FINANCIAL EDUCATION AND RETIREMENT SAVINGS

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Increasingly, workers are responsible for making their own savings decisions in order to accumulate sufficient resources to retire at the desired age and have an adequate retirement income. Individuals must decide when to start saving, how much to save, and how to invest their account balances. This study examines the role of financial education on retirement savings and illustrates how individuals alter their retirement goals and their saving behavior in response to improved financial literacy. Survey results suggest that after completing a financial education program, individuals are likely to reevaluate their lifetime plans for work and retirement as well as saving and consumption. A greater understanding of retirement income needs and the saving process encourages many workers to increase their saving rate in order to achieve their modified retirement goals.

Over the past three decades, there has been a large and continuing decline in the use of defined benefit plans, which typically provide automatic coverage and do not require workers to make any choices concerning contributions or investments. Employees are increasingly being covered by defined contribution plans. Defined contribution plans are often voluntary and require workers to decide when to contribute, how much to contribute, and how to invest these funds. In addition, many workers are now offered the opportunity to establish supplemental retirement savings plans through their employers. Supplemental plans also require employees to make investment decisions.

In this new environment, where individuals have greater responsibility for determining their own retirement income, factors such as general financial knowledge, an understanding of the retirement saving process, and recognition of the need for adequate savings have become critical to successfully achieving one's retirement objectives. Most individuals seem to have extremely limited knowledge of financial markets, the level of

risk associated with specific assets, and how much they must save to achieve a retirement income goal. Therefore, the need for financial education to improve individuals' level of financial literacy is an important policy issue facing our society. Recently, Federal Reserve Chairman Alan Greenspan (2002) commented that helping Americans understand basic concepts of budgeting and financial markets through financial education programs should enable them to make more appropriate short- and long-term savings decisions. Greenspan stated that

> …education can play a critical role by equipping consumers with the knowledge required to make wise decisions when choosing among the myriad of financial products and providers. …. In addition, comprehensive education can help provide individuals with the financial knowledge necessary to create household budgets, initiate savings plans, manage debt, and make strategic investment decisions for their retirement or children's education. Having these basic financial planning skills can help families to meet their near-term obligations and to maximize their longer-term financial well being. While data available to measure the efficacy of financial education are not plentiful, the limited research is encouraging.[1]

It seems obvious that increased financial awareness would be beneficial. However, most economic models assume that individuals have a basic level of financial literacy, understand financial markets, and know the risk–return characteristics of all assets. The influence of financial education on retirement goals and the impact of enhanced financial education on the likelihood of achieving the savings necessary to reach these goals have gone virtually unexplored. In this paper, we report the results of our study, which examines how financial education affects the choice of retirement goals, the level of retirement savings, and investment choices in retirement accounts.

SETTING RETIREMENT GOALS

Economic life-cycle models are used to explain how individuals divide their time between work and leisure, including a period of retirement at the end of life. They predict the age of retirement, annual saving rates, and the level of retirement income, subject to individual and household characteristics, as well as other factors such as returns on investments. To finance consumption during nonworking years, individuals save a portion of their earnings earlier in life. They decide on their optimal path of earnings and savings to achieve the desired level of consumption in each period. These consumption and savings decisions determine their retirement income at their chosen retirement ages.

In order to get predictions from the life-cycle models, researchers usually make simplifying assumptions as follows:

- Individuals know their lifetime path of annual earnings and the amount of retirement income needed to provide desired levels of consumption in retirement
- Individuals know rates of return on various types of investments, present value calculations, and the process of compounding returns
- There is either a known rate of return on a single investment possibility, or several different assets are available, and individuals know the risk and return characteristics of the various assets
- The age of retirement is exogenous and fixed
- Current and future tax rates are known with certainty

In a model with such assumptions, the primary choice facing individuals is to select the saving rate that yields the desired pattern of annual consumption while working and

during retirement. In reality, however, individuals may lack knowledge of the saving process and have incorrect assessments of potential rates of return on various assets. Individuals select retirement goals and objectives, such as the age of retirement and the desired level of retirement income, based on their current knowledge. If new information became available, individuals surely would review their choices. The result of any reassessment could be changes in retirement goals or retirement saving behavior.

Individuals maximize lifetime utility using the knowledge they have at the time. An expected outcome of this process is illustrated in figure 1. It shows annual earnings (E_t), from first entry into the labor force until retirement, required tax payments, net earnings (NE_t), annual savings and consumption (C_t) while working, and retirement income at R. But what if individuals lack certain financial knowledge and base their retirement saving behavior on incorrect information? Or what if workers have a flawed understanding of financial mathematics and thus do not understand concepts such as compound rates of return and the importance of starting to save early in life? Financial illiteracy could easily result in sub-optimal choices such as saving too little and not having enough retirement income. Specifically, if their prior behavior had been based on incorrect information, individuals could respond by changing their expected age of retirement or the amount of desired retirement income. They also could alter their saving rates and investment behavior in order to attain their retirement goals.

