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**Financial Literacy:
An Essential Tool for Informed Consumer Choice?**

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Abstract

Increasingly, individuals are in charge of their own financial security and are confronted with ever more complex financial instruments. However, there is evidence that many individuals are not well-equipped to make sound saving decisions; that they do not possess adequate financial literacy. This paper demonstrates widespread financial illiteracy among the U.S. population, particularly among specific demographic groups. Those with low education, women, African-Americans, and Hispanics display particularly low levels of literacy. Financial literacy impacts financial decision-making. Failure to plan for retirement, lack of participation in the stock market, and poor borrowing behavior can all be linked to ignorance of basic financial concepts. While financial education programs can result in improved saving behavior and financial decision-making, much can be done to improve these programs' effectiveness.

Introduction

Over the past thirty years, individuals have had to become increasingly responsible for their own financial security following retirement. The shift from defined benefit (DB) to defined contribution (DC) plans has meant that workers today have to decide both how much they need to save for retirement and how to allocate pension wealth. Furthermore, financial instruments have become increasingly complex and individuals are presented with new and ever-more-sophisticated financial products. Access to credit is easier than ever before and opportunities to borrow are plentiful. But are individuals well equipped to make financial decisions. In other words, do they possess adequate financial literacy to do so?

This paper shows that most individuals cannot perform simple economic calculations and lack knowledge of basic financial concepts, such as the working of interest compounding, the difference between nominal and real values, and the basics of risk diversification. Knowledge of more complex concepts, such as the difference between bonds and stocks, the working of mutual funds, and basic asset pricing is even scarcer. Illiteracy is widespread among the general population and particularly acute among specific demographic groups, such as women, African-Americans, Hispanics, and those with low educational attainment.

Financial literacy affects financial decision-making; ignorance about basic financial concepts can be linked to lack of retirement planning, lack of participation in the stock market, and poor borrowing behavior. Several initiatives have been undertaken to foster saving and financial security. The evidence is, in some cases, mixed, but several programs have proven effective in fostering saving and increasing participation in pension plans. However, much more can be done to improve the effectiveness of these programs. Furthermore, initiatives should consider a wider spectrum of financial behavior; for example not only saving, asset allocation, and pension but also borrowing behavior.

Theoretical Framework

The theoretical framework used to model consumption/saving decisions posits that rational and foresighted consumers derive utility from consumption over their lifetimes. In the simplest format, the consumer has a lifetime expected utility, which is the expected value of the sum of per-period utility discounted to the present from the consumer's current age to his/her oldest attainable age. Assets and consumption each period are determined endogenously by

maximizing this utility function subject to an intertemporal budget constraint, which represents the present discounted value of future resources (which include earnings, Social Security, and pensions). This model posits that the consumer holds expectations regarding discount rates, investment returns, earnings, pension and Social Security benefits, and inflation. Further, it posits that the consumer uses that information to formulate and execute optimal consumption/saving plans. In other words, the consumer looks ahead and plans for the future taking his/her lifetime resources into account.

Even in this basic formulation of the saving decision, the actual requirements for making saving decisions are demanding: Individuals have to collect information and make forecasts about many variables, from Social Security and pensions to interest rates and projected inflation, to name just a few. Moreover, they have to perform calculations that require, at minimum, an understanding of compound interest and the time value of money. Decisions about how much to accumulate and how much to borrow to be able to smooth consumption over the life-cycle also require an understanding of the working of interest rates.

Do individuals possess the level of financial knowledge and numeracy necessary to perform the calculations mentioned above? Does saving and borrowing behavior follow the predictions of these simple models? While financial literacy has often been overlooked in previous studies, it can be an important predictor of financial behavior. The next section provides an examination of the level of literacy individuals possess.

Basic and Advanced Financial Literacy

Basic Financial Literacy

Several surveys exist that report information on financial knowledge in sub-groups or among the whole U.S. population.² However, these surveys rarely provide information on variables related to economic outcomes such as saving, borrowing, or retirement planning. In an effort to combine data on financial literacy with data on financial behavior, Lusardi and Mitchell (2006) have pioneered inserting questions measuring financial literacy into major U.S. surveys. They first designed a special module on financial literacy for the 2004 Health and Retirement Study (HRS); this module has now been added to the National Longitudinal Survey of Youth (NLSY). These and other questions measuring financial knowledge have also been added to the

² See Lusardi and Mitchell (2007b) for an overview of these surveys.

Rand American Life Panel (ALP) and to other surveys covering specific sub-groups of the population.³ The addition of these types of questions to existing surveys not only allows researchers to evaluate levels of financial knowledge but, most importantly, makes it possible to link financial literacy to a rich set of information about household financial behavior.

Given the limited number of questions that can effectively be added to surveys, researchers have to assess financial literacy from only a handful of questions. But which questions should be asked to determine whether respondents possess financial literacy? Moreover, which data allow researchers to most accurately assess the effect of literacy on behavior? As will be reported below, it is possible to gauge financial knowledge from a small set of questions. However, to assess the effect of knowledge on behavior, researchers need information about variables other than respondents' current levels of financial literacy.

The three questions Lusardi and Mitchell (2006) devised for the HRS measure basic but fundamental concepts relating to financial literacy, such as the working of interest rates, the effects of inflation, and the concept of risk diversification. The questions are as follows:

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: more than \$102, exactly \$102, less than \$102?
2. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in this account?
3. Do you think that the following statement is true or false? "Buying a single company stock usually provides a safer return than a stock mutual fund."⁴

The first two questions (*compound* and *inflation*) evaluate whether respondents display knowledge of fundamental economic concepts and competence with basic financial numeracy. The third question (*stock risk*) evaluates respondents' knowledge of risk diversification, a crucial element of any informed investment decision.

The HRS sample covers respondents who are 50 or older, with the average age being 65. Results from this survey module reveal an alarmingly low level of financial literacy among older

³ These questions have been added to a survey of participants to the state employees plan in the state of Nebraska (Medill 2007). Moreover, they have been added to the 2005 Dutch DNB Household Survey (van Rooij, Lusardi and Alessie 2007), and a 2007 pilot survey of participants in Mexico's privatized Social Security plan (Hastings 2007).

