The Keys to Financial Success Curriculum: Impact on Personal Finance Behaviors

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I. Introduction

In the wake of the Great Recession, there has been increased attention paid to the importance of financial literacy and, in particular, the need to include personal finance in the school curriculum. This perceived need has been fueled by articles from the popular press, statistics on the impact of poor financial decisions made by young adults, and articles from the academic community. In addition, the call for financial education has been reinforced by past Federal Reserve Chairman Greenspan (2001) and current Chairman Bernanke (2006). As a result, school-based programs and curriculum initiatives have expanded as has research on the effectiveness of these efforts. While there has been a growing interest in offering personal finance education in the K-12 classroom, there is limited evidence that personal finance instruction changes student personal finance behavior. This paper explains the features of a high school personal finance curriculum, "Keys to Financial Success", offered by a consortium of partners in Delaware, New Jersey, and Pennsylvania and the results from a two year study of pre- and post-ratings on a set of behavioral questions from students in the classrooms with teachers who use the "Keys" materials. Specifically, this study attempts to determine the impact of the "Keys" curriculum on personal finance behaviors and the characteristics that contribute to students having improved personal finance behaviors.

II. Literature

Today, more than any other time, individuals are expected to take more responsibility for handling their personal finances and planning for their retirements. At the same time, the financial services available to them have become more complex and specialized. Today's consumers face an array of sophisticated products. In this environment combined with the recent financial crisis, the focus on a financially literate citizenry has moved center stage. Part of the

responsibility to insure that this goal is reached rests with America's K-12 schools. Students leaving high school should be grounded in the fundamentals of personal finance to be prepared for their adult roles as consumers, savers, and investors. A number of studies have emerged showing that programs that use quality materials, implemented by trained teachers, can positively and significantly increase high school students' financial knowledge (Harter & Harter, 2009, Swinton et al., 2007, Walstad, Rebeck & MacDonald, 2010) However, fewer studies have been conducted that focus on how an increase in financial achievement may impact student financial behaviors. (Hogarth, 2002; Vitt, et al., 2000).

The findings from some research articles and studies on the relationship between teaching personal finance at the high school level and changing student behaviors and attitudes are promising. Bernheim et al. (2001) found that there was a positive relationship between financial education mandates and adult financial behavior. This study used a sample of adults who had experienced state mandated financial education in high school, and the resulting regressions found positive relationships between education and saving rates as well as between education and earnings. Varcoe et al. (2005) also found positive results when looking at personal finance learning in California high schools and the resulting financial behaviors. Teenagers were surveyed on topics that were relevant to them and instructional formats that appealed to them. Based on the survey findings, *Money Talks,* a series of four newsletters, was developed that focused on saving habits, shopping tips, car costs, and money values. The student newsletters contained activities and teachers were provided a teacher guide. After participation in the *Money Talks* program, student financial knowledge and appropriate behavioral changes increased. Students increased amounts saved from pre-to post-test, made more informed shopping decisions and knew more about ways to lower automobile insurance rate costs. The NEFE High School

Financial Planning Program (HSFPP) was evaluated in 1998 (Danes, Casas & Boyce, 1999) and again in 2004 (Danes, 2004) to assess the impact of financial knowledge, behavior, and self-efficacy of teens using a post- and pre-evaluation. Students were asked a set of core questions upon completion of HSFPP, then asked the same questions about what they knew before studying the curriculum and then asked to respond to these questions again three months later. The 1998 study found an increase in number of students keeping track of their expenses and saving for future purchases and increased self confidence in making financial decisions. The 2004 study had similar results. In this study the students surveyed three months later showed that the HSFPP's positive impact continued and even increased over time.

Additional studies that have looked at the impact of a personal finance course on student behavior have mixed results. Tennyson and Nguyen (2001) concluded that there is very little difference in financial knowledge between those students who had mandated personal finance courses in high school and those who did not. However, there was a positive relationship between test scores and those who planned on attending a four-year college. Mandell (2009) 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.

Overall, however, current attitudes toward personal finance courses in high school were not overly positive. Peng et al. (2007) looked at personal finance courses at both the high school and college level. For high school personal finance courses, they found no significant relationship between taking the course and investment knowledge. While their web survey did not find financial knowledge to increase, one significant finding was that students who had only a high school personal finance course had a higher level of stock or bond ownership prior to age 16. However, this could be because those surveyed were alumni of a four-year university.

Mandel and Klein's (2007) study concluded that students who had personal finance courses in high school still did not have much more increased financial knowledge, citing lack of motivation and retention of skills as the possible causes. Yet, the authors did find that explaining why certain financial tools and knowledge were important to students in their everyday life would increase motivation and thus increase knowledge. A later study (Mandel and Klein 2009) looked at the impact on high school students of participation in a personal finance course one to four years earlier. Those who took the course were no more financially literate than those who had not taken the course. Furthermore, those who took the course did not evaluate themselves to be more savings-oriented nor did they seem to have better financial behavior then students who had not taken a course. A lack of motivation may explain why there seems to be minimal relationship between attaining personal finance knowledge and changing behaviors. Unlike adult financial education where behavior changes are seen when a program is designed to address a current financial problem, high schools students may fail to see the application of what they learn to problems they face on a daily basis.

III. Methodology

Keys to Financial Success

In the spring of 2001, the University of Delaware Center for Economic Education and Entrepreneurship (Center), the Federal Reserve Bank of Philadelphia, the Delaware Bankers Association, and the Consumer Credit Counseling Service of Maryland and Delaware formed a partnership to provide curriculum resources and teacher training to Delaware high schools interested in teaching a semester personal finance course. Work commenced in the late spring and early summer of 2001 to compile a 90-day instruction plan for a high school personal finance course, which would make use of existing curriculum resources, approach the teaching

of personal finance using materials grounded in the economic way of thinking, and allow the course to be flexible enough to be taught by teachers in the social studies, family and consumer science, mathematics, and business departments. The resulting course plan, called "Keys to Financial Success," makes extensive use of lessons from the Council on Economic Education's widely distributed *Financial Fitness for Life* (*FFL*) and *Learning, Earning, and Investing* (*LEI*) lesson books. These lessons make use of active and collaborative learning and are engaging for the students. Where these two packages did not include lessons on specific topics of importance to the partners such as risk management, goal setting, and career planning, lessons were developed by the staff at the Center and the Federal Reserve Bank of Philadelphia or taken from VISA's *Practical Money Skills*. To motivate students and add relevance to the course, students are asked in the first two units to research different careers and set personal and financial goals. Based on their research and goals, students, with guidance from the teacher, select a mock career. The students' goals and careers with entry-level wages are revisited throughout the remaining units in the course. Students are asked to apply what they have learned using the income associated with their chosen career and determine how their decisions impact their goals. The intent of this approach is to help students see the relevance of being financially literate both now and as adults.

