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Financial Literacy and Planning: Implications for Retirement Wellbeing

Annamaria Lusardi
Department of Economics
Dartmouth College
Hanover, NH 03755
Tel: (603) 646-2099
E-mail: annamaria.lusardi@Dartmouth.edu

Olivia S. Mitchell
Department of Insurance & Risk Management
The Wharton School, Univ. of Pennsylvania
3620 Locust Walk, St. 3000 SH-DH
Philadelphia, PA 19104
Tel: (215) 898-0424
E-mail: mitchelo@wharton.upenn.edu

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Financial Literacy and Planning: Implications for Retirement Wellbeing

Annamaria Lusardi and Olivia S. Mitchell

Abstract

Only a minority of American households feels "confident" about retirement saving adequacy but little is known about why people fail to plan for retirement and whether planning and information costs might affect retirement saving patterns. To better understand these issues, we devised and fielded a purpose-built module on planning and financial literacy for the 2004 Health and Retirement Study (HRS). This module measures how workers make their saving decisions, how they collect the information for making these decisions, and whether they possess the financial literacy needed to make these decisions. Our analysis shows that financial illiteracy is widespread among older Americans: only half of the age 50+ respondents could correctly answer two simple questions regarding interest compounding and inflation, and only one-third correctly answered these two questions and a question about risk diversification. Women, minorities, and those without a college degree were particularly at risk of displaying low financial knowledge. We also evaluate whether people tried to figure out how much they need to save for retirement, whether they devised a plan, and whether they succeeded at the plan. In fact, these calculations prove to be difficult: fewer than one-third of our age 50+ respondents ever tried to devise a retirement plan, and only two-thirds of those who tried actually claim to have succeeded. Overall, fewer than one-fifth of the respondents believed they engaged in successful retirement planning. We also find that financial knowledge and planning are clearly interrelated: those who displayed financial knowledge were more likely to plan and to succeed in their planning. Moreover, those who did plan were more likely to rely on formal methods such as retirement calculators, retirement seminars, and financial experts, and less likely to rely on family/relatives or co-workers. Most importantly, those who display higher financial literacy are more likely to save and invest in complex assets, such as stocks.

Introduction

American workers are increasingly responsible for securing their own retirement. Yet only a minority of American households feels "confident" about retirement saving adequacy, and one third of adults in their 50s say they have failed to develop any kind of retirement saving plan at all (Lusardi 1999, 2003; Yakoboski and Dickemper, 1997). What explains this low level of retirement preparedness? Why do people do such a poor job, when it comes to designing and carrying out retirement saving plans? This paper explores the hypothesis that poor planning may be a primary result of financial illiteracy. That is, we evaluate whether those who report that they are unable to plan for retirement and/or who cannot carry out their retirement saving plans are also those who are most unaware of fundamental economic concepts driving economic wellbeing during the lifetime and in old age.

Previous studies offer few insights regarding the reasons why people do not plan for retirement, nor do they illuminate the roles that planning and information costs might play in affecting retirement saving decisions.[1] To gain better insight into these issues, we have devised and fielded a purpose-built module on planning and financial literacy for the 2004 Health and Retirement Study (HRS). The module includes questions that measure how workers make their saving decisions, how they collect the information for making these decisions, and whether they possess the financial literacy needed to make these decisions.

Approach and Data

The theoretical framework used to model consumption/saving decisions posits that rational and foresighted consumers derive utility from consumption over their lifetimes. In the simplest format, the consumer has a lifetime expected utility, which is the expected value of the

sum of per-period utility $U(c_j)$ discounted to the present (using the discount factor β), multiplied by the probability of survival p_j from the worker's current age j to the oldest possible lifetime D:

$$E\left[\sum_{j=s}^{D}\beta^{j-s}U(c_j)\right].$$

Assets and consumption each period (a_j and c_j) are determined endogenously by maximizing this function subject to an intertemporal budget constraint. Thus c_j represents per period consumption, e_j is labor earnings, ra_j represents the households' returns on assets a_j, and SS and PP represent the household's Social Security benefits and pensions which depend on the worker's retirement (R) age:

$$y_j = e_j + ra_j, j \in \{S,...,R-1)\}$$

and

$$y_j = SS_j(R) + PP_j(R) + ra_j, j \in [R,...,D].$$

Furthermore, consumption from income, assets, and benefits is set so that:

$c_j + a_{j+1} = y_j + a_j, j \in [S,...,R-1]$ before retirement (R), and

$c_j + a_{j+1} = y_j + a_j, j \in [R,...,D]$ from retirement to death (D). [2]

In other words, the economic model posits that the consumer holds expectations regarding prospective survival probabilities, discount rates, investment returns, earnings, pensions and Social Security benefits, and inflation. Further, it posits that he/she uses that information to formulate and execute optimal consumption/saving plans.

This formulation makes it clear that consumers making retirement saving decisions require substantial financial literacy, in addition to the ability and tools needed to plan and carry

[1] See, however, the discussion in Ameriks, Caplin and Leahy (2003, 2004) and the findings by Lusardi (2002, 2003).
[2] There is also the condition that assets in the last period of life are equal to zero and that the consumer does not die leaving any debt.

out retirement saving plans. Whether and how "real people" behave when confronted with this challenge– that is, whether individuals seem to have knowledge of and the capability to plan and implement these complex planning tasks – is a topic of substantial current interest.[3] This subject is particularly important in view of the fact that workers are increasingly being given responsibility to save, manage their pension investments, and draw down their retirement assets in the defined contribution pension environment. Accordingly, what is critically needed is new information permitting analysts to investigate the links between financial literacy, the sources of information that households rely on for their economic decision-making, and planning.

