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Article — Published Version

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Review of Financial Economics

Provided in Cooperation with:

John Wiley & Sons

Suggested Citation: Max, Suchanek; Liêu, Minh-Lý (2021) : The disposition effect and admiration seeking, Review of Financial Economics, ISSN 1873-5924, Wiley Periodicals, Inc., Hoboken, USA, Vol. 40, Iss. 2, pp. 200-234,
<https://doi.org/10.1002/rfe.1146>

This Version is available at:

<https://hdl.handle.net/10419/264516>

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The disposition effect and admiration seeking

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Abstract

This paper examines the relationship between the disposition effect and personality traits and aims to find an additional explanation of this bias in a willingness to pay for admiration. We conduct a personality assessment, a stock trading game and a sealed-bid English auction for 84 individual investors. The gathered data correspond with the literature on a descriptive level; however, even though admiration-seeking behavior is an important part of social interaction, there is no significant willingness to pay for it. Furthermore, we do not see any influence of personality on the disposition effect. Our findings add to the ongoing discussion of personality traits in connection with behavioral biases.

KEYWORDS

admiration, big five, dark triad, disposition effect, personality traits

JEL CLASSIFICATION

D14; G11; G23; G24

1 | INTRODUCTION

Personality traits and financial decision making have been widely assessed by current research, for example, on household finances (Brown & Taylor, 2014) or risk tolerance (Pinjisakikool, 2017). Furthermore, personality traits play an important role in regard to the appearance and strength of behavioral biases. For example, Rzeszutek et al. (2015) indicate that individuals with the traits of impulsivity and empathy are more susceptible to all three of the biases included certainty effect, sunk-cost fallacy, and mental accounting. Additionally, Lin (2011) finds that individuals high in the trait openness are prone to herding bias. The disposition effect—the tendency to sell winning positions early and keep losing positions in the books (Shefrin & Statman, 1985)—is one of those biases. This effect is independent of asset classes and even occurs among experienced investors (Grinblatt & Keloharju, 2001). It is a very popular behavioral bias experiencing high research coverage (Haryanto et al., 2020; Von Beschwitz & Massa, 2020) and is specially affected by social settings; Heimer (2016) showed that “self-image or reputation [...] contributes to the disposition effect.” Introducing an interaction between individuals by allowing access to a social network has a significant influence on individuals' trading behavior, which ultimately increases the disposition effect. By leveraging this argument of reputation (Heimer, 2016), some

Suchanek Max and Minh-Lý Liêu contributed equally to this work. We thank Tarun Mukherjee (the editor), two anonymous reviewers, and Matthias Pelster for valuable comments and suggestions.

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individuals show a higher disposition effect in a social setting, which could indicate admiration-seeking behavior (see Pelster and Hofmann (2018) for a similar argument).

Based on this argument, a facet of narcissism (Rijsenbilt & Commandeur, 2013) may drive the disposition effect. In this case, the reputation power arising from possessions (Belk, 1985) would outrank the plain purchasing function for certain individuals (Pilch & Górnik-Durose, 2016). Individuals might prioritize admiration over the monetary value of trading profits. Therefore, we would expect a tradeoff between the social admiration that an individual receives and the monetary payoffs. Explaining this relationship could contribute to a better understanding of preference construction and how much admiration is worth to an individual in a social setting.

In this paper, we concentrate our research on the disposition effect and the measurement of admiration-seeking behavior and aim to test whether investors' personality explains their behaviors. We pose two important research questions. First, we ask whether there is a significant influence of personality traits on the disposition effect. Second, we ask whether there exists a willingness to pay for admiration.

For our analysis, we combine reliable personality assessment inventories, that is, the dark triad, the honesty-humility dimension of the HEXACO¹ and the big five. We implement a widely used stock trading game to measure the disposition effect and set up a reliable auction design to measure willingness to pay for admiration. In addition to providing insights into the disposition effect of participants, the stock trading game also allows the introduction of a social setting through a leaderboard. Coming out of the trading game, each participant has a certain balance in a virtual currency available depending on the achieved performance. Additionally, the participants know their place on the leaderboard. They have the possibility to take part in a sealed-bid English auction measuring the willingness to pay for admiration. The bidding item of this auction is a unique certificate. Since the certificate owner will have the possibility to post it on social media, it should result in admiration from one's peers. Funding for taking part in this auction is determined by the balance of the stock trading round. Particularly, the maximum bid value that participants can bid is their final balance after the stock trading game.

Our results show that the data are in line with existing findings and correlations of personality traits. In regard to the relationship of personality traits on the disposition effect, we observe no statistically significant relationship between the dark triad and big five personality traits and the disposition effect. With this finding, our paper contributes to a growing body of literature on the impact of personality traits on behavioral biases. Importantly, this literature does not yet reach a consensus, as existing studies offer contradictory results. For example, Cecchini et al. (2019) and Lin (2011) found different explanations for various traits influencing the disposition effect. On the one hand, the results show that extroverts quickly sell their stock to receive an immediate profit realization and a tendency for conscientious individuals to be more patient and not fall for the disposition effect (Cecchini et al., 2019). In addition, high neuroticism counteracts the disposition effect by setting a stop-loss threshold (Lin, 2011). On the other hand, Cecchini et al. (2019) confirm the extraversion and conscientiousness part but lack a similar explanation for neuroticism even though both studies make use of the NEO Revised Personality Inventory from Costa and McCrae (1992). Such differences in results could arise from participant sample selection but also through different methodological approaches. For example, Lin (2011) used hypothetical questions, while Cecchini et al. (2019) applied an experiment.

Regarding the second research question, for the personality trait sincerity in the honesty-humility dimension of the HEXACO assessment, we see no significant influence on the bid amount and therefore willingness to pay for admiration. This result is controversial with the previous result of Kleinlogel et al. (2017) and Scigala et al. (2020), which addresses the relationship between honest humility and predicted cheating behavior. These findings suggest a positive relationship for a low score in honesty-humility personality and the frequency of cheating. Although these specific individuals might perceive the unique certificate as a kind of ploy to gain privileges, our study finds that there is no link between this stimulation and the honesty-humility personality. Our results fuel the ongoing inconclusive discussion about the influence of personality traits on financial decision making.

In addition to our main hypothesis, we were able to analyze overconfidence and its relationship with personality traits. Embedded questions in the stock trading game tested how sure a participant felt with her trading decision. This allowed us an assessment of overconfidence. Since this elicitation design is directly linked to the experiment, it provides a more believable proxy for overconfidence compared to the existing literature that uses trading frequency (Benos, 1998). Interestingly, we found an association between overconfidence and dark triad traits. These findings add to the literature about the role of personality traits on both overconfidence and cognitive biases.

Our paper proceeds as follows. Section 2 provides background information about the personality traits used. Section 3 develops our hypothesis based on related studies. Section 4 outlines the methodological approach by explaining the different parts and used models and their anchoring within the current literature. Section 5 illustrates the relationship

between personality traits and the selected behavioral biases. Section 6 discusses the implications of these findings, shows limitations and opens a door for further research.

2 | PERSONALITY TRAITS

Personality traits are defined as general, internal and comparative dispositions that an individual ascribes to people (McAdams, 2009). The goal of personality traits is to structure a behavioral pattern into categories. Research started exploring personality traits with a linguistic approach looking at the English dictionary and the words describing personality (Allport, 1937). These different dispositional traits can be merged into one of five different categories, that is, the big five traits. This form of assessment is widely used in psychological research and still counts as a reliable approach to assess personality (McAdams, 2009). In addition to the categorization into five general traits, there are other assessments, such as the dark triad, which focuses on malevolent attitudes of individuals or honesty as the opposite. Scaling these personality traits often ends in an expression of extremes, that is, extroverts versus introverts, while people in general have some introverted and some extroverted features. The sum of these features then points toward the more extroverted or introverted end (McCrae & Greenberg, 2014). Within this section, we provide background on the personality traits used for this study. The nature of these traits is important to understand, as the next section describes hypothesis creation. Due to popularity and our motivation derived from recent literature, we first start with the dark triad, followed by the honesty-humility dimension and the big five.

2.1 | Dark triad

The dark triad established by Paulhus and Williams (2002) introduces a method for measuring the malevolent personality traits of narcissism, Machiavellianism and psychopathy, which share a mutual core of callous manipulation (Furnham et al., 2013). The dark triad has become popular in recent years (Lee & Ashton, 2014) and has shown a significant relationship with cognitive biases (Suchanek, 2021) in financial decision making.

- Freud (1914) provided fundamental research on narcissism; the term was originally introduced as referring to an individual who treats their own body as a sexual object to achieve satisfaction. However, as of today, this term still lacks a clear operational definition (Crowe et al., 2012). Research commonly differentiates between the grandiose and vulnerable narcissism dimensions; definitions for grandiose narcissism highlight a special behavior of individuals in interpersonal relationships that is characterized by self-concentration and conceitedness (Campbell & Baumeister, 2006). The vulnerable dimension, on the other hand, is described with attributes such as low self-esteem or social isolation (Miller & Campbell, 2008). While both dimensions share certain components such as entitlement or egotism (Crowe et al., 2012), our study gives priority to the grandiose dimension because of the underlying admiration aspect.
- Machiavellianism goes back to the work “The Prince” by Niccolo Machiavelli, who was a consultant of the powerful Medici family in the 16th century (Fehr et al., 2014). The author describes a certain way of ruling as self-serving, malevolent and exploitative. With the research of Christie and Geis (1970), Machiavellianism became popular in psychological research as a measurable individual-difference variable (Fehr et al., 2014). Today, Machiavellianism determines the degree to which people use traits such as manipulation, flattery and emotional distance to exploit social and interpersonal relationships to reach their goals (Christie & Geis, 1970).
- Psychopathy describes a personality disorder that is characterized by antisocial behavior and a lack of empathy (Patrick et al., 2009). There is a differentiation between the clinical and subclinical spheres of psychopathy (Paulhus & Williams, 2002). For the widely used subclinical definition, individuals show especially high impulsivity and thrill-seeking behavior, which is also validated by looking into non-criminal samples (psychopathy often being related to criminal activities).

2.2 | Honesty-humility

HEXACO is another concept of categorizing personality traits (Ashton et al., 2004). It covers the six factors honest humility (H), emotionality (E), extraversion (X), agreeableness (A), conscientiousness (C), and openness to experience (O);

therefore it also covers three dimensions of the big five. For instance, agreeableness and neuroticism/emotional stability are similar to agreeableness and emotionality. More details on similarities and differences between HEXACO and the big five can be found in Gaughan et al. (2012). We add the honesty-humility element of the HEXACO personality assessment to describe individual variations in subscales sincerity, fairness, greed avoidance, and modesty. Furthermore, it acts as the opposite for the dark triad explained above. The descriptions of the singular subscales of honest humility below are based on Ashton et al. (2014):

- Sincerity measures the subject's willingness to be manipulative or dishonest in their interactions with others to achieve a desired outcome. A low score shows dishonesty or manipulative intentions toward others.
- Fairness measures the subject's willingness to cheat or steal with the intention of obtaining an advantage and the tendency to use fraud. A low score is related to treating other parties unfairly.
- Greed avoidance measures the importance put on items such as money, prestige and costly items by an individual. Low-scoring individuals are usually less concerned about wealth and prestige.
- Modesty measures the view of an individual about himself concerning others. High scorers see themselves as equal to others. Low scorers believe in superiority and that they merit special treatment.

