

Risk Tolerance Assessment: Research and Practice

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Considerations Today:

- ▶ What is **risk tolerance**?
- ▶ What theories underlie **risk tolerance**?
- ▶ How is **risk tolerance** typically measured?
- ▶ Are there discrepancies among theory, research, and practice?
- ▶ Why is a valid, reliable **risk tolerance** scale needed?
- ▶ What are the implications for your practice?

Risk Tolerance... What Is It?

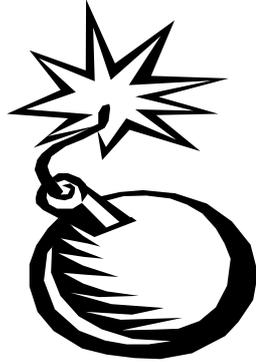
Willingness to engage in “behaviors in which the outcomes remain uncertain with the possibility of an identifiable negative outcome” (Irwin, 1993)



What Is Risk Tolerance?

- ▶ The maximum amount of uncertainty that someone is willing to accept when making a financial decision (Grable)
- or
- ▶ The willingness to engage in behaviors in which the outcomes remain uncertain with the possibility of an identifiable negative outcome (Irwin)

What Is Financial Risk?



- Sense of Danger
- Possibility of Loss
- Volatility
- Absolute loss
- Beta, standard deviation

Theoretical Dimensions of Risk

- ▶ The literature suggests that risk tolerance is a multidimensional concept that includes a person's comfort with:
 - General risk taking
 - Gambles and speculation
 - Losses and gains
 - Investments
 - Investment terminology

Theory of RT

Expected Utility Theory

- ▶ Investors should select investments with the highest expected outcomes.
- ▶ Utility function = constant relative risk aversion utility
 - A constant ratio by which people give higher weights to downside risks than to upside risks
 - Assumes that risk preferences are stable
 - Are individuals rational?

Modern Portfolio Theory

- ▶ An extension of expected utility theory conceptualized by Markowitz (1952).
- ▶ Risk-averse investors construct portfolios that maximize utility by maximizing returns for a given level of risk.
 - Risk and Return Trade-offs
 - Investors prefer high returns and low risks

Behavioral Finance

- ▶ It is unlikely that decision makers perceive risk the same way.
- ▶ Normative models are typically violated.
 - Long-term investors should invest aggressively
- ▶ Behavioral Finance is Descriptive.
 - Few people exhibit constant risk aversion
 - Allais Paradox (1953)
 - Friedman and Savage (1948)

Behavioral Finance (cont.)

- ▶ Investors tend to prefer to take risks when faced with certain losses.
 - Prefer sure gains when profits are assured.
- ▶ Risk tolerance, then, depends on how risk situations are framed.
 - The same person may be risk averse or risk seeking in similar situations
 - Welcome to Reno and Las Vegas!

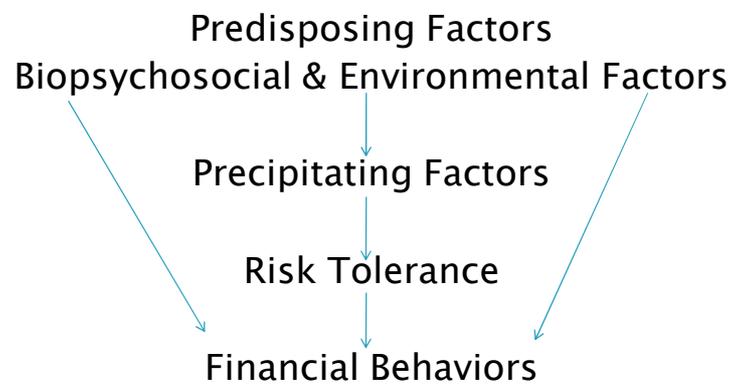
Risk as Feelings

- ▶ Other theories assume that individuals make decisions based on an assessment of consequences.
- ▶ Risk as Feelings posits that emotional reactions to risky situations diverges from reasoned assessments.
 - Emotion overrides reason
 - Mood, fear, anxiety, worry all matter

Biopsychosocial & Environmental Model

- ▶ Predisposing Factors
 - Inherent traits and personality dimensions
 - Age, ethics, socioeconomic status, etc.
- ▶ Precipitating Factors
 - Aspects of a person's life that impact the assessment of risk
 - Knowledge, experience, skills, cognition, etc.