The Health and Retirement Study (HRS), a nationally representative longitudinal dataset of Americans over the age of 50, has been designed to address these questions by tracking health, assets, liabilities, and patterns of wellbeing in older households.[4] Beginning in 1992, a 90-minute core questionnaire has been administered every two years to age-eligible respondents and their spouses. In addition, a random sample of respondents has also been subjected to very short experimental modules in each wave, aimed at helping researchers assess additional topics of substantive interest. For the 2004 HRS wave, we designed and administered a special module on retirement planning, seeking to assess respondents' level financial literacy along with their efforts to budget, calculate, and develop retirement saving plans, in relatively few questions.

In particular, our module includes three questions on **financial literacy,** as follows:

- Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow: more than $102, exactly $102, less than $102?

[3] See for example Clark and D'Ambrosio (2002); Clark et al. (2003, 2004), EBRI (1996, 2001), Duflo and Saez (2003, 2004), Hancock (2002).
[4] http://hrsonline.isr.umich.edu/

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

The first two questions, which we refer to as "Compound Interest" and "Inflation," help us evaluate whether respondents display knowledge of fundamental economic concepts for saving decisions as well as possess competence with basic financial numeracy. The third question, which we dub "Stock Risk," evaluates respondents' knowledge of risk diversification, a crucial element of an informed investment decision.

The module also asks respondents to discuss what they do to calculate their retirement saving needs. Other surveys, including those devised by EBRI in its Retirement Confidence Survey (RCS) and questionnaires developed by TIAA-CREF have previously asked respondents whether they "plan for retirement," a question we replicate here.[5] More insight into this issue is also afforded by our additional queries investigating not only whether people ever assessed their retirement saving needs, but also what followed from such assessment. The questions about **retirement planning calculations** are as follows:

- Have you ever tried to figure out how much your household would need to save for retirement?
- Did you develop a plan for retirement saving?
- How often were you able to stick to this plan: Would you say always, mostly, rarely, or never?

[5] See Ameriks, Caplin and Leahy (2003), and the RCS questionnaire.

Finally, we also seek to assess what **planning tools** people rely on to devise and carry out their retirement saving plans. Specifically, we inquired whether respondents contacted friends, relatives, or experts, and whether they used retirement calculators. In addition, we asked whether respondents tracked their spending and set spending budgets. The specific question phrasing is as follows:

- Tell me about the ways you tried to figure out how much your household would need.
    - Did you talk to family and relatives?
    - Did you talk to co-workers or friends?
    - Did you talk to co-workers or friends?
    - Did you use calculators or worksheets that are computer or Internet-based?
    - Did you consult a financial planner or advisor or an accountant?

The module also asks to respondents:

- How often do you keep track of your actual spending: would you say always, mostly, rarely, or never?
- How often do you set budget targets for your spending: would you say always, mostly, rarely, or never?

In what follows, we tabulate the prevalence of financial literacy, retirement calculations, and the planning tools people report they deploy to devise and execute their plans. In addition, we evaluate whether those who lack insight into simple economic facts also prove to be those who have particular difficulty devising plans and carrying them out in practice. The idea is to evaluate whether those who are more financially literate are also more likely to plan and be successful planners.

Descriptive Findings

In this section we present preliminary findings from our 2004 HRS module which included 1,269 respondents. As sample weights are currently unavailable, the statistics and findings below refer only to unweighted data.

Financial Literacy. Turning first to **financial literacy**, the simple tabular results are far from comforting (Table 1). The compound interest question has a 67% correct response rate; this is an easy question and it is rather astounding that one-third of the sample cannot respond correctly, particularly because the sample includes older respondents (mostly respondents in their 50s and 60s), who had probably dealt already with interest rate calculations. The inflation question has a higher correct response rate, with three-quarters (75%) answering correctly that they would be able to buy less after a year if the interest rate were 1% and inflation were 2%. By contrast, only 52% of the respondents understand correctly that holding a single company stock implies a riskier return than a stock mutual fund.

We further distinguish between those offering correct answers and those giving an incorrect answer or responding "don't know" (abbreviated DK). The proportion of incorrect or DK responses varies according to the question. For example, regarding interest compounding, only 9% did not know but over one-fifth (22%) gave an incorrect answer. On the inflation question, 10% did not know, while 13% gave a wrong answer. The question about stock risk elicited the most DKs: 34% of the sample did not know, while a smaller fraction (13%) gave a wrong answer.

Since the first two questions are key to respondent financial numeracy, it is disturbing that only slightly over half (56%) of the sample get both questions right. This is a remarkably low figure if we contemplate the complex financial calculations that households on the verge of

retirement have most likely engaged in over their lifetimes. Also disturbing is the fact that only one-third (34%) of respondents correctly answer all three questions. Another interesting finding is that the "DK" responses are highly correlated: that is, financial illiteracy is systematic across areas examined. For instance, there is a 70% correlation between those who cannot answer both the interest compounding question and the inflation question. Erroneous answers are more scattered, with mistakes having a correlation of only 11%.

These results reinforce survey findings about financial literacy from Bernheim (1995, 1998), Hogarth and Hilgerth (2002), and Moore (2003), who report that most respondents do not understand basic financial concepts, particularly those relating to bonds, stocks, mutual funds, and the working of compound interest; they also report that people often fail to understand loans and, particularly, mortgages.[6] Such findings extend beyond the US: for instance, Miles (2004) shows that UK borrowers display poor understanding of mortgages and interest rates. Christelis, Jappelli, and Padula (2005) use SHARE surveys conducted in several European countries to show that respondents there also score low on financial numeracy and literacy scales.[7] In 2005, the National Council on Economic Education (NCEE) conducted a study of high school students and working-age adults, and showed a general lack of knowledge of fundamental economic concepts, confirming the findings of several studies from the Jump$tart Coalition for Personal Financial Literacy, which surveys US high school students (Mandell, 2004)). It is noteworthy that our three financial literacy questions reveal a similar lack of knowledge, even though these questions are quite a bit simpler and addressed to older respondents who might have been expected to be more finally sophisticated, given lifetime exposure to financial contracts (e.g.

