

ASSESSING FINANCIAL RISK-TOLERANCE ATTITUDES USING SEMANTIC DIFFERENTIAL SCALES

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ABSTRACT

This paper describes the development and testing of financial risk-tolerance semantic differential scales. A review of the semantic differential technique is provided. This is followed by a description of the process used to create 25 semantic differential scales, four of which proved statistically significantly related to the Grable and Lytton (1999) risk-assessment scale. The 'Bank Account' semantic differential scale was found to be the most reliable and valid test for predicting actual respondent stock and fixed-income asset ownership. Although exploratory at this point, certain semantic differential scales appear to offer researchers and financial advisors with a reliable and valid way to measure financial risk-tolerance attitudes and behaviors.

Introduction

Financial advisors work in an environment where making a correct assessment of a client's risk tolerance will more likely lead to the development and implementation of strategies that will positively impact the lives of clients. It is widely accepted that correctly assessing and understanding someone's risk tolerance can lead to financial strategies that positively impact client outcomes, including saving for retirement, accumulating an emergency fund for an unknown contingency, or locking in the rate on a mortgage application or a credit card. It is logical to assume that an increased self-awareness of underlying financial attitudes can empower clientele to take responsibility for their financial situation. Critical to these benefits is the accurate assessment of financial risk-tolerance attitudes.

A need currently exists for a financial risk-tolerance assessment instrument that measures risk attitudes in both a valid and reliable manner. To date there are few, if any, recognized assessment instruments currently in use.

The objective of this paper is to describe the development and exploratory testing of semantic differential risk scales. It is hypothesized that one or more semantic differential scales may fill the need for a better way to assess personal financial risk-tolerance attitudes. The semantic differential technique is described within the context of risk assessment methodologies. The paper concludes with a discussion of how semantic differential scales can be used to profile client attitudes and behaviors.

Literature Review

Schaefer (1978) defined financial risk tolerance as referring to the maximum amount of risk someone is comfortable taking in a financial situation. Risk tolerance induces an order relation on risk evaluation. Schaefer described the relation this way: "Two persons may very well agree on the riskiness of a set of gambles, but may nevertheless prefer different gambles, rank-ordering them differently according to their personal tolerance. This is not to say that people should agree on riskiness of options" (p. 17).

In general, one can expect individuals with a low level of risk tolerance to act differently with regard to risk than individuals with a high-risk tolerance. Someone with a high level of risk tolerance would be expected to "accept a higher exposure to risk in the sense of taking sole responsibility, acting with less information, and requiring less control than would" someone with a low level of risk tolerance (MacCrimmon & Wehrung, 1986, p. 34). Individuals with low levels of risk tolerance generally (a) require lower chances of a loss, (b) choose not to operate in unfamiliar situations, (c) tolerate less uncertainty, and (d) require more information about the performance of an investment (MacCrimmon & Wehrung, 1985). In summary, highly risk-tolerant individuals accept volatile events, while lower risk-tolerant individuals require certainty.

Over the past 50 years risk-tolerance attitudes have been assessed, examined, and tested using a wide variety of methods. Keynes (1921) was one of the first researchers to systematically study risk taking. He used traditional economic theory to better understand risk-tolerance attitudes. The economic model dominated risk assessment from the 1920s through the 1950s. Starting in the late 1950s psychologists began to take an interest in risk attitudes. Wallach and Kogan (1959; 1961) were among the first to advocate the use of choice dilemma questionnaires to measure risk tolerance. This was the primary assessment method for the next 20 years. From the 1970s until today the assessment of individual risk attitudes has been studied in fragmented ways. Some researchers have migrated to behavioral finance theory as a possible way to measure risk attitudes (Kahneman & Tversky, 1979; Shefrin & Statman, 1993), while others have attempted to develop traditional questionnaire methods for use in assessing risk attitudes (Roszkowski, 1998). Ironi-

cally, little unified effort has been expended on the development of a standardized assessment method or instrument (Warneryd, 1999). Financial advisors still do not have a standard method for assessing risk-tolerance attitudes. Many advisors continue to rely on heuristic judgments to assess risk attitudes. For example, some advisors believe that there is a strong relationship between certain demographic and socioeconomic characteristics and risk tolerance, and that simply observing certain client characteristics can lead to accurate assessments.

