Educational Achievement as a Mediator Between Gender and Financial Risk Tolerance
- An Exploratory Study -

Sam Cupples[1] · Erika Rasure[2] · John E. Grable[3]

〈Abstract〉

The purpose of this study involved testing whether attained education mediates the association between gender and financial risk tolerance. Using data from a demographically diverse sample living in the United States (N = 249), it was determined that the direct association between being female and risk tolerance was negative. That is, women exhibited a risk-averse profile. Attained education was found to be positively associated with risk tolerance. Using a Sobel test, it was then determined that the total effect of gender on risk tolerance could be significantly reduced when education was used a mediator between gender and risk tolerance. Results were confirmed using a bootstrap estimation procedure that showed a medium to large overall effect size for the indirect effect.

Key Words: Risk Tolerance, Gender, Education, Sobel Test, Risk

1) MBA, University of Central Oklahoma
2) M.S., Kansas State University
3) Contact Information: Ph.D., Housing and Consumer Economics, University of Georgia, Email: grable@uga.edu

Ⅰ. Introduction

Financial risk tolerance (FRT) is a concept generally defined as the maximum degree of uncertainty a person is *willing* to accept when making a financial decision where negative outcomes are possible (Grable, 2000; Irwin, 1993). FRT is an important factor that helps shape financial planning decisions. Finke and Huston (2003) noted that because the pursuit of increased wealth and income (i.e., financial security) entails making decisions where financial consequences are uncertain, FRT ought to be a primary input into decision-making models. Nearly every theoretical discussion of the determinants and outputs associated with FRT suggests that an enhanced willingness to take financial risk should be, and generally is, positively related with improved financial security. That is, individuals with a high level of risk tolerance (i.e., low risk aversion) ought to, over time, earn more income and hold greater wealth.

This is the core argument framing much of the applied and theoretical work conducted where FRT has served as either a predictor or outcome variable. Consider differences between women and men in relation to career choices, income, and wealth accumulation. At both the aggregate country and household levels, differences based on gender are commonly seen in free-market economies. Some have even argued that income and wealth discrepancies can be accounted for, in part, by the willingness of women and men to engage in financially risky behavior (e.g.,

Palsson, 1996). Nearly every published risk tolerance study, regardless of academic domain (e.g., financial, social, environmental), that has examined risk attitudes in relation to demographic and socioeconomic characteristics, has arrived at a similar conclusion; namely, women tend to exhibit a greater level of risk aversion compared to men.

Over the past two decades, researchers have focused on both documenting gender differences in FRT and in explaining such differences. Two general arguments have emerged. On the one hand, some contend that gender FRT differences are physiological. For example, Sapienza, Zingales, Maestripieri, and Heckman (2009) noted that testosterone levels help explain why women are generally more risk averse than men–because men exhibit higher testosterone levels they are more prone to taking risks. Others (e.g., Miller & Stark, 2002) have arrived at a physiological perspective through the elimination of alternative explanations. These researchers maintain that biological differences between women and men account for the divergence in risk attitudes because no other theoretical explanation can be verified.

Other researchers look at gender differences in risk attitudes and behaviors and arrive at a counter argument. Take the work of Olsen and Cox (2001) as an example. They determined that women are more apt to choose alternatives where downside protection is offered. Rather than being a physiological difference between women and men, Olsen and Cox, as well as many others (e.g., Collett & Lizardo, 2009; Hagan, Gillis, & Simpson, 1985; Miller & Stark), link gender differences to socialization factors

(Bajtelsmit & Bernasek, 1996). Stated another way, this argument is premised on the notion that women are raised and taught (both formally and informally) to seek alternatives that minimize downside risk.

Debating the merits of either the physiological or socialization arguments is beyond the scope of this paper. The introduction of these points-of-view is meant to highlight a significant hurdle facing financial planners and counselors who attempt, on a daily basis, to help their clientele achieve a reasonable level of financial security. If it is assumed as true that gender differences in FRT are consistent and widespread, and that either the physiological or socialization argument is accurate in explaining such differences, then financial advisors have a dilemma. If the physiological argument is true, advisors must either recommend "prenatal" (Sapienza et al. 2009, p. 15271) counseling for parents or encourage their female clients to engage in physiological supplementation. If the socialization argument is true then it may simply not be possible to help women overcome career, income, and wealth obstacles in the short- to medium-term. By definition, the only effective means of alleviating gender differences involves long-term changes in the way children are raised.

