Financial Literacy and The Effectiveness of Financial Education and Counseling: A Review of the Literature

Gene Amromin
Federal Reserve Bank of Chicago

Itzhak Ben-David
Ohio State University

Sumit Agarwal
Federal Reserve Bank of Chicago

Souphala Chomsisengphet
Office of the Comptroller of the Currency

Douglas D. Evanoff
Federal Reserve Bank of Chicago

1. Introduction

In recent years, concern has been growing about the financial astuteness of consumers as research suggests they often make what appear to be welfare-reducing decisions.[1] Many individuals do not hold a checking account (Hilgert et al., 2003); maintain large outstanding balances on credit cards when cheaper forms of credit are available (Gartner & Todd, 2005); take out payday loans at astronomical interest rates when cheaper forms of credit are available (Agarwal, Skiba, and Tobacman, 2009); choose sub-optimal credit contracts (Agarwal et al., 2006); fail to refinance mortgages when it would be optimal to do so (Agarwal, Driscoll, and Laibson, 2006); and fail to plan for retirement, reaching it with little or no savings (Lusardi and Mitchell, 2006). A leading explanation for this behavior is that consumers are not financially literate—they lack sufficient information about financial concepts and instruments to make informed financial decisions.[2]

[1] The review draws on a more comprehensive analysis by Agarwal, Amromin, Ben-David, Chomsisengphet and Evanoff (2010b).

[2] Others have linked financial literacy to cognitive ability. For example, Agarwal, Driscoll, Gabaix, and Laibson (2008, 2009) find that some consumer are more likely to make suboptimal financial decisions by paying higher fees and interest rates and are less likely to learn from their mistakes. Agarwal and Mazumder (2010) explicitly link these mistakes to cognitive abilities.

Financial Literacy and The Effectiveness of Financial Education and Counseling: A Review of the Literature

Surveys find that a shocking proportion of consumers, both in the U.S. and in other countries, fail basic financial literacy tests. Many adults do not understand the difference between compound and simple interest; the characteristics of financial assets such as stocks and bonds; the benefits of portfolio diversification; or the important features of their own mortgages, Social Security and pension plans (Lusardi and Mitchell, 2006, 2007a, 2007b).

If financial illiteracy drives suboptimal (or welfare-reducing) financial behavior, then improving literacy could increase consumer welfare. A growing literature investigates whether financial education programs are effective in improving financial literacy and financial behavior. Though the evidence is mixed, it appears that some financial education programs do improve the behavior and outcomes of their graduates. The effects appear to be strongest for the most financially vulnerable, especially those with low incomes and levels of education. However, the relationships among financial education, financial literacy, and financial behavior and outcomes are not straightforward. Some financial education programs improve financial literacy, but not financial behavior; others lead to improved behavior and outcomes without improving financial literacy; and still others do not appear to be effective at all.

In what follows, we review the literature on financial literacy. In particular, we critique existing studies evaluating the extent of consumer financial literacy. We then evaluate the evidence on the effectiveness of financial education programs in improving participants' financial behavior and outcomes. We do not attempt a comprehensive survey of the literature in these areas; instead, we look for the most convincing evidence, paying particular attention to study design, data limitations, and potential sources of bias. We also pay particular attention to whether the impact of educational programs results from increases in financial literacy or from auxiliary influences. Overall, it appears that some financial education programs improve financial outcomes and that some portion of this effect is due to increased financial literacy. However, it is difficult to differentiate the factors contributing to this improvement. Some is due to the educational programs, some to the selection of participants, and some to auxiliary influences resulting from the educational program. We also discuss how the gains from financial literacy

programs may wane over time, as financial decision making becomes more difficult with age. We conclude with a discussion of the need for future research in this area.

2. Review of the Financial Literacy Literature

There is considerable evidence that a large segment of the U.S. population is not financially literate. This means that many people do not understand basic financial concepts and products well enough to make sound short- and long-term financial decisions for themselves and their families. The evidence comes from surveys administered to various groups of consumers over the past two decades to ascertain their knowledge of financial products and understanding of basic concepts. While the surveys vary significantly in content and sample population, they generally agree on the following:

1) a large proportion of consumers are not financially literate, even among the wealthiest and most educated population segments,
2) financial literacy rates vary consistently by demographic groups, tending to be higher for those with more wealth and education, for men (although results vary), and for whites (in the U.S.),
3) financial illiteracy leads to welfare-reducing financial behavior and outcomes.

There appears to be a fairly broad consensus that financial illiteracy leads to suboptimal decisions by consumers. However, there is significant disagreement as to how best to combat these ill effects, as well as on the effectiveness of the approaches that have been tried to date. Research efforts to evaluate the impact of such programs encounter an array of econometric issues that could bias the findings. Similarly, changes in behavior may not result from the educational benefits of these programs, but rather from auxiliary influences associated with the program. In the discussion that follows, we first evaluate the evidence on financial literacy and the adverse effects of suboptimal financial decisions; then, we discuss the impact of educational programs aimed at improving literacy, all the while emphasizing the potential problems involved with quantifying these effects.

2.1 Financial Literacy

Most research on financial literacy has been conducted in the United States and we concentrate on that literature.[3] Early studies to measure adult financial literacy were conducted during the 1990s by private firms (CFA/AMEX, 1991; EBRI, 1995; KPMG, 1996; PSRA, 1996, 1997; Oppenheimer Funds/Girls Inc., 1997; Vanguard Group/Money Magazine, 1997) and utilized surveys that consisted of a small number of questions covering material specific to the company's interests (Volpe, Chen, and Liu, 2006). Similarly, early studies of high school and college students asked relatively few questions and often sampled few institutions (Bakken, 1967; Langrehr, 1979; Danes and Hira, 1987; Volpe, Chen, and Pavlicko, 1996).

Perhaps the most useful studies assessing overall financial literacy were those conducted on high school and college students. One of the more comprehensive studies is the Jump$tart Financial Literacy Survey, which administered the same exam to randomly selected high school seniors every two years from 1997 to 2006. The exam includes 31 questions on income, money management, saving and investment, and spending and credit. It is intended to capture financial competence in a broad set of areas. Jump$tart's findings are not encouraging—students scored an average of 57% in 1997 (with 60% being a passing score), and scores declined by several percentage points in subsequent years (2000, 2002, 2004, and 2006).[4]

Chen and Volpe (1998) find similarly low rates of financial literacy among college students. In a sample of 13 public and private universities, the average respondent scored only 53% on a 36-question exam covering general financial knowledge. The sample included a high proportion of business majors, who scored higher than —students in other fields that barely averaged 50% on the exam. Importantly, students scored highest on questions covering areas in which young people are likely to have some

[3] Several surveys conducted in other countries generally confirm the U.S. findings (Miles, 2004; ANZ, 2005; OECD, 2005).

[4] Mandell (2008) analyzes the results in detail and notes that income, parent education, and race are strong predictors of scores.

experience—for example, auto insurance and apartment leases—and lowest where they are likely to have the least experience—taxes, life-insurance, and investment. This suggests that financial experience could increase financial literacy, and studies that find an effect of financial literacy on financial behavior should test for reverse causality.

Although these low financial literacy scores are worrisome, these results must be interpreted with caution. Both studies have low response rates—51% for the survey of Chen and Volpe and much lower for the Jump$tart exams—and hence could suffer from non-response bias. Chen and Volpe received a disproportionally high share of responses from business majors. While business majors may have been oversampled to begin with, it is plausible that they were also more likely to respond to the survey as it was less costly for them to complete in terms of time and effort. Chen and Volpe do not address this concern, nor do they weight results to reflect the demographic distribution of college students. Jump$tart suffered from a different sampling problem. The study randomly selected U.S. public high schools and asked each to administer the survey to one class of seniors; however, only 44% of high schools agreed to conduct the survey in 1997, and this rate dropped below 20% in 2002, 2004, and 2006. High schools that declined most often cited the need to prepare for state and federally mandated standardized tests, suggesting that the most disadvantaged schools were the least likely to participate. Thus, Jump$tart may suffer from non-response bias. It is important to note that these non-response biases, if they exist, would bias the results of both studies upward, so these studies would *understate* the pervasiveness of financial illiteracy.