The reason that researchers have not yet settled on one method of risk assessment is that each approach has its benefits and disadvantages. In many cases, the disadvantages associated with a method outweigh the advantages. The search for a reliable and valid risk-assessment method continues to this day. It is interesting that risk attitudes have been assessed using economic theory, choice dilemmas, heuristics, multiple choice tests, summated scales, true/false questions, and simple observations of behavior, but the use of one potentially useful assessment method has not been reported in the literature. The use of semantic differential scales, as a tool for measuring risk attitudes, is relatively unknown within the financial planning literature. This is unfortunate because the semantic differential methodology offers many advantages and limited disadvantages as a tool for assessing attitudes. The following discussion provides a review of the semantic differential technique.

The Semantic Differential Technique Defined

According to Osgood, Suci, and Tannenbaum (1975b), the first researchers to systematically study the measurement of meaning, "the semantic differential is essentially a combination of controlled association and scaling procedures" (p. 20). According to sources, such as Kaufman (1959), the semantic differential technique can be used to provide an insight into the emotional and unconscious attitudes of respondents.

The technique is conceptually easy to implement within a research framework. First, respondents are presented with a concept. The concept can be a noun, term, phrase, or descriptor. A set of bipolar adjectival scales (e.g., hot/cold) is used to differentiate the concept. The respondent's only task is to indicate his or her level of association between the adjectives and the concept. The measurement of the association is usually assessed using a seven-step intensity scale. Respondents simply check a box closest to the adjective that characterizes their attitude about the concept. Those who have no opinion or are neutral about a concept tend to mark the middle box. An example of a semantic differential scale, as presented by Osgood et al. (1975b), is presented in Figure 1.

Father								
Happy			X					Sad
Hard		X						Soft
Slow					X			Fast

Figure 1
Semantic Differential Scale Example

In effect, the semantic differential technique requires respondents to rate all items by creating their own sentences. This method forces the use of metaphors, and this fact “turns out to be highly significant both for its power to reveal affective universals and for its limitation in revealing other types of semantic features” (Osgood, May, & Miron, 1975a, p. 42). This is the reason why attitudes towards inanimate concepts, like Tornados, can be evaluated using this technique. Again, Osgood and his associates explain this phenomenon: “Literally speaking, a tornado cannot be either fair or unfair (only humans can have these attributes), and subjects ought to judge the item as irrelevant by checking the zero position on the scale. The fact of the matter is that nearly all native English-speakers, working under semantic differential conditions, judge tornado to be extremely unfair” (1975a, p. 42).

According to Osgood et al. (1975a), native speakers of a language typically agree upon the meanings of familiar adjective opposites. It is this agreement that allows attitudes to be measured accurately. Osgood and his associates described the measurement process as follows: “In at least some respects the adjectives of English do seem to behave like colors. For example, combinations of an adjective with its opposite typically has the effect of canceling the imports of the terms taken separately, just as the additive mixture of complementary hues yields neutral grey” (p. 39). Based on results obtained from responses to scales, such as that represented in Figure 1, a summated scale can be created to represent a respondent’s attitude towards a concept.

While the delivery of a semantic differential scale is relatively easy, as Osgood and his associates point out, “the crux of the method, of course, lies in selecting the sample of descriptive polar terms” (1975b, p. 20). Fortunately, the study of U.S. and cross-cultural semantic usage has generated valid and reliable indicators of bipolar descriptives. Three common factors have been found to encompass the majority of U.S. adjectives. The first factor, as defined by Osgood et al., is commonly given the evaluative label.