The purpose of this paper is to offer an alternative perspective for financial planners and counselors that acknowledges gender differences in FRT do exist but avoids having to make a choice between the physiological and socialization arguments. Our intent is to specifically test whether *education* mediates the association between gender and FRT. A review of the *PsychInfo* and *Proquest*

databases shows that few researchers have attempted to explain gender differences in risk tolerance as a function of education. In this study, we argue that education likely plays a significant role in reducing gender's effect on risk tolerance. Results from this study add to the literature in two important ways. First, this is among the first studies to specifically test a mediation effect related to FRT. Second, the research helps move the financial planning and counseling therapy literature away from merely describing and explaining differences in risk tolerance to offering a workable solution that can help women, on the average, reach an acceptable level of financial security.

Ⅱ. Review of Literature

As noted by Grable (2008), the inclusion of gender as a variable in empirical studies designed to evaluate either the determinants of FRT or the outcomes associated with risk-taking behavior is nearly universal. Nearly every study that has tested the gender-FRT relationship has noted a strong bias towards risk aversion among women (Bajtelsmit, Bernasek, & Jianakoplos, 1999; Embry & Fox, 1997; Roszkowski, Davey, & Grable, 2004; Yao, Hanna, & Lindamood, 2004; Yao & Hanna, 2005). When given a choice of risky alternatives, men are more likely to report being willing to choose a course of action that entails greater risk of loss (Grable, 2000; Grable & Joo, 1999). This is true regardless of the type of risky activity (e.g., drug use, driving, finances) (Arch, 1993; Byrnes,

Miller, & Schafer, 1999; Kohler, 1996). The partiality towards risk seeking among men has caused a great deal of consternation among financial planners, counselors, educators, as well as policy makers, those in the media, and some academicians. Practitioner questions such as, "How do I help my female clients make different decisions if their willingness to take risk is anchored as a result of biological factors?" and "While I can help socialize the next generation to think of risk differently, what do I do with my female clients today?" can sometimes lead to answers that are of limited practical use, at best, and dangerous at worst. Concluding, for instance, that women and men are different, and that women will always prefer less risky financial choices, can lead to financial advice that leads women to accept lower paying positions of employment, lower yielding investments, and reduced human capital expenditures, all of which can lead to decreased levels of systematic goal achievement (Yao & Hanna).

Proceeding from the standpoint that the main direct effect of gender on FRT is large and relatively stable (both facets of the physiological and socialization causal arguments) may unintentionally distract practitioners, researchers, and policy makers from the real gender effect. An alternative perspective grounded in the literature shows that education results from individual and community efforts after birth. That is, level of attained education is an outcome of many factors, including choice frameworks shaped by gender norms and standards. This alternative perspective also rests on the knowledge that education is positively associated with FRT (Chang, DeVaney, & Chiremba, 2004; Grable & Joo, 2004; Yao &

Hanna, 2005). It is possible, as hypothesized in this study, that education does more than simply covary with gender in relation to FRT. We propose that education mediates the effect of gender on FRT－specifically, attained education significantly reduces measured risk aversion among women.[4]

Smith (1995) noted that nearly every sociological study implicitly accounts for an education effect, and that in most cases education tends to be a consequentially significant variable in empirical models. Kingston, Hubbard, Lapp, Schroeder, and Wilson (2003) wrote a sweeping review focused on addressing two key questions; namely, why is education so important and why does schooling matter? Their insights provide a further foundation supporting an alternative perspective suggesting education mediates the gender–FRT relationship. Kingston and his associates noted that those with more education tend to also be healthier, more politically active, more cosmopolitan, wealthier, and more open to accepting lifestyle risk choices made by others.

