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Emotional Intelligence and risk taking in investment decision-making

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Abstract

Previous work on investment decision-making suggested that emotions prevent investors from taking risks and from investing in a rational way, whereas other work found that there is great variability in people's ability to manage and use emotional feedbacks. We hypothesized that people with high trait emotional intelligence should be more willing, than people with low trait emotional intelligence, to accept risks when making an investment. Data supported a model in which trait emotional intelligence predicted willingness to invest both when the expected value is positive and when it is negative. The effect of trait emotional intelligence was significant even controlling for other variables, like attitude toward economic risk and money attitude. We believe that these results help improving the understanding of how emotions influence investors' behavior and show that their role is not always detrimental but depends on the interplay between individual differences and situational factors.

Keywords: Risk, Emotional intelligence, Money, Investment

JEL codes: G11

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1. The role of emotions on investment behavior

Past literature suggests that emotions have a detrimental impact on investment performance, mainly because of investors' loss aversion and the anticipation of the regret they may experience if risk-taking leads to a negative outcome (Kahneman & Tversky, 1979; Shefrin & Statman, 1985; Benartzi & Thaler, 1995; Stracca, 2004; Shiv, Loewenstein, Bechara et al., 2005; Statman, Fisher &, Anginer, 2008). We believe that the effect of emotions on investment decision-making is more complex than how it is currently understood and depends on an interplay between individual differences in dealing with affective stimuli and situational factors (e.g., differences in the expected value of the investments). A large body of research, in many different domains, showed that people do not behave in accordance to economic theories, like Expected Utility, but rather are prone to use heuristics and cognitive shortcuts as well as to fall prey to their affective reactions (Finucane, Alhakami, Slovic, & Johnson, 2000; Tversky & Kahneman, 1974). As a consequence, situational factors become very relevant in influencing the quality of decisions made by relying on heuristics or emotions (Lichtenstein & Slovic, 1971; Tversky & Kahneman, 1981; Hsee, Loewenstein, Blount, & Bazerman, 1999).

Psychologists have also demonstrated that affective reactions are an often unavoidable component of human decision-making and thinking (Schwarz & Clore, 1983, 2003; Finucane et al., 2000). Further, past research demonstrated that emotional reactions have a fundamental role as motivators of human behavior (Frijda, 1986) and can be used as an information about the quality of decision alternatives or as a feedback to evaluate the outcomes of one's choices (e.g., whether an investor has followed a successful strategy, that made her better off, or not; Schwarz & Clore, 2003). Despite the fact that emotions can be useful to inform the decision maker, there are plenty of situations in which emotional reactions lead people to make mistakes, like shown by research on risk perception (Finucane et al., 2000; Loewenstein,

Weber, Hsee & Welch, 2001). Since emotional feedbacks are often experienced in an automatic, unconscious way, they may negatively impact decision-making because their effect is not recognized when people are trying to make conscious, informed evaluations (Finucane et al., 2000). For instance, an investor may understand that a specific stock is losing value and she should sell it, but ends up keeping it in her portfolio anticipating the regret she would experience if the stock recovers the loss (Shefrin & Statman, 1985).

As we stated above, most of past research about the influence of emotions on investment decision-making has dealt with their detrimental effect on investors' portfolios performance, supporting the hypothesis that emotions lead investors to make mistakes. As a consequence, both among economists and psychologists there is a belief that emotions influence investors' behavior in a negative way, leading to a resistance to accept risks and to lower returns on investments.

More in detail, investors appear to perceive a negative correlation between risk and return (Ganzach, 2000), a perception that is in contrast with actual data and with classic theories of finance. Consistent, Statman and colleagues (2008) interviewed high net-worth clients of an investment company and found a positive correlation between investors' affective reactions toward two-hundred and ten different companies and the expected returns of these companies stocks. Moreover, a negative correlation between expected returns and subjective risks scores, as well as between risk scores and affective reactions, emerged. Finally, expected returns also correlated negatively with the scores provided by thousands of professional investors interviewed for the Fortune 500 Most Admired Companies ranking (Statman et al., 2008). These results demonstrate that investors expect higher returns and lower risk from stocks of companies inducing more positive affective reactions. These evaluations are not based on actual fundamental data and are in contrast with the golden rule of investments stating that risk and returns should be positively correlated (*equity risk*

premium) (Dimson, Marsh & Staunton, 2002; Siegel, 1992). However, and consistent with the equity risk premium, stocks of companies inducing more positive affective reactions (most admired companies in Fortune's ranking) perform worse than stocks of companies inducing less positive affective reactions (most spurned companies) (Statman et al., 2008). These results suggest that affective reactions have a detrimental effect on investors' decisions and induce them to incorrectly expect higher returns from safer stocks. In other words, emotions prevent investors from maximizing their returns.