The majority of bipolar descriptors used in the English language are evaluative. Examples of evaluative factors include good-bad, sweet-sour, happy-sad, and honest-dishonest. Potency descriptors are a second type of commonly identified factors. Potency factors include large-small, strong-weak, and heavy-light. The third most common type of descriptive is described by the term activity. Activity factors include fast-slow, active-passive, and hot-cold. Other factors can be isolated using factor analysis techniques; however, almost 50 years of research using the semantic differential technique suggests that these three factors (i.e., evaluative, potency, and activity) account for the majority of bipolar descriptors in use within English speaking countries.

Why The Semantic Differential Is Used

Glenn (1980) defined an attitude as a subjective reference to the evaluation of an object. By comparison, "beliefs or knowledge are thoughts about an object rather than an evaluation" (Intrieri, von Eye, & Kelly, 1995). The strength of the semantic differential technique is that it allows researchers to tap into the emotional and unconscious *attitudes* of respondents. The semantic differential technique offers several unique advantages as a method of assessing attitudes. First, respondents find semantic differential scales easy to complete. The level of reading comprehension needed to complete a typical scale is low, which means that a wider audience can be sampled. Second, a large number of concepts can be evaluated in one setting. A 100-item test, for example, consisting of 10 concepts and 10 scales can be completed in less than 15 minutes. Third, respondent boredom can be reduced by mixing the bipolar descriptors for a concept. Fourth, validity problems associated with other types of survey methods can be reduced. For example, respondent ambiguity based on definitional interpretations can be reduced using a semantic differential because a respondent's choice is limited to commonly understood bipolar adjectives. Probably the greatest benefit associated with the semantic differential technique, in terms of validity, involves increased accuracy of respondent choices. Underreported events and attitudes directly associated with a respondent's need to be viewed as socially desirable are frequently reduced because the semantic differential technique minimizes a sense of outside judgment (Fowler, 1993). This improvement in the measurement of respondent attitudes is often the result of the simple non-threatening format of the semantic differential scale.

The greatest advantage associated with the semantic differential technique was summarized by Osgood and his associates (1975b) in their seminal book. They stated, "The procedures of measurement with the semantic differential are explicit and can be replicated" (p. 125). According to DeVellis (1991), the technique's strength is best exemplified in attitudinal

research. The semantic differential response format can be highly compatible with theoretical modeling. Over the past 20 years the technique has been surpassed in use by the Likert scale. The Likert scale, as a scale response format, “uses a declarative sentence, followed by response options that indicate varying degrees of agreement with or endorsement of the statement” (DeVellis, p. 68). The Likert scaling technique has gained increased usage because the method is relatively easy to develop, administer, and analyze. However, several potential problems face those that use the Likert scale format when assessing financial risk-tolerance attitudes. First, because the technique relies on statements, exceptionally long sentences are often required to elicit a strong response. Second, the Likert scale method requires respondents to have a relatively high level of reading and cognitive ability. Third, the method is subject to ambiguous pronoun references and misplaced modifiers (DeVellis). Finally, in order to assure valid responses, the method requires both positively and negatively worded declarative sentences. Threats to validity, including agreement bias and social desirability bias, must be accounted for in the development of a Likert scale. The semantic differential technique, on the other hand, either significantly reduces or eliminates these threats to validity if designed correctly. Improvement in validity is achieved by reducing response bias associated with lengthy items, reading difficulty, statement ambiguity, and social desirability.

Examples of the Semantic Differential Technique in Practice

The semantic differential technique, as suggested above, received a great deal of attention and use in the 1950s, 1960s, and 1970s. The use of the technique has been widely overshadowed by the use of Likert-type scales since the early 1980s. However, the semantic differential technique has not disappeared altogether. In fact, the use of semantic differential scales has continued to be employed in cases where researchers wish to assess deeply held attitudes among survey respondents.