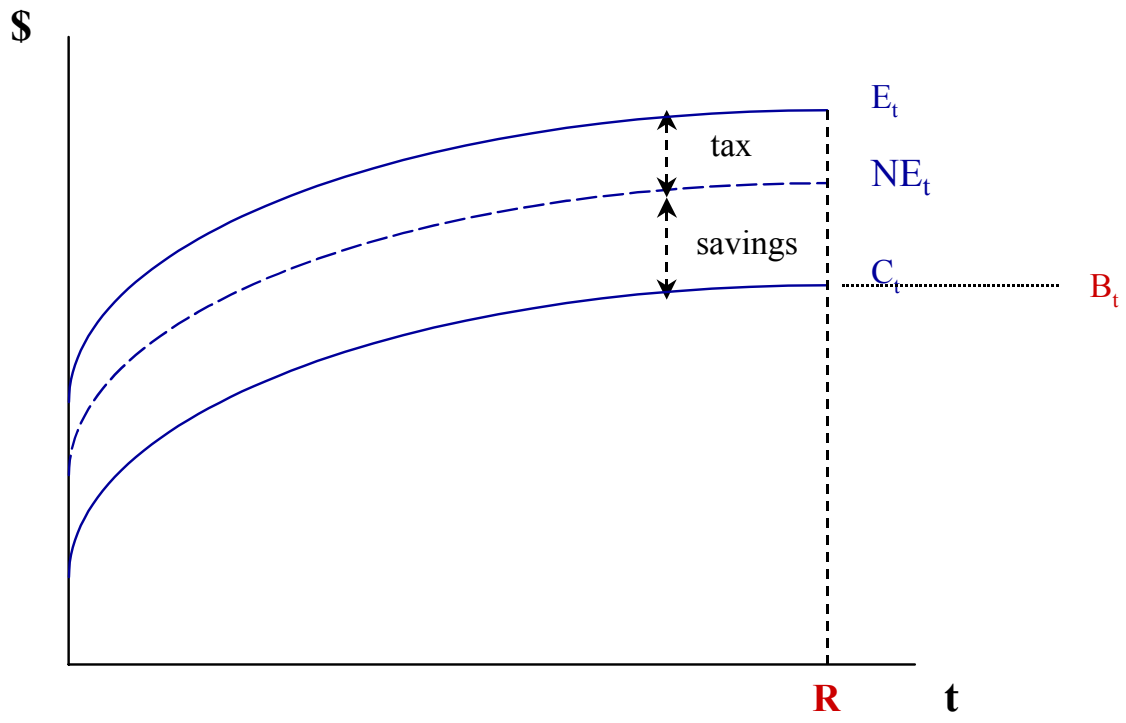

Figure 1. The Lifecycle Profile of Earnings, Savings, and Retirement

DOES FINANCIAL EDUCATION INFLUENCE RETIREMENT SAVING: WHAT DO WE KNOW NOW?

A lack of financial education may cause workers to start saving too late in life to realize their stated retirement goals. As a result, they are unlikely to achieve an optimal balance between current consumption while working and future consumption in retirement. In addition, a lack of information concerning the risk–return distribution of various investments might lead them to misallocate their retirement portfolios. Bernheim (1998) presents evidence that questions whether the typical household is financially literate enough to make appropriate savings decisions in their employer-provided pension plans.

Recognizing this lack of financial knowledge, some employers now offer financial education programs for their employees. Employer-provided financial information consists of written communications that explain company retirement saving options, general information about financial markets and economic conditions, and financial education or retirement seminars led by pension providers, third-party experts, or in-house staff. Other firms provide subsidies for their employees to hire a financial advisor to develop a financial plan.[2] Some of the programs are provided with the specific goal of increasing participation in and contributions to tax-qualified pension plans to help the company meet nondiscrimination standards.

Arnone (2002) estimates that 40 percent of employers with more than 1,000 employees offer some type of educational program; however, he believes that only half of these companies provide a high-quality educational program. He defines such a program as "an employer-paid program available throughout the year during working

hours and including both education that is custom tailored to the employer's specific benefit plans and counseling that is individualized to each employee." It is his assessment that most of the 42 million participants in 401(k) plans are, in effect, "on their own" as they plan for retirement.

Relatively few studies have attempted to estimate the effectiveness of these programs in altering retirement goals or retirement saving behavior. Using the KPMG Peat Marwick Retirement Benefits Survey, Bayer, Bernheim, and Scholz (1996) estimate that workers employed by firms that offered financial education programs had higher participation rates in and contribution rates to 401(k) plans compared to firms that did not provide this type of program.[3] Their analysis indicates that seminars were the most effective type of communication. Sponsorship of financial education seminars was associated with a 12 percentage point increase in the participation rate of nonhighly compensated workers and a 6 percentage point increase among highly compensated employees. Company-sponsored retirement seminars produced a 1 percentage point increase in the contribution rate of the nonhighly compensated and no significant increase among highly compensated employees. This increase in the contribution for nonhighly compensated employees is quite large, given that the average contribution rate for these employees is only 3 percent.

Clark and Schieber (1998) examine employment records gathered by Watson Wyatt Worldwide from 19 firms covering over 40,000 employees. They estimate the effect of company-provided written communications describing the retirement saving process, the need for workers to save, the national economic environment, and the characteristics of the company retirement plan. This type of financial information

significantly increased the probability of participating in a 401(k) plan and raised the contribution rate to that plan. Providing written documents to workers about retirement savings increased the probability of participating in the 401(k) plan between 15 and 21 percentage points. In addition, they find that providing information about the company's 401(k) plan increased the annual contribution rate by 2 percentage points, whereas generic financial and economic information did not have any significant influence on the contribution rate.

Madrian and Shea (2001) examine the administrative records of a large employer in the health care and insurance industry. The only retirement plan offered by this company is its 401(k) plan. In 2000, the company offered one-hour financial education seminars at 42 different sites. Madrian and Shea examine participation and saving behavior in the 401(k) plan before and after the seminar. Their estimates indicate that attendance at financial education seminars has small but statistically significant effects. Attendees tend to have increased rates of participation in a 401(k) plan and they tend to have greater diversification in their retirement plan portfolios.[4]

Lusardi (1999, 2000) uses data from the Health and Retirement Survey to examine the role of planning and the lack of financial literacy in retirement saving. She finds that individuals who do not plan for retirement have lower net wealth and are less likely to invest in assets with higher expected returns, such as equities. Lusardi (1999) states that extensive information is needed to plan adequately for retirement and that financial education programs are important to the planning process. Muller (2000) also estimates the effect of financial education seminars on the allocation of investments in defined contribution plans using the Health and Retirement Survey. She uses the

survey's 1992 wave, which asks whether the respondent has ever attended a retirement seminar. She reports no general effect of seminar attendance on the allocation of retirement funds. However, her measure of investment allocation is very broad and would miss small and even medium-size adjustments to pension investments.[5]

The general conclusion of this limited literature is that financial education provided by employers can increase retirement savings and potentially alter the investment of assets in retirement accounts. The mechanism by which education alters retirement saving and investment decisions is unclear. Maki (2001) provides three possibilities. First, financial education could increase household savings by causing the family to reduce its discount rate. Second, increased knowledge could lead the household to become less risk averse and thus increase investment in assets with a higher level of risk and expected return. Finally, financial education programs could change the household's knowledge of its investment choice set. For example, the information might reveal to workers that their existing saving and investment strategy will not enable them to achieve their current goal of retiring at a specific age with a certain level of income.

Maki dismisses the first two possibilities and argues that greater knowledge of what is possible is the primary mechanism through which these programs alter household decision-making. The data used in this study allow us to examine the extent to which workers alter their retirement goals and/or their saving behavior in response to new information concerning financial markets and the saving process.