[6] Other surveys also find similar results, in particular concerning knowledge regarding properties of bonds, stocks, and mutual funds (cf Agnew and Szykman 2005)

[7] We have also inserted the module questions into a survey of Dutch households to permit a direct comparison of American and Dutch respondents in the near future.

mortgages, bank accounts, credit cards, etc.). Nevertheless, the news is not positive: financial literacy levels are low among older Americans.

Lack of literacy and financial sophistication can have important consequences. For instance, Calvert, Campbell, and Sodini (2006) show that households with greater financial sophistication are more likely to participate in risky assets markets and invest more efficiently.[8] Hilgerth, Hogarth, and Beverly (2003) also demonstrate a strong link between financial knowledge and financial behavior.

Who Is Financially Literate? Though these figures are rather grim, they obscure important heterogeneity in financial knowledge across demographic groups. Specifically we are interested in whether the patterns differ by race and educational attainment, and Figures 1a-c report some of our findings. There are large differences between Whites, Blacks, and Hispanics.[9] Blacks and particularly Hispanics are much less likely to correctly answer the question about interest compounding: fewer than half of the Hispanics gave a correct answer, and a sizable fraction of the remainder simply stated they did not know the answer. This is a potentially important result in view of the fact that many Hispanics do not hold even basic assets, such as checking accounts (Hogarth, Anguelov, and Lee, 2004). A similar pattern emerges with the question about inflation, where again Hispanics are those least likely to answer correctly. As far as risk diversification is concerned, Hispanics and Blacks both display difficulty answering this question: only one third (37%) of the Blacks responded correctly while more than 40% of Blacks did not know the answer to this question. This may shed further light on why so many Blacks do not hold stocks (c.f. Haliassos and Bertaut 1995).

[8] See also Campbell (2006) for an excellent examination of household financial decisions.
[9] The remaining racial groups are very small and for brevity we do not include them in the figures. We also do not include those who "refuse" to answer the questions, since they are a very small group.

Differences in financial knowledge across education groups (Figures 2a-c) confirm our expectation that financial literacy is highly correlated with schooling. Most importantly, financial illiteracy is acute among those with less than a high school degree. Fewer than one-third of respondents with elementary education correctly answer the question about interest compounding, and one-third simply stated they did not know. The proportion of correct answers to the question about interest compounding increases gradually with education, while the proportion of both incorrect answers and DKs falls. A similar pattern is revealed in answers to the inflation question, where again those without a high school education are much more likely to be incorrect or unable to answer the question. The question about risk diversification reveals that only those who have a college degree display a high proportion of correct answers. Nevertheless, even here, almost one-third of those with a college degree do not know the answer or answer incorrectly to this question. For the less-educated, the proportion of DK is particularly high; over half of those with less than high school education report they do not know the answer to these questions.

Looking at the pattern of responses across gender, the results show that women are generally less financially knowledgeable than are men (Figure 3). For women, the proportion of correct answers is significantly lower across the three questions; females are approximately 10 percentage points less likely than males to answer correctly to both the question about interest compounding and inflation. Concerning risk diversification, women are less likely to respond correctly to the question compared to men, and are more likely to not know the answer rather than answering incorrectly.

For brevity, we do not report the distribution of financial literacy results across other demographic factors such as age, marital status, and immigration status. Yet some findings are

worth highlighting: for instance, the leading edge of the Baby-Boomers (those age 51-56 in 2004) are much less knowledgeable about inflation, perhaps a result of their limited historical exposure to inflation, or the fact they were in their 20s in the high inflation period during the 1970s and early 1980s. Demographic differences remain statistically significant even when we perform a multivariate analysis of pattern of responses and include controls for race, sex, marital status, educational attainment, place of birth, Baby-boomer cohort, and age. Thus, for example, Blacks and Hispanics, are still less likely to answer correctly to interest compounding and inflation questions (Blacks are also less likely to answer correctly the question about risk diversification), even after accounting for educational attainment.

Prevalence of Retirement Planning Calculations. We now turn to evaluating other predictions of the canonic economic model, namely that people will look ahead and calculate how much they need to save for retirement. Accordingly, the module asks HRS respondents whether they ever tried to figure out how much they need to save for retirement; Table 2 provides the results. Fewer than one-third of the sample respondents (31%) indicated that they actually attempted to do a retirement saving calculation; these we call the S*imple Planners*. The small size of this group confirms Lusardi's analysis (1999, 2002, 2003) of previous HRS waves, where she found that many people have given little thought to retirement even when they are just a few years away from leaving the workforce. Our results also confirm findings from the Retirement Confidence Survey and TIAA-CREF, which indicated that few undertake retirement planning, even among the educated (Yakobosky and Dickempers, 1997; Ameriks, Caplin and Leahy, 2003). It is also consistent with the work of Mitchell (1988) and Gustman and Steinmeier (2004) who found that workers display little knowledge about their Social Security and pension benefits, two of the most important components of retirement wealth. In fact, close to half of

workers in the HRS sample analyzed by Gustman and Steinmeier (2004) could not report their type of pension plan, and an even larger portion was ignorant of future Social Security benefits.[10]

A key advantage of our module, compared to previous core HRS questions and other surveys, is that we can probe respondents further to inquire about the outcomes of their calculations. Thus Panel A of Table 2 shows that only 58% of those who tried to develop a plan actually did so, while another handful "more or less" developed a plan (9%). Both of these we refer to below as the *Serious Planners*. The high failure rate, so far as developing a plan is concerned, underscores the fact that retirement projections are difficult to do. If we consider those who responded yes to the question, as many as half of simple planners did not succeed in developing a plan, another disappointing finding. Furthermore, of the subset of serious planners, only one-third (38%) was always able to stick to its plan, while half were "mostly" able to stick to their plans (below we call these respondents *Successful Planners*). In the sample as a whole, this represents a meager 19% overall rate of successful planning. Of course, households may face unexpected shocks making them deviate from plans, but the fact remains that few respondents do what the economic models suggest that they should. In other words, planning for retirement is difficult, few do it, and fewer still think they get it right.