⁴ In addition to the list of answers provided above, respondents can also choose that they do not know the answer to the question (DK), or they can refuse to answer (refusal).

individuals in the United States. Only 50 percent of respondents in the sample were able to correctly answer the first two questions, and only one-third of respondents were able to answer all three questions correctly. The question that was most difficult for respondents to answer was the one about risk diversification; more than one-third of respondents reported they did not know the answer.⁵ Not only is the finding that most respondents do not grasp the concept of risk diversification an important one, but posing difficult questions allows researchers to differentiate among different levels of financial sophistication, even when using a limited number of questions to measure financial literacy

Lusardi and Mitchell (2007a) have also examined numeracy and financial literacy among a younger segment of the population, the Early Baby Boomers, who were 51 to 56 years old in 2004. This segment of the population is particularly useful to study as respondents in this age group should be close to the peak of their wealth accumulation and should have dealt with many financial decisions already (mortgages, car loans, credit cards, pension contributions, etc.). The following questions were posed to these respondents in the 2004 HRS:

1. If the chance of getting a disease is 10 percent, how many people out of 1,000 would be expected to get the disease?
2. If 5 people all have the winning number in the lottery and the prize is 2 million dollars, how much will each of them get?

For respondents who answered either the first or the second question correctly, the following question was asked:

3. Let's say you have 200 dollars in a savings account. The account earns 10 percent interest per year. How much would you have in the account at the end of two years?

Table 1 summarizes how Early Boomers answered these questions. Again, numeracy is found to be low among respondents; only about half could divide \$2 million by 5. Moreover, the large majority did not have a good grasp of the power of interest compounding: only 18 percent correctly computed the compound interest question. Of those who got the interest question wrong, 43 percent undertook a simple interest calculation, thereby ignoring the interest accruing on both principal and interest. These are not comforting findings, especially considering that these respondents have already dealt with many financial decisions during their lifetimes.

⁵ See Lusardi and Mitchell (2006) for details.

These findings are confirmed in several other studies. Bernheim (1995, 1998) was one of the first to emphasize that most individuals lack basic financial knowledge and numeracy. Lusardi and Mitchell (2007b) and Smith and Stewart (2008) survey the evidence on financial literacy in the United States and in other countries and report similar findings. Lusardi and Tufano (2008) report that the vast majority of respondents in a representative sample of U.S. households have limited knowledge of the power of interest compounding.

Advanced Literacy

To competently make saving and investment decisions, individuals need knowledge beyond the fundamental financial concepts discussed above, including understanding the relationship between risk and return; how bonds, stocks, and mutual funds work; and basic asset pricing. To quantify how knowledgeable individuals are in this area, Lusardi devised several additional questions for the ALP. Most of these questions had earlier been added to the Dutch DNB Household Survey⁶ and are similar to questions used in other U.S. surveys.⁷ Because the question about risk diversification had been found to be hard to answer, it was included in the set of questions on advanced financial literacy.

The exact wording of these questions is as follows:

1. Function of Stock Market

Which of the following statements describes the main function of the stock market? (i) The stock market helps to predict stock earnings; (ii) The stock market results in an increase in the price of stocks; (iii) The stock market brings people who want to buy stocks together with those who want to sell stocks; (iv) None of the above; (v) DK; (vi) Refuse.

2. Knowledge of Mutual Funds

Which of the following statements is correct? (i) Once one invests in a mutual fund, one cannot withdraw the money in the first year; (ii) Mutual funds can invest in several assets, for example invest in both stocks and bonds; (iii) Mutual funds pay a guaranteed rate of return which depends on their past performance; (iv) None of the above; (v) DK; (vi) Refuse.

⁶ See van Rooij, Lusardi, and Alessie (2007) for a detailed explanation and review of these questions.

⁷ Specifically, questions were taken from the National Council of Economic Education Survey, the NASD Investor Knowledge Quiz, the 2004 Health and Retirement Study module on financial literacy and planning, the Survey of Financial Literacy in Washington State, and the 2001 Survey of Consumers.

3. Relationship Between Interest Rates and Bond Prices

If the interest rate falls, what should happen to bond prices? (i) Rise; (ii) Fall; (iii) Stay the same; (iv) None of the above; (v) DK; (vi) Refuse.

4. Risk Diversification: Company Stock or Mutual Fund?

True or false? Buying a company stock usually provides a safer return than a stock mutual fund. (i) True; (ii) False; (iii) DK; (iv) Refuse.

5. Riskier: Stocks or Bonds?

True or false? Stocks are normally riskier than bonds. (i) True; (ii) False; (iii) DK; (iv) Refuse.

6. Long Period Returns

Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return? (i) Savings accounts; (ii) Bonds; (iii) Stocks; (iv) DK; (v) Refuse.

7. Highest Fluctuations

Normally, which asset displays the highest fluctuations over time? (i) Savings accounts; (ii) Bonds; (iii) Stocks; (iv) DK; (v) Refuse.

8. Risk Diversification: Spreading Money Among Different Assets

When an investor spreads his money among different assets, does the risk of losing money: (i) Increase; (ii) Decrease; (iii) Stay the same; (iv) DK; (v) Refuse.

The average age of the ALP sample is about 53, and most respondents are between the ages of 40 and 60. The sample is composed mostly of highly educated (over half have at least a college education) and high-income (almost 30 percent earn \$100,000 or more) respondents. This sample characteristic is partly due to the fact that the survey is done online, and frequent internet users are not a representative sample of the U.S. population. Yet it is useful to see how these respondents fare when asked questions about financial concepts they should have dealt with in their financial decisions.⁸

Responses to the more complex battery of advanced financial literacy questions are summarized in Table 2. Panel A shows that most respondents, over three-quarters, do get most of the answers right, so they have some knowledge of how the stock market and risk diversification work. They are also more likely to be knowledgeable about fluctuations in assets than they are about patterns of asset returns. But only about one-third of the sample knows about the

⁸ See Lusardi and Mitchell (2007c) for details.

relationship between bond pricing and interest rates, indicating striking ignorance of how assets are priced.⁹ Moreover, while the large majority of respondents responded correctly to several of the more advanced questions, only one-fifth of respondents were able to answer all of these questions correctly (Table 2, panel B). Thus, advanced knowledge is not widespread, even among a sample of highly educated respondents.¹⁰