In the rest of the paper, we assess the impact on retirement goals and retirement saving behavior of participation in financial education seminars offered by TIAA–CREF. After participating in a seminar that provides an overview of the retirement saving

process, do individuals revise their retirement goals? Do they expect to change their saving behavior by making specific changes in the amounts they save or how they invest their retirement assets? Do they intend to acquire additional information about their retirement income needs and the retirement saving process? The answers to these questions are explored by analyzing data from the seminars using a series of logit models.

TIAA–CREF FINANCIAL EDUCATION SEMINARS

The Consulting Services division of TIAA–CREF conducts Financial Education Seminars at educational institutions and other nonprofit organizations across the United States. Seminars are open to all employees of these institutions. Thus, participants at colleges and universities may include administrative, technical, clerical, and service workers, as well as faculty. Seminar attendees may participate in a defined contribution plan offered by TIAA–CREF or another pension provider, or in a defined benefit plan. Seminars are also given all across the country in community settings with participants coming from many different institutions.

The seminars are aimed at audiences in different stages of life, including newly hired employees, mid-career workers, and pre-retirees. In addition, there are special seminars developed for female employees. The objective of all of these seminars is to provide financial information that will assist individuals in the retirement planning process. Consultants discuss retirement goals such as the amount of money needed in retirement to maintain the same level of consumption as during the working years and the relationship between the age of retirement and the annual amount of savings needed to achieve the retirement income goal. Consultants also devote considerable time in the

seminars to examining the risk–return characteristics of alternative investments. Although they differ somewhat in content, all of the seminars provide this basic information concerning retirement savings and retirement income goals.

RESEARCH METHODOLOGY

The lifecycle model presented earlier predicts that before retiring, individuals set retirement goals by choosing the desired retirement age and ratio of retirement income to gross earnings. Throughout their working careers, they make saving and investment decisions to achieve these objectives. Optimal decisionmaking requires that they understand the saving process, the expected risk–return distribution of various investments, and the magnitude of annual saving necessary to accumulate sufficient wealth to retire at the expected age with the desired level of income. Without this knowledge base, individuals are likely to form unrealistic goals and find themselves with inadequate savings at retirement.

We use the responses of participants in TIAA–CREF Financial Education Seminars to measure the effect of financial education on their retirement goals and saving behavior. The primary objective is to determine if participants altered their goals and planned behavior based on the information presented at the seminars. This section describes the two surveys used to assess the impact of the information provided in the seminars and the participants' responses to them.

Survey Content and Procedures

The analysis of retirement saving is based on information obtained in two surveys of participants in TIAA–CREF Financial Education Seminars. Survey One is given to participants at the beginning of the seminar, and Survey Two is completed at the end of the seminar before participants leave the room.[6] Survey One asks participants to indicate the age at which they hope to retire and their desired annual retirement income as a percent of their final working years' earnings. Respondents are asked to indicate the likelihood that they will achieve this goal, how strongly committed they are to this goal, and whether other priorities might make it difficult for them to attain this goal.

Individuals are asked whether their basic pension is a defined benefit or a defined contribution plan. Those in a defined contribution plan are asked to report their account balance, annual contributions, and the allocation of funds in their accounts between equities and bonds. All respondents are asked if they have a supplemental retirement account and, if so, its current account balance, annual contributions, and investment allocations. Finally, they are asked their age, gender, employment, years of service, marital status, education, earnings, income, number of children, and occupation. Survey One provides baseline information on the participants' retirement goals and saving behavior prior to the seminar.

After completing Survey One, individuals participate in the financial educational seminar for approximately one hour. Seminars include information on setting retirement goals, employer-provided savings plans, the risk and return properties of various assets, and the amount of annual savings needed to achieve certain retirement income objectives. At the conclusion of the seminar, participants are asked to complete Survey Two. This

survey asks them whether, based on the information provided in the seminar, they have changed their retirement age goal or revised the level of retirement income they desire. Respondents are also asked whether they intend to reallocate the funds invested in their basic defined-contribution plan to include more equities or more bonds. If respondents have a supplemental retirement plan, they are asked if they intend to increase their contributions or change their investment allocations in it. Individuals who do not have a supplemental plan are asked if they plan to establish one.

A risk-preference question asks whether individuals would describe themselves as conservative investors, moderately conservative investors, moderately aggressive investors, or aggressive investors. Finally, participants are asked a series of questions concerning other actions that they might take on the basis of their newly acquired financial information. Possible actions include using telephone services to amend investment decisions or contact counseling centers, using the World Wide Web to make financial decisions, or seeking the help of a financial planner. In addition, respondents are asked if they plan to establish passwords to allow online access to their accounts, purchase long-term-care insurance, open an IRA or increase contributions to an existing IRA, or engage in other non-tax-deferred savings plans.

The research project is based on seminars conducted from March 2001 to May 2002, including 36 seminars at 24 institutions and 24 community-based seminars in eight different locations. A total of 633 usable responses in which participants completed both Survey One and Survey Two have been obtained. The responses to these surveys are described below.[7]

Sample Means

Table 1 presents the mean values for demographic and economic variables. The sample is reasonably diverse. The average age of the sample is 54. Women account for 54 percent of the sample. The distribution of educational attainment is 11 percent with a high school degree, 25 percent with a college degree, 31 percent with a master's degree, 27 percent with a doctoral degree, and 6 percent with a professional degree. Mean annual household income is $102,677, with $63,786 coming from respondents' earnings. The respondents' average years of service with the current employer is 15 years and their average number of children is 1.7. About half of the respondents expect to continue working after retirement. Prior to the seminar, respondents indicated that on average they have a goal of retiring at age 64 and having about 80 percent of their final working year's income in retirement. Respondents indicated on the pre-seminar survey that on average they were 72 percent sure of achieving their retirement age goal and 63 percent certain of achieving their retirement income goal.

[Table 1]

About one-third of the sample was engaged in teaching and research, and one-fourth in administrative and management. Secretarial and clerical workers comprised 7 percent of respondents, other professional and technical employees 20 percent, and maintenance and service workers 3 percent. Among those in teaching and research, 62 percent were tenured, 13 percent were non-tenured but tenure-track faculty, and 25 percent were non-tenure-track faculty. Of those in teaching and research positions, 18

percent were instructors, 11 percent assistant professors, 24 percent associate professors, and 47 percent professors.