Financial Literacy and Use of Planning Tools. To further evaluate what planning means and what people actually do when planning for retirement, we ask respondents to indicate which tools they use in this process. To the extent that they use crude or inaccurate tools, this may explain the low planning success rates in the population. Panel A of Table 3 shows that respondents use a wide variety of tools to calculate their retirement needs (note that these questions are asked only of those who reported they attempted a retirement saving calculations).

[10] There is also mounting evidence that knowledge about pensions and Social Security affects retirement decisions (Chan and Huff Stevens (2003), Mastrobuoni (2005)).

The results show that between one-quarter and one-fifth of respondents talked to family/relatives or co-workers/friends, while one-third or more used formal means such as retirement calculators, retirement seminars, or financial experts. *Successful Planners* were more likely to use formal means (over 40%), whereas *Simple Planners* – some of whom tried and failed – tended to rely on less formal approaches. The table also shows that financial literacy is correlated with planning tools, even though unevenly. The list of tools does not exhaust what people might do; in fact, as many as one quarter of the self-reported planners indicated that they did not use any of the listed tools.

Those who were correct regarding compound interest and inflation were more likely to have attended a retirement seminar, suggesting that such seminars may provide information (without further control variables we cannot hold constant other background variables). Those knowledgeable about risk diversification also tend to use formal rather than informal tools for planning. Turning to the sample as a whole, Panel B of Table 3 reveals for the planners what the correlations were between their level of financial literacy and the tools they used in their planning efforts. Those who used more sophisticated tools were always more likely to get the literacy questions right, as compared to those who relied on personal communications; furthermore, the knowledge gap was relatively the greatest for the compound interest question. Panel C shows that a very large segment – almost three-quarters (74%) of the respondent pool – indicates that it always or mostly tracks its spending, and over half (51%) always or mostly tries to set spending budget targets. This is impressive given the low level of planning for retirement. It is not clear whether those undertaking the spending budget efforts do so simply to get through the month without running out of money, or whether these efforts indicate a larger consciousness

of retirement saving needs and plans. Below we evaluate planning and financial literacy in a multivariate setting.

Planning and Financial Literacy

One reason people fail to plan for retirement, or do so unsuccessfully, may be because they are financially illiterate. In this case, they may fail to appreciate the role of (or may have a hard time solving problems with) compound interest, inflation, and risk. Table 4 reports a multivariate analysis to shed some light on the importance of financial literacy and the relationship with planning.[11] The three dependent variables show who was a planner, who developed a plan, and who was able to stick to a plan. Column I in each case takes on a value of 1 if the respondent was correct regarding the literacy variables (else, = 0); Column II adds an indicator equal to 1 if the respondent indicated he did not know the answer to the question (else, = 0); and Column III has the same dependent variable but adds controls for demographics and specifically age, race, gender, educational attainment, and a dummy for being a Baby-boomer. We use a Probit analysis as the outcomes are qualitative (0,1) variables, and we report marginal effects.

The regression estimates suggest several interesting findings. First, financial literacy is strongly and positively associated with planning, and the results are statistically significant at conventional levels. That is, planners of all types are much more likely to give a correct answer to our basic questions about financial literacy (Columns I). Second, knowledge about risk diversification best differentiates between sophisticated and unsophisticated respondents. Not only does it have a much larger estimated marginal effect than being able to correctly answer the

[11] We are aware the causality may also go the other way: that is, those who plan also develop financial literacy and an ability to do retirement calculations. We will address causality more formally in future versions of the paper.

interest and the inflation questions, but it also remains statistically significant even after accounting for the demographic characteristics of the respondent. Third, lack of knowledge also matters. Even with respect to those answering incorrectly, those who cannot answer the questions are much less likely to plan and to succeed in their planning effort (Columns II). What appears most crucial is a lack of knowledge about interest compounding, which makes sense since basic numeracy is crucial for doing calculations about retirement savings

Column III in Table 4 reports the estimates when we account for demographic characteristics. As reported above, it is useful to note that some indicators of financial literacy remain statistically significant even after we account for many demographic characteristics. This means, for example, that financial literacy affects planning above and beyond the effect of education. Thus, the information provided in the financial literacy variables may prove very useful in explaining the differences we observe among households in their behavior toward retirement savings, to which we now turn.

Wealth Accumulation and Financial Literacy

If financial illiteracy leads to poor or no planning, it may also affect wealth accumulation. Lusardi (2003) shows that those who plan accumulate more wealth before retirement and are more likely to invest in stocks. Moreover, planners are more likely to experience a satisfying retirement, perhaps because they have higher financial resources to rely on after they stop working.

In Table 5 (Panel A), we report the estimate of a simple regression of total net worth on the three dummies measuring financial literacy and a set of demographic characteristics. Specifically, we control for age, gender, race, education attainment, marital status, place of birth,

and income. Wealth is defined as the sum of checking and savings accounts, certificate of deposits and other short-terms assets, bonds, stocks, other assets, housing equity, other real estate, IRAs and Keoghs, business equity, and vehicles minus all debts.[12] Since the direction of causality is unclear, we perform regressions in the total sample and also across quartiles of the wealth distribution. Financial illiteracy is particularly pronounced among those with low income and low education who also display low wealth holdings. If financial literacy is positively correlated with wealth at the bottom of the wealth distribution, it is likely to indicate that those who have basic financial knowledge are better able to save. This is what we find in Table 5A. Financial literacy is positively correlated with wealth, but only in the first two quartiles of the wealth distribution. Those who display basic numeracy and understand risk diversification display higher wealth holdings. This is a remarkable result as the regressions account for several of the demographic characteristics that are related to low financial literacy (race, gender and low income) and also account for educational attainment.