Socialization theory provides a conceptual framework to better understand the effect of education on the subsequent attitudes and behaviors of individuals. Within the context of socialization theory, schooling acts as a transforming agent (Kingston et al. 2003). Formal education tends to (a) increase a person's capacity for

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4) The term *mediator*, as used in this study, refers to a variable in a model that is part of a causal sequence (MacKinnon, Fairchild, & Fritz, 2007). This differs from a moderator. Moderation, which is also known as an interaction, happens when the relationship between an independent and dependent variable changes as the moderator value changes. A mediator fundamentally alters the association between the independent and dependent variable.

critical thinking, (b) expand intellectual abilities, and (c) alter social values and dispositions. When viewed with an economics lens, the pursuit of education increases a person's human capital in such a way that future prospects for income and wealth production are improved. Some might argue that education signals an ability to identify and process information that leads to better choice outcomes (Spence, 1974).

Schooling changes people's perceptions of the world in which they live in other distinct ways as well. Meyer (1977) coined the term *chartering* to describe how students adopt both personal and interpersonal attributes to match their educational status. Consider the case of a young person entering high school. While some expectations for performance and social standards may be explicitly stated by school staff, many of the expectations related to what is acceptable are learned through interactions with other students. These learned expectations and experiences, according to Meyer, become long-lasting personal characteristics. In this way, school cultivates interactions among diverse social, racial, and economic classes. Additionally, and possibly just as important in formulating the effect of education on the gender-FRT relationship, schooling improves numeracy, problem solving ability, and knowledge (Kingston et al.). These are the same skill factors that are required when making risky financial decisions. That is to say, someone faced with a choice that entails the possibility of a financial loss needs a skill set that allows for mathematical calculation acumen, probability assessment, and decision-making skill. The level of attained education is the key factor that

improves these three skills.

When viewed from an education socialization perspective, it is reasonable to hypothesize that education mediates the relationship between gender and FRT. In some respects, this argument makes the physiological and general socialization debate associated with gender less important. Education, rather than gender, may be the key to explaining some differences in risk choices of men and women.

In order to test for a mediation effect it is also important to account for other factors that may influence a person's FRT. Much of the empirical FRT work to date among financial planning and counseling researchers has focused on descriptions of variable associations. Grable (2008) summarized the key demographic and socioeconomic findings from this literature. He noted that in addition to gender and education, age, household size, household income, financial knowledge, marital status, and race are often used in FRT studies.

In general, findings related to the age-FRT relationship have been mixed. Yao, Hanna, and Lindamood (2004) and Yao, Gutter, and Hanna (2005), for example, noted that FRT, as measured by the Survey of Consumer Finances risk-assessment item, is negatively associated with age. This is the common starting point for most financial planners and counselors—that is, older individuals are thought to be less risk tolerant. It is important to note, however, that this may be a simple heuristic. Wang and Hanna (1997) and Yang (2004) failed to find any statistically significant association between FRT and age. It is possible that age

is simply a proxy for someone's time horizon.

Household size, when used as a control variable, tends to be either negatively or not significantly associated with FRT (Grable, 2008). Household income, on the other hand, is apt to be a stable factor within the research literature. Nearly all studies that incorporate income in models predicting FRT show a positive association between income and FRT (e.g., Grable & Joo, 2004; Huston, Chang, & Metzen, 1997; Sung & Hanna, 1996).

Financial knowledge is another important factor in FRT research. The logic underlying the association is similar to the educational proposition. Those with more experience and background related to context specific decisions may be more comfortable when making choices that entail risk. Stated another way, a person who has specific personal finance knowledge may possess the skills and abilities to differentiate between choice outcomes, which could prompt riskier decisions as a way to maximize income and wealth over time. Typically, a positive association between FRT and financial knowledge has been reported in the literature (Grable & Joo, 2004), although others have sometimes failed to find any statistical relationship between the two factors (Morse, 1998).

The association between FRT and marital status has commonly been tested as well. For example, Chang, DeVaney, and Chiremba (2004) noted that those who are married tend to be more risk tolerant than singles, although others (e.g., Arch, 1993) have argued that singles should be and are more risk tolerant. The argument in favor of a single marital status bias in relation to FRT rests on the assumption that a single person has less to lose

if a risky decision turns out unfavorably, whereas a married person must account for the financial situation of a significant other if a decision results in financial loss. An opposing argument can be made that a single person has more to lose if a risky decision turns out unfavorably as the sole income is impacted, compared to a married couple that has two incomes to compensate for the loss. Finally, racial/ethnic background is a factor frequently evaluated in relation to FRT. As is the case with many demographic factors, tests of the association tend to be mixed. Some (e.g., Coleman, 2003) have noted similarities between Whites, Blacks, and others, whereas other research teams (e.g., Yao et al. 2005) have reported distinct differences between and among racial/ethnic groups.