Approximately one-quarter of the respondents were currently working with a financial advisor and two-thirds had previously attended some type of financial seminar. Regarding their investment behavior, 12 percent described themselves as aggressive, 41 percent moderately aggressive, 40 percent moderately conservative, and only 7 percent as conservative investors. The basic pension plan for 82 percent of the respondents was a defined contribution plan, and their average account balance was $349,786, with 64 percent of the balance invested in equities. The mean employee contribution to these plans was 7.5 percent, whereas the average employer contribution was 8.9 percent. New contributions were also almost 59 percent invested in equities. More than 49 percent of the respondents were making contributions to a supplemental tax-deferred retirement plan. The average account balance for those with a supplemental plan was $109,016, with 69 percent of these assets invested in equities. The mean contribution to these plans was $5,546 or 9.2 percent of salary.

Initial Retirement Goals

Before the seminar, the average participant set a retirement age goal of 64 and a retirement income goal of 80 percent of pre-retirement earnings. However, there was considerable variation in participants' retirement goals. About 40 percent of the respondents set their retirement age goals between 60 and 64 years, but their goals ranged all the way from 50 to 99. To explain the differences in retirement ages across participants, we estimate a logit probability model. In this specification, the probability

of seminar participants setting retirement age goals younger than age 60, between ages 60 and 64, age 65, or over 65 is a function of individual and household characteristics. The demographic characteristics include age, gender, marital status, and children. Human capital variables are education, occupation, and years of service with their employers. Measures of financial resources are household income, whether respondents are the sole income earners in their households, and whether their basic pension plans are defined benefit. Finally, to control for potential differences in financial knowledge before the seminar, an indicator variable for whether or not they worked with a financial advisor is included.

The marginal effects derived from the logit estimates are presented in table 2. The marginal effects estimate the change in the probability of an individual reporting an expected retirement age in each of the four age groups, given a change in each characteristic and holding the other characteristics constant at the sample means. The model is ordered. This means that more of attributes with positive effects on the desired retirement age increase the probability of being in the older age groups and decrease the probability of being in the younger age groups. Because the probabilities across the four age groups add to one, the marginal effects sum to zero for each characteristic.

The results show that pre-seminar retirement ages varied across demographic groups. Compared to men, women planned to retire at younger ages. They were 5 percentage points more likely to set a retirement age goal younger than 60 and 9 percentage points more likely to set a goal between ages 60 and 64. Married participants and those younger than 45 also planned to retire earlier. Participants who had children set older retirement ages (65 and over). Respondents' education and work experience also

accounted for differences in retirement age goals. Those without advanced graduate and professional degrees reported younger desired retirement ages than did respondents who had such degrees. Similarly, secretarial, clerical, and maintenance personnel were more likely to set younger retirement ages than were teaching and professional employees. Interestingly, participants who were working with financial advisors planned to retire earlier than those who were not.

[Table 2]

Almost half of participants (47%) set their retirement income goals between 65 percent and 85 percent of pre-retirement income. Nineteen percent of participants set low goals of less than 65 percent; 35 percent of participants set high goals of more than 85 percent. We estimate a similar logit probability model to explain these differences in retirement income goals. The probability of seminar participants setting retirement income of less than 65 percent, between 65 percent and 85 percent, or over 85 percent is modeled as a function of individual and household characteristics. They include the same demographic characteristics included in the retirement age equation as well as years of service, annual job earnings, whether respondents are the sole income earners, and whether their basic pension plans are defined benefit. The estimates of the marginal effects from the retirement income goal equation are reported in table 3.

The demographic characteristics explaining retirement income goals are age and children. Participants younger than age 45 were 10 percentage points more likely to set income replacement goals greater than 85 percent, while those with children were 7

percentage points more likely to set income goals less than 65 percent. Employees with more years on the job tended to have higher target levels of income in retirement. Financial resources were a consideration when setting retirement income goals. Individuals with higher job earnings were more likely to set relatively low income replacement goals compared those with lower job earnings. For example, compared to participants earning $50,000, those earning 20 percent more ($60,000) were 1 percentage point more likely to set income goals less than 65 percent and 0.5 percentage points more likely to set them between 65 percent and 85 percent. In addition to the level, the importance of respondents' job earnings to total household income was a consideration. Respondents who were the sole income earner in their households were 9 percentage points more likely to set retirement income goals below 65 percent.

[Table 3]

RESPONSES TO FINANCIAL EDUCATION

After completing the seminars, respondents indicated whether they were likely to change their retirement goals and saving behavior. The response of individuals obviously depends on how they viewed the quality of the information they received. In general, participants thought they had been part of a high-quality financial education program, with 36 percent rating the seminar excellent and 54 percent good. In response to the statement that the seminar had improved their understanding of the need for retirement savings, 32 percent strongly agreed with the statement and 58 percent agreed

with the statement. Respondents also indicated that they now had a greater likelihood of achieving their retirement age goal and their retirement income goal.

Did participants alter their retirement goals and/or their retirement saving behavior after attending the seminar? In this section, we examine their post-seminar plans and estimate the factors that might differentiate their reactions. Comparing the responses in Survey Two to those in Survey One, we are able to determine whether individuals

- Altered their expected age of retirement or their desired level of income in retirement
- Changed their savings plans (by increasing voluntary contributions to existing supplemental plans, opening new supplemental plans, or changing the investment mix of new contributions and account balances)
- Expected to engage in other actions in response to the knowledge gained in the seminar. (Actions include being more active in the investment process by using the Web or consulting a financial planner, opening an IRA or increasing contributions to an existing IRA, or purchasing long-term-care insurance.)

We also estimate how the changes vary across individuals.

The seminar may have provided participants with new information concerning how much money is needed to equalize consumption in retirement with consumption during the working years, the basic mathematics of retirement savings, and the risk–return characteristics of investment alternatives. Based on this new information, participants would be expected to reconsider their retirement plans and alter their saving behavior. A comparison of responses given in Survey Two after the seminar to those

selected prior to the seminar indicates how participants adjusted their retirement goals and saving behavior based on this new information.

The lifecycle model predicts that the new retirement plan might require a change in the expected retirement age. An individual may decide to work longer in order to build up more retirement savings or may select a lower retirement income goal that is either more consistent with consumption smoothing or more attainable. Of course, individuals could also have a positive surprise and be able to attain their retirement income goals at an earlier age. These respondents could lower their retirement age goals or increase their income targets.