It is also questionable whether the exams given by Jump$tart and by Chen and Volpe actually evaluate a respondent's financial competence. Both exams consist entirely of multiple choice questions, which means some correct responses are likely guesses, which will lead to an overstatement of financial literacy. On the other hand, inaccurate responses may not reflect one's ability to save, plan for retirement, manage debt, and make important financial decisions. For example, some questions required general knowledge of factual data (e.g., how much would a college degree affect one's earning power), which

respondents may have answered in terms of their own personal prospects. Additionally, certain questions concerned concepts that many high school students may not understand (e.g., down payments and liquidity). But a current misunderstanding of such concepts may be a poor indicator of the student's future knowledge and ability to make financial decisions. The questions from the Chen and Volpe survey are even more difficult and often require specific financial knowledge that a competent individual might not have (e.g., what is the maximum amount of money that is FDIC insured in a savings account at a federally insured commercial bank: $50,000 or $100,000?). Some questions are less difficult but more ambiguous.

Other research evaluates financial literacy among adults in more specific contexts. In particular, there is an extensive literature on the relationship between financial literacy and planning/saving for retirement. This literature yields two broad, but important findings: First, after controlling for a broad range of economic and demographic characteristics, individuals who are more financially literate are more likely to plan for retirement, and those who plan have greater net worth upon reaching retirement. Second, causation goes from literacy to planning to wealth.

Individuals save for retirement both privately and through Social Security and employer-sponsored pensions. To figure out how much to save for retirement, individuals must know their expected dates of retirement, expected lifespan after retirement, and Social Security and/or pension entitlements. They must then calculate, given the expected rate of return on savings, how much to save to maintain a certain standard of living in retirement. This planning process requires knowledge of Social Security and pension plan characteristics, as well as the ability to perform calculations involving compound interest and monthly accumulation.

Two early studies by Bernheim (1998) and Mitchell (1988) and later work by Gustman and Steinmeier (2005) find that many adults do not know important features of their Social Security entitlements and pensions. Bernheim finds in the Social Security Retirement History Survey (RHS) that adults nearing retirement did not provide accurate estimates of the amount of Social Security benefits they would receive. He compares expected benefits to realized benefits, finding that predictions were unbiased

but "noisy". Expected benefits accounted for only 60% of the variation in realized benefits. In addition, over half of respondents did not provide any estimate. Perhaps respondents systematically skipped questions in the RHS, but they may have simply been unable to form an expectation.

Mitchell (1988) finds that while most employees with pensions know the type of plan they have (defined benefit or defined contribution), many are unaware of important features of the plan. She compares pension characteristics reported by individuals from the Survey of Consumer Finances (SCF) to accurate administrative data. Only half of employees who were required to contribute to their pensions reported doing so, and only half of those whose employers contributed said they did. Over one-third of respondents did not know about early retirement provisions and, among those who did, two-thirds gave inaccurate descriptions of the provisions. Those who gave correct information were more likely to be white, have a higher income and level of education, and have greater seniority within their firm.

Gustman and Steinmeier (2005) confirm these earlier findings in the 1992 cohort of the Health and Retirement Survey (HRS). A majority of those surveyed were unable to accurately report their Social Security or pension entitlements. Only 27% of respondents gave estimates within 25% of their true Social Security entitlements, and only 16% of respondents with pensions gave estimates within 25% of their true pension entitlements. Perhaps most surprising, over 40% of respondents were unable to provide any estimate. In a multivariate analysis, few variables significantly predicted a correct response, but the patterns appear to mimic those found by Mitchell (1988). In particular, education, income, and being white and male predicted more accurate responses.

Even if consumers had information about their Social Security and pension entitlements, many would have trouble performing the calculations necessary to plan for retirement. Significantly, many adults are unable to correctly answer questions requiring a basic financial understanding. In the 2004 HRS cohort,

Lusardi and Mitchell (2006, 2007a) asked three questions providing information related to financial literacy concerning interest rates, inflation, and risk diversification.[5]

The authors find that only 18% of respondents thought that an account initially holding $100 and earning 20% compound annual interest would hold more than $200 after five years. In particular, many respondents thought the account would hold exactly $200, suggesting they did not understand compounding. An easier interest rate question, from a three-question financial literacy module in the 2004 HRS, yielded more correct responses, but did not require one to understand the difference between compound and simple interest. Consistent with other research in this area, the probability of answering correctly was higher for those with more wealth and education, for whites, and for men. However, mistakes persisted, even among the groups that were most likely to answer correctly. Lusardi and (2007b) find that even in the Rand American Life Panel (ALP), a sample of educated and high-earning middle-aged adults, over a quarter of respondents could not accurately answer the more difficult HRS compound interest question.

Further research shows that facility with interest rates is only weakly related to age. Lusardi, Mitchell, and Cortu (2009) find that respondents in their twenties do about as well as respondents in their fifties. The same demographic characteristics predicted correct responses as in other studies.

These studies also reveal other forms of financial illiteracy. Many consumers answered a "money illusion" question incorrectly, suggesting they did not understand the consequences of inflation (Lusardi and Mitchell, 2006, 2007b). Nearly half of HRS respondents missed a "lottery division" question, which amounted to a simple division problem (Lusardi and Mitchell, 2007a). In the HRS financial literacy module, only 52% of respondents said investing in a mutual fund was less risky than investing in a single company's stock, indicating a misunderstanding of risk and portfolio diversification (Lusardi and Mitchell, 2006).

[5] Agarwal (2010b) analyze responses to the same questions by a highly educated group involved in a financial planning program in India.

Additional examples of financial illiteracy appear in mortgage markets. For example, many individuals who hold adjustable rate mortgages (ARMs) exhibit shocking ignorance of their mortgage terms. Bucks and Pence (2006) document this by comparing the distribution of household-reported mortgage characteristics in the Survey of Consumer Finances to distributions in three lender-reported datasets. ARM borrowers often could not provide basic information about their own loans.[6] When ARM borrowers did report these loan characteristics, they regularly got them wrong, often underestimating their risks and potential liabilities.

Agarwal et al. (2009) corroborate this evidence with data from a mandatory loan counseling program for high-risk mortgage applicants in select Chicago zip codes. Most of the applications were for ARMs. According to a summary of counselor assessments from the program, the "overwhelming majority" of ARM applicants were unaware that their interest rate was not fixed for the life of the mortgage.[7] In addition, 9% of counseled borrowers gave a verbal description of the loan that was significantly different from loan documents.

These studies suggest that many consumers lack the financial knowledge and computational ability to make informed financial decisions. However, a survey-based study could dramatically *overstate* the lack of financial literacy in the population since respondents have no concrete incentive to answer questions correctly. Respondents may ignore or give the wrong answer to a question they could answer accurately with more time and analysis. In contrast, when one realizes there is a monetary impact resulting from a financial decision, one has a strong incentive to make the correct choice. Thus, when faced with making a financial decision as opposed to simply answering questions about it, individuals may expend more effort to make the proper calculations and acquire the necessary information. However, if higher financial

[6] 35% did not know the per-period cap on interest rate changes; 41% did not know the maximum interest rate allowed; and 20% did not know the initial interest rate.

[7] Counseling information was provided by Housing Action Illinois (2007). For loans for which the counseling was aimed at protecting against predatory lending, they also found that 9% of loans had "indications of fraud," 22% had interests rates over 300 basis points above the market rate, and half of all borrowers were deemed unable or nearly unable to afford the loan.

literacy scores lead to positive financial behavior and outcomes, we can at least say that these tests capture variables that seem to be important.