2.3 | Big five

Early research faced several issues in regard to personality assessment, such as the number of different scales or derivations in the formulation of traits (subscales) (John & Srivastava, 1999). This absence of a common language was resolved by consensus on a general taxonomy, namely, the big five. These classifications are also known as the OCEAN model, which contains the traits of openness to experience, conscientiousness, extraversion, agreeableness and neuroticism. The title does not appreciate the greatness of the concept but rather refers to the broadness of the single traits (John & Srivastava, 1999). With this broad but widely agreed structure, the model is one of the most researched assessments for personality (Cobb-Clark & Stefanie, 2011; John & Srivastava, 1999; McCrae & Costa, 1999). The single traits can be described by following McCrae and John (1992); McCrae and Greenberg (2014):

- Openness to experience describes individuals with fertile imaginations and an awareness of public and private events. While there is a rich vocabulary describing extraversion and agreeableness, only a few words are related to openness (McCrae & Greenberg, 2014). Usually, we can observe explanations such as being more responsive to art and beauty, preferring alternation and trying out new things. It does not surprise that the subscale includes openness to fantasy, aesthetics, feelings, action ideas and values.
- Conscientiousness people are seen as efficient, organized, planful and reliable. The trait is a significant determinant of health, positive aging and human capital according to Roberts et al. (2014). The attributes related to high conscientiousness also predict higher achievements, for example, in case of education or job performance. Furthermore, conscientiousness implies high ethical standards through responsible behavior.
- The term extraversion originated from psychological research but passed on into common usage. It describes active, energetic behavior and an outgoing, talkative attitude of individuals. Extraversion is also associated with endeavoring power and status (Olson & Weber, 2004).
- Agreeableness or "conformity," as labeled in early research (Graziano & Eisenberg, 1997), is linked to adjectives such as appreciative, forgiving, generous, kind and sympathetic. Although this dimension seems to be desirable for most individuals, in many situations, such as career performance, agreeableness can be obstructive (Judge et al., 2012).
- Neuroticism defined by Eysenck (1947) is an alternative term for emotional stability. This implies the calm stable behavior of individuals with low scores in this trait. Those with a high score are often found to be nervous, moody, dissatisfied and sensitive to stress.

3 | HYPOTHESES DEVELOPMENT

The following paragraph outlines our hypothesis development categorized in disposition effect and willingness to pay for admiration. We leverage the existing findings from the literature on common personality traits about financial decision making.

3.1 | Personality traits and the disposition effect

The disposition effect, known as the cognitive dissonance that appears when investors sell winning stocks too early and realize losses too late (Shefrin & Statman, 1985), has outstanding popularity in regard to behavioral bias research, as shown in Von Beschwitz and Massa (2020) and Haryanto et al. (2020).

To the best of our knowledge, there is no existing literature about the disposition effect and dark personality traits. However, individuals with distinct dark personality traits narcissism, Machiavellianism, and psychopathy (Paulhus & Williams, 2002) decide differently in regard to financial matters. Another argument for including the dark triad in the disposition effect discussion arises from the risk-seeking attitude of individuals. A common explanation for the disposition effect is based on prospect theories asymmetric risk aversion; in this concept, individuals are risk averse when experiencing gains and risk seeking when confronted with losses (Hens & Vlcek, 2011). In particular, individuals scoring high in the dark triad are seen as more risk seeking than other individuals (Grover & Furnham, 2021). Interestingly, narcissists and psychopaths show a propensity for taking investment/gambling risks, while narcissists are involved in real stock investments, Machiavellianism was not related to any aspect of financial risk-taking (Sekscinska & Rudzinska-Wojciechowska, 2020). Therefore, one would expect individuals with a high score in the dark triads to gamble with losing stocks and not realize these losses, which leads to a higher disposition effect.

Furthermore, individuals with high levels of Machiavellianism will do whatever it takes to achieve their goals due to their manipulative and callousness tendencies. This could lead to a stricter adherence to a trading strategy, meaning holding on to losing positions much longer. In particular, in a social environment, the risk behavior of dark triad individuals could further be triggered by the tendency to protect their personal image and their social standing. Particularly, dark triad individuals use gossip to tune their image (Hartung et al., 2019), while narcissists manipulate the others, protecting their social standing and using interaction as a social influence strategy (Lyons & Hughes, 2015). In particular, Crysel et al. (2013) demonstrated that in ego-threat situations, dark triad individuals tend to protect their self-images by engaging in risk taking.

Another argument for this hypothesis can be found in the confirmed correlation between the dark triad and selected big five traits (Jakobwitz & Egan, 2006). Paulhus and Williams (2002) showed these correlations; that is, agreeableness was negatively correlated with narcissism, Machiavellianism, and psychopathy. Extraversion and openness for experience scores were significantly higher for narcissists and psychopaths. Machiavellists and psychopaths were low on conscientiousness. Finally, psychopaths tended to report lower levels of neuroticism (Paulhus & Williams, 2002). The relationship between the big five and the disposition effect that has been mentioned by Cecchini et al. (2019), and Lin (2011) supports the link between the big five and the disposition effect. These prior studies support the idea that individuals with dark triad traits would be risk taking and take any cost to protect their standing. Thus, we expect that dark triad individuals are prone to the disposition effect by quickly executing gaining positions and holding on to losses.

The literature poses that the big five personality traits can influence the appearance and strength of the disposition effect. As briefly mentioned in the introduction, Lin (2011) assessed this relationship for individual investors from the Taiwan stock market. By using the big five assessment, it was found that neuroticism was positively related to the disposition effect. This means that a higher score led to a higher level of the disposition effect. For conscientiousness, there is a significant positive relationship as well Cecchini et al. (2019) showed that personality traits can influence the disposition effect in a different way: The authors illustrated a reward system that motivated extroverted individuals to sell their positions rather early. Individuals with high scores in conscientiousness observed a tendency to resist this impulsivity. The individuals hoped patiently for even higher returns in the future. Last, they highlight the importance of openness to experience to acquire more information with thinking of producing higher performance.

Thus, we hypothesize that there exists a significant relationship between the personality traits of the dark triad and the big five and the disposition effect. We therefore put forth the following hypotheses:

- Hypothesis 1a: Dark triad personality traits have a positive relationship with the disposition effect.
- Hypothesis 1b: Extraversion has a positive relationship with the disposition effect.
- Hypothesis 1c: Neuroticism has a positive relationship with the disposition effect.
- Hypothesis 1d: Conscientiousness has a negative relationship with the disposition effect.
- Hypothesis 1e: Openness has a negative relationship with the disposition effect.

3.2 | Personality traits and admiration-seeking behavior

Financial profits for individuals are associated not only with monetary value but also with admiration that they receive through it (Back et al., 2013; Szücs et al.,). This attitude of narcissistic individuals toward money was elaborated in the study of Pilch and Górnik-Durose (2016): Along with the ability to fulfill biologically relevant incentives such as buying food or providing shelter, money also comes with a set of social factors. These factors arise from the symbolic character and can fulfil functions such as social display or protection. This second nature of money, the possible perception as a symbol of power, status or prestige (Pilch & Górnik-Durose, 2016), is a driving factor for individuals with a high level of narcissism. In particular, narcissists have self-enhancement and self-protection strategies. Admiration seeking is a part of the self-enhancing strategy used to help narcissists keep their high rank orders consistent over time (Back et al., 2013). Szücs et al. (2020) also support Back et al. (2013)'s view; the authors find that narcissists demonstrate admiration seeking in social contests. We assume that there is a tradeoff between profit and admiration for certain types of individuals. Analyzing this willingness to pay for admiration is important for understanding individuals' trading behavior, especially the appearance of behavioral biases. Admiration as a kind of social profit might be able to mitigate potential underperformance in investments in regard to a comparison with a benchmark. Admiration-seeking behavior is an essential part of narcissism. For individuals with high scores in the dark triad, we expect admiration-seeking behavior to be more dominant than the pure need for monetary reasons. This admiration-seeking behavior could be assessed through an auction with a unique certificate stating success in a trading game.

There are also distinctive behavioral patterns for auctions emerging from a high score in dark triad personalities. These include, for example, high competitiveness (Fong et al., 2020; Jonason & Webster, 2010) and risk preferences (Hu et al., 2011), such as those that influence bidding behavior in an auction. Thus, once an individual has shown the need for admiration by entering the auction, dark triad traits could increase the bid height. A recent contribution from Fong et al. (2020) also showed the relationship between personality and competitiveness for experimental auctions. The authors introduced two settings: a winner-pay auction and an all-pay auction with riskier settings. In these settings, competitions are seen as zero-sum games constructed out of the success of one individual and the failure of the others. High competitiveness leads to higher bidding at auctions. For narcissists, agreeableness is low, and extraversion is high (Cook et al., 2020). In addition, narcissists are prone to risky decision-making (Yang et al., 2018). This results in greater overconfidence and greater willingness to bet (Campbell et al., 2004). We also expect Machiavellians to engage in this auction setting. Individuals with high levels of Machiavellianism will do anything to achieve their goal (Jones & Paulhus, 2009), which should be observable in the bidding height. We see the admiration-seeking behavior of narcissistic individuals as a key driver for taking part in our specific auction. The prize of the auction is the unique participation certificate. Winning the auction by showing superiority can therefore achieve admiration for the owner. With this additional drive in mind, they should out-scale other individuals in the urge to succeed in the auction.

In addition to the dark personality traits, we also included the honesty-humility trait in our analysis. This trait is largely unrelated to markers of the big five, despite the presence of agreeableness; as a facet of the HEXACO assessment, the enhancement of the big five comes with four subscales (Ashton et al., 2014). The subscale of greed avoidance is especially interesting for our setup. Low-scoring individuals who are more concerned with showing prestige could be more likely to bid on the certificate.

Due to this argumentation, we construct the following hypotheses regarding personality traits and admiration-seeking behavior:

- Hypothesis 2a: Dark triad has a positive relationship with the bid value.
- Hypothesis 2b: Honesty-humility has a negative relationship with the bid value.
- Hypothesis 2c: Extraversion has a positive relationship with the bid value.
- Hypothesis 2d: Agreeableness has a negative relationship with the bid value.

4 | METHODOLOGICAL APPROACH

This study combines three approaches to gain insight into a subject's decision-making behavior. We apply the setting of Weber and Camerer (1998) to create a portfolio management scenario. Afterward, a personality assessment takes place followed by a sealed-bid English auction. This experiment with all three components is coded in o-Tree, which is an open-source platform software that integrates many advantageous features, such as not requiring installation and having

low costs and high scalability (Chen et al., 2016). The implementation is conducted through the online recruitment system Prolific.ac (Palan & Schitter, 2018).

4.1 | Procedure and experiment design

The following paragraph outlines these three components in detail by explaining their individual relevance to achieving our research goal and by putting them into the literature context. We show that the research methods are commonly used within the current literature and that combining these components is a fitting approach to test our hypothesis.