Reynolds (2002) used the semantic differential technique to assess self-image of women during hot flashes. She found the technique both sensitive and valid when examining whether poor self-image during hot flashes [sic] is linked to flush [sic] distress, perceived control, flush [sic] frequency and chronicity, self-esteem, and depression. Tiller and Rea (1992) used the semantic differential technique in their study of attitudes towards lighting. Their research offered insights into the technique’s usefulness in psychophysical research. Hsu, Chuang, and Chang (2000) used the semantic differential technique to assess the relationship between evaluations of telephone samples and form design elements. They found the technique useful in assessing subjective evaluations.

The semantic differential technique has also been widely used in the psychological and psychiatric professions. For example, Giron and Gomez-Beneyto (1995) used the technique to investigate the relationship between family attitudes and relapse into schizophrenia. They concluded that the three widely used semantic differential factors (i.e., evaluative, potency, and activity), as proposed by Osgood et al. (1975b), were useful as descriptors of respondents' attitudes. The semantic differential technique was also found to be useful because it allowed for assessment when only brief evaluation methods could be used. Other uses of the technique include the assessment of attitudes towards aging (Intrieri et al., 1995; Polizzi & Steitz, 1998), stereotyping (Shiflett, 1974), and the death penalty (Brinton, 1961).

The usefulness of the semantic differential technique has been proven over the past half century. From the origins of the technique by Osgood and his associates (1975b) to the most recent uses of the tool in assessing complex and emotion-laden attitudes, the semantic differential has consistently proven effective in research studies. Based on 50 years of published research it is plausible to suppose that the technique may be useful in assessing financial risk-tolerance attitudes.

Methodology

An exploratory study was conducted to develop and test semantic differential scale measures of financial risk tolerance. The development of semantic differential scales was based on a review of the semantic differential and risk-taking literature. The steps taken during the development and testing stage of the research are discussed below.

The research began by first reviewing the dimensions of financial risk tolerance as discussed in the literature. It was determined that the following dimensions constitute the primary factors associated with financial risk tolerance: (a) general risk-taking propensity, (b) gambles and speculation, (c) experience or knowledge, (d) comfort with potential losses, (e) willingness to invest in risky assets, and (f) aversion to uncertainty (MacCrimmon & Wehrung, 1986; Roszkowski, 1995). Grable and Lytton (1999) used these core factors when compiling a multiple-choice type risk-assessment instrument. They further refined these risk-tolerance dimensions, using a factor analysis technique, into three factors: (a) Investment Risk, (b) Risk Comfort and Experience, and (c) Speculative Risk. These three factors were used as the basis of the next step in the semantic differential scale development process. This step involved gathering concepts that related specifically to these dimensions of financial risk tolerance. This process is described below.

Choice of Concepts

Personal finance concepts were selected to correspond to the risk dimensions as described above. Concepts were chosen using a sampling analysis of topical headings found in the personal finance and investment behavior literature. Additional concepts were generated from a brief survey that was administered to working professionals enrolled in a personal financial planning certificate program. Participants in the survey were asked to provide at least five concepts or terms that they associated with financial risk-taking behaviors. Concepts such as stock market, bond, investing, speculation, gambling, and cash were generated using these techniques.

Once a sufficiently large number of concepts and terms were generated these were analyzed using screening techniques as outlined by Osgood et al. (1975b). First, concepts and terms that one would theoretically expect to generate considerable individual differences in attitude were selected. Concepts such as gambling, stock, and bond passed this initial screen. Second, concepts and terms that offered a single meaning were retained. All other ambiguous or multi-factor concepts were removed. Finally, only concepts and terms that one would reasonably expect to be familiar with respondents were retained. Of the approximately 50 concepts and terms originally obtained from the literature review and survey, 32 remained after administering the screens listed above. These concepts are presented in Table 1. Each concept in the table is matched with one of the three core risk dimensions as described by Grable and Lytton (1999).