Some of the strongest evidence that the causal chain proceeds from literacy to outcomes comes from three papers by Lusardi and Mitchell (2006, 2007a, 2007b). The authors document low levels of financial literacy, little successful retirement planning, and wide variation in household wealth entering retirement. Data from the 1992 and 2004 HRS cohorts and from the Rand ALP indicate that the three variables are strongly and positively correlated, even controlling for economic, demographic, and other characteristics available in the HRS. Furthermore, Lusardi and Mitchell establish that causation proceeds from literacy and planning to wealth, and not from wealth to planning and literacy.

Lusardi and Mitchell (2006) establish positive correlations among knowledge, planning, and wealth using the three-question financial literacy module in the 2004 HRS. These relationships persist after controlling for a broad range of economic and demographic characteristics available from the survey. A correct response to each financial literacy question significantly increases the probability of having successfully calculated how much to save for retirement. Correct responses also predict higher net worth in the lowest two quartiles of household wealth, but the relationships are less significant among the wealthier. In addition to these results, the HRS indicates that very few households even attempt to figure out how much to save. Less than one third of respondents said they had tried, and only 18% claimed to have successfully done so.

In a complementary paper, Lusardi and Mitchell (2007a) examine the 1992 and 2004 HRS cohorts, and find that planning for retirement affects wealth and not vice versa. After confirming that planning predicts wealth, the authors test for reverse causality using instrumental variable techniques. In particular, they regress a dummy variable for having planned for retirement on economic and demographic characteristics and on the previous year's regional change in housing prices. The last variable is thought to be a valid instrument for household wealth. The effect of the wealth instrument on planning is not

significant, which suggests that individuals are not more likely to plan for retirement because they are wealthier.

Lusardi and Mitchell's (2007b) analysis of the Rand ALP confirms their findings in the HRS. They find that scores on a more detailed financial literacy test predict planning behavior. To eliminate endogeneity, they use answers to the following question as an instrument for financial literacy: *How much of your school's education (high school, college or higher degrees) was devoted to economics? A lot, some, little, or hardly at all?*

Interestingly, the instrument produces an even larger estimate of the relationship between literacy and planning than the original test scores. The ALP asked a larger set of financial literacy questions than the HRS, many of which require more detailed knowledge of financial instruments. Lusardi and Mitchell find that after instrumenting for retirement planning, planning behavior still predicts financial literacy. Thus, it is possible that planning affects literacy but not vice versa. However, it is unlikely that reverse causality fully explains the relationship. The NLSY sample of young adults performed just as well as the HRS cohort on the same measures of financial literacy, even though the HRS sample population were more likely to have thought about retirement (Lusardi, Mitchell, and Curto, 2009; Lusardi and Mitchell, 2006). In the realm of retirement planning and savings, financial literacy appears to affect financial behavior and outcomes.

The correlation between financial literacy and behavior is generally corroborated by studies of the loan market. In a survey of Washington State residents, Moore (2003) finds that less financially literate consumers tended to make less intelligent mortgage product choices. Furthermore, consumers who had loans from lenders involved in a predatory lending lawsuit tended to do worse on questions about investing and compound interest. The study suggests that financial illiteracy leaves consumers open to exploitation. Stango and Zinman (2006, 2007) document that consumers who were unable to calculate the interest rate on a loan—given the principal and a stream of payments—borrowed more, accumulated less wealth, and paid more for credit. Campbell (2006) finds that less financially sophisticated households

tend to make significant financial mistakes. In particular, they are less likely to refinance their mortgages under advantageous circumstances.

In summary, there is overwhelming evidence that many consumers are not financially literate and, further, that these consumers tend to make poor financial decisions.

2.2 Financial Education, Financial Literacy and Financial Behavior

If financial illiteracy causes undesirable financial behaviors, then increasing financial literacy could improve consumer welfare. An array of financial education programs have been introduced in the United States for this purpose over the past few decades. These programs range from employer-provided seminars on retirement planning, to state-mandated personal finance classes in public schools, to one-on-one mortgage counseling. Are these programs effective? If so, which types of programs are more effective? Our discussion here draws on several reviews of the financial education literature, not all of which agree on the strength of the available evidence. The most comprehensive of these reviews is a recent article by Collins and O'Rourke (2009), who are cautiously optimistic that financial education can be effective. Martin (2007) shares this optimism for programs targeting savings and retirement, credit, and homeownership. Hogarth (2006) gives an even more sanguine assessment. However, not all reviews are positive. Hathaway and Khatiwada (2008) and Willis (2008a, b) find no conclusive evidence that financial education programs are effective. In a review of five studies evaluating personal financial management courses, Caskey (2006) concludes that non-experimental program evaluations—even ones that use instrumental variables and other modeling techniques to eliminate endogeneity—often fail to approximate results obtained under experimental conditions. This critique casts doubt on studies where treatment is not randomly assigned and, hence, on the vast majority of papers in the financial education literature.

Despite the limitations of existing research, we believe there is strong evidence that some financial education programs improve financial behavior and outcomes. There is weaker evidence that these programs increase financial literacy. However, the link between education, literacy, and outcomes is

poorly established. No study definitively demonstrates that a financial education program improved participant outcomes *through* financial literacy, and many studies find that the financial education programs evaluated were ineffective.

In addition, we find that the level of evidence for financial education's effectiveness depends heavily on the type of financial education program studied. In the next two sections, we discuss the effectiveness of financial education in the workplace and in schools, respectively; since this literature provides the strongest evidence that financial education can be effective. Then, we examine how evaluations of mortgage, bankruptcy, credit-repair, and other financial education programs augment these results. Finally, we document initial research into optimal programs and innovative study designs that could serve as models for future research.

2.2.1 Behavior and Outcomes—Evidence from Workplace Programs

Financial education program evaluations may not produce credible impact estimates if the program suffers from potential selection bias: that is, if participation is voluntary, then exposure to treatment may be correlated with unobserved traits that affect outcomes. As a result, the impact may actually be attributable to these traits instead of to the treatment. To deal with this problem, studies of school and workplace financial education have looked for valid instruments for exposure to treatment. Workplace studies have used *availability* of workplace financial education programs rather than actual attendance, while school-based studies have used state financial education mandates. Overall, these studies find that financial education does affect outcomes, increasing savings rates, pension plan participation, and net worth later in life. Since this body of research provides the strongest evidence that financial education can affect outcomes, we discuss several of these papers in detail.

Bernheim and Garrett (2003) use a telephone survey of U.S. workers conducted by Merrill Lynch to study whether available financial education in the workplace predicts savings behavior. Survey respondents provided economic and demographic information and also reported whether their current employer offered financial education seminars. Availability of workplace financial education predicted

increases in savings rates, assets held in 401(k) accounts and other retirement accounts, and 401(k) participation. However, the effect on total assets was not significant, suggesting that differences could be due to asset shifting rather than greater overall savings. Bernheim and Garrett argue that availability of financial education should be a valid instrument for treatment because workers do not choose employers based on financial education offerings. In fact, there is evidence from the survey that workplace financial education is often remedial, which could bias the estimated impact downward and allow positive impact estimates to be interpreted as lower bounds on the true impact.

This study potentially suffers from a number of sources of bias. The first is that the tendency to offer financial education seminars might be correlated with employer characteristics that attract certain types of workers, in which case availability of financial education might still be correlated with unobservable worker characteristics even though it is not a factor in the job search process, causing upward bias. Second, the authors cannot control for pension plan characteristics, which could drive differences in savings patterns. Though they cite studies that find low correlations between plan features and participation and savings rates, other papers find stronger relationships (Bayer et al., 2008). Third, the fact that education does not affect net worth raises the possibility that observed savings differences are driven by asset shifting, not greater total savings.