Ⅲ. Methodology

The statistical tests, as described below, were designed to evaluate the primary question of interest－whether education mediates the association between gender and FRT. In order to answer this question it was first necessary to ascertain whether, with the data examined, gender was associated with FRT. A model was created that included gender and education, as well as the control variables described above. The remainder of the paper discusses the study's methodology and results.

Data were obtained from a proprietary dataset owned by the research team. The original sample frame was designed to

over-represent financially stressed households living in three Midwestern United States' counties. The geographic reach of the survey consisted of over 500 squares miles. A proportional representation sampling technique was used to select 1,000 addresses from all known addresses in a utility database. The sample was stratified so that low- to middle-income households were slightly over-represented. A $20 incentive was provided to those who completed the survey. After an adjustment for incorrect addresses, returned envelops, and exclusion of business addresses, 706 surveys were delivered. Of these, 249 contained enough information for use in this study.

1. Sample

Table 1 provides demographic information about the sample. Respondents were skewed towards women (64%). The average level of education was relatively high (15 years). Overall, the sample was primarily White (83%), middle age (41 years), and married (59%). Average household income was $3,252 (U.S.). The mean household size was just over two persons, and in terms of financial knowledge, respondents indicated being slightly above average. In other respects, respondents were representative of the state from which the sample was taken.

<Table 1> Sample Descriptive Statistics

(N=249)

Personal Characteristic	Mean/ Standard Deviation	Frequency
Years of Education	15.05/3/34	
Age	40.94/17.62	
Race/Ethnic Group		
Hispanic		3.5%
African-American		5.8%
Pacific Islander		2.3%
Asian		1.9%
Native American		1.2%
Non-Hispanic White		83.0%
Biracial		2.3%
Gender		
Male		35.7%
Female		64.3%
Marital Status		
Never Married		20.9%
Separated		0.4%
Divorced		10.3%
Widowed		6.7%
Married		58.9%
Not Married but Living with Significant Other		2.8%
Household Size	2.24/1.29	
Household Monthly Income	$3,224.50/$2,583.99	
Financial Knowledge (1 - 10 Scale)	5.98/2.30	

2. Outcome Variable

FRT was measured using the Grable and Joo (2001) 7-item risk-assessment scale. A six-point Likert-type scoring procedure was used, with 1 = strongly disagree, 2 = disagree, 3 = not sure, probably disagree, 4 = not sure, probably agree, 5 = agree, and 6 =

strongly agree. The seven items were as follows:

  (a) I would prefer a sure gain of $500 over a 50% chance to gain
      $1,000 and a 50% chance to gain nothing;

  (b) Investing is too difficult to understand;

  (c) I am more comfortable putting my money in a bank account
      than in the stock market;

  (d) When I think of the word "risk" the term "loss" comes to
      mind;

  (e) Making money in stocks and bonds is based on luck;

  (f) In terms of investing, safety is more important than returns;
      and

  (g) The thought of taking a risk is exciting to me (reverse
      coded).

Scores for each question were summed into a scale score. Scale
scores could range from 7 to 42, with higher totals representing
increased risk tolerance. The mean score was 22.65 (SD = 5.47).
Cronbach's alpha for the scale was 0.70.

3. Independent Variables

Gender was coded dichotomously, with men = 1, women = 2.
Education was assessed by asking respondents to report the
number of years of formal education they had completed. No
statistically significant differences in education were noted between
women and men. Age was entered as reported by respondents in
years. No statistically significant differences in age were noted
between women and men. Household income was assessed by

recording each respondent's usual monthly before-tax income. Income was measured using all sources that could be used to fund household expenditures. No statistically significant differences in household income were noted between women and men. Household size was assessed by asking how many people lived in a respondent's home. No differences between women and men were noted. Financial knowledge was evaluated using a 10-item stair-step question that asked, "How knowledgeable do you think you are about personal finances compared to others?" Responses differed based on gender. Women exhibited slightly lower scores (6.13) compared to men (6.79). Finally, marital status and race/ethnicity were coded dichotomously so that marrieds and Whites were 1, otherwise 0.