Table 1
Concepts Associated with Risk-Tolerance Factors

Investment Risk	Risk Comfort and Experience	Speculative Risk
Bank Account		
Bonds		
Cash		
Certificate of Deposit		
Corporate Bond		
EE Savings Bond		
Gold		
Investing		
Junk Bond		
Money		
Municipal Bond		
Mutual Fund		
NASDAQ		
Real Estate		
Stock		
Stock Market		
Stock Option		
Treasury Bill		
Treasury Bond		
	Bargain	
	Debt	
	Guarantee	
	Inflation	
	Mortgage	
	Risk	
		Chance
		Gain
		Gambling
		Loss
		Opportunity
		Thrill
		Uncertainty

Choice of Scale Items

The third step in the process involved selecting semantic differential scale items (i.e., bipolar adjectives). Scale items related to evaluative, potency, and activity factors were selected from scale lists published in semantic differential manuals (e.g., Snider & Osgood, 1969). Scale items presented in semantic differential methodological manuals tend to be consistent in reported factor weightings. For example, the scale hot-cold reappears throughout the literature to be most closely associated with the activity factor. Scale items such as good-bad, valuable-worthless, and fair-unfair are consistently linked with the evaluative factor, whereas scales items like strong-weak tend to be associated with the potency factor.

Edwards and Porter (1972) reported that the evaluative factor is the strongest factor, "accounting for the largest percentage of the total variance in individual responses" (p. 122); however, they also pointed out that it is important for researchers who use the semantic differential technique to initially include scales representing potency and activity dimensions as well. The combination of evaluative, potency, and activity factors often provides more information about a person's attitude than any one-factor measurement alone.

Three criteria were used in selecting scale items. First, each scale needed to have a relatively high factor loading on a previously reported dimension of attitude as reported in the literature. Factor scores were obtained from published scale tables that include factor loadings (e.g., Osgood et al., 1975b). The second criterion for the selection of scale items was relevancy. For example, bipolar scale items such as good-bad were chosen because of the relevant nature of the scale in terms of financial risk tolerance. Scale items such as complete-incomplete and clean-dirty were excluded for the opposite reason. The final criterion used in the selection of scale items was one related to reliability. As Osgood et al. (1975a) suggest, certain scale items tend to remain stable across concepts. These scale items tend to provide a more reliable measure of attitudes from one concept to the next and from one sample to another. As a result of applying these screening criteria, 14 bipolar adjective scale items were chosen for use in this study. Table 2 shows the 14 scales with coding rankings in a traditional 1 to 7 scale. Bi-polar items coded as 7 indicate a very positive attitude toward the concept or term. A score of 1, on the other hand, represents a very strong negative attitude. Summing scores from each bi-polar scale provides a summated scale score for the concept.

Table 2
Original Fourteen Semantic Differential Descriptor Scales

EVALUATIVE FACTORS	POTENCY FACTORS	ACTIVITY FACTORS
Good (7)/Bad (1)		
Honest (7)/Dishonest (1)		
High (7)/Low (1)		
Nice (7)/Awful (1)		
Happy (7)/Sad (1)		
Sweet (7)/Sour (1)		
Fair (7)/Unfair (1)		
Valuable (7)/Worthless (1)		
Needed (7)/Unneeded (1)		
Smart (7)/Dumb (1)		
	Strong (7)/Weak (1)	
	Powerful (7)/Powerless (1)	
	Thrilling (7)/Boring (1)	
		Hot (7)/Cold (1)

Reliability Testing

A *semantic differential scale* can be created by summing scores from items relating to a concept. For example, the semantic differential scale for stock (i.e., the concept) consists of summated scores from each of the bi-polar adjectives used to ascertain respondent attitudes. The resulting scale can be interpreted similarly to a Likert-type scale. As such, it is important for a semantic differential scale to show a high level of reliability. For the purposes of this exploratory study, a test of scale reliabilities was conducted using a convenience sample of 80 young employed professionals. One hundred professionally employed individuals enrolled in a university sponsored certificate program (i.e., different individuals from those who provided financial terms in the concept selection stage of the study) were asked to

complete a survey consisting of semantic differential scales, a 13-item risk assessment scale (Grable & Lytton, 1999), personal asset allocation descriptions, and basic demographic data. Information from the 80 individuals that responded to the mailed survey was used in the development and testing of semantic differential scales as described in this study.

