Spousal Differences in Financial Risk Tolerance

John E. Gilliam, Joseph W. Goetz, and Vickie L. Hampton

Differences in husbands' and wives' tolerance for financial risk were analyzed, including an investigation of demographic variables previously found to be significant between men and women in predicting financial risk tolerance. The sample consisted of 110 couples who completed a web-based survey designed to measure the financial risk tolerance of both husbands and wives. Although a positive relationship between wives' risk tolerance and their level of education was consistent with previous results that indicated individuals with higher levels of formal education tend to possess higher levels of risk tolerance, findings also indicated that wives' higher level of education was associated with a lower tolerance for risk among husbands. Further research and practice recommendations regarding couples' risk tolerance assessment are provided.

Key Words: risk tolerance, financial planning, investment risk

Introduction

Numerous studies have illustrated the substantial impact that asset allocation has on portfolio return (Perry, 1997; Seidner & Spano, 1998; Sharpe, 1992; Wang, 2002) and the importance of clients' risk tolerance as an input factor in asset allocation decisions (Beam, Poole, Bickelhaupt, & Crowe, 2003; Butler & Domian, 1991). An examination of the investment policies of 82 large pension plans indicated that asset allocation decisions accounted for 91.5% of the variation in returns (Brinson, Singer, & Beebower, 1991). Individuals with a low tolerance for risk have tended to allocate a greater percentage of their assets to fixed-income securities, which are considered less risky than equity investments. Cordell (2001) stated that "an extremely risk-averse individual may not be willing to utilize enough equity investments to earn a high enough rate to reach his or her financial goals" (Cordell, 2001, p. 78). Myriad methods are currently being used by financial planners to assess their clients' levels of risk tolerance, few of which have been psychometrically validated or widely accepted within the financial planning profession (Rice, 2005). Roszkowski, Davey, and Grable (2005) provided further explanation on the lack of validity and reliability of risk tolerance measures and stressed the importance of using a psychometrically sound measure of risk tolerance as a best practice.

For these reasons, the accurate assessment of clients' financial risk tolerance has been an integral and intricate component to the financial planning process. Spousal considerations have compounded the complexity of risk tolerance assessment and portfolio allocation decisions. Financial planners have negotiated conflicting risk tolerances of spouses in various ways, including implementing separate portfolios for each spouse, taking an average or weighted average of each spouse's tolerance for risk, or simply basing portfolio allocation decisions on the spouse with the lowest risk tolerance (Hanna & Lindamood, 2005; Stevens, 2003). Using these rules of thumb or heuristics in practice may have represented an oversimplification of the arduous task of accurately assessing financial risk tolerance levels for a couple. Currently, a joint measure for assessing a couple's financial risk tolerance does not exist.

The majority of previous studies that examined the relationship between gender and risk tolerance compared single males to single females. The current study investigated factors that affect married individuals' financial risk tolerance and addressed the differences and similarities in risk tolerance between spouses. As compared to the numerous articles addressing the topic of risk tolerance, only a few presented results that were specific to married couples (e.g., Elder & Rudolph, 2003; Hanna & Lindamood,

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2005; Roszkowski, Delaney, & Cordell, 2004; Sung & Hanna, 1998; Yao & Hanna, 2005). This paper addressed this paucity of past research by examining demographic determinants of financial risk tolerance within the context of spousal relationships, including gender, age, level of education, income, asset ownership, and number of financial dependents, as well as the interaction between gender and education. The results have implications for financial planners and counselors in determining the appropriate risk level to be used in clients' investment portfolios.

