
ARTICLES

Comparing the Traits of Stock Market Investors and Gamblers

Janice W. Jadow and John C. Mowen

Oklahoma State University

The goal of this research is to investigate to what extent gamblers and stock investors share similar characteristics. Using survey data, a hierarchical model of personality is employed to compare the traits of gamblers and investors. The results reveal that gamblers and investors share five trait characteristics and differ on three traits. Cluster analysis supports the proposal that gamblers and investors can be divided into four groups that differ across the personality traits. As a result, divergent communication strategies should be used to influence each group's propensity to invest and/or to gamble.

Keywords: Stock investing, Gambling, Personality, Behavioral finance

"It is generally agreed that casinos should, in the public interest, be inaccessible and expensive. And perhaps the same is true of stock exchanges." (Keynes [1936, p. 159])

"Some investors may be akin to gamblers flocking to Las Vegas. These gamblers know they are unlikely to make money. But they enjoy themselves nonetheless." (Stephen Thorley, as quoted in Clements [1998])

As the two quotes suggest, gambling and investing in the stock market have many commonalities. Most important, both involve placing financial resources at risk. In addition, the level of interest shown by the public in both activities has increased in the last decade. For example, according to the Federal Reserve Board's Survey of Consumer Finances, 49% of all families held stock in publicly traded companies directly or indirectly in 2004 compared to 40% in 1995. Similarly, the gambling industry has experienced tremendous growth. According to the National Council on Problem Gambling (2006), approximately 60% of U.S. adults gamble at least once a year. Except for Hawaii and Utah, every state in the United States has legalized some form of gambling. Gambling revenues obtained through legal means were estimated to be nearly \$73 billion in 2004, about \$30

billion more than the total spent on other entertainments such as movies, sports, music, and theme parks (McCormick [2005]).

Various pundits have discussed the differences in gambling and stock market investing. The fathers of value investing, Graham and Dodd [1940, p. 63] define an investment "[a]s one which, upon thorough analysis, promises safety of principal and a satisfactory return." Any other purchase they regard as speculation. These authors identify three requirements for an investment, and gambling does not satisfy these. That is, gambling often depends more on luck than analysis, the stake can be entirely lost, and a lucky bet can result in an excessive (far more than a satisfactory) return. Pundits in the financial press also distinguish gambling from investing. For example, one column notes that investing involves taking a disciplined approach to taking risk and providing an economic function versus inventing risk and enjoying entertainment (Hoenig [2007]). An investment newsletter notes perceived distinctions, including that "investing is based on skill and requires the use of a system based on research, while gambling is based on luck and emotions"; and because gambling has a negative expected value and investing a positive expected value, "investors are risk-averse, while gamblers are risk-seekers" (Murcko [2007]).

The problem with these distinctions between gambling and investing is that supposed disciplined investors frequently act like gamblers. Indeed, the demise of Long Term

Address correspondence to Janice Jadow, Associate Professor and Regents Service Professor, Spears School of Business, Oklahoma State University, Stillwater, OK 74078. Email: janice.jadow@okstate.edu

Capital Management, Lehman Brothers, Bear Stearns, and IndyMac illustrates how seasoned investors, trained at the best universities, can act like gamblers. Krantz [2007] states that investing is very much like gambling. According to this author, the primary difference is time: investors have a longer time horizon while gamblers focus more on short-term entertainment.

The goal of this research is to investigate the personality traits of gamblers and of stock investors. We propose and empirically show that gamblers and stock market investors share a number of traits. Indeed, we identify a cluster of individuals who appear to participate in the stock market for the purpose of gambling rather than investing. However, we also show that there are key differences as well, and one of them is time horizon as suggested by Krantz [2007].

Our research has both academic and practical importance. From an academic perspective, it provides an opportunity to test hypotheses concerning the factors that motivate individuals to invest and to gamble. To our knowledge, we are the first researchers to compare and contrast the personality traits of gamblers and stock investors in a single study. We develop a number of new scales having relevance to gambling and stock investing propensity, including measures of a global propensity to purchase stock and to gamble, as well as measures of financial conservatism, numeracy, and superstition. These traits are included in a hierarchically arranged set of 17 constructs. This approach advances previous research, which has tended to focus on bivariate correlational relationships. In addition, the analysis of the data via structural equation modeling and by cluster analysis provides complementary perspectives on gambling and stock investing.

From the perspective of the marketing of financial services, by identifying the trait characteristics of segments of consumers relative to their propensity to invest in stocks, it is possible to tailor messages that influence people to invest for the long term. It is also possible for financial services firms to use the results of this study to screen prospective employees who are likely to make decisions based on motives more aligned with investing than gambling. From a public policy view, our research shows that different approaches are needed to encourage differing personality types to participate in the stock market for improved retirement planning. Similarly, appropriate personality-based messages may be developed to discourage gambling—whether at a gaming table or in the stock market.

This article is organized along the following lines. First we present an overview of a model of motivation and personality that is employed as a structure for organizing the trait predictors of the two activities. We then review the literatures in finance and psychology on the trait predictors of stock market investing and of gambling. Here we identify the traits that will be investigated and our hypotheses. The methodology and results of a survey of a sample of consumers broadly representative of the U.S. population is

presented. We then discuss the results and their implications for theory and practice.

AN ORGANIZING STRUCTURE: THE 3M MODEL

We employ the 3M Model (Mowen [2000]) as the theoretical foundation for organizing the trait predictors of gambling propensity and stock market involvement. (3M stands for “metatheoretic model of motivation.”) Because the 3M Model has been presented previously (e.g., Mowen [2000], Licata, Mowen, Harris, and Brown [2003], Mowen [2004], Mowen, Park, and Zablah [2007]), it is described briefly in this article.

The 3M Model organizes traits based on their level of abstraction, and four levels are identified—elemental, compound, situational, and surface traits. Figure 1 diagrams the model that will be employed. In the following paragraphs, we describe the four trait levels and where in the hierarchical model each of the traits under investigation is placed.

Residing at the highest abstraction level and cross-situational in nature, the elemental traits are the most basic components of the hierarchically organized system. Elemental traits are proposed to result from genetic influences and the early learning history of the individual. Five of the eight elemental traits are derived from Saucier’s [1994] version of the Five-Factor Model of Personality: openness to experience, conscientiousness, extroversion (measured as introversion), agreeableness, and emotional instability. Using an evolutionary psychology perspective, three additional elemental traits are proposed by Mowen [2000] as residing at the elemental level: the needs for body resources, material resources, and arousal. Consistent with previous research using the 3M Model, each of the eight elemental traits is placed at level four and investigated either as a control variable and/or as a hypothesized antecedent of gambling and/or investing propensities. Mowen and Voss [2008] argue that the elemental traits should always be included as control variables to avoid illusory prediction, which is a type of missing variable problem that occurs when a more concrete trait appears to predict an outcome construct when in fact it is the effect of one of the elemental traits that is the cause of the relationship.

At the next level in the hierarchy are compound traits. They are defined as cross-situational, enduring dispositions that result from culture, subculture, and the effects of combinations of elemental traits. In this research, we investigate four traits at the compound level: competitiveness, impulsiveness, present-time orientation, and need for learning. As is shown later in this article, previous research supports their inclusion in the model.