The "Keys" course consists of fifty-four lessons built around nine themes: goals and decision making; careers and planning; budgeting; saving and investing; credit; banking services; transportation issues; housing issues; and risk protection. Throughout the course, students use the Internet for access to the latest information on personal finance topics and financial products. This approach allows teachers to update lessons from year to year to reflect changes in the financial marketplace. Using knowledge gained from the lessons and information gleaned from

the Internet, students create a personal portfolio of tools and data. The students are encouraged to keep their portfolios as a reference when making financial decisions after high school.

Participating schools commit to offering the course at least once per academic year. Teachers attend a week-long training at the Federal Reserve Bank of Philadelphia taught by individuals from the Center and the Federal Reserve Bank of Philadelphia. All have degrees in economics or economic education and extensive experience in teaching classes for teachers. Providing training at the Federal Reserve Bank of Philadelphia, by the authors of the curriculum, helps to ensure fidelity of teacher training.

In the 2001 through 2002 school year, the "Keys" course was piloted in one Delaware high school. From 2002 through 2005 an additional twenty schools were added with 26 additional teachers receiving training. Beginning in the 2005 through 2006 academic year, schools in New Jersey and Pennsylvania were recruited to participate in the program. In the six school years since recruiting began in New Jersey and Pennsylvania, 117 schools were added to the program and 168 additional teachers were trained. While new schools were continuing to adopt the "Keys" program over this period, a few schools left the program each year. These attritions from the program were usually due to the retirement of the teacher who had taught the course or due to school administrators realigning teachers' schedules to different areas. As of 2011, over 230 teachers from 121 schools from the Third Federal Reserve Bank district have received training to teach a "Keys" course in their own classrooms.

Study Design

From the inception of the "Keys to Financial Success" program, the partners recognized the importance of measuring the impact of the course on the personal finance achievement of the students. A 50-question personal finance test was developed based on the 50-item high school

multiple-choice test published by the Council for Economic Education to accompany the *Financial Fitness for Life* personal finance curriculum.[1] This test, developed by Walstad and Rebeck (2005), provided strong internal consistency and was well suited to the content covered in the "Keys to Financial Success" course since the course makes use of many lessons from the *Financial Fitness for Life* curriculum.

Initially, Keys teachers were asked to administer the 50-item "Keys" test at the beginning of the semester and at the end of the semester. They were also asked to administer, as a comparison, a test with 10 questions drawn from the 50-question "Keys" test to another section of students not taking "Keys". That section of comparison students could be either the "Keys" teacher's own students or a section of students taught in the same school by a colleague. The teachers were encouraged to choose a comparison section of students who were about the same age and ability level as the students in their "Keys" course. During this early period in the study, no demographic information was collected on the students in either the treatment or the comparison groups.

In subsequent years of the study, students in both the treatment and the comparison groups were asked to self-report whether they have held a job currently or in the past, whether they have a checking account, whether they have a savings account, their gender, and their age. The comparison test was expanded from 10 to 20 questions. The 10 questions asked in the first comparison test were carried over to the new 20-question test, but 10 additional questions were added from the 50-item test administered to the treatment group. Also in the subsequent years of the study, students in both the treatment and comparison groups were asked a set of behavioral questions about how they save and spend money, their credit card use, and how they make

[1] The test developed for this study omitted five questions from the *FFL* high school test and substituted five questions developed by the authors.

decisions. This set of questions from the later period is the focus of our current study and are as follows:

1. I save money before I spend it.
2. I keep track of my spending closely.
3. I have developed a budget for this year.
4. I set aside money for special events (e.g., prom, homecoming, gifts).
5. I would put some of my savings in the stock market.
6. I use my own credit card regularly.
7. I shop around for banking services such as checking and savings accounts.
8. I use the Internet to gather information for choices I have to make about money.
9. I believe that investing in education after high school will improve my lifetime earnings.
10. I think setting goals is important for my future success.

The participants were asked to respond to the questions using a value from a 5-point Likert scale with 1 equal to 'strongly agree' and 5 equal to 'strongly disagree'. The Likert scale (1932) was developed as way of measuring attitudes. Since that time, the use of Likert scale responses in social science research is readily accepted as a reliable measure, but some debate does continue regarding the optimal number of response categories. In this study, we employed the 5-point Likert scale, which includes a midpoint response for neutrality. Some, such as Garland (1991), argue that it is preferable to force the respondent to take a side and therefore use a 4-point Likert scale. However, Adelson and McCoach (2010) found that "regardless of whether a neutral midpoint was offered or not, the structure of the instrument was virtually the same with equal intercepts, means, variances and covariances, pattern coefficients, and nearly all residuals" when measuring the mathematical attitudes of elementary school students.

The participants in this study are the 2,669 (2,305 treatment and 364 comparison) students who were accessed during the Fall of 2008 through Spring of 2010. The students came

from 39 different schools and had 49 different teachers[2]. Selected sample characteristics can be found in Table 1 of the Appendix. The comparison group is comprised of slightly more males (52.8%) than females, while the treatment group is only 41.8% male. In both groups, the majority of students are 16 and 17 years old. Also, in both groups the majority of the students sampled are from Pennsylvania. Finally, a little over half (55.6%) of the treatment group students are in courses that are less than a year long while 56.3% of comparison students are in year long courses.

It is important to note that this study is a quasi-experimental study. Students in the treatment group self-selected themselves into their elective "Keys to Financial Success" course and therefore the treatment group. Students in the comparison group are other classes, most often taught by the same teacher, in the school that are not receiving the Keys curriculum. The comparison classes could be a business, social studies, or math class. As with many studies that examine the effects of specific curriculum on student achievement, random assignment was not possible given the specific circumstances present in the participating schools that range across three states. For example, while all three states include personal finance education requirement in their standards that are required to be implemented, they differ in their degree of implementation. Pennsylvania and Delaware do not require a separate personal finance course, only that content be implement somewhere in the curriculum. New Jersey, however, requires a separate course as part of its high school graduation requirements. However, if random assignment to the treatment or comparison group had been possible, it would have potentially added external validity to the study.

[2] While we ask for all trained teachers to participate in the testing portion of the Keys program, participation is completely voluntary and occasionally, due mostly to schedule changes, a teacher is assigned to teach the course in their school before being trained by the partners.

Analysis

To address the first part of our research question we utilize a comparison of the univariate response rates to the individual questions by both the treatment and comparison groups. In particular, we present, for each question, tables that indicate how the response rate changed for the treatment group and for the comparison group. These tables show whether the students' self-reported personal finance behaviors and attitudes to personal finance topics change from the beginning of the study period (pre-test) to the end of the study period (post-test). In these tables, we only examine those respondents who answered each of the questions in both the pre-test period and the post-test period. Results reported along the upper-left to lower-right diagonal of each table indicate the number of respondents who did not change their response from the pre-test period to the post-test period. Results reported to the right of the diagonal indicate the number of respondents who disagreed more (worsening) in the post-test period than in the pre-test period. Results reported to the left of the diagonal indicate the number of respondents who agreed more (improving) in the post-test period than in the pre-test period.