The Relationships

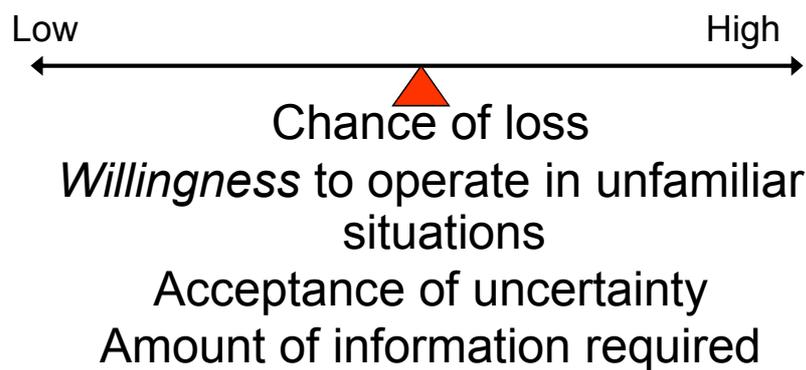


Measuring Risk Tolerance

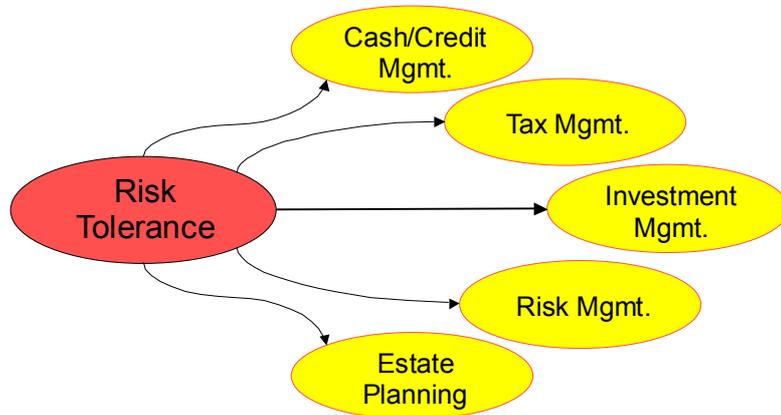
Underlying Factor of Consumer Decisions

- Saving versus Consumption Decision
- Debt versus Saving Decision
 - Mortgage choice
 - Credit card choice
 - Minimum payments
 - Late fees
 - Other penalty fees and charges
 - Auto loan choice
 - Home equity loan choice
 - Reverse mortgage loan choice
- Consumer Choices
 - Type of car purchased

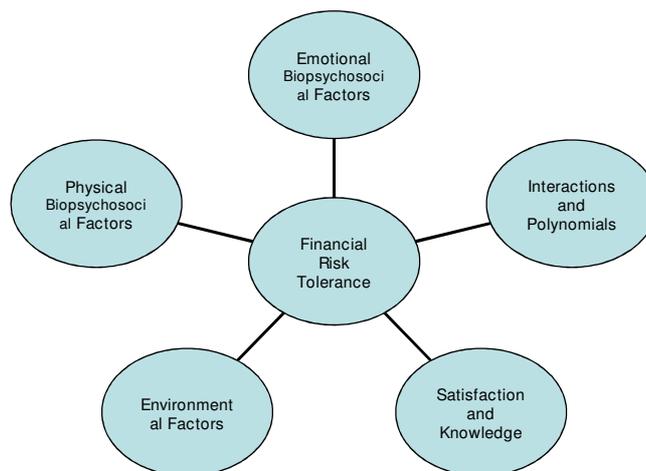
Risk Tolerance



Risk Tolerance in Financial Management



Framework of Risk Tolerance

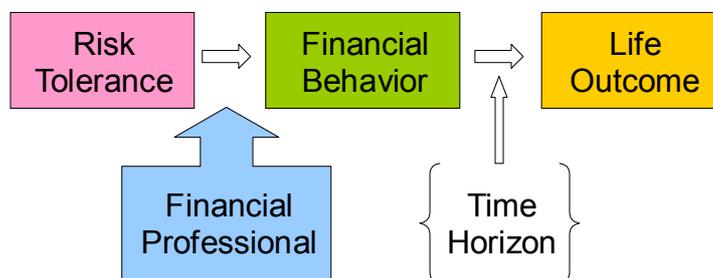


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The Social Science View



Risk Tolerance in the Financial Planning Process



Why Is It Important To Measure Risk Tolerance Appropriately?