At level two in the hierarchy are situational traits, which result from the effects of elemental traits, compound traits, and the press of the general situational context in which

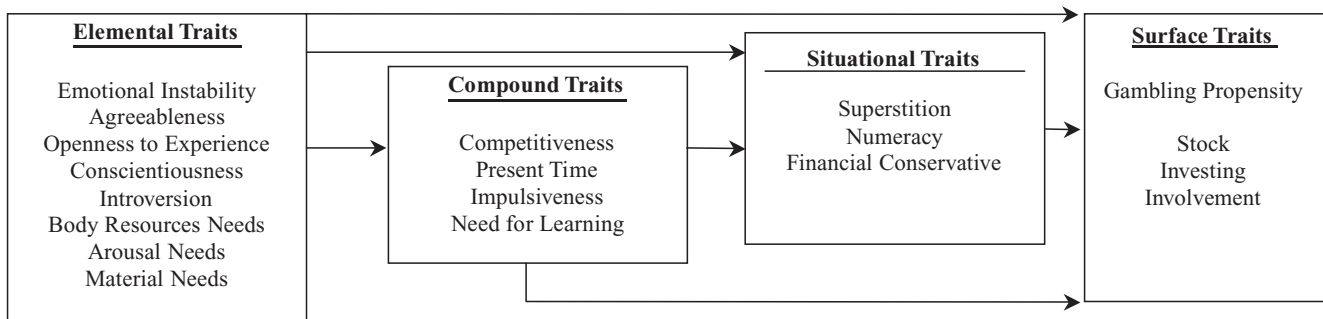


FIGURE 1 The hierarchical model.

behavior occurs. In this research, we place three constructs at the situational level—superstition, financial conservatism, and numeracy. They are placed at the situational level because each of these traits can be exhibited only within a situational context in which it is possible to reveal the behavior. For example, financial conservatism can only be shown in contexts in which money is changing hands. Similar to the compound traits, situational traits may mediate the effects of the more basic traits on gambling and stock investing propensities.

In the 3M Model, surface traits represent the most concrete and context-specific enduring dispositions and belief patterns. These enduring dispositions and beliefs result from the combined effects of elemental, compound, and situational traits. In addition, they result from the press of the specific situational context. They are strongly predictive of behavior because they include both a behavioral and an affective component in their measurement. In the present research, measures of enduring dispositions to gamble and to invest in stocks are placed at the surface level. The four-item scales contain items designed to measure feelings about the behaviors (e.g., “I really enjoy gambling for money,” “I really enjoy buying stocks”) and behavioral tendencies (e.g., “Whenever I have the opportunity, I will make a bet”, “Whenever I have the opportunity, I will purchase a stock”). Thus, the measures of the surface traits of stock investing and gambling propensity are worded similarly, and they assess a wide range of levels of behavior related to investing and gambling activity. At the highest levels, the measures assess individuals who may exhibit excessive forms of the behaviors—whether at the gaming table or in the stock market. At the lowest levels, the measures identify individuals who do not engage in either of the two types of behavior.

BACKGROUND LITERATURE AND HYPOTHESES

When one investigates gambling and stock investing, the topic of risk must be broached. Expected utility theory in its various forms is the traditional way to measure attitude toward risk. One of its basic tenets is the prevalence of risk

aversion (Kahneman and Tversky [1979]). Indeed, the risk-return tradeoff pervasive in the finance literature is based on individuals being risk averse and therefore requiring a greater expected return to accept greater risk with regard to their investing decisions. Yet behaviors differ among individuals regarding situations involving similar risks, and individuals’ risk-taking behaviors differ among various contexts. Various interpretations of utility theory have been developed in attempts to make the theory fit with observed behaviors.¹ In addition, alternative theories of choices involving risk have been developed. Prospect theory (Kahneman and Tversky [1979]) is a well-known example of an alternative to utility theory and explains a number of individual behavioral inconsistencies to risk and uncertainty. Because individuals do not always act rationally, behavioral finance—in contrast to traditional finance—focuses on understanding why people differ in their responses to uncertain situations. Our research is consistent with this tradition.

Research within the behavioral finance literature has only recently begun to examine the impact of personality on the level of stock investing.² As a result, there are a relatively small number of studies from which hypotheses can be drawn. In contrast to financial investing, a plethora of studies exist investigating the trait predictors of gambling.

In our literature review, we found two studies that directly compare gamblers and stock investors. Weber, Blais, and Betz [2002] develop a scale to assess risk taking and find that risk taking reflects differences in the perception of the benefits and risks of an activity rather than differences in attitude toward risk. They demonstrate that the degree of risk-taking is highly specific across six domains, two of which are related to financial risk. Factor analysis of the data shows that investment and gambling each have well-defined factor loadings for both the risk behavior and risk perception scales. They conclude that risk taking differs between the domains of investing and gambling. From the perspective of the present research, however, the Weber, Blais, and Betz [2002] study can say nothing about the underlying motivation for gambling and investing. In other research, Keller and Siegrist [2006] investigate a scale designed to assess money attitudes for eight money-related components, including attitude toward

investing in stocks and attitude toward gambling. From the responses, they create four clusters based on attitude rather than behavior. Again, however, these researchers fail to investigate the underlying motives for gambling and/or investing. In sum, our current research also differs from these two studies in that it investigates a theoretically derived set of personality traits that form the motivational structure for gambling and/or investing. In addition, we assess surface trait measures of behavioral propensities to gamble and invest rather than attitudes. This is important because the relationship between attitudes and behavior is frequently very low—particularly in comparison to measures of behavioral propensities.

Hypotheses Development

In this section, we review pertinent literature on stock investing and gambling to develop hypotheses as to the traits that are predictive of these behaviors. Because we employ the 3M Model as the theoretical structure for placing traits, we develop hypotheses for elemental, compound, and situational trait predictors of gambling and stock investing in that order.

Elemental Trait Predictions

In the 3M Model, the elemental traits are composed of the Big-Five traits along with three additional traits—the need for arousal, the need to protect and enhance the body, and the need to protect and enhance material resources. Consistent with the approach advocated by Mowen [2000] and Mowen and Voss [2008], each of the eight elemental traits is included in the analysis as a control variable to minimize the likelihood of the occurrence of an omitted variable problem. Interestingly, however, specific predictions can be made for several of them.

The literature reveals that one of the key features of gambling is the excitement and arousal it generates. Thus, the traits receiving the greatest support as predictors of gambling are the need for arousal and the closely related traits of sensation seeking and optimum stimulation level. For example, in an examination of the role of optimum stimulation level (OSL), Steenkamp and Baumgartner [1992] find that subjects with higher OSLs are significantly more likely to gamble than those with lower OSLs. Similarly, McDaniel [2002] finds that sensation seeking is positively associated with participation in promotional games. From a theoretical perspective, a positive association between arousal and gambling makes sense. The risk associated with gambling increases physiological arousal, which should be sought after by those with a high need for sensation.

We anticipate that the same relationship will be found for stock investing. That is, because of the risk involved, those who are more active stock investors will have a higher need for arousal. Studies support this hypothesis, although they focus on trading rather than participation in the stock market. For example, Grinblatt and Keloharju [2006] propose that the entertainment value of trading has consumptive ap-

peal similar to the element of risk and thrill obtained from gambling. They find that investors with the psychological attribute of sensation seeking trade stocks more frequently. Similarly, Keller and Siegrist [2006] survey households and group the respondents (current and potential investors) according to their attitudes about money. They find four clusters of investors: safe players, risk seekers (both of whom like money-related matters), open books, and money dummies (both of whom have low interest in money matters). Of the four groups, the risk seekers have the most positive attitudes toward securities, the stock market, and gambling. These results suggest that both stock market investors and gamblers share a trait involving risk-taking propensity, which is assessed by the elemental trait of need for arousal.