F-tests, with one-tailed probability, were conducted to investigate whether the responses in each array are statistically significantly different. In other words, we are measuring the probability that the variances in a selected pre-array and selected post-array are not significantly different. For example, are those who answered strongly agree on the pre-test statistically significantly different than those who answered one on the post-test. The null hypothesis is that the change is not statistically different.

To predict characteristics that contribute to students having improved personal finance behaviors we employ the use of ordinal logistic regression. Specifically, let p_{ij} be the probability

that student *i* falls into category *j* of the dependent variable. The categories are ordered in the sequence *j* = 1, 2, 3, 4, 5.

Then the cumulative probability is modeled as follows:

$$F_{ij} = \sum_{m=1}^{j} p_{im}$$

and the model is specified as:

$$\log\left[\frac{F_{ij}}{1 - F_{ij}}\right] = \alpha_j + \beta x_i \qquad j = 1, 2, 3, 4$$

where $\beta x_i = \beta_1 x_{i1} + \ldots + \beta_k x_{ik}$.

Setting the model up in this manner allows the explanatory variables to predict the probability of being in a lower category, that is, being in categories two (agree) through five (strongly disagree) rather than one (strongly agree). Stated differently, each reported odds ratio can be interpreted as the effect of the explanatory variable of being in categories two (agree) through five (strongly disagree) rather than category one (strongly agree). For a description of the variables used in the logistic regression please see Table 14.

IV. Results

The students' survey responses by question from both the pre- and post-test period for the treatment group are reported in Table 2. The students' survey responses by question for the comparison group are reported in Table 3. Tables 4 through 13 report how both treatment and comparison group responses changed for each of the questions. Results for the ordinal logistic regression models are shown in Table 15. All models satisfy the proportional odds assumption, which means the ordinal restrictions are valid, and are significant.

"I save money before I spend it."

An examination of the Table 2 shows that 683 (70.56 percent) of students in the treatment group came into the "Keys" course reporting that they either strongly agree or agree with the statement "I save money before I spend it." In contrast, as shown in Table 3, in the pre-test period, 191 students in the comparison group (74.90 percent) agreed or strongly agreed with the statement.

In the post-test period, 715 (73.86 percent) students in the treatment group strongly agreed or agreed with the statement while 191 (74.51 percent) students in the comparison group in the same period responded that they strong agreed or agreed with the statement. Based on these univariate results, there appears to be improvement on the part of the treatment students' self-reported saving/spending behavior with no comparable improvement on the part of students in the comparison group.

The change analysis results for this question are reported in Table 4. Excluding sparse cells with significance (indicated in bold) and only examining change results that are statistically significant at the 1 percent or 5 percent level, 149 (15.39 percent) treatment students' responses went from negative or neutral to strongly agree or agree, while 124 (12.81 percent) treatment students' responses went from strongly agree or agree to neutral or negative. Ten students in the treatment group improved slightly from strongly disagree to disagree.

In contrast, again excluding sparse cells with significance and only looking at cells where the changes are statistically significant at the 1 percent or 5 percent level, 25 (9.80 percent) comparison group students changed their rating from neutral or negative to agree. Twenty-four (9.41 percent) comparison group students went from a positive response to a neutral or disagree response.

Taken together, these results point to some improvement on the part of students in the treatment group with respect to their counterparts in the comparison group. But, there is also a potential change with respect to awareness. The movement of some students from strongly agree or agree to disagree or strongly disagree may not necessarily reflect a negative result. In fact, if the course has in fact increased their awareness of their behaviors that might reflect a positive effect of the course on students' attitudes.

Table 15 shows that student's gender, if they held a job, and how they answered this question on the pre-test, are significant predictors of their answer to this question on the post-test. The odds of males being in a lower category are 1.2 times the odds for females. This would imply that females would be more like to strongly agree that they save money before they spend it than males would. Additionally, the student's who currently hold, or held a job in the past, are 1.3 times more likely to be a lower category. Finally, while those who answered that they have a savings account adds to the overall significance of the model, by itself it is not significant. These last two results seem counter intuitive because we would expect those who have/had a job and have a savings account to be more likely to strongly agree that that they save money before they spend it.

"I keep track of my spending closely."

As shown in Table 2, 537 students (56.47 percent) in the treatment group responded strongly agree or agree to the statement "I keep track of my spending closely." In the same pre-test period, as shown in Table 3, 144 students (56.25 percent) in the comparison group responded strongly agree or agree to the statement. In the post-test period, 581 students (61.09 percent) in the treatment group responded strongly agree or agree to the statement, while 144 students (56.25 percent) in the comparison group responded strongly agree or agree.

In Table 5, we show the change analysis results for the same question for both the treatment and comparison groups. As before, we look at only the changes that are statistically significant at the 1 percent or 5 percent level and exclude results from sparse cells. Eight students (0.84 percent) in the treatment group went from strongly disagree in the pre-test period to strongly agree in post-test period. Twenty-two other students (2.31 percent) who responded strongly disagree in the pre-test period responded disagree or neutral in the post-test period. But, 21 students (2.21 percent) who had responded neutral or disagree in the pre-test period changed their response in the post-test period to strongly disagree.

In the comparison group, six students (2.34 percent) changed from disagree in the pre-test period to agree in the post-test period. Nineteen students (7.42 percent) in the comparison group who had responded agree in the pre-test period changed their response in the post-test period to neutral or disagree.

Taken together, these results show some limited improvement in the treatment group, particularly on the part of those students who reported in the pre-test period that they strongly disagreed with the statement.

"I have developed a budget for this year."

As reported in Table 2, 206 students (21.91 percent) in the treatment group reported in the pre-test period that they strongly agreed or agreed with the statement "I have developed a budget for this year." In the post-test period, 274 students (29.15 percent) in the treatment group reported that they strongly agreed or agreed with the statement, a 7.24 percent improvement.

In contrast, as reported in Table 3, 44 students (17.46 percent) in the comparison group reported in the pre-test period that they strongly agreed or agreed with the statement. In the post-

test period, 43 students (17.06 percent) in the comparison group responded strongly agree or agree to the statement, a decrease of 0.40 percent.

Looking at the change analysis for this question reported in Table 6 and, again, excluding the statistically insignificant and sparse cells, 103 students (10.96 percent) changed their response from the pre-test to post-test periods from negative or neutral to strongly agree or agree. Only 41 students (4.36 percent) in the treatment group changed their responses from positive in the pre-test period to negative in the post-test period. However, it is interesting to note the majority of the students indicated that they still had not developed a budget even after going through the Keys course.

In the comparison group, 8 students (3.17 percent) changed their response from disagree in the pre-test period to agree in the post-test period, but 14 students (5.56 percent) in the comparison group changed their response from positive to neutral or disagree. Here again, there seems to be some improvement in the response rate among the treatment group in comparison to the comparison group.

