

Influence of future time perspective, financial knowledge, and financial risk tolerance on retirement saving behaviors

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Abstract

The purpose of this study is to explore the extent to which individuals' knowledge of retirement planning, future time perspective, and financial risk tolerance influence retirement saving practices. A total of 270 young working adults participated in the study. Regression analyses reveal that each of the three variables is predictive of saving practices, and they interact with one another as well. From an applied perspective, the findings suggest that counseling and intervention efforts aimed at promoting retirement saving should differentially target individuals on the basis of these three psychological dimensions. © 2005 Academy of Financial Services. All rights reserved.

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1. Introduction

The lack of sufficient savings among American workers raises concerns about their financial solvency in retirement. Studies indicate that baby boomers are only saving at a rate of one-third of what will be needed to fund their retirement (Glass & Kilpatrick, 1998a), and younger baby boomers are saving less than older boomers (Warner, 1996). In fact, Warshawsky and Ameriks (2000) predict that fully half of all individuals ages 25–71 years will not have sufficient savings to support themselves in retirement, which is similar to findings by Yuh, Hanna, and Montalto's (1998). Taken together, this suggests it will be difficult for

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future retirees to remain financially independent in late life. In an effort to better understand the reasons why individuals are not saving at an adequate rate, researchers are focusing their attention on the factors that influence the tendency to plan and save.

Understanding the motives that underlie individuals' retirement saving practices is important because many, if not most future retirees, will need to rely on personal savings to maintain a reasonable replacement income (Sterns, 1998; Kotlikoff & Morris, 1989; Ferraro & Su, 1999; Blank, 1999; Kleinman, Anandarajan & Lawrence, 1999; Wiatrowski, 1993). Much of the literature on retirement saving focuses on the influence of demographic factors. This line of work has shown that age (Bassett, Fleming & Rodrigues, 1998; Glass & Kilpatrick, 1998b), income (Bassett et al., 1998; Grable & Lytton, 1997; Mitchell & Moore, 1998), educational level (DeVaney & Su, 1997; Yuh & Olson, 1997), marital status (Cohn, Lewellen, Lease & Schlarbaum, 1975; Glass & Kilpatrick, 1998a; Henkens, 1999), and gender (Behling, Kilty & Foster, 1983; Hurd & Wise, 1989; Quick & Moen, 1998) are all systematically related to retirement saving practices. Often overlooked, however, are psychological influences on planning and saving. In a recent article, Hershey (2004) argues that although demographic factors have an influence on retirement saving decisions, their effect is mediated through the psyche. Alternatively stated, psychological factors represent proximal influences that have a direct effect on savings decisions; demographic factors, in contrast, are the distal influences that lead individuals to think about saving in predictable ways.

This paper focuses on the extent to which three psychological variables are related to individuals' tendencies to save. The three predictors are future time perspective, knowledge of retirement planning and saving, and financial risk tolerance. The remaining sections of the paper are organized as follows: Section 2 provides a review of the literature on the psychological factors that influence saving. Section 3 outlines the objectives of the study. The methodology and results appear in Sections 4 and 5, respectively. The paper concludes in Section 6 with a summary of findings, future research directions, and a discussion of implications.

2. Literature review

The past decade witnessed a growth in the number of studies that examine psychological influences on retirement planning. Among these investigations, a fair number have focused on the role of future time perspective, knowledge of retirement planning, and financial risk tolerance. The section below summarizes the relevant studies pertaining to these constructs.

2.1. *Future time perspective*

Future time perspective is a psychological variable that receives a good deal of attention in the financial planning literature. It is a measure of the extent to which individuals focus on the future, rather than the present or past. Not only is the construct operationalized in a variety of ways, but the terms used to describe it vary depending on whether one is reading the literature in psychology or economics. Among psychological studies, the construct is

typically referred to as FTP or future orientation, whereas in the economic literature it is often referred to as one's level of patience, time preference, or planning horizon.