In Table 5B we report a simple probit analysis of stock ownership. One area where financial literacy should be influential is portfolio choice: if investor do not understand interest compounding, inflation, or risk diversification, they may be less likely to invest in complex assets, such as stocks. The regressions account for the demographics listed above and we additionally add total net worth. We find there is a strong positive correlation between stock ownership and knowledge of risk diversification. This is the case in the total sample and across education groups. Basic numeracy also plays a role, but mostly for those with high education (defined as having more than a high school degree). Again, the results are noteworthy since we account not only for education but also for total net worth in the regressions. These findings may

[12] We use the preliminary release of the 2004 wealth data, which includes imputations for those who did not report assets and debt data.

help explain the "puzzle" of why so few households hold stocks (Haliassos and Bertaut, 1995). Moreover, they may shed light on another puzzling finding in household surveys, such as the Survey of Consumer Finances. When asked how much risk respondents are willing to take, a large majority (more than 60%) state they are unwilling to take any financial risk. This finding may capture not only high risk aversion but also the fact that many respondents do not know or understand risk diversification.

Implications and Conclusions

As an increasingly large group of the US population moves into retirement, it is crucial to learn whether families knows how to plan for retirement and whether they can execute these plans effectively. How people react when confronted with this challenge – that is, whether individuals seem to have knowledge of and the capability to plan and implement these complex planning tasks – is a topic of substantial current interest.

Our module for the 2004 HRS is useful in addressing this issue as it first asks about people's basic financial literacy, that is, whether they understand compound interest rates and the effects of inflation, along with the more nuanced concept of risk diversification. We find that only half of the respondents correctly answer two simple questions regarding interest compounding and inflation, and only one-third correctly answer these two questions and a question about risk diversification. In other words, financial illiteracy is widespread among older Americans. Second, we evaluate whether people tried to figure out how much they need to save for retirement, whether they devised a plan, and whether they succeeded at the plan. We find that retirement calculations are not an easy task: only 31% of these older people had ever tried to devise a retirement plan, and only two thirds of these succeeded. For the sample as a

whole, only 19% engaged in successful retirement planning. Third, we find that financial knowledge and planning are clearly interrelated. Fourth, we evaluate the planning tools people use. The respondents who did plan were less likely to talk to family/relatives or co-workers/friends than they were to use formal means such as retirement calculators, retirement seminars, or financial experts. Fifth, keeping track of spending and budgeting habits appears conducive to retirement saving.

Inasmuch as planning is an important predictor of saving and investment success, we may have uncovered an important explanation for why household wealth holdings differ, and why some people enter retirement with very low wealth (Venti and Wise 2001, Lusardi 1999). Our preliminary empirical analysis finds that financial literacy has an effect on both savings and portfolio choice.

Our work has important implications on several public policy frontiers. Throughout the 1990s, there was been an explosion of products and programs for financial planning. The government has recently fostered several programs to spur financial education, and employers are increasingly offering retirement seminars to their workers (Lusardi 2004). Some researchers contend that these programs have only minimal effects on saving, but our work suggests that this may be due to the lack of well-targeted content. For example, if financial illiteracy is widespread among particular employees, a one-time financial education lesson is likely to be insufficient to influence planning and saving decisions. Similarly, education programs targeted specifically to particular subgroups may be better suited to address large differences in preferences and saving needs.

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Table 1. Financial Literacy Patterns

(HRS 2004, Planning Module - preliminary, unweighted data)

Panel A: Distribution of Responses to Financial Literacy Questions

	Responses			
	Correct	*Incorrect*	*DK*	*Refuse*
Compound Interest	67.1%	22.2%	9.4%	1.3%
Inflation	75.2%	13.4%	9.9%	1.5%
Stock Risk	52.3%	13.2%	33.7%	0.9%

Panel B: Joint Probabilities of Being Correct to Financial Literacy Questions

	All 3 responses correct	*Only 2 responses correct*	*Only 1 response correct*	*No responses correct*
Proportion	34.3%	35.8%	16.3%	9.9%

Note: DK = respondent indicated "don't know

Table 2. Prevalence of Retirement Planning Calculations

(HRS 2004, Planning Module - preliminary, unweighted data)

Panel A. Proportion of Planners in Respective Sub-Groups

Did you try to figure out how much to save for retirement?							
Yes						*No*	*Refuse/DK*
31.3%						67.8%	0.9%
Did you develop a plan?							
Yes				*More or Less*		*No*	*Refuse/DK*
58.4%				9.0%		32.0%	0.6%
Were you able to stick to the plan?							
Always	*Mostly*	*Rarely*	*Never*	*Refuse/DK*			
37.7%	50.0%	8.0%	2.6%	1.0%			

Panel B. Proportion of Planners in the Full Sample

Question	*Proportion of Sample*
Simple Planners Yes to "tried to figure out how much to save for retirement"	31.3%
Serious Planners Replied Yes/More or less to "developed a plan"	21.1%
Successful Planners Replied Always/Mostly to "able to stick to the plan"	18.5%

Table 3. Links between Planning Tools, Planning Success, and Financial Literacy

(HRS 2004, Planning Module - preliminary, unweighted data)

Panel A: Tools Planners Report Using

Tools	*Simple Planners* n = 397	*Successful Planners* n = 235
Talk to family/friends	21.1% (.409)	17.4% (.380)
Talk to coworkers/friends	24.7% (.432)	21.3% (.410)
Attend retirement seminar	35.3% (.479)	40.4% (.492)
Use calculator/worksheet	37.8% (.485)	43.4% (.497)
Consult financial planner	39.0% (.488)	49.4% (.501)

Panel B: Correlation Between Planning, Tools Used, and Financial Literacy

	Simple Planners n = 397	*Talk to family/ friends* n = 84	*Talk to coworkers/ friends* n = 98	*Attend retirement seminar* n = 140	*Use calculator/ worksheet* n = 150	*Consult financial planner* n = 155
Correct on Compound Interest	75.3%	65.5%	69.4%	77.9%	83.3%	80.6%
Correct on Inflation	84.4%	82.1%	88.8%	88.6%	89.3%	86.5%
Correct on Stock Risk	52.2%	65.5%	71.4%	80.0%	79.3%	73.5%