Interestingly, while the majority of the students indicated they had not developed a budget even after going through the Keys training, the treatment effect was significant in the logistic regression for this question. Specifically, if a student was in the treatment group the odds of being in a lower category increases by 2.4. Coupled with the univarite results from above we are taking this as a sign that we need to address our curriculum materials specifically with respect to the content on the importance of budgeting.

"I set aside money for special events (e.g., prom, homecoming, gifts)."

As shown in Table 2, 680 students (71.73 percent) in the treatment group reported strongly agreeing or agreeing with the statement "I set aside money for special events" in the

pre-test period. In the post-test period, 727 students (76.69 percent) in the treatment group responded strongly agree or agree to the statement. In contrast, as shown in Table 3, 187 students (73.62 percent) in the comparison group responded strongly agree or agree to the statement in the pre-test period. And, 195 students (76.77 percent) of students in the comparison group responded strongly agree or agree to the statement in the post-test period. Here, both groups showed improvement.

We examined the change analysis as reported in Table 7 and, again, excluded the statistically insignificant changes and the sparsely populated cells. In the treatment group, 159 students (16.77 percent) changed their response from neutral or negative in the pre-test period to strongly agree or agree in the post-test period. However, 116 treatment group students (12.24 percent) changed their response from positive in the pre-test period to neutral or negative in the post-test period. Eight students (0.84 percent) from the treatment group changed their response in the pre-test period from strongly disagree to neutral in the post-test period.

In contrast, 37 students (14.57 percent) in the comparison group changed their response to the statement from neutral or negative in the pre-test period to strongly agree or agree in the post-test period. Twenty-two students (8.66 percent) in the comparison group changed their response from positive in the pre-test period to neutral or negative in the post-test period. Taken together, these results, on a percentage basis, seem to show that both the treatment group and the comparison group are changing in similar ways toward setting money aside for special events over the period. This may reflect the fact that as the school year progresses, the students move closer and closer toward large events like proms.

"I would put some of my savings in the stock market."

As reported in Table 2, 240 students (25.79 percent) in the treatment group responded strongly agree or agree to the statement "I would put some of my savings in the stock market" in the pre-test period. That response rate grew to 29.65 percent (276 students) in the post-test period. As reported in Table 3, 55 students (21.74 percent) in the comparison group responded strongly agree or agree to the statement in the pre-test period. Fifty-seven students (22.53 percent) in the comparison group responded strongly agree or agree in the post-test period.

In Table 8, we report the results of our changes analysis. Thirty-six students (3.87 percent) in the treatment group changed their response to the question from neutral to negative in the pre-test period to strongly agree in the post-test period. However, 78 students (8.38 percent) in the treatment group changed their response from strongly agree or agree in the pre-test period to neutral or negative in the post-test period.

Seven students (2.77 percent) in the comparison group changed their response from neutral or negative in the pre-test period to strongly agree in the post-test period. Sixteen students (6.32 percent) in the comparison changed their response from strongly agree to agree in the pre-test period to neutral in the post-test period.

These results point to an overall decrease in self-reported willingness on the part of both treatment and comparison group students to put their money in the stock market. But, given the volatility exhibited in the stock market over the study period, these results could be highly sensitive to changes in the Dow Jones Industrial Average or other measures of short-term stock market performance.

As shown in Table 15, gender, their answer to this question on the pre-test, and their score on the financial portion of the test are significant predictors of whether or not a student is

likely to put some of their money in the stock market. Results show that males 1.5 times more likely to be in a lower category than females.

"I use my own credit card regularly."

As shown in Table 2, 174 students (15.82 percent) in the treatment group strongly agreed or agreed with the statement "I use my own credit card regularly" in the pre-test period. In the post-test period, 167 students (15.18 percent) in the treatment group strongly agreed or agreed with the statement. In the comparison group, as reported in Table 3, 28 students (11.02 percent) responded strongly agree or agree to the statement in the pre-test period, while 50 students (19.69 percent) responded strongly agree or agree in the post-test period.

Our change analysis is reported in Table 9. Eighty-eight (8 percent) of students in the treatment group changed from responded strongly disagree or disagree in the pre-test period to strongly agree or agree in the post-test period. Fifty-six (5.09 percent) of students in the treatment group changed from a negative response to a neutral response, while 194 treatment group members switched between disagree and strongly disagree between the two survey periods. One hundred and four (9.45 percent) of students in the treatment group changed their response from strongly agree or agree in the pre-test period to disagree or strongly disagree in the post-test period, while 51 (4.64 percent) of treatment group members changed their response from neutral on the pre-test to strongly disagree or disagree on the post-test.

In contrast, excluding sparse cells and statistically insignificant cells, 16 students (6.30 percent) in the comparison group changed their response from strongly disagree on the pre-test to agree on the post-test and 13 students (5.12 percent) in the comparison group changed their response from strongly disagree or disagree on the pre-test to neutral on the post-test. Twenty-

nine (11.42 percent) of comparison group members changed their response from neutral or disagree on the pre-test to strongly-disagree on the post-test.

"I shop around for banking services such as checking and savings accounts."

As reported in Table 2, 160 students (14.79 percent) in the treatment group responded strongly agree or agree to the statement "I shop around for banking services such as checking and savings accounts" in the pre-test period. In contrast, 235 students (21.72 percent) in the treatment group responded positively to the statement in the post-test period; an increase of nearly seven percent.

As reported in Table 3, 21 students (8.30 percent) in the comparison group responded strongly agree or agree to the statement in the pre-test period, while 34 students (13.44 percent) responded in positively in the post-test period.

Our changes analysis for this question is reported in Table 10. Eighty-six students (7.95 percent) in the treatment group changed their response from strongly disagree or disagree to strongly agree or agree between the two survey periods. Eleven treatment group students (1.02 percent) changed their response from strongly agree to agree. Eighty-four students (7.76 percent) changed their response from the strongly agree or agree in the pre-test period to strongly disagree, disagree, or neutral in the post-test period. And, 87 students (8.04 percent) in the treatment group who responded neutral in the pre-test period changed their response in the post-test period to strongly disagree or disagree.

The results for the comparison group, again excluding sparse cells, are slightly different with 13 students (5.14 percent) of comparison group students changing their response between the pre-test and the post-test period from strongly disagree to disagree to agree. Eight students (3.16 percent) in the comparison group changed their response from neutral to strongly disagree.

Seven students (2.77 percent) in the comparison group changed their response from agree in the pre-test period to neutral in the post-test period.

"I use the Internet to gather information for choices I have to make about money."