Determining Suitability...a Precursor To Financial or Investment Plans

- ✓ Goals, Objective
- ✓ Time Horizon
- ✓ Risk Capacity
 - ✓ Financial Stability (income, net worth)
 - ✓ Previous Investment Experience
 - ✓ Knowledge
- ✓ **Risk Tolerance**

Outcomes of Failing to Accurately Assess Risk Tolerance:

Client and consultant dissatisfaction

Account turnover

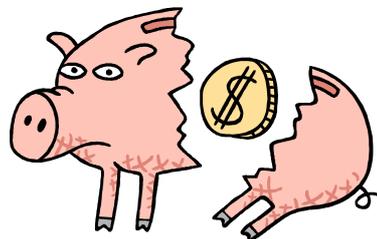
Arbitration

Lawsuits

(Momus, 1999)

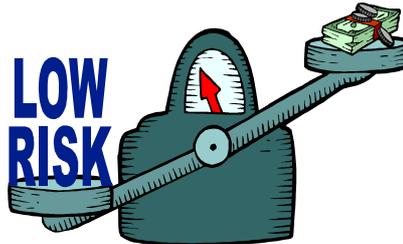
“Dispersion of Wealth and Welfare” (Palsson, 1996)

Clients sell at a loss if incorrectly classified into a higher risk tolerance category



“Dispersion of Wealth and Welfare” (Palsson, 1996)

Fail to meet goals and objectives if incorrectly classified into a lower risk tolerance category.



How Has Risk Tolerance Been Measured?

1. Behavioral Assessment
2. Proxies, Heuristics, and Informal Method
3. Direct Assessment
 - Scales and psychometrically designed instruments

Risk Tolerance is a Construct

“...something that is not itself directly measurable but that explains observable effects.”

(Ary, Jacobs, & Razavieh, 1990)

Ex: anxiety, intelligence, motivation, self-concept, aptitude

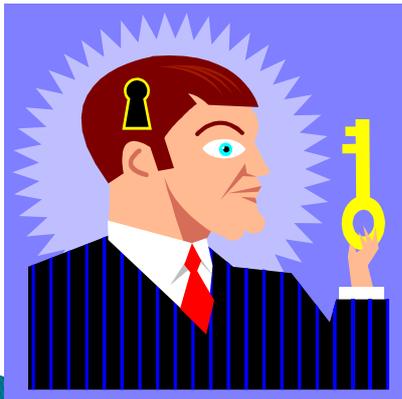


#1. Behavioral Assessment

- ▶ What has a client done in the past?
- ▶ Weak assumption for both researchers and practitioners



#2. Informal Method, Proxies, Or Heuristics



Heuristics:
Mental strategies
used to reduce
difficult tasks to
simpler judgments

Strategy to reduce the
information
processing load

#2. Informal Method , Proxies, Or Heuristics



- ▶ Observable psychological or demographic traits
- ▶ Usually one predisposing factor
- ▶ Problem: Generalities Applied to Individuals!!

Can Heuristics Be Used to Predict Risk Tolerance??



Heuristics: **True** or **False??**

Men are more risk tolerant than women.

▶ True

Older people are more risk tolerant than younger people.

▶ Assumed True; research mixed

Heuristics: True or False??

Risk tolerance increases with income.

- ▶ Assumed True, but be cautious

Risk tolerance increases with level of attained education.

- ▶ True

Heuristics: True or False??

Risk tolerance increases with knowledge of investments.

- ▶ True

Risk tolerance does not vary by race or ethnicity.