The complete participation process overall included a demographic questionnaire covering age, gender, risk self-assessment and trading self-assessment. Following that was the round-based trading game; after rounds 7 and 14, the participants guessed the type of stock they wanted to trade and completed a self-assessment about their confidence with their guesses. A loss and risk aversion elicitation task, personality assessment including attention check questions and auction complemented this section. All questions can be found in the appendix, while the following paragraph outlines the more complex settings.

4.1.1 | Portfolio management setting

The literature widely uses the experimental design by Weber and Camerer (1998) to investigate the disposition effect in a practical, rather than theoretical, setting. In detail, the setup provides six different stocks (A-F) that participants can trade over a total of 14 rounds. The prices are predetermined by a random process that is independent of the participants' investment decisions. The random movement price process includes two steps. First, we determine the direction of price (increase or decrease) based on the type of stock. This is done by setting fixed probabilities on the different asset classes to give an indication of a price increase or decrease. The type of stocks is summarized in Table 1 stock types. After the direction of the stock price is determined, the magnitude of the price change is randomly chosen between 1, 3, or 5 Talers, which are the currency to play with. The outcome of this price setting process is communicated to the participants in the way that exactly one asset follows one of the following types: “++”, “+”, “-”, “--”, where “++” represents a 65% chance of increasing, similar to “+” being 55%, “0” being 50%, “-” being 45% and “--” being 35%.

In the current study, the participants were not informed about which stock had which characteristic. Therefore, we added two guessing sessions, after rounds 7 and 14, to investigate the understanding of players with different types of stocks and confidence with their choices. This framework allowed a reallocation of the current portfolio after a pricing period, in which the assets change their values. In each period, this stage randomly determined the magnitude of the stock price change. The participants received 10,000 Talers as an initial investment and historical stock data about three periods before their investment. Moreover, to ensure that the participants were clear about the rules, participants underwent three trial rounds before the experiment started. No lending, borrowing or short selling was allowed during the experiment. Participants could only invest in the six stocks with characteristics described earlier. After 14 rounds, the system automatically liquidated the portfolio, and the result of participants was determined by the value of their portfolio in Talers.

To introduce the impact of social competition, after rounds 5, 10, and 14, the participants were ranked together with other participants who had previously completed the same trading game based on their percentage of the winning trades over the total trades. Winning trade measures the number of trades sold at the price that are higher than the buying prices. To ensure feasibility in an online setting where not all participants take part in the trading game at the same time,

TABLE 1 The stock types with their probabilities of price increases and decreases

Stock	Type	Probability of price increase	Probability of price decrease
B	++	65%	35%
F	+	55%	45%
A, C	0	50%	50%
E	-	45%	55%
D	--	35%	65%

the participants were ranked with a random sample of participants who had previously completed the exact same trading game.² The top performers of the previous participants were excluded to increase the probability of a high ranking and the motivation to bid in the auction.

4.1.2 | Personality assessment

After the trading session, the participants had to finish additional tasks to be eligible for compensation. First, they had to complete an assessment for risk preferences (Eckel & Grossman, 2008; Gächter et al., 2007; Holt & Laury, 2002). Afterward, a survey with 39 questions was conducted to assess personality traits. This survey included three measures: the dark triad (Jonason & Webster, 2010), the HEXACO honesty–humility dimension (Ashton et al., 2014), and the big five (Gosling et al., 2003).

4.1.3 | Auction setting

Using an auction to determine willingness to pay for the respective auction price is a commonly used method in research (Noussair et al., 2004). Particularly, using an auction method to reveal willingness-to-pay information is more effective than the Becker–DeGroot–Marschak method (BDM) (Noussair et al., 2004). It is also more precise compared to, for example, the use of product cards and gifts. Thus, in this study, we chose the auction as the most suitable method to determine a possible willingness to pay. We created a social setting in our measurement of the disposition effect. This was done by leveraging the methodology of Weber and Camerer (1998)'s stock trading game by introducing a rating system between the participants.

To trigger admiration-seeking behavior, our auction price had to fulfill three requirements. First, it had to be linked to the participant in a way that personal identification is possible. Second, it had to be immediately available and usable. Third, it had to create a social reaction from related and relevant peers. We assessed that a certificate stating the trading game success of the participant might be the best way to trigger such admiration-seeking behavior. We introduced this at the end of the trading game; after 14 rounds, we offered the participants a possibility to receive the certificate for finishing the trading game. The certificate showed their achieved final ranking. We believed that for some participants with specific dark personality traits, the certificate would more impressive than for others. Each player would see their real ranking in the ranking list with the past players based on Liêu and Pelster (2020b). For the auction itself, the participants first read an explanation of the concept. After confirming to have understood the rules, the current rankings were displayed, as well as the balance from the stock trading game in addition to the field, where the participant could enter the bid amount in thalers.

The winner of the auction was the participant who entered the highest bid among all the participants. Since the setup was a sealed-bid English auction, no participant was able to observe the other bid amounts. Instead, at the end of the auction, and therefore the completion of the experiment, the participants were shown the payout they received from the different experiment categories.

4.2 | Data collection

The participants were recruited through Prolific.ac. This platform allows participants to be recruited from all around the world and automatically closes the experiment after obtaining the target number of participants. The participants were randomly enrolled from the pool of members in the Prolific platform. The participants had to speak English to participate in the experiment; no other restrictions were put in place.

Each participant was issued a specific Prolific ID, which prevented them from enrolling in the experiment more than once. Finally, the participants were scored on their reliability by the provider. This was done by counting the number of rejections from previous experiments they participated in. Palan and Schitter (2018) indicates that the data quality of Prolific and MTurk is comparable. Moreover, the Prolific's participants had a diverse set of locations and ethnicities. They were also more naive regarding the research tasks (Palan & Schitter, 2018). With those attributes in mind, we believe that Prolific is an appropriate choice for scientific online experiments. This platform is not only user-friendly but also offers many good features for conducting our experiment.

To ensure that participants paid full attention to the experiment, we applied instructional manipulation checks (IMCs). While Ward and Meade (2018) confirm that attention checks help to avoid careless responding, Hauser and Schwarz (2015) indicate that placing the IMCs at the end of the survey could help to eliminate their effect on the ways that participants react during the experiment. We considered attention checks in the instructions and included two attention check questions in the survey at the end of the experiment. Only the participants who passed the attention checks were used for the analysis. The complete questionnaire can be found in the Appendix.

We collected 107 observations from the system through 84 participants who finished the whole experiment and passed the attention checks. On average, the participants took 57.78 min to finish the experiment, and they received a range of 12.75 Euro/GBP to 18.40 Euro/ GBP, with an average of 15.63 Euro/GBP in payoff from their trading results. The total payoff for participating was determined by the sum of the value of participants' portfolio at the end of the experiment (including cash and the value of the shares), the earnings of correct guesses, and the earnings from the three additional tasks (the summary statistic of payoff can be found in Table 3). This amount was converted into Prolific's standard currency of GBP to pay participants. The personal characteristics of the participants are shown in Table 2.

In cases where the participants won the auction, their payoff was the total payoff deducted from the second-highest bidding price. In our setting, we afterward converted the thalers back to GBP as an additional dynamic payout for the participants. The experiment was conducted in August 2020.

Our sample contained 84 participants who completed all the tasks and passed the attention checks. Thus, our sample size is similar to previous studies on similar research questions, such as Rzeszutek (2015) with 90 participants or Liêu and Pelster (2020b) with 81 participants.

TABLE 2 Personal characteristics of the respondents

	Percentage
Age	
18–34	76.25
35–44	11.25
45–54	10
>55	2.5
Gender	
Female	28.39
Male	64.19
Unknown	7.4
Nationality	
Australia	2.469
Canada	1.235
Chile	2.469
Finland	2.469
Greece	2.469
Hungary	1.235
Italy	3.704
Kazakhstan	1.235
Mexico	6.173
Poland	18.519
Portugal	7.407
Slovenia	1.235
South Africa	2.469
Spain	3.704
United Kingdom	20.988
United States	16.049
Unknown	6.173

TABLE 3 Descriptive statistics, gender differences for demographics, personality preference, and trading

	Mean	SD	Skew	Kurtosis	N	t-test (Gender)
Trading experience	0.369	1.015	3.25	11.51	84	0.516
Risk self-assessment	5.083	2.218	-0.26	-0.88	84	0.053
Guess	2.869	1.574	0.10	-0.28	84	0.789
Risk aversion (Eckel & Grossman, 2008)	0.534	0.837	-0.54	-0.44	84	0.699
Risk aversion (Holt & Laury, 2002)	0.549	0.641	0.03	-0.25	61	0.745
Loss aversion (Gächter et al., 2007)	2.744	1.355	0.86	-0.44	60	0.281
Hexaco	3.47	0.705	-0.51	0.32	84	0.662
Sincerity	3.702	1.23	-0.70	-0.65	84	0.514
Fairness	3.583	1.282	-0.28	-1.23	84	0.492
Greed avoidance	2.821	1.121	0.30	-0.80	84	0.497
Modesty	3.774	1.034	-0.71	0.06	84	0.592
Extraversion	2.512	0.969	0.43	-0.56	84	0.055
Agreeableness	3.512	0.868	-0.13	-0.54	84	0.072
Conscientiousness	3.774	0.859	-0.28	-0.59	84	0.353
Emotional stability	3.202	1.053	0.00	-0.77	84	0.169
Open experience	3.685	0.842	-0.27	-0.54	84	0.258
Dark triad	2.416	0.674	0.65	-0.24	84	0.341
Machiavellianism	2.188	0.974	0.78	-0.21	84	0.473
Psychopathy	2.429	0.747	0.31	0.15	84	0.098
Narcissism	2.631	0.776	-0.05	-0.53	84	0.991
Narc (Back et al., 2013)	3.085	0.661	0.09	-0.42	84	0.310
Bid value	3.936	3.419	0.00	-1.65	84	0.688
Performance	10,324	523.7	0.67	1.66	84	0.180
Total payoff	15,633	1.266	-0.134	-0.281	84	0.163

Notes: Trading experience denotes participant stock trading experience, with a 5-point scale ranging from 1 (<1 year), to 5 (>10 years). Risk self-assessment denotes the risk willingness level of participants, with a scale ranging from 1 (not at all willing to take risks) to 10 (very willing to take risks). Guess denotes the total amount of correct guesses from the stock types in round 7 and 14. Risk aversion (Eckel & Grossman, 2008) denotes the result of the Eckel and Grossman task; risk aversion (Holt & Laury, 2002) denotes the result of the Holt and Laury task. Loss aversion (Gächter et al., 2007) denotes the result of the Gächter–Johnson–Herrmann task. Participants who had no consistent choices with transitivity in the Holt and Laury task and the Gächter–Johnson–Herrmann task, were excluded from the descriptive statistics. Hexaco denotes the mean value of the honesty–humility measure (Ashton et al., 2014). Sincerity, Fairness, Greed Avoidance, Modesty denotes the result of honesty–humility measure; Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Open experience denotes the result of big five factors; Machiavellian, Psychopathy, and Narcissism denotes the result of the Dirty Dozen measure. Bid value denotes the logarithm of bid value. Performance denotes the final returns of participants. Total payoff denotes the final earnings of participants included additional tasks bonus. t -test (gender) = p _value for gender difference.

4.3 | Measurement

To measure personality traits and financial decision-making behavior, we use widely established and reliable instruments. The paragraph below describes these instruments and refers to the existing literature to show reliability.