Demographically, the average respondent resembled the profile of young working U.S. professionals. The average respondent was 30.18 years of age, with a standard deviation of 9.80 years. Approximately 55% of respondents were female, while 56% of those who responded indicated being married. Personal incomes ranged from a low of \$10,000 to over \$100,000 per year. Approximately 64% of respondents indicated having achieved an educational level of at least a baccalaureate degree.

Participants in the exploratory study were asked to complete a survey comprised of 32 concepts (Table 1), each with 14 bi-polar adjective scales (Table 2). An example of a concept with corresponding bipolar adjectives from the survey is presented in Table 3. Coding of answers followed accepted standards as published in semantic differential manuals (e.g., Snider & Osgood, 1969). Appropriate recoding of data was completed to assure that all concepts were evaluated on a scale of one to seven, with one (1) indicating a strong negative attitude and seven (7) suggesting a strong positive attitude toward the concept. For example, someone who believed that "stock" was awful would receive a score of 1, while someone who felt "stock" was nice would receive a score of 7. (Refer to Table 2 for bipolar scoring methods.) Scores for each set of bi-polar adjective scales were summed to create a total concept score or what is termed a *semantic differential scale*.

Table 3
Semantic Differential Survey Item Example

STOCK							
Awful							Nice
Boring							Thrilling
Dumb							Smart
Fair							Unfair
Good							Bad
Happy							Sad
High							Low
Honest							Dishonest
Hot							Cold
Powerless							Powerful
Sour							Sweet
Unneeded							Needed
Weak							Strong
Worthless							Valuable

Scale Reduction

The next stage in the scale development process involved reducing the number of semantic differential scales used in the assessment of financial risk-tolerance attitudes. A reliability analysis was used to reduce the number of scales. Reliability estimates, based on Cronbach's alpha, for each scale are presented in Table 4. Scales with relatively low reliability coefficients were removed. Specifically, scales with a Cronbach's alpha (i.e., reliability estimate) less than .70 were eliminated from the final analysis. The choice of a .70 level of reliability was based on recommendations by Pedhazur (1982) and others (e.g., MacCrimmon and Wehrung, 1985), who suggest that given a choice of items with a range of reliability coefficients, only those with high levels of reliability should be retained. The choice to use a relatively high alpha was

also driven by the limitations inherent in the small sample size of the exploratory study, which indicated that a high cut-point was needed in order to achieve statistically significant alphas. Once this step was complete, the remaining scales and scale items were re-evaluated for signs of consistency in scores for respondents. Certain items did not solicit strong attitude differences among respondents. These concepts were removed from further analyses. The following scales were removed: Bargain, Gain, Mutual Fund, NASDAQ, Risk, Treasury Bill, and Thrill. Twenty-five concepts remained after the reliability and ambiguity analysis.

Table 4
Scale Reliability Estimates

Item	Alpha		
Bank Account	.90	Loss	.80
Bargain	.58*	Money	.86
Bonds	.82	Mortgage	.86
Cash	.86	Municipal Bond	.88
Certificate of Deposit	.89	Mutual Fund	.61*
Chance	.91	NASDAQ	.63*
Corporate Bond	.86	Opportunity	.92
Debt	.88	Real Estate	.91
EE Savings Bond	.93	Risk	.22*
Gain	.48*	Stock	.73
Gambling	.87	Stock Market	.76
Gold	.89	Stock Option	.92
Guarantee	.90	Treasury Bill	.68*
Inflation	.84	Treasury Bond	.86
Investing	.86	Uncertainty	.88
Junk Bond	.94	*Reliability Estimate Below	
		Cut-Off Score	

Validity Assessment

As was suggested in the review of literature, it is reasonable to expect individuals with a low risk tolerance to act differently than individuals with a high risk tolerance. Someone with a high level of risk tolerance should, all things held constant, exhibit risk-taking behaviors that are different than someone with a low level of risk tolerance. Highly risk-tolerant individuals should accept volatile events, while lower risk-tolerant individuals should require higher levels of certainty. In the case of a semantic differential scale, one would expect significant differences in mean scale scores between those who exhibit high risk-taking behaviors and those that exhibit reduced levels of risk taking.

