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Attitudes and Trading Behavior of Stock Market Investors: A Segmentation Approach

Ryan Wood and Judith Lynne Zaichkowsky

This study identifies and characterizes segments of individual investors based on their shared investing attitudes and behavior. A behavioral finance literature review reveals five main constructs that drive investor behavior: investment horizon, confidence, control, risk attitude, and personalization of loss. Ninety individual investors were surveyed via questionnaire on these constructs. A cluster segmentation analysis identified four main segments of individual investors: 1) risk-intolerant traders; 2) confident traders; 3) loss-averse young traders; and 4) conservative long-term investors. Each segment purchased different types of stocks, used different information sources, and had different levels of trading behavior.

Over the past ten years, several events have combined to cause a large inflow of funds into the equity markets: the explosion in retail investment accounts, the growth of the mutual fund industry, and the government's tax reduction programs for retirement investments. Because institutional investors are constrained by market capitalization, their investments in small companies are usually limited. But individual investors, who now hold so much of the market, are able to take risks on smaller, unprofitable companies (*Investor Relations Business* [May 2000]).

Individual investors have generated momentum in an increasingly volatile stock market. To illustrate, note how the turnover on the NASDAQ stock exchange has risen over the past ten years. In 1995, it was 100%, but by 2000 the turnover had increased to 400% (*Investor Relations Business* [April 2000]). Individual investors often buy a handful of "must own" names, while tending to neglect everything else. In 1999, just nine technology stocks accounted for half the return of the S&P 500 index. When investors concentrate on a reduced number of stocks, the market becomes increasingly vulnerable to collapse (Gibbs [2000]).

As their numbers have exploded, it has become increasingly more important to understand the minds, motivations, and decision-making styles of individual investors. Prior research has looked at investment styles of stockbrokers (Morrin et al. [2002]), or the segmentation of investors in selecting a brokerage firm (Chan, Chan, and Yau [1991]). But profiling segments of individual investors on their use of market information and actual investment history could help companies and financial advisors selectively target and communicate to these individuals. This classification may also help individual investors understand their own investing habits, encouraging successful investment growth, rather than the volatile earnings swings that can lead to buying high and selling low.

Ryan Wood is with Bayer HealthCare.

Judith Lynne Zaichkowsky is a visiting professor of marketing at H. E. C., Paris.

Requests for reprints should be sent to: Judith Zaichkowsky, Simon Fraser University, Burnaby, British Columbia, Canada, V5A 1S6. Email: zaichkow@sfu.ca

Selected Literature Review

We use attitudes and opinions found in the behavioral finance literature to segment investors. Investor overconfidence (Barber and Odean [2001b]) may account for the high level of trading in financial markets, as well as the fact that individual investors make systematic mistakes in the way they process information. Griffin and Tversky [1992] note that overconfidence is greatest for difficult tasks, for forecasts with low predictability, and for tasks lacking immediate and clear feedback. Investing in stocks is a difficult task, with low predictability and poor feedback. Overconfidence manifests itself in several other important behavioral biases: illusion of knowledge, hindsight bias, self-attribution bias, and the illusion of control.

The illusion of knowledge can occur when people are given a lot of information on which to base a forecast or assessment. As Oskamp [1965] noted, forecast accuracy tends to improve a lot more slowly than investor confidence. Thus, investors may believe that data, especially from online sources, confers knowledge, and they may overestimate the precision of the data.

The tendency of more information to increase overconfidence can be magnified by cognitive dissonance. Investors who spend a considerable amount of time (or money) gathering data will be convinced that

their actions are reasonable. Because it would be unreasonable to spend so much time gathering useless data, investors are motivated to believe their data are useful, thus resolving cognitive dissonance (Barber and Odean [2001a]).

Many behavioral economists call investors suffering from hindsight bias "rearview visionaries." These investors believe they can forecast economic events based on what has happened in the past. Once investors know the outcome, their memories of what they did or could have done in the past are widely skewed. This is often because individuals filter information and bias their behavior in ways that allow them to maintain their confidence.

Self-attribution bias says individuals tend to attribute their successes to their personal abilities, and their failures to bad luck or the actions of others. Individuals also tend to ignore, or at least underweight, information that lowers their self-esteem (Daniel and Titman [1999]). As a result, investors tend to forget past failures.