As shown in Table 2, 422 students (39.44 percent) in the treatment group responded strongly agree or agree to the statement "I use the Internet to gather information for choices I have to make about money" in the pre-test period. In the post-test period, 491 students (45.89 percent) in the treatment group responded strongly agree or agree to the statement. In contrast, as reported in Table 3, 78 students (30.95 percent) in the comparison group responded strongly agree or agree to the statement in the pre-test period. In the post-test period, 97 students (38.49 percent) in the comparison group responded positively to the statement.

Our changes analysis for this question is shown in Table 11. For the treatment group, none of the changes are statistically significant. For the comparison group, only one change is statistically significant and not in a sparsely populated cell in the table. Eight comparison group students (3.17 percent) who responded strongly disagree in the pre-test period responded disagree in the post-test period. So, overall, for both the treatment and the comparison groups, there seems to no measurable change in students' self-reported comparison shopping using the Internet.

"I believe that investing in education after high school will improve my lifetime earnings."

As shown in Table 2, 909 students (84.32 percent) in the treatment group strongly agreed or agreed with the statement "I believe that investing in education after high school will improve my lifetime earnings" in the pre-test period. In the post-test period, 925 students (85.81 percent) in the treatment group strongly agreed or agreed with the statement. In contrast, as reported in Table 3, 217 students (86.11 percent) in the comparison group strongly agreed or agreed with the

statement in the pre-test period, while 208 students (82.54 percent) in the same group responded strongly agree or agree in the post-test period.

Our change analysis results for this question are reported in Table 12. In the treatment group, 89 students (8.26 percent) changed from a neutral or negative response to the statement in the pre-test period to strongly agree in the post-test period. One hundred and thirty students (12.06 percent) in the treatment group changed their response from agree in the pre-test period to strongly agree in the post-test period. However, 98 students (9.09 percent) in the treatment group changed their response from positive in the pre-test period to neutral or negative in the post-test period. And, 96 students (8.91 percent) in the treatment group changed their response from strongly agree in the pre-test period to agree in the post-test period.

In the comparison group, 46 students (18.25 percent) improved their response from neutral or agree in the pre-test period to strongly agree in the post-test period. Seventeen students (6.75 percent) in the comparison group lowered their response to the statement from strongly agree in the pres-test period to agree in the post-test period. Fourteen students (5.56 percent) in the comparison group reduced their response from strongly agree or agree in the pre-test period to neutral or disagree in the post-test period.

"I think setting goals is important for my future success."

As reported in Table 2, 963 students (91.63 percent) in the treatment group responded strongly agree or agree to the statement "I think setting goals is important for my future success" in the pre-test period. In the post-test period, 976 students (92.86 percent) in the treatment group responded strongly agree or agree to the statement. As reported in Table 3, 227 students (91.16 percent) in the comparison group responded strongly agree or agree to the statement in the pre-

test period. In the post-test period, 224 students (89.96 percent) responded strongly agree or agree to the statement.

Our change analysis for this question is reported in Table 13. Sixty-one students (5.80 percent) in the treatment group changed their response to the statement from neutral or negative in the pre-test period to strongly agree or agree in the post-test period. Moreover, 112 treatment group members (10.66 percent) changed their response from agree in the pre-test period to strongly agree in the post-test period. Thirty-five members of the treatment group (3.33 percent) changed their response from positive in the pretest period to neutral in the post-test period. Eighty-seven (8.28 percent) of students in the treatment group changed their response to the question from strongly agree in the pre-test period to agree in the post-test period, while 8 treatment group members (0.76 percent) reduced their response from strongly agree in the pre-test period to disagree in the post-test period.

In contrast, for the comparison group, excluding sparse cells, there were few statistically significant changes in responses between the pre-test period and the post-test period. Thirty-two comparison group members (12.40 percent) downgraded their response from strongly agree in the pre-test period to agree in the post-test period. Twelve students (4.65 percent) in the comparison group reduced their response from strongly agree or agree in the pre-test period to neutral in the post-test period.

V. Conclusions

The intention of including a set of questions related to attitudes or behaviors to pre- and post-tests of students in the Keys to Financial Success course and their counterparts in a comparison group was to examine whether the course made a difference in students' attitudes toward what are perceived as positive personal finance behaviors. Some of these behaviors or

attitudes are readily applicable by students in both the treatment and comparison groups. That is to say, they are behaviors or attitudes that they are readily able to exhibit at their age, even while in high school. However, other behaviors are not ones that they are readily able to or likely to exhibit while still in high school and most likely living under their parents' roofs. For instance, it is much less likely that a high school student will have their own credit card than a college student would. Moreover, it's less likely that a high school student would need to shop for banking services.

Saving money before spending it and keeping track of spending closely are both behaviors which would be relatively easy for students to exhibit even while in high school. Results from the change analysis related to the saving money before spending it question showed some limited improvement in the treatment group with respect to the comparison group. However, there seemed to be little or no measureable change in student behavior or attitudes with respect to tracking spending.

While budgeting is a behavior that will be much more significant as part of a financially successful life as an adult, it is also a behavior that is relatively easy for high school students to exhibit even while remaining dependents in the homes of their parents or guardians. Students in the treatment group reported more of a change toward budgeting than did their counterparts in the comparison group.

Students are also able to and likely to set money aside for special events like proms. As one might expect, the students in both the treatment and comparison groups showed an increase in their agreement with the statement "I set aside money for special events."

While some high school students already invest money in the stock market, the majority likely don't. The change analysis results point to an overall worsening in both the treatment and

comparison groups around their willingness to invest savings in the stock market. However, there was significant volatility in the stock market throughout the study period and it is likely that that volatility affected student attitudes towards investing in the stock market.

Younger high school students generally do not have their own credit card accounts, but as students approach college age, they are more likely to either own credit card accounts or shared credit card accounts with the a parent or guardian. There were a lot of changes in the distribution of answers to this question, particularly in the treatment group. These changes could reflect that more students in the treatment group were getting access to their own credit cards, but it could also reflect that many students who have credit cards have stopped using them regularly over the survey period. With 396 students in the treatment group responding strongly disagree in both the pre-test and post-test period, it is likely that given that they don't have their own credit cards, this question was difficult for them to answer.

High school students are unlikely to shop for banking services. They are much more likely to either have bank accounts opened with the help of parents or guardians. However, one of the goals of the Keys course is to encourage students to shop around for banking services once they reach adulthood. For this question, there was significantly more movement in the treatment group than in the comparison group. This movement may reflect that the students in the treatment group learned what was meant by the statement, but that at this point in their lives they don't need to shop for banking services.

Students in both the treatment and comparison groups exhibited little change in their use of the Internet to gather information for choices they have to make about money.

An overwhelming number of students in both the treatment and comparison groups believe that investing in education after high school will improve their lifetime earnings. Most of

the students entered the pre-test period either strongly agreeing or agreeing with the statement. Many students in the treatment group who had not responded strongly agree in the pre-test period changed their response to strongly agree in the post-test period. But, a surprising number of students in the treatment group also downgraded their response between the pre-test period and the post-test period from strongly agree or agree to neutral or negative. The comparison group exhibited similar, but smaller changes in both directions.