The main drawback to this study, however, is that it relies on self-reported employee survey data, which is less reliable than employer-provided or administrative data. Importantly, the survey instrument for exposure to workplace financial education may not be exogenous because of imperfect recall. If respondents who were most influenced by workplace financial education were more likely to recall that it was offered, estimated impacts would be upwardly biased. Though this potential bias is serious, if we assume that workplace financial education did not convince anyone to save less, then this upward bias would show that financial education did have a positive effect, just a smaller one than estimated.

A complementary paper by Bayer et al. (2009) corroborates the findings of Bernheim and Garrett while addressing several concerns about that study. It uses a survey of employers taken over two

consecutive years, providing more accurate measures of employee 401(k) contributions and availability of workplace financial education. The employer survey allows Bayer et al. to control for pension plan characteristics, and its longitudinal nature allows them to control for individual firm characteristics, eliminating a significant potential source of selection bias. Cross-sectional results confirm that workplace seminars have a significant and positive effect on 401(k) participation and contributions, with a greater effect for low-income employees. In addition, Bayer et al. confirm that workplace seminars are often remedial, making estimated cross-sectional impacts lower bounds of the true effects. The only potentially serious drawback to Bayer et al. is a lack of information on individual employees, including demographic characteristics and non-retirement forms of saving. The authors cannot reject the possibility that increased participation and contribution rates are driven by asset shifting and individual heterogeneity. Nevertheless, in conjunction with Bernheim and Garrett (2003), Bayer et al. (2009) provide evidence that workplace education programs can influence financial behavior.

Lusardi (2004) finds that having attended a retirement seminar (most of which are employer-provided) predicts greater overall savings, not just larger pension contributions. This finding fills an important gap in Bernheim and Garrett and Bayer et al. Lusardi uses the 1992 Health and Retirement Survey, which contains detailed information on demographic and economic characteristics, past and expected economic shocks, Social Security and pension wealth, and other characteristics that could influence savings. The data permit Lusardi to control for individual heterogeneity to an extent that Bernheim and Garret (2003) and Bayer et al. (2009) cannot. She finds that having attended a retirement seminar increases several measures of total savings and wealth by economically significant amounts. She also finds that differences are greatest (proportionally) for those who save the least and are the least educated. Importantly, Lusardi notes that her estimates decrease but remain significant when a full set of individual controls are included.

These three studies make a strong case that financial education can improve financial behavior. They find that the effect is greatest for the most economically vulnerable populations. However, these studies

do not show that programs are effective because they increase financial literacy. It is true that many workers are unaware of their financial vulnerabilities and hence save too little (Bernheim, 1995) and that workplace seminars may increase awareness of these vulnerabilities. However, these seminars may increase savings because they make peer effects more important (Duflo & Saez, 2003), increase employees' exposure to plans offered by the firm, or provide strong encouragement to contribute, rather than because they improve employees' understanding of the benefits of saving or the specific financial products they are using.

Among studies that test explicitly whether workplace financial education increases financial literacy, the results are somewhat questionable (e.g., Kim et al., 1998; Garman et al., 1999; Clark and D'Ambrosio, 2002; Kim, 2007; Holland et al., 2008). An example is a paper by Hira and Loibla (2005), who find in a survey of a large U.S. insurance company that employees who attended a half-day retirement seminar reported increased knowledge in four areas: retirement needs, investing, planning for the future, and managing credit. However, these measures of financial knowledge are employee perceptions, not objective assessments. Individuals often perceive knowledge gains to be greater than actual gains, and those who attended a seminar may claim to have derived some benefit whether or not they actually did (Willis, 2008b).

2.2.2 Behavior and Outcomes—Evidence from School-Based Programs

Studies of school-based financial education programs provide mixed evidence of effectiveness. Results from studies of individual school-based programs that found significant improvements in student financial knowledge and behavior (e.g., Boyce & Danes, 1998; Danes, 2004; Peng et al., 2007; Mandell, 2008) were subsequently challenged based on research design flaws or data limitations. Another set of papers that used state financial education mandates as an instrument for exposure to in-school financial education found some evidence that school programs affect savings and investment in adulthood, but the results are not conclusive. An oft-cited study by Bernheim, Garrett, and Maki (2001, hereafter BGM) provides some evidence that state financial education mandates lead to greater asset accumulation in

adulthood. They use the same Merrill Lynch survey as Bernheim and Garrett (2003). Most respondents were in school during the 1960s and 1970s, when most state mandates were introduced. Mandates are used as an instrument for treatment based on the argument that mandates do not reflect population characteristics, so these results should be robust to selection effects.

Several steps are required to argue that a link between state mandates and adult savings behavior is due to financial education. State mandates must be exogenous to population characteristics that might affect savings; they must lead to greater exposure to financial education; and they must be correlated with saving behavior. BGM argue that state mandates are exogenous, usually driven by efforts from individual legislators and interest groups rather than broad public consensus. States with and without mandates do not differ significantly in income, proportion of high school graduates, or retail sales during the period studied. To demonstrate increased exposure, BGM estimate a probit model and find that survey respondents who graduated high school after the introduction of a mandate in their state are more likely to report having been taught about household finance in school. The probability increases with years in school after the mandate, suggesting mandates take time to implement. The authors check whether a variable for "years before mandate" affects the probability of exposure and find the coefficient is small and statistically insignificant, suggesting that results do not reflect a general trend of increasing financial education independent of state mandates. Finally, BGM find that more years in high school after a mandate predict higher reported savings rates and net worth.

The BGM study is subject to a number of criticisms. In a recent paper, Cole and Shastry (2009, hereafter CS) attempt to replicate BGM's results with U.S. Census data and a more robust empirical specification. Their findings do not match. In particular, CS criticize BGM for assuming that years in school after imposition of a mandate is linearly related to outcome variables and for not controlling for statewide differences in economic conditions. CS use the same specification as BGM to estimate the effect of mandates on financial market participation rates and investment income (used as a proxy for savings). As in BGM, relationships are small but statistically significant for both outcome variables. But

when CS adjust the BGM specification by including a full set of birth-year cohort dummies and state fixed effects, the results change. One would expect to see no effect on outcomes for dummies indicating the number of years a respondent graduated before a mandate and monotonically increasing (positive) estimates for each extra year in school after a mandate. Instead, the coefficients on all dummies, from graduation five years prior to a mandate to five or more years post mandate (and all years in between), are large and positive and most are statistically significant. This holds for both participation rates and investment income. There is no clear break point at the time of mandate introduction, and perhaps most worryingly, coefficients for having graduated at least five years after a mandate are much smaller than the others; the relationship is not monotonic.

CS investigate a number of possible explanations for their results. One interesting finding comes from a check for macroeconomic covariates with mandate introduction. Mandates were overwhelmingly introduced during times of high state GDP growth, which could explain why financial market participation and investment income went up both before and after the mandates. It is possible that these effects dominated any actual effects of state mandates.

The findings of CS suggest that BGM's results may not survive a more robust empirical specification. However, BGM perform checks of their own indicating that the differences might come from the datasets and measures used. When they add a complete set of age dummies and a wider range of socioeconomic controls, they find their estimates do not change significantly, though standard errors increase. In addition, CS fail to mention that coefficients for dummies for the third and fourth post-mandate years in school are much higher than others for all specifications. Given implementation lags and higher GDP growth when mandates were introduced, one could interpret CS's results in a manner consistent with BGM's findings. Finally, CS's measure of investment income is a very imprecise proxy for savings and net worth. CS only show that state mandates did not lead students to invest more in 'revenue-producing' savings vehicles; they cannot conclude that overall savings did not increase.