Langer and Roth [1975] found that people behave as if their personal involvement can influence the outcome of chance events. Of the key attributes that foster an illusion of control and increased confidence (*choice, task familiarity, competition, and active involvement*), active involvement is most relevant for investors. Many investors who are making the transition to online trading list the "feeling of empowerment" as the most important reason (Balasubramanian, Konana, and Menon [2003]). Advertisements for online brokerages often emphasize the importance of taking control of one's investments (Barber and Odean [2001b]).

Overconfidence causes investors to be too certain about their own opinions and not to sufficiently consider the opinions of others. Overconfident investors lower their expected utility by trading too much, they hold unrealistic beliefs about how high their returns will be and how precisely they can be estimated, and they spend too much time and money on investment information (Odean [1998]; Barber and Odean [1999]).

Psychological research shows that while both men and women exhibit overconfidence, it is generally more prevalent in men (Lundeberg, Fox, and Puncochar [1994]). Indeed, Barber and Odean [2001b] found that men trade 45% more actively than women. While both men and women reduce their returns by trading, men reduce theirs by an additional 1%.

Overconfidence cannot explain all the reasons that individual investors act "irrationally," however. Another important area of behavioral finance is the study of how individual investors deal with the elements of risk and uncertainty. This study identifies the different segments of investors that can be grouped based on these shared attitudes, biases, and behaviors. These segments will then be characterized on the investors' knowledge of their investments, their use of investing information, and their actual investment history. We attempt to answer the following questions to understand the micro sources of stock volatility:

1. What sources of information do the different investor segments use to evaluate their investment decisions?
2. Do the segments search differently for information about their stable investments versus their volatile ones?
3. Does the actual trading history of the investor segments differ in the types of stocks purchased and sold and their reasons for buying or selling?

Methodology

After extensive pretesting with regular investors, we finalized a questionnaire to help us gather the information. The first section was based on six main constructs:

1. Long-term/short-term investment horizon.
2. Stability versus volatility.
3. *Risk attitude.*
4. Personalization of loss.
5. Confidence.
6. Control.

To ensure that each construct was measured reliably, multiple questions were asked for each. The answers were measured on seven-point Likert scales, with 1 being "strongly disagree," and 7 being "strongly agree."

The second section asked the participants how important they consider several sources of information for evaluating investments, and what type of information is read and found useful for evaluating stable versus volatile investments. The third section asked participants to recall the most recent stock or fund purchased and sold, and why the action was taken. In addition, data on stock performance, trading activity, and price-checking habits were collected. The fourth section included demographic characteristics, trading activity, portfolio size and composition, and the most usual method of investment.

Sampling

We used several snowball[1] and convenience sampling procedures, as the data collected were highly personal and confidential and could not be obtained through any institutional source. First, the survey was distributed to friends and colleagues with investment experience. Second, students in four executive MBA classes were asked to fill out the survey (most were mobile professionals, so we expected them to have significant investment experience). They were also en-

tered in a drawing to win a golf shirt. Another group of MBA students, primarily aged twenty-four to thirty-five and with more limited investing experience, were surveyed by distributing questionnaires into individual mailboxes. As an incentive, we gave them a chance to win a $50 restaurant gift certificate.

Results

We collected a total of ninety-five surveys. Seventy came from the 120 EMBA students. Of these, five were significantly incomplete and were discarded, leaving a total sample size of ninety. More females (59%) than males (41%) responded to the questionnaire. Many of the younger investors under thirty years of age (19%) were sampled from the full-time MBA program, while the bulk of the thirty-one- to fifty-year-old respondents (74%) were obtained from the executive MBA program. Since most of the respondents are still early in their professional careers, 72% had investment portfolios of less than $100,000, and 28% had portfolios of greater than $100,000.

The bulk of the respondents purchased their investments either in person or on the telephone with an advisor or a broker (64%). Only a few used a discount broker on the telephone (3%), and 32% used the Internet as their usual method of trading. 71% traded less than ten times per year, 29% traded more than ten times, and only 8% actively traded more than twenty-five times per year. The investors did, however, check their investments frequently, with 50% checking prices at least weekly.

