

The Impact of Financial Literacy Education on Subsequent Financial Behavior

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This study examined the differential impact on 79 high school students of a personal financial management course completed 1 to 4 years earlier. This study used a matched sample design based on a school system's records to identify students who had and had not taken a course in personal financial management. The findings indicated that those who took the course were no more financially literate than those who had not. In addition, those who took the course did not evaluate themselves to be more savings-oriented and did not appear to have better financial behavior than those who had not taken the course. The study raises serious questions about the longer-term effectiveness of high school financial literacy courses.

Key Words: financial literacy, financial management, high school students, personal financial management course

Those who study financial literacy generally agree that many, if not most, consumers lack the financial literacy necessary to make important financial decisions in their own best interests (Perry 2008; Braunstein & Welch 2002). Experts also generally agree that financial knowledge appears to be directly correlated with self-beneficial financial behavior (Hilgert, Hogarth, & Beverly, 2003). However, questions exist concerning the effectiveness of financial education in improving financial literacy (Lyons, Palmer, Jayaratne, & Scherpf, 2006). Thus, a paradox exists between the efficacy of education in improving financial literacy and the impact of education on short-and long-term financial behavior. How can education, which is correlated to financial literacy, improve financial behavior without first improving financial literacy?

The seminal work on the impact of financial education by Bernheim, Garrett, and Maki (2001) reported that middle-age individuals who took a personal financial management course in high school tended to save a higher proportion of their incomes than others who did not. The research was based on a Merrill Lynch survey and on historical education records of whether a personal financial management course was required in the state during the time that the respondent attended high school. However, survey

results indicated that many respondents could not remember whether or not they had taken a course in money management or personal finance in high school. Given the nature of the data, as well as the impact of financial literacy education of the respondents as young adults on financial literacy, the effect of education on subsequent behavior is unclear.

In an attempt to reconcile the findings of Bernheim, Garrett, and Maki (2001), which showed a positive impact on savings from high school financial education, with the Jump\$tart surveys, which showed little if any impact, Mandell (2008) offered two hypotheses. The first was that some of what is learned in high school financial education classes may lie dormant in the minds of the students until much later in life when they have sufficient resources to utilize what they have learned. In this situation, a course in personal financial management or personal finance may not have an immediate impact on financial literacy until the knowledge is actually applied. The second hypothesis is related to the Bernheim, Garrett, and Maki (2001) study. Respondents to their survey graduated from high school between 1964 and 1983, a time when families had less discretionary income, and when the proliferation of easy-to-use debt vehicles like credit cards had not yet

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begun. Also the parents of many of these students had lived through the difficult years of the Depression and World War II and therefore had different attitudes toward saving. In this situation, the impact of a course in personal financial management or personal finance may be a function of the economic environment existing at the time the course was taken.

The current study extends the work of Bernheim, Garrett, and Maki (2001) by assessing a more direct link between financial literacy education and financial decision making. We surveyed recent high school graduates from a single Midwestern school system in which only a portion of the students had taken a well-regarded course in personal financial management. The sample provided a unique opportunity to examine the separable impact of taking a personal financial management course on the respondents' level of financial literacy and on a wide variety of financial behaviors.

Background

Deregulation of the U.S. financial service industry since the 1970's has created both opportunities and problems for American consumers. On the positive side, those with assets can obtain higher interest rates on their investments and lower fees for services. Individuals have enhanced choices for virtually every financial product. On the negative side, consumers are faced with increased costs. Banks have eliminated interest rate ceilings on debt and charge greater fees on low-balance accounts. Over the years, the financial services industry has become more complex. The passage of the Financial Services Modernization Act in 1999 deregulated the industry. Individuals were presented with non-conventional lending options such as longer term and interest only loans. New investment options with increasingly obscure derivative products and opt-out retirement plans have made financial decision making more important and difficult to understand.

While deregulation and the concomitant proliferation of financial products provide greater opportunities for all consumers, they also provide greater dangers for less financially sophisticated consumers. The recent expansion of sub-prime loan markets enabled less credit worthy borrowers to buy a home or obtain a credit card. However, teaser rates for these debt products may have enticed some consumers to assume debt that they ultimately could not afford. The recent collapse of sub-prime mortgage markets has been attributed, in part, to the lack of financial sophistication on the part of borrowers who may not have understood the impact of

"exploding" monthly payments when rates subsequently adjusted to the market (McVicker, 2007).