Few of the studies discussed so far find convincing evidence that financial education actually increases financial literacy. There has been more of an emphasis on outcomes, regardless of the source of the outcome. However, a paper by Tennyson and Nguyen (2001) finds that high school students in states requiring financial coursework scored higher on a test covering several areas of financial knowledge. Differences were greater for knowledge-based questions than for analytical questions, and scores were significantly higher in the categories of savings and investment, but not much higher in money management, spending, and debt. Mandatory coursework was shown to be more important than mandatory testing. The authors control for individual student characteristics, school size, and a few state characteristics that might affect scores.

As with other studies, this one has its limitations. Most worrisome is that only three states in the sample mandated specific financial education coursework. Unusually high scores due to unobserved characteristics in just one state could produce the positive results. Another issue is that the results are small in magnitude. It would be beneficial to extend the study by using a larger dataset with more states to see how robust the results are. It is worrisome, for example, that treated students exhibited greater knowledge of savings and investment but not of other financial management subjects. A population that knows how to invest money, but not how to manage expenditures or debt will remain financially vulnerable.[8]

2.2.3 Behavior and Outcomes—Evidence from Mortgage- and Other Counseling Programs

Studies of mortgage counseling programs build on the workplace- and school-based literature in three important ways. First, the studies evaluate specific financial education programs and so tell us more about the programs as well as the participants' financial circumstances before and after counseling. Second, mortgage counseling programs are very different in format from school and workplace programs, which

[8] Studies of programs for consumers in bankruptcy provide weak evidence that bankruptcy education improves financial literacy. Since 2005, federal law has mandated counseling for anyone in bankruptcy, and certain states and metropolitan areas required counseling before that mandate. Required counseling has historically been related to other local bankruptcy practices that affect successful bankruptcy plan completion, making the effect of financial education on outcomes difficult to disentangle (Braucher, 2001). Studies in this area include Wiener et al. (2005) and Lyons et al. (2008). This may be a prime area for future research in the area.

are usually conducted in a classroom setting. Mortgage programs are usually offered in a one-on-one counseling format that addresses individual questions and needs. In addition, mortgage programs treat individuals who are at the point of making a critical financial decision. Finally, the mortgage programs discussed here are primarily targeted at low- to middle-income populations with characteristics that make them more likely to default on their mortgages. Since this group has the lowest level of financial literacy, it may be most in need of counseling and is therefore an important group to study.

Overall, there is mixed evidence that mortgage counseling improves behavior and outcomes. There is also the potential for these studies to suffer from sample selection bias. The first program evaluation that tried to rigorously correct for the selection problem is Hirad and Zorn (2002), who analyze a large sample of high-risk borrowers whose mortgages were purchased by the Fannie Mae Affordable Gold program. Most borrowers were required to go through mortgage counseling before Fannie Mae would buy their loans from the original servicers, but some borrowers were exempt. Controlling for observable characteristics, counseled borrowers were less likely to become 90 days delinquent on their mortgages. Hirad and Zorn estimate a four-stage model for selection into treatment, type of organization providing treatment, and type of treatment received. Once selection is accounted for, certain types of treatment were still effective, but of questionable magnitudes. In particular, one-on-one counseling was found to reduce delinquency rates by over 90 percent while other forms of treatment had no effect. The authors note that their selection model is a poor fit and included variables that are most likely correlated with the error term in the original regression. Consequently, one might reasonably be skeptical of their results.

Studies by Hartarska and Gonzalez-Vega (2005, 2006) and Quercia and Spader (2008) also find that pre-mortgage counseling is related to loan outcomes, but their results are somewhat contradictory. Hartarska and Gonzalez-Vega find that counseled borrowers had lower default rates and exercised default more optimally, but that prepayment behavior was not affected. In contrast, Quercia and Spader find more optimal prepayment behavior, but no effect on default rates. Tthese differences may reflect the period studied in each case— Hartarska and Gonzalez-Vega used the 1990s, whereas Quercia and Spader

followed borrowers through 2006, a time of unusually low interest rates which gave many borrowers the opportunity to refinance. However, there may be additional issues with these studies. Quercia and Spader do not test whether there is selection into different types of counseling nor do they control for selection into treatment, arguing instead that since treatment requirements were determined by lenders, riskier borrowers were more likely to have received treatment. They are unable to test this claim directly. In Hartarska and Gonzalez-Vega, counseled borrowers were not allowed to apply for a loan until they achieved nonnegative cash flow, defined as income netting out expenses, mortgage, and other debt payments. Thus, counseling may have acted as a filter, preventing less financially able borrowers from taking out loans, which would upwardly bias their results. It is not clear what happened to individuals who did not "graduate" from counseling, so we don't know whether counseling led to better loan outcomes by improving financial management or by weeding out the less credit worthy.

In contrast to the last three papers, Agarwal et al. (2009) find little evidence that a state-mandated pre-mortgage counseling program for high-risk borrowers in select Chicago zip codes led to better mortgage choices. However, their study shows how a financial education program can affect outcomes without necessarily improving literacy. The authors find a significant drop in default rates of mortgages originated in the treated zip codes during the period of mandatory counseling. However, this drop appears to occur because the riskiest lenders and borrowers left the market, not because the remaining borrowers chose better mortgage products. The threat to lenders of increased oversight and potential fraud detection, as well as the perceived cost to borrowers of attending counseling sessions, dramatically reduced both the supply and demand for credit. Borrowers who were able to choose less risky products to avoid counseling did so, and lenders rejected far more loan applications and originated fewer low-documentation loans during the treatment period (activity resumed to normal levels when the program ended). While some borrowers followed the advice provided by counselors, many modified their loans in ways that were contrary to counselor recommendations, and others took out loans they had been told they could not

afford. In aggregate, the counseling program did not appear to materially improve loan outcomes for individuals who stayed in the market.

Mortgage and credit counseling programs often include services apart from financial education, such as client advocacy and proactive intervention, which make the effects of financial education difficult to disentangle. One such program is the Indianapolis Neighborhood Housing Partnership (INHP), a voluntary mortgage counseling program evaluated by Agarwal et al. (2010a). The study finds that, controlling for loan characteristics, borrowers who participated in INHP, some of whom had mortgages originated and serviced by INHP itself, had significantly lower default rates 12 and 18 months after origination. This result is robust to several econometric specifications and to a matched propensity score model. However, while it is clear that INHP's services improved outcomes, it is not clear how much of the effect was due to better loan terms, how much due to INHP's proactive interventions when loans became delinquent, and how much due to improved financial management on the part of borrowers.

The strongest evidence for the effectiveness of mortgage counseling comes from a study of a post-mortgage counseling program by Ding, Quercia, and Ratcliffe (2008). The program treated over 25,000 borrowers with high-risk characteristics but low-risk mortgages. All loans were fixed-rate and 99% had 30-year amortization periods, but borrowers had low credit scores, and loans had high loan-to-value ratios (three-quarters were over 95%). The authors find that telephone counseling delivered to 45-day delinquent mortgage borrowers led to a higher cure rate and a lower foreclosure frequency for those particular loans. The authors control for selection into treatment with a well-fitting model, noting that their estimates decrease in magnitude as a result, but remain positive and statistically significant. Apart from exemplifying the importance of controlling for unobserved borrower characteristics, this paper suggests that mortgage counseling can be effective if provided at a critical point in the decision process.

One non-mortgage counseling study produces further evidence that financial counseling can affect outcomes. Elliehausen, Lundquist, and Staten (2007) examine credit counseling programs that five agencies approved by the National Foundation for Credit Counseling (NFCC) provided to 8,000

borrowers during the summer of 1997; a matched comparison group did not receive NFCC counseling. The study follows credit and payment histories until 2000 and finds that credit scores, debt levels, and bank account usage improved for counseled individuals. Counseling was most effective for those with the worst initial credit scores and debt behaviors. Differences are much smaller but statistically significant after correcting for selection. This study benefits from uniformity in treatment; the NFCC had specific standards for its counseling providers, and treated borrowers did not receive other NFCC services in 1997. Unobserved financial services received by members of the comparison group would bias results downward, lending more credibility to the estimated effect of counseling.