Developing Segments

Cronbach's alpha test was used to determine the degree of consistency among the multiple measurements of each construct. Questions that caused the overall alpha coefficient to fall below 0.60 were removed (Robinson, Shaver, and Wrightsman [1991]). The final constructs and their internal reliability are shown in Table 1.

The long-term/short-term investment horizon construct and the stability versus volatility construct were

Table 1. *Behavioral Constructs of Investors*

Investment Horizon (alpha = 0.61)
1. Fluctuations in the stock market DO NOT concern me.
2. The constant media reporting of stock market fluctuations does NOT bother me.
3. If one of my investments dropped 20% over six months, and this drop coincided with a stock market crash, I would keep that investment in hopes that it would recover.
4. I am investing to supplement my income *(reverse-coded).*
Risk Attitude (alpha = 0.71)
1. I am prepared to take greater risks (possibility of initial losses) in order to earn greater future returns.
2. I feel more comfortable taking risks (possibility of initial losses) when my investments are performing well.
Personalization of Loss (alpha = 0.62)
1. When one of my investments performs poorly, I feel unlucky.
2. My investment losses are felt more than my gains.
Confidence (alpha = 0.70)
1. I am an experienced investor.
2. I feel that on average my investments perform better than the stock market.
3. When I purchase a winning investment, I feel that my actions and knowledge affected the result.
4. I expect my investments to perform better than the stock market.
5. I feel more confident in my own investment opinions over opinions of financial analysts and advisors.
6. I feel more confident in my own investment opinions over opinions of friends and colleagues.
7. I am likely to purchase investments that have been recommended by friends or colleagues (*reverse-coded).*
Control (alpha = 0.75)
1. I feel more confident in the validity of information that I collect myself.
2. The more information I collect on my investments, the more confident I feel.
3. I spend considerable effort researching my investments.
4. I check the performance of my investments very frequently.
5. After I have spent a long time researching an investment, I am more likely to act on this information (buy or sell).
6. I feel more confident when I have immediate access to my investments.

highly correlated. This makes sense conceptually, because long-term investors often want investments that will be more stable over the long term, and often care less about market volatility. We combined these two constructs into one, with an overall reliability of 0.61.

Once the constructs were finalized, we calculated an overall score for each by adding the scores for each representative question and dividing by the number of questions in the construct. The individual investors were then segmented based on the cluster scores of their behavioral constructs. To estimate how many clusters might actually exist, we performed a hierarchical cluster procedure with Ward's linkage and squared Euclidean distances on the sample of ninety using the five construct averages as variables. The four-cluster solution provided the greatest distinctiveness among the groups. In addition, the ANOVA test showed a statistical difference at the $p < 0.05$ level between the clusters for all constructs (Table 2). The final cluster centers, which are the construct averages, are shown in Table 3 and in Figure 1.

Profiling of Individual Investor Segments

To validate the K-means cluster and to further describe these newly identified four clusters, we conducted a multiple comparison ANOVA test on the mean ratings of each of the five constructs (Table 3). We also ran cross-tabulations between clusters for several demographic variables. When we identified a difference between clusters for these variables we tested it for significance using multiple comparison ANOVAs (Table 4). The four clusters can be described as follows.

Table 2. *Anova of Four-Cluster Solution*

	Cluster Mean Square	F
CONTROL	10.36	19.8**
CONFIDEN	5.40	8.2**
LOSS	33.87	46.7**
STBLNG	4.22	3.8*
RISK	23.43	40.9**

Note: *p≤ 0.01. **p≤ 0.001.

Table 3. *Behavioral Profile of Each Segment*

Characteristic	Cluster 1 Risk-Intolerant (n = 10)	Cluster 2 Confident Traders (n = 31)	Cluster 3 Loss-Averse Young Traders (n = 24)	Cluster 4 Conservative Long-Term (n = 25)
Control	4.68^{a} (0.91)	5.34^{bc} (0.58)	4.32^{b} (0.83)	3.91^{ac} (0.70)
Confidence	4.04 (0.86)	4.67^{ab} (0.71)	3.86^{a} (0.92)	3.67^{b} (0.80)
Personalization of Loss	3.50^{a} (1.08)	3.27^{a} (0.94)	5.71^{a} (0.63)	3.28^{a} (0.83)
Stable/Long	4.35 (0.69)	4.10^{a} (1.11)	4.68 (1.17)	5.02^{a} (0.95)
Risk	2.85^{a} (1.22)	5.66^{a} (0.49)	5.77^{a} (0.91)	5.50^{a} (0.63)
# of Stocks Owned	5.0	8.1^{a}	4.8	2.7^{a}
# of Mutual Funds Owned	2.7	4.6	3.7	5.3