- ▶ False

Predicting Risk Tolerance

Variable	Type	Characteristic	Relationship
Age*	Biopsychosocial	Younger	Positive
Gender	Biopsychosocial	Male	Positive
Race/Ethnic Background	Biopsychosocial	Non-Hispanic White	Positive
Financial Satisfaction	Biopsychosocial	Higher	Positive
Household Income	Environmental	Higher	Positive
Net Worth	Environmental	Higher	Positive
Education	Environmental	Bachelor's Degree or Higher	Positive
Homeownership	Environmental	Own Home	Positive
Marital Status*	Environmental	Married	Positive
Employment Status	Environmental	Employed Full-Time	Positive
Financial Knowledge	Environmental	Higher	Positive

* Relationship is inconclusive

Can Rules of Thumb Be Used to Predict Risk Tolerance??



- ▶ Professionals have been criticized for relying too heavily on heuristics.
- ▶ Professionals are unaware that they are making poor decisions when using heuristics (Heisler, 1994)

#3. Direct Assessment

Tests,
Inventories,
Scales,
Checklists,
Questionnaires



Do You Feel Lucky?

To get a handle on how much you can spend in retirement without running out of money, check out the table below. For instance, the table suggests there is a 58% chance that a mix of 60% stocks and 40% bonds will sustain a 5% withdrawal rate all the way through a 30-year retirement.

20-Year Retirement						
WITHDRAWAL RATE	STOCK/BOND MIX					
	100/0	80/20	60/40	40/60	15/85	5/95
4%	97%	99%	100%	100%	100%	100%
5	91	93	95	96	97	93
6	76	78	77	70	48	19
7	56	53	46	28	2	0

25-Year Retirement						
WITHDRAWAL RATE	STOCK/BOND MIX					
	100/0	80/20	60/40	40/60	15/85	5/95
4%	93%	95%	96%	97%	98%	93%
5	78	79	79	66	46	14
6	59	56	48	(27)	2	0
7	38	31	18	3	0	0

30-Year Retirement						
WITHDRAWAL RATE	STOCK/BOND MIX					
	100/0	80/20	60/40	40/60	15/85	5/95
4%	85%	88%	86%	85%	71%	37%
5	68	66	58	42	8	0
6	47	41	28	10	0	0
7	24	18	7	1	0	0

Source: T. Rowe Price Associates

Daniel Pezans

Scale Assessment – The Safest Approach

“Most of the tests, inventories, scales, checklists, and questionnaires employed today by financial planners to measure their clients’ risk tolerance have not been developed under strict standards”

(Roszkowski, 1999)

Standard Psychological Question

- ▶ In general, how would your best friend describe you as a risk taker?
 - a. A real gambler
 - b. Willing to take risks after completing adequate research
 - c. Cautious
 - d. A real risk avoider

How Low Will You Go? Potential Qtrly. Decline of \$100,000

- \$97,000 (3%)
- \$94,000 (6%)
- \$92,000 (8%)
- \$90,000 (10%)
- \$85,000 (15%)
- \$77,000 (23%)
- \$65,000 (35%)
- \$50,000 (50%)

Check the box
where you
would take
action.

What Should You Do?

- ✓ Develop solutions that best match the client's risk tolerance, given historical performance
- ✓ Monitor the allocations and adjust as needed
- ✓ Periodically re-assess the client's risk tolerance



What Should You Do?

- ✓ Build trust
- ✓ Be a trainer, coach, educator, mentor
- ✓ Work to provide higher/lower risk experiences and modify expectations



Reassessment of True Risk Tolerance

- ▶ Make adjustments in client needs and objectives (e.g., delay retirement, increase savings, reduce current or future withdrawals)
- ▶ Tolerate portfolio risk rather than compromise goals and objectives

(Neff, 2001)

Theory/Research/Practice

DISPARITIES

- ▶ between risk tolerance assessment and reality
- ▶ between portfolio theory and financial planning advice

Where does that leave the advisor?
Where does that leave the client?

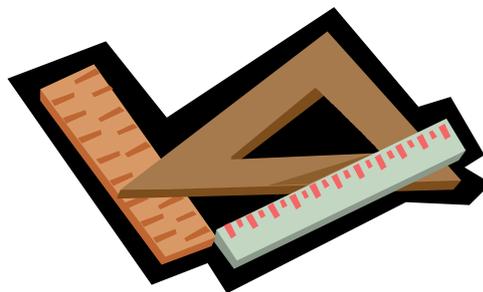


Needing A Risk Tolerance Scale

- ▶ Research 101: Validity and Reliability
- ▶ Development of the Grable & Lytton Risk Tolerance Assessment Scale
- ▶ Use and Interpretation of the Scale

Research 101: Is Your Scale Valid & Reliable?