Literature Review

The majority of previous studies that examined the relationship between gender and risk tolerance has shown women to be more financially risk averse than men (Bajtelsmit & Bernasek, 1996; Bajtelsmit, Bernasek, & Jianakoplos, 1999; Embrey & Fox, 1997; Guiso, Jappelli, & Terlizzese, 1996; Hallahan, Faff, & Mckenzie, 2003; Hariharan, Chapman, & Domian, 2000; Hartog, Ferrer-I-Carbonell, & Jonker, 2002; Jianakoplos & Bernasek, 1998; Powell & Ansic, 1997; Roszkowski, Delaney, & Cordell, 2004; Sung & Hanna, 1996). Contrary to these findings, Grable and Joo (1999) did not find gender to be a significant predictor of an individual's risk tolerance level. Furthermore, Embrey and Fox (1997) examined gender differences of one person households in the investment decision making process and found that women were more risk averse than men based on the Survey of Consumer Finances (SCF) measure of risk tolerance but that gender did not influence investment choice; more specifically, it was found that "differences in purely financial investment decisions between men and women appeared to be more a result of differences in wealth as measured by net worth and the expectation of an inheritance" (p. 38). When one considers the fact that women's longevity is greater than men's, a rational economic model fails to explain why so many studies found men to be more financially risk tolerant than women (Ho, Milevsky, & Robinson, 1994). With a longer investment time horizon, wives' average tolerance for financial risk should be higher than their husbands'.

Several demographic variables have consistently been found to be positively associated with financial risk tolerance including education, income, and asset ownership. For the most part, an individual's age and number of dependents have been found to be negatively associated with risk tolerance (Grable & Lytton, 1998; Grable & Joo, 1999; Kennickell, Starr-McCluer, & Suden, 1997; Sung & Hanna, 1996; Wang & Hanna, 1997). For example, Yao, Hanna, and Lindamood (2004) found that "the presence of

related children under 18 has a significant, negative relationship with some risk" (p. 259). However, Sung and Hanna (1996) found that after controlling for the other variables in their study, only households with five people had lower risk tolerance scores. Furthermore, when utilizing large samples of financial advisory clients, Hallahan et al. (2003) did not find the number of dependents to be significant, and Ardehali, Paradi, and Asmild (2005) found that individuals with six or more dependents did not vary significantly in risk tolerance from those with less than six dependents. Ardehali et al. stated that although this finding seemed counterintuitive, "the number of dependents is clearly not as important in explaining risk tolerance as education, income, and wealth" (p. 509).

Elder and Rudolph (2003) looked at the decision making processes of 4,297 married couples who participated in the 1991 Health and Retirement Study and were asked the question: "When it comes to making major family decisions, who has the final say—you or your partner?" The survey defined "major family decisions" as being "when to retire, where to live or how much to spend on a major purchase" (p. 294). The two approaches explored in their research on the decision making process were the unitary model and the bargaining model (Nash, 1950). The unitary model explained the household decision making process as the result of a single utility function, whereas the bargaining model explained the decision making as a process of negotiation between the husband and wife that was either non-cooperative or cooperative. Spouses maximized their utility in the non-cooperative framework based on their partner's behavior, which was determined by income from labor and non-labor sources. Non-labor income in this context was based on investment earnings and excluded pension income. In the cooperative framework the negotiation between spouses resulted in the *Pareto optimal* solution. This method allowed each spouse to negotiate or bargain for an acceptable solution that benefited at least one of the partners without damaging the other. To estimate bargaining power, the wages and decision making skills of each spouse were examined. Decision making skills were determined by financial knowledge or educational attainment.

Elder and Rudolph (2003) found that their results were "largely consistent with the implications of the household bargaining models" (p. 306). The variables that indicated greater bargaining power were higher wages and education levels as well as the couple's perception of which partner was the most financially knowledgeable. Results also

suggested that as women's income increased, they were more likely to assume a greater role in financial decision making; conversely, as non-labor income (i.e., income from investments) rose, the opposite was true. As the bargaining power for women increased, so did the likelihood of participation in financial decision making. Findings from this research were consistent with previous studies that showed income and education as significant predictors of risk tolerance.