H1a: The need for arousal will be positively related to gambling propensity.

H1b: The need for arousal will be positively related to stock investing propensity.

Arguably, the dominant trait theory in psychology today is the Big-Five Model. Our review identifies six studies that employ various versions of the Big-Five traits to investigate various forms of gambling and three studies utilizing the traits to investigate investing. (The Big-Five traits are emotional instability, conscientiousness, openness to experience, extroversion, and agreeableness.) In general, the results of the studies related to gambling can be described as quite mixed, with many examples of a failure to replicate. Among the Big-Five traits, the one showing the most consistent relationship to gambling is emotional instability (i.e., neuroticism), which refers to the tendency to be moody, temperamental, and depressed. Four out of six studies in our review find a positive relationship between emotional instability and gambling behavior. For example, Blaszczynski, Steel, and McConaghy [1997] as well as Walsh [2002] find that gamblers are higher in emotional instability (neuroticism). Theoretically, for individuals with high levels of emotional instability, gambling may provide a useful means to cope with anxiety and depression. Thus, from our review of the studies using the Big-Five Model, we derive our second hypothesis.

H2a: Emotional instability will be positively related to gambling propensity.

What is the expected relationship between emotional instability and stock investing? Writing on his Web site, Murko [2007] refers to the perception that gambling is based on luck and emotions and, in contrast, investing is based on skill and sound research. These ideas suggest that emotional instability will be negatively related to stock investing. Academic studies of emotional stability and stock investing yield mixed results, however. For example, in a study utilizing the Big-Five personality inventory, Durand, Newby, and Sanghani [2006] investigate the impact of personality on investors' opinions on investing and exposure to stocks and find no

evidence that emotional instability is associated with investors' opinions on investing. They do find that extroversion has a significant, positive relation to exposure to stocks and agreeableness a negative relationship. Consistent with the extroversion finding, Hong, Kubick, and Stein [2004] find that social individuals are more likely to invest in the stock market. They reason that social interaction may influence stock market participation through word-of-mouth, through observational learning, or through finding pleasure from talking about the movements of the market with friends. Overall, while past research does not support the negative relationship between emotional instability and investing, the trade literature strongly supports the proposal that emotions should be controlled when investing, which is a characteristic of a stable person. In addition, evidence for a positive relationship between extroversion and investing as well as a negative relationship of agreeableness with investing is found in the literature. Thus, we propose the next three hypotheses, utilizing three of the Big-Five traits for investing propensity.

- H2b:** Emotional instability will be negatively related to stock investing propensity.
- H3:** Extroversion will be positively related to stock investing propensity.
- H4:** Agreeableness will be negatively related to stock investing propensity.

Four of the Big-Five traits fail to show consistent relationships with gambling in the literature (conscientiousness, openness to experience, extroversion, and agreeableness). Similarly, the literature does not find relationships for two of the Big-Five traits and stock market investing propensity (conscientiousness and openness to experience), nor do we find a relationship of body resource needs with gambling or investing propensities.

Moving beyond the need for arousal and the Five-Factor traits, research studies obtain findings suggestive of additional traits related to gambling and investing propensities. One motive for gambling and for investing is the desire to make money. Thus it is generally assumed that economic incentive is one of the primary motives for most gamblers (Cotte [1997]). For example, in a survey of 70 students, Gibson and Sanbonmatsu [2004] find that making money is a motivator for gambling. We believe that the need for material resources will be positively associated with stock investing propensity for similar reasons. Malkiel [2007, p. 27] notes that "we must undertake investment strategies that maintain our real purchasing power; otherwise, we are doomed to an ever-decreasing standard of living." Thus, like gamblers, people invest to make money. A trait that is closely related to the motive of making money is materialism. This suggests that the desire to enhance one's level of material resources is likely to be a motive for gambling and investing. As such, we hypothesize the following.

- H5a:** The need for material resources will be positively related to gambling propensity.
- H5b:** The need for material resources will be positively related to stock investing propensity.

Compound Trait Predictions

Moving beyond the elemental traits, the next category of traits to consider are compound-level traits, and we identify four for investigation. One of the strongest findings in the literature is a positive relationship between competitiveness and gambling. For example, Parke, Griffiths, and Irwing [2004] find a strong relationship between competitiveness and pathological gambling. They state that the "... most lucid result from this study is the strong prediction value of competitiveness as a risk factor for pathological gambling" (p. 209). Similarly, to make a contest more interesting, people frequently bet on who will win a sports competition (e.g., Final Four NCAA Basketball Tournament).

- H6a:** Competitiveness will be positively related to gambling propensity.

Our literature review fails to find any studies investigating the relationship between competitiveness and the propensity to invest.³ Although the relationship between competitiveness and *the propensity for* stock investing has not been investigated previously, we anticipate that to deal with the inevitable losses that occur when investing, those who enjoy investing will have a higher need to compete. That is, those with a need to compete are able to deal with the possibility of loss because that is inherent in competition. In addition, there is an element of a zero sum game when investing in the stock market, which should appeal more to competitive individuals. That is, one person wins and another loses, which is at the heart of competition. Thus, we anticipate that a similar association will be found between competitiveness and stock market investing.

- H6b:** Competitiveness will be positively related to stock investing propensity.

In our literature review of gambling, six studies find evidence that impulsiveness is positively related to gambling behavior (Clarke [2004, 2006], Vitaro, Arseneault, and Tremblay [1999]). For example, Vitaro et al. [1999] find that children who score high on self-reported impulsivity measures are more at risk of becoming gamblers than others. Blaszczynski et al. [1997] find that impulsivity is highly associated with the degree of severity of psychological and behavioral change in pathological gamblers. According to Puri [1996, p. 88], "... impulsive behavior refers to individuals' preferences for an option that offers immediate hedonic benefits, but serious long-term consequences." These examples suggest that impulsive individuals lack inhibitory control to keep them from responding appropriately in the face of

positive or negative consequences. Therefore, we hypothesize as follows.

H7a: Impulsiveness will be positively related to gambling propensity.

An interesting question concerns the relationship of impulsiveness with stock investing. On one hand, the impulsive purchase of stocks could be quickly punished in the stock market. On the other hand, there are occasions when quick action can result in profits in the stock market. Our literature review of investor personality finds only one study that includes impulsivity. Zaleskiewicz [2001] distinguishes between two types of risk taking, instrumental risk taking (orientation toward a particular goal) and stimulating risk taking (orientation toward the search for excitement). While the former is associated with risk preference in the investment domain and the latter with gambling risks, he finds that both are positively related to the impulsivity trait. Although perhaps surprising, he attributes the result to the fact that "one cannot expect that risk taking would be a kind of strictly reflective behavior, even in its instrumental form. If anybody wants to take advantage of some market chances, she has to act very quickly" (p. S120–121). A seminal schema (Bailard, Biehl, and Kaiser [1986]) focuses on two dimensions of personality, decision confidence and decision style, where decision style ranges from careful to impetuous. The resultant four personality classifications among individuals who invest are: careful-confident individualists, impetuous-confident adventurers, careful-anxious guardians, and impetuous-anxious celebrities. Because of these conflicting views of the role of impulsivity and stock investing, we make no prediction concerning the relationship between impulsiveness and stock investing propensity.