The relationship between the semantic differential scales developed in this study and a respondent's risk-taking attitudes and behavior was measured with a series of criterion-related validity tests. An examination of criterion validity involves testing the relationship between a scale and a criterion believed to be representative of the attribute or behavior under study. In this case, data were available to match semantic differential scores with a recognized risk-assessment instrument. Each semantic differential scale was compared to scores generated from a 13-item risk assessment scale (see Grable & Lytton, 1999) using a correlation coefficient. Correlation coefficients are shown in Table 5.

Table 5
Correlations Between Semantic Differential Scales and a 13-Item Risk Scale

Scale	Correlation With 13-Item Scale
Bank Account	-.3621**
Bonds	.2061
Cash	.0674
Certificate of Deposit	.1293
Chance	.3806**
Corporate Bond	.2197
Debt	-.1002
EE Savings Bond	.3727**
Gambling	.2096
Gold	-.1432
Guarantee	-.0852
Inflation	.0621
Investing	-.0007
Junk Bond	.2378
Loss	.0029
Money	.0754
Mortgage	-.0928
Municipal Bond	.2530
Opportunity	.0777
Real Estate	-.1033
Stock	.2337
Stock Market	.1665
Stock Option	.1449
Treasury Bond	.4479**
Uncertainty	.2356

** p. < .01

Four scales were found to be statistically significantly related to the 13-item scale: Bank Account, Chance, EE Savings Bond, and Treasury Bond. These scales were then compared to respondents' known level of stock and fixed income asset ownership. Respondents were asked to indicate their current level of stock, bond, cash, real estate, and other asset ownership during the data collection phase of this project. Stock ownership used in this analysis included individual stocks and stock mutual funds. Fixed income ownership included respondents' level of bond, bond mutual fund, and cash assets. It was hypothesized that scales which were highly correlated with the 13-item scale would also be highly correlated with stock and fixed income investment ownership. It was further hypothesized that the strongest scale(s) would have a statistically significant relationship with stock ownership and a statistically significant relationship with fixed income ownership in the opposite direction. Correlation relationships are shown in Table 6.

Table 6
Correlations Between Four Semantic Differential Scales, Stock Ownership, and Fixed-Income Ownership

Scale	Correlation With Stock Ownership	Correlation With Fixed-Income Ownership
Bank Account	-.4447**	.4308**
Chance	-.0777	.0665
EE Savings Bond	.2959*	-.2049
Treasury Bond	-.0060	.0593

* $p < .05$ ** $p < .01$

The correlation analysis indicated that individuals who held more positive attitudes toward bank accounts (i.e., closer to 7 than to 1) tended to own less stock and more fixed-income assets. The relationship was statistically significant. No significant relationships were noted between the Chance scale and asset ownership or between the Treasury Bond scale and asset ownership. A modest positive relationship was evident between the EE Savings Bond scale and stock ownership. Those who held a more favorable attitude towards this concept also held more stock as a percent of their portfolio. However, the scale was not statistically significantly related to fixed-income asset ownership, although the relationship was negative as one might expect.

Discussion

This paper reported results from an exploratory study of the effectiveness of the semantic differential technique in assessing financial risk-tolerance attitudes and behavior. The findings from this study suggest that the semantic differential technique offers a promising and unique insight into the risk attitudes of individual investors. Results suggest that certain semantic differential scales may be more effective than others in accurately assessing someone's financial risk-tolerance attitudes. Although only exploratory at this point, this paper has built a justification for further research using the semantic differential technique for risk-attitude assessment.