The Federal Reserve Board of San Francisco (2005) reported that U.S. households are less savings-oriented and more consumption-oriented than they were in the past. Americans have had a negative savings rate and older Americans have insufficient savings for retirement (Guidolin & La Jeunesse, 2007). According to a recent survey by the Employee Benefits Research Institute (Helman, VanDerhei, & Copeland, 2007), workers who had not saved for retirement had limited savings, with 70% having less than \$10,000 in total assets. Additionally, about half of those who had saved for retirement reported total savings and investments for retirement of less than \$25,000, excluding the value of their primary residence and defined benefit plan. The decline in personal savings rates raises concerns about consumers having sufficient resources to maintain their desired lifestyle in retirement.

In general, consumers' inability to make self-beneficial financial decisions in key areas relating to consumer financing can have negative ramifications on the entire economy. Potential problems include exacerbated business cycles, further inequality in the distribution of income and wealth, inadequate savings for retirement, low savings rates and capital formation, a weakening in the value of the dollar, and inflation. In part, concern for the economy has led the Federal Reserve to focus on the importance of financial education and understanding basic financial applications (financial literacy) in the functioning of the financial markets (e.g., Morton, 2005; Greenspan, 2003, 2005; Hilgert, Hogarth, & Beverly, 2003; Braunstein & Welch, 2002).

Many policy makers believe that the impact of poor decision making due to lack of financial knowledge can be overcome through mandated financial education. For example, the recent report of the National Association of State Boards of Education Commission on Financial and Investor Literacy (NASBE) recommended that "States should consider financial literacy and investor education as a basic feature of K-12 education" (NASBE, 2006, p. 20). According to the National Council on Economic Education (NCEE) 2007 data, 40 states had personal finance standards or guidelines, 28 states required these standards to be implemented, 9 states required a course with personal finance content, 7 states required students to take a personal financial management course, and 9 states tested personal finance knowledge (NCEE, 2008).

Level of Financial Literacy

Concerns about financial preparedness are documented in recent studies demonstrating that both young and older adults lack the basic knowledge needed to make good financial choices. These concerns were heightened in a 2005 report by the Organization for Economic Co-operation and Development (OECD) indicating that financial illiteracy is widespread across age groups and geographical areas. Various surveys demonstrated that Americans lack the ability to make good financial choices (Chen & Volpe, 1998; Volpe, Chen, & Pavlicko, 1996; Volpe, Chen, & Liu, 2006). A Nellie May report (2005) indicated that 56% of undergraduate college students have four or more credit cards in their final year and that these students have an average balance of close to \$3,000. Only 21% of the undergraduates with credit cards pay their balances in full each month, and 11% paid less than the minimum amount. The average balance was over \$999 for 49% of the students while 7% had balances greater than \$7,000.

Several researchers have reported that poor financial decisions hurt productivity in the workplace (Garman, Kim, Kratzner, & Brunson, 1999; Garman, Leech, & Grable, 1996; Joo & Grable, 2000; Kim, Bagwell, & Garman; Kim & Garman, 2004). Volpe, Chen, and Liu (2006) surveyed corporate benefit administrators who cited basic personal finance as an important area in which employee knowledge is deficient and recommended educational programs that focus on improving basic personal finance knowledge.

Using the 2004 Health and Retirement Study (HRS) to test basic financial knowledge of adults over the age of 50, Lusardi and Mitchell (2006) developed questions related to the understanding of interest compounding and the effects of inflation and risk diversification. They found widespread financial illiteracy that is particularly severe among the elderly, females, and those with limited education. The results with respect to the elderly were particularly surprising since most respondents over age 50 tend to have more experience with credit cards and bank accounts and have taken out at least one mortgage.

Studies by the OECD (2005) and Lusardi and Mitchell (2007) reviewed international evidence on financial literacy and found that financial illiteracy is common in many developed countries such as Australia, Japan, and Korea, as well as developed countries in Europe. These findings are similar to those of Christelis, Jappelli, and Padula (2006) who found that most respondents in Europe score low on financial literacy scales.

Financial Literacy and Behavior

Several studies showed that financial literacy is positively related to self-beneficial financial behavior. Hilgert, Hogarth, and Beverly (2003) added financial behavior and financial literacy questions to the nationwide Survey of Consumer Finances. They formed a Financial Practices Index based upon behavior in four variables: cash-flow management, credit management, savings, and investment practices. Comparing the results of this index with scores on the financial literacy quiz, they found that those who were more financially literate had higher Financial Practices Index scores, indicating that financial knowledge is related to financial behavior.