A small handful of studies have demonstrated that future orientation predicts the tendency to plan and save. For instance, Hershey and Mowen (2000) found that among individuals age 35–88 years, future time perspective is positively associated with self-reported financial preparedness for retirement. Lusardi (1999) reports that pre-retirees with a short planning horizon have not only a lower average net worth, but they expect to receive less in the way of income from personal savings in retirement. Similarly, one's level of patience (i.e., the willingness to postpone spending to save) is related to retirement saving tendencies (Bernheim, Skinner & Weinberg, 1997; Burtless, 1999). Taken together, these findings convincingly reveal that one's future orientation is likely to have a significant impact on saving behaviors.

2.2. *Knowledge of financial planning for retirement*

Of the various psychological variables studied in relation to saving, perhaps none has received as much attention as financial knowledge. Research demonstrates that knowledge is positively related to retirement planning activities (Ekerdt, Hackney, Kosloski & DeViney, 2001) and financial saving practices (Hershey & Mowen, 2000; Yuh & DeVaney, 1996). In fact, Hayslip, Bezerlein, and Nichols (1997) argue that young adults tend to show high levels of retirement anxiety because they lack accurate information about retirement. Consistent with that proposition, Mitchell and Moore (1998) report one reason individuals fail to plan for retirement is because they lack sufficient knowledge. Similarly, Loewenstein, Prelec, and Weber (1999; see also Hershey, Brown, Jacobs-Lawson & Jackson, 2001) find that pre-retirees report they should become more knowledgeable about retirement saving and investments. These findings suggest that many workers nearing retirement age lack the requisite knowledge to make informed decisions about whether it is economically feasible to leave the workforce.

Grable and Lytton (1997) find that investment knowledge is positively related to saving behaviors. Research also shows that investment knowledge can have a significant impact on the quality of one's investment decisions. For instance, Walsh and Hershey (1993) report that expert financial planners and older individuals are more accurate than novices and younger individuals at determining how much should be invested in the 401(k) accounts of hypothetical investors. Hershey and Walsh (2000/2001) also find that expert financial planners make better investment decisions than novices; but trained novices, who are taught to understand the "deep structure" of a 401(k) investment task, make decisions that are *ten times better* than novices. In sum, these findings indicate that knowledge of financial planning for retirement can have a profound effect on retirement saving decisions.

2.3. *Risk tolerance*

The concept of risk tolerance is studied in a variety of contexts, including risk of physical danger, risk in gambling, and risk in everyday life experiences (see Bromiley & Curley, 1992; Byrnes, Miller & Schafer, 1999 for reviews). Most of the work in the area of financial

risk tolerance focuses on individuals' general financial investment decisions; far fewer studies examine its influence on retirement saving tendencies. Studies from the general investment literature show that risk-tolerant individuals prefer to invest in high risk options (e.g., equities), whereas those who are risk averse prefer investing in bonds and certificates of deposit. Similar findings emerge from studies that focus on retirement investments (Bajtelsmit, Bernasek & Jianakoplos, 1999; Hariharan, Chapman & Domian, 2000; Sunden & Surette, 1998). For instance, Yuh and DeVaney (1996) demonstrate that the defined contribution plans of risk tolerant individuals tend to be larger than those of individuals who are risk averse, which suggests risk tolerant individuals will be more likely to remain financially independent after leaving the workforce. Along similar lines, Grable and Joo (1997) report that risk tolerance is a significant predictor of retirement investment and saving strategies.

3. Study objectives

The goal of this paper is to gain a better understanding of how future time perspective, knowledge of financial planning for retirement, and financial risk tolerance influence retirement saving. Although other psychological factors such as goal clarity (Moen, 1996; Stawski, Hershey & Jacobs-Lawson, 2005) and attitudes toward retirement (Jacobs-Lawson & Hershey, 2002; Taylor-Carter, Cook & Weinberg, 1997) influence retirement saving tendencies, future time perspective, knowledge, and risk tolerance receive the lion's share of attention in the financial planning literature. One major objective of the investigations, therefore, is to replicate previous findings by demonstrating significant positive relationships between the three predictor variables and saving.