4. Data Analysis Methods

Three statistical methods were used in this study. First, a correlation comparison was made to assess the relative associations between and among the variables. One outcome of the correlation analysis was to test for possible mulitcollinearity in the data. Second, an OLS regression followed, with FRT as the outcome variable and the other factors entered as independent variables. The purpose of the regression was to determine if gender and education were statistically significantly associated with FRT, and if yes, what the nature of the relationship might be, holding other factors constant. The third analysis involved conducting a joint Sobel test and a bootstrapped effect size estimation to determine if the

association between gender and FRT was significantly reduced after including education as a mediator variable.

IV. Results

1. Correlation Analysis

Table 2 summarizes results from the correlation analysis. In general, the correlation estimates were all of small to medium size, suggesting their appropriate use in the regression model. It is

<Table 2> Variable Correlation Coefficients

	FRT	Gender	Education	Age	Household Size	Household Income	Financial knowledge	Marital Status	Race/Ethnicity
FRT	1.00								
Gender	$-.25^{***}$	1.00							
Education	$.22^{***}$	$-.13^{*}$	1.00						
Age	$-.01$	$-.05$	$-.05$	1.00					
Household Size	$.05$	$-.02$	$-.07$	$-.16^{**}$	1.00				
Household Income	$.19^{***}$	$-.06$	$.14^{*}$	$.07$	$.17^{**}$	1.00			
Financial Knowledge	$.27^{***}$	$-.16^{**}$	$.18^{**}$	$.10$	$-.06$	$.21^{***}$	1.00		
Marital Status	$.13^{*}$	$-.02$	$.13^{*}$	$.08$	$.45^{***}$	$.39^{***}$	$.14^{*}$	1.00	
Race/Ethnicity	$.16^{**}$	$-.04$	$.19^{**}$	$-.03$	$.08$	$.11^{*}$	$.22^{***}$	$.22$	1.00

Notes: $^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$

worthwhile to note that several factors were found to have a significant bivariate relationship with FRT. Of particular importance, women (females coded 2, males coded 1) were found to score lower on the FRT scale. Initially, this correlational finding provided support for the commonly held assumption among financial planners and counselors; namely, women exhibit a greater propensity towards risk aversion. Education was also found to be associated with FRT. As predicted in the literature, the association was positive. Those reporting more years of formal education were found to have higher FRT scores.

2. Regression Analysis

Results from the regression analysis are shown in Table 3. Taken as a whole, the model was significant ($F_{8,249}$ = 5.929, $p <$ .001), with approximately 14% of the variance in FRT scores explained by the model. Holding all other factors constant, women were found to be less risk tolerant, whereas those with more education were more willing to take financial risk. One other factor was found to be associated with FRT. Financial knowledge was positively related to FRT, suggesting that those who self-report knowing more than others share a common profile that leads away from risk aversion.

<Table 3> Regression Results Showing Independent Variable Associations on FRT

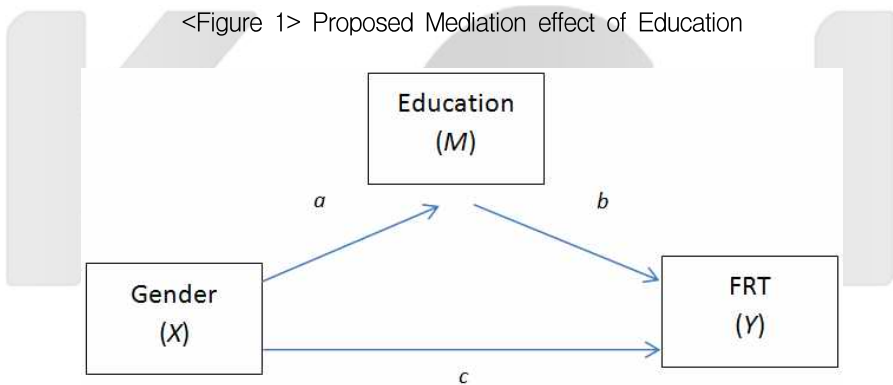| Variable	Parameter Estimate	Standard Error	Standardized Coefficient	t Value
Gender	−2.224	0.680	−0.196	−3.269**
Education	0.216	0.101	0.132	2.133*
Age	−0.010	0.292	−0.033	−0.541
Household Size	0.121		0.029	0.414
Household Income	0.000	0.000	0.107	1.648
Financial Knowledge	0.479	0.165	0.184	2.905**
Marital Status (1 = Married)	0.219	0.813	0.020	0.269
Race/Ethnicity (1 = White)	0.970	0.900	0.067	1.078
Constant	18.463	2.536		7.279***