In a study of Dutch adults, van Rooij, Lusardi, and Alessie (2007) found that those with low financial literacy are more likely than others to base their behavior on financial advice from friends and are less likely to invest in stocks. Mandell (2006) found that high school seniors with higher financial literacy scores were less likely than others to bounce a check and more likely to balance their checkbooks.

Financial Education and Behavior

While financial behavior seems to be positively affected by financial literacy, the effects of various forms of financial education on financial behavior are less certain. Research on the impact of retirement seminars has shown mixed results. Bayer, Bernheim, and Scholz (1996) found that employer retirement seminars increased the participation in and contributions to voluntary savings plans. Duflo and Saez (2003) reported that retirement seminars had a positive effect on participation in retirement plans, but the increase in contributions was negligible. Lusardi and Mitchell (2007) found retirement seminars had a positive wealth effect; however, this effect was found mainly for those with less wealth or education. Choi, Laibson, Madrian, and Metrick (2006) and Madrian and Shea (2001) found that participants in retirement seminars had much better intentions than follow through.

Outside of retirement planning, Elliehausen, Lundquist, and Staten (2003) reported that credit counseling tended to improve both borrowing behavior and creditworthiness. Hira and Zorn (2001) found that pre-purchase counseling programs for potential home buyers decreased delinquency rates.

The Impact of Financial Education Courses on Financial Literacy

Using a national survey of students who completed the high school personal finance curriculum supplied by the National Endowment for Financial Education (NEFE), Danes (2004) and Danes, Casas, and Boyce (1999) found that in the short-run, self-reported financial behavior improved immediately after exposure to the NEFE curriculum. They conducted a 3 month follow-up survey and found that over half of the respondents reported that they had made changes in their spending and savings habits. Students were more apt to comparison shop, set money aside for the future, and repay debts on time. The researchers also found that the students felt that they knew more about the cost of buying on credit and believed that the way they managed their money would affect their future.

On the other hand, the large-scale, biennial surveys of high school seniors carried out by the Jump\$tart Coalition for Personal Financial Literacy consistently found that students who had taken a high school class in personal finance or money management are no more financially literate than those who have not (Mandell, 2009). Specifically, a financial literacy index was developed from student responses to basic age-relevant questions relating to financial knowledge. The four key areas covered in the survey included income, money management, savings and investing, and spending and credit. Six surveys have been administered from 1997 through 2008, and the average grade has never exceeded 58%. Furthermore, students who took a full semester high school class in money management or personal finance were no more financially literate than students who had not taken such a course. Mandell and Klein (2007) did find evidence supporting the presence of student motivation as a factor in increasing the financial literacy of respondents, indicating that motivated adults benefit from targeted financial education. This study provides further evidence of these mixed results concerning the impact of financial education by analyzing a longer term impact on both financial literacy and subsequent behavior.

Data and Methodology

The results of the current study are based on a survey administered to a matched sample of students. These students were 2001 to 2004 graduates from three high schools within a single school system. Each of the schools offered a highly regarded course in personal financial management. The course lasted a full semester and covered all aspects of personal financial management that were thought to be relevant and important to students.

The sample was segmented by high school and year of graduation. Half of the 400 student sample took a personal financial management course while the other half did not. Since the students came from the same environment and educational system, this population provided an opportunity to examine the separable impact of the personal financial management course on subsequent financial behavior. While the program was voluntary for the students, college bound students were no more likely than others to take the course.

The superintendent of schools wrote letters to the sampled students ($N = 400$) explaining the importance of the study and asking for their cooperation. In addition, a local financial institution provided a \$25 incentive for each completed questionnaire. In many cases, letters to students who were no longer living at home were forwarded by parents. The letter contained the Web address for an online survey and a coded identification number that could be placed at the end of the survey to qualify respondents for the \$25 payment. Altogether, 79 completed questionnaires were received, a response rate of 19.75%. Of the total respondents, 39 students had taken the course in personal financial management and 40 had not. See Table 1 for sample demographics.