Following the Elder and Rudolph (2003) research, Hanna and Lindamood (2005) used the SCF to analyze the risk tolerance of married couples. Using four administrations of the SCF, the objective of their study was to determine the willingness of couples to take investment risk and to examine whether differences in household risk tolerance were based on which spouse acted as the respondent. Risk tolerance was measured by a single question asked by the SCF:

> "Which of the statements on this page comes closest to the amount of financial risk that you and your (spouse/partner) are willing to take when you save or make investments?
> 1. Take substantial financial risk expecting to earn substantial returns
> 2. Take above average financial risks expecting to earn above average returns
> 3. Take average financial risks expecting to earn average returns
> 4. Not willing to take any financial risk"

Due to a low number of participants who selected the "substantial financial risk" or the "above average financial risk" response, Hanna and Lindamood (2005) combined these responses with the "average financial risk" response and renamed the category "some risk." The findings indicated that women were generally more risk averse than men and that education and household incomes were positively correlated with the willingness to take some risk. There was also a significant relationship between what was called a husband/wife "difference variable" and risk tolerance. Education data was based on a self-reported level of attainment (i.e., high school or less, associate degree or trade school, and university graduate or higher). A difference variable was created that indicated the spouse with the greater or equal educational attainment and was separated into 10 dummy variables (e.g., wife has some college and husband has less, husband has some college and wife has less, wife has college degree or more and

husband has less, husband has college degree or more and wife has less, etc.). When the wife was the respondent, the variable that indicated that she had some college education and that the husband had less was positively associated with her willingness to take risk. This was in contrast to when the husband was the respondent and he had some college and the wife had less. This finding suggested that households where the wife has more education than her husband would be willing to accept greater risk.

Using the 1992 SCF, Sung and Hanna (1998) examined the impact that one spouse had on the other when deciding which investment choices to make in a retirement plan and whether to participate in a retirement plan. In households where both spouses were working, the decisions by one spouse to participate in a retirement plan and to allocate most of their retirement contribution to a stock investment were positively affected by the other spouse. This likely resulted from the sharing of information between spouses that concerned investment choices available in the retirement plan. The husbands' risk tolerance scores were higher than their wives', and the husbands' tolerance for risk had a significant positive effect on their investment allocation toward equities. However, the wives' risk tolerance scores were not found to significantly affect their asset allocation decisions. Unlike previous research that has found education to be a significant predictor of risk tolerance and asset allocation, the education variable was not found to be significant. Also, when controlling for marital and working status, gender differences were not significant in either the decision to participate in a retirement plan or the investment allocation (Sung & Hanna, 1998).

The study outlined in the present paper was designed to address the inconsistency and lack of research on demographic determinants of financial risk tolerance between husbands and wives. The factors hypothesized to have an affect on one's risk tolerance were as follows: gender, age, level of education, relative income, asset ownership, and number of financial dependents. Based on the bargaining model and past literature, it was hypothesized that husbands were more risk tolerant than their wives, that age was inversely related with risk tolerance, education was positively related to one's tolerance for risk, income and asset ownership was positively related to risk tolerance, and a spouse's number of financial dependents was negatively related to risk tolerance.

Data and Methodology
Data and Surveys
Twenty-three financial advisors throughout the United States assisted with the data collection process by recruiting participants ($N = 110$ couples) for the study who were currently their clients. Hence, the possibility of selection bias existed. All the participating couples responded to a web-based survey that included demographic data and a modified version of the SCF risk tolerance question. The survey was administered by FinancialDNA®—a company that specialized in assessing an individuals' behavior in a financial advisory setting. While FinancialDNA® collected the data for this research, no remuneration was exchanged between FinancialDNA®, the researchers, or the affiliated academic institution with which the research was conducted. The slight modification of the SCF question involved removing the phrase "your (spouse/partner)" from the question as used in previous studies (c.f. Grable & Lytton, 1998, 1999, 2001).