In light of the fact that previous research focuses on how future time perspective, knowledge, and risk tolerance independently influence individuals' saving practices, a second major objective is to examine how the three psychological factors *interact* with one another. To this end, four substantive research questions are addressed: (1) Does future time perspective interact with financial knowledge to influence saving tendencies? (2) Does the effect of risk tolerance on saving depend on how much an individual knows about financial planning for retirement? (3) Does the effect of risk tolerance on saving depend on one's level of future time perspective? And finally, (4) does the effect of risk tolerance on saving depend on a combination of future time perspective and financial knowledge? All four questions will be answered by examining the pattern of two- and three-way statistical interactions among the three variables using regression models designed to predict retirement saving tendencies.

4. Method

4.1. Participants

A total of 270 working adults (154 men, 116 women) participated in the present study. The data are from part of a larger national study on the psychological determinants of

retirement planning among young and middle-aged working adults. All participants are members of a large household data panel maintained by a major international market research firm. Sampling of the panel is limited to Americans 25–45 years of age ($M = 36.2$, $SD = 6.18$), and stratified on the basis of geographical region. Participants' median level of education is 14.0 years, and their median income is \$55K. The ethnic background of the group is as follows: Caucasian, 85.6%; African American, 4.4%; Hispanic, 4.1%; Asian, 1.9%; Native American, 1.1%; multi-ethnic, 0.4%; and 2.5% unreported. Each participant received a small financial incentive for completing the questionnaire.

4.2. Questionnaire

Provided below are descriptions of each of the measures used in this investigation, along with what is known about their psychometric properties. For each of the four measures, a mean scale score for individuals is derived by averaging responses across multiple items.

4.2.1. Future time perspective

This construct is measured using a six-item scale developed by Hershey and Mowen (2000) that taps the extent to which individuals enjoy thinking about and planning for the future. Respondents rate how well each of six different statements describe them, using a seven-point response format (1 = never like me, 7 = always like me). The scale is not specific to the topic of retirement but is a more general measure of this personality dimension. A sample item from the future time perspective instrument is “*I enjoy thinking about how I will live in the future*” (see appendix for a full list of items). The coefficient alpha level for the scale is 0.75.

4.2.2. Knowledge of financial planning for retirement

The knowledge of financial planning for retirement scale contains five items designed to assess individuals' general knowledge of the topic (Hershey & Mowen, 2000; Mowen, Hershey & Jacobs-Lawson, 2000). A sample item from this scale is “*I am very knowledgeable about financial planning for retirement*” (see appendix). All items use a seven-point response format (1 = strongly disagree, 7 = strongly agree). The coefficient alpha level for the scale is 0.94.

4.2.3. Financial risk tolerance

Financial risk tolerance is measured using a six-item scale developed by Jacobs-Lawson (2003). The instrument taps individuals' attitudes toward risk, specifically, as applied to financial investing for retirement. Each of the items uses a seven-point response format (1 = strongly disagree, 7 = strongly agree). A sample item from this scale is: “*As a rule, I would never choose the safest investment when planning for retirement*” (see appendix). The coefficient alpha level for the scale is 0.83.

4.2.4. Retirement saving indicator

Retirement saving tendencies are measured using a five-item scale designed to evaluate individuals' retirement saving practices (Neukam & Hershey, 2002). Each of the items uses

Table 1
Hierarchical regression analysis of retirement saving tendencies

Variable	β	t	p -level
Level 1			
Financial planning knowledge	0.51	10.01	0.01
Future time perspective	0.25	5.26	0.01
Financial risk tolerance	0.16	3.53	0.01
Level 2			
Financial knowledge \times Future time perspective	0.00	0.05	0.96
Financial knowledge \times Risk tolerance	-0.07	-1.49	0.14
Risk tolerance \times Future time perspective	0.13	2.72	0.01
Level 3			
Financial knowledge \times Future time perspective \times Risk tolerance	-0.19	-4.00	0.01

Note: Regression values are standardized beta weights.

a seven-point Likert-type response format (1 = strongly disagree, 7 = strongly agree). A sample item from this scale is “*Made a conscious effort to save for retirement*” (see appendix for full list of items). The coefficient alpha level for the scale is 0.93.