Notes: $F_{8,249}$ = 5.929, p < .001; R^2 = 0.164; Adjusted R^2 = 0.137
*p < .05 **p < .01 ***p < .001

3. Sobel Test

Findings from the regression analysis were needed to complete the mediation test. It was determined, as documented in the review of literature, that risk aversion was present among women and those with fewer years of attained education. A Sobel test was used to determine if the gender–FRT association was strictly a direct relationship, as shown in Table 3, or one mediated by education. As such, the key question of interest in this study was whether education significantly reduces the gender effect on FRT. Stated another way, does education mediate the association between gender and FRT? Several factors must be in place in order

for education to act as mediator. Baron and Kenny (1986) concluded that a factor can only be considered a mediator if the variable accounts for some or all of an association between two other variables. Consider the relationships shown in Figure 1. As illustrated, a direct effect between gender and FRT (path *c*) is hypothesized. Gender is also hypothesized to be associated directly with education (path *a*). Additionally, an association between education and FRT is hypothesized (path *b*). The combination of these paths results in a possible indirect effect.

<Figure 1> Proposed Mediation effect of Education

A key assumption is that *Y* should not cause *M*, or in this paper, FRT should not be a causal factor of educational attainment. Baron and Kenny proposed a formal methodology for assessing mediation. Mediation exists if the following occurs:

$$Y = i_1 + cX \tag{1}$$

$$M = i_2 + aX \tag{2}$$

$$Y = i_3 + cX + bM \tag{3}$$

where,

i = intercept coefficient

Y = outcome variable

X = independent variable

M = mediating variable

In cases where X decreases significantly in the third formula (3), compared to the $X \to Y$ relationship in formula 1, mediation is said to have occurred. Complete mediation happens when the $X \to Y$ relationship in formula 3 is zero. Partial mediation is said to have occurred with the $X \to Y$ association in formula 3 is significant but the coefficient is smaller the $X \to Y$ coefficient in formula 1.

Table 4 shows the results of the mediation test used in this study. Coefficients were estimated using procedures outlined by Preacher and Hayes (2004). Estimated coefficients met all requirements as outlined above, suggesting that education does, indeed, mediate the relationship between gender and FRT. Because the direct effect of gender on FRT was statistically significant, controlling for education in equation 3, it is possible to conclude that education serves as a partial mediator.

The formal test just described provides evidence that the total effect of gender on FRT is significantly reduced when education is accounted for in the model of association. A further, and possibly more important, question is what effect education has in mediating the association between gender and FRT. To answer this question, a bootstrapped estimation procedure as described by Preacher and Hayes, Hayes and Preacher (2009), and Hayes (2012) was employed

to determine the effect size of the indirect effect. The *ab* paths were bootstrapped to estimate confidence intervals from the sampling distribution. In this study, 1,000 sample iterations were estimated. The bootstrapped estimate (-.2764) was essentially similar to the point estimate from the regression. The true indirect effect was projected to lie between -.6065 and -.0077 at the *p* < .05 level. Interpretation of the coefficient indicates a medium to large overall effect size for the indirect effect.