Results emerging from these surveys are also supported by laboratory data. Shiv and colleagues (2005) compared patients with neurological lesions that impair their emotional responses and healthy participants in a simplified investment task and demonstrated that the former were more willing to take risks, therefore obtaining higher returns at the end of the experiment. Despite having a similar behavior in the early stages of the task the two groups developed very different strategies. The lack of emotional feedbacks means patients were equally willing to take risk across the whole investment game, whereas healthy participants showed a tendency to invest less and less as the task went on. In other words, every time healthy participants incurred in a loss their willingness to invest decreased.

2. Trait emotional intelligence

In a direct extension to the literature described so far, which highlights the detrimental effect of affective reactions on investment behavior, we believe that emotions, and in particular people's tendency to perceive and manage them, may have a less straightforward impact on financial decision making. A construct that takes into account individual differences in processing, using and regulating affect-laden information is that of trait emotional intelligence (trait EI or trait emotional self-efficacy; Petrides & Furnham, 2001).

Trait EI is defined as a set of emotion-related self-perceptions and dispositions located at the lower level of personality hierarchies, encompassing the emotion-related facets of personality (Petrides, Pitta, & Kokkinaki, 2007). High trait EI individuals are thought to be more able to manage stress and peer relations (Petrides, Sangarieau, Furnham, & Frederickson, 2006) and are considered more sensitive to the environment emotional cues, such as the effects of mood induction (Petrides and Furnham, 2003). Consistent with these results, Sevdalis, Petrides and Harvey (2007) demonstrated that individual differences in trait EI influenced the anticipation and experience of post-decisional affect. Further, Telle, Senior and Butler (2011) showed that participants with high trait EI, compared with those with low trait EI, made significantly better decisions in a social gambling task. Finally, recent work showed that people with high trait EI, compared with those with low trait EI, have a larger pupil dilation when presented with charts depicting the past performance of an investment fund in which they are investing (Rubaltelli, Agnoli, & Franchin, 2015). In turn, these individuals are also more likely to hold on their investment and even to by additional shares regardless from the positive or negative past performance of the fund.

Based on these earlier findings, the goal of the present work is to show that individual differences in people's tendency to deal with their emotions can influence their reactions and their appetite for risk when investing their money. In particular, we hypothesize that compared with people with low trait EI, individuals with high trait EI should be more able to face the uncertainty associated to risky investment decisions. In turn, these people should decide to invest more often in a simulated investment task (Shiv et al., 2005). Further, these investors should be in a better position to exploit situations in which the investment has a positive expected value (EV), but also more likely to lose money when the investment has a negative EV. When the EV is positive, accepting a risk is the best strategy since it allows to maximize the gains, however, when EV is negative, the opposite is true. Our hypotheses are

consistent with past research on trait EI showing that it is akin to a personality disposition, therefore it influences people's behavior regardless from the specific situation and can be advantageous on some occasion but not in others (Petrides, 2011).

Finally, these hypotheses are also based on evidence reported by Engelberg and Sjoberg (2006) showing that people with high trait EI have a lower orientation toward money, a greater sense of economic self-efficacy, and a more optimistic attitude. For this reason, we measured other variables that can influence investing behavior and risk seeking like people's attitude toward economic risk (Engelberg & Sjoberg, 2006) and their attitude toward money (Yamauchi & Templer, 1982). Therefore, an additional goal of the present study was to investigate whether trait EI has a unique effect on investment behavior controlling for the other dimensions that we investigated.

3. Method

3.1 Participants

We asked 239 college students (42% female; mean age 22 years, *SD* = 2.5 years) to complete a simulated investment task (Shiv et al., 2005). 120 students were enrolled in the economics program, whereas 119 students were enrolled in the psychology program. Half of the participants were assigned to the positive EV condition, whereas the remaining people was assigned to the negative EV condition.