Many students in both the treatment and comparison groups entered the pre-test period believing that goal setting was important for their future success. A number of students in the treatment group who had responded neutral or negative in the pre-test period changed their response to strongly agree in the post-test period. While there was some movement from positive to neutral or negative in the treatment group, it appears that the treatment group showed an increase in their belief that goal setting was important to future success. Excluding sparsely populated cells, the comparison group did not exhibit a significant improvement in the respondents' belief in goal setting.

Overall, the results reported in this paper point to some limited improvement in self-reported behaviors, attitudes, and perceptions on the part of students in the treatment group when compared to those of students in the comparison group. However, the results are not overwhelmingly conclusive. Moreover, self-reported data is notoriously less reliable than data that can be obtained from other sources. Over the last couple years, the economic education community has increasingly discussed the need for a large-scale longitudinal study of student achievement in personal finance and its effects on individuals' long-run financial health beyond high school and the college years and into the world of work. The limitations of this study amplify the need for such high quality, longitudinal data, which could be available for use by

many researchers in the field.

References

Adelson, J. and B. McCoach. 2010. Measuring the mathematical attitudes of elementary students: The effects of a 4-Point or 5-Point Likert-type scale. *Educational and Psychological Measurement*, 70(5): 796–807.

Allison, P. 1999. *Logistic Regression Using SAS: Theory and Application*. SAS Publishing.

Bernanke, B. 2006. Financial Literacy: Testimony before the Committee on Banking, Housing, and Urban Affairs of the United States Senate. http://www.federalreserve.gov/newsevents/testimony/Bernanke20060523a.ht

Bernheim, B. D., D.M. Garrett, & D.M. Maki. 2001. Education and saving : The long-term effects of high school financial curriculum mandates. *Journal of Public Economics*, *80*(2001): 435-465.

Danes, S.M. 2004. Evaluation of the NEFE High School Finanical Planning Program®, 2003-2004. Greenwood village, CO: National Endowment for Financial Education.

Danes,S.M., C. H. Casas, and L. Boyce. 1999. Financial planning curriculum for teens: Impact evaluation. *Financial Counseling and Planning,* 118: 25-37.

Garland, R. 1991. The mid-point on a Likert rating scale: Is it desirable? *Marketing Bulletin*, *2*, 66-70.

Greenspan, A. 2001. Remarks by Chairman Alan Greenspan: The importance of education in today's economy. Speech presented at the Community Affairs Research Conference of the Federal Reserve System. http://www.federalreserve.gov/boarddocs/speeches/2001/20011026/default.htm

Harter, C. and J. Harter. 2009. Assessing the effectiveness of financial fitness for life in eastern Kentucky. *Journal of Applied Economics and Policy* 28: 20-33.

Hogarth, J. M. 2002. Financial literacy and family & consumer sciences. *Journal of Family and Consumer Sciences,* 94(1): 15-28.

Likert, R. 1932. A technique for the measurement of attitudes. *Archives of Psychology*, *22*, 2-55.

Mandell, L. and L. Klein. 2007. Motivation and financial literacy. *Financial Services Review* 16: 105-116.

_____. 2009. The impact of financial literacy education on subsequent financial behavior. *Journal of Financial Counseling and Planning* 20: 14-24.

.

Peng, T. M., S. Bartholomae, J.J. Fox, and G. Cravener. 2007. The impact of personal finance education delivered in high school and college courses. *Journal of Family and Economic Issues*, *28*(2): 265-284.

Swinton, J., T. DeBerry, B. Scafidi, and H. Woodard. 2007. The impact of financial education workshops for teachers on students' economic achievement. *The Journal of Consumer Education* 24: 63-77.

Tennyson, S., and C. Nguyen. 2001. State curriculum mandates and student knowledge of personal finance. *The Journal of Consumer Affairs*, *35*(2): 241-262.

Varcoe, K. P., A. Martin, Z. Devitto, and C. Go. 2005. Using a financial education curriculum for teens. *Financial Counseling and Planning*, *16*(1): 63-71.

Vitt, L.A., C. Anderson, J. Kent, D..M. Lyter, J. K. Siegenthaler, and J. Ward. 2000. *Personal finance and the rush to competenece: Financial literacy education in the U.S.* Middleburg, Virginia: Institute for Socio-Financial Studies.

Walstad, W. and K. Rebeck. 2005. *Financial Fitness for Life: High School Test Examiner's Manual (grades 9-12.)* New York: Council for Economic Education.

Walstad, W., K. Rebeck, and R. MacDonald. 2010. The effects of financial education on the financial knowledge of high school students. *The Journal of Consumer Affairs* 44: 336-357.

Appendix

Table 1. Student Sample Characteristics

	Treatment (%)	Comparison (%)
Male	41.8	52.8
Age < 15	19.0	27.5
Age 16 & 17	45.1	48.1
Age > 18	35.9	24.5
Avg Pre Score	41.8	42.1
Avg Post Score	61.4	39.3
DE	23.9	35.2
NJ	9.1	17.8
PA	67.0	47.0
Year long course	44.4	56.3
< year long course	55.6	43.7
Sample size	2,035	364

Notes: Age is the self-reported age at the time of the post-test. Pre- and post-test average scores are for the portion of the test that deals with financial knowledge only.

Table 2. Treatment, Pre- and Post-Test Survey Responses by Question							
Question		SA	A	N	D	SD	n
I save money before I spend it.	Pre	301	382	121	127	37	968
	Post	339	376	116	109	28	968
I keep track of my spending closely.	Pre	205	332	191	182	41	951
	Post	218	363	173	162	35	951
I have developed a budget for this year.	Pre	75	131	229	337	168	940
	Post	98	176	209	326	131	940
I set aside money for special events (e.g., prom, homecoming, gifts).	Pre	332	348	124	102	42	948
	Post	359	368	102	93	26	948
I would put some of my savings in the stock market.	Pre	107	133	281	218	192	931
	Post	118	158	283	172	200	931
I use my own credit card regularly.	Pre	96	78	84	267	575	1100
	Post	90	77	80	294	559	1100
I shop around for banking services such as checking and savings accounts.	Pre	55	106	214	368	339	1082
	Post	78	157	228	348	271	1082
I use the Internet to gather information for choices I have to make about money.	Pre	151	271	206	271	171	1070
	Post	171	320	201	237	141	1070
I believe that investing in education after high school will improve my lifetime earnings.	Pre	671	238	112	37	20	1078
	Post	719	206	109	29	15	1078
I think setting goals is important for my future success.	Pre	769	194	51	22	12	1051
	Post	807	169	47	20	8	1051