<Table 4> Mediation Test of FRT as a Function of Gender and Education

	Mediation Formula	Independent Variables	Dependent Variables	Coefficients
Model 1	$Y = i_1 + cX$	Gender	FRT	-2.8725***
Model 2	$M = i_2 + aX$	Gender	Education	-.8879*
Model 3	$Y = i_3 + cX + bM$	Education Gender	FRT	.3113** -2.5961***

Note: *p < .05 **p < .01 ***p < .001

Ⅴ. Discussion

Imagine a financial planner or counselor who reads a research paper showing women to be less risk tolerant than men. Naively, the planner may incorporate this information into his or her practice by assuming women are systematically biased, either physiologically or socially, to make choices that entail less risk of loss. If this is the case, the planner may recommend "safer"

planning strategies to women clients. If Finke and Huston (2003) and others (e.g., Palsson, 1996; Yao & Hanna, 2005) are correct, implementation of lower risk planning strategies may lead to worse financial outcomes for this planner's women clients over time. While it is true that some risky course of action may subject a client to financial losses in the near term, it is also likely that consistently taking the safe path will lead to significant opportunity costs in the long run. Depending on one's theoretical preferences, the gender-FRT relationship that is so commonly reported could be easily dismissed, which may be indicative of a sense of helplessness. If it is true that women are not only predisposed to search for solutions that entail less risk but also the effect size of the gender bias is strong, then it may not be possible, in the short- or medium-term, to, on the average, positively influence the financial security of women.

Until very recently, nearly all financial planners, counselors, and educators, as well as many policy makers and those in the academy, subscribed to a gender bias in relation to FRT. Results from this study hint that such a bias may not actually be as strong as once thought. Initial results did point to women scoring lower on the risk-tolerance scale compared to men (i.e., women were more risk averse). When controlling for important demographic and socioeconomic factors, the negative association between gender and FRT was still noted. However, in both the correlational and regression analyses, education was found to be positively related to FRT. This finding is consistent with the literature. The Sobel test for mediation brought to light the hypothesized mediating effect of

education on the gender-FRT association. Specifically, the total effect of gender on FRT was reduced significantly by accounting for each respondent's attainted educational level. While the degree of mediation was not perfect, results do suggest that the gender bias often indicated in studies of association may need to be reexamined to account for indirect, as well as direct, effects.

Given the findings from this study, a financial planner might now take a different approach when working with female clients. Rather than assume women and men will differ in terms of FRT, with women being more risk averse, an advisor would be better served by first documenting the educational level of the client. As a client's education increases, the likelihood of exhibiting risk aversion appears to decrease. While it is true that women do appear less risk tolerant in a path model from $X \rightarrow Y$ (see Figure 1), the inclusion of educational attainment into the equation, via an indirect association between gender and FRT, significantly dampens the gender bias.

Indirectly, findings from this study offer some support to proponents of the socialization aspect of education. Education does appear to improve a person's capacity for numeracy, decision analysis, evaluation, and choice. It may be that through formal education people learn the benefits and costs associated with risky choice decisions. Alternatively, education may be a mechanism that helps shape expectations about career choice, wealth accumulation, and success. Over time, within the educational system, those who excel academically and those who engage in activities that involve degrees of risk (e.g., athletic participation) sometimes receive

benefits that are not available to others. It is also true, however, that engaging in risky behavior can lead to possible injury or loss of benefits; however, over extended periods, those who are willing to take risk－a type of learned behavior－tend to receive greater gains. As a form of learned behavior, those who continue in the educational system may adapt their current behavior or adopt another's behavior as a way to gather additional benefits. If these learning adaptations are long lasting, this might help explain how education works as a mediating variable in the context of FRT.

1. Limitations and Suggestions for Future Research

While findings from this study add to the FRT literature in several important ways, it is important to note some general limitations associated with the study. First, although the sample was randomly selected, the geographical area from which responses were taken may not be representative of the general U.S. population. Second, given the overrepresentation of women respondents, it is possible, although not likely, that women and men responding to another survey might answer the FRT scale questions differently. In other words, it is important to take note that results from this study may not be generalizable to other samples or populations, particularly respondents living outside the United States. It is possible, for example, that non-U.S. consumers might find the risk-tolerance questions difficult to answer because of their lack of familiarity with American investment and insurance products. Further research is needed to confirm the findings from

this analysis with data from both the United States and other countries. Even so, findings do indicate that financial planners, counselors, and educators should not blindly assume that women are always less risk tolerant than men. While there does appear to be a direct association between being female and exhibiting risk aversion, this effect is partially mediated by a person's education. More attained education tends to dampen the gender-FRT association. Failing to account for the educational attainment of women could lead to financial planning recommendations that significantly reduce the likelihood that a woman who follows such advice will obtain financial security.

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