The modified version read as follows:

"Which of the statements on this page comes closest to the amount of financial risk that you are willing to take when you save or make investments?
1. Take substantial financial risk expecting to earn substantial returns
2. Take above average financial risks expecting to earn above average returns
3. Take average financial risks expecting to earn average returns
4. Not willing to take any financial risk"

This SCF question was found to be the most common measure for risk tolerance in past literature (c.f. Grable & Lytton, 2001; Hanna, Gutter, & Fan, 2001; Hanna & Lindamood, 2005; Schooley & Worden, 1996; Yao & Hanna, 2005). Moreover, Gutter, Fox, and Montalto (1999) used data from the 1995 SCF and found that 66% of households willing to accept risk did indeed own risky assets. Grable and Lytton (2001) showed the SCF to have a concurrent validity of .54 when compared to their 13-item risk tolerance index, indicating that it was a modestly stable measure. As other authors have pointed out, "various measures of risk tolerance were not rigorously linked to the concept of risk tolerance in economic theory...the SCF measure might reflect a combination of current situation and/or the investor's limited information" (Hanna et al., 2001, p.54). The most current research on the SCF measure is found in a working paper from the

Take Charge America Institute for Consumer Financial Education and Research produced by Grable and Schumm (2007); their findings indicated that the reliability of the SCF measure ranged from .07 to .78 with the most likely result being between .52 and .59.

Variables
The dependent variable used in this study was the SCF risk tolerance question. In the original format, responses consistent with taking substantial risk were coded as 1, and responses consistent with taking no risk were coded as 4. This variable was reverse coded so that 1 indicated the least amount of risk tolerance and 4 reflected the highest level of risk tolerance. The independent variables were gender, age, education, relative income, asset ownership, and number of dependents. The education variable was split into three categories: high school, associate degree, and university degree. The proportion of income that each spouse earned compared to the total family income defined the relative income variable. Similarly, the asset ownership variable was operationalized as the percentage of assets owned by each spouse separately.

It was necessary to recode several variables. A pairwise comparison was conducted on the age variable and resulted in a significant correlation ($r = .95$, $p < .01$). Due to this high correlation, the age of husband and wife was combined to create a couple's age variable. A frequency distribution of the education variable indicated a comparatively small sample size for the high school and associate degree categories; consequently, the education variable was recoded into those who were university graduates and those who were not. There was a significant negative correlation found between the husbands' and wives' relative income ($r = -.72$, $p < .01$). In order to reduce reporting error, a new income variable was created and labeled husband's income contribution. The number of financial dependents may have been different for husbands and wives due to previous marriages. Husbands, on average, had 1.6 financial dependents, whereas wives had 1.3 financial dependents. This could have also been explained by the number of wives not working ($n = 32$) compared to husbands ($n = 1$). As expected, the number of financial dependents variable showed significant correlation between spouses ($r = .82$, $p < .01$) and was therefore recoded by taking the average number of dependents between a husband and wife to create a combined couples variable for financial dependents. Husbands' relative income showed a significant negative correlation with wives' assets ($r = -.49$, $p = < .01$), whereas wives' relative income

Table 1. Sample Descriptive Statistics

Variable	Wives			Husbands		
	n	*M*	*SD*	*n*	*M*	*SD*
Age	110	47.5	12.5	110	49.7	12.3
High school	20			7		
Associate degree	18			9		
College degree	72			94		
Relative income (%)	110	25.2	27.1	110	77.6	23.4
Relative assets	110	14.0	22.2	110	20.7	26.7
Number of financial dependants	149	1.3	1.6	179	1.6	1.5

was significantly correlated with couples' asset level ($r = .36$, $p < .001$). A significant negative correlation existed between the risk tolerance variable for women and the husbands' education ($r = -.19$, $p = < .05$). This suggested that wives' lower tolerance for risk was associated with husbands' higher levels of education.

As outlined in Table 1, the descriptive statistics showed the husbands' mean age ($M = 49.66$, $SD = 12.32$) to be slightly higher than the wives' ($M = 47.53$, $SD = 12.48$). In terms of education level, a greater number of husbands ($n = 94$) had received university degrees than wives ($n = 72$). Although the relative income was overwhelmingly in favor of the husbands ($M = 77.62$, $SD = 23.43$) as compared to wives ($M = 25.28$, $SD = 27.12$), the amount of personally owned assets by the husbands ($M = 20.74$, $SD = 26.72$) were more similar to those of their wives ($M = 14.02$, $SD = 22.20$).