3.2 Materials and procedure

Upon arrival at the laboratory, participants were endowed with twenty fake $1 banknotes to use during the investment task and were explained the rules. Each participant had to make twenty decision. At each round they were asked whether they wanted to invest $1.00 or not. If they decided to invest a fair coin was tossed and depending on the condition participants could either: win $1.50 or lose the dollar they had invested (positive EV

condition); win $.50 or lose the dollar they had invested (negative EV condition). Therefore, the investment task required to take a risk at every round, however, depending on the condition, accepting the risk would be a rationally convenient, profit maximizing strategy when the EV was positive or a poor, detrimental strategy when the EV was negative. At the end of the experiment, four participants were randomly extracted to win the same amount they were able to gain during the simulated task. After the investment task, participants completed a questionnaire comprising three measures described below.

TEIQue-SF (Petrides & Furnham, 2006): This thirty-item scale refers to the theory of trait EI, which defines this construct as an individual disposition at the lower hierarchical level of personality and it is based on the long form of TEIQue. The items ask to self-report one's tendency in regulating, expressing, and perceiving his/her emotions. Adequate internal consistencies and broad coverage of the sampling domain of the construct have been reported (Petrides, Perez-Gonzalez, & Furnham, 2007). Answers are provided on a 7-point scale ranging from 1 ("completely disagree") to 7 ("completely agree"). The measure showed a good reliability: $\alpha = .85$.

Economic Risk Attitude (Sjoberg & Engelberg, 2009): This scale includes twenty-two questions like "Skillful economists never take business risk" (recoded) or "The danger of taking business risk is usually exaggerated." Answers are provided on a 4-point scale ranging from 1 ("completely disagree") to 4 ("completely agree"). The scale reached a relatively low but acceptable level of reliability: $\alpha = .50$.

Money Attitude Scale (Yamauchi & Templer, 1982): This scale measures different sub-constructs related to the way people perceive and handle money, respectively: power-prestige, retention-time, distrust, quality, and anxiety. Examples of items are the following "I argue or complain about the cost of things I buy" (distrust sub-scale) or "I am very prudent with money" (retention-time sub-scale). Answers are provided on a 7-point scale ranging

from 1 (“never”) to 7 (“always”). All dimensions reached satisfactory levels of reliability: respectively, α = .87 for power-prestige, α = .86 for retention-time, α = .85 for distrust, α = .81 for quality, and α = .75 for anxiety.

4. Results

4.1 Correlations

Correlations among the three measures included in the questionnaire revealed that trait EI was significantly correlated with economic risk attitude (r = .22; p < .01) and with two of the subscales of money attitude: respectively, distrust (r = - .31; p < .01) and anxiety (r = - .27; p < .01). Therefore, people with higher trait EI also have a more positive attitude toward risk in economic contexts, feel less distrust in economic exchanges, and feel less anxious about spending and losing money.

4.2 Positive vs. negative expected value

First of all, we tested the effect of the condition on the number of times participants decided to invest (see Table 1). An ANOVA 2 (condition: positive vs. negative EV) x 2 (group: economics vs. psychology) x 4 (blocks of five decisions) with the third factor within-subjects and the proportion of investments as the dependent variable. The analysis revealed a significant effect of blocks, F (3, 711) = 22.49, p < .01, η^2 = .09, a significant effect of condition, F (1, 237) = 41.84, p < .01, η^2 = .15, and an interaction between blocks and condition, F (3, 711) = 6.97, p < .01, η^2 = .03. Neither the effect of group (p = .74) nor the interaction with the condition (p = .61) were significant. Therefore, the group variable was excluded from subsequent analysis.

We also repeated the same analyses separately for the two conditions. When the EV was positive, we found a significant effect of the within-subjects factor on the number of times

participants decided to invest, F (3, 357) = 2.85, $p < .04$, $\eta^2 = .02$. Pairwise comparisons showed that participants were significantly less willing to invest in the last block than in the first one ($p < .05$). Similarly, when the EV was negative, results revealed a significant effect of the within-subjects factor, F (3, 354) = 22.39, $p < .01$, $\eta^2 = .16$. This time all comparisons between blocks were significant (always $p < .01$) with the exception of the comparison between the second and third block ($p > .05$).

Table 1. Percentage of times participants decided to invest for each block of the task. Results for the positive EV condition are reported in the top panel, whereas results for the negative EV condition are reported at the bottom. Each block includes five investing decisions.