- ▶ Validity
 - Face
 - Content
 - Construct
 - Criterion
- ▶ Reliability



What is Validity & Reliability?

Validity:

Does the test measure what we **think** it is measuring or what was intended?

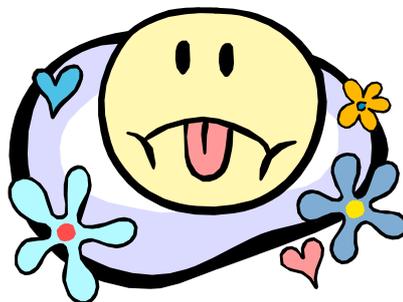
Validity is TEST and SITUATION specific.

Reliability:

Does the test provide consistent measurement or results?

Face Validity

Accuracy of a scale or test as measured by non-experts.



Content Validity

- ▶ Expert review of items for accuracy, relevance to the topic domain. Experts recommend that risk tolerance scales include items that:
 - Assess the probability of gains and losses
 - State \$\$ amounts of potential gains and losses
 - Focus on financial and investment situations
 - Have similar psychometric measures
 - Avoid non-response options

Construct Validity

- ▶ Measure of how meaningful an item or index is in multiple situations.



Criterion Validity

- ▶ Effectiveness of a measure in estimating behavior.
 - Concurrent: Relationship between past/present behavior and the measure.
 - Predictive: Relationship between future behavior and the measure.

Grable & Lytton Risk Tolerance Assessment Scale



Developed from
approximately 100
items reduced to 13

- ✓ Face validity
- ✓ Content validity

Assess Yourself

- ▶ Want to improve your personal finances? Start by taking a risk quiz to get an idea of your risk tolerance--one of the fundamental issues to consider when planning your investment strategy, either alone or in consultation with a professional.

<http://www.rce.rutgers.edu/money/riskquiz/>

- ▶ Note: This quiz was developed by two university personal finance professors, Dr. Ruth Lytton at Virginia Tech and Dr. John Grable at Kansas State University. By taking this quiz you will be contributing to a study on measuring financial risk tolerance. Your results will be recorded anonymously. We are not collecting any identifying information.

Use and Interpretation of the Scale

- ▶ Multidimensional financial risk tolerance assessment tool
- ▶ Tests suggest a high degree of validity and reliability
- ▶ Easy to administer, score, and interpret

Risk Assessment: The Narrator Effect

As a Financial Planner You Influence Your Client's
Risk Tolerance

K-State Study

- ▶ Randomized experimental study was designed to compare risk-profile scores of those who completed
 1. a pen-and-paper risk-tolerance assessment instrument (i.e., the control group)
 2. listened to the same questions being asked by a female narrator
 3. Listened to the same questions being asked by a male narrator
- ▶ It was hypothesized that the possibility of a narrator effect might be present, and if true, financial advisors ought to consider this possibility as a factor that influences responses to risk assessments

Are You a Narrator?

- ▶ Voice narration refers to a voice of authority that is used to sell, promote, or describe a product or idea in an effort to solicit a consumer response.
- ▶ Financial planners and advisors, and their staff, play the role of product and service narrators.

Pitch Matters

- ▶ Female voices have an advantage over men's narration in being able to portray urgency.
 - A woman's voice has a higher pitch and pitch range
 - Men tend to remain constant in their pitch while talking.
 - Male narration is typically associated with qualitative factors such as strength, dependability, and authority
 - Women's voices tend to be associated with childhood and nurturing.
 - A client's perception or judgment of a scenario can be influenced, in part, by the sex of the narrator.

What Explains this Effect?

- ▶ The role of female and male narration has been explored as a biological preference.
 - Women prefer masculine men's voices.
 - Men prefer feminine women's voices.
 - These preferences appear to be a response to "reflect adaptations that identify high-quality (e.g., healthy) mates" (Jones et al., 2010).
 - An opposite-sex bias.
 - The preference for a low pitched male voice among women, but not men, may be indicative of the desire among women to identify a strong mate.
 - For men, a high pitched female voice may suggest a reproductive female that has potential as a mate.
 - Voice pitch influences the way people respond to commands and inquiries.