Table 1. Respondents by Graduation Year for Students Who Had and Had Not Taken the Personal Financial Management Course

| | Taken course | No course | Total |
|-------|--------------|-----------|-------|
| 2001 | 19 | 14 | 33 |
| 2002 | 3 | 3 | 6 |
| 2003 | 4 | 1 | 5 |
| 2004 | 13 | 22 | 35 |
| Total | 39 | 40 | 79 |

A questionnaire consisting of 49 questions was partitioned into 3 sections. First, the entire 2004 Jump\$tart questionnaire (Mandell, 2004) was included to test the current level of financial literacy. Second, questions about the students' financial behavior and attitude toward risk were included. Third, demographic questions, such as educational attainment, were included.

Table 2. Mean Financial Literacy Scores by Whether Respondents Had and Had Not Taken a Personal Financial Management Course

| | Taken course | No course |
|------------------|--------------|-----------|
| Current study | 68.7% | 69.9% |
| 2000 Jump\$start | 51.4% | 52.0% |
| 2002 Jump\$start | 48.2% | 50.5% |
| 2004 Jump\$start | 53.5% | 52.0% |
| 2006 Jump\$start | 51.6% | 52.5% |
| 2008 Jump\$start | 47.5% | 48.5% |

Data Analysis and Results

Results are divided into categories that address three issues. The first category addresses whether a well-regarded high school course in personal financial management increased the financial literacy or knowledge of the student in the post-high school years. The second category addresses if the course had a lasting effect on the student's attitudes, particularly the propensity toward savings or "thrift." The final category addresses whether the course had an impact on subsequent financial behavior.

Course Impact on Financial Literacy

The average personal financial literacy score, among all respondents, on the Jump\$start questions was 69.3%. Although these scores were high in comparison to the national Jump\$start results, there was virtually no difference between those who had taken the course and those who had not. Students who had taken the course averaged a score of 68.7%, and those who had not averaged a score of 69.9%.

Table 2 shows that these results are consistent with those from the biennial Jump\$start surveys from 2000 through 2008. In fact, only the 2004 Jump\$start survey showed that those who had taken a course in personal financial literacy had a slightly higher mean score than those who had not.

Course Impact on Financial Attitudes

The following question measured self perceptions of thrift levels.

"Some people tend to be very thrifty, saving money whenever they have the chance, while others are very spending-oriented, buying whenever they can and even borrowing to consume more. How would you classify yourself"?

1. Very thrifty, saving money whenever I can
2. Somewhat thrifty, often saving money
3. Neither thrifty nor spending-oriented
4. Somewhat spending-oriented, seldom saving money
5. Very spending-oriented, hardly ever saving money

Table 3 shows the results of the respondent's attitude toward thrift based on whether or not the respondent had a course in personal financial management. The results are inconclusive. As expected, a higher percentage of students who had taken the course evaluated themselves as being "very thrifty" (28.2% vs. 20.0% for those that had not taken the course). Surprisingly however, those who had taken the course also self identified as "very spending-oriented" (10.3% vs. 7.5% who had not taken the course). Therefore, these data do not support a conclusion that students who took a course in personal financial management are subsequently more savings-oriented than those who have not taken such a course.

Table 3. Thrift Attitude for Respondents Who Had and Who Had Not Taken a Personal Financial Management Course

| Thriftiness | Taken course | No course | Literacy score |
|----------------------------|--------------|-----------|----------------|
| Very thrifty | 28.2% | 20.0% | 66.1% |
| Somewhat thrifty | 28.2% | 40.0% | 75.1% |
| In between | 12.8% | 12.5% | 61.4% |
| Somewhat spending-oriented | 20.5% | 20.0% | 66.4% |
| Very spending-oriented | 10.3% | 7.5% | 73.9% |

Note. The Pearson $X^2 = .821$ between thriftiness and having had the personal finance course which indicated no significant relationship.

Table 4. Financial Behavior for Respondents Who Had and Who Had Not Taken a Personal Financial Management Course

| Financial behavior | Taken course | No course | All | <i>p</i> |
|--|--------------|-----------|-------|----------|
| Always pays credit card in full | 53.8% | 60.0% | 57.0% | .581 |
| Never makes late credit card payment | 71.8% | 67.5% | 69.6% | .678 |
| Never bounces a check | 64.7% | 73.7% | 69.4% | .409 |
| Balances checkbook at least weekly | 46.2% | 32.5% | 39.2% | .214 |
| Does own income tax | 33.3% | 35.0% | 34.2% | .876 |
| Has savings and investments adequate for needs | 43.6% | 55.0% | 49.4% | .311 |
| Never worries about debt | 25.6% | 25.0% | 25.3% | .948 |
| Mean score of 7 items | 3.62 | 3.47 | 3.54 | .771 |

Note. Significance of difference for the first 7 items is based on Pearson X^2 . Mean score *p*-value is based on an ANOVA.