2.3 Optimal Program Structure

A few papers have investigated whether different types of programs vary in effectiveness, and others have estimated the marginal impact of extra hours of treatment. Evidence on delivery methods is inconclusive, but it appears that extra hours of education or counseling have a positive impact on outcomes.

Papers by Hirad and Zorn (2002), Quercia and Spader (2008), and Barron and Staten (2009) compare the effects of four types of treatment: home-study, telephone/Internet instruction, classroom education, and one-on-one counseling. Their findings do not consistently support one type of treatment over others. The first two studies evaluate mortgage counseling programs and find that classroom and one-on-one treatment—which tend to be more intensive than other forms—had larger impacts than telephone and home study, which had no significant effects. In contrast, Barron and Staten find that, in a credit counseling program, one-on-one counseling was not more effective than telephone or Internet counseling when clients were allowed to choose the type of treatment. The conflicting studies evaluate two different types of programs, which could explain their diverse findings. It is also possible that the limitations of the mortgage studies biased their results upward, or that Barron and Staten's results do not reflect true impacts due to selection bias. As discussed earlier, the selection model of Hirad and Zorn was a rather poor fit and included regressors that may have been positively correlated with the error term in the main

specification. Quercia and Spader did not model selection into treatment at all, let alone selection into treatment types. Thus, the results in both papers may be upwardly biased. Barron and Staten do not model selection, but they do find evidence of selection that may have driven their results. In their credit counseling program, Internet clients had seen larger reductions in their credit scores during the year preceding counseling, which could indicate that these clients were particularly motivated to learn and change their behavior. In contrast to Hirad and Zorn and Quercia and Spader, Ding, Quercia, and Ratcliffe (2008) find that telephone counseling was effective for 45-day delinquent mortgage holders. Again, the different results may stem from program differences (or perhaps pre-mortgage counseling is simply less effective than post-mortgage counseling).

Two studies by Collins (2007) and Clancey et al. (2001) find evidence that more treatment leads to better outcomes. Collins finds that for delinquent borrowers, extra hours of counseling (up to five hours) decreased their probability of moving to a more serious stage of foreclosure. Thus, the marginal effect of extra counseling was positive. However, the study suffers from a small sample, a short follow-up period of six months, and the possibility that borrowers were simultaneously exposed to other treatments. Furthermore, the instrument for hours of instruction—marketing efforts in the borrower's metropolitan area—leaves open the possibility that more motivated individuals received more counseling.

Clancy et al. (2001) study financial education classes for low-income participants in individual development account (IDA) programs, which involve matched savings accounts. Extra hours of class were positively correlated with savings behavior through 18 hours of treatment; someone receiving 12 hours of education saved over $100 more per year than someone receiving no education. The 14 programs studied all had financial education requirements, but specific content varied. In general, education provided both financial information and strategies for effective saving, as well as instruction on more specific topics such as home purchase. Though the authors use a two-stage selection model for leaving the program, they do not control for selection into hours of treatment. Thus, we do not know whether the

results are due to endogeneity with characteristics of the borrowers or of the particular requirements of each IDA program.

For the most part, evidence on treatment types and hours of treatment is inconclusive. More studies that correct for selection into treatment types and hours are needed to corroborate and clarify existing results. At the very least, given that some financial education programs are effective, we know that this research agenda is worth pursuing.

2.4 Innovative Research Study Designs

The literature on financial education has produced several papers notable for the design of their program evaluations. These papers provide instructive examples of randomization techniques that do not require denying treatment, of specific demographic focus, and of unconventional forms of treatment.

As we discussed earlier, a problem plaguing the majority of program evaluations is endogeneity—selection into treatment, or into type and intensity of treatment, is not random. This problem is difficult to overcome because randomization would require denying treatment to some who want and need it. A few studies have delayed treatment for the control group (rather than denying it entirely) or offered an extra incentive to the treatment group to participate. These studies have had varying success in implementation, but their methods are instructive.

Collins (2009) and Servon and Kaestner (2008) delay treatment. In the Collins study, women in both the treatment and control groups receive the same financial education curriculum, but the control group receives it a year after the treatment group. If similar changes in credit scores and savings behavior are observed for the two groups roughly one year apart, then differences may be attributed to financial education. Servon and Kaestner use the same strategy to test whether access to what they call "information and communications technologies," including Internet and online banking services, can be a pathway to financial literacy. They study a program that gave participants a computer; taught them how to use the Internet and online banking services; and provided financial literacy training. A treatment group was given computers and instruction immediately, while a control group received the same services nine

months later. Although the study suffered from implementation problems (imperfect randomization) and produced insignificant statistical results, it is instructive for its experimental design and for its isolation of a particular factor—access to and facility with technology—that could impact financial literacy.

An interesting paper by Duflo and Saez (2003) illustrates the incentive strategy. The authors study enrollment by employees at a large university in a tax-deferred accounts program. They offered a $20 incentive to attend a university-sponsored benefits information fair, randomly selecting departments within the university and then randomly selecting employees within the selected departments to receive the offer. This setup let the authors compare behavior of treated employees to that of untreated employees in the same department and also to that of employees in untreated departments. Duflo and Saez do not examine the effect of financial education per se, but their design could be used to develop incentive-based financial literacy programs, thus providing exogenous difference in take-up of treatment.

Since educational needs vary widely among consumers, financial education programs are often targeted toward very specific demographic and socioeconomic groups. As one example, Sanders, Weaver, and Schnabel (2007) study battered women at four emergency shelters. Two of the shelters had implemented a financial education curriculum tailored to the needs of these women, while the other two shelters had not yet implemented the program. The study suffers from a very small sample, subjective measures of financial knowledge and "self-efficacy," and significant attrition before the follow-up exam. Nevertheless, this research model is promising for situations with more observations, objective knowledge and behavior data, and more effective follow-up measures. All of the above cited studies evaluate conventional forms of financial education. However, educators have recently experimented with more innovative delivery methods. Spader et al. (2009) analyze one such experiment, a Spanish-language soap opera entitled "Nuestro Barrio" (Our Neighborhood) targeted at low-income Hispanic immigrants. Information and instruction about financial products, such as banking services and credit behavior, are incorporated into the plot line. The creators hoped to reach audiences that otherwise would not be exposed to financial education. They also hoped to overcome traditional barriers to participation in

financial education programs, such as time and monetary costs as well as mistrust of organizations providing the education. However, the impact of this effort will be difficult to quantify.

3. Conclusions

Mandated financial counseling and increased oversight of lenders (anti-predatory legislation) are important policy tools being considered for implementation following the meltdown of the housing market in 2007-2008 ; e.g., see President Obama's *Homeownership Affordability and Stability Plan of 2009*.[9] In this chapter we review the literature on financial counseling, financial literacy, and consumer decision making. We find ample evidence that many consumers lack basic financial literacy. In some cases, financial education improves financial literacy and behavior, and it is most effective for those who have the least financial knowledge, income, and savings. However, it is not clear that effective programs improve behavior through increased literacy, whether programs are cost-effective, or which types of programs are most effective. Answering these questions requires a great deal more research.

Fortunately, the recent proliferation of financial education programs provides ample opportunity to conduct such research. However, the designs of existing programs are rarely conducive to robust impact evaluations.[10] In their review, Hathaway and Khatiwada call for the introduction of formal program evaluation methods into the design of financial education programs. This recommendation seems to be most appropriate.

[9] Details of the plan aimed at stabilizing U.S. housing markets can be found at: http://www.ustreas.gov/press/releases/reports/hfa%20initiative%20fact%20sheet%2010%2019%2009.pdf

[10] For a discussion of problems involved with evaluating financial counseling and training programs see LaLonde (2010).