Several other surveys covering the U.S. population or specific sub-groups have also documented low levels of advanced financial knowledge across the age spectrum. For example, data from five surveys from the Jump\$tart Coalition for Personal Financial Literacy spanning from 1997 to 2006 show that only a small minority of high school students score above a passing grade in financial literacy. Low scores are not only pervasive among high school students but have changed little over time (Mandell 2008). These findings are confirmed by the National Council of Economic Education (NCEE), which periodically surveys high school students and working-age adults to measure financial and economic knowledge. The NCEE survey consists of a 24-item questionnaire on topics including “Economics and the Consumer,” “Money, Interest Rates, and Inflation,” and “Personal Finance.” Adults got an average score of C on these questions, while the high school population fared even worse, with most earning an F. Hilgert, Hogarth, and Beverly (2003) examine data from the 2001 Survey of Consumers, where some 1,000 respondents (ages 18–98) were given a 28-question true/false financial literacy quiz covering knowledge about credit, saving patterns, mortgages, and general financial management. Again, most respondents earned a failing score on the quiz, documenting widespread illiteracy among the population. Similar findings are reported in smaller samples or specific groups of the

⁹ Very similar findings are provided by Moore (2003), which also reports that the fraction of correct responses to questions measuring sophisticated knowledge is very low.

¹⁰ When levels of literacy are low, one may wonder whether respondents even understand the meaning of the questions they are asked. To investigate whether the wording of questions matters, two randomly chosen groups of respondents to the ALP were posed the same questions but with different wording. This was implemented for three questions: a rather simple question about the risk differences between bonds and stocks (a first group was asked: “Stock are normally riskier than bonds; true or false?” while a second group was asked: “Bonds are normally riskier than stocks; true or false?”); a more difficult question about risk diversification (a first group was asked: “Buying a company stock usually provides a safer return than a stock mutual fund; true or false?” while a second group was asked: “Buying a stock mutual fund usually provides a safer return than a single company stock; true or false?”); and the most difficult question about the link between bond prices and interest rates (a first group was asked: “If the interest rate falls, what should happen to bond prices?” and a second group was asked: “If the interest rate rises, what should happen to bond prices?”). The wording of the question did not matter for the first two questions, but it did matter for the third question, showing a fair amount of guessing and measurement error in the responses to complex financial literacy questions. See Lusardi and Mitchell (2007c) for details.

population (Agnew and Szykman 2005). Moore (2003) examines financial literacy in Washington State and reports low levels of financial knowledge in that state.

Who Is Financially Literate?

Financial illiteracy is not only widespread, it is particularly acute among specific demographic groups. For example, financial literacy, as measured by the three questions in the 2004 HRS module, declines strongly with age/cohorts (Figure 1). This is an important finding as individuals are required to make financial decisions until late in the life cycle and there is mounting concern about the incidence of financial scams that prey upon the elderly. There are sharp gender differences in financial literacy, with women displaying a lower level of knowledge than men, particularly with regard to risk diversification (Figure 2). Lusardi and Mitchell (2008) examine this issue in more detail and warn about the difficulties women may face in making financial decisions, particularly after the death of a spouse.

Financial literacy varies widely among education groups. Only half of respondents with less than a high school correctly answer the question requiring a simple calculation of interest rates, and close to 20 percent state they do not know the answer to this question. The large majority of those without a college degree do not know or answer incorrectly the question about risk diversification. Similarly, there are major differences in financial literacy across racial groups, with African-Americans and Hispanics displaying much lower levels of financial literacy than whites. Approximately half of African-Americans correctly answer the question about interest rate calculations, and the proportion of correct answers is even smaller among Hispanics. Lusardi and Mitchell (2007a) document similar findings when using different measures of literacy among a sample of Early Baby Boomers.

These results are not specific to the age groups covered in the HRS, but are common to many other surveys on financial literacy.¹¹ Moreover, the findings outlined above are already present among young respondents. For example, Mandell (2008) focuses on a small group of students who are defined as being financially literate (all had received a score of 75 percent or more on a financial literacy test) in the 2006 Jump\$tart Coalition survey. Note that this group represents a tiny fraction of the whole sample: only 7 percent. The financially literate students

¹¹ See Lusardi and Mitchell (2007b) for a review.

are overwhelmingly white, male, and the children of college graduates. Thus, the correlation between literacy and gender, race, and education is present at early stages of the life cycle.

Lusardi and Mitchell (2007c) show that financial literacy is highly correlated with exposure to economics in school. Those who studied economics (in high school, college, or at higher levels) were much more likely to display higher levels of financial literacy later in life, a finding which is also present in data from other countries.¹² They use this information to assess the impact of financial literacy on financial behavior later in life. Because financial literacy can be affected by experience with saving and investing—learning by doing—data on literacy early in life (or on other determinants of financial literacy) is necessary to evaluate the impact of literacy on financial behavior, as will be explained in the next section.

Does Financial Literacy Matter?

As mentioned earlier, one of the major advantages of inserting questions about financial literacy in major U.S. surveys is that researchers can assess whether literacy influences financial decision-making. Table 3 displays the relationship between financial literacy and retirement planning. As shown by Lusardi (2003), Lusardi and Beeler (2007) and Lusardi and Mitchell (2007a), retirement planning is a powerful predictor of wealth accumulation; those who plan have more than double the wealth of those who have not done any retirement planning.

Financial literacy matters for planning: Those who are more financially knowledgeable are much more likely to have planned for retirement. In terms of economic importance, both the knowledge of interest compounding and the ability to perform simple calculations (such as a lottery division) are the strongest predictors of planning. This is to be expected, given that any saving plan requires some numeracy, the ability to calculate present values, and an understanding of the advantages of starting to save early in life. Financial literacy is not simply a proxy for low education, race, or gender; as has been noted, women, minorities, and those with low education are disproportionately less likely to be financially literate. Even after accounting for many demographic characteristics, Table 3 (column III) shows that financial literacy continues to be an important determinant of planning.¹³

¹² See van Rooij, Lusardi, and Alessie (2007).

¹³ See, also, Lusardi and Mitchell (2006).