Table 3. Comparison, Pre- and Post-Test Survey Responses by Question							
Question		SA	A	N	D	SD	n
I save money before I spend it.	Pre	70	121	28	33	3	255
	Post	71	119	32	25	8	255
I keep track of my spending closely.	Pre	45	99	55	50	7	256
	Post	52	92	52	44	16	256
I have developed a budget for this year.	Pre	11	33	61	101	46	252
	Post	15	28	64	93	52	252
I set aside money for special events (e.g., prom, homecoming, gifts).	Pre	85	102	34	29	4	254
	Post	97	98	27	25	7	254
I would put some of my savings in the stock market.	Pre	20	35	99	52	47	253
	Post	19	38	92	53	51	253
I use my own credit card regularly.	Pre	6	22	20	66	140	254
	Post	22	28	20	62	122	254
I shop around for banking services such as checking and savings accounts.	Pre	4	17	49	97	86	253
	Post	11	23	58	80	81	253
I use the Internet to gather information for choices I have to make about money.	Pre	20	58	54	82	38	252
	Post	35	62	48	66	41	252
I believe that investing in education after high school will improve my lifetime earnings.	Pre	145	72	29	3	3	252
	Post	162	46	27	12	5	252
I think setting goals is important for my future success.	Pre	156	71	13	8	1	249
	Post	158	66	15	7	3	249

Table 4: I save money before I spend it

Treatment Group

		Post					
		1	2	3	4	5	Total
Pre	1	188	72	19*	17*	**5***	301
	2	106	200	44*	26*	6*	382
	3	20**	51**	28	16	6*	121
	4	17*	43**	21	40	6*	127
	5	8*	10*	**4***	10**	**5***	37
	Total	339	376	116	109	28	968

Comparison Group

		Post					
		1	2	3	4	5	Total
Pre	1	40	24	**4****	**1****	**1***	70
	2	25	70	14*	10*	**2***	121
	3	**4****	15*	5	3	**1***	28
	4	**1****	10*	9	10	**3****	33
	5	**1***	**0***	**0***	**1***	1	3
	Total	71	119	32	25	8	255

Notes: * Significant at less than 1%; ** significant at less than 5%; sparse cells with significance indicated in bold.

Table 5: I keep track of my spending closely

Treatment

		Post					
		1	2	3	4	5	Total
Pre	1	89	70	25	17	**4***	205
	2	73	162	57	36	**4***	332
	3	26	71	57	29	8*	191
	4	22	55	25	67	13*	182
	5	8*	**5***	9*	13*	6	41
	Total	218	363	173	162	35	951

Control

		Post					
		1	2	3	4	5	Total
Pre	1	20	14	5	5	1	45
	2	23	55	10**	9**	**2***	99
	3	4	17	18	13	3	55
	4	5	6**	15	16	8	50
	5	**0***	**0***	**4****	**1****	2	7
	Total	52	92	52	44	16	256

Notes: * Significant at less than 1%; ** significant at less than 5%; sparse cells with significance indicated in bold.

Table 6: I have developed a budget for this year

Treatment

		Post					
		1	2	3	4	5	Total
Pre	1	25	20	14	10*	6	75
	2	17	40	30	31*	13	131
	3	22*	52	76	66	13	229
	4	22*	47**	60	164	44	337
	5	12**	17	29	55	55	168
	Total	98	176	209	326	131	940

Control

		Post					
		1	2	3	4	5	Total
Pre	1	2	4	**1***	**3***	**1***	11
	2	6	10	7*	7*	**3****	33
	3	**4***	6	31	14	6	61
	4	**3***	8*	20	53	17	101
	5	**0***	0	5	16	25	46
	Total	15	28	64	93	52	**252**

Notes: * Significant at less than 1%; ** significant at less than 5%; sparse cells with significance indicated in bold.

Table 7: I set aside money for special events (e.g. prom, homecoming, gifts).

Treatment

		Post					
		1	2	3	4	5	Total
Pre	1	192	92	21*	19*	8*	332
	2	101	179	39*	23*	6*	348
	3	39**	48**	20	16**	**1***	124
	4	23*	38*	14	23	**4****	102
	5	**4***	11*	8**	12	7	42
	Total	359	368	102	93	26	948

Control

		Post					
		1	2	3	4	5	Total
Pre	1	50	25	**5****	**4***	**1***	85
	2	33	46	13**	9*	**1***	102
	3	11**	14**	2	4	3	34
	4	**3***	12**	5	7	**2****	29
	5	**0***	**1***	**2***	**1***	0	4
	Total	97	98	27	25	7	254

Notes: * Significant at less than 1%; ** significant at less than 5%; sparse cells with significance indicated in bold.

Table 8: I would put some of my savings in the stock market.

Treatment

		Post					
		1	2	3	4	5	Total
Pre	1	38	22	23**	15	9**	107
	2	27	37	33**	23	13**	133
	3	25**	50	121	50	35	281
	4	17	30	68	53	50	218
	5	11**	19	38	31	93	192
	Total	118	158	283	172	200	931

Control

		Post					
		1	2	3	4	5	Total
Pre	1	4	2	8*	2	**4****	20
	2	3	14	8**	5	5	35
	3	7*	14	50	19	9	99
	4	**0****	4	22	17	9	52
	5	**5****	4	4	10	24	47
	Total	19	38	92	53	51	253

Notes: * Significant at less than 1%; ** significant at less than 5%; sparse cells with significance indicated in bold.

Table 9: I use my own credit card regularly.

Treatment

		Post					
		1	2	3	4	5	Total
Pre	1	22	11	6	25**	32*	96
	2	12	15	4	26*	21*	78
	3	9	10	14	28*	23*	84
	4	20*	22*	30**	108	87**	267
	5	27*	19*	26*	107**	396	575
	Total	90	77	80	294	559	1100

Control

		Post					
		1	2	3	4	5	Total
Pre	1	1	**0***	2	**2***	**1***	6
	2	6	**4***	4	**5***	**3***	22
	3	5	5	1	**3***	6*	20
	4	**5***	3	6**	29	23**	66
	5	**5***	16*	7*	23	89	140
	Total	22	28	20	62	122	254

Notes: * Significant at less than 1%; ** significant at less than 5%; sparse cells with significance indicated in bold.

Table 10: I shop around for banking services such as checking and savings accounts.

Treatment

		Post					
		1	2	3	4	5	Total
Pre	1	5	11**	17*	12*	10*	55
	2	14	20	27	34*	11*	106
	3	18	52	57	53**	34**	214
	4	18*	45**	78	160	67	368
	5	23*	29	49	89	149	339
	Total	78	157	228	348	271	1082

Control

		Post					
		1	2	3	4	5	Total
Pre	1	1	**0****	**1***	**0***	**2***	4
	2	3	4	7**	**2***	**1***	17
	3	**3***	6	16	16	8**	49
	4	**3***	6*	23	41	24	97
	5	**1***	7*	11	21	46	86
	Total	11	23	58	80	81	253

Notes: * Significant at less than 1%; ** significant at less than 5%; sparse cells with significance indicated in bold.

Table 11: I use the Internet to gather information for choices I have to make about money.