Note: ^{abc}Denotes significant difference at $p \leq 0.05$ with the means with the same letter. Rating categories: 1 = Low, 7 = High. Standard deviations are given in parentheses.

FIGURE 1
Profile of Four-Cluster Solution

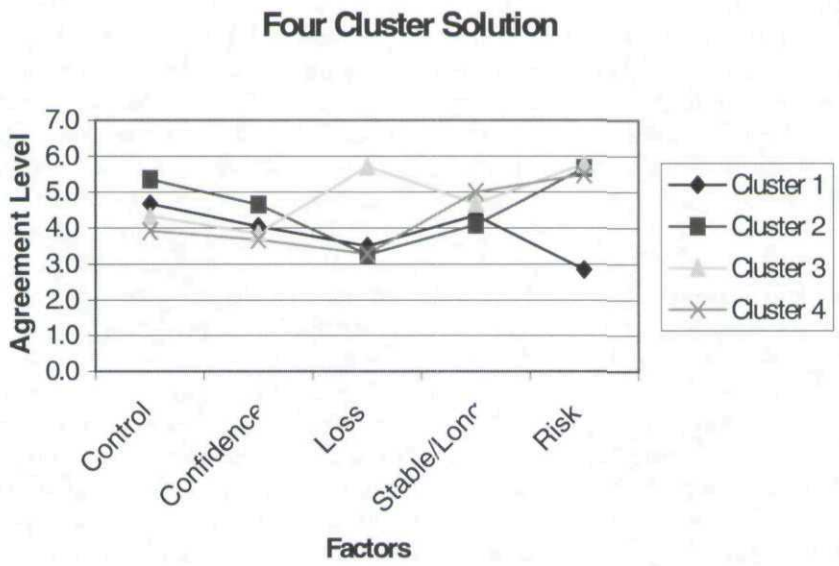

Table 4. *Demographic Profile of Clusters*

		Risk-Intolerant (n = 10)		Confident Traders (n = 31)		Loss-Averse Young Traders (n = 24)		Conservative Long-Term (n = 25)	
	Average	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Gender									
Male	41%		60		42		39		35
Female	59%		40		58		61		65
Age									
20-30 years	19%		20		3		33		26
31-40	44%		30		45		50		44
41-60	36%		50		52		17		30
Method of Trading									
In person with advisor or broker	41%		50		39		26		56
Internet	32%		30		36		48		13
Telephone with advisor or broker	26%		20		26		26		30
Value of Portfolio									
< $10,000	16%		30		8[a]		26[a]		9
$10,001-$25,000	15%		0		12		13		27
$25,001-$50,000	12%		10		0		22		18
$50,001-$100,000	28%		30		31		30		23
$100,001- $200,000	16%		20		23		9		14
> $200,000	12%		10		27		0		9
Trades/yr									
1–3 trades	39%		60		23		42		48
4–5 trades	23%		20		23		21		26
6–15 trades	22%		0		33		12		26
Greater than 15 trades	16%		20		20		25		0
# Times Checked									
Daily	22%		40[a]		36[ab]		17[ab]		0[a]
Couple times/wk	17%		40		23		17		0
Weekly	11%		0		19		8		9
Monthly	24%		0		13		29		44
Quarterly	26%		20		10		29		48

Note: [ab]Denotes significant differences at $p \leq 0.05$ with the means with the same letter.

Cluster 1–Risk-Intolerant Traders. We call Cluster 1 the "risk-intolerant" group of individual investors. The primary characteristic of this group, which separates it from the other groups, is an extremely low risk tolerance (average 2.85, $p < 0.05$) (see Figure 1). Cluster 1 is small (n = 10), probably because of the non-random sampling procedure, and therefore may be unstable in terms of analyses. It has medium levels of confidence and control versus the other groups. Corresponding to their intolerance for risk, 80% of cluster 1 members trade less than five times per year. But 80% also closely monitor their investments, checking them at least weekly.