The third compound-level trait of interest is present-time orientation. The difference in the time orientation between investing and gambling is noted by Malkiel [2007, p. 26] in his classic book *A Random Walk Down Wall Street*: "Investing [i]s a method . . . to gain profit in the form of reasonably predictable income (dividends, interest, or rentals) and/or appreciation over the long term. It is the definition of the time period for the investment return and the predictability of the returns that often distinguish an investment from a speculation." Hershey and Mowen [2000] develop a scale to measure this present-time orientation construct. They find the construct to be negatively related to consumers' level of retirement planning. Because investing in the stock market is part of retirement planning behavior, we anticipate that present-time orientation will be negatively related to stock investing propensity.

On the other hand, we anticipate that gamblers will tend to have a present-time orientation because they are seeking short-term gains. Zaleskiewicz [2001, p. S105] finds that "instrumental risk taking is related to risk preference in the investment domain and is determined by personality traits

connected with orientation toward the future . . . whereas those individuals with a preference for . . . gambling risk ha[ve] personality features connected with paratelic orientation." Thus, we propose a reversal of signs for the relationship between present-time orientation and gambling propensity versus stock investing propensity.

H8a: Present-time orientation is positively related to gambling propensity.

H8b: Present-time orientation is negatively related to stock investing propensity.

The fourth compound trait we investigate is the need for learning. First proposed as a trait by Mowen [2000], it was later investigated by Harris, Mowen, and Brown [2005] in the exploration of factors influencing the job performance of sales personnel. With regard to investing, one of the Graham and Dodd [1940] requirements for an investment as opposed to a speculation is a "thorough analysis." Later, Malkiel [2007, p. 28] notes that "a successful investor is generally a well-rounded individual who puts a natural curiosity and an intellectual interest to work to earn more money." We anticipate that to be successful, stock investors must collect a great deal of information and have a desire to learn about the companies or mutual funds in which they invest. In contrast, because gambling has a larger chance component than stock investing, we did not anticipate a significant relationship.

H9: The need for learning will be positively associated with stock investing propensity.

Situational Trait Predictions

Several researchers find that participation in gambling activities is related to superstitious beliefs. Lucky charms and rituals are widely used by many gamblers. King [1990] describes several superstitious behaviors used by bingo players, including psychokinesis or premonitions and thoughts or chanting a number. Joukhador, Blaszczyński, and Maccallum [2004] find that problem gamblers tend to possess superstitious beliefs to a greater degree than nonproblem gamblers and that such beliefs are correlated with gambling intensity. Rogers [1998, p. 124] concludes that "superstitious thinking is likely to exist in most gambling activities, in particularly, other games of chance." The rationale for such positive association is that superstitious beliefs may give gamblers an illusion of control and the false perception that one can influence the outcome of a chance event. Therefore, we propose the following.

H10a: Superstition will be positively related to gambling propensity.

An interesting question concerns whether superstition will be associated with stock investing propensity. We believe the answer is yes. There is copious anecdotal evidence that

investors can be superstitious. For example, a *Wall Street Journal* article notes that Chinese investors seek stocks that have the number 8 in their ticker codes (Areddy [2007]). There are also stock funds, such as *The Astrologers Fund*, that base their stock picks on companies' astrological signs. Then there is the famous Super Bowl Stock Market Predictor, which states that if a team from the "original" National Football league rather than the "old" American Football League wins the Super Bowl, the market will go up. Between the first Super Bowl in 1967 and the 2007 game, the predictor has been right more than 81% of the time (Power [2008]). Apparently, some investors actually use the indicator (Dobosz [2004]).

H10b: Superstition will be positively related to stock investing propensity.

Because both investing and gambling involve the possibility of taking a loss, we anticipate that a measure of financial conservatism will be negatively associated with each construct. Both pursuits have elements of a zero-sum game, that is, for every winner there is a loser. Thus, in both pursuits there is a possibility of losing money, which a highly financially conservative person would find distasteful. In their money attitude typology, Keller and Siegrist [2006, p. 91] find the "safe players" cluster to be "cautious in financial matters . . . and to have a negative attitude about stocks, the stock market, and gambling." Based on these ideas, we include a general measure of financial conservatism as an antecedent to gambling propensity and stock investing propensity and propose a negative relationship between it and our two focal constructs.

H11a: Financial conservativeness will be negatively related to gambling propensity.

H11b: Financial conservativeness will be negatively related to stock investing propensity.

The last trait we hypothesize to influence investing and gambling is numeracy. We anticipate that both gambling and stock investing involve a heavy use of numbers. In gambling, numbers are used to calculate the odds of winning. In investing, numbers must be understood to read financial statements and market data and estimate the future value of a company. Our review of the literature includes two studies of numeracy and investing. Christelis, Jappelli, and Padula [2006] find that cognitive abilities are a significant factor positively related to the propensity to invest in stock, either through direct participation or indirectly through mutual funds or investment accounts, and controlling for education. The results hold for each of three domains of cognitive abilities: numeracy, verbal fluency, and memory. Van Rooij, Lusardi, and Alessie [2007] also document a strong positive relationship between financial literacy and stock market participation. Thus we propose

that a measure of numeracy will be positively related to both stock investing and gambling propensity.

H12a: Numeracy will be positively related to gambling propensity.

H12b: Numeracy will be positively related to stock investing propensity.

METHODOLOGY

The data for this study are obtained through an online consumer panel run by Zoomerang.com. Our four-page survey was posted on the Web site, and responses were collected through the Web. Zoomerang's panel connects researchers to any target audience worldwide. For our study, we requested a panel representative of the U.S. population. Zoomerang states that its technology assures that the panel accurately represents the requested population. In addition, it validates that the participants are who and where they say they are, and they crosscheck the respondents for uniqueness with the panel. The respondents are not paid but receive Zoomerang points that can be redeemed for merchandise, gift certificates, or charitable donations.

Over a five-day period, a total of 1,158 completed surveys were received for a 45% response rate. The demographic characteristics of the sample are gender (58% male), age (12%, 18–24; 63%, 35–64 years; 25%, 65+), and education (42% had a least a college degree and 35% had some college). A review of U.S. Census data reveal that the demographics of the sample are generally consistent with the U.S. population. An analysis reveal no significant differences in early and late responders in the mean responses to the constructs investigated.

Our structural model includes 17 constructs: the eight elemental traits, the compound traits of competitiveness, need for learning, present-time orientation, and impulsiveness; the situational traits of superstition, numeracy, and financial conservatism; and the two surface traits of gambling propensity and stock investing involvement. (These scales are found in the Appendix.)

For the elemental and compound traits respondents are asked, "How often do you feel/act this way." Responses are taken on nine-point scales with the end points labeled "never" and "always." The situational and surface traits are assessed by 7-point Likert scales with end points labeled "strongly agree" and "strongly disagree."