REFERENCES

Agarwal, Sumit, Gene Amromin, Itzhak Ben-David, Souphala Chomsisengphet, and Douglas D. Evanoff, 2009. "Do Financial Counseling Mandates Improve Mortgage Choice Performance? Evidence From a Legislative Experiment." Fisher College of Business Working Paper 2008-03-019.

———, 2010a. "Learning to Cope: Voluntary Financial Education Programs and Loan Performance during a Housing Crisis." American Economic Review: Papers & Proceedings, 100 (3), forthcoming.

———, 2010b. "Financial Counseling, Financial Literacy, and Household Decision Making." in Lusardi, Annamaria and Olivia S. Mitchell, Financial Literacy: Implications for Retirement Security and the Financial Marketplace, Oxford University Press, forthcoming.

Agarwal, Sumit, Souphala Chomsisengphet, Chunlin Liu, and Nicholas Souleles, 2006. "Do Consumers Choose the Right Credit Contracts?" Working Paper, Federal Reserve Bank of Chicago, 2006-11.

Agarwal, Sumit, John Driscoll, Xavier Gabaix, and David Laibson, 2008. "Learning in the Credit Card Market," NBER Working Paper #13822.

———, 2009. "The Age of Reason: Financial Decisions over the Life-Cycle and Implications for Regulation," Brookings Papers on Economic Activity, 2009 (2), 51-117.

Agarwal, Sumit, John Driscoll, and David Laibson, 2008. "Optimal Mortgage Refinancing: A Closed Form Solution." NBER Working Paper #13487.

Agarwal, Sumit, and Bash Mazumder, 2010. "Cognitive Ability and Financial Decision Making" Working Paper, Federal Reserve Bank of Chicago.

Agarwal, Sumit, Paige Skiba, and Jeremy Tobacman, 2009. "Payday Loans and Credit Cards: New Liquidity and Credit Scoring Puzzles?" American Economic Review – Papers and Proceeding, 99 (2), 412-417.

Australia and New Zealand Banking Group (ANZ), 2005. "ANZ Survey of Adult Financial Literacy in Australia."

Bakken, R., 1967. "Money Management Understandings of Tenth Grade Students." National Business Education Quarterly, 36, 6.

Barron, John M., and Michael E. Staten, 2009. "Is Technology-Enhanced Credit Counseling as Effective as In-Person Delivery?" Presented at the Networks Financial Institute at Indiana State University Conference: Improving Financial Literacy and Reshaping Financial Behavior, May 14-15, 2009.

Bayer, Patrick J., B. Douglas Bernheim, and John K. Scholz, 2009. "The Effects of Financial Education in the Workplace: Evidence From a Survey of Employers." Economic Inquiry, 47 (4), 605-624.

Bernheim, B. Douglas, 1995. "Do households appreciate their financial vulnerabilities? An analysis of actions, perceptions, and public policy," in Tax Policy and Economic Growth, American Council for Capital Formation, Washington, DC, 1–30.

———, 1998. "Social Security Benefits: An Empirical Study of Expectations and Realizations," in Rita Ricardo-Campbell and Edward P. Lazear (eds.), Issues in Contemporary Retirement, Hoover Institution Press.

Bernheim, B. Douglas, and D. Garrett, 2003. "The Effects of Financial Education in the Workplace: Evidence From a Survey of Households." Journal of Public Economics, 87, 1487-1519.

Bernheim, B. Douglas, D. Garrett, and D. Maki, 2001. "Education and Saving: The Long-Term Effects of High School Financial Curriculum Mandates." Journal of Public Economics, 80, 435-465.

Boyce, L. and Sharon M. Danes, 1998. "Evaluation of the NEFE high school financial planning program." National Endowment for Financial Education, Denver, CO.

Braucher, J., 2001. "An Empirical Study of Debtor Education in Bankruptcy: Impact on Chapter 13 Completion Not Shown." The American Bankruptcy Institute Law Review, 9, 557-592.

Bucks, Brian and Karen Pence, 2006. "Do homeowners know their house value and mortgage terms?" Working Paper, Federal Reserve Board of Governors.

Campbell, John Y., 2006. "Household Finance." The Journal of Finance, 61 (4), 1553-1604.

Caskey, John P., 2006. "Can Personal Financial Management Education Promote Asset Accumulation by the Poor?" Networks Financial Institute Policy Brief 2006-PB-06.

Chen, Haiyang and Ronald P. Volpe, 1998. "An Analysis of Personal Financial Literacy Among College Students." Financial Services Review, 7 (2), 107-128.

Clancy, M., M. Grinstein-Weiss, and M. Schreiner, 2001. "Financial Education and Savings Outcomes in Individual Development Accounts." Center for Social Development, Working Paper No. 01-2, Washington University.

Clark, Robert L. and Madeleine B. D'Ambrosio. 2002. "Financial Education and Retirement Savings." TIAA-CREF Institute Working Paper No. 4-070102-A.

Cole, Shawn and Gauri Kartini Shastry, 2009. "Smart Money: The Effect of Education, Cognitive Ability, and Financial Literacy on Financial Market Participation." Harvard Business School Working Paper 09-071.

Collins, Michael J., 2007. "Exploring the Design of Financial Counseling for Mortgage Borrowers in Default." Journal of Family and Economic Issues, 28, 207-226.

———, 2009. "The Impacts of Mandatory Financial Education: Evidence From a Field Study." University of Wisconsin.

Collins, M. and C. O'Rourke, 2009. "Evaluating Financial Education and Counseling: A Review of the Literature." Draft, University of Wisconsin-Madison.

Consumer Federation of America and American Express Company (CFA/AMEX), 1991. "Student Consumer Knowledge: Results of a National Test." Washington, D.C.

Danes, Sharon M. and Takira K. Hira, 1987. "Money Management Knowledge of College Students." The Journal of Student Financial Aid, 17(1), 4-16.

Danes, Sharon M., 2004. "Evaluation of the NEFE High School Financial Planning Program Curriculum: 2003-2004."

Ding, Lei, Roberto G. Quercia, and Janneke Ratcliffe, 2008. "Post-purchase Counseling and Default Resolutions among Low- and Moderate- Income Borrowers." Journal of Real Estate Research, 30 (3), 315-344.

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 (3), 815-842.

Elliehausen, Gregory, E. Christopher Lundquist, and Michael E. Staten, 2007. "The Impact of Credit Counseling on Subsequent Borrower Behavior." Journal of Consumer Affairs, 41 (1), 1-28.

Employee Benefit Research Institute (EBRI), 1995. "Are Workers Kidding Themselves? Results of the 1995 Retirement Confidence Survey." Washington, D.C.

Garman, E. Thomas, Jinhee Kim, Constance Y. Kratzer, Bruce H. Brunson, and So-hyun Joo, 1999. "Workplace Financial Education Improves Personal Financial Wellness." Financial Counseling and Planning, 10 (1), 79-88.

Gartner, Kimberly and Richard M. Todd, 2005. "Effectiveness of Online 'Early Intervention' Financial Education for Credit Cardholders." Federal Reserve Bank of Chicago, available at: www.chicagofed.net/digital_assets/others/events/2005/promises_and_pitfalls/paper_intervention.pdf

Gustman, Alan L. and Thomas L. Steinmeier, 2005. "Imperfect Knowledge of Social Security and Pensions." Industrial Relations, 44 (2), 373-397.

Hartarska, Valentina and Claudio Gonzalez-Vega, 2005. "Credit Counseling and Mortgage Termination by Low-Income Households." Journal of Real Estate Finance and Economics, 30 (3), 227-243.

———, 2006. "Evidence on the Effect of Credit Counseling on Mortgage Loan Default by Low-Income Households." Journal of Housing Economics, 15 (1), 63-79.