Cluster 2–Confident Traders. Cluster 2 investors have high levels of confidence and control. They are slightly older than the other groups, with 97% older than thirty, and their portfolio values are greater than the other groups: 50% have more than $100,000. 37% trade more than ten times per year (the sample average is 29%), and 58% check their investments at least weekly (the sample average is 39%). As expected, with higher levels of confidence, control, trading activity, and monitoring of investments, cluster 2 investors own the most stocks (8.1 on average). Since these members are trading more frequently, they have a shorter-term investment horizon (4.1) than the other groups.

Cluster 3–Loss-Averse Young Traders. Cluster 3 is characterized as having the highest rating for personalization of loss while still having high risk ratings. In other words, this group does not mind taking risks, but feels terrible when they lose money. Cluster 3 investors have significantly lower levels of confidence and control than the confident traders in cluster 2. Cluster 3 is also the youngest segment of investors, with 33% of its members under thirty and 80% under forty. As a result, the value of their portfolios is low, with 39% having less than $25,000. These investors probably personalize their losses more because they are young, relatively inexperienced at investing, and cannot afford to lose their money. Cluster 3 investors are also the most likely to use the Internet as their method of investment (48%). As a result, they also trade quite frequently, with 25% trading more than fifteen times per year.

Cluster 4–Conservative Long-Term Investors. Cluster 4 investors have low confidence and control, but do not personalize losses. Cluster 4 also has a slightly larger proportion of females (65%). These characteristics may explain why these investors rely heavily on financial advisors to make their trades: 87% use an advisor or broker in person or on the phone (the sample average is 64%), and only 13% use the Internet as their usual method of trading (sample average 32%). 74% of cluster 4 investors trade less than five times per year, and no members of this group trade more than fifteen times per year. They also own the least number of stocks (2.7), and a high number of mutual funds (5.3). Because these investors trade less frequently and own a high proportion of mutual funds, they do not check their investments as frequently. 91% monitor their stocks on a monthly basis or less, and none of them check their stocks more than once per week. Cluster 4 investors have a longer investment horizon than the other groups. They are conservative investors who take a stable approach to investing by using long-term growth strategies with the help of a financial advisor.

Types of Stocks Held by Investor Segments — Retirement versus Regular Portfolios

Each segment of investors treated their regular portfolio differently than their tax-sheltered retirement portfolio (TSRP), and each group chose different types of stocks for each one (see Table 5).[2] All segments owned predominantly mutual funds in TSRPs (sample average 63%).

Each segment treated their allocations of stock type into each portfolio differently. The heavy investing in mutual funds may be linked to the diversified content of funds, a longer-term time horizon, and hence lower associated perceived risk (see Shefrin [2000, p. 139] for a detailed discussion of retirement savings).

The results for the risk-intolerant group are limited due to their small size. The confident traders owned significantly higher percentages of technology and small or mid-sized stocks when compared to the conservative investors.

When considering their TSRPs, the confident traders significantly reduced their percentages of technology (24% versus 13%) and small stocks (20% versus 7%) versus their regular portfolios ($p < 0.05$). The loss-averse investors significantly reduced the number of technology stocks in their TSRP portfolios (7%) versus their regular portfolios (25%). As expected, the conservative long-term investors owned a significantly higher percentage of mutual funds in their regular portfolios (42%) than the other segments. They also invested in smaller percentages of technology and small or mid-sized stocks than the other groups.

Trading History

Respondents were asked to detail their most recently purchased and most recently sold investments (Table 6). The confident traders had most recently purchased (50%) and sold (62%) technology or small and mid-sized stocks. These investors had received advice from friends (20%), but mainly purchased their investments because of growth potential (48%); they sold either because of poor performance (42%) or to realize profits (26%). They claimed they realized profits more frequently than any other group. These reported behaviors match their profile of high confidence and control.