It is interesting to note that the mean financial literacy scores seem to be unrelated to perceived thriftiness. Respondents identifying themselves as “somewhat thrifty” had the highest literacy scores and those reporting themselves as “in between” had the lowest literacy scores. The “very thrifty” and “very spending oriented” respondents fell between the extremes (see Table 3). This finding differs somewhat from the 2004 Jump\$Start data which show that students with the highest levels of financial literacy cluster in the middle and that those who claim to be “very thrifty” and “very spending-oriented” have lower scores than the rest.

Course Impact on Financial Behavior

Table 4 summarizes responses to questions relating to financial behavior based on whether or not the respondent had taken the personal financial management course. The results show that the course in personal financial management did not systematically impact respondent’s financial

behavior. Those who had the course were more likely to make credit card payments on time (71.8% vs. 67.5%); however they were also less likely to pay their credit card in full each month (53.8% vs. 60.0%). Therefore, respondents taking the course were more likely to pay interest on their credit card balance. Also, while a greater proportion of those taking the course balanced their checkbook (46.2% vs. 32.5%), they also were more likely to have bounced a check (35.3% vs. 26.3%). In addition, those who had not taken the course were more likely to prepare their own taxes (35.0% vs. 33.3%) and believed that they had adequate savings and investments (55.0% vs. 43.6%).

To estimate overall financial behavior, we assigned a point for each reported beneficial financial behavior. The mean number of points accumulated by all respondents was 3.54, indicating that respondents reported favorable financial behavior on about half of the seven items. Although those who had taken the personal financial management course

Table 5. Ordinary Least Square Regression Analysis of Mean Financial Literacy Score on College Status, Years Since High School Graduation, and Whether They Had the Personal Finance Course

| Explanatory variable | Coefficient | <i>t</i> | <i>p</i> |
|--|-------------|----------|----------|
| Constant | 2.659 | 5.15 | .000 |
| College full-time student or graduate | .967 | 2.371 | .021 |
| Years since high school graduation | .035 | .255 | .800 |
| Had taken personal financial management course | .384 | .973 | .334 |
| Adjusted R^2 | .038 | | |

had a slightly higher mean score than did those who had not (3.62 and 3.47), the difference was not significant at the .05 level (see Table 4).

Table 5 presents the results of a regression analysis of the mean financial behavior score. Independent variables included whether the student had the course as well as control variables for the number of years since high school graduation and whether the respondent was a full time college student or graduate. The number of years since high school graduation (ranging from 1 to 4) was included, as older respondents are more likely to have more life experience with financial products and may have developed better financial behavior patterns. College status was included to control for potential impact of subsequent education. Analysis of the 2004 and 2006 Jump\$tart surveys found that high school students who expected to pursue a four-year college education and work as a professional tended to have significantly higher financial literacy scores than others, even after controlling for parents' income and education (Mandell, 2004, 2006). Therefore, the regression included a binary variable indicating whether the respondent is a full-time college student or graduate versus a part-time college student or someone who had never attended college. Those who enroll and remain as full-time college students tended to be more focused, future-oriented, and willing to defer current consumption gratification for future benefits.

The regression results indicated that financial behavior is not related to taking the course or to having more life experience (see Table 5.) However, being a graduate

or full-time college student positively and significantly impacted financial behavior ($p = .021$). To further analyze this result, we investigated the specific behaviors that were most strongly impacted by committing to a full-time college education.

Table 6 shows that full-time college students or graduates dominated each of the behavior categories with the exception of frequent balancing of checkbooks and doing one's own taxes. We cannot explain the former, but the latter may be explained by the fact that many full-time college students reported that their income taxes were completed by their parents. Individual binary probit regressions controlling for college status and years since graduation were run on each of the behaviors and summarized in Table 7. Neither the time since graduating from high school nor taking the personal finance course related to any of the behaviors. However, attending full time or graduating from a 4-year college did have a positive and significant impact on two of the behaviors: always paying credit card bills in full and having savings and investments that are adequate for one's needs.