4.3. Analysis plan

Before analysis all distributions were checked for evidence of normality, abnormal skewness and irregular kurtosis. None of the distributions were found to exhibit unusual characteristics. As the goal is to examine interactions between the psychological factors predictive of retirement saving, the predictors (i.e., future time perspective, financial knowledge, and financial risk tolerance) were centered before conducting the analyses. According to Aiken and West (1991), centering predictors (i.e., subtracting a scale’s overall mean from individuals’ scale scores) helps to reduce the problems associated with multicollinearity that occur when examining interactions between variables (also see Wainer, 2000 for a discussion on centering).

A hierarchical regression model, using retirement saving score as the criterion measure, is used to analyze the data. In this model, the three predictors are entered in the first level, followed by two-way interactions in the second level (i.e., time perspective by knowledge, knowledge by risk tolerance, and time perspective by risk tolerance), and the three-way interaction in level three (i.e., time perspective by knowledge by risk tolerance).

5. Results

Results reveal the first level of the model is statistically significant, $F(3, 266) = 113.38$, $p = 0.001$, $R^2 = 0.56$. Furthermore, all three predictors’ p -values exceed the 0.05 significance threshold (see Table 1). For each of the predictors, larger scores are associated with larger saving scores. The addition of the three two-way interactions in the second level of the model lead to a significant increase in explained variance, $F_{\Delta}(3, 263) = 2.70$, $p = 0.05$, R^2_{Δ}

= 0.013. Examination of the coefficients for these three effects only reveals a significant interaction between future time perspective and risk tolerance (see Table 1). The inclusion of the three-way interaction in the final level of the model again lead to a significant increase in explained variance, $F_{\Delta}(1, 262) = 15.97, p < 0.01, R^2_{\Delta} = 0.024$ (see Table 1). Overall, the model accounts for 59% of the variability in retirement saving scores. As can be seen by comparing the beta weights across predictors in the first and second levels, the strength of the significant interactions are consistent with that of the main effects (the exception being the main effect of knowledge, which had a substantially larger beta weight). This indicates that the significant interaction effects, particularly the three-way interaction, do play an important role in saving. By convention, any time significant interactions occur among predictors at different hierarchical levels (as is the case in this analysis), decomposition occurs at the level of the highest-order effect (Cliff, 1987). As the p -values for the three-way interaction exceeded the 0.05 significance threshold, the remainder of the result section will focus on decomposing this effect using a simple slope analysis.

A simple slopes analysis of a higher-order interaction in multiple regression is conceptually similar to the commonly reported simple effects analysis in analysis of variance. The observed significant three-way interaction indicates that the effect of one predictor variable on the criterion measure is dependent upon two other predictors; however, the interaction term fails to specify *how* the predictors are related to one another. Therefore, a simple slopes computation is carried out to reveal the essential nature of this interaction. Graphically, the technique involves plotting four separate “lines of best fit” for two of the three-predictor variables as a function of the third (which is represented along the x-axis). For ease of interpretability, these four regression slopes are represented across two different line graphs. One benefit of this technique is that the resulting figures allows one to “see” the pattern of effects simultaneously for all three predictor variables, while at the same time, testing for the statistical significance of individual slopes. For more information on this procedure, see Aiken and West (1991) or Cohen, Cohen, West, and Aiken (2003).

For the simple slopes analysis in the present study, the saving variable is regressed on risk tolerance at combinations of high and low levels of time perspective and financial knowledge. This procedure requires four separate computations: (1) regressing saving on risk tolerance at high levels of time perspective and knowledge, (2) regressing saving on risk tolerance at high time perspective and low knowledge, (3) regressing saving on risk tolerance at low time perspective and high knowledge, and (4) regressing saving on risk tolerance at low levels of time perspective and knowledge.