One may argue that financial literacy and retirement planning are both decision variables and that the act of planning may enhance financial knowledge. In other words, those who want to plan for retirement may invest in acquiring financial knowledge. To evaluate the relationship between literacy and planning, it is important to have information beyond individuals' current levels of financial literacy. Lusardi and Mitchell (2007c) use information on individuals' past financial literacy, prior to their entering the job market. They find that those who were financially literate when young are more likely to plan for retirement, showing that it is literacy that affects planning and not the other way around.

Advanced financial literacy also matters for financial decision-making. Van Rooij, Lusardi, and Alessie (2007) use questions they designed for a module on financial literacy for the Dutch DNB Household Survey to show that financially sophisticated households are more likely to participate in the stock market. They address the argument that participation in the stock market or success in investing may also influence financial knowledge by relying on individuals' financial knowledge in the past and prior to investing in the stock market. They find that those who were literate when young are more likely to invest in stocks, again showing there is an independent effect of literacy on stock market participation.

Other studies have confirmed the positive association between financial knowledge and household financial decision-making. Stango and Zinman (2007) show that those who are unable to correctly calculate interest rates out of a stream of payments end up borrowing more and accumulating lower amounts of wealth. Lusardi and Tufano (2008) find that those who severely underestimate the power of interest compounding are more likely to end up with excessive amounts of debt. Brown, Casey, and Mitchell (2007) show that those who are more financially literate are more likely to annuitize rather than take retirement wealth as a lump sum. Agarwal et al. (2007) show that financial mistakes are most prevalent among the young and the elderly—demographic groups that display the lowest levels of financial knowledge and cognitive ability. Hilgerth, Hogarth, and Beverly (2003) also document a positive link between financial knowledge and financial behavior. Campbell (2006) further demonstrates that many investors failed to refinance their mortgages during a period of falling interest rates. This finding is consistent with lack of literacy, as those who failed to refinance were disproportionately investors with low education. Those investors also seem less likely to know the terms of their mortgages, including

the interest rates they pay (Bucks and Pence 2006 and Moore 2003). Moore (2003) also shows that borrowers who took out high-cost mortgages display little financial literacy.

Financial Education¹⁴

As additional evidence that financial illiteracy is a severe impediment to saving, both the government and employers have promoted financial education programs. Most large firms, particularly those with DC pensions, offer some form of financial education programs (Bernheim and Garrett 2003). The evidence to date on the effectiveness of these programs is mixed.¹⁵ Only a few studies find that those who attend financial education programs, such as retirement seminars, are much more likely to save and contribute to pensions (Bernheim and Garrett 2003 and Lusardi 2002, 2004).

Clearly, those who attend seminars are not necessarily a random group of individuals. Because attendance is voluntary, it is likely that workers who attend already have a proclivity to save, and it is hard to disentangle whether it is seminars per se or the characteristics of seminar attendees that explain the higher saving rates of attendees shown in the empirical estimates. However, Bernheim and Garrett (2003) argue that seminars are often remedial, i.e., offered in firms where workers do little or no saving. If this is the case, the effect of seminars is likely to be underestimated with conventional estimation methods.

Lusardi (2004) uses data from the HRS and confirms the findings of Bernheim and Garrett (2003). Consistent with the fact that seminars are remedial, she finds that the effect of seminars is particularly strong for those at the bottom of the wealth distribution and those with low education. As shown in Table 4, retirement seminars are found to have a positive effect mainly in the lower half of the wealth distribution and particularly for those with low education. Estimated effects are sizable, particularly for the least wealthy, for whom attending seminars appears to increase financial wealth (a measure of retirement savings that excludes housing and business equity) by approximately 18 percent.¹⁶ Note also that seminars affect not only private

¹⁴ This part summarizes the evidence and discussion provided by Lusardi (2004). For an analysis of the different programs and approaches to promote saving and financial security, see also Lusardi (2007).

¹⁵ See Lusardi (2004) and Lusardi and Mitchell (2007b) for a review of the effectiveness of financial education programs, and Hogarth (2006) for a description of many financial education programs currently offered in the United States.

¹⁶ Moreover, Lusardi (2005) uses the supply of retirement seminars to pin down the direction of causality between seminars and saving. Specifically, she uses the proportion of large firms across states as an instrument for retirement

wealth but also measures of wealth that include pensions and Social Security wealth, perhaps because seminars provide information about pensions and encourage workers to participate and contribute (Gustman, Steinmeier, and Tabatabai 2008).

One can also learn from the experience of Individual Development Accounts (IDAs), which are subsidized savings accounts targeted to the poor. One of the features of IDAs is that they require general financial education; participants are offered several hours and sessions of financial education. Financial education proves effective and is associated with a sizable increase in savings among IDA participants (Schreiner and Sherraden 2007). However, the effect of education is non-linear; after 10 hours of education, there seem to be no additional discernible effects on saving (Sherraden and Boshara 2008). This suggests that the payoff in financial education can be reaped by offering a sizable, yet limited, number of financial education sessions.

In addition to fostering saving among the poor, financial education can affect behavior toward debt. For example, there is some evidence that financial counseling can be effective in reducing debt levels and delinquency rates (Hirad and Zorn 2001 and Elliehausen, Londquist, and Staten 2007).

Clark and D'Ambrosio (2008) have examined the effects of seminars offered by TIAA-CREF to a variety of institutions. The objective of the seminars is to provide financial information that would assist individuals in the retirement planning process. Their empirical analysis is based on information obtained in three surveys: participants completed a first survey prior to the start of a seminar, a second survey at the end of a seminar, and a third survey several months later. Respondents were asked whether they had changed their retirement age goals or revised their desired levels of retirement income following attendance of a seminar.

After attending a seminar, several participants stated an intent to change their retirement goals and many revised their level of retirement income. While a small percentage of respondents changed their desired retirement age, more than a quarter altered their retirement income goals, showing that the information provided in the seminars did have some effect on behavior. Women were particularly receptive to information presented in the seminars. Before attending the seminars, women reported less confidence in their ability to attain their retirement goals than men. But women were substantially more likely than men to increase their expected retirement age and also

seminars. She finds that those who are more likely to be exposed to retirement seminars because they live in states with a high proportion of big firms accumulate more wealth.

to alter their retirement goals. Thus, women seem more responsive to financial education, perhaps because, as reported earlier, they are less likely to be financially literate.