The loss-averse group traded heavily in technology or small and mid-sized stocks (45% of purchases, 53% of sales). This group also traded primarily for performance-related reasons. The loss-averse group is the

Table 5. *Composition of Regular versus Retirement Portfolios*

	Sample Average	Risk-Intolerant	Confident Traders	Loss-Averse Young Traders	Conservative Long-Term
Regular	**N = 74**	**N = 7**	**N = 27**	**N = 21**	**N = 19**
Blue-chip	17%	53[b]	14	14	11
Technology	20%	37	24[d]	25[h]	3[i]
Small or mid-sized	11%	6	20[e]	8	1
Mutual funds	25%[a]	4[c]	15[f]	29[g]	42[j]
Retirement	**N = 79**	**N = 8**	**N = 29**	**N = 22**	**N = 20**
Blue-chip	9	8[b]	14	5	9
Technology	10	5	13[d]	7[h]	10[i]
Small or mid-sized	6	10	7[e]	6	2
Mutual funds	63[a]	64[c]	57[f]	67[g]	65[j]

Note: [abcdefg]Denotes significant difference at the $p \leq 0.05$ level between % with same letter. [hij]Denotes significant difference at the $p \leq 0.05$ level between % with same letter. Numbers do not always add to 100, due to holdings such as cash, bonds, or other investments.

Table 6. *Actual Investment History of Segments*

Stock Purchased	Freq.	%	Reason Purchased	Freq.	%	Stock Sold	Freq.	%	Reason Sold	Freq.	%
Risk-Intolerant											
Blue-Chip	3	33	Work for Company	1	11	Blue-Chip	3	43	Needed Cash	2	29
Tech	4	44	Friend	3	33	Small/Mid	2	29	Poor Performance	1	14
Small/Mid	0	0	Advisor	2	22	Fund	2	29	Poor Management	2	29
Fund	2	22	Growth Potential	3	33				Profit	2	29
Confident Traders											
Blue-Chip	5	19	Work for Company	3	12	Blue-Chip	3	14	Needed Cash	2	11
Tech	9	35	Advisor	2	8	Tech	5	24	Poor Performance	6	32
Small/Mid	4	15	Friend	5	20	Small/Mid	8	38	Profit	5	26
Fund	8	31	Growth Potential	12	48	Fund	5	24	Work for Company	1	5
			Stable	3	12				Reinvest	5	26
Loss-Averse Young Traders											
Blue-chip	4	20	Work for Company	3	18	Blue-Chip	1	8	Needed Cash	2	17
Tech	7	35	Advisor	3	18	Small/Mid	2	15	Poor Performance	5	42
Small/Mid	2	10	Growth Potential	7	41	Tech	5	38	Profit	1	8
Fund	7	35	Stable	2	12	Fund	5	38	Reinvest	3	25
			Value	2	12				Advisor	1	8
Conservative Long-Term Investors											
Blue-Chip	1	6	Work for Company	3	17	Blue-Chip	1	8	Needed Cash	1	8
Tech	3	17	Friend	1	6	Small/Mid	1	8	Poor Performance	4	31
Small/Mid	2	11	Advisor	6	33	Tech	4	33	Profit	2	15
Fund	12	67	Growth Potential	7	39	Fund	6	50	Reinvest	4	31
			Stable	1	6				Advisor	2	15

only one that did not report using the advice of friends for recent investment decisions, perhaps corroborating their high score on personalization.

As expected, the conservative investors traded in mutual funds (67% of purchases, 50% of sales). They used the advice of financial advisors more than any other group (33% of purchases, 15% of sales). Interestingly, one common reason given by all groups for purchasing a stock was that they worked for the company and had insider information (10%-20%).

Sources of Investment Information: Readership and Rated Importance

Respondents were asked to allocate 100 points across seven information sources they used for stable and for volatile investments, according to each one's importance. The choices were: the Internet, financial analysts, TV reporting, friends and colleagues, financial statements, financial advisors, and print media.

We found that financial advisors and financial analysts were the most important information sources (with approximately 20% each). The Internet, friends and colleagues, and print media all had a relative importance of approximately 10%. TV reporting was deemed the least important (approximately 7%). These results should be examined in light of the next question, however, which asked investors whether they had *read* any of the company's pertinent information, such as financial statements, strategic plans or prospectus, technology or product information, growth predictions, or current news. Investors were also asked to rate on a 7-point scale how useful each type of information was for either their stable or volatile investments.