The measures of elemental traits and the compound trait of competitiveness are taken from Licata et al. [2003] and Mowen [2000]. The measure of impulsiveness is adapted from the Eysenck Impulsive Scale (Eysenck and Eysenck [1977, 1978]). It is widely used in most prior gambling studies (e.g., Blaszczynski et al. [1997], Clarke [2006], Vitaro, Ferland, Jacques, and Ladouceur [1998]). The original Eysenck scales contain 23 impulsiveness items. Since the

scale is long, we adapt several items with high factor loadings on the scale and develop a new four-item measure of impulsiveness as a compound trait. Our review of the literature provides the basis for our hypotheses relating the surface traits of gambling propensity and stock market involvement to the personality traits. Five elemental traits for gambling (conscientiousness, openness to experience, extroversion, agreeableness, body resource needs) and three elemental traits for investing (conscientiousness, openness to experience, and body resource needs) are not included in the hypotheses but are included in the statistical analysis as control variables.

We create three situational-level measures for this study. The literature search does not reveal an extant measure of financial conservatism, so we create a set of four items to measure the construct (e.g., "I am extremely financially conservative" and "I take steps to keep my money safe") (see Appendix). Similarly, we develop four items to assess both superstition and numeracy. Four-item scales are employed to assess stock investing involvement and gambling propensity. It should be noted that the use of four-item scales is inconsistent with the approach typically employed by psychologists to measure traits. Because of the large number of constructs employed in a hierarchical model, Mowen [2000] and Mowen and Voss [2008] argue that constructs should be assessed with a small number of items.

To test the predictive validity of the two surface traits, a question is also included that asks respondents, "About how many times a year do you gamble in any way." A 7-point scale is employed with the end points labeled "never" and "almost every day." The correlation between the measure of gambling propensity and frequency of gambling is $r = 0.60$ ($p < 0.001$). A similar measure is asked for purchasing stocks, and the correlation is $r = 0.70$ ($p < 0.001$). This relationship supports the predictive validity of the measures of gambling propensity and stock investing propensity.

RESULTS

We analyze the data via three approaches. First, we perform a series of analyses to test the discriminant validity of the constructs. Second, we employ structural equation modeling (SEM) to test the hypotheses. Third, we use cluster analyses to identify four groups of individuals based on their gambling and stock investing propensities. These groups are then compared using analysis of variance to identify the traits on which they differ. This approach is useful for identifying different segments of investors/gamblers.

Discriminant Validity Assessments

The first set of analyses assesses the discriminant validity of the surface, situational, and compound traits. (Because numerous previous studies investigate the elemental traits, they

are not included in the tests for discriminant validity.) We conduct a factor analysis (maximum likelihood estimation with varimax rotation). The cumulative variance explained is 76.3%. The analysis reveals a clean set of nine factors with no cross-loadings of items. All factor scores are above 0.61 and at least 0.40 greater than scores associated with other constructs. We also perform a confirmatory factor analysis, and the fit indices support the discriminant validity of the constructs (CFI = 0.93, TLI = 0.94, RMSEA = 0.06). All measures reveal acceptable internal reliabilities with coefficient alphas above 0.80. We compute the average variance extracted (AVE) for each compound, situational, and surface trait. (Variance extracted reflects the overall amount of variance in the indicators accounted for by the construct.) The threshold for variance extracted is 0.50 (Fornell and Larcker [1981]), and the AVEs for all traits are well above 0.50.

Hypothesis Testing

To test the hypotheses, we estimate both the SEM and bivariate correlations. The SEM analysis employs a partial mediation model in which paths are created from the elemental traits to the compound, situational, and surface traits; paths are run from the compound traits to the situational and surface traits; and paths are run from the three situational traits to the surface traits of gambling and stock investing propensities. (Amos 5.0 was used to perform the SEM analysis.) Multiple indicators are employed for the surface, situational, and compound traits. Single indicators are employed for the elemental traits. Fit statistics for the model are acceptable (CFI = 0.92, TLI = 0.91, RMSEA = 0.05). Variance accounted for in each of the constructs is: gambling propensity = 35.9%, stock investing propensity = 23.4%, financial conservatism = 10.0%, superstition = 20.7%, numeracy = 14.4%, competitiveness = 44.7%, impulsiveness = 24.8%, present-time orientation = 14.9%, and need for learning = 53.7%.

We also calculate bivariate correlations because of the likelihood that the hypothesized relationships between elemental traits and surface traits and/or between compound traits and surface traits may be fully mediated by intervening constructs. Table 1 summarizes the findings for the hypotheses.

The results of the correlation analysis reveal that 18 of the 20 hypotheses are supported. SEM analysis supports 16 of the 20 hypotheses. Thus, in two cases the direct relationship between a construct and a surface trait is mediated by an intervening construct.

H1a and H1b propose that the need for arousal is positively related to gambling and stock investing propensities. The analysis supports the prediction for gambling but not for stock investing. The bivariate correlation of need for arousal with stock investing, however, is significant ($r = 0.27$, $p < 0.001$). The relationship of need for arousal, an elemental trait, with stock investing is mediated by one or more of the compound or situational traits. Additional analyses reveal

TABLE 1
Test of Hypotheses for Gambling Propensity and Stock Investing Involvement.

Hypotheses	SEM Results	Correlations
H1a Need for arousal → gambling	Supported ($t = 2.17, p < 0.05$)	0.326**
H1b Need for arousal → investing	Not Supported ($t = 0.91, p > 0.36$)*	0.268**
H2a Emotional instability → gambling	Not Supported ($t = -1.15, p < 0.25$)	0.114**
H2b Emotional instability ← investing	Supported ($t = -2.17, p < 0.05$)	0.021
H3 Extroversion → investing	Not Supported ($t = 1.12, p < 0.25$)	0.005
H4 Agreeableness ← investing	Supported ($t = -1.80, p < 0.07$)	-0.077**
H5a Material resource needs → gambling	Supported ($t = 2.27, p < 0.05$)	0.273**
H5b Material resource needs → investing	Supported ($t = 2.33, p < 0.05$)	0.224**
H6a Competitiveness → gambling	Supported ($t = 5.70, p < 0.001$)	0.364**
H6b Competitiveness → investing	Supported ($t = 3.63, p < 0.001$)	0.318**
H7 Impulsiveness → gambling	Supported ($t = 2.07, p < 0.05$)	0.287**
H8a Present time orientation → gambling	Supported ($t = 2.67, p < 0.01$)	0.144**
H8b Present time orientation ← investing	Supported ($t = -2.31, p < 0.05$)	-0.055
H9 Need for learning → investing	Not Supported ($t = 0.64, p < 0.50$)*	0.164**
H10a Superstition → gambling	Supported ($t = 2.92, p < 0.01$)	0.337**
H10b Superstition → investing	Supported ($t = 9.10, p < 0.001$)	0.128**
H11a Financial conservatism → gambling	Supported ($t = -6.52, p < 0.001$)	-0.198**
H11b Financial conservatism → investing	Supported ($t = -6.87, p < 0.001$)	-0.186**
H12a Numeracy → gambling	Supported ($t = 3.81, p < 0.001$)	0.246**
H12b Numeracy → investing	Supported ($t = 6.95, p < 0.001$)	0.286**

Note: *indicates that while the direct path was not significant, the bivariate correlation was significant, which indicates that the hypothesized relationship was fully mediated by one or more of the intervening traits.