4.3.1 | The disposition effect

We measured the disposition effect by following Odean (1998) and Weber and Camerer (1998). Hereby, we relied on two measures. First, we applied the method of Odean (1998), using the proportion of gain realized (PGR) and the proportion of losses realized (PLR). As the definition, the disposition effect is the difference between PLR and PGR. Therefore, we can calculate the disposition effect by the following formula:

$$\textit{Disposition_Effect} = \textit{PGR} - \textit{PLR} \quad (1)$$

with

$$\textit{PGR} = \frac{\textit{Realized_gains}}{\textit{Realized_gains} + \textit{Paper_gains}} \quad (2)$$

$$\textit{PGR} = \frac{\textit{Realized_losses}}{\textit{Realized_losses} + \textit{Paper_losses}} \quad (3)$$

where the *realized_gains* (*realized_losses*) is counted when the stocks are sold at a profit (loss) position. The paper gain (paper loss) is counted when the current price of the stocks is higher (lower) than the purchasing price. To determine the purchasing price of the stocks, we used the weighted average purchasing price.

The second method calculated the disposition effect based on the method of Weber and Camerer (1998).

The α -measure is the percentage between the number of gaining sells and losing sells. Formally:

$$\alpha = \frac{S_+ - S_-}{S_+ + S_-} \quad (4)$$

where S_+ and S_- denote the number of sells after the prices increase and decrease, respectively.

4.3.2 | Willingness to pay for admiration

An auction is a reliable form to measure someone's willingness to pay for the respective auction item (Noussair et al., 2004; Tat et al., 2007). For this, we needed to enable the participants of our experiment to engage in the auction for admiration. After the screen showed the ranking of participants, we offered an auction round where they could bid for a unique certificate with their ranking on it. To increase the probability that the participants had an incentive to bid in the auction, we removed the top performers from the previous participants. In this way, we increased the probability of a high ranking and the motivation to bid in the auction. This setting could trigger the need to show off success and to be admired. For anonymity reasons, we use a sealed-bid auction setup, where no participant could see the others' bid. This prevented the participants from feeling observed, and they could bid any value to pay for the certificate within the budget they have. We measured the relative bid amount of a participant compared with their available funds that came together after the trading game finished. The percentage of people participating in the auction accounted for 64.29% (we denoted participants who did not join the auction as those who had a bid value equal to zero). Specifically, 54 of 84 participants joined the auction.

4.3.3 | Dark triad

We assessed the dark triad by using the Dirty Dozen questionnaire from Jonason and Webster (2010). This instrument contains twelve items, that is, four items per subscale on narcissism, Machiavellianism and psychopathy, which efficiently recover information for dark personality traits (Webster & Jonason, 2013) and shows a consistent factor structure (Kajonius et al., 2016). These items are measured with a Likert scale, ranging from 1 to 5 (1 = Strongly Disagree, 5 = Strongly Agree). Although there is criticism stating the Dirty Dozen is too brief (Jones & Paulhus, 2013), we relinquished introducing the Short Dark Triad (SD3) due to the participation length of the overall experiment.

4.3.4 | Honesty-humility

To measure honest humility, we applied the inventory of Ashton et al. (2014). In particular, we added four questions to determine four subscales: sincerity, fairness, greed avoidance, and modesty. The items were measured with a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

4.3.5 | Big five

Due to time constraints in the survey and the need to assess personality traits, we use the ten-item personal inventory of the big five Dimensions (TIPI-G) by Gosling et al. (2003). We did not contest the funded criticism on short-version measures usage stated by Crede et al. (2012) but rather prioritized the survey length over it. Items were measured with a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

4.3.6 | Risk aversion

To measure risk aversion, we followed Eckel and Grossman (2008)'s approach due to simplicity and based on the criticism around (Becker et al., 1964). Participants need to pick one of five gambles. One of them is a safe option, while the others consist of 50/50 gambles constructed from a linear function of payoff and risk. With this setup, the expected returns are easy to measure, and the expected payoff is linear in risk.

4.3.7 | Loss aversion

To measure the loss aversion level of individuals, we replicated the task of Gächter et al. (2007). In this choice task, individuals have ten lotteries that they can choose to accept or reject. The win value of lotteries is fixed, while the loss value increases. At the end of the experiment, the computer system randomly chooses one lottery and flips the coin. The participants who choose to reject the lotteries will end the task with their endowment. However, those who accept the coin and the outcome of the coin toss will receive the win value of the coin. Through this task, we can determine loss aversion based on prospect theory. The participants who did not make it through consistent choices were excluded from the data.

4.3.8 | Overconfidence

As mentioned in Section 4.1, after completing the trading section in rounds 7 and 14, the participants were required to guess the type of stocks and were asked afterward to state the probability that they were confident in their guessing (from 0% to 100%). We used this value to determine the confidence level of participants. The confidence level of participants is the average of their confidence levels after rounds 7 and 14. In addition to the confidence level, we created a dummy variable for the overconfidence of participants by comparing their confidence levels with the number of correct guesses. The participants whose confidence levels were 20% higher than the percentage of corrected guessing took a value of one, and the value was zero otherwise.

5 | RESULTS

We divide our results section into four parts. In the first part, we show summary statistics and the correlation between personality traits and overconfidence. The second part explains the relationship between personality traits and the disposition effect. Third, we explain the relationship of personality traits and admiration-seeking behavior through the auction. Due to contradiction with existing literature, the last part provides a description of additional results that were obtained from the data. For our regressions, we make use of a robust regression that may be more appropriate in cases where extreme values exist. Robust regression is also "...providing a convenient way to control for influential observations and enhance inter-study comparability..." (Leone et al., 2019).

5.1 | Descriptive analysis

The following paragraph outlines the descriptive findings in our data. We provide confirmation that our data are congruent with the existing literature by looking at summary statistics and correlations within the key variables used.

5.1.1 | Summary statistics

Table 3 provides descriptive statistics among our 84 observations. In general, male and female investors have insignificant differences in their trading experience, preferences, and understanding of stocks, except for their willingness to take risks. Indeed, male investors are more willing to take risks compared to female investors (p -value = 0.053). They also show a higher level of psychopathy compared to women, which compliments the study of Jonason and Davis (2018), whereas women seem to be more extroverted than men. This result is consistent with many prior studies (Costa et al., 2001; Schmitt et al., 2008; Weisberg et al., 2011).

Table 3 also provides descriptive statistics among the distribution of the dark triad elements. In comparison with the study of Preotiuc-Pietro et al. (2016), our data correspond with the established literature to some extent. For psychopathy, the data of Preotiuc-Pietro et al. (2016) peak at approximately 1.5, which indicates a concentration of individuals with only mild psychopathy tendencies. For our data, we see that the distribution of psychopathy is slightly positively skewed. For narcissism, we observe a similar distribution as Preotiuc-Pietro et al. (2016) as well, with a peak at approximately 3 on the scale. For our data, we see a more heterogeneous distribution with higher variance in the different scores over the complete set. For Machiavellianism, we find the most similar distribution. Most individuals in the reference data are located between 1 and 2 on both sets. The rest of the distribution on site of the higher scales follows a flatter tendency. In general, prior studies have shown that the distribution of dark triad traits is not normally skewed but negatively skewed (Preotiuc-Pietro et al., 2016). This is fitting with the distributions in our study.

Table 3 also provides descriptive statistics among the distribution of the subsets of the big five. We observe similar distributions for the personality traits in the literature (Chapman et al., 2009; Samek, 2017).

For the honesty–humility dimension of the HEXACO personality assessment, we describe the distribution of the subscales in Table 3. We observe a right leaning distribution for sincerity and modesty, whereas greed avoidance is a more left-leaning distribution. Fairness seems to be most evenly distributed, but with a peak at the highest point in scale.

Concerning the disposition effect, the mean value of PLR, PGR, DE, and α of our study can be compared with the treatment results from the study of Liêu and Pelster (2020b) because we applied similar settings of ranking (ranking based on the winning trades). In particular, our results regarding the disposition effect (0.043) are lower than the result of Liêu and Pelster (2020b) (0.088). We argue that the gap in the study of Liêu and Pelster (2020b) and our study may be caused by the difference in the environment of the experiment. Indeed, Liêu and Pelster (2020b) is a laboratory experiment, while our experiments use an online platform.

Interestingly, the average disposition effect and α of our study are higher than the baseline condition from the study reports for the individual investors of Rau (2015b). Hence, our result confirms the impact of the frame on the disposition effect, which is in line with Liêu and Pelster (2020b). Additionally, this high disposition effect complements prior studies, which indicates the impact of social interaction on the disposition effect (Lukas et al., 2017; Pelster & Hofmann, 2018). Thus, we focus on differences in the trading and auction behavior of investor groups. In Table 4, we cannot find a difference in the trading behavior and the auction behavior of investors when comparing the high dark triad or overconfident participants. However, investors who are willing to engage in risky activities have significantly higher bid values than investors who are less willing (0.164 versus; 0.0684; t -test, $p = 0.0312$). This means that the risk-willing participants consider auctions a risky activity and are interested in putting a higher bid, while the others are not.

5.1.2 | Correlation between personality traits and risk attitude

The relationship between the dark triad and other personality traits was summarized in the study of Furnham et al. (2013). In detail, due to the antisocial tendency of people scoring high in the dark triad, the authors found a low relationship with agreeableness. Similarly, prior studies have also indicated that the dark triad is negatively associated with conscientiousness (Furnham et al., 2013). Jakobwitz and Egan (2006) found that psychopathy and Machiavellianism had a positive relationship with neuroticism. These results are consistent with our correlation in Table 5 at some points. In general, we find that the correlation between the dark triad mean and agreeableness is -0.378 . Moreover, the results from the partial correlation show that there is no correlation between the disposition effect and the alpha with any traits. Specifically, we find a partial correlation between bid amount and agreeableness (0.509). When focusing on the relationship between personality traits and risk preferences, Table 5 shows the association between risk aversion (Eckel and Grossman-task) and loss aversion (0.482), whereas loss aversion has a negative association with confidence (-0.469). In addition, risk

TABLE 4 Trading behavior of participants

	PGR	PLR	DE	Alpha	Bid value	Auction on Result	N
Mean	0.154	0.09	0.064	0.241	3.936	0.111	84
SD	0.099	0.065	0.098	0.297	3.419	0.203	
Dark triad							
Low	0.149	0.0822	0.0664	0.237	3.55	0.102	41
High	0.159	0.0983	0.0610	0.245	4.33	0.119	43
<i>t</i> -test	0.622	0.259	0.804	0.912	0.318	0.701	
Overconfidence							
Low	0.156	0.0949	0.0607	0.241	4.18	0.0997	55
High	0.151	0.0820	0.0693	0.240	3.48	0.131	29
<i>t</i> -test	0.85	0.389	0.704	0.989	0.375	0.503	
Risk willingness							
Low	0.146	0.0982	0.0479	0.209	3.14	0.0684	47
High	0.164	0.0805	0.0836	0.281	4.95	0.164	37
<i>t</i> -test	0.411	0.216	0.0972	0.273	0.0146	0.0312	

Note: *PLR* denotes the proportion of losses realized. *PGR* denotes the proportion of gain realized. *DE* denotes the disposition effect. α denotes the α measure followed Weber and Camerer (1998). *Bid value* denotes the logarithm of participants' bid value. *Auction on Result* denotes the proportion of bid value over the final asset of participants.

aversion (Holt and Laury task) has a negative link to emotional stability (-0.337). Table 5 also indicates some connection between personality traits. Particularly agreeableness is negatively related to both dark triad (-0.378) and psychopathy (-0.405). This result is consistent with the prior study of Lee and Ashton (2005) and Jonason et al. (2013). In addition, the other popular measure is the HEXACO honesty-humility trait (Ashton & Lee, 2001), which determines honesty, fairness, greed avoidance, and modesty. These traits reflect high prosocial traits that contradict the antisocial behavior of dark triad traits. Consequently, a negative correlation between HEXACO honesty-humility and the dark triad is observed, for example, Lee et al. (2013) or Hodson et al. (2018), as well as in this study (-0.531). Notably, Table 5 applies the partial correlation that helps to observe the relationship between traits when controlling for the influence of the other traits.