A finding that is common when studying the effects of financial literacy programs, and which is highlighted in the work of Clark and D'Ambrosio (2008) is that, for many participants, intentions do not translate into actions. When surveyed several months later, many of those who had intended to make changes to their retirement plans had not implemented them. Thus, financial education programs may be of limited effectiveness in the short run; it may take several months or years for programs to work. Moreover, it may be important to find ways to more effectively stimulate an active choice among seminar participants.¹⁷

Overall, the evidence reported by Bernheim and Garrett (2003), Lusardi (2002, 2004) and Clark and D'Ambrosio (2008) show that financial education can affect behavior. However, other papers have reported more modest effects of education programs. Duflo and Saez (2003, 2004) investigate the effects of exposing employees of a large not-for-profit institution to a benefit fair. This study is notable for its rigorous methodology; a randomly chosen group of participants was given incentives to participate in the benefit fair, and their behavior was compared with that of another similar group, which was not offered incentives to attend the fair. This methodology overcomes the problem mentioned before that those who attend education programs may already be inclined to save. This is clearly important, and findings from this study show that the benefit fair induced participants to increase their participation in pensions, but the effect on saving was almost negligible. Perhaps the most relevant result of this study is how pervasive peer effects are; not only participants but also their colleagues who did not attend the benefit fair were affected by it, providing evidence that individuals rely on the behaviors of those around them in making financial decisions, a finding documented in many other studies (Brown et al. 2007 and Hong, Kubik, and Stein 2004).¹⁸

Financial education programs deliver disappointing results among high school students. As reported by Mandell (2008), students who took courses in financial management or personal finance did not do any better on financial literacy tests than students who did not take any such course. This finding does not seem to be explained by either the quality of the students who

¹⁷ See Lusardi, Keller and Keller (2008) for an alternative program aimed to stimulate an active choice among new hires at a not-for-profit institution.

¹⁸ For a discussion of the tools and sources of advice that individuals use to make financial decisions, see Lusardi (2007).

enroll in such courses, the training of the teachers, or the quality of the courses. However, a specific school-based educational program that is consistently related to higher financial literacy scores is the stock market game. Those who play a stock market game in class do three to four percentage points better than all students on financial literacy tests. This may provide some guidance on how literacy courses could be improved upon.

Discussion and Implications for Public Policy

As shown throughout this paper, the existence of financial literacy should not be taken for granted. Financial illiteracy is widespread and particularly acute among specific groups, including those with low education, women, and minorities. Given the increased complexity of day-to-day financial transactions, the evidence of illiteracy raises important questions for policy.

The mixed evidence on the effectiveness of financial education programs has led some to question whether it is worth trying to improve financial literacy. In fact, it is not clear there is even a choice. As it was impossible to live and operate efficiently in the past without being *literate*, i.e., knowing how to read and write, so it is very hard to live and operate efficiently today without being *financially literate*. Given the complexity of current financial instruments and the financial decisions required in everyday life, from comparing credit card offerings, to choosing methods of payments, to deciding how much to save, where to invest, and how to get the best loan, individuals need to know *how to read and write* financially.

Note that, as with reading and writing, the objective of any policy designed to promote financial literacy should be basic knowledge. While it may not be feasible to transform financially illiterate people into sophisticated investors, it may be possible to teach them a few principles about the basics of saving and investing. Moreover, as illiteracy was not eradicated with a handful of lessons or in a matter of months, so financially illiteracy cannot be eradicated with a few seminars or one benefit fair.

Set in this framework, it is clear that some standards for financial literacy are needed. What do people need to know? What should the pillars of financial literacy programs be? Setting these standards will be the backbone of devising financial education programs. There are obvious benefits to having one institution that presides over or establishes those standards, and the U.S. Department of Treasury seems an obvious candidate for this role.

Technology makes it possible to use interactive methods to teach. Thus, “students of financial literacy” do not necessarily have to attend classes at school, but can learn from courses online (or from CDs or DVDs) from their homes. Courses can be customized and tailored to various needs and levels of financial knowledge. Moreover, as the evidence on the effectiveness of the stock market game in high schools seems to suggest, it may be important to find ways to make courses engaging and to stimulate interest in acquiring financial literacy.

New ideas also deserve consideration. For example, as discussed by Sherraden and Boshara (2008), it is not necessarily the case that people first become financially literate and then save and accumulate assets. It may also be that, when people begin to accumulate assets, they become more interested in improving their literacy. Thus, providing economic incentives, such as a small fund for children’s education or for retirement, may be one way to encourage people to become financially literate.

Moreover, as mentioned earlier, illiteracy can be linked to financial mistakes. A few studies have hinted at financial illiteracy as a determinant of excessive borrowing or attaining high-cost mortgages, but we need more research analyzing the effect of literacy on credit and borrowing behavior. The problem of financial mistakes seems so pressing that some credit card companies have taken the unusual step of offering financial education to new-to-credit and at-risk consumers (Brown and Gartner 2007). Early intervention may be a more promising approach than providing counseling during or after bankruptcy, and these initiatives deserve some attention.

If people with low literacy make mistakes, who will pay for these mistakes? The individual, or society at large? If taxpayers will be asked to support those who have made mistakes, there is a role for regulation and for implementing “mandatory” programs. One such program could be to require people to obtain some basic financial knowledge (Alesina and Lusardi 2006). In the same way people are required to have a driving license before they venture out on the road, a “financial license” could be required before individuals contribute to their pensions, invest their pension assets, or borrow to buy a house. In this way, individuals may learn about some basic financial concepts and may reduce their reliance on random advice and potentially misleading tips from those around them.

Several initiatives have been undertaken in other fields with the objective of “educating” consumers, and they provide suggestions for financial education as well. For example, in the

field of health, guidelines have been offered on how to eat well. In the same way that a “food pyramid” provides general information about how people should eat, a “saving pyramid” could provide general guidelines on how to save and invest. Principles such as diversification of investments, exploitation of the power of interest compounding, taking advantage of tax-favored assets or employer matches are fundamental concepts that can benefit every investor. Clearly, there is already a lot of information on these topics. However, as there are many books about diets, so there are many books about how to save and invest, and it may be worthwhile to provide a “seal of approval” from experts in the field. For example, one official website that people can turn to may be more powerful than the many websites that are now available and for which there are no guarantees about quality.