Participants might also have learned more about the mathematics of retirement savings and have a more realistic assessment of the amount of retirement income that they will have based on their current saving rates. This new information could result in respondents deciding to increase or decrease their contributions to retirement plans. Finally, participants may have a better grasp of the risk associated with various types of financial instruments, inflation, and longevity. These new data might lead them to alter the investment allocations in their retirement accounts.

Table 4 reports the proportion of participants who made a change in one of their retirement goals or indicated that they would be making a change in their saving or investment behavior. Among these participants, 34 percent altered either their income goal or their retirement age goal. When revising either the age goal or the income goal, respondents were more likely to raise than to lower them. Only 6 percent of the participants changed both goals after the seminar, while 22 percent changed only their income goal and 6 percent changed only their retirement age goal.

[Table 4]

Compared to changing their retirement goals, a much higher proportion of participants indicated that they planned to alter their saving behavior. Table 4 shows that 91 percent of respondents reported that they anticipated making changes in their retirement savings plans. These changes include increasing contributions to tax deferred accounts or altering investment allocations. Individuals who changed their age goals but not their income goals were more likely to plan to increase tax-deferred savings or change their investment allocations. Among respondents who changed both goals, a higher percentage of those with no supplemental plan indicated that they intended to establish one. Similarly, higher percentages of those with a supplemental plan indicated that they planned to increase their contribution rate and/or change their investment allocations in the plan. A smaller percentage of those making changes to their age goal were in defined contribution plans, but a higher percentage of those that were said that they planned to change their investment allocations in that plan. These expected changes imply that after the seminar, most participants anticipated making some changes in their planned lifetime pattern of work, retirement, consumption, and saving.

Altering Retirement Goals

A small percentage of respondents changed their desired retirement age, whereas more than one-fourth of participants altered their retirement income goal. Table 5 shows how they changed their expected retirement ages after the seminar given their pre-

seminar retirement age goals. After the seminar, 7 percent of the sample reported having increased their retirement age goal by an average of three years, and 4 percent of respondents reduced this goal by an average of four years. As one might expect, a larger proportion of people with relatively low initial desired retirement ages tended to raise their expected retirement age. For example, 15 percent of participants initially setting a retirement age goal younger than age 60 indicated an older retirement age goal after the seminar. The average increase was more than four years. In contrast, only 2 percent of those with an initial expected retirement age greater than 65 indicated an older retirement age after the seminar. The tendency to lower retirement ages was greatest for participants whose pre-seminar retirement age goal was 65. On average, they lowered their age goals by five years.

[Table 5]

Table 6 presents the results of a logit probability model explaining how these changes in retirement age goals varied across individual and household characteristics. Variables included in addition to those in table 2 are indicator variables for whether the participants considered themselves conservative or moderately conservative investors and for the planning horizon for their savings. The characteristics that explain changes in retirement age goals are respondents' ages, education, and occupations. Compared to older seminar participants, respondents under age 45 were less likely to raise their desired retirement ages. Individuals without advanced degrees were more likely to raise their target ages of retirement while secretarial, clerical, and maintenance workers were

more likely to lower their retirement ages.

[Table 6]

The proportions of individuals changing their retirement income goals given their pre-seminar goals are shown in table 7. There was a much greater tendency to adjust retirement income goals than age goals. A little more than 20 percent increased their income goal, while another 8 percent decreased their income objective. Over one-third of the participants who set a retirement income goal of less than 65 percent before the seminar revised that goal upward by an average of 19 percentage points. This suggests that on the basis of information provided in the seminar, these individuals determined that their goal was too low and that they should attempt to achieve a higher standard of retirement consumption. About one-fourth of those with pre-seminar goals of between 65 percent and 85 percent revised their retirement income goal upward, while less than 5 percent of those with initial targets greater than 85 percent revised their income goal upward. People with higher initial retirement income goals were more likely to revise their income targets downward.

[Table 7]

The results of a logit model explaining these changes in income goals as a function of individual and household characteristics are in table 8. They show significant differences across participants. Women were 6 percentage points more likely to increase

their income goal than men were. Participants with higher earnings were also more likely to raise their desired income replacement rates. Compared to respondents earning $50,000, those earning 20 percent more ($60,000) were 1 percentage point more likely to raise their income goal after the seminar. Individuals with defined benefit plans were 12 percentage points more likely to raise their income goals.

[Table 8]

Change in Retirement Saving Behavior

On the basis of the information provided in the seminar, respondents indicated that they planned to be more active in planning for their retirement. Forty percent of those who did not have a supplemental pension plan said that they planned to establish one with their employer. Among respondents who currently had a supplemental plan, 37 percent stated that they would increase their contributions to them. After completion of the seminar, 29 percent of the respondents stated that they planned to open a new individual retirement account (IRA) or increase their contributions to an existing IRA.

To further examine these changes in saving behavior we estimate two logit models:

1. If the respondent had not previously established a supplemental retirement plan, did they intend to do so, and
2. If the respondent already had a supplemental plan, did they intend to increase their contributions to it?

Each choice is estimated as a function of household and personal characteristics. The results are in table 9. The entries indicate the mean change in the probability of establishing a new plan or increasing contributions to an existing plan from a one-unit change in the corresponding explanatory variable while holding the others shown in the table constant.

[Table 9]

Respondents in basic defined-benefit pension plans were 30 percentage points more likely to state that they wanted to start a new supplemental plan than were respondents in basic defined-contribution plans. Compared to younger individuals, respondents aged 60 and older were 21 percentage points less likely to want to start a new plan. Women were 22 percentage points more likely than men to say that they intended to start a new supplemental plan, and married respondents were 28 percentage points more likely than others to want to start a new plan. As one might expect, individuals with longer-term savings horizons were more likely to report that they now want to establish a pension plan. Finally, the desire to establish a new plan was positively influenced by having worked for their current employer for less than five years and by their share of total household income.

The second column of table 9 reports the results from the logit estimation of the probability of increasing contributions to a supplemental plan for participants who currently had them. Compared to respondents age 45 to 59, individuals age 44 or younger were 17 percentage points more likely to report that they were going to increase their

contributions to their supplemental plan after participating in the seminar. Those 60 and older were 29 percentage points less likely to indicate a desire to increase their contributions. Once again, women were more likely than men to want to increase contributions (the difference was 14 percentage points). Secretarial, clerical, and maintenance workers had a much higher desire to increase contributions after the seminar than did faculty, other professionals, and administrators.