Results

The dependent variable was the SCF risk tolerance score. A paired-sample *t* test was used to examine the difference in SCF scores between husbands and wives. The results indicated that the mean scores for husbands ($M = 2.70$, $SD = 0.57$) were significantly greater [$t(109) = 4.99$, $p < .001$] than those for wives ($M = 2.30$, $SD = 0.67$). A repeated measure General Linear Model (GLM) was conducted with the within subjects factor as gender and the between subjects factors as wives' education level, couples' age, wives' assets, husbands' assets, husbands' income contribution, and number of dependents. A significant interaction effect was found between gender and wives' education [$F(1, 103) = 4.18$, $p = .04$] as illustrated in Table 2.

These results indicated that wives who were university graduates had a higher tolerance for risk, whereas their husbands' mean risk tolerance score was lower than husbands whose wives did not have university degrees. Although there was a significant interaction on risk tolerance between gender and the wives' education, there was not significant difference in risk tolerance when controlling for the wives' education, couples' age, assets ownership,

Table 2. Test of Within-Subjects Contrast

Source	*df*	*F*	η^2	*p*
Gender	1	1.71	.02	.20
Gender x Wives' education	1	4.18*	.05	.04
Gender x Couples' age	1	1.75	.02	.19
Gender x Wives' assets	1	0.01	.00	.93
Gender x Husbands' assets	1	2.80	.03	.10
Gender x Husbands' inc. contribution	1	0.19	.00	.66
Gender x Number of financial dependants (couple)	1	0.00	.00	.97
Error	103			

*$p < .05$.

Table 3. Test of Between-Subjects Effects

Source	df	F	η²	p
Intercept	1	68.47	.40	0
Wives' education	1	0.00	.00	.95
Couples' age	1	0.91	.01	.34
Wives' assets	1	2.08	.02	.15
Husbands' assets	1	0.03	.00	.87
Husbands' income contribution	1	0.00	.00	.97
Number of financial dependants (couple)	1	0.97	.01	.33
Error	103			

husbands' income contribution, and number of dependents as shown in Table 3.

Discussion

Using a sample made up of clients who were being advised by a financial advisor at the time of data collection and were self-selected into the study seriously limits the application of the findings to the overall population. However, the findings may retain substantial value to financial service professionals as the client pool they work with is likely to be quite similar to the sample in this study, particularly as compared to a random sampling of the general population used in most other studies examining risk tolerance. The uniqueness of this sample does make it difficult to compare the results to those of previous studies that included very different sampling techniques.

Although gender, age, education, relative income, asset ownership, and number of financial dependents are typically found to be significantly related to risk tolerance, the current study did not find significance, which could be explained by the small sample size and associated lack of power in the analysis as well as the homogeneity of the sample. It could also be that demographic variables have less predictive ability among clients of financial advisory services versus the general population. Additionally, the relative income and asset ownership variables in this analysis are measured as a percentage of the couples' total income or asset ownership instead of a specific number, which could diminish the robustness of the data. Because this sample was made up of clients of financial planners, their incomes and assets were higher than the samples utilized in most other studies, which may have had a mitigating effect on differences explored within the other independent variables. The negative correlation between the husbands' and wives' relative income might suggest

that as the husbands' income increased, the wife chose to work less or not to work at all.