Research Questions

1. Is there a gender (sex) difference in risk-tolerance scores between women and men?
2. Is there a main narrator effect in relation to risk-tolerance assessment?
3. Is subjective financial knowledge associated with risk-tolerance scores?
4. Is there an interaction between gender and narration on risk-tolerance scores?

Research Participants

- ▶ Research conducted at the Financial Therapy Clinic at K-State
- ▶ Sixty men and women took part in this study
 - Participants were recruited from the undergraduate and graduate student population at Kansas State University
 - Participants were compensated with a \$10 gift card

Risk Tolerance

- ▶ Risk tolerance was measured with 13 multiple-choice risk items.
- ▶ The measure was originally designed by Grable and Lytton (1999).
- ▶ The questionnaire has historically shown a reasonable level of validity and reliability
 - Cronbach's alpha estimates ranging from .70 to .85.
 - In this study, Cronbach's alpha for the participant group was .74.

Financial Knowledge

- ▶ Financial knowledge was measured by asking participants, as part of the pre-test to “Rate yourself on your level of knowledge about personal finance issues and investing.”
- ▶ A ten-step scale was used to record answers, with 1 indicating the lowest level of knowledge and 10 being the highest level.
- ▶ The mean score for the sample was 5.35 ($SD = 2.26$). Men reported a mean knowledge score of 6.07 ($SD = 1.90$), whereas women reported a mean score of 4.83 ($SD = 2.35$).
- ▶ A t-test indicated that the difference in knowledge between women and men was statistically significant ($t_{55} = 2.18$, $SE = 0.57$, $p < .05$).

Control Group

- ▶ A control group was established by randomly assigning 10 women and 10 men to complete the questionnaire using a traditional pen-and-paper method.
- ▶ Each question was presented on a separate 8½ x 11-inch white piece of paper.
- ▶ Each participant was asked to sit alone in a quiet assessment room when completing the questionnaire.
 - Participants circled their answer preference for each item. Scores were then summed, with higher scores representing an elevated tolerance for financial risk—i.e., a higher risk profile.

Treatments

- ▶ The remaining participants were randomly assigned to either the female or male narration groups, with an equal sex distribution in each group.
- ▶ Proxies for masculinized and feminized voices were chosen by the researchers based on pitch variation analysis.
 - A number of narrator volunteers were evaluated.
 - The selected female was chosen because of her feminized pitch variation when speaking.
 - A male narrator was chosen as a result of pitch variation analysis that showed a more narrow range of pitch and a lower overall tone.
 - Participants heard only the voice narration for their particular group.

I-Clickers

Participants sat in comfortable arm chairs while watching the risk-assessment questions appear via video on a large-screen television.

The progression of the questions was timed, however, each slide was narrated, either with a female voice or a male voice.

Method

- ▶ An analysis of covariance (ANCOVA) was used to test the research questions and hypotheses.
- ▶ Financial risk-tolerance scores from the 13-item risk questionnaire were used as the dependent variable.
 - Two between-subjects factors were tested:
 - gender, with men coded 0 and women coded 1
 - narration effect, with male voice coded 1, female voice coded 2, and the control group coded 3.
 - The covariate was a participant's subjective financial knowledge