Given the current low levels of financial literacy, employers and the government should devise and encourage programs that simplify financial decision-making as well as provide sources of reliable financial advice. One way to reduce the barriers that individuals face when making saving decisions is to simplify their planning process.¹⁹ For example, Lusardi, Keller and Keller (2008) used a social marketing approach to develop a planning aid to motivate and encourage new hires at a not-for-profit institution to open and contribute to supplementary retirement accounts. The planning aid they designed displays several interesting features. First, it breaks down the process of enrollment in supplementary pensions into several small steps, describing to participants exactly what they need to do to be able to enroll online. Moreover, the aid provides several pieces of information to help overcome barriers to saving, such as describing the low minimum amount of income employees can contribute (in addition to the maximum) and indicating the default fund that the employer has chosen for them (a life-cycle fund). Finally, the planning aid contains pictures and messages designed to motivate participants to save.

The planning aid was designed following thorough data collection. Lusardi, Keller and Keller (2008) devised a survey asking explicitly about barriers to saving, sources of financial advice, and level of financial knowledge and attractive features of a pension plan. They conducted focus groups and in-depth interviews (with both employees and human resources administrators) to shed more light on the impediments to saving. These data-collection methods,

¹⁹ See Choi, Laibson and Madrian (2006) for the analysis of another program that relies on simplifying decision-making.

common in the field of marketing, are well suited to capturing the wide heterogeneity relating to individuals' saving decisions. The program was very successful; contribution rates to supplementary pensions tripled after the introduction of the planning aid.

The results of this program have implications for financial education programs and policies to foster saving. First, while economic incentives such as employer matches or tax advantages may be useful, there are many more methods that can be employed to make people save. In fact, given the massive lack of information and lack of financial knowledge that exists in the general population, implementation of programs aimed at simplifying saving decisions might be a more cost-effective alternative than tax incentives. Second, individuals are most prone to decision-making in specific time periods. For example, the start of a new job pushes people to think about saving (often because they have to make decisions about their pensions), and it may be very important to exploit such "teachable moments." Third, to be effective, programs have to recognize the many differences among individuals, not only in terms of preferences and economic circumstances but also of their existing levels of information, financial sophistication, and ability to carry through with plans. In other words, relying on "one-size-fits-all" principles can lead to rather ineffective programs.

While the problems are many and the challenges are daunting, programs can be designed to change saving behavior. We have a wealth of information to rely on, and that information should make effective financial education increasingly possible. In the current economic environment it is essential to equip consumers with the necessary tools to make informed financial choices. One of these tools is financial literacy.

References

- Agarwal, S., J. Driscoll, X. Gabaix, and D. Laibson (2007), “The Age of Reason: Financial Decisions over the Lifecycle,” mimeo, Harvard University.
- Agnew, Julie and Lisa Szykman (2005), “Asset Allocation and Information Overload: The Influence of Information Display, Asset Choice and Investor Experience,” *Journal of Behavioral Finance*, 6, pp. 57–70.
- Alesina, Alberto and Annamaria Lusardi (2006), “Driving Your Financial Investment? Perhaps a License is Needed,” mimeo, Dartmouth College.
<http://www.dartmouth.edu/~vox/0607/0724/lusardi.html>
- Bernheim, Douglas (1995), “Do Households Appreciate Their Financial Vulnerabilities? An Analysis of Actions, Perceptions, and Public Policy,” *Tax Policy and Economic Growth*, Washington, DC: American Council for Capital Formation, pp. 1–30.
- Bernheim, Douglas (1998), “Financial Illiteracy, Education and Retirement Saving,” in Olivia S. Mitchell and Sylvester Schieber (eds.), *Living with Defined Contribution Pensions*, Philadelphia: University of Pennsylvania Press, pp. 38–68.
- Bernheim, Douglas and Daniel Garrett (2003), “The Effects of Financial Education in the Workplace: Evidence from a Survey of Households,” *Journal of Public Economics*, 87, pp.1487–1519.
- Brown, Amy and Kimberly Gartner (2007), “Early Intervention and Credit Cardholders: Results of Efforts to Provide Online Financial Education to New-to-Credit and At-Risk Consumers,” Center for Financial Services Innovation, Chicago, IL.
- Brown, Jeffrey, Zoran Ivkovich, Paul Smith, and Scott Weisbenner (2007), *Neighbors Matter: Causal Community Effects and Stock Market Participation*, NBER Working Paper n. 13168.
- Brown, Jeffrey R., Marcus Casey, and Olivia S. Mitchell. 2007. “Who Values the Social Security Annuity? Evidence from the Health and Retirement Study.” Unpublished.
- Bucks, Brian and Karen Pence (2006), “Do Homeowners Know Their House Values and Mortgage Terms?” Working Paper, Federal Reserve Board of Governors.
- Campbell, John (2006), “Household Finance,” *Journal of Finance*, 61, pp. 1553–1604.
- Clark, Robert and Madeleine D’Ambrosio (2008), “Adjusting Retirement Goals and Saving Behavior: The Role of Financial Education,” forthcoming in Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.
- Choi, James, David Laibson, and Brigitte Madrian (2006), “Reducing the Complexity Costs of 401(k) Participation Through Quick Enrollment (TM),” NBER Working Paper n. 11979.

Duflo, Esther and Emmanuel Saez (2003), “The Role of Information and Social Interactions in Retirement Plan Decisions: Evidence from a Randomized Experiment,” *Quarterly Journal of Economics*, 118, pp. 815–842.

Duflo, Esther and Emmanuel Saez (2004), “Implications of Pension Plan Features, Information, and Social Interactions for Retirement Saving Decisions,” in Olivia S. Mitchell and Stephen Utkus (eds.), *Pension Design and Structure: New Lessons from Behavioral Finance*, Oxford: Oxford University Press, pp. 137–153.

Elliehausen, Gregory, Christopher Lundquist and Michael Staten (2007), “The Impact of Credit Counseling on Subsequent Borrower Behavior,” *Journal of Consumer Affairs*, 41(1), pp. 1-27.

Gustman, Alan, Thomas Steinmeier, and Nahid Tabatabai (2008), “Do Workers Know about Their Pensions? Comparing Workers’ and Employers’ Pension Information,” forthcoming in Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.

Hastings, Justine (2007), “Information, Financial Literacy and Sensitivity to Fees: Evidence from Mexico’s Privatized Social Security Market,” mimeo, Yale University.