Current news topped the list: It was read by 83% of the total sample, and 93% of the confident traders. This finding corroborates recent work by Barber and Odean [2003], which finds that "attention-grabbing stocks," or stocks featured in news stories, are bought heavily by individual investors.

The confident traders had a higher percentage of readership of almost all types of information. They read significantly more financial statements (89% stable, 93% volatile) and technology or product information (85% stable and volatile) than any other cluster. This is to be expected, given that confident investors

trade more actively. The confident traders invest in more short-term volatile stocks than, for example, the conservative long-term investors, who trade mostly in mutual funds. The confident traders check the news more frequently, which corresponds to their behavior of checking stock prices more frequently.

Confident traders rated financial statements as significantly less useful than current news in evaluating their volatile investments (4.6 versus 5.9, $p < 0.01$). Risk-intolerant and confident traders placed more importance on financial statements when evaluating their stable investments (15%, 22%) than their volatile investments (7%, 15%). Both segments invested heavily in technology stocks. When evaluating their volatile investments, confident traders talked to their friends more (12%) than when they evaluated their stable versus volatile investments (6%).

Loss-averse young traders rely significantly more on the Internet (16%) and on advice from friends (20.4%) when they evaluate their volatile investments. Conversely, they use financial advisors more for their stable investments (31%) than for their volatile ones (17%).

Conservative long-term investors reported the lowest use and usefulness of any of the print materials, relying more on their financial advisors for information. This is probably because they invest primarily in mutual funds and rely heavily on financial advisors for all their investment decisions.

Analysis of Attitudes and Trading Behavior for the Total Sample

Control. Individuals with high control ratings like to keep a close watch over their investments and also like to be able to trade quickly. As expected, the results for the total sample show a significant increase in control levels as investors checked their stocks more frequently ($p > 0.001$) (see Table 7). There was no significant relationship between control levels and the number of trades investors made in a year.

Confidence. We also found that investors who checked their stocks more frequently had higher confidence in their investment choices (Table 7). Table 8 shows that investors who traded six to ten times per year had increased confidence levels (5.1) over investors who traded less than that. Interestingly, once investors traded more than ten times per year, their confidence stopped increasing. In fact, confidence and trading showed a curvilinear effect, with low confidence (3.8, 4.0) at both low (one to three a year) and high trade frequencies (more than twenty-five a year).

Risk. We did not find a significant difference in risk levels for investors who checked their stock prices more frequently than others. However, investors who traded more actively had a significant increase in their risk tolerance level until they traded more than twenty-five times per year. Then risk tolerance dropped dramatically (Table 8). This relationship could be explored in more detail with expanded risk and trading activity scales to determine whether high levels of trading are done to preserve capital rather than to realize profits.

Discussion and Summary

The individual investor segments that we identified and profiled provide an opportunity for investors, financial analysts, and companies to improve investment decisions and communication. Each segment purchased different stocks, used different information, and treated their stable and volatile investments differently. The implications for each segment are discussed next.

Cluster 1–Risk-Intolerant

Although the risk-intolerant sample was small (n = 10), this group may actually be quite large in the full investing population. We believe the convenience sam-

Table 7. *Control and Confidence versus Frequency of Checking Prices*

Frequency of Checking Stock Performance	N	Control Mean	Confidence Mean
Quarterly	23	4.0*	3.8**
Monthly	21	4.1	3.7
Weekly	10	4.9	4.4
Twice/wk	15	4.9	4.2
Daily	16	5.5	4.7
> Once/day	3	5.5	5.3

Note: *Univariate $F = 11.93$, $p \leq 0.001$. **Univariate $F = 5.18$, $p \leq 0.001$.

Table 8. *Confidence and Risk versus Number of Trades*

Number of Trades per Year	N	Confidence Mean	Risk Mean
1 to 3	34	3.8*	5.0**
4 to 5	20	4.3	5.4
6 to 10	8	5.1	5.8
11 to 15	11	3.8	5.7
16 to 25	7	4.6	6.4
> 25	7	4.0	4.6

Note: *Univariate $F = 4.14$, $p \leq 0.01$. **Univariate $F = 3.21$, $p \leq 0.05$.

pling procedure of well-educated business types may not have found many members of this group. Risk-intolerant investors have medium levels of both confidence and control. They trade infrequently, but monitor the prices of their investments on a regular basis. Their actual trading history shows that they invest in similar investments compared to other groups, but are most likely to seek advice from financial advisors. It would seem prudent for financial advisors to this group to concentrate their efforts and advice on diversification and risk management. Mutual funds and stable blue-chip investments might be appropriate for this segment.