Treatment

		Post					
		1	2	3	4	5	Total
Pre	1	52	45	27	18	9	151
	2	52	116	45	43	15	271
	3	18	77	50	36	25	206
	4	31	59	55	95	31	271
	5	18	23	24	45	61	171
	Total	171	320	201	237	141	1070

Control

		Post					
		1	2	3	4	5	Total
Pre	1	10	1	6	**1****	2	20
	2	11	29	5	6	7	58
	3	5	12	13	19	5	54
	4	**3****	16	18	32	13	82
	5	6	4	6	8**	14	38
	Total	35	62	48	66	41	252

Notes: * Significant at less than 1%; ** significant at less than 5%; sparse cells with significance indicated in bold.

Table 12: I believe that investing in education after high school will improve my lifetime earnings.

Treatment

		Post					
		1	2	3	4	5	Total
Pre	1	512	96*	46*	11*	6*	671
	2	130**	70	28**	7*	**3***	238
	3	48*	27	24	7**	6*	112
	4	13*	12*	9	3	0	37
	5	16*	**1***	2	1	0	20
	Total	719	206	109	29	15	1078

Control

		Post					
		1	2	3	4	5	Total
Pre	1	115	17*	8*	**3***	**2***	145
	2	35**	18	11	6*	**2***	72
	3	11*	11	6	1	**0***	29
	4	**1***	**0***	**2***	0	0	3
	5	**0***	**0***	**0***	2	1	3
	Total	162	46	27	12	5	252

Notes: * Significant at less than 1%; ** significant at less than 5%; sparse cells with significance indicated in bold.

Table 13: I think setting goals is important for my future success.

Treatment

		Post					
		1	2	3	4	5	Total
Pre	1	644	87*	26*	8*	**4***	769
	2	112*	67	9**	**4***	**2***	194
	3	26*	10**	12	**2****	**1***	51
	4	13*	**4***	0	5	**0****	22
	5	12*	**1***	0	1	**1****	15
	Total	807	169	47	20	8	1051

Control

		Post					
		1	2	3	4	5	Total
Pre	1	114	32**	6*	**2***	**2***	156
	2	35	28	6*	**2***	**0****	71
	3	**4***	**4****	1	3	10	22
	4	**4***	**2***	2	0	0	8
	5	**1***	**0***	**0***	0	**0***	1
	Total	158	66	15	7	12	258

Notes: * Significant at less than 1%; ** significant at less than 5%; sparse cells with significance indicated in bold.

Table 14. Variable Specification Used in Ordinal Logistic Regressions	
Variable	Definition
Job	Do you currently have or have you had in the past a part-time job and/or summer job? (1 = yes, 0 = no)
Checking	Do you currently have your own checking account? (1 = yes, 0 = no)
Savings	Do you currently have your own savings account? (1 = yes, 0 = no)
Gender	Student's gender (1 = male, 0 = female)
Treatment	Student received the Keys treatment (1 = yes, 0 = no)
Age	Student's age (1 = < 15 , 2 = 16, 3 = 17, 4 = 18, 5 = 19 +)
Score	Score on the financial knowledge portion of the test.
Save	I save money before I spend it. (1 = SA, 2 = A, 3 = N, 4 = D, 5 = SD)
Track	I keep track of my spending closely. (1 = SA, 2 = A, 3 = N, 4 = D, 5 = SD)
Budget	I have developed a budget for this year. (1 = SA, 2 = A, 3 = N, 4 = D, 5 = SD)
Events	I set aside money for special events (e.g., prom, homecoming, gifts). (1 = SA, 2 = A, 3 = N, 4 = D, 5 = SD)
Stock Market	I would put some of my savings in the stock market. (1 = SA, 2 = A, 3 = N, 4 = D, 5 = SD)
Credit Card	I use my own credit card regularly. (1 = SA, 2 = A, 3 = N, 4 = D, 5 = SD)
Shop	I shop around for banking services such as checking and savings accounts. (1 = SA, 2 = A, 3 = N, 4 = D, 5 = SD)
Internet	I use the Internet to gather information for choices I have to make about money. (1 = SA, 2 = A, 3 = N, 4 = D, 5 = SD)
Invest Educ	I believe that investing in education after high school will improve my lifetime earnings. (1 = SA, 2 = A, 3 = N, 4 = D, 5 = SD)
Goals	I think setting goals is important for my future success. (1 = SA, 2 = A, 3 = N, 4 = D, 5 = SD)
Note: information gathered for all variables both in the pre- and post-test phase.	

Table 15. Ordered Logistic Regression Results

	Dependent Variables									
	Save		Track		Budget		Events		Stock Market	
Explanatory Variables	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio
Treatment	0.139	1.150	0.215	1.240	0.891*	2.438	0.046	1.047	-0.380	0.684
Gender	0.241**	1.272	0.212	1.237	0.206	1.229	-0.003	0.997	0.430*	1.537
Age	-0.044	0.957	0.038	1.038	-	-	0.093	1.097	-0.006	0.994
Pre [ ]	-0.866*	0.421	-0.678*	0.508	0.642*	0.526	-0.613*	0.542	0.572*	0.564
Job	0.298**	1.347	0.370*	1.447	-	-	0.285**	1.330	0.034	1.034
Checking	-	-	0.258**	1.294	-	-	-0.161	0.851	-	-
Savings	-0.044	0.957	-	-	-	-	-	-	0.230	1.258
Score	-	-	-	-	- 0.020*	0.980	-	-	0.025*	1.026
n	1,116		1,100		1,138		1,098		1,080	

	Dependent Variables Cont.									
	Credit Card		Shop		Internet		Invest Educ		Goals	
Explanatory Variables	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio
Treatment	-0.211	0.810	0.369*	1.446	0.173	1.189	-0.585*	0.557	0.647*	1.909
Gender	-0.008	0.992	0.229**	1.257	0.322*	1.380	-0.341*	0.711	- 0.524*	0.592
Age	0.040	1.040	0.079	1.082	-0.007	0.993	0.051	1.052	-0.072	0.930
Pre [ ]	-0.509*	0.601	-0.457*	0.633	- 0.551*	0.577	-0.534*	0.586	- 0.619*	0.538
Job	0.355*	1.426	0.294	1.342	0.095	1.099	0.017	1.017	-0.063	0.939
Checking	-	-	0.341	1.406	-	-	-0.209	0.812	-	-
Savings	-0.040	0.961	-0.133	0.875	0.131	1.140	0.407*	1.502	0.419*	1.520
Score	-	-	-	-	-	-	0.031*	1.032	-	-
n	1,241		1,214		1,213		1,209		1,194	

Notes: * Significant at less than 1%; ** significant at less than 5%; Dependent variables are all the post values for the variable. Pre [ ] is pre-test value for the respective dependent variable. For example, when modeling Post Save as the dependent variable, Pre Save was included as a possible explanatory variable.