Panel C. Budgeting Questions: All Respondents

	Always	*Mostly*	*Rarely*	*Never*	*Do not know/Refuse*
Track spending	43.2%	30.8%	14.7%	11.0%	0.3%
Set spending budget	23.6%	27.6%	22.4%	26.0%	0.5%

Table 4. Probit Analysis of Simple, Serious, and Successful Planners: Marginal effects reported
(HRS 2004, Planning Module - preliminary, unweighted data)

	Simple Planners n = 1269			*Serious Planners* n = 1269			*Successful Planners* n = 1269		
	I	**II**	**III**	**I**	**II**	**III**	**I**	**II**	**III**
Correct on Compound Interest	.068**	.032	.024	.064**	.037	.004	.061**	.037	.007
	(.028)	(.031)	(.032)	(.024)	(.025)	(.027)	(.022)	(.024)	(.024)
Correct on Inflation	.104***	.079**	.053	.073***	.057*	.038	.072***	.062**	.043
	(.03)	(.035)	(.037)	(.026)	(.029)	(.030)	(.024)	(.027)	(.027)
Correct on Stock Risk	.165***	.109***	.094***	.155***	.101***	.086***	.137***	.088***	.067***
	(.026)	(.038)	(.038)	(.022)	(.032)	(.032)	(.021)	(.031)	(.029)
DK Compound Interest		-.171**	-.162***		-.138**	-.127**		-.130**	-.117**
		(.056)	(.056)		(.042)	(.040)		(.036)	(.032)
DK Inflation		.025	.035		.036	.047		.057	.068
		(.080)	(.081)		(.077)	(.078)		(.078)	(.079)
DK Stock Risk		-.071*	-.044		-.070*	-.044		-.064*	-.038
		(.042)	(.043)		(.035)	(.036)		(.033)	(.033)
Demographics	no	no	yes	no	no	yes	no	no	yes
Pseudo R^2	.048	.056	.107	.060	.069	.133	.060	.069	.142

* estimated coefficient significant at the 10% level; ** estimated coefficient significant at the 5% level; *** estimated coefficient significant at the 1% level.

Table 5A. Wealth Accumulation and Financial Literacy: OLS and Quantile Regressions
(HRS 2004, Wealth is divided by 1,000; Preliminary, unweighted data)

	Total sample	1st quartile	Median	3rd quartile
Correct on Compound interest	40.85 (25.66)	19.72 (16.91)	29.18*** (10.43)	21.29 (27.28)
Correct on Inflation	31.23 (27.71)	3.44 (7.54)	17.96 (11.28)	34.51 (29.39)
Correct on Stock Risk	11.68 (23.79)	19.39*** (6.44)	26.95*** (9.67)	20.73 (26.31)
Demographics	yes	yes	yes	yes
Adjusted or Pseudo R^2	0.32	0.14	0.20	0.24

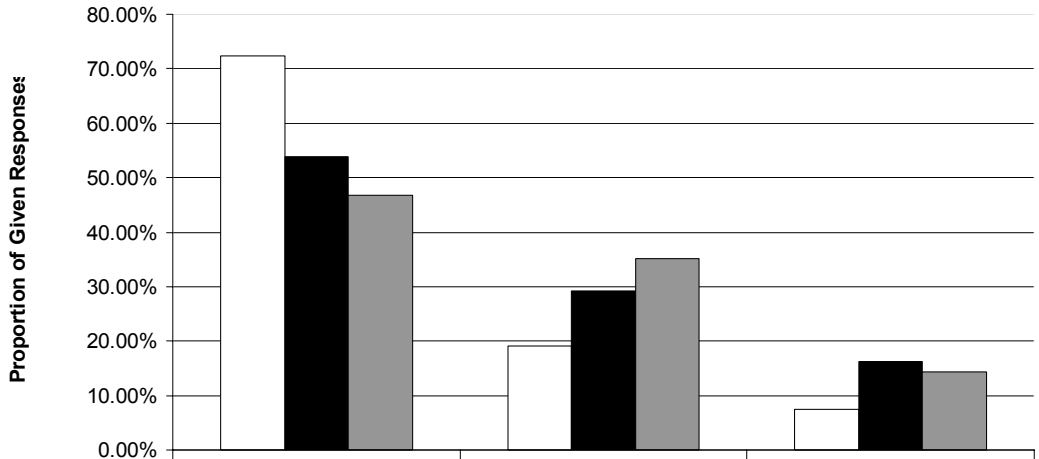
* estimated coefficient significant at the 10% level; ** estimated coefficient significant at the 5% level;
*** estimated coefficient significant at the 1% level.

Table 5B. Probit Analysis of Stock Ownership: Marginal effects reported
(HRS 2004, Preliminary, unweighted data)

	Total sample	Low education	High education
Correct on Compound interest	.064** (.030)	.041 (.030)	.101* (.051)
Correct on Inflation	.035 (.033)	.001 (.037)	.027 (.057)
Correct on Stock Risk	.121*** (.027)	.077** (.032)	.202*** (.042)
Demographics and wealth	yes	yes	yes
Pseudo R^2	0.173	0.257	0.168

* estimated coefficient significant at the 10% level; ** estimated coefficient significant at the 5% level;
*** estimated coefficient significant at the 1% level.