5.2 | Personality and the disposition effect

The following section explains the regression results for different combinations of personality traits and the disposition effect.

5.2.1 | Dark triad and disposition effect

We run robust regression models to explain the disposition effect with the dark triad personality traits. None of the personality traits show any significance even after adding demographic control variables and control variables for loss and risk aversion. Due to missing research on the dark triad and the disposition effect, a comparison with existing results is not possible. We think that the mentioned stock market experience within our sample could be determining a weaker disposition effect for the results overall. Thus, we focus on the relationship between the dark triad and two components of the disposition effect, including *PGR* and *PLR*. Similarly, we cannot find a significant relationship between these factors (Table 6).

5.2.2 | Big five and the disposition effect

Table 7 shows the regression models with the big five personality traits as exogenous variables and the disposition effect as an endogenous variable. The results show non-significant differences for all subscales of the big five.

TABLE 5 Spearman Correlation between personal traits and confidence and risk preference

	R_eckel	Lambda_gaechter	R_holt	Confidence	Hexaco	Extraversion	Agreeableness	Conscientiousness	Emotional Stability	Open Experience	Dark Triad	Machiavellian	Psychopathy	Narcissism	DE	α
R_eckel																
Lambda_gaechter	0.482*															
R_holt	0.312	-0.275														
Confidence	0.397	-0.469**	-0.334*													
Hexaco	-0.135	0.226	0.198	0.132												
Extraversion	0.133	-0.187	-0.241	-0.394*	0.193											
Agreeableness	-0.167	0.059	0.084	0.045	-0.072	0.107										
Conscientiousness	-0.017	0.181	0.127	0.129	-0.068	0.034	-0.292									
Emotional stability	0.105	-0.355	-0.337*	-0.306	-0.194	-0.166	-0.029	0.262								
Open experience	0.082	-0.037	-0.041	0.093	0.213	0.206	0.253	0.355	0.241							
Dark triad	-0.122	0.240	0.194	0.247	-0.531**	0.256	-0.378*	-0.316	-0.062	0.169						
Machiavellian	-0.230	0.031	0.029	0.202	-0.268	0.280	0.065*	-0.094	0.231	0.1	-0.038					
Psychopathy	0.067	0.084	0.06	-0.121	-0.066	-0.224	-0.405*	-0.095	-0.191	0.053	-0.508**	0.676***				
Narcissism	-0.013	0.165	0.141	0.315	-0.327	0.405	0.058	-0.178	-0.046	0.033	-0.533***	0.008	0.138			
DE	-0.214	0.044	0.269	0.249	-0.036	0.208	0.083	-0.049	0.211	0.128	-0.155	-0.203	0.015	-0.004		
α	0.039	0.189	-0.178	-0.057	-0.086	-0.121	-0.098	-0.032	-0.134	-0.081	0.027	0.095	0.003	-0.0791	0.873***	
Bid value	0.172	0.0009	0.170	0.109	0.094	0.142	0.509*	0.233	0.273	-0.185	0.195	0.034	0.174	-0.053	-0.218	0.213

Notes: *** $p < .0001$, ** $p < .01$, * $p < .05$.

R_{eckel} denotes the result of the risk aversion measure of the Eckel and Grossman-task, R_{holt} denotes the result of the risk aversion measure of the Holt and Laury task. $Lambda_{gaechter}$ denotes the result of the loss aversion measure of the Gächter-Johnson-Herrmann task. Participants who have no consistent choices with transitivity in the Holt and Laury task and the Gächter-Johnson-Herrmann task, are excluded from the descriptive statistics. $Confidence$ denotes the average self-assessment value of participants about their confidence with their guessing choices, with the 10 scale from 10% to 100%. $Hexaco$ denotes the mean value of the honesty-humility measure (Ashton et al., 2014); $Dark triad$ denotes the mean value of the dirty dozen measure (Jonason & Webster, 2010); $Extraversion$, $Agreeableness$, $Conscientiousness$, $Emotional stability$, and $Open experience$ denote the result of big five factors (Gosling et al., 2003); DE denotes the disposition effect. α denotes the α measure followed Weber and Camerer (1998). $Bid value$ denotes the logarithm of participants' bid value.

TABLE 6 Robust regression the disposition effect on narcissism, Machiavellian, and psychopathy

The disposition effect (DE)									
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Narcissism	-0.007 (0.0145)	-0.000 (0.0153)	0.0115 (0.0196)						
Machiavellian				-0.0168 (0.0113)	-0.0140 (0.0118)	-0.0122 (0.0173)			
Psychopathy							-0.0198 (0.0143)	-0.0240 (0.0156)	-0.0301 (0.0251)
Female		-0.0151 (0.0245)	-0.0022 (0.0289)		-0.0180 (0.0241)	0.0000 (0.0300)		-0.0209 (0.0248)	-0.0050 (0.0314)
Age		-0.0097 (0.0107)	-0.0016 (0.0131)		-0.0100 (0.0104)	-0.0052 (0.0135)		-0.0104 (0.0106)	-0.0066 (0.0143)
Trading self-assessment		-0.0220 (0.0122)	-0.0012 (0.0321)		-0.0197 (0.0118)	0.0125 (0.0326)		-0.0208 (0.0117)	0.0136 (0.332)
Loss aversion (Gächter et al., 2007)			0.0138 (0.0101)			0.0129 (0.0106)			0.0174 (0.0112)
Risk aversion (Eckel & Grossman, 2008)			-0.0244 (0.0161)			-0.0252 (0.0169)			-0.0232 (0.0175)
(Intercept)	0.0816* (0.0397)	0.0973* (0.0486)	0.0224 (0.0659)	0.0990** (0.0271)	0.1266 (0.0371)	0.0832* (0.0592)	0.1117*** (0.0363)	0.1585** (0.0488)	0.1221 (0.0739)
Num. obs.	84	82	59	84	82	59	84	82	59

Notes: *** $p < .001$, ** $p < .01$, * $p < .05$.

The dependent variable is the participant's disposition effect. *Narcissism* denotes the narcissism value of participants in the Dirty Dozen assessment, with a scale ranging from 1 to 5. *Machiavellian* denotes the Machiavellianism value of the participants in the Dirty Dozen assessment, with a scale ranging from 1 to 5. *Psychopathy* denotes the psychopathy value of the participants in the Dirty Dozen assessment, with a scale ranging from 1 to 5. *Trading self-assessment* denotes participant stock trading experience, with a 5-point scale ranging from 1 (<1 year), to 5 (>10 years). *Female* is a dummy variable that takes a value of one for female participants and zero otherwise. *Age* denotes participants' age in years. *Risk aversion* (Eckel & Grossman, 2008) denotes the result of the Eckel and Grossman-task; *Risk aversion* (Holt & Laury, 2002) denotes the result of the Holt and Laury task. *Loss aversion* (Gächter et al., 2007) denotes the result of the Gächter–Johnson–Herrmann task. Participants who have no consistent choices with transitivity in the Gächter–Johnson–Herrmann task are excluded from this regression.

TABLE 7 Robust regression of subscales of the big five on the disposition effect

The disposition effect										
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Extraversion	0.0014 (0.0115)	0.0096 (0.0156)								
Agreeableness			0.0083 (0.0130)	0.0212 (0.0167)						
Conscientiousness					-0.0186 (0.0123)	-0.0169 (0.0160)				
Neuroticism							-0.0062 (0.0167)	-0.0069 (0.0140)		
Open experience									0.0099 (0.0134)	0.0111 (0.0167)
Female		-0.0064 (0.0304)		-0.0111 (0.0310)		-0.0056 (0.0289)		-0.0040 (0.0293)		-0.0037 (0.0289)
Age		-0.0038 (0.0130)		-0.0035 (0.0134)		-0.0029 (0.0127)		-0.0043 (0.0128)		-0.0031 (0.0128)
Trading self-assessment		-0.0025 (0.0327)		0.0069 (0.0316)		0.0075 (0.0298)		0.0102 (0.0311)		-0.0012 (0.0315)
Loss aversion (Gächter et al., 2007)		0.0139 (0.0102)		0.0174 (0.0110)		0.0143 (0.0101)		0.0126 (0.0106)		0.0153 (0.0103)
Risk aversion (Eckel & Grossman, 2008)		-0.0219 (0.0166)		-0.0221 (0.0170)		-0.0233 (0.0160)		-0.0243 (0.0162)		-0.0239 (0.0161)
(Intercept)	0.0591 (0.0311)	0.0327 (0.0510)	0.0328 (0.0471)	-0.0259 (0.0745)	0.1294* (0.0477)	0.1123 (0.0685)	0.0814* (0.038)	0.0800 (0.0683)	0.0256 (0.0506)	0.0093 (0.0751)
Num. obs.	84	59	84	59	84	59	84	59	84	59

Notes: *** $p < .001$, ** $p < .01$, * $p < .05$.

The dependent variable is the participant's disposition effect. Extraversion denotes the extraversion value of the participants in the big five scale (Gosling et al., 2003), with a scale ranging from 1 to 5. Agreeableness denotes the agreeableness value of the participants in the big five scale (Gosling et al., 2003), with a scale ranging from 1 to 5. Conscientiousness denotes the conscientiousness value of the participants in the big five scale (Gosling et al., 2003), with a scale ranging from 1 to 5. Neuroticism denotes the neuroticism value of the participants in the big five scale (Gosling et al., 2003), with a scale ranging from 1 to 5. Open experience denotes the openness to experience value of the participants in the big five scale (Gosling et al., 2003), with a scale ranging from 1 to 5. Trading self-assessment denotes the participant's stock trading experience, with a 5-point scale ranging from 1 (<1 year), to 5 (>10 years). Female is a dummy variable that takes a value of one for female participants and zero otherwise. Age denotes participants' age in years. Risk aversion (Eckel & Grossman, 2008) denotes the result of the Eckel and Grossman-task; Risk aversion (Holt & Laury, 2002) denotes the result of the Holt and Laury task. Loss aversion (Gächter et al., 2007) denotes the result of the Gächter-Johnson-Herrmann task. Participants who have no consistent choices with transitivity in the Gächter-Johnson-Herrmann task are excluded from this regression.