**correlation significant at the 0.01 level.

that when competitiveness is removed from the analysis, the relationship between need for arousal and stock investing propensity becomes significant. Because the need for arousal is an antecedent to competitiveness, this finding indicates that competitiveness is the mediating construct.

H2a proposes that emotional instability is positively associated with gambling, and H2b proposes a negative relationship with investing. The SEM analysis supports the hypothesized negative relationship of emotional stability with investing. In contrast, the expected positive relationship with gambling is not found (H2a). However, the correlation of emotional instability with gambling is significant ($r = 0.11, p < 0.001$). The effect is fully mediated by one or more of the situational traits. Additional analyses reveal that emotional instability and material needs are correlated; when material needs are not included in the analysis, the relationship of emotional instability and gambling is significant.

H3 proposes a positive relationship between extroversion and investing. Neither the SEM nor the correlation analysis supports the prediction. In H4, a negative relationship is hypothesized between agreeableness and stock investing propensity, and this effect is supported.

Hypotheses 5–8 are all supported by our results. H5a and H5b propose that material resource needs will be positively

associated with gambling and stock investing propensities. Similar results are obtained for H6, which proposes that competitiveness is positively associated with the two surface traits. It is hypothesized in H7 that impulsiveness is positively associated with gambling propensity, and this effect is obtained. Finally, in H8a and H8b we propose that present-time orientation is positively associated with gambling and negatively associated with stock investing. Both hypotheses are supported.

H9 proposes that the need for learning, a compound-level trait, is positively associated with stock investing. The SEM analysis fails to support the prediction. The bivariate correlation between the need for learning and stock investing is significant, however ($r = 0.16, p < 0.001$). Thus, the effect is fully mediated by one or more of the situational traits.

The last set of hypotheses concerns the relationship between the situational traits and the two surface traits. Hypotheses H10a and H10b propose that a measure of trait superstition is positively associated with both gambling and stock investing propensities, and the results support the hypotheses. In H11a and H11b, we predict that financial conservatism is negatively related to gambling and stock investing propensities, and these propositions are also supported.

Finally, H12a and H12b propose positive relationships between numeracy and gambling and stock investing propensities, and the results support these predictions.

Additional SEM Findings

An important question concerns whether any of the relationships are changed if demographic variables are included in the analysis. Using hierarchical regression, an analysis is performed in which the demographic variables are added to the previously employed model as control variables. The results are then compared to a model in which the demographic variables are not included. The results indicate that each demographic variable is a significant predictor of gambling propensity. Consequently, males ($p < 0.001$) and younger respondents are more likely to gamble ($p < 0.05$). Those with lower education levels are more likely to gamble ($p < 0.01$). However, the addition of the three demographic variables did not change any of the effects previously obtained for the trait predictors of gambling propensity. A similar analysis was run for stock investing. The results revealed that age ($p < 0.001$) and education ($p > 0.001$) were positively related to stock investing. The addition of the demographic variables did not significantly change any of the effects for stock investing. To summarize, the addition of demographic variables does not significantly change the results obtained for the trait predictors of gambling propensity and stock investing propensity.

While not the focus of this research, the SEM analysis also allows us to investigate the antecedents of the three situational traits and the four compound traits. Of particular interest to the financial community are the results for financial conservatism. The model accounts for 9.9% of its variance. Significant predictors are material needs (negative), arousal needs (negative), and body resource needs (positive). The model accounts for 14.4% of the variance in numeracy. Significant predictors are conscientiousness, competitiveness, impulsiveness, body needs (negative), and agreeableness (negative). Finally, for the situational trait of superstition, the model accounts for 20.7% of its variance. Significant predictors are competitiveness, present-time orientation, impulsiveness, introversion, agreeableness, emotional instability, material needs, body needs, and need for learning (negative).

We also investigate the ability of the model to account for variance in the compound-level traits. The model accounts for 44.7% of the variance in competitiveness, 14.9% of the variance in present-time orientation, 53.7% of the variance in need for learning, and 34.8% of the variance in impulsiveness.

Cluster Analysis Findings

While SEM analysis provides the ability to identify associations among constructs, it does not provide a means for identifying groups of respondents who differ in their

gambling and investing propensities. The identification of such groups and subsequent analyses of how they differ in the antecedent traits provides information that is useful for placing consumers into distinct segments. If John Maynard Keynes is correct in the quote that began this article, one should find four clusters—low gamblers-low investors, low gamblers-high investors, high gamblers-low investors, and high gamblers-high investors.

Using the K-means cluster technique in SPSS, the data are analyzed via an *a priori* specified four-cluster solution. We selected the K-means approach because it lends itself to the *a priori* identification of the number of clusters and because it is less affected by outliers. The cluster variables utilized are gambling propensity and investing propensity. We then employ analysis of variance techniques to identify whether significant differences exist among the four means for gambling propensity, investing propensity, and each of the constructs for which we developed hypotheses. Table 2 summarizes the results.

The ANOVA indicates that significant differences exist among the means for each of 13 constructs shown in Table 2. To identify which of the means differed significantly from each other, the Duncan post hoc test is employed. Looking at the means for gambling and investing in Table 2, one can see that the expected four clusters emerge. Each of the means is significantly different for both gambling and investing. In addition, the means match the expected pattern. That is, Cluster 1 = low gamblers-low stock investors, Cluster 2 = low gamblers-high stock investors, Cluster 3 = high gamblers-low stock investors, and Cluster 4 = high gamblers-high stock investors.

Of equal interest is the pattern of means of the constructs antecedent to gambling and investing. Cluster 4, the high gambling-high investing group, matches the type of individual whom John Maynard Keynes warned against participating in the stock market. Among the four clusters, this group is highest in need for arousal (or risk-taking propensity), material needs, competitiveness, impulsiveness, numeracy, and superstition. These individuals are also lowest in agreeableness and financial conservatism.

The pattern of means also reveals that Cluster 3 (high gambling-low investing) shares more similarities with Cluster 4 than does the group of high stock-low gamblers (Cluster 2). The means are not significantly different between Clusters 3 and 4 on 5 of the 10 constructs antecedent to gambling and investing (emotional instability, impulsiveness, present-time orientation, learning needs, and superstition). In contrast, the means of Clusters 2 and 4 are not significantly different on only one construct—emotional instability.

Cluster 1 has a distinct pattern of means. In addition to being the lowest in gambling and stock investing propensities, the group is also lowest in arousal needs, emotional instability, material needs, competitiveness, impulsiveness, need for learning, superstition, and numeracy. Finally, it is highest in

TABLE 2
Cluster Analysis Results.

Construct	Cluster 1 Low Gamble Low Stock	Cluster 2 Low Gamble High Stock	Cluster 3 High Gamble Low Stock	Cluster 4 High Gamble High Stock
Gamble	1.65a	2.47b	4.08c	4.74d
Stock	1.33a	4.45c	1.56b	4.99d
Arousal	3.46a	4.33b	4.32b	4.95c
Unstable	3.92a	4.08ab	4.53c	4.28bc
Material	3.42a	4.34b	4.14b	4.70c
Agreeable	6.61a	6.76a	6.50a	6.32b
Compete	3.63a	4.72b	4.60b	5.54c
Impulsive	3.57a	3.78b	4.12c	4.28c
Present Time	3.75b	3.48a	4.06c	3.96bc
Learning	5.78a	6.57c	6.19b	6.24b
Superstitious	2.65a	2.91b	3.44c	3.71c
Financial Conservative	5.04c	4.77b	4.66b	4.29a
Numeracy	3.88a	4.81c	4.49b	4.94c
Cluster size	N = 443	N = 191	N = 279	N = 245

Notes: The numbers represent the means for each cluster. Means with different letters are significantly different.

financial conservatism. Interestingly, this is also the largest group in terms of its cluster size, 443 people.