These results indicate significant differences in the reaction of individuals to the information presented in the seminars. As one might expect, younger workers were more likely to indicate that they planned changes in their retirement savings. Perhaps the seminar showed them the power of compounding returns and the payoff to saving earlier in life. Women, as well as individuals employed in secretarial and maintenance positions, were also more responsive to the information provided. This may reflect a greater gain in knowledge concerning savings and financial markets among these individuals or simply a different reaction to the same gain in knowledge. Another key finding is that individuals in basic defined-benefit plans were more likely to increase retirement savings than were those in basic defined-contribution plans. An interpretation of this finding is that participants in the defined contribution plan have had greater exposure to the retirement savings process and thus may be less surprised by the information presented in the seminar.

Change in Investment Behavior

In addition to changing their saving rate, some individuals may choose to alter their choices of assets in their pension accounts. Ten percent of all respondents with

basic defined-contribution plans indicated that they intended to increase the proportion of their investment in equities, while 20 percent reported that they intended to increase their investment in bonds. Moreover, one-third of those with supplemental retirement plans intended to change their investment allocations in those plans. The change in investment allocations is estimated separately for balances in the basic retirement plan and in supplemental plans, and the results are shown in table 10. Women were more likely than men to plan to alter their investment allocations, especially in their supplemental plans. Married individuals had a higher probability of changing their investment patterns in both plan types. Those with basic defined-benefit plans were less likely to indicate a desire to reallocate the investments in their supplemental plans. Respondents attending a financial seminar for the first time were more likely, after the seminar, to plan to reallocate their investments.

[Table 10]

CONCLUSIONS AND IMPLICATIONS

Individuals develop lifetime savings plans to ensure that they will have the desired level of income in retirement. These plans are based on individuals' current knowledge and their level of understanding of financial markets. Ignorance is not bliss and can lead to many individuals saving too little. As a result, they are surprised as they approach and enter retirement. Of course, individuals can have positive surprises such as the rapid increase in equity prices during the late 1990s. Does financial education lead to different and better choices? While the conclusion seems obvious, very little is actually

known about how education influences savings decisions. This paper provides significant new findings on the impact of financial education on retirement savings.

Survey responses indicate that after an educational event, individuals might alter their retirement goals and/or change their retirement saving behavior. To determine the influence of new information, we examine the responses from two surveys completed by individuals before and after participation in a financial education seminar. The results are clear. A significant proportion of the respondents indicated that they had revised their goals and planned to modify their savings and investments. The responses to a follow-up survey are now being examined to determine whether individuals actually made the changes in accordance with their revised goals.

Women initially set younger retirement age goals and lower retirement income goals than men but they are more likely to raise both these retirement goals after the seminar. They are also more likely to start new tax-deferred savings accounts, to increase contributions to existing retirement plans, and to change their investment allocations. Younger participants set earlier retirement age goals and higher income goals and are not likely to increase them after the seminar but they do plan to change their saving behavior in order to achieve these objectives. Married participants also plan to change their saving behavior as well as reallocate the investments in their pension plans. Secretarial, clerical, and maintenance personnel set lower retirement age goals and don't increase them. But they do plan to increase their retirement savings in order to increase the likelihood that they will attain their goals.

In the twenty-first century, workers will be more responsible for their own retirement income. In order to make optimal retirement plans, an appropriate level of

financial knowledge and understanding is necessary. Otherwise, many Americans will make bad saving choices without recognizing the consequences of their actions. Financial education can improve their knowledge base and help future retirees enjoy their retirement years.

These findings have important implications for employers that offer pension plans, especially those with defined contribution plans. While many companies already provide some form of financial education, the quality of these programs has been questioned; of course, many companies do not currently provide any form of financial education to their employees. This paper has shown the importance of financial education to successful retirement planning. Greater efforts by employers can provide the resources needed to assist workers in their retirement planning and enable them to achieve their retirement objectives.

Table 1. Summary Statistics

Variable	Mean
Number of Respondents	633
Age	54.4
Female (percent)	53.5
Years of Service	15.3
Number of children	1.7
Education Attainment (percent)	
High School Degree	10.9
College Degree	25.3
Masters Degree	31.1
Doctoral Degree	26.5
Professional Degree	6.2
Annual Household Income (dollars)	102,677
Earnings from Primary Employer (dollars)[b]	63,823
Type of Investor (percent)[a]	
Conservative	6.7
Moderately Conservative	40.2
Moderately Aggressive	41.3
Aggressive	11.8
Retirement Age Goal	63.6
Likelihood of Achieving Retirement Age Goal (scale 1-10)	7.2
Retirement Income Goal (percent of final year's income)	79.7
Likelihood of Achieving Income Goal (scale 1-10)	6.3
Planning to Work after Retirement (percent)	52.0
First Financial Seminar Ever Attended (percent)	33.5
Number of Financial Seminars Previously Attended	3.4
Currently Working with Financial Advisor (percent)	25.7

Table 1. Summary Statistics (continued)

Variable	Mean
Basic Pension Plan	
Defined Contribution Pension (percent)	81.9
Account Balance (dollars)	358,411
Percent of Account Balance Allocated to Equities	64.1
Employee Contribution Rate	7.6
Employer Contribution Rate	8.6
Percent of New Contributions Allocated to Equities	60.1
Supplemental Pension Plans	
Currently Making Contribution (percent)	49.6
Account Balance (dollars)	109,330
Percent of Account Balance Allocated to Equities	67.3
Contribution as a Percent of Salary	9.1
Percent of New Contributions Allocated to Equities	65.3
Type of Employment (percent)	
Secretarial/Clerical	7.1
Teaching/Research	31.1
Administrative/Management	25.6
Maintenance/Service	2.6
Other Professional/Technical	19.5
Other	4.7
Retired	5.8
Not Currently Employed	3.5
Tenure Status of Teaching/ Research (percent)	
Tenured	62.0
Tenure-Track, non-tenured	12.7
Non-tenure Track	25.4
Rank of Teaching/ Research (percent)	
Instructor	18.1
Assistant Professor	11.0
Associate Professor	23.6
Professor	47.3

[a]Collected in Survey Two

[b]Respondents who are retired or not currently working are excluded

Source: TIAA-CREF Financial Education and Retirement Savings Study, Survey One unless otherwise noted.