Even with a small sample size and relatively little statistical power, the analysis found a significant interaction effect between gender and the level of education. This finding suggests that a higher educational degree for married women has a positive relationship with their risk tolerance and a negative impact on husbands' risk tolerance scores (see Figure 1). Although the positive relationship between wives' risk tolerance and their level of education is consistent with previous results that indicated individuals with higher levels of formal education tend to possess higher levels of risk tolerance (Grable & Lytton, 1998; Haliassos & Bertaut, 1995; Hawley & Fujii, 1993; Sung & Hanna, 1996; Zhong & Xiao, 1995), it is noteworthy to mention that wives' higher level of education was associated with a lower tolerance for risk among husbands, which is generally consistent with the findings of Hanna and Lindamood (2005). This finding is supported by the cooperative framework found in the bargaining model. The wife's bargaining power increases through her educational attainment. However, it is possible that the relationship may vary across gender and educational level for those individuals who are married.

A possible explanation for this interaction is the large percentage of participants with university degrees. Based on survey data provided by the Census Bureau (2007), only 26.5% of men and 25.8% of women over the age of 18 in this country have a university degree or higher, whereas the current analysis utilized a sample with 65% of wives and 85% of husbands as university graduates. Perhaps due to a higher level of household income, it is unnecessary for the husband to take a higher level of risk in order to accomplish their goals. Another possible expla-

Figure 1. Interaction of Risk Tolerance and Education
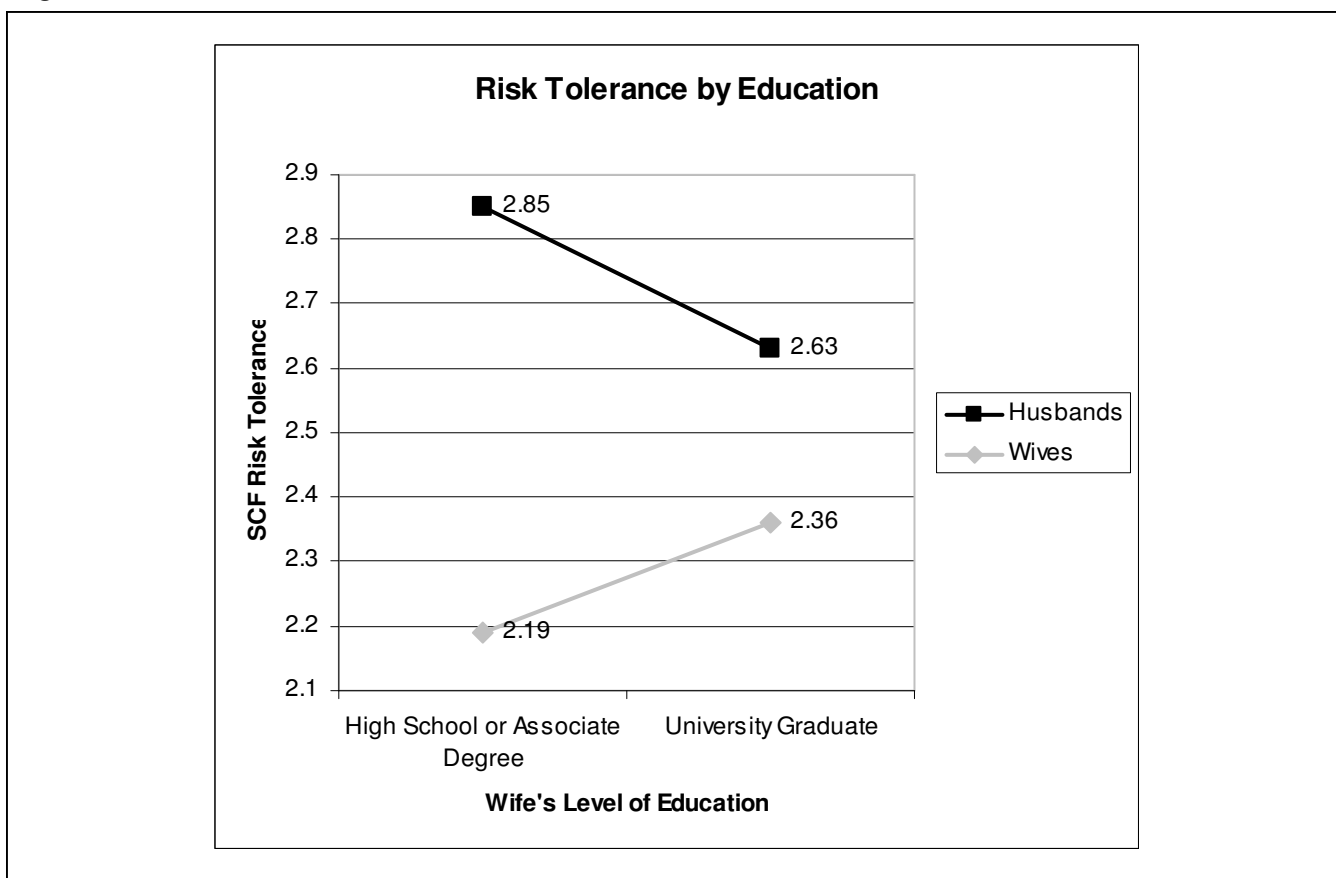
nation could be the source of financial information received by the respondent. Considering the fact that the study participants were clients of a financial advisor, it is possible that those without university degrees relied more on the advice of their advisor.