The high stock-low gambler cluster (Cluster 2) also has a distinct pattern of means. It is lowest in present-time orientation, which fits the pattern of investors having a future time orientation. They are also highest in need for learning. They are similar to Cluster 4 in numeracy. Finally, while they are not as low in impulsiveness as Cluster 1, they are significantly less impulsive than Clusters 3 and 4.

DISCUSSION

This research investigates whether the personality traits of those with a propensity to invest in stocks are different from those with a propensity to gamble. The results of the structural modeling analyses reveal similarities and differences in the trait predictors of the two behavioral dispositions. The following constructs are found to be predictive of both activities: material needs, competitiveness, superstition, financial conservatism (negative), and numeracy. On the other hand, the pattern of relationships differs for three of the trait predictors. First, present-time orientation is positively related to gambling but negatively related to stock investing. Second, emotional instability is negatively related to stock investing but positively related to gambling. Finally, there is a significant relationship between impulsiveness and gambling, while there is not a significant relationship with stock investing.

The cluster analysis results provide a second way of investigating the traits associated with investing and gambling. These results support the proposal that gamblers and investors can be divided into four segments of consumers as shown in Table 3. First, there is a group called "financially cautious consumers," who comprise 38% of the re-

spondents. These individuals are low in gambling and low in stock investing propensity (Cluster 1). In comparison to the other groups, financially cautious individuals are prudent individuals, who are low in impulsivity, materialism, competitiveness, superstition, learning, and financial conservatism. Additional analyses indicate they are also more frequently female. At the other end of the spectrum are "financial risk takers," who comprise 22% of the respondents and are significantly more likely to gamble and invest in stocks (Cluster 4). Financial risk takers are noted for a high need for arousal combined with impulsiveness and materialism. Finally, they are the youngest of the four clusters and more frequently male. The traits of financial risk takers are consistent with the description of some investors identified in the *Wall Street Journal* quote at the beginning of this article. That is, they are "... akin to gamblers flocking to Las Vegas."

Finally, it is possible to compare a "stock investing group" (high investing-low gambling, Cluster 2) to a "gambling group" (low investing-high gambling) (Cluster 3). The stock investing group includes 16% of the respondents and the gambling group 24% of the sample. The outstanding traits

TABLE 3
Traits Associated with Each Cluster.

	Low Invest	High Invest
Low Gamble	<u>Financially Cautious</u> Extreme caution Financial conservatism Low materialism	<u>Stock Investors</u> Future-time orientation High need for learning
High Gamble	<u>Gamblers</u> Present-time orientation Impulsiveness Emotional instability	<u>Financial Risk Takers</u> High need for arousal Impulsiveness High materialism

for gamblers are impulsiveness, emotional instability, and a present-time orientation. Indeed, this pattern of results for the gambling group is strikingly similar to the pattern of results for compulsive buyers that Mowen [2000] finds in his study of consumers with debt problems. Finally, the high investing and low gambling group is denoted by a future-time orientation and a high need for learning. The characteristics of the stock investing group are consistent with the views of pundits we quote above (i.e., Graham and Dodd [1940, p. 63], Hoenig [2007], Krantz [2007], Murcko [2007]) that investing involves skill that is applied on a continuous basis with an eye toward the future. On the other hand, the results differ from the perception discussed by Murcko [2007] that investors are risk averse. The results reveal that the stock investing group is not financially conservative. Indeed, the pattern of results for the stock investing group matches what would be expected from those who follow Peter Lynch's description of investing: "An investment is simply a gamble in which you've managed to tilt the odds in your favor" (as cited in Murcko [2007]).

Contributions to the Literature

Our research advances the literature along a number of fronts. To our knowledge, we are the first researchers to compare and contrast the traits of gamblers and stock investors in a single study. We also advance the literature by developing a number of new scales having relevance to gambling and stock investing. These include scales to measure a general propensity to gamble and to invest in stocks as well as scales to measure superstition, numeracy, and financial conservatism. We find each of these traits to be predictive of the propensity to gamble and to invest in the stock market.

We also contribute to the literature by employing a set of traits that form a hierarchically arranged network of constructs. Much of the prior research on gambling and investing uses a piecemeal approach in which the researchers only investigate bivariate correlational relationships. By investigating gambling and stock investing via a hierarchical framework and by including a set of eight basic elemental traits, the analysis minimizes the likelihood of a missing variable problem. Along these lines, our research also contributes to the literature by continuing the testing of the 3M Model (Mowen [2000]). Previous scholars such as Kassarian and Sheffet [1991] propose that researchers should move away from using traits developed by psychologists and create constructs that directly measure enduring consumer behavior-related dispositions. The hierarchical approach provides a means for including more abstract traits (elemental and compound) that are associated with psychological studies, as well as traits that are consumption related, such as financial conservatism, stock investing, and gambling propensity.

Another contribution to the literature is the analysis of the data via both SEM and cluster analysis. Researchers rarely employ both types of statistical techniques to a single data set.

We propose, however, that SEM and cluster analysis results provide complementary perspectives on the traits of gamblers and stock investors. For example, the SEM results reveal that there is a positive association of superstition and numeracy with both stock investing and gambling. Similarly, the two activities are negatively related to financial conservatism. On the other hand, the cluster analysis results provide a comparison of the means of the constructs across the four groups. The gambling group is significantly higher than the investing group on superstition and significantly lower on numeracy. By analyzing the results through each technique, this study provides a more complete understanding of the results.

Implications for Practitioners

The results yield a number of implications for practitioners. From an investment counselor's perspective, the results suggest that different clients have different motives for purchasing stocks. The financial conservative group has a tendency to avoid stocks. Because this group has a low need for learning and low interest in numbers, it will be difficult to use numerical examples and detailed arguments as to why it is important to take some financial risk to minimize the effects of inflation. One approach may be to employ pictorial graphs to communicate ideas. At the other end of the spectrum are the financial risk takers. Advisors should seek to identify these individuals based on their high need for material things, their competitiveness, and their high need for risk taking. It is important to identify financial risk takers because they are the most likely to make poor investment decisions and generate large losses.

The results also have implications for both the marketing and demarketing of gambling. For organizations that wish to increase gambling (e.g., casinos, lotteries), the results suggest that messages should emphasize the adrenaline rush obtained from gambling and what one can buy with the winnings. In the pictorial content of communications, good luck symbols should be included along with the use of numbers—perhaps along with dollar signs that symbolize money. On the other hand, the findings can also be used to demarket gambling. For example, because financial risk takers are more comfortable with numbers, it may be possible to use numerical illustrations to show the excessive risk that they may be taking. The risk can be linked to their material need concern by showing what they will lose with poorly placed bets.