Positive EV							
		High trait EI		Low trait EI		Total	
		Mean	SD	Mean	SD	Mean	SD
	Block 1	.89	.17	.80	.22	.85	.20
	Block 2	.82	.27	.79	.27	.80	.27
	Block 3	.81	.26	.77	.23	.79	.24
	Block 4	.80	.27	.75	.27	.78	.27
Negative EV							
		High trait EI		Low trait EI		Total	
		Mean	SD	Mean	SD	Mean	SD
	Block 1	.80	.22	.74	.22	.77	.22
	Block 2	.66	.27	.63	.31	.64	.29
	Block 3	.68	.28	.56	.34	.62	.32
	Block 4	.59	.31	.45	.34	.52	.33

4.3 Models

The hypothesized model, presented in Figure 1, was tested separately for the two conditions with LISREL 8.7 program (Jöreskog & Sorbom,1993) using the weighted least squares method. To evaluate the fit of a model, the following criteria are commonly considered. If the model fits the data well, the chi-square test statistic ($\chi 2$) should be non-significant. Moreover, other indices are indicative of acceptable model fit: chi square*/degree*

of freedom ratio ($\chi 2$/df <3); comparative fit index (CFI >0.90), goodness-of-fit index (GFI>0.90), adjusted goodness-of-fit index (AGFI >0.85), root mean square error of approximation (RMSEA <0.05), standardized root mean square residual (SRMR<0.05; Schermelleh-Engel, Moosbrugger, & Muller, 2003).