Cluster 2–Confident Traders

Confident traders exhibit high levels of confidence and control and are active traders. This corresponds to Barber and Odean's [1999] finding that investors with high levels of confidence trade more frequently. They also check their stocks the most frequently and own more stocks than any other group. With this increased trading activity, they also have the shortest investment horizon. Confident traders are older than other groups, have the largest investment portfolios, and thus the most experience. They invest heavily in technology and small-cap stocks in their regular portfolios, but maintain a high proportion of stable investments (approximately 60%) in their retirement portfolios. Confident traders consult friends for advice, but do not consult advisors often. This may be because, among their social network of friends, the exchange of investment information is a common topic. As a result, they may not feel they need a financial advisor (see Shiller [2000, p. 148]).

Communications to confident traders should concentrate on performance-related issues, such as growth potential and profits, as they have the highest readership of all the forms of information. Communications to them about volatile technology stocks should concentrate on current news updates, which they find the most valuable, rather than on detailed financial numbers.

Cluster 3–Loss-Averse Young Traders

Loss-averse young traders are the youngest segment of investors, with correspondingly the smallest investment portfolios. They are probably loss-averse because they do not have the experience to psychologically handle losing money, and cannot yet afford to lose what they have. These investors are the most likely group to use the Internet to trade. Like confident traders, they own technology and small stocks in their regular portfolios, but have more stable mutual funds in their retirement portfolios. This group uses the Internet to evaluate volatile investments, but uses financial advisors for stable investments. Loss-averse traders find current news most useful for volatile investments. Therefore, companies could target this segment with an effective website updating investors on current developments.

Cluster 4–Conservative Long-Term Investors

Conservative long-term investors are almost the exact opposite of confident traders. They have low ratings for both confidence and control. This segment has a large proportion of females who trade infrequently. As a whole, the group also owns the least number of stocks and does not check their investments often. They purchase long-term conservative mutual funds (and the most ethical funds), most often with the help of financial advisors.

The literature characterizes the use of financial advisors as having a self-preservation and external attribution component in case of poor market performance (Shefrin [2000, p. 128]). This is evident in this group, as they have a very low score for internalizing losses. They may be using financial advisors for risk reduction and for knowledge, and the advisors, who do not want to be blamed for poor performance, may be advising them to purchase mutual funds. This group does not find detailed financial statements useful in evaluating investments, but they do use current news to evaluate their volatile stocks.

Implications and Limitations

This was an exploratory study to be used as a starting point for understanding the complex behavior of individual investors. Further research needs to be conducted to validate some of the findings. We used a convenience sampling procedure because this topic is highly personal. We speculate that the small risk-intolerant group in Cluster 1 may actually be a considerable proportion of the investing population.

Investing attitudes and behaviors often involve trade-offs of several complex and interrelated concepts; therefore, it may be difficult to express a concept accurately with only a few questions. Further research needs to validate which questions best represent each conceptual construct (e.g., confidence, control). Once the constructs are optimized, it would be useful to explore in more detail some of the behavioral finance theories proposed by Odean and Barber [2000].

For example, the relationship between confidence and trading seems to be an inverted U-shape. The most confident investors trade about ten times a year. Those with few trades and many trades had lower levels of confidence. Therefore, something other than overconfidence may lead to excessive trading, which is characterized as over twenty-five trades a year.

The actual trading history of each investor segment was only investigated descriptively, because responses were written in by respondents. It is important that fu-

ture behavioral finance research stay connected to actual investing behaviors like investment performance or stock selection.

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Notes

1. Under this technique for finding research subjects, one subject gives the researcher the name of another subject, who in turn provides the name of a third, and so on (see Vogt [1999]).
2. The authors thank Peter Klein for this suggestion of portfolio separation.

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