can be seen, a noticeable trend exists, such that those in lower income brackets exhibit lower scores on the financial literacy quiz than those in higher income brackets. The results range from a mean score of just 1.57 amongst those earning an income of less than \$15,000 per year to a mean score of 3.29 for those earning between \$200,000 and \$300,000 per year. The average financial literacy levels consistently increase by income bracket, except for those in the highest income group, which is the only segment where the mean financial literacy score decreases as income increases and is likely attributable to a diminished need for money management skills. The differences in the mean financial literacy scores shown in Figure 1 were tested using ANOVA and found to be statistically significant at the  $p < .01$  level. Notable in the factorial plot is the fact that low-income females exhibit the lowest level of financial literacy, further highlighting the urgency to address the financial education needs of this population segment.



**Figure 1.** Factorial Plot of Financial Literacy (by Income and Gender)

**Table 3.** Analysis of Variance for Financial Literacy (Gender and Income as Independent Variables)

Source	Degrees of Freedom	Sum of Squares	Mean Square	F Value	Pr > F
Model	19	6088.11144	320.42692	149.63	<.0001
Error	27098	58028.99735	2.14145		
Total	27117	64117.10878			
Independent Variable					
Gender	1	1363.759732	1363.759732	636.84	<.0001
Income	9	4651.117018	516.79078	241.33	<.0001
Gender x Income interaction	9	73.234688	8.137188	3.8	<.0001

**4. Discussion**

Financial literacy is a very important life skill as it leads to improved financial decision making, such as properly budgeting and managing one's debt. The findings of this study confirm this perspective by demonstrating the positive correlation between one's level of financial literacy and participation in long-term oriented financial behaviors, such as budgeting to pay bills on time and creating a retirement plan. The results from our analysis of the financial literacy test scores of FINRA's NFCS respondents highlights the struggle American adults have in properly managing money. The mean score across the national sample was a mere 2.3 out of 6. Further troubling was the disparity in performance between genders. A means comparison of the financial literacy scores paints a stark contrast in the financial literacy levels of each gender, with male participants tallying a mean score of 2.69, while female respondents only managed a mean of 1.97 – a divergence that is significant at the  $p < .01$  level.

The findings of this study also highlight the vast disparities in financial literacy by both gender and income level, emphasizing the need to prioritize personal financial education amongst these communities. While the gaps in financial literacy between population segments could be due to societal pressures and expectations, we find it crucial to improve these skills amongst all segments of the population, as the effects of a low financial literacy can be detrimental and long-lasting. Of note among the study's findings is the observation that women at all income levels tend to lag men in financial literacy. The lowest financial literacy scores were observed for females in the lowest income bracket. This observation points to the pressing need for channeling educational resources to serve the financial literacy needs of this population segment.

### 5. Implications for Research and Practice

The results of this study indicate a large drop in financial literacy levels for those in lower income levels. This finding emphasizes the urgent need for public policy and consumer protection advocates to focus on financial education in low-income communities. Those in the lower income brackets can be further harmed by having a low level of financial literacy as they generally spend a greater percentage of their income on necessities and have an even greater need to effectively budget and save when possible. Future research can therefore explore strategic approaches to expanding financial literacy initiative among the most vulnerable segment of the population.

Future research can consider expanding the scope of inquiry beyond American consumers. The data utilized in this study was obtained from a large US-based sample. The dynamics of consumers' financial behaviors may however be considerably different across the globe, due to cultural, educational and national differences. The role of these forces in affecting financial literacy and financial behavior, and the varying influences of gender roles across countries, may require global replication of FINRA's NFCS survey-based approach. The emerging results may help inform a worldwide and globally coordinated approach to advancing the positive impact of financial education on financial behavior. The current study highlights the large disparities in financial literacy by both gender and income, as well as the importance of improving the financial skills of the general population in the United States.

### References

- Bannier, C., & Schwarz, M. (2018). Gender- and education-related effects of financial literacy and confidence on financial wealth. *Journal of Economic Psychology*, 67(1), 66-86. <https://doi.org/10.1016/j.joep.2018.05.005>
- Bayer, P., Bernheim, D., & Scholz, J. (2009). The effects of financial education in the workplace: Evidence from a survey of employers. *Economic Inquiry*, 51(1), 428-444. <https://doi.org/10.1111/j.1465-7295.2008.00156.x>
- Bernheim, D., Garrett, D., & Maki, D. (2001). Education and saving: The long-term effects of high school financial curriculum mandates. *Journal of Public Economics*, 80(3), 435-465. [https://doi.org/10.1016/S0047-2727\(00\)00120-1](https://doi.org/10.1016/S0047-2727(00)00120-1)
- ElShaabany, Mona (2021). Do accounting and finance courses enable soft skill learning? A mediation study. *World Journal of Education*, 11(1), 42-50. <https://doi.org/10.5430/wje.v11n1p42>
- Fernandes, D., Lynch, J., & Netemeyer, R. (2014). Financial literacy, financial education, and downstream financial behaviors. *Management Science*, 60(8), 1861-1883. <https://doi.org/10.1287/mnsc.2013.1849>
- Henager, R., & Cude, B. (2019). Financial literacy of high school graduates: Long- and short-term financial behavior by age group. *Journal of Family and Economic Issues*, 40(1), 564-575. <https://doi.org/10.1007/s10834-019-09626-2>
- Mandell, L., & Klein, L. (2013). The impact of financial literacy education on subsequent financial behavior.

*Association for Financial Counseling and Planning Education, 20(1), 15-24.*

Wagner, J., & Walstad, W. (2019). The effects of financial education on short-term and long-term financial behaviors. *The Journal of Consumer Affairs, 53(3)*, 1192-1219. <https://doi.org/10.1111/joca.12210>

Yasar, O. M., & Turgut, M. (2020). Financial situation of college students. *World Journal of Education, 10(1)*, 42-48. <https://doi.org/10.5430/wje.v10n1p42>

Xiao, J., & O'Neill, B. (2016). Consumer financial education and financial capability. *International Journal of Consumer Studies, 40(6)*, 712-721. <https://doi.org/10.1111/ijcs.12285>

## APPENDIX: Financial Capability Study Measures

### Financial Literacy:

- (1) 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?
- (2) 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?
- (3) If interest rates rise, what will typically happen to bond prices?
- (4) 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?
- (5) 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.
- (6) Buying a single company's stock usually provides a safer return than a stock mutual fund.

### Financial Behavior:

#### *Savings*

- (1) In a typical month, do you have difficulty paying bills?
- (2) Do you have an emergency fund that could cover your expenses for three-months?
- (3) Do you have a savings account?
- (4) Do you have an employee sponsored retirement plan?
- (5) Do you have any other retirement savings accounts?
- (6) Do you have any investments outside of retirement accounts?

#### *Credit*

In the past twelve months, have you:

- (1) Carried over the balance and been charged interest?
- (2) Been charged a late fee?
- (3) Exceeded your credit line?

#### *Billing*

- (1) Are you covered by health insurance?

- (2) Do you have any unpaid medical bills that are past due?
- (3) Have you been contacted by a debt agency in the past 12 months

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**Data sharing statement**

No additional data are available.

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