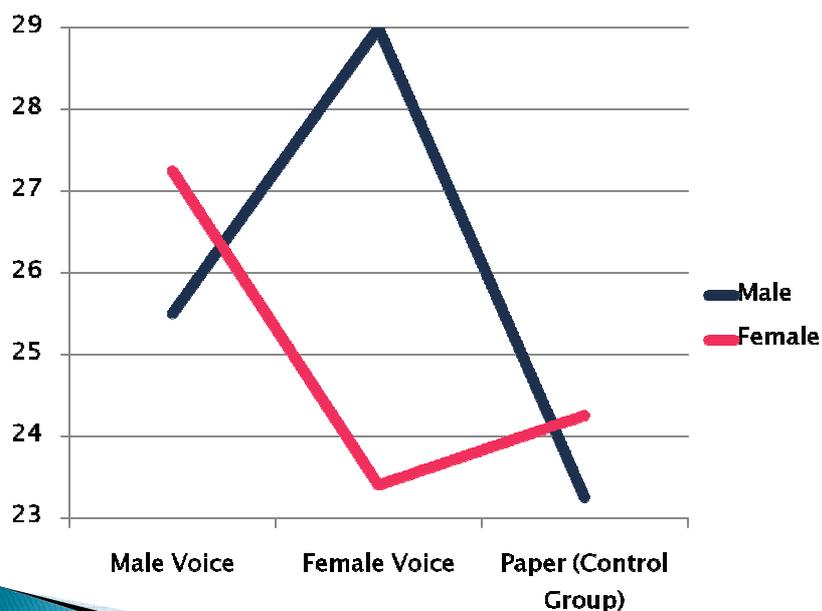
Results

- ▶ The model was found to be statistically significant, $F_{6,53} = 3.39, p < .01$.
- ▶ Results indicated that *neither* gender nor the type of narration had a main effect on risk-tolerance scores.
 - Although men did report, on average, a higher mean risk score ($M = 26.30$) compared to women ($M = 24.43$), the difference was not statistically significant.
 - The covariate, financial knowledge, was found to be significantly positively associated with risk-tolerance scores ($F_{1,59} = 7.62, p < .01$).

An Interaction



- ▶ There was a significant interaction effect between the the type of narration (i.e., male, female, and control group) and the gender of the participant, on calculated risk-tolerance scores ($F_{2,53} = 3.51, p < .05$).
- ▶ Females and males were affected differently by the type of narration used in the experiment.
- ▶ When controlling for financial knowledge, women are predicted to exhibit **higher** risk scores when responding to male narrated questioning.
- ▶ Men exhibit **higher** estimated scores than women.
 - Women's scores, when compared to those with male narration, are estimated to be lower.
 - Men in the control group displayed the lowest estimated tolerances for risk.
 - Women in the control group were also predicted to have a relatively low risk tolerance, but higher than that for men.
 - Overall, the model explained 19.50% (Adjusted R-squared) of variance in risk-tolerance scores. Financial knowledge alone explained 12.60% of the variability in tolerance for risk.



Discussion

- ▶ When controlling for financial knowledge—a predisposing personal factor—women were more likely to have a predicted tolerance for risk higher than that for men when responding to questions narrated by a male voice.
- ▶ When the same questions were narrated by a female voice, men’s estimated scores on the risk assessment were significantly higher than for women.
 - Men’s scores were the highest, among the three categories, when listening to a women’s narration.
 - The pen-and-paper control group exhibited the lowest estimated scores, controlling for financial knowledge.

Discussion

- ▶ The traditional pen-and-paper method of risk-tolerance assessment provides the lowest risk scores for women and men.
 - Nominally, men score higher in risk tolerance on these tests, but when controlling for financial knowledge there is no difference between women and men.
 - When accounting for differences in financial knowledge women’s estimated scores on these tests is slightly higher than scores for men.

The Bottom Line

- ▶ Women and men react very differently when exposed to female and male narration.
- ▶ Financial planning implication:
 - Advisors who meet with clients to discuss financial risk-tolerance issues, in terms of establishing an assessment of attitudes, run the risk of influencing client responses.
 - Male advisors who work with female clients may find that their client's responses are skewed to the high side, in comparison to a benchmark pen-and-paper assessment.
 - Women advisors who ask questions of male clients will find the same pattern of response, but to an even greater extent.

What We Don't Know

- ▶ There is insufficient literature to know if the pen-and-paper method or a narrated approach provides a more accurate description of a client's tolerance for risk.

What We Learned

- ▶ Narrated assessment techniques do skew responses.
 - A female advisor working with a woman client should expect lower risk answers.
 - If the same client worked with a male advisor, accounting for the client's subjective level of financial knowledge, the client's risk responses will be much higher.

So, What Should You Do?

- ▶ The safest approach is to prescribe a standard risk-assessment technique within your firm.
 - You should choose one consistent method of client assessment.
 - For example, if a pen-and-paper approach is to be used, the tactic should be employed in all client situations.
 - If you prefer a narrated method then all client assessments should be conducted using a male-to-male or female-to-female style.
 - The greatest variation from pen-and-paper assessment will occur in mixed-gender assessments.