Summary and Conclusions

In spite of the reportedly excellent personal finance course offered by all three high schools in the community studied, a comparison of those who did and did not take the course does not demonstrate a meaningful positive impact for those taking the financial education course. This finding is evident in several different measures. After several years, those who took the course were no more financially literate than those who did not take the course. Those who

Table 6. Financial Behavior by Subsequent College Graduate Status

| Financial Behavior | Graduate or full-time student | Not graduate or full-time student | All | <i>p</i> |
|--|----------------------------------|--------------------------------------|-------|----------|
| Always pays credit card in full | 70.8% | 35.5% | 57.0% | .002 |
| Never makes late credit card payment | 77.1% | 58.1% | 69.6% | .073 |
| Never bounces a check | 76.1% | 57.7% | 69.4% | .088 |
| Balances checkbook at least weekly | 31.3% | 51.6% | 39.2% | .058 |
| Does own income tax | 31.3% | 38.7% | 34.2% | .495 |
| Has savings & investments adequate for needs | 62.5% | 29.0% | 49.4% | .004 |
| Never worries about debt | 29.2% | 19.4% | 25.3% | .327 |
| Mean score (of 7 items) | 3.85 | 3.00 | 3.54 | |

Note. Significance of difference based on Pearson X^2 .

Table 7. The Relation of Taking a Personal Financial Management Course on Specific Financial Behaviors, Controlling for College Status and Years Since High School Graduation

| Dependent Variable | Constant | College | Years since high school | Had taken personal financial management course | Nagelkerke (pseudo) R^2 |
|--|------------------|------------------|-------------------------|--|---------------------------|
| Always pays credit card in full | -0.693 (.283) | 1.515 (.003) | 0.01 (.957) | 0.108 (.833) | 0.156 |
| Never makes late credit card payment | 0.386 (.558) | -0.153 (.058) | 0.538 (.402) | 0.386 (.314) | 0.082 |
| Never bounces a check | 0.716 (.309) | 0.772 (.158) | -0.11 (.561) | -0.183 (.737) | 0.060 |
| Balances checkbook at least weekly | -0.117 (.851) | -0.763 (.119) | -0.035 (.837) | 0.424 (.387) | 0.067 |
| Does own income tax | -0.446 (.479) | -0.365 (.465) | 0.039 (.819) | -0.182 (.715) | 0.011 |
| Has savings & investments adequate for needs | -0.041 (.110) | 1.386 (.007) | 0.107 (.539) | -0.215 (.665) | 0.146 |
| Never worries about debt | -1.52 (.035) | 0.582 (.309) | -0.008 (.966) | 0.173 (.751) | 0.020 |

Note. p -levels given in parentheses below coefficients.

took the course did not consider themselves to be more savings-oriented than those who did not take the course. Those who took the course did not report better financial behavior than those who did not take the course. On the other hand, positive financial behavior is associated with respondents who were full-time college students or graduates. However, these results are driven by paying credit cards in full and the belief that their savings and investments are adequate for their needs. While disappointing, the first two results appear to be consistent with those from other studies. The third finding, relating to financial behavior, seems to differ from the results of Bernheim, Garrett, and Maki (2001).

Care must be utilized in interpreting these results with respect to the benefit of financial education in high school. First, the results are based on a small sample size of 79 respondents. Additionally, although respondents attended three different high schools, the sample was drawn from only one school system. As such, it may be argued that a much larger sample might produce different results. On the positive side, however, the fact that all the respondents came from the same geographic location and were

educated in the same school system helps to exclude many extraneous variables which could account for differences in behavior. Clearly, the study should be expanded before more generalizable conclusions can be made. However, longitudinal data of this type are difficult to collect, and it may be some time before a similar natural experiment occurs with documented proof of who did or did not take a course in financial behavior in high school.

A second drawback of this study is that it follows high school graduates only for the first five years after graduation, so that the respondents' ages ranged from about 18 to 23. This corresponds to a low earning period and occurs before the respondents have formed true adult behavior patterns. Knowledge gained in a high school personal financial management class might be more influential later in life when people had stable financial lives. This possibility would be consistent with the findings of Bernheim, Garrett, and Maki (2001). Finally, the findings of positive financial literacy scores and financial behavioral for those with a full-time college education may have resulted from receiving additional personal finance education.