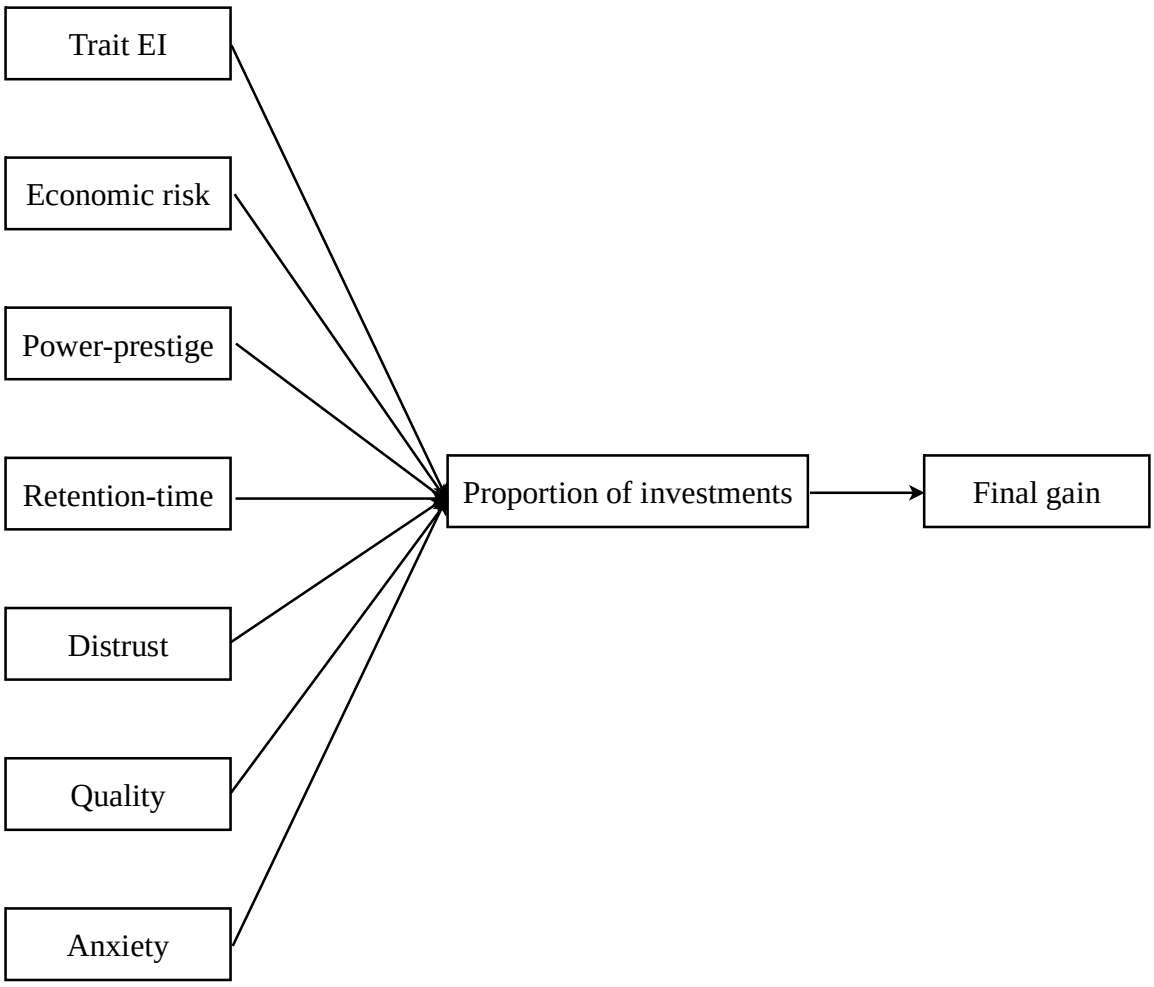

Figure 1. Hypothesized model including all independent variables (trait emotional intelligence, economic risk attitude, and the five subscales of money attitude).

For both the conditions, the hypothesized model fitted the data well (positive EV condition: $\chi 2(28)=9.26$, $p=.99$, $\chi 2/df=.33$, CFI=1.00, GFI=0.99, AGFI=0.98, RMSEA=0, SRMR=0.05; negative EV condition: $\chi 2(28)=3.70$, $p=.99$, $\chi 2/df=0.13$, CFI=1, GFI=0.99,

AGFI=0.99, RMSEA=0, SRMR=0.02), however some paths were not statistically significant. Subsequently, two more parsimonious models were tested by removing one by one all those exogenous variables that did not significantly predict the proportion of investments, starting from those with the smaller standardized loading. The final models, represented in Figure 3 and Figure 4, fitted the data well (positive EV condition: $\chi 2(3)=3.28$, $p=.35$, $\chi 2/df=1.09$, CFI=0.99, GFI=0.99, AGFI=0.95, RMSEA=0.03, SRMR=0.05; negative EV condition: $\chi 2(3)=.85$, $p=.83$, $\chi 2/df=.28$, CFI=1, GFI=1, AGFI=0.99, RMSEA=0, SRMR=0.04). As far as positive EV condition is concerned (see Figure 2), only trait emotional intelligence and the retention-time subscale of money attitude predicted the proportion of investments (positively and negatively, respectively) that, in turn, showed a positive effect on the final gain. The model explained 7% of variance of the proportion of investments and 9% of the final gain. In regards to the negative EV condition, the final model (see Figure 3) showed that both trait emotional intelligence and distrust positively predicted the proportion of investments that was negatively linked to the final gain. This model explained 6% of variance of the proportion of investments and 9% of the final gain.

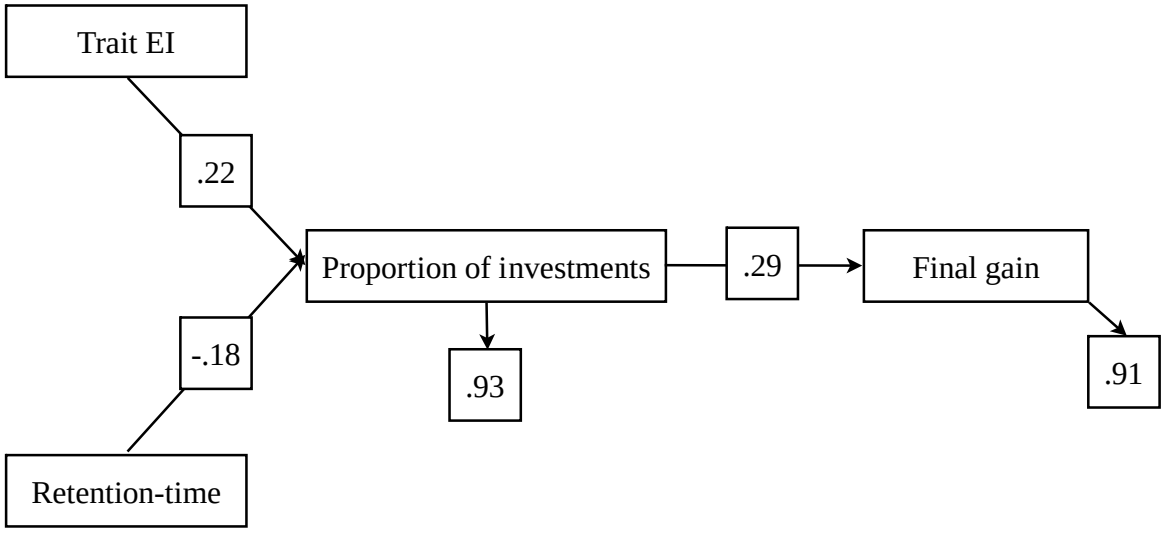

Figure 2. Final model for the condition with positive expected value. In this condition, trait EI and retention-time were the only significant predictors of the number of times participants decided to invest their money.