Table 2. Estimates of Retirement Age Goals

Variable	Less than 60	60 - 64	65	Over 65	Significance Level
DB Plan	0.0133	0.0232	-0.0131	-0.0233	0.544
Age					
Age 44 or younger	0.0490	0.0854	-0.0485	-0.0859	0.041
Age 45 - 59					
Age 60 and over					
Female	0.0504	0.0880	-0.0499	-0.0885	0.005
Married	0.0481	0.0839	-0.0476	-0.0844	0.038
Children (yes/no)	-0.0459	-0.0801	0.0455	0.0806	0.022
Education					
High School Degree	0.0600	0.1047	-0.0594	-0.1054	0.075
College Degree	0.0583	0.1017	-0.0577	-0.1024	0.006
Graduate/Professional Degree					
Occupation					
Teaching/Research					
Professional/Technical, Other					
Administration/Management	0.0494	0.0861	-0.0488	-0.0866	0.949
Secretarial/Clerical	0.0022	0.0038	-0.0022	-0.0038	0.009
Maintenance/Service					
Years of Service with Employer	0.0014	0.0025	-0.0014	-0.0025	0.092
Household Income (% change)	0.0002	0.0003	-0.0002	-0.0003	0.339
Respondent Sole Income Earner	0.0227	0.0396	-0.0225	-0.0398	0.315
Works with a Financial Advisor	0.0362	0.0632	-0.0358	-0.0636	0.050
Number of Observations	50	170	122	94	
Percent of Sample	11.4	38.9	27.9	21.5	

Shown are the estimated marginal effects. The derivatives are evaluated at the sample means.

Table 3. Estimates of Retirement Income Goals

Variable	Less than 65	65-85	Over 85	Significance Level
DB Plan	0.0232	0.0123	-0.0356	0.521
Age				
Age 44 or younger	-0.0677	-0.0359	0.1036	0.082
Age 45 - 59				
Age 60 and over	0.0082	0.0043	-0.0125	0.793
Female	0.0341	0.0181	-0.0522	0.261
Married	0.0229	0.0122	-0.0351	0.528
Children (yes/no)	0.0689	0.0365	-0.1054	0.036
Years of Service with Employer	-0.0053	-0.0028	0.0081	0.000
Annual Earnings (% change)	0.0005	0.0003	-0.0008	0.047
Respondent Sole Income Earner	0.0884	0.0468	-0.1353	0.017
Number of Observations	82	204	151	
Percent of Sample	18.7	46.6	34.5	

Shown are the estimated marginal effects. The derivatives are evaluated at the sample means.

Table 4. Changes in Retirement Goals and Saving and Investment Behavior

	All Respondents	No Change in Age Goal		Change Age Goal	
		No Change in Income Goal	Change Income Goal	No Change in Income Goal	Change Income Goal
Sample Percentage		66.0	22.0	5.6	6.4
Plan to Change Savings or Investments (%)	91.0	90.3	92.1	96.0	89.3
No Supplemental Plan (%)	44.1	45.4	40.0	42.3	45.2
Plan to Establish One	41.1	39.5	38.5	40.0	66.7
Supplemental Plan (%)	55.9	54.6	60.0	57.7	54.8
Plan to Increase Contributions	43.2	41.9	42.4	46.2	56.3
Plan to Change Investments	33.5	29.5	36.8	38.5	52.9
Defined Contribution Plan (%)	83.9	85.0	82.7	80.0	79.3
Plan to Change Investments	39.8	36.7	42.3	50.0	57.9

Table 5. Changes in Retirement Age Goals

	All Respondents	Less than 60	60 - 64	65	Over 65
Change	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**
Sample Percentage		10.9	39.5	27.7	21.8
No Change (percent)	88.3	81.1	88.4	85.7	95.3
Age Goal	63.7	56.1	61.4	65.0	69.6
Raise Age Goal (percent)	7.4	15.1	8.7	6.8	1.9
New Age Goal	64.9	59.6	64.6	68.7	69.5
Amount of Increase	3.5	4.3	3.2	3.7	2.0
Lower Age Goal (percent)	4.3	3.8	2.9	7.5	2.8
New Age Goal	60.0	57.0	56.8	60.2	68.0
Amount of Decrease	-4.1	-1.0	-5.0	-4.8	-2.0

Table 6. Estimates of Changes in Retirement Age Goals

Variable	Lower Goal	No Change	Raise Goal	Significance Level
DB Plan	-0.0047	-0.0020	0.0066	0.788
Age				
Age 44 or younger	0.0366	0.0155	-0.0520	0.044
Age 45 - 59				
Age 60 and over				
Female	-0.0157	-0.0067	0.0224	0.230
Education				
High School Degree	-0.0524	-0.0222	0.0746	0.022
College Degree	-0.0301	-0.0128	0.0429	0.058
Graduate/Professional Degree				
Occupation				
Teaching/Research				
Professional/Technical, Other				
Administration/Management	0.0206	0.0087	-0.0294	0.157
Secretarial/Clerical	0.0506	0.0214	-0.0720	0.039
Maintenance/Service				
Household Income (% change)	-0.0001	0.0000	0.0001	0.622
Conservative/Moderate Investor	0.0246	0.0104	-0.0351	0.069
Focus of Savings				
Short Term				
Long Term				
Long Term/Short/Intermediate	-0.0182	-0.0077	0.0259	0.329
Number of Observations	19	345	26	
Percent of Sample	4.8	88.2	6.9	

Shown are the estimated marginal effects. The derivatives are evaluated at the sample means.