Decomposition of the three-way interaction reveals two statistically significant simple slopes among the four tested. Risk tolerance is a significant predictor of savings at a high level of future time perspective and a low level of financial knowledge, $\beta = 0.55, t(262) = 5.62, p = 0.01$, as well as at a high level of future time perspective and high level of financial knowledge, $\beta = 0.16, t(262) = 2.39, p = 0.02$ (see Fig. 1A). Risk tolerance is not a significant predictor of savings at low levels of future time perspective and financial knowledge, $\beta = 0.05, t(262) = 0.76$; however, there is a marginally significant effect of risk on savings at a low level of future time perspective and high level of financial knowledge, $\beta = 0.20, t(262) = 1.85, p = 0.07$ (see Fig. 1B).

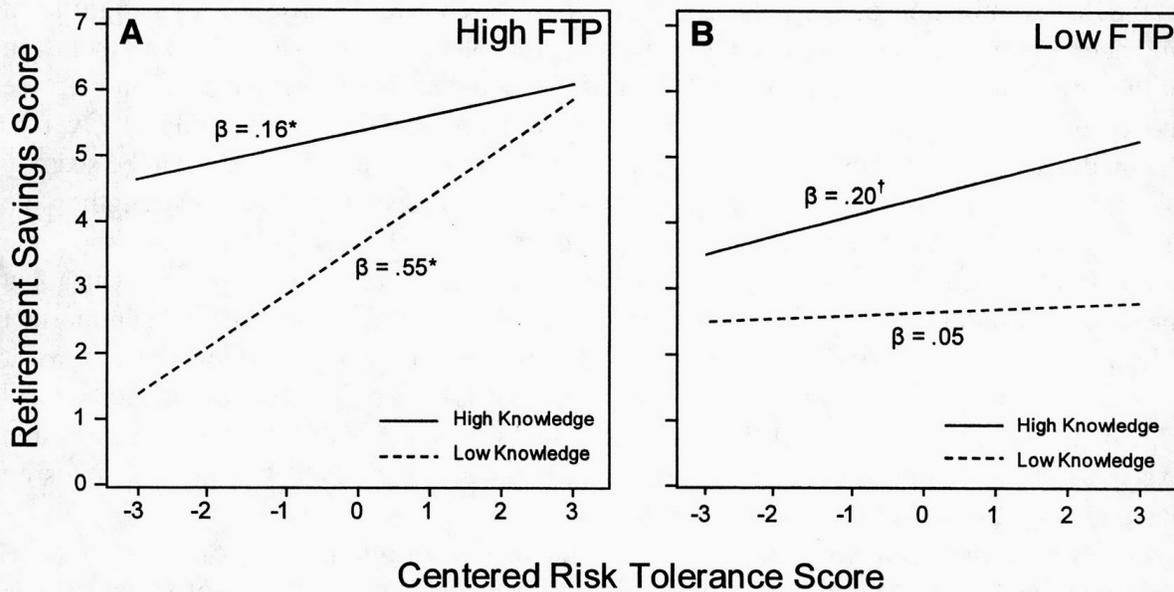


Fig. 1. Simple slopes decomposition of the three-way interaction between FTP, financial knowledge, and financial risk tolerance. (A) Represents the slopes between risk tolerance and savings for a high-future orientation individual at high and low levels of knowledge. (B) Represents the slope between risk tolerance and savings for low future orientation individuals at high and low levels of knowledge. * Indicates slopes significant at the $p < 0.05$ level; † indicates slopes at the level of a trend (i.e., $p < 0.10$).