The following semantic differential scales were found to have a strong relationship with a recognized 13-item risk assessment scale: Bank Account, Chance, EE Savings Bond, and Treasury Bond. Only the Bank Account scale was found to be statistically significantly related to both a respondents' ownership of stock and fixed-income asset ownership. In this case, those respondents who held a strong positive attitude toward the bank account concept tended to be more likely to hold a larger percent of their portfolio in fixed-income assets, including cash. Respondents who held a strong negative attitude toward bank accounts, on the other hand, tended to own a greater percent of stock in their portfolios. These relationships were what one would expect theoretically. Cash and fixed income ownership was greatest for those who held a positive attitude toward a bank account, which is basically a secure, insured, cash-type asset. Individuals who held a less positive attitude toward bank accounts, on the other hand, were significantly more likely to own equities within their portfolio. These relationships suggest that the Bank Account semantic differential offers users a valid way to assess financial risk tolerance.

Results from this study have significant implications for financial planning practitioners and others who have an interest in assessing financial risk-tolerance attitudes. First, the results suggest that it may be possible to accurately assess a person's risk attitude with a semantic differential scale. Semantic differential scales have an advantage over other measurement techniques, namely, these tools are quick to administer and free from many of the cognitive traps that cause respondents trouble when completing traditional multiple choice or Likert-type assessments. Second, the statistically significant correlation between the Bank Account scale and the Grable and Lytton (1999) risk scale suggests that this one measure offers a high degree of validity for practical use. Third, the findings showing a strong correlation between the Bank Account scale and asset ownership indicates the technique's capacity to predict risky investment behavior. Practitioners and researchers interested in finding an easy to administer, quick, reliable, and valid measure of risk attitudes should consider the Bank Account scale.

Future development of semantic differential scales offers exciting possibilities. The development of semantic differential scales is not restricted to the pursuits of academicians alone. This is one area within the financial planning profession where practice can inform the development of a research agenda. Thus, it is essential that practitioners join forces with those in academic institutions in the joint development of a recognized and standardized risk-assessment instrument. Practitioners can inform research by better clarifying the concepts and descriptors used in the development of semantic differential scales. Academicians can then help practitioners implement survey techniques with clients. This synergistic approach to client attitude assessment may lead to additional insights into the strengths and weaknesses associated with the semantic differential technique.

Finally, as suggested above, this research, while promising, should be evaluated as an exploratory study. While it is true that the semantic differential technique is widely recognized as a valid and reliable technique for assessing attitudes, this research is one of the first, and possibly only, attempt(s) to use the technique in assessing financial risk-tolerance attitudes. As such, it is important to note that additional refinement and verification is needed before these scales can be used widely within the financial planning profession. More research is needed to determine if the scales may be more effective as attitude assessment tools with individuals who are less knowledgeable about investing and less inclined to believe that 'investing' is beneficial. Given this caution, however, the strength of the findings presented here does suggest promising opportunities for further research.

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¹ Instructions for the semantic differential survey:

The purpose of this study is to measure the meanings of certain concepts. You have been selected as a participant to judge concepts against a series of scales. In helping with this study, mark your choices on the basis of what the concepts mean to you. Remember, there are no correct or incorrect answers!

If you feel that the concept being judged is very closely related to one end of the scale, you should place your mark as follows:

Fair		X										Unfair
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If you feel that the concept is quite closely related to one the other end of the scale (but not extremely) you should place your mark as follows:

Strong								X				Weak
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If the concept seems only slightly related to one side as opposed to the other (but is really not neutral) then you should mark as follows:

Active				X								Passive
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If you consider the concept to be neutral on the scale, both sides equally associated with the concept, or if the scale is completely irrelevant to the concept, you should place your mark on the middle space:

Safe						X						Dangerous
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Be sure to mark EVERY scale for every concept on the following pages. Please do not omit any scales – even if you think the scale does not apply to you.

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