Table 7. Changes in Retirement Income Goals

	All Respondents	Less than 65	65-85	Over 85
Change	**Mean**	**Mean**	**Mean**	**Mean**
Sample Percentage		18.8	47.1	34.1
No Change (percent)	71.4	59.8	66.4	84.5
Income Goal	83.0	53.4	76.6	101.1
Raise Income Goal (percent)	20.4	36.8	25.3	4.8
New Income Goal	85.1	70.9	89.1	111.3
Amount of Increase	14.8	18.9	12.3	17.5
Lower Income Goal (percent)	8.3	3.4	8.3	10.7
New Income Goal	69.9	40.0	63.5	81.9
Amount of Decrease	-15.2	-19.0	-13.3	-16.7

Table 8. Estimates of Changes in Retirement Income Goals

Variable	Lower Goal	No Change	Raise Goal	Significance Level
DB Plan	-0.0486	-0.0719	0.1205	0.013
Age				
Age 44 or younger	0.0237	0.0351	-0.0588	0.247
Age 45 - 59				
Age 60 and over				
Female	-0.0258	-0.0382	0.0640	0.099
Education				
High School Degree	-0.0297	-0.0439	0.0736	0.252
College Degree	-0.0154	-0.0228	0.0382	0.389
Graduate/Professional Degree				
Annual Earnings (% change)	-0.0003	-0.0004	0.0007	0.050
Respondent Sole Income Earner	0.0204	0.0302	-0.0506	0.245
Conservative/Moderate Investor	0.0305	0.0450	-0.0755	0.050
Works with Financial Advisor	0.0131	0.0193	-0.0324	0.426
Focus of Savings				
Short Term				
Long Term	0.0480	0.0710	-0.1191	0.006
Long Term/Short/Intermediate				
Number of Observations	29	272	79	
Percent of Sample	7.6	71.5	20.7	

Shown are the estimated marginal effects. The derivatives are evaluated at the sample means.

Table 9. Estimates of Changes in Retirement Saving Behavior

Variable	Plans to Establish Supplemental Plan	Plans to Increase Contributions to Supplemental Plan
DB Plan	0.2992 (0.024)	0.0451 (0.579)
Age		
Age 44 or younger	-0.0637 (0.541)	0.1731 (0.095)
Age 45 - 59		
Age 60 and over	-0.2065 (0.049)	-0.2936 (0.001)
Female	0.2219 (0.019)	0.1392 (0.053)
Married	0.2827 (0.014)	0.0497 (0.587)
Occupation		
Teaching/Research		
Professional/Technical, Other		
Administration/Management	0.0871 (0.330)	0.1470 (0.045)
Secretarial/Clerical	0.0465 (0.735)	0.2747 (0.033)
Maintenance/Service		
Annual Earnings (% change)	-0.0006 (0.466)	0.0005 (0.576)
Earnings % Household Income	0.0046 (0.050)	0.0013 (0.497)
Worked for Employer 5 Years or Less	0.2310 (0.033)	
Conservative/Moderate Investor	-0.0751 (0.396)	0.1404 (0.054)
Works with Financial Advisor	-0.0961 (0.269)	0.1281 (0.072)
Focus of Savings		
Short Term		
Long Term	0.2408 (0.031)	0.2012 (0.153)
Long Term/Short/Intermediate	0.3956 (0.010)	0.2510 (0.150)
Number of Observations	131	196

Shown are the estimated marginal effects. The derivatives are evaluated for each observation and averaged over the sample. Significance levels are in parentheses.

Table 10. Estimates of Changes in Investment Allocations

Variable	Plans to Change Investment Allocations	
	DC Plan	Supplemental Plan
DB Plan		-0.1404 (0.087)
Age		
Age 44 or younger	0.0022 (0.979)	-0.0574 (0.560)
Age 45 - 59		
Age 60 and over	-0.0425 (0.559)	0.0037 (0.963)
Female	0.0426 (0.516)	0.1610 (0.024)
Married	0.1557 (0.044)	0.1362 (0.082)
Children (yes/no)	-0.0551 (0.468)	
Occupation		
Teaching/Research		
Professional/Technical, Other		
Administration/Management	0.0553 (0.399)	-0.0086 (0.905)
Secretarial/Clerical	-0.2232 (0.044)	-0.1337 (0.247)
Maintenance/Service		
Household Income (percent change)	-0.0007 (0.349)	0.0000 (0.049)
Conservative/Moderate Investor	0.1414 (0.039)	0.0949 (0.204)
Works with a Financial Advisor	-0.1084 (0.088)	0.0437 (0.545)
Focus of Savings		
Short Term		
Long Term	-0.1216 (0.341)	0.0718 (0.603)
Long Term/Short/Intermediate	-0.1172 (0.379)	0.3016 (0.105)
First Financial Seminar Ever Attended	0.0857 (0.176)	0.1372 (0.067)
Current Account Balance ($1,000)	-0.0002 (0.057)	
Percent Allocated to Equities	0.0030 (0.030)	
Number of Observations	250	191

Shown are the estimated marginal effects. The derivatives are evaluated for each observation and averaged over the sa

Significance levels are in parentheses.

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ENDNOTES

[1] Lusardi (2000) agrees that financial literacy is a key to effective retirement saving and concludes that lack of planning and a lack of understanding the saving process is one of the primary reasons for the low saving rate in the United States. She also argues that more research is needed "to determine why households do not plan for retirement, and whether the provision of information … can play a role in affecting household decision making and, ultimately, the financial security of many American households."

[2] Bernheim and Garrett (2000) and Bayer, Bernheim, and Scholz (1996) provide an assessment of employer-provided financial education programs.

[3] Other studies using this survey include Bernheim (1998), Bernheim and Garrett (1996), and Bernheim and Garrett (2000).

[4] However, most seminar participants made no changes in their saving behavior. It is important to note that the authors had a very short post-seminar period of observation.

[5] The question in the HRS asks whether the household's assets are mostly or all in stocks, mixed, or mostly or all in bonds.

[6] A third survey is sent to participants about three months after the seminar to determine what actions have actually been taken. Copies of the three surveys can be obtained from the authors upon request.

[7] Surveys have been completed by participants at seminars held at Campbell University (two seminars), Duke University (three seminars), Center for Creative Leadership (two seminars), Furman University (two seminars), University of North Carolina at Charlotte (two seminars), Phillips Academy (two seminars), Northeastern University, Iowa State, Des Moines Area Community College, Kirkwood Community College, New York City Technical College, Fort Hays State University (two seminars), North Carolina State University (two seminars), Groton, Head Royce School (two seminars), University of North Carolina at Chapel Hill, Kansas University, Wake Forest, Loyola LA, Appalachian State University, Methodist College, and Washburn University (two seminars). In addition, 24 community-based seminars were held in New Jersey, Puget Sound, Portland, Palo Alto, Oakland, Boston, New York, and Charlotte. In total, 2,157 people attended part or all of these seminars and 725 individuals completed some parts of the two surveys for a response rate of 34 percent. The sample included in the analysis contains 633 usable surveys in which participants completed both Survey One and Survey Two. It is important to recognize that some individuals arrive after the seminar has begun and are not given either of the surveys. In addition, some participants who have completed the first survey leave the seminar early and do not complete the second.