6. Conclusions and implications

6.1. Conclusions

The goal of the present study is to examine the effects of three psychological variables on retirement saving tendencies. The findings from this investigation are consistent with previous research, which show higher levels of future time perspective, knowledge of financial planning for retirement, and financial risk tolerance are associated with more aggressive saving profiles. Often it is the case that these variables are studied in isolation of one another or in combination with other variables such as age, gender, and household income. This study is unique in that all three psychological variables were investigated simultaneously. Doing so allowed us to establish the relative influence of these three predictors.

Our findings indicate that future time perspective, financial knowledge, and financial risk tolerance are all important variables (both individually and in combination with one another) when it comes to understanding individuals' retirement saving practices. The results of this investigation further suggest it would be fruitful to continue to examine how demographic and psychological factors interact with one another to shape individuals' investment behaviors. On balance, although research of this type presents challenges, it stands to contribute much to our understanding of the forces that motivate individuals to save.

6.2. *Outcomes and implications*

Returning to the four research questions posed in the introduction, the first three focus on the possibility of two-way interactions between constructs. One of these interactions (risk tolerance by future time perspective) is statistically significant. However, this two-way interaction is overshadowed by a significant three-way interaction (i.e., corresponding to research question four). Therefore, the remainder of this discussion focuses on the nature of this higher-order effect.

As shown in Fig. 1B, among individuals with a low future time perspective, knowledge of financial planning does not appreciably bear on the relationship between risk tolerance and saving. More specifically, for those with a short time perspective who were high in knowledge, the relationship between risk tolerance and saving is only marginally significant. For those who were both low in time perspective and knowledge, the relationship between risk tolerance and saving is near zero. One possible explanation for these weak and non-existent effects is that when it comes to saving, it is difficult to overcome a short time horizon. Failing to look to the future ensures a minimal impact of risk tolerance on saving, almost irrespective of how much one knows about financial planning. In light of the relatively young average age of the sample, it is interesting to speculate as to how the observed pattern of results might change developmentally for individuals with a low future orientation as their retirement age draws near. It could be that as individuals grow older and begin to ponder their departure from the workforce, the pattern of effects seen in Fig. 1B become more similar to the effects in Fig. 1A. Future studies are needed to further explore the relative influence of knowledge and risk tolerance in determining saving patterns among pre-retirees with a short time perspective.

For those who are high in future orientation, and either high or low in knowledge (see Fig. 1A), there are significant relationships between risk tolerance and saving tendencies. This relationship is stronger, however, for low knowledge individuals than for those who have more in the way of knowledge. This suggests that, among individuals high in future orientation and knowledge, risk tolerance has a relatively small, yet non-trivial, influence on saving practices. For individuals high in future orientation and low in knowledge, in contrast, risk tolerance exerts a relatively strong effect on savings.

From a theoretical perspective, the novel finding from this study is that future time perspective and risk tolerance interact with one another to influence retirement saving. If we are to fully understand the forces that underlie retirement saving decisions, we can no longer be satisfied with simply studying main effects. Instead, we must broaden the focus of our investigations to simultaneously examine main effects as well as the interrelationships between multiple psychological variables. Doing so should help pin down the multiplicative nature of the determinants of saving practices.

6.3. *Limitation and future directions*

The present study is limited by the fact that only a few variables are included in the analysis of the potentially many that affect saving practices. Other psychological factors, such as one's retirement goal clarity (Moen, 1996; Stawaski et al., 2005) and attitudes toward

retirement (Jacobs-Lawson & Hershey, 2002; Taylor-Carter et al., 1997) also influence individuals' retirement planning and saving behaviors. Although a number of demographic variables (notably age, income, and gender) relate to saving practices (Bassett et al., 1998; Glass & Kilpatrick, 1998b; Quick & Moen, 1998; Henkens, 1999), the present study is limited to psychological variables—specifically, those that appear to be the strongest predictors of saving tendencies. Perhaps future studies could include additional psychological and demographic predictors in an effort to determine how these two classes of variables interact with one another. For instance, it would be interesting to explore the extent to which psychological variables change as a function of increases in age, and the effect any such normative developmental shifts have on saving practices.