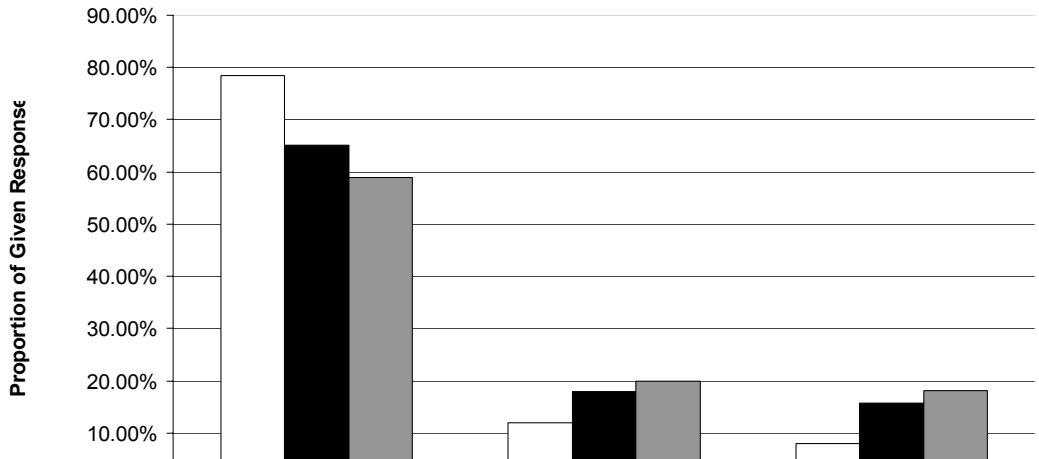
Figure 1a -- Distribution of Responses to Compound Interest Across Race



	Correct	Incorrect	DK
White	72.30%	19.00%	7.50%
Black	53.90%	29.20%	16.30%
Hispanic	46.70%	35.20%	14.30%

Response

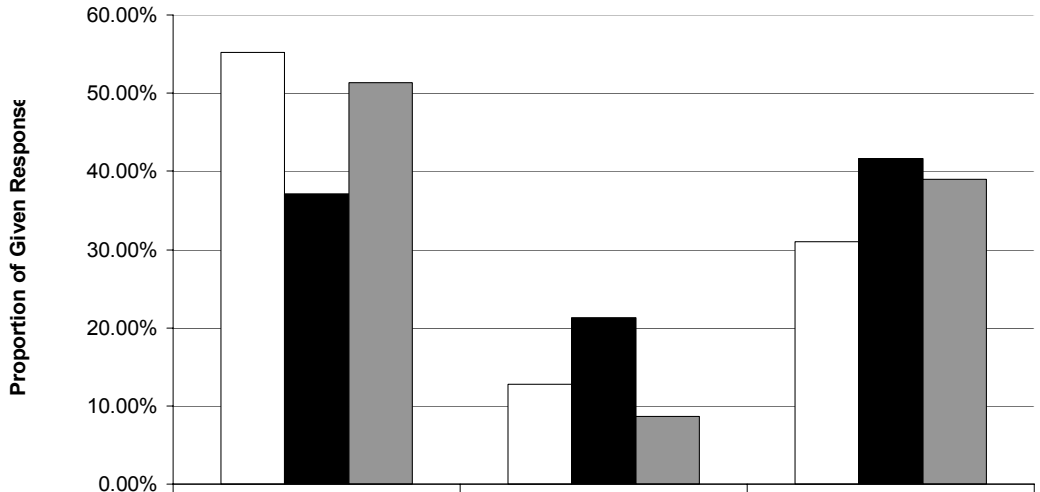
Figure 1b -- Distribution of Responses to Inflation Across Race



	Correct	Incorrect	DK
White	78.50%	12.00%	8.00%
Black	65.20%	18.00%	15.70%
Hispanic	59.00%	20.00%	18.10%

Response

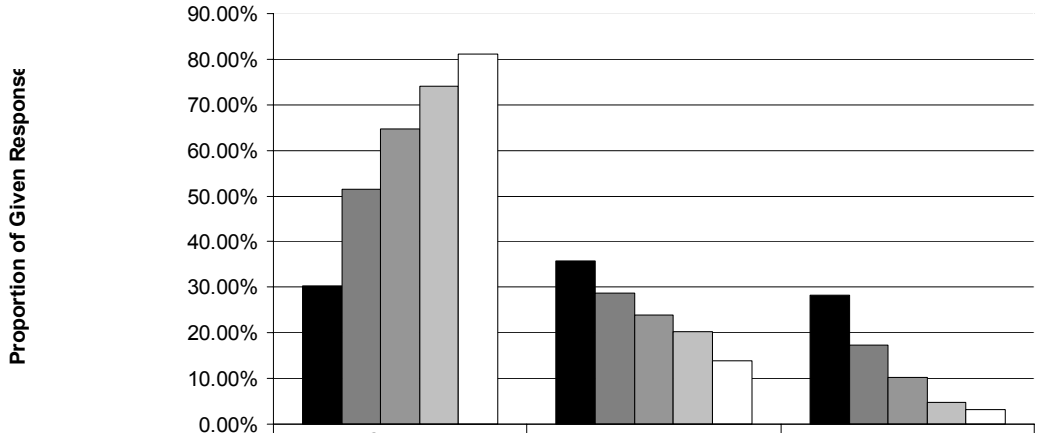
Figure 1c -- Distribution of Responses to Stock Risk Across Race



	Correct	Incorrect	DK
White	55.20%	12.80%	31.00%
Black	37.10%	21.30%	41.60%
Hispanic	51.40%	8.60%	39.00%

Response

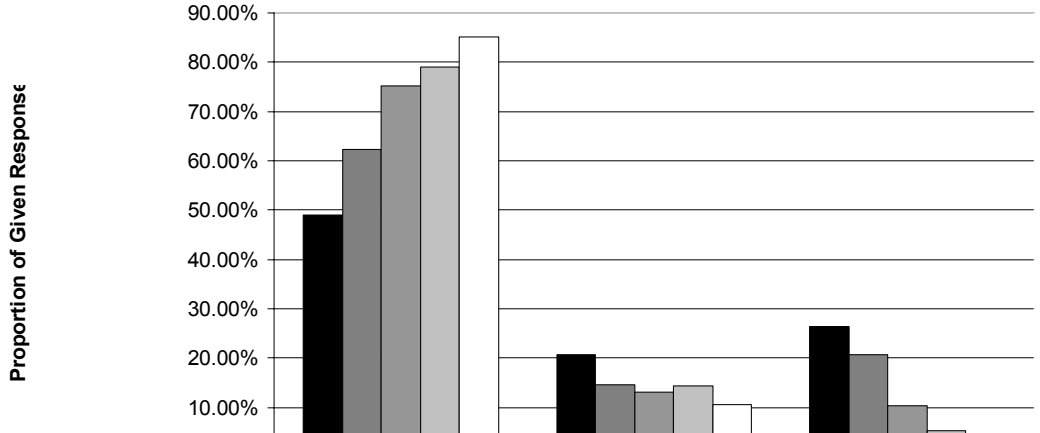
Figure 2a -- Distribution of Responses to Compound Interest Across Education