Hilgert, Marianne, Jeanne Hogarth and Sondra Beverly (2003), “Household Financial Management: The Connection between Knowledge and Behavior,” *Federal Reserve Bulletin*, pp. 309–322.

Hirad, Abdighani and Peter Zorn (2001), “A Little Knowledge Is a Good Thing: Empirical Evidence of the Effectiveness of Pre-Purchase Homeownership Counseling,” Working Paper, Freddie Mac.

Hogarth, Jeanne (2006), “Financial Education and Economic Development,” paper presented at the G8 International Conference on Improving Financial Literacy.
<http://www.oecd.org/dataoecd/20/50/37742200.pdf>

Hong, Harrison, Jeffrey Kubik, and Jeremy Stein (2004), “Social Interaction and Stock Market Participation,” *Journal of Finance*, 59, 137–163.

Lusardi, Annamaria (2002), “Preparing for Retirement: The Importance of Planning Costs,” *National Tax Association Proceedings – 2002*, pp. 148–154.

Lusardi, Annamaria (2003), “Planning and Saving for Retirement,” Working Paper, Dartmouth College.
http://www.dartmouth.edu/~alusardi/Papers/Lusardi_pdf.pdf

Lusardi, Annamaria (2004), “Savings and the Effectiveness of Financial Education,” in Olivia S. Mitchell and Stephen Utkus (eds.), *Pension Design and Structure: New Lessons from Behavioral Finance*, Oxford: Oxford University Press, pp. 157–184.

Lusardi, Annamaria (2005), "Financial Education and the Saving Behavior of African American and Hispanic Households," Report for the US Department of Labor.
http://www.dartmouth.edu/~alusardi/Papers/Lusardi_pdf.pdf

Lusardi, Annamaria (2007), "Household Saving Behavior: The Role of Literacy, Information and Financial Education Programs," for the book *Implications of Behavioral Economics for Economic Policy*.

Lusardi, Annamaria, Punam Keller and Adam Keller (2008), "New Ways to Make People Save: A Social Marketing Approach," forthcoming in Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.

Lusardi, Annamaria and Jason Beeler (2007), "Saving Between Cohorts: The Role of Planning," in Brigitte Madrian, Olivia Mitchell, Beth Soldo (eds), *Redefining Retirement. How Will Boomers Fare?*, Oxford: Oxford University Press, pp. 271–295.

Lusardi, Annamaria and Olivia S. Mitchell (2006), "Financial Literacy and Planning: Implications for Retirement Wellbeing," Working Paper, Pension Research Council, Wharton School, University of Pennsylvania.

Lusardi, Annamaria and Olivia S. Mitchell (2007a), "Baby Boomer Retirement Security: The Role of Planning, Financial Literacy, and Housing Wealth," *Journal of Monetary Economics*, 54, pp. 205–224.

Lusardi, Annamaria and Olivia Mitchell (2007b), "Financial Literacy and Retirement Preparedness. Evidence and Implications for Financial Education," *Business Economics*, January 2007, pp. 35–44.

Lusardi, Annamaria and Olivia Mitchell (2007c), "Financial Literacy and Retirement Planning: New Evidence from the Rand American Life Panel," mimeo, Dartmouth College.

Lusardi, Annamaria and Olivia Mitchell (2008), "Planning and Financial Literacy: How Do Women Fare?," forthcoming *American Economic Review*, May 2008.

Lusardi, Annamaria and Peter Tufano (2008), "Debt in America: Too Much, Too Little, or Just Right"? Mimeo, Harvard Business School.

Mandell, Lewis (2004), "*Financial Literacy: Are We Improving?*" Washington, D.C.: Jump\$tart Coalition for Personal Financial Literacy.

Mandell, Lewis (2008), "Financial Literacy in High School," forthcoming in Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.

Medill Colleen (2007), "Participant Perceptions and Decision-Making Concerning Retirement Benefits," paper present to the 9th Annual Joint Conference of the Retirement Research Consortium, Washington, D.C., August 9-10, 2007.

Moore, Danna (2003), "Survey of Financial Literacy in Washington State: Knowledge, Behavior, Attitudes and Experiences," Technical report 03-39, Social and Economic Sciences Research Center, Washington State University.

National Council on Economic Education (2005), "What American Teens and Adults Know About Economics," Washington, D.C.

Schreiner Mark and Michael Sherraden (2007), *Can the Poor Save? Saving and Asset Building in Individual Development Accounts*, New Brunswick, NJ: Transaction Publishers.

Sherraden Michael and Ray Boshara (2008), "Learning from Individual Development Accounts," forthcoming in Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.

Smith Barbara and Fiona Stewart (2008), "Learning from the Experience of OECD Countries: Lessons for Policy, Programs, and Evaluations," forthcoming in Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.

Stango, Victor and Jonathan Zinman (2007), "Fuzzy Math and Red Ink: When the Opportunity Cost of Consumption is Not What It Seems," Working Paper, Dartmouth College.

Van Rooij, Maarten, Annamaria Lusardi and Rob Alessie (2007), "Financial Literacy and Stock Market Participation," NBER Working Paper n. 13565.

Table 1: Financial Literacy Among Early Baby Boomers

<i>Question Type</i>	Correct (%)	Incorrect (%)	Do Not Know (%)
Percentage Calculation	83.5	13.2	2.8
Lottery Division	55.9	34.4	8.7
Compound Interest*	17.8	78.5	3.2

Note: *Conditional on being asked the question. Percentages may not sum to 100 due to a few respondents who refused to answer the questions. Observations weighted using HRS household weights. The total number of observation is 1,984. Adapted from Lusardi and Mitchell (2007a).

Table 2A. Advanced financial literacy

Weighted percentages of total number of respondents (N=812)

	Correct	Incorrect	Do not Know
1) Which statement describes the main function of the stock market? ¹⁾	75.5	17.7	6.8
2) Function of mutual fund. ¹⁾	72.4	11.3	16.3
3) If the interest rate falls/rises, what should happen to bond prices: rise/fall/stay the same/none of the above? ²⁾	36.7	41.1	22.2
4) Buying a company fund/stock mutual usually provides a safer return than a stock mutual fund/a company fund. True or false? ²⁾	80.2	3.3	16.5
5) Stocks/Bonds are normally riskier than bonds/stocks. True or false? ²⁾	81.7	4.6	13.8
6) Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return: savings accounts, bonds or stocks?	70.1	20.6	9.4
7) Normally, which asset displays the highest fluctuations over time: savings accounts, bonds, stocks?	88.8	3.7	7.5
8) When an investor spreads his money among different assets, does the risk of losing money increase, decrease or stay the same?	81.2	12.9	5.9

1) See exact wording in the text;

2) This question has been phrased in two different ways.