As the preceding paragraphs note, the implications for practitioners of the findings in this study focus on how to identify individuals in the four clusters and how to develop messages to influence them. An important question concerns how to identify the traits that influence reactions to communications. In their self-schema theory, Fiske and Taylor [1984] propose that individuals' self-schemas influence how they respond to communications. Mowen [2000] provides evidence that a person's self-schema is composed in part of traits. As such, they act as frames of reference for evaluating

communications, expectations, and outcomes. Communications can be created that activate schema associated with the traits predictive of gambling propensity or stock investing propensity. For example, the results of the present study reveal that both gamblers and stock investors are highly competitive. As such, both gamblers and stock investors can be predicted to pay attention to and respond more favorably to messages having a competitive theme (Mowen [2004]).

Limitations and Future Research

The research has the usual limitations of a survey study. First, the use of a consumer panel can be problematic because the respondents are not randomly selected. While the respondents are selected to match the general population, those who join the panel may be systematically different in ways that limit the generalizability of the results. It is also possible that the preferences stated in surveys may differ from actual behavior. It should be added, however, that the wording of the surface traits includes references to actual behavior, which increases their predictive validity.

An important question concerns whether our results can be generalized to the population of serious investors and gamblers. To understand the trait characteristics of investors and gamblers, those who are not investors or gamblers should be included in the sample. The low gamble-low investor cluster clearly accomplishes one-half of this goal. However, is there a sufficient number of heavy investors and gamblers in the sample? It is unlikely that individuals with incomes in the upper 2% of the population will spend time completing surveys of this nature. So, does that make our results irrelevant? For two reasons, we propose that the results are relevant. First, the results support most of our hypotheses, which were developed *a priori*. Second, an important question is whether the traits that influence gambling and investing among the wealthy are different from the traits that influence gambling and investing among the nonwealthy. While we did not ask respondents to provide information on income (which would have decreased the response rate), we did ask for information on education, which is highly correlated with income. When education was added to the model, it did not change any of the relationships obtained. This result suggests that the relationships obtained will generalize to the population of wealthy investors.

Another limitation concerns the development of the constructs. Several new constructs were developed for the study, including stock investing propensity, gambling propensity, superstition, financial conservatism, and numeracy.⁴ Additional work needs to be performed to assess their construct validity. It should be added, however, that they show excellent discriminant validity and internal reliability. In addition, they are generally associated with the other constructs as one would expect, which supports their construct validity.

In conclusion, our research focuses on investigating the traits associated with general propensities to gamble and to

invest in the stock market. While appropriate as an initial starting point for research, it should be noted that people engage in distinct types of gambling and investing. For example, gamblers who use slot machines are apt to be very different from those who play poker, and high rollers may be very different from the average gambler or investor. Similarly, stock investors who focus on long-term capital appreciation are probably very different from day traders. Future research should compare and contrast the traits of those who have propensities to engage in different types of stock market participation and/or gambling. In addition, future research should investigate the characteristics of those who engage in high risk forms of gambling and stock trading. We suspect, however, that the traits of these individuals will be very similar to those identified in the high gamble/high stock investing cluster. In sum, much is left to be done, and we view the present research as a beginning.

NOTES

1. For example, Friedman and Savage [1948] present an analysis to reconcile with utility theory the apparent conflict of an individual choosing certainty by the purchasing of insurance and also choosing uncertainty by engaging in a gamble.
2. Researchers have also investigated the traits that influence the performance, for example, Hirschhorn [2005]. Because we are focusing on the degree to which individuals invest in stocks and gamble, we do not review this literature.
3. Hirschhorn [2005] examined the influence of personality differences and the level of success in male traders employed full-time at U.S. trading firms with and without a competitive athletic background and found no statistical difference between athletes and nonathletes in their ability to be successful traders.
4. Guiso, Sapienza, and Zingales [2007] investigate the role of trust in stock investing, a characteristic that is not included in this research. They find that less trusting individuals are less likely to buy stock; if they do buy stock, they purchase fewer shares. More specifically, individuals who believe that financial data are reliable and that the overall system is fair have a 50% higher probability of buying stock and a 3.4% greater share of their wealth invested in stock. Future research could investigate the relationship of trust to both gambling and investing propensities in a hierarchical model.

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APPENDIX: SCALES EMPLOYED TO MEASURE TRAITS

Elemental Traits

Introversion	$\alpha = .91$	Emotional Instability	$\alpha = .91$
1) Feel bashful more than others		1) Moody more than others	
2) Introverted		2) Temperamental	
3) Quiet when with people		3) Emotions go way up and down	
4) Shy		4) Touchy	
Conscientiousness	$\alpha = .92$	Need for Material Resources	$\alpha = .89$
1) Precise		1) Enjoy buying expensive things	
2) Efficient		2) Like to own nice things more than most people	
3) Organized		3) Acquiring valuable things is important to me.	
4) Orderly		4) Enjoy owning luxurious things	
Openness to Experience	$\alpha = .94$	Need for Arousal	$\alpha = .91$
1) Frequently feel highly creative		1) Drawn to experiences with an element of danger	
2) Imaginative		2) Seek an adrenaline rush	
3) Find novel solutions		3) Actively seek out new experiences	
4) More original than others		4) Enjoy taking more risks than others	
Agreeableness	$\alpha = .87$	Need for Body Resources	$\alpha = .89$
1) Tender hearted with others		1) Focus on my body and how it feels	
2) Agreeable with others		2) Devote time each day to improving my body	
3) Softhearted		3) Work hard to keep my body healthy	
4) Kind to others		4) Feel that making my body look good is important	

Compound Traits

Learning Needs	$\alpha = .88$	Impulsiveness	$\alpha = .82$
1) Enjoy learning new things more than others.		1) I often do things spontaneously.	
2) People consider me to be intellectual.		2) "Just do it" describes the way I act.	
3) Enjoy working on new ideas.		3) I often do things without thinking.	
4) Information is my most important resource.		4) Sometimes I feel like doing things on the spur of the moment.	
Competitiveness	$\alpha = .92$	Present Time Orientation	$\alpha = .82$
1) Enjoy competition more than others.		1) The distant future is too uncertain to plan for.	
2) Feel that it is important to outperform others.		2) I pretty much live on a day-to-day basis.	
3) Enjoy testing my ability against others.		3) The future seems very vague and uncertain to me.	
4) Feel that winning is extremely important.		4) I focus on the present more than the future.	

Situational Traits

Financial Conservatism	$\alpha = .83$	Superstition	$\alpha = .91$
1) I am extremely financially conservative.		1) I sometimes perform little rituals to bring good luck to myself.	
2) I do not like to take risks with my money.		2) I do not want to lose things that bring me good luck.	
3) I am very cautious about making investments that are not a sure thing.		3) I have to admit that sometimes I act like I am superstitious.	
4) Protecting my money is very important to me.		4) People who know me well will say that I am superstitious.	
Numeracy	$\alpha = .95$		
1) I enjoy work that requires numbers.			
2) It is satisfying to solve everyday problems with numbers.			
3) I like to make calculations using numerical information.			
4) I like to go over numbers in my mind.			

Surface Traits

Gambling Propensity	$\alpha = .88$	Stock Investing	$\alpha = .97$
1) I really enjoy gambling for money.		1) I really enjoy buying and selling stocks.	
2) Whenever I have the opportunity, I will make a bet.		2) Playing the stock market is exciting to me.	
3) I frequently make wagers with others.		3) I frequently buy and sell stocks.	
4) I have developed good skills at gambling.		4) I see myself buying and selling stocks in the future.	

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