	Correct	Incorrect	DK
Elementary	30.20%	35.80%	28.30%
Less than High School	51.40%	28.80%	17.40%
High School	64.80%	24.00%	10.30%
Some College	74.00%	20.30%	4.70%
College and More	81.20%	13.80%	3.30%

Response

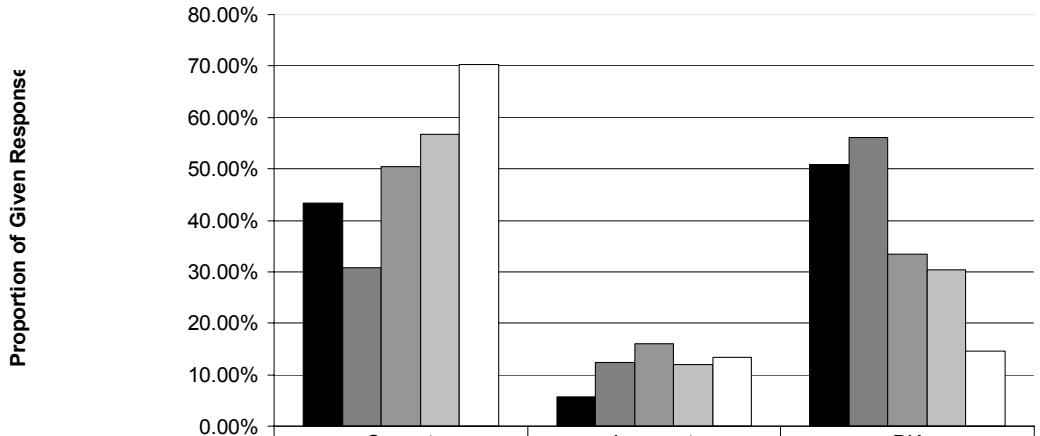
Figure 2b -- Distribution of Responses to Inflation Across Education



	Correct	Incorrect	DK
Elementary	49.10%	20.70%	26.40%
Less than High School	62.30%	14.60%	20.70%
High School	75.20%	13.10%	10.30%
Some College	79.00%	14.40%	5.30%
College and More	85.10%	10.50%	3.30%

Response

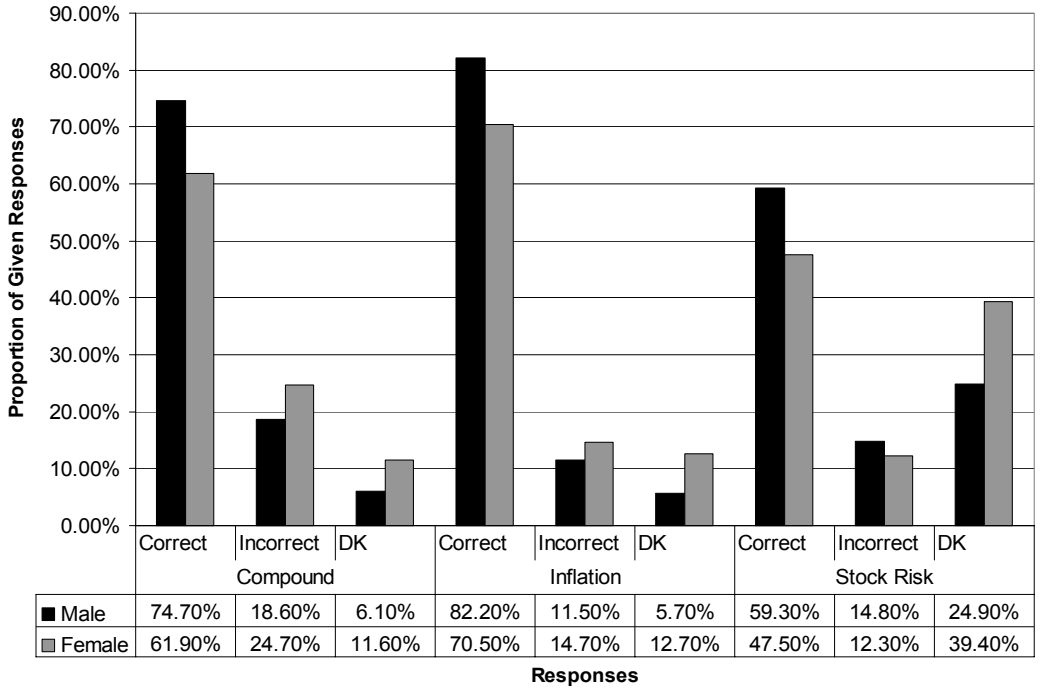
Figure 2c -- Distribution of Responses to Stock Risk Across Education



	Correct	Incorrect	DK
Elementary	43.40%	5.70%	50.90%
Less than High School	30.70%	12.30%	56.10%
High School	50.40%	16.10%	33.50%
Some College	56.70%	12.00%	30.30%
College and More	70.20%	13.40%	14.50%

Response

Figure 3 -- Distribution of Responses Across Gender



	Compound			Inflation			Stock Risk		
	Correct	Incorrect	DK	Correct	Incorrect	DK	Correct	Incorrect	DK
Male	74.70%	18.60%	6.10%	82.20%	11.50%	5.70%	59.30%	14.80%	24.90%
Female	61.90%	24.70%	11.60%	70.50%	14.70%	12.70%	47.50%	12.30%	39.40%

Responses