One other potentially profitable future direction would be for investigators to develop more holistic models of the factors that influence retirement saving. It would seem that a multidisciplinary approach would be central to such an effort to effectively integrate the work of psychologists, economists, demographers, sociologists, and financial service professionals. The literature already contains a number of piecemeal studies on the determinants of savings. An argument could be made that it is time for retirement investment researchers to move beyond disciplinary boundaries.

6.4. Applications

From an applied perspective, the findings from this study indicate that to be maximally effective, printed materials, media campaigns, and workplace intervention programs aimed at stimulating saving practices should be targeted at individuals on the basis of their future time perspective, financial knowledge, *and* financial risk tolerance. Without question, this would raise the bar with respect to the way saving intervention programs are presently conducted. Most current group-based interventions tend to cast a wide net during the participant solicitation phase. Focusing on a smaller, more homogeneous subset of individuals, however, would allow retirement counselors and intervention specialists to make stronger assumptions regarding individuals' psychological pre-dispositions, which in turn, should allow them to fine tune their message to the consumer.

The results of this investigation may also have important applications for financial planning professionals. One is that the future time perspective, risk tolerance, and financial knowledge scales contained in the Appendix could profitably be used as assessment tools to gauge client pre-dispositions. They could either serve as an initial measure of investor tendencies if administered at the outset of a professional relationship, or periodically administered as a way of assessing how an investor's dispositions change over time. Analysis of the pattern of responses should provide the advisor with an indication of the types of investments the client would likely be comfortable with and, on that basis, how assets in an individual's portfolio might optimally be allocated.

Financial advisors also could use the results of an initial psychological assessment with the client for counseling and educational purposes. For example, a client low in financial knowledge with a short future time perspective might benefit from receiving not only informational packets on retirement investing, but also long-range retirement goal-setting exercises. Even those clients who are average along these two dimensions (i.e., who score at

the mean on these two scales) would stand to benefit from combined (information- and goal-based) interventions. This would have the effect of simultaneously enhancing the individual's understanding of financial planning, while at the same time extending his or her focus on the future. Personalized assessments and one-on-one interventions could even be taken a step further by attempting to cultivate "age-appropriate" levels of risk tolerance among investors. Of course, any such individualized efforts should not only take into account the investors age and proximity to retirement, but also his or her baseline level of risk tolerance, long-term goals, and general financial knowledge. Personalized interventions of this type should help to increase the client's satisfaction with the advisor's services, resulting in stronger and longer lasting professional relationships, and an increased number of referrals.

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Appendix. Items from the four scales used in the investigation

Knowledge of financial planning for retirement

1. I am very knowledgeable about financial planning for retirement.
2. I know more than most people about retirement planning.
3. I am very confident in my ability to do retirement planning.
4. When I have a need for financial services, I know exactly where to obtain information on what to do.
5. I am knowledgeable about how Social Security works.
6. I am knowledgeable about how private investment plans work.

Future time perspective

1. I follow the advice to save for a rainy day.
2. I enjoy thinking about how I will live years from now in the future.
3. The distant future is too uncertain to plan for. (R)
4. The future seems very vague and uncertain to me. (R)
5. I pretty much live on a day-to-day basis. (R)
6. I enjoy living for the moment and not knowing what tomorrow will bring. (R)

Financial risk tolerance

1. I am willing to risk financial losses.
2. I prefer investments that have higher returns even though they are riskier.
3. The overall growth potential of a retirement investment is more important than the level of risk of the investment.

4. I am very willing to make risky investments to ensure financial stability in retirement.
5. As a rule, I would never choose the safest investment when planning for retirement.

Retirement saving

1. Made meaningful contributions to a voluntary retirement savings plan.
2. Relative to my peers, I have saved a great deal for retirement.
3. Accumulated substantial savings for retirement.
4. Made a conscious effort to save for retirement.
5. Based on how I plan to live my life in retirement, I have saved accordingly.

Note: (R) indicates item is reverse scored.

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