Implications for Practitioners and Educators and Further Research Needs

The findings from this study cast some doubt on the ability of a high school course in personal financial management, as currently administered, to significantly improve financial decision making later in life. The fact that an adult client had taken such a course in high school appears to do little to alleviate the responsibilities placed on the financial counselor. Therefore, either the content or the educational methods used to provide this information to students needs to be reconsidered. Additional study is needed to determine more appropriate approaches to teaching financial literacy. Research should focus on determining teaching methods that enable students to understand the impact of financial decisions and/or the information that would improve subsequent financial behavior. Until more evidence can be presented to demonstrate that high school courses in personal financial management positively influence subsequent financial behavior, further allocation of scarce educational resources toward mandatory classes of this type should be reconsidered.

Jump\$tart surveys (Mandell, 2006) have shown consistently that high school students who play a stock market game are significantly more financially literate than those who do not. This implies that classes which are interactive, relevant, and fun may be more effective than those that are purely didactic. Furthermore, Mandell & Klein (2007) indicated that students of such classes do better if they are properly motivated to understand why personal financial management is important to their futures. Thus, future research should focus on whether the effectiveness of such classes can be materially improved through interactivity, currency, enjoyment, and motivation.

Some of the ineffectiveness of these classes may be due to the fact that they may be taken by students of almost any age or high school class. It is reasonable to assume that classes taken during the senior year, when students have either attained or are about to attain legal adulthood and have taken on some of the financial responsibilities of adults, would be more relevant and interesting than if taken when a student was 15 or 16 years old. This issue has not been addressed in the available literature. Finally, additional research with a larger sample and over a longer period of time is needed to more fully assess the value of financial education on subsequent financial behavior.

References

- Bayer, P. J., Bernheim, B. D., & Scholz, J. K. (1996). *The effects of financial education in the workplace: Evidence from a survey of employers*. Working Paper Issue 5655, Cambridge, MA: NBER.
- Bernheim, B. D., Garrett, D. M., & Maki, D. M. (2001). Education and saving: The long-term effects of high school financial curriculum mandates. *Journal of Public Economics*, 80, 435-465.
- Braunstein, S. & Welch, C. (2002). Financial literacy: An overview of practice, research and policy. *Federal Reserve Bulletin*, 88, 445-457.
- Chen, H., & Volpe, R. P. (1998). An analysis of personal financial literacy among college students. *Financial Services Review*, 7, 107-128.
- Christelis, D., Jappelli, T., & Padula, M. (2006). *Cognitive abilities and portfolio choice*. Working Paper 157, University of Salerno.
- Choi, J., Laibson, D., Madrian, B., & Metrick, A. (2006). Saving for retirement on the path of least resistance. In E. J. McCaffrey & J. Slemrod (Eds.), *Behavioral Public Finance: Toward a New Agenda* (pp. 304-351). New York: Russell Sage Foundation.
- Danes, S. M. (2004). *Evaluation of the NEFE High School Financial Planning Program® 2003-2004*. St. Paul, MN: University of Minnesota, Family Social Science Department.
- Danes, S. M., Casas, C.H., & Boyce, L. (1999). Financial planning curriculum for teens: Impact evaluation. *Financial Counseling and Planning*, 10, 25-37.
- Duflo, E. & Saez, E. (2003). The role of information and social interactions in retirement plan decisions: Evidence from a randomized experiment. *Quarterly Journal of Economics*, 118, 815-842.
- Federal Reserve Bank of San Francisco (2005). *Spend thrift nation*. (Economic Letter, No. 2005-30). San Francisco, CA: FRBSF.
- Elliehausen, G., Lundquist, C., & Staten, M. E. (2003). *The impact of credit counseling on subsequent borrower credit usage and payment behavior*. Silver Spring, MD: National Foundation for Credit Counseling.
- Garman, E. T., Kim, J., Kratzer, C. Y., Brunson, R. H. (1999). Workplace financial education improves personal financial wellness. *Financial Counseling and Planning*, 10, 79-88.
- Garman, E. T., Leech, I. E., & Grable, J. E. (1996). The negative impact of employee poor personal financial behaviors on employers. *Financial Counseling and Planning*, 7, 157-168.