Hathaway, I. and S. Khatiwada, 2008. "Do Financial Education Programs Work?" Federal Reserve Bank of Cleveland, Working Paper 08-03.

Hilgert, Marianne A., Jeanne M. Hogarth, and Sondra Beverly, 2003. "Household Financial Management: The Connection between Knowledge and Behavior." Federal Reserve Bulletin, 89 (7), 309-322.

Hira, Tahira K., and Cazilia Loibl, 2005. "Understanding the Impact of Employer-Provided Financial Education on Workplace Satisfaction." Journal of Consumer Affairs, 39 (1), 173-194.

Hirad, Abdighani and Peter Zorn, 2002. "A Little Knowledge is a Good Thing: Empirical Evidence of the Effectiveness of Pre-Purchase Homeownership Counseling," in Nicolas Retsinas and Eric Belsky (eds.), Low-income Homeownership: Examining the Unexamined Goal. Washington, D.C.: Joint Center for Housing Studies; Brookings Institution Press. 146-174.

Hogarth, Jeanne M, 2006. "Financial Education and Economic Development." Presented at the G8 International Conference on Improving Financial Literacy, November 29-30, 2006.

Holland, Joseph H., Doug Goodman, and Bethany Stich, 2008. "Defined Contribution Plans Emerging in the Public Sector: The Manifestation of Defined Contributions and the Effects of Workplace Financial Education." Review of Public Personnel Administration, 28 (4), 367-384.

Housing Action Illinois, 2007. "Findings from the HB 4050 Predatory Lending Database Pilot Program." Memorandum.

Kim, Jinhee, 2007. "Workplace Financial Education Program: Does It Have an Impact on Employees' Personal Finances?" Journal of Family and Consumer Sciences, 99 (1), 43-47.

Kim, Jinhee, Dorothy C. Bagwell, and E. Thomas Garman, 1998. "Evaluation of Workplace Personal Financial Education." Personal Finances and Worker Productivity, 2 (1), 187-192.

KPMG Peat Marwick LLP (KPMG), 1995. "Retirement Benefits in the 1990s: 1995 Survey Data." New York, NY.

Langrehr, F.W., 1979. "Consumer Education: Does it Change Students' Competencies and Attitudes?" The Journal of Consumer Affairs, 13, 41-53.

LaLonde, Robert J. 2010. "Evaluating Financial Counseling and Training Success: Research Perspectives." Chicago FedLetter, Federal Reserve Bank of Chicago, forthcoming.

Lusardi, Annamaria, 2004. "Saving and the Effectiveness of Financial Education," in O. Mitchell and S. Utkus (eds.), Pension Design and Structure: New Lessons from Behavioral Finance, Oxford University Press, 2004, pp. 157-184. Reprinted in the Journal of Financial Transformation, Issue on Wealth, vol.15, December 2005.

Lusardi, Annamaria, and Olivia S. Mitchell, 2006. "Financial Literacy and Planning: Implications for Retirement Wellbeing." Pension Research Council Working Paper No. 1.

———, 2007a. "Baby Boomer Retirement Security: The Roles of Planning, Financial Literacy, and Housing Wealth." Journal of Monetary Economics, 54, 205-224.

———, 2007b. "Financial Literacy and Retirement Planning: New Evidence From the Rand American Life Panel." Michigan Retirement Research Center WP 2007-157.

Lusardi, Annamaria, Olivia S. Mitchell and Vilsa Curto, 2009. "Financial Literacy Among the Young: Evidence and Implications for Consumer Policy." Pension Research Council WP 2009-09.

Lyons, Angela C., Tommye White, and Shawn Howard, 2008. "The Effect of Bankruptcy Counseling and Education on Debtors' Financial Well-Being: Evidence from the Front Lines." Money Management International, Houston, TX.

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

Martin, M., 2007. "A Literature Review of the Effectiveness of Financial Education." Federal Reserve Bank of Richmond WP 07-03.

Miles, David, 2004. "The UK Mortgage Market: Taking a Longer-Term View." Final Report, Controller of Her Majesty's Stationery Office.

Mitchell, Olivia S., 1988. "Worker Knowledge of Pension Provisions." Journal of Labor Economics, 6, 21-39.

Moore, Danna, 2003. "Survey of Financial Literacy in Washington State: Knowledge, Behavior, Attitudes, and Experiences." Washington State Department of Financial Institutions, Technical Report 03-39.

Oppenheimer Funds/Girls Inc., 1997. "Girls, Money, and Independence." New York, NY.

Organization for Economic Co-Operation and Development (OECD), 2005. "Improving Financial Literacy: Analysis of Issues and Policies."

Peng, Tzu-Chin Martina, Suzanne Bartholomae, Jonathan J. Fox, and Garrett Cravener, 2007. "The Impact of Personal Finance Education Delivered in High School and College Courses." Journal of Family and Economic Issues, 28, 265-284.

Princeton Survey Research Associates (PSRA), 1996. "Investor Knowledge Survey." Investor Protection Trust, Arlington, VA.

Princeton Survey Research Associates (PSRA), 1997. "Planning for the Future: Are Americans Prepared to Meet Their Financial Goals?" Nations Bank/Consumer Federation of America, Princeton, NJ.

Quercia, Roberto and Jonathan Spader, 2008. "Does Homeownership Counseling Affect the Prepayment and Default Behavior of Affordable Mortgage Borrowers?" Journal of Policy Analysis and Management, 27 (2), 304-325.

Sanders, Cynthia K., Terri L. Weaver, and Meg Schnabel, 2007. "Economic Education for Battered Women: An Evaluation of Outcomes." Affilia: Journal of Women and Social Work, 22 (3), 240-254.

Servon, Lisa J. and Robert Kaestner, 2008. "Consumer Financial Literacy and the Impact of Online Banking on the Financial Behavior of Lower-Income Bank Customers." The Journal of Consumer Affairs, 42 (2), 271-305.

Spader, Jonathan, Janneke Ratcliffe, Jorge Montoya, and Peter Skillern, 2009. "The Bold and the Bankable: How the Nuestro Barrio Telenova Reaches Latino Immigrants with Financial Education." The Journal of Consumer Affairs, 43 (1), 56-79.

Stango, V. and J. Zinman, 2006. "How a Cognitive Bias Shapes Competition: Evidence From Consumer Credit Markets." Working Paper, Dartmouth College.

———, 2007. "Fuzzy Math and Red Ink: When the Opportunity Cost of Consumption is Not What it Seems." Working Paper, Dartmouth College.

Tennyson, Sharon and Chau Nguyen, 2001. "State Curriculum Mandates and Student Knowledge of Personal Finance." The Journal of Consumer Affairs, 35 (2), 241-262.

Vanguard Group/Money Magazine, 1997. "Financial Literacy of Mutual Fund Investors." January, New York, NY.

Volpe, Ronald P., Haiyang Chen, and Sheen Liu, 2006. "An Analysis of the Importance of Personal Finance Topics and the Level of Knowledge Possessed by Working Adults." Financial Services Review, 15, 81-96.

Volpe, Ronald P., Haiyang Chen, J.J. Pavlicko, 1996. "Personal Investment Literacy Among College Students: A Survey." Financial Practice and Education, 6, 86-94.

Wiener, Richard L., Corinne Baron-Donovan, Karen Gross, and Susan Block-Lieb, 2005. "Debtor Education, Financial Literacy, and Pending Bankruptcy Legislation." Behavioral Sciences and the Law, 23, 347-366.

Willis, Lauren E., 2008a. "Against Financial Literacy Education." University of Pennsylvania Law School, Public Law and Legal Theory Research Paper No. 08-10.

———, 2008b. "Evidence and Ideology in Assessing the Effectiveness of Financial Literacy Education." University of Pennsylvania Law School, Public Law Research Paper No. 08-08.