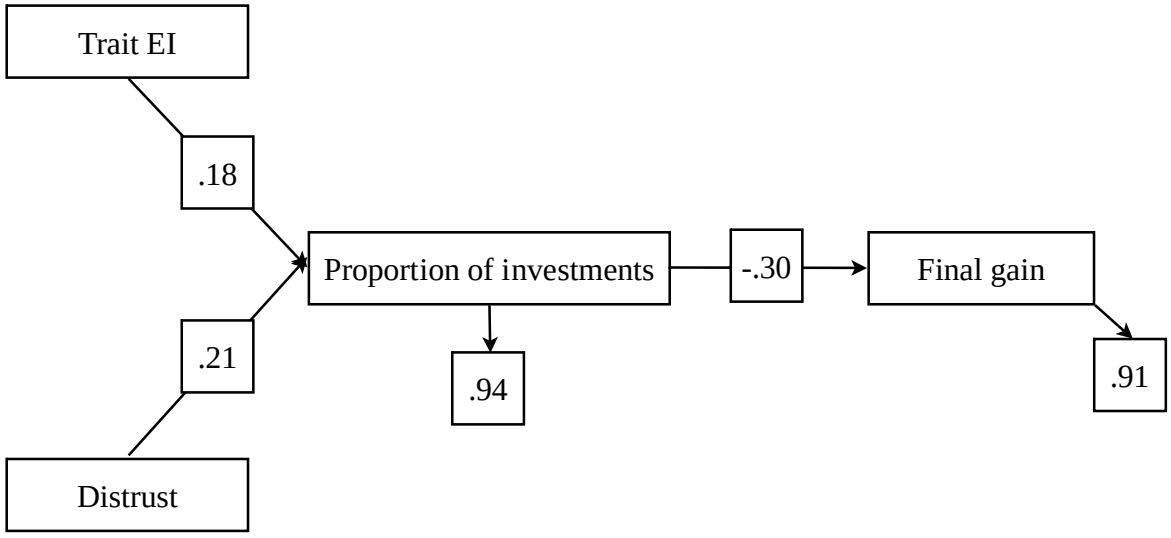

Figure 3. Final model for the condition with negative expected value. In this condition, trait EI and distrust were the only significant predictors of the number of times participants decided to invest their money.

5. Discussion

Overall, the results of our study demonstrated that participants with higher trait EI are consistently more likely to invest compared with participants with lower trait EI. These results suggest that investing behavior is influenced by individual differences in perceiving and managing emotions. Our findings also support the hypothesis that high trait EI is not always advantageous, but it is a disposition that leads people to be consistently less influenced by their emotions. Indeed, participants with high trait EI invested more often regardless from the positive or negative EV of the task. These results are in line with previous

work on trait EI suggesting that it can be advantageous on some occasions but not in others (Petrides, 2011). This findings are also consistent with work by Rubaltelli and colleagues (2015) showing that people with high trait EI have larger pupil dilation that people with low trait EI, but then were more likely to invest additional money on funds with positive or negative recent performance. Pupil dilation indicates a higher affective arousal, which leads high trait EI individuals to manage their emotions and cope with them, something that people with low trait EI are less able to do (Petrides et al., 2006).

Compared to previous research on the impact of emotions on investment behavior, we shifted the focus from emotions per se to a framework that considers the importance of individual differences in perceiving and managing emotional information. In addition, we showed the importance of considering individual differences in relation to situational factors like the positive or negative EV of the investment. The present study demonstrates that high sensitivity to emotions allows people to manage them more effectively without becoming entrapped by their fear of losing money. However, the other side of the coin is that, being less worried about losing money, people with high trait EI are more likely to take risk even when this is not the most advantageous strategy. Overall our results are partially in contrast with previous literature suggesting that emotions have a negative impact on investment behavior. Indeed, we demonstrated that in some situations this effect can be positive and, more generally, what really matters in investment decision-making is the interplay of individual differences in managing emotions and the characteristics of the decision context.