Note: Correct, incorrect and do not know responses do not sum up to 100% because of refusals. Adapted from Lusardi and Mitchell (2007c).

Table 2B. Advanced literacy: Summary of responses
Weighted percentages of total number of respondents (N=812)

	Number of correct, incorrect and do not know answers (out of eleven questions)									
	None	1	2	3	4	5	6	7	All	Mean
Correct	.7	2.7	3.6	6.2	8.9	13.3	17.7	25.6	21.4	5.9
Incorrect	35.6	33.0	18.4	8.1	3.5	1.5	0	0	0	1.2
Do not know	56.5	18.7	11.0	6.3	3.3	1.9	.6	1.2	.5	1.0

Note: Categories do not sum up to 100% because of rounding. Adapted from Lusardi and Mitchell (2007c).

Table 3: Empirical Effects of Financial Literacy on Retirement Planning

	<i>Probability of Being a Retirement Planner</i>		
	I	II	III
Correct Percentage Calculation	-.016 (.061)	-.012 (.062)	-.034 (.060)
Correct Lottery Division	.059* (.030)	.034 (.031)	.001 (.032)
Correct Compound Interest	.153*** (.035)	.149*** (.035)	.114*** (.039)
DK Percentage Calculation		.021 (.068)	.054 (.067)
DK Lottery Division		-.154*** (.050)	-.141*** (.051)
DK Compound Interest		-.114 (.080)	-.073 (.081)
Demographic controls	No	No	Yes
Pseudo R ²	.031	.038	.074

Note: This table reports Probit estimates of the effects of literacy on planning; marginal effects reported. Analysis sample consists of HRS Early Baby Boomers who responded to financial literacy questions. Being a planner is defined as having thought a little, some, or a lot about retirement. Demographic controls include age, education, race, sex, marital status, retirement status, number of children, and a dummy variable for those not asked the question about interest compounding. Regressions also include dummies for political literacy (knowing the President and Vice President of the United States). DK indicates respondent who did not know the answer. Observations weighted using HRS household weights. The total number of observations is 1,716. * Significant at 10% level; ** significant at 5% level ; *** significant at 1% level. Adapted from Lusardi and Mitchell (2007a).

Table 4: The Effect of Retirement Seminars on Retirement Accumulation

	Total sample	1 st quartile	median	3 rd quartile
<i>a. Financial net worth</i>				
Total sample	17.6% **	78.7% **	32.8% **	10.0%
Low education	19.5%	95.2% **	30.0% **	8.8%
High education	13.1%	70.0% **	19.4% **	10.2%
<i>b. Total net worth</i>				
Total sample	5.7%	29.2% **	8.7%	0.5%
Low education	3.4%	27.0% **	7.1%	4.0%
High education	7.3%	26.5% **	6.5%	3.6%
<i>c. Total net worth + Pensions and Social Security</i>				
Total sample	16.0% **	18.6% **	20.4% **	17.2% **
Low education	12.7% **	14.7% **	12.7% **	9.5% **
High education	17.7% **	25.4% **	25.8% **	17.0% **

Note: This table reports the percentage changes in different measures of retirement accumulation resulting from attending retirement seminars. Financial net worth is defined as the sum of checking and savings accounts, certificate of deposits and Treasury bills, bonds, stocks, IRAs and Keoghs and other financial assets minus short-term debt. See Table 1 for the definition of total net worth. * significant at the 10% level ** significant at the 5% level. Adapted from Lusardi (2004).

Figure 1: Financial Literacy: By Age

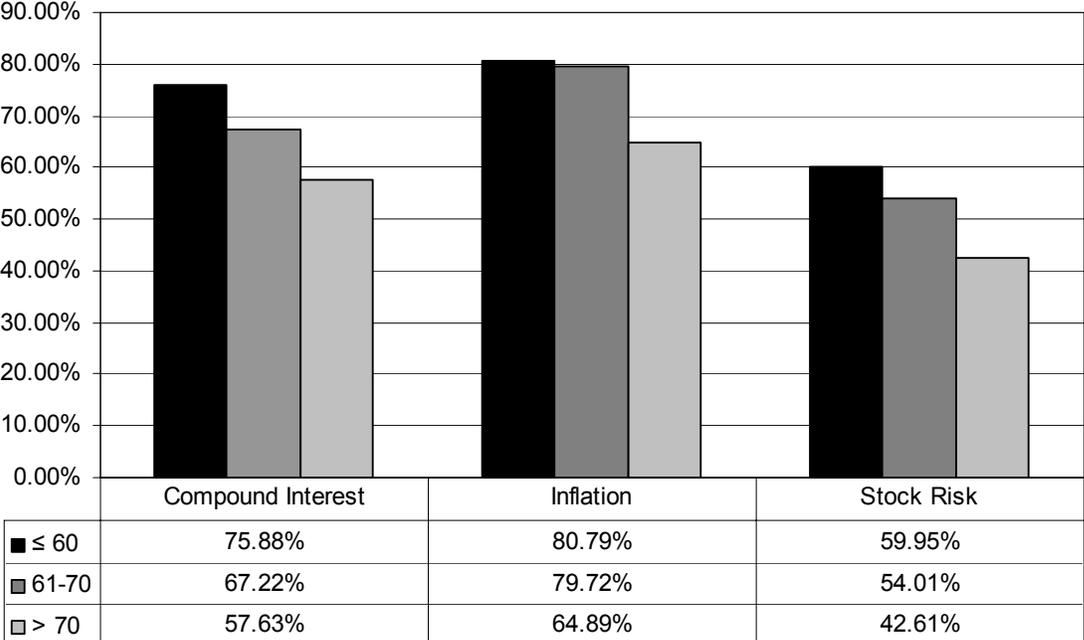


Figure 2: Financial Literacy: By Gender