These results contradict Lin (2011). In particular, Lin (2011) found a significant relationship between conscientiousness and the disposition effect. Similarly, neuroticism has a positively significant relationship with the disposition effect. The difference in results can arise from using different instruments to measure the disposition effect. While Lin (2011) differentiated behavioral biases in the form of latent variables, the study used hypothetical questions rather than a real experiment in the methodology. On the other hand, De Bortoli et al. (2019) used a laboratory setting similar to Weber and Camerer (1998) to show risk seeking behavior in the choice of investment instruments. With greater risk tolerance according to the investor profile, the individuals also chose to invest in riskier asset classes. This effect is also partially explained by a significant relationship between openness to experience and risk seeking. While the main goal of De Bortoli et al. (2019) was to “observe whether each participant chooses higher or lower risk assets to invest in, in order to approximate their ‘real’ investor profile,” it did not directly include the disposition effect concerning changes in investments (e.g., holding on to losing stocks/asset classes). Because of the construction of the study variables and a different research goal, the findings are not directly comparable to ours.

While our questionnaire seems rather consistent (with a Cronbach's alpha of 0.68 concerning the small item scale), we see this as the main source of the diverging results. This idea of overstating demand, which arises from the usage of hypothetical answers, was underlined by Balistreri et al. (2001). A more comparable setting, run by Cecchini et al. (2019), also used the experimental design of Weber and Camerer (1998). There are only small differences in the setup, such as incentivizing high performance in the trading game: Cecchini et al. (2019) reached this goal over a competition-related payout to the participants, with 165 for the winner, 100 for second place, and 50 for third place. In our setting, we showed the participants a leaderboard after certain intervals and trigger competition over the social setting. Payout was also related to the performance in our setting but not in a fixed amount, as in the comparative study. Comparing our data with the summary statistics of Cecchini et al. (2019) shows one additional explanation of the differences; while the authors used a larger sample, the participants were also significantly younger and had less stock market knowledge compared to those in our study. Da Costa et al. (2013) confirmed that investing experience mitigates the disposition effect. For two groups (one experienced—26 investors, the other not—38 students), the authors found less exposure of the experienced group to the disposition effect.

5.3 | Personality and admiration-seeking behavior

The following section explains our results for different combinations of personality traits and admiration seeking. As the relative bid amount represents the willingness to pay for the certificate, it translates to the willingness to pay for admiration, which arises by publishing the certificate on social media.

5.3.1 | Dark triad and admiration-seeking behavior

Table 8 shows different regression models with the bid amount as an endogenous variable and the dark triad personality traits together with demographic control variables as exogenous factors. Both narcissism and Machiavellianism show no significance for all three models. Even though manipulativeness is a central facet for Machiavellians, they do not show a significant relation with the auction price. This means that these individuals do not use the auction to achieve the unique certificate and certify their uniqueness. In other words, Machiavellians are not interested in the certificate and rate monetary value higher than the possible admiration that might come with the publication of the certificate. Psychopathy was also insignificant in all three models.

These non-resilient findings could suggest that there is no significant willingness to pay for admiration. It could also suggest that dark triad personality traits do not influence auction behavior.

5.3.2 | Honesty–humility trait and admiration-seeking behavior

We test the influence of sincerity, fairness, greed avoidance, and modesty on auction behavior. Table 9 insignificant results with all the subtraits of the honesty-humility trait. Although we are offering a rather unethical choice to manipulate the initial ranking, we cannot confirm our hypothesis.

TABLE 8 Robust regression of dark triad personality traits on bid amount

	Auction on the result								
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Narcissism	0.0034 (0.0118)	-0.0057 (0.0122)	-0.0160 (0.0115)	0.0102 (0.0088)	0.0068 (0.0093)	-0.0000 (0.0083)	0.0100 (0.0122)	0.0051 (0.0120)	-0.0057 (0.0118)
Machiavellian									
Psychopathy									
Female	0.0030 (0.0196)	0.0353* (0.0170)	0.0036 (0.0191)	0.0274 (0.0144)	0.0036 (0.0191)	0.0274 (0.0144)	0.0036 (0.0191)	0.0040 (0.0190)	0.0264 (0.0148)
Age	-0.0056 (0.0085)	-0.0106 (0.0077)	-0.0046 (0.0083)	-0.0069 (0.0065)	-0.0046 (0.0083)	-0.0069 (0.0065)	-0.0046 (0.0083)	-0.0045 (0.0081)	-0.0077 (0.0068)
Trading self-assessment	0.0363** (0.0098)	0.0220 (0.0189)	0.0220 (0.0189)	0.0120 (0.0156)	0.0292** (0.0094)	0.0120 (0.0156)	0.0120 (0.0156)	0.0310 (0.0090)	0.0131 (0.0157)
Loss aversion gachter2007individual									
Risk aversion eckel2008forecasting									
(Intercept)	0.0395 (0.0323)	0.0600 (0.0388)	0.0792* (0.0388)	0.0240 (0.0210)	0.0281 (0.0294)	0.0463 (0.0284)	0.0244 (0.0311)	0.0296 (0.0375)	0.0600 (0.0348)

Notes: *** $p < .001$, ** $p < .01$, * $p < .05$.

The dependent variable is the participant's proportion of the bid value on the final asset. Narcissism denotes the narcissism value of the participants in the Dirty Dozen assessment (Jonason & Webster, 2010), with a scale ranging from 1 to 5. Machiavellianism denotes the Machiavellianism value of the participants in the Dirty Dozen assessment (Jonason & Webster, 2010), with a scale ranging from 1 to 5. Psychopathy denotes the psychopathy value of the participants in the Dirty Dozen assessment (Jonason & Webster, 2010), with a scale ranging from 1 to 5. Trading self-assessment denotes the participants' stock trading experience, with a 5-point scale ranging from 1 (<1 year), to 5 (>10 years). Female is a dummy variable that takes a value of one for female participants and zero otherwise. Age denotes participants' age in years. Risk aversion (Eckel & Grossman, 2008) denotes the result of the Eckel and Grossman task; Risk aversion (Holt & Laury, 2002) denotes the result of the Holt and Laury task. Loss aversion (Gächter et al., 2007) denotes the result of the Gächter–Johnson–Herrmann task. Participants who have no consistent choices with transitivity in the Gächter–Johnson–Herrmann task are excluded from this regression.

TABLE 9 Robust regression the honesty-humility on the bid amount

	Auction on the result									
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Sincerity	0.0050 (0.0092)	-0.0014 (0.0119)								
Fairness			-0.0011 (0.0086)	-0.0083 (0.0123)						
Greed avoidance					-0.0056 (0.0099)	-0.0102 (0.0121)				
Modesty							0.0167 (0.0105)	0.0050 (0.0141)		
Hexaco									0.0080 (0.0159)	-0.0135 (0.0226)
Female		-0.0010 (0.0286)		0.0013 (0.0299)		0.0026 (0.0296)		0.0004 (0.0291)		0.0003 (0.0286)
Age		-0.0037 (0.0127)		-0.0015 (0.0138)		-0.0027 (0.0131)		-0.0049 (0.0132)		-0.0046 (0.0132)
Trading self-assessment		0.0055 (0.0301)		-0.0026 (0.0337)		0.0049 (0.0308)		0.0070 (0.0304)		0.0014 (0.0308)
Loss aversion (Gächter et al., 2007)		0.0142 (0.0101)		0.0163 (0.0109)		0.0123 (0.0103)		0.0131 (0.0104)		0.0155 (0.0103)
Risk aversion (Eckel & Grossman, 2008)		-0.0235 (0.0161)		-0.0230 (0.0167)		-0.0257 (0.0166)		-0.0229 (0.0164)		-0.0242 (0.0160)
(Intercept)	0.0440 (0.0357)	0.0575 (0.0573)	0.0663* (0.0329)	0.0717 (0.0488)	0.0783* (0.0302)	0.0842 (0.0520)	0.0006 (0.0412)	0.0375 (0.0590)	0.0347 (0.0562)	0.0924 (0.0763)
Num. obs.	84	59	84	59	84	59	84	59	84	59

Notes: ** $p < .001$, * $p < .01$, * $p < .05$.

The dependent variable is the participant's proportion of the bid value on the final asset. Sincerity denotes the sincerity value of the participants in the honesty-humility measure (Ashton et al., 2014), with a scale ranging from 1 to 5. Fairness denotes the fairness value of the participants in the honesty-humility measure (Ashton et al., 2014), with a scale ranging from 1 to 5. Greed avoidance denotes the greed avoidance value of the participants in the honesty-humility measure (Ashton et al., 2014), with a scale ranging from 1 to 5. Modesty denotes the modesty value of the participants in the honesty-humility measure (Ashton et al., 2014), with a scale ranging from 1 to 5. Hexaco denotes the mean value of the honesty-humility measure of the participants (Ashton et al., 2014). Trading self-assessment denotes the participant stock trading experience, with a scale ranging from 1 to 5. Hexaco denotes the age of the participants (Ashton et al., 2014). Age denotes participants' age in years. Risk aversion with a 5-point scale ranging from 1 (<1 year), to 5 (>10 years). Female is a dummy variable that takes a value of one for female participants and zero otherwise. Loss aversion (Gächter et al., 2007) denotes the result of the Eckel & Grossman, 2008) denotes the result of the Eckel and Grossman-task; risk aversion (Holt & Laury, 2002) denotes the result of the Holt and Laury task. Loss aversion (Gächter et al., 2007) denotes the result of the Gächter-Johnson-Herrmann task. Participants who have no consistent choices with transitivity in the Gächter-Johnson-Herrmann task are excluded from this regression.

TABLE 10 Robust regression of the big five on bid amount

	Auction on the result										
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	
Extraversion	0.0070 (0.0094)	0.0059 (0.0077)									
Agreeableness			0.0255 (0.0117)	0.0190* (0.0080)							
Conscientiousness					0.0109 (0.0121)	0.0171 (0.0096)					
Neuroticism							0.0082 (0.0087)	0.0125 (0.0072)			
Open experience									0.0058 (0.0106)	0.0115 (0.0091)	
Female		0.0248 (0.0150)		0.0207 (0.0148)		0.0374 (0.0174)		0.0365 (0.0150)		0.0293 (0.0158)	
Age		-0.0076 (0.0064)		-0.0078 (0.0064)		-0.0092 (0.0076)		-0.0067 (0.0066)		-0.0079 (0.0070)	
Trading self-assessment		0.0079 (0.0161)		0.0108 (0.0150)		0.0115 (0.0179)		0.0056 (0.0159)		0.0063 (0.0173)	
Loss aversion Gächter et al., (2007)		-0.0088 (0.0050)		-0.0060 (0.0052)		-0.0115 (0.0060)		-0.0066 (0.0054)		-0.0084 (0.0056)	
Risk aversion Eckel and Grossman (2008)		0.0139 (0.0082)		0.0147 (0.0081)		0.0145 (0.0096)		0.0152 (0.0083)		0.0143 (0.0088)	
(Intercept)	0.0309 (0.0252)	0.0347 (0.0251)	-0.0342 (0.0425)	-0.0222 (0.0355)	0.0140 (0.0469)	-0.0034 (0.0411)	0.0234 (0.0295)	-0.0014 (0.0349)	0.0262 (0.0399)	0.0075 (0.0411)	
Num. obs.	84	59	84	59	84	59	84	59	84	59	84

Notes: *** $p < .001$, ** $p < .01$, * $p < .05$.