Further, despite replicating previous results showing that people tend to reduce their investments over time, we found that people with high trait EI are significantly more likely to invest. This is likely to depend on their lower attachment to material goods and money (Engelberg & Sjoberg, 2006) and on their capability to avoid the negative impact of the anticipated emotions induced by a potential future loss (Sevdalis et al., 2007). Importantly,

the decision to invest was mainly related to individual differences in emotional intelligence rather than to individual differences in economic risk attitude. Indeed, even controlling for the economic risk attitude the effect of trait EI was significant. Since taking risks when investing money is an affectively-charged decision, we believe that the concept of trait EI helps explaining investing behavior in a more comprehensive way than the sole risk attitude. In other words, trait EI should encompass investors' risk attitude since it can explain individual tendencies in managing the affective cues stemming from the uncertainty characterizing financial markets.

In addition, in the positive EV condition, we found an effect of the retention-time subscale of money attitude on the number of times participants decide to invest, whereas, in the negative EV condition, a significant effect of the distrust subscale emerged. These findings can be interpreted in light of the literature on investment behavior. The retention-time subscale is defined by Yamauchi and Templer (1982) as a factor composed by items that relate to planning and orientation toward the future. People who score high on this subscale place a great importance on the process of preparation and on the goal of security in the future. Consistent, in the positive EV condition, increasing importance of the retention-time dimension led to lower willingness to invest. This result is reasonable because people with a lower tendency to plan for their financial future should be more willing to put their money at risk and less scared by the idea of losing. In other words, planning for financial stability in the future should lead to avoid unnecessary risks at present, even when the EV is positive. We believe that the findings described in this paper are consistent with the profiles of traders described in the financial literature, where it is reported that these investors are risk-seekers, overconfident, and place higher weight on short-term opportunities than on long term investments (Kahneman & Riepe, 1998; Grinblatt & Keloharju, 2009). Distrust is defined by Yamauchi and Templer (1982) as a tendency for high scorers to maintain hesitant, suspicious,

and doubtful attitudes in situations that involve money. In the negative EV condition, the significant effect of this subscale is probably related with the fact that it was very difficult for participants to end up with a gain, therefore people with high distrust may have decided to invest more often in the hope of uncovering a trick to gain more money. Future research should try to better explain these effects of money attitude on people's willingness to invest.

Looking at the overall picture, the construct of trait EI seems to be related to the major characteristics linked to the profile of traders identified in the financial literature (Petrides & Furnham, 2001). More work is needed to understand whether trait EI can be the fundamental construct upon which building a more integrated model of trading, still we believe that the present study provides important, new evidence about the way emotions influence investors' behavior. Although much of previous work found a detrimental effect of emotions on investment choices (Shiv et al., 2005; Statman et al., 2008), we found that it is a rather simplistic way to explain the impact of emotions on this type of decisions. In fact, things look considerably more complex since people who are better equipped to process emotional information end up taking more risks that pay off only under specific circumstances (for instance, when investments have a positive EV). In the task we used, it is not too difficult to identify the best strategy (investing at every round if EV is positive, or not investing at all if EV is negative), still both participants with low trait EI and those with high trait EI are influenced by their individual dispositions toward emotion-related stimuli and are not flexible enough to switch strategy depending on situational factors, like the different expected value. In the end, as we stated above, it would be very simplistic to think that the advantages given by being more risk prone in the financial markets would not be matched by potential pitfalls due to this very same characteristic.

Finally, our results suggest that people with high trait EI may engage in excessive trading and could be penalized by the high turnover of their portfolios. Again, these

characteristics are consistent with the profile of traders, who are looking for short term speculative opportunities, more than with the profile of an investor who pursue a long term strategy. Furthermore, previous research on excessive trading supports our reasoning showing that individual investors who change their portfolios more often tend to have lower net returns once costs are taken into account (Barber & Odean, 2000). Still, the present results are important because they show a more complex picture of the relation between emotions and behavior in the financial domain and provide a first evidence about the possible link between individual differences in dealing with affective information and the profile of traders. Future research should investigate this link in more detail with the goal of finding whether trait EI can be the construct which encompass the main psychological dimensions characterizing risk prone investors, like traders.

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