This research adds to the limited body of literature that addresses the differences between spouses in terms of their tolerance for risk and the significance of these differences in determining an investment portfolio. Future research should replicate this study using larger sample sizes and varying measures of financial risk tolerance to corroborate the results and to further explore the dynamics unique to spousal differences in risk tolerance.

Implications
Although there are many potential applications of these findings for financial professionals, one potential scenario might involve a couple where the wife has a university education and the husband does not. Based on the findings of this study, financial planners should not assume that a husband will be more risk tolerant than his wife, which is

a common assumption based in part on previous research and existing heuristics. Rather, financial professionals should be aware of the dynamics between gender and educational level when working with married couples as clients. Furthermore, financial planners and counselors should recognize the limitation of relying solely on a risk tolerance measure to understand a couple's tolerance for risk.

Given the findings of the present study as well as the inconsistency in past literature, financial advisors should be cautious in using demographic characteristics as a heuristic for identifying clients' tolerance for risk. For example, perhaps even more important than a client's educational attainment level is that client's level of understanding risk—not only the risk associated with one's investment portfolio but also the risk of not being able to fund one's goals. Clients also often fail to fully understand the impact of purchasing power risk with a particularly conservative investment portfolio. Therefore, assessing a client's perception of risks may be as equally important as understanding that client's tolerance towards in-

vestment risk. Financial service professionals and educators should address each spouse's perception of risk through education along with assessing the risk tolerance of each spouse. Further research should explore the relationship between perception of risk accuracy and risk tolerance and, more specifically, the effect that client education can have on these constructs.

Assessing the risk tolerance of couples presents a unique challenge and is handled in various ways. For example, when each partner has significantly different risk tolerance levels, some financial planners average the scores to derive a combined risk tolerance indicator for the couple, whereas other planners practice the "law of the lowest common denominator" and simply go with the risk tolerance level of the spouse that is the lowest. This later option may make sense given the nature of risk tolerance being rooted in the psychological and emotional comfort of the client; in other words, to maintain the comfort of a couple, a planner may need to manage the investment portfolio consistent with the partner with the lowest risk tolerance. Research could be conducted to develop a couples' risk scale with a combined risk tolerance score derived in part by giving slightly more weight to the spouse with less tolerance for risk.

Overall, the findings from this study indicate that demographic characteristics of clients may have little practical significance when considering that the results on an objective risk measure are usually just one piece of the puzzle in fully understanding clients' risk tolerance and how an investment portfolio should be constructed. Advisors often report using a mix of finance, psychology, and instinct, with maybe a questionnaire or two in understanding clients' risk tolerance, to form a basis for putting together an investment plan. Financial services professionals of all types have a responsibility to make an appropriate effort to ascertain an accurate assessment of a client's risk tolerance and to use this information in developing their investment plan. Further research on financial risk tolerance will ultimately increase financial planners' understanding of their clients and improve those clients' financial planning and investment experiences.

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