The dependent variable is the participant's proportion of the bid value on the final asset. Extraversion denotes the extraversion value of the participants in the big five scale (Gosling et al., 2003), with a scale ranging from 1 to 5. Agreeableness denotes the agreeableness value of the participants in the big five scale (Gosling et al., 2003), with a scale ranging from 1 to 5. The dependent variable is the participant's proportion of the bid value on the final asset. Conscientiousness denotes the conscientiousness value of the participants in the big five scale (Gosling et al., 2003), with a scale ranging from 1 to 5. Neuroticism denotes the neuroticism value of the participants in the big five scale (Gosling et al., 2003), with a scale ranging from 1 to 5. Open experience denotes the openness to experience value of the participants in the big five scale (Gosling et al., 2003), with a scale ranging from 1 to 5. Trading self-assessment denotes participant stock trading experience, with a 5-point scale ranging from 1 (<1 year), to 5 (>10 years). Female is a dummy variable that takes a value of one for female participants and zero otherwise. Age denotes participants' age in years. Risk aversion (Eckel & Grossman, 2008) denotes the result of the Eckel and Grossman-task; Risk aversion (Holt & Laury, 2002) denotes the result of the Holt and Laury task. Loss aversion (Gächter et al., 2007) denotes the result of the Gächter-Johnson-Herrmann task. Participants who have no consistent choices with transitivity in the Gächter-Johnson-Herrmann task are excluded from this regression.

5.3.3 | Big five and admiration-seeking behavior

Table 10 shows different regression models with the bid amount as an endogenous variable and the big five personality traits together with demographic control variables as exogenous factors. The regressions show an influence on agreeableness after including demographic control variables in the model. This means that agreeable individuals are more likely to pay a higher amount for the certificate. This circumstance could be explained if agreeable people see the bidding as an offer they should take, rather than a competition. We see similar behavior in career choices and salary discussions (Rode et al., 2008; Seibert & Kraimer, 2001).

The model shows no significance for subscales of the big five, including neuroticism, extraversion, conscientiousness, and openness to experience. Comparing these results to the existing literature, Grebitus et al. (2013) showed that “personality plays a larger role in explaining behavior in choice experiments than in auctions.” Similar to Grebitus et al. (2013), we observed conscientiousness as an irrelevant personality trait for bidding behavior. Furthermore, in the auction model of Grebitus et al. (2013), personality trait agreeableness was significant, which is consistent with our result in Table 10. Differences arise in regard to extraversion; Grebitus et al. (2013) found a significant positive influence on the bidding amount. This led them to the conclusion that extraversion increases the willingness to pay. Our results cannot confirm these findings due to the insignificance of extraversion. Fong et al. (2020) showed in a laboratory setting that high agreeableness leads to lower auction results. The authors explained this with the less-competitive attitude of agreeable individuals.

5.4 | Personality and overconfidence

Overconfidence causes many consequences, such as failures of firms i (Invernizzi et al., 2017) and entrepreneurs (Hogarth & Karelaia, 2012) and market bubbles (Glaser & Weber, 2007; Michailova & Schmidt, 2016). There are many reasons that raise overconfidence, and personality traits could be one of the reasons. In this section, we additionally explore the relationship between overconfidence and personality traits. The study of Moore and Healy (2008) mentions three approaches to overconfidence: (a) overestimating the actual performance, (b) overplacing the performance relative to others, and (c) excessively precise beliefs. In a financial context, the most obvious manifestation of overconfidence is overestimation. In this paper, we also define overconfidence based on an overestimation of self-efficacy. By using self-assessment, we can determine the overconfidence in the most direct and accurate way. In particular, the gap between their self-assessment and their performance (guessing the type of stocks) is the highly reliable scale of overconfidence (the details of the overconfidence measure are shown in Section 4.3.8).

For the dark triad measured with the dirty dozen scale, Table 11 shows significance for all components, that is, psychopathy, Machiavellianism, and narcissism. High scores in psychopathy, Machiavellianism or narcissism tend to influence overconfidence in a positive way. All exogenous variables remained significant after adding demographic variables, gender, age, and trading experience. This is also valid for the dark triad as a combined variable. Dark triad individuals are often depicted as being callous, manipulative, and having fetish for their self-image. With these characteristics, dark triad individuals tend to think that they are superior to others and that perception is the cause of overconfidence. Specifically, narcissism has the strongest link to overconfidence. This result supports the description of narcissism as ego satisfaction, a sense of superiority, and grandiosity.

This result is consistent with the notion that dark triad individuals have an inflated view of themselves and are often shameless about self-promotion. Moreover, the association between (over)confidence and dark triad adds to the literature review an explanation for predicting (over)confidence. Specifically, this result supports the view that personality traits contribute to the formation of (over)confidence and thus further contribute to the results of Schaefer et al. (2004), which focuses on the relationship between overconfidence and the big five. In addition, because of the close relationship between the dark triad and overconfidence, we can infer that the effects of overconfidence also affect dark triad individuals. In particular, dark triad individuals may also have problems with overestimating the outcomes, overpredicting the results, and underestimating the risk.

6 | DISCUSSION AND CONCLUSION

The literature has shown that the disposition effect, as a central research topic in behavioral finance, is influenced by different personality traits. Furthermore, there exists a relationship with special social interactions such as reputation/

TABLE 11 Robust regression of the Dirty Dozen on confidence

	Confidence mean							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Machiavellian	0.0700*	0.0629*						
	(0.0262)	(0.0260)						
Psychopathy			0.0892*	0.0767*				
			(0.0316)	(0.333)				
Narcissism					0.1132**	0.1096*		
					(0.0319)	(0.0320)		
Dark triad							0.1337*	0.1247**
							(0.0367)	(0.0375)
Female		-0.0257		-0.0055		-0.0360		-0.0154
		(0.0532)		(0.0529)		(0.0514)		(0.0524)
Age		-0.0208		-0.0206		-0.0138		-0.0201
		(0.0230)		(0.0226)		(0.0223)		(0.0227)
Trading self-assessment		-0.0057		0.0039		-0.0178		-0.0126
		(0.0261)		(0.0250)		(0.0256)		(0.0258)
(Intercept)	0.03871***	0.4637***	0.3256**	0.4060**	0.2367*	0.2998*	0.2133*	0.2948*
	(0.0626)	(0.0819)	(0.0801)	(0.1041)	(0.0874)	(0.1017)	(0.0920)	(0.1101)
Num. obs.	84	82	84	82	84	82	84	82

Notes: *** $p < .001$, ** $p < .01$, * $p < .05$.

In Models (1)-(2), the independent variable is the participant's Machiavellian value that was calculated based on the Dirty Dozen scale. In Models (3)-(4), the independent variable is the participant's psychopathy value that was calculated based on the Dirty Dozen scale. In Models (5)-(6), the independent variable is the participant's narcissism value that was calculated based on the Dirty Dozen scale. *Confidence mean* denotes the average self-assessment value of participants about their confidence with their guessing choices, with the 10-point scale ranging from 10% to 100%. *Female* is a dummy variable that takes a value of one for female participants and zero otherwise. *Age* denotes participants' age in years. *Trading self-assessment* denotes participants' stock trading experience, with a 5-point scale ranging from 1 (<1 year), to 5 (>10 years).

self-image that could increase this effect as well. We build our paper on the idea of analyzing a potential relationship between personality traits, the disposition effect and admiration-seeking behavior, also considering that personality traits have shown no significant relationship with behavioral biases in some studies. This also introduces the challenge of reproducibility from a meta-science perspective.

To test our hypothesis, we make use of a well-established methodology; we use a stock trading game setup introduced by Weber and Camerer (1998) to measure the strength of the disposition effect. Furthermore, we introduce a social setting by including a leaderboard and the possibility to take part in a sealed-bid English auction that has a unique certificate as an auction item. Our idea is that admiration-seeking people who score high in the dark triad will be more likely to bid a high price for the certificate. To assess personality traits, we make use of instruments for measuring the dark triad, the honesty-humility dimension of the HEXACO personality assessment and the big five. With robust regression analysis, we combine the data from these approaches to present our results.

In general, we were motivated by explaining investors' preferences in the case of the disposition effect. This should reveal important information about influencing factors that play a role in financial decision making and preference construction. Satisfying admiration-seeking behavior instead of maximizing returns could therefore lead to different market behaviors of investors, especially in social trading settings, which have gained increasing popularity (Oehler et al., 2016; Pelster & Hofmann, 2018). This understanding could lead to a stronger link of character assessments to trading activities and result in different regulatory approaches to protect investors from behavioral biases. From a methodological point of view, this paper is important to confirm uprising personality assessments such as the dirty dozen to show interactions between personality dimensions and linking behavioral biases to them.

Our paper results show the relationships of different personality traits; we find a negative correlation between the dark triad and conscientiousness and a positive correlation between the dark triad and (over)confidence. Furthermore, the dark triad is negatively correlated with the honesty-humility dimension of the HEXACO assessment, thereby confirming previous results found in the literature. However, we reveal that there is no significant relationship between

popularly used personality trait assessments and the disposition effect. This result comes despite the descriptive analysis agreeing with the previous literature on terms such as distribution and correlation. Furthermore, our data do not show any significant relationship between personality traits and willingness to pay for admiration. These observations add to the inconclusive literature regarding the influence of personality traits on behavioral biases.

The reason for these unexpected findings regarding non-significant willingness to pay for admiration may come from a violation of our assumptions regarding the auction price in the form of the certificate. To recap, the item has to be linked to the participant in a way that personal identification is possible. Second, it has to be immediately available and usable. Third, it needs to create a social reaction from related and relevant peers. Participants could have no incentive to identify themselves with the experimental results.

Another explanation could be found by taking a deeper look at current research practice and the issue of reproducibility; since psychology is impacted with the problem of weak significance, we see structural difficulties for the field of behavioral finance as well. Differences in the study designs, for example, hypothetical versus experimental settings (Lin, 2011) or different data compositions in Cecchini et al. (2019), are driving factors that cause study results to end up with different findings (Ionnidis, 2005). Additionally, Dowgwillo and Aaron (2017) indicated that the different measurement instruments for the dark triad could lead to heterogeneity in the findings. We look forward to future research that explicitly tests such differences. This issue of reproducibility could be addressed over two potential causes. First, there is a potential for priming when a previous stimulus unintentionally affects the individuals' response to another stimulus (Weingarten et al., 2016). This might especially take place in studies where the personality assessment is conducted before the disposition effect is measurement. Second, especially arising from longer personality assessments and experiments, we might see ego depletion, which limits the willingness of an individual to participate (Baumeister et al., 1998). Despite not being able to find a significant answer to our main research question, with this study, we overcome publication bias (Song et al., 2010) and contribute to the ongoing discussion about the impact of personality traits on behavioral biases.

ACKNOWLEDGMENT

Open access funding enabled and organized by Project DEAL.

ENDNOTES

¹ HEXACO is an improved version of big five personality model that included H: Honesty–Humility / Integrity, E: Emotionality, X: eXtraversion A: Agreeableness, C: Conscientiousness, O: Openness to Experience.

² Data on previous participants were taken from Liêu & Pelster (2020b).