- Greenspan, A. (2003). The importance of financial and economic education and literacy. *Social Education*, 67(2), 70-72.
- Greenspan, A. (2005). The importance of financial education today. *Social Education*, 69(2), 64-66.
- Guidolin, M. & E. A. La Jeunesse (2007). The decline in the US personal saving rate: Is it real and is it a puzzle? *Federal Reserve Bank St. Louis Review*, 89(6), 491-514.
- Helman, R., VanDerhei, J., & Copeland, C. (2007). *The retirement system in transition: The 2007 retirement confidence survey*. (Issue Brief No. 304). Washington, DC: Employee Benefit Retirement Institute.
- Hilgert, M. A., Hogarth, J. M., & Beverly, S. G. (2003). Household financial management: The connection between knowledge and behavior. *Federal Reserve Bulletin*, 89, 309-322.
- Hirad, A., & Zorn, P. M. (2001). *A little knowledge is a good thing: Empirical evidence of pre-purchase homeownership counseling*. McLean, VA: Freddie Mac.
- Joo, S., & Grable, J. E. (2000). Improving employee productivity: The role of financial counseling and education. *Journal of Employment Counseling*, 37, 2-15.
- Kim, J., Bagwell, D. C., & Garman, E. T. (1998). Evaluation of workplace financial education. *Personal Finances and Worker Productivity*, 2, 187-192.
- Kim, J., & Garman, E. T. (2004). Financial stress, pay satisfaction, and workplace performance. *Compensations and Benefits Review*, 36(1), 69-76.
- Lusardi, A., & Mitchell, O. S. (2006). *Financial literacy and planning: Implications for retirement wellbeing*. Working Paper 1 Pension Research Council. Philadelphia, PA: The Wharton School.
- Lusardi, A., & Mitchell, O. (2007). Financial literacy and retirement preparedness: Evidence and implications for financial education, *Business Economics*, 42, 35-44.
- Lyons, A. C., Palmer, L., Jayaratne, K.S.U., & Scherpf, E. (2006). Are we making the grade? A national overview of financial education and program evaluation. *The Journal of Consumer Affairs*, 40, 208-235.
- Mandell, L. (2004). *Financial literacy: Are we improving? Results of the 2004 national Jump\$tart survey*. Washington, DC: Jumpstart Coalition.
- Mandell, L. (2006). *Financial literacy: Improving education results of the 2006 national Jump\$tart survey*. Washington, DC: Jumpstart Coalition.
- Mandell, L., & Klein, L. S. (2007). Motivation and financial literacy. *Financial Services Review*, 16, 106-116.
- Mandell, L. (2008). Financial knowledge of high school seniors. In Jing J. Xiao (ed.), *Advances in Consumer Finance Research* (pp. 170-171). New York: Springer Publishing.
- Mandell, L. (2009). Financial education in high school. In Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs* (pp. 257-279). Chicago: University of Chicago Press.
- Madrian, B. & Shea, D. (2001). *Preaching to the converted and converting those taught: Financial education in the workplace*. Working Paper, University of Chicago.
- McVicker, E. D. (2007). What the subprime shakeout means to banks, *American Bankers Association Banking Journal*, 99(6), 1-17.
- Morton, J. S. (2005). The interdependence of economic and personal finance education. *Social Education*, 69(2), 66-70.
- NASBE. (2006). *Who owns our children?* Alexandria, VA: National Association of State Boards of Education.
- NCEE. (2008). *Economic, personal finance & entrepreneurship education in our nation's schools, a report card*. New York, NY: National Council on Economic Education.
- Nellie May (2005). *Undergraduate students and credit cards in 2004: An analysis of usage rates and trends*. Wilkes-Barre, PA: Sally May Inc.
- OECD. (2005). *Improving financial literacy: Analysis of issues and policies*. Paris: OECD.
- Van Rooij, M., Lusardi, A., & Alessie, R. (2007). *Financial literacy and stock market participation*. National Bureau of Economic Research Working Paper No. 13565, Cambridge, MA: NEBR.
- Perry, V.G. (2008). Is ignorance bliss? Consumer accuracy in judgments about credit ratings. *The Journal of Consumer Affairs*, 42(2), 189-205.
- Volpe, R. P., Chen, H., & Liu, S. (2006). An analysis of the importance of personal finance topics and the level of knowledge possessed by working adults. *Financial Services Review*, 15, 81-99.
- Volpe, R. P., Chen, H., & Pavlicko, J. J. (1996). Personal investment literacy among college students: A survey. *Financial Practice and Education*, 6(2), 86-94.