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How to cite this article: Max, S., & Liêu, M.-L. (2022). The disposition effect and admiration seeking. *Review of Financial Economics*, 40, 200–234. <https://doi.org/10.1002/rfe.1146>

APPENDIX 1 – Experimental instructions

Dear study participant,

Thank you for agreeing to participate in our experiment on decision making in financial markets. Below, you will be presented a detailed description of the following experimental setup. Please read these instructions to the experiment carefully.

In the experiment, you will receive an amount of 10,000 Talers of fictional money, which you can use for investment in stocks subsequently presented to you in fourteen investment rounds.

If you complete all investment rounds and fill in all questionnaires you will receive a performance-based compensation for your participation in the experiment. After completing the study, you will receive the account balance of your fictional money divided by 1,000 in real money. Thus, during the experiment you will earn Talers which are converted to Euros by the following exchange-rate:

1,000 Talers = 1 Euro For example, if your fictional account balances at 10,000 Talers at the end of the study, you will receive 10 Euros in real money.

Description of the experiment

The experiment consists of 14 periods. In every period you have the possibility to buy shares of the firms A, B, C, D, E, and F. Every share has a certain value in Talers in every period. You start the experiment with an endowment of 10,000 Talers.

Performance of shares

The shares A-F will change in prices at the beginning of each of the 14 periods; that is, in the subsequent period there was no share which will have the same price as in the previous period. The share-price changes have been randomly predetermined before the experiment started. That is, all price changes of all shares are completely independent of all your buying and selling decisions. The same is true for all buying and selling decisions of the other participants of the experiment. Each of the shares A-F is of a certain type. The share types differ regarding their probability of increasing (decreasing) in value at the beginning of the period. The distributions of the types are given in the table below. In the experiment there was exactly one share (of the shares A-F) which follows type “+ +” and the same is true for one share of type “+”, “–”, and “– –”. There was two types (of the shares A-F), which follow type “0.” All types are displayed in the below table.

Shares in the market	Type	Probability of price increase	Probability of price decrease
1	++	65%	35%
1	+	55%	45%
2	0	50%	50%
1	-	45%	55%
1	–	35%	65%

Example:

- Assume that share X is of type: " + + "
- At the beginning of each period the probability of a price increase of X is: 65%
- At the beginning of each period the probability of a price decrease of X is: 35%

The share price is determined as follows:

1. At the beginning of each period a share either increases (decreases). The probability depends on the share's type (see table).
2. Furthermore, the magnitude of the price movement (increase/decrease) was determined. The magnitude of the price movement can either be of 1, 3, or 5 Talers. Every magnitude (1, 3, or 5 Talers) can happen with the same probability. That is, every magnitude (1, 3, or 5 Talers) can happen with a probability of one-third. This is the same for every share, independent of its type.

Buying and selling actions of shares

In each of the 14 periods, you have the possibility to buy and sell shares for your portfolio. You will find a screen shot below, which depicts all of your decision possibilities in the course of the experiment.

Please decide which stocks you want to buy or sell.

Note that you can only sell shares, which you currently hold in your portfolio. Also note, that the amount you invest in new shares cannot exceed your current cash holdings.

Your current cash amounts to **4951 Talers**

Stock	A	B	C	D	E	F
Current Price	93	87	156	134	70	73
Shares owned	6	7	8	9	10	11

Stock A:

Buy Sell None

Number of shares I want to trade:

Stock B:

Buy Sell None

Number of shares I want to trade:

Stock C:

Buy Sell None

Number of shares I want to trade:

Stock D:

Buy Sell None

Number of shares I want to trade:

Stock E:

Buy Sell None

Number of shares I want to trade:

Stock F:

Buy Sell None

Number of shares I want to trade:

Possibilities of decisions in the experiment

In the upper part you will find the share price window, displaying shares A-F. The price changes of shares A-F will be displayed here. (not shown in the figure).

Below, the screen displays your current portfolio value, your endowment (cash), and your current portfolio.

- “Current cash” displays your endowment, your cash. If you decide to buy shares of a firm then you have to pay for each share its current price. The sum of your expenditures cannot exceed your actual endowment.
- The array “Current price” depicts the price which has to be paid in order to buy new shares. At the same time you would receive this price for each share sold. For example, in the screen shot share A has a price of 93 Talers.
- The array “Shares owned” displays the current number of shares owned. For example, in the screen shot, you currently own four shares of A.

The window at the bottom is the transaction window. Here, you can decide in each period whether you would like to buy/sell one or more shares of shares A-F. If you decide to buy shares of a firm then you have to pay for each share its current price. The sum of your expenditures cannot exceed your current cash.

Example:

- Share A's current price in period 1 is 110 Talers. You decide to buy five shares of A.
- The expenditures for this transaction are given by: $5 * 110 \text{ Talers} = 550 \text{ Talers}$ and are immediately subtracted from your endowment.

If you already own some shares at the beginning of a period, then you have the possibility to sell these shares. You will receive the current price of each share which is sold. Then the revenue is added to your cash. Selling shares follows the same principles as buying shares. However, the numbers of sold shares cannot exceed the total number of shares owned.

Example:

- Share C's current price in period 5 is 90 Talers. Assume, you own a total of four shares C, which you bought for 85 Talers in the previous round, and decide to sell 3 shares C.
- This will lead to a payoff of: $3 * 90 \text{ Talers} = 270 \text{ Talers}$. This amount will be directly credited to your current cash. Afterward you will still own one share of C.

The experiment ends after 14 periods. Then you do not have the possibility to buy or sell shares. All shares that you own at this point in time are automatically liquidated. The resulting money amount will automatically credited to your endowment.

Rankings

During the experiment, and at the end of the experiment, you will be presented rankings, which show your success in the experiment compared to other study participants. In this ranking, participants will be ordered according to their percentage of successful (“winning”) trades.

To generate the ranking, you will be asked to enter a “screen name” at the beginning of the experiment. The screen name will not be saved together with your decision variables, but is only used for the rankings. You are completely free to choose any screen name you want.

In order to calculate your percentage of successful (“winning”) trades, the number of trades you closed at a price, which is higher than the price you paid to purchase the stock, will be counted and divided by the number of trades you initiated (the number of times you buy new shares of a stock).

Note that you have to sell your shares (at a higher price than you paid for the shares) in order for your trade to be successful. Thus, shares, which are currently in your portfolio, do not count toward your successful trades.

Example:

- Share C's current price in period 5 is 90 Talers. Assume, you own a total of four shares C, which you bought for 85 Talers in the previous round, and decide to sell 3 shares C.
- This will count as a successful trade and increase your number of successful trades.
- Share D's current price in period 5 is 60 Talers. Assume, you own a total of three shares D, which you bought for 59 Talers in the previous round.
- This will not count as a successful trade, because you did not sell any of the shares, yet. Thus, the transaction is not ended, yet.

Additional tasks

During the main experiment, you have to submit guesses on the stock types. This happens after the end of period 7 and after the end of period 14. Here, you have to guess which stock A-F followed the types: "+ +," "+," "0," "-" and "- -". You will be credited 200 Talers to your endowment for every correct guess at the end of the main experiment.

After the main experiment ends, you have the possibility to earn additional money by carrying out three short tasks. The instructions for the tasks are displayed on the computer screen, respectively.

Payoff

The total payoff you earn in the experiment is calculated as follows:

Total payoff = cash at the end of the experiment + value of the shares in your portfolio + earnings of your guesses + your earnings from the three additional tasks.

Practice rounds

We will start the experiment with 3 practice rounds of investments (the main experiment), which allows you to get accustomed to making the decisions and to get a feeling for the six different stocks.

After the practice rounds, we will reset your endowment to 10,000 Talers and then start the experiment. Thus, any gains or losses during the practice rounds will not affect your payoff.

Additional Task 1: Eckel and Grossman (2008)

In this part, you have to choose one of 9 lotteries which you prefer most. After your decision the computer will perform your selected lottery. Both payoffs arise with a probability of 50%. At the end of the experiment, you will be informed of the outcome of the draw.

Additional Task 2: Gächter et al. (2007)

For this part, you receive an endowment of 70 cents. In the following, you are faced with 10 lotteries. Assume that for each of the lotteries a fair coin is thrown. The coin can either land on "heads" or "tail." To answer each of the 10 questions you will have to choose "accept" or "reject" for taking part in the respective lottery. After you submit your decision, the computer will randomly draw one of the lotteries. If you reject this specific lottery, you will receive the endowment after the experiment. If you accept the randomly chosen lottery, the computer will flip a coin and the outcome of this coin toss will be added to your endowment. At the end of the experiment, you will be informed of the randomly selected lottery and the outcome of the draw.

Additional Task 3: Holt and Laury (2002)

Below you are presented a set of lottery choices. For each of the ten lottery choices you can choose between lottery A and B. Please note that—while the payoffs for both lotteries remain the same across all ten lotteries—the probabilities between the lotteries vary. After you submit your decisions, the computer will randomly draw one of the lotteries. Then, the computer will randomly decide the outcome of the chosen lottery. At the end of the experiment, you will be informed of the outcome of the draw.

Additional task 4: Personality test

Please answer the following questions. Your participation is completely anonymous and your identity is not known. There are no right or wrong answers. We would, therefore, kindly ask you to be as truthful as possible.

To what extent do the following statements apply to you?

Additional task 5: Auction

CONGRATULATIONS! YOU ACHIEVED THE RANKING NUMBER 3 IN OUR TRADING GAME!

We want to provide you with an official certificate for participating in the trading game that you can share with your friends or on social media. The certificate will show your ranking (see above) amongst all participants that took part in the experiment over the last 24 hr. We will provide a link where you can download the certificate on the next page.

As we believe that the certificate will be more impressive if the certificate is **UNIQUE**, we will issue **ONLY 1** certificate. Here you have the opportunity to bid for this certificate.

Auction design:

- In this auction, you will be asked to decide how much you would be willing to pay for the certificate.
- The auction is a sealed bid, second price auction. You can bid Talers that you earned during the trading game.
- The winner of the auction is the one with the highest bid among all participants over the last 24 hr. We will compare your bid with all bids from the last 24 hr.
- A second price auction means that the winner of the auction will have to pay the second-highest bidding price.

For example, if the highest bid was x Talers and the second-highest was 300 Talers, the highest bidder would receive the certificate and must pay 300 Talers.

TABLE A1 Eckel and Grossman-task

Lottery	Expected value of the lottery	Payoff A probability 50%	Payoff B probability 50%	Please choose your preferred lottery	Range of constant relative risk aversion if choosing this lottery
(1)	(2)	(3)	(4)	(5)	
1	€2.00	€2.00	€2.00	°	$1.37 \leq r \leq \infty$
2	€20.8	€2.56	€1.59	°	$0.97 < r \leq 1.37$
3	€2.26	€3.28	€1.24	°	$0.68 < r \leq 0.97$
4	€2.46	€4.00	€0.92	°	$0.41 < r \leq 0.68$
5	€2.55	€4.35	€0.74	°	$0.15 < r \leq 0.41$
6	€2.58	€4.59	€0.57	°	$-0.15 < r \leq 0.15$
7	€2.57	€4.65	€0.48	°	$-0.49 < r \leq -0.15$
8	€2.55	€4.67	€0.42	°	$-0.95 < r \leq -0.49$
9	€2.45	€4.68	€0.22	°	$-\infty \leq r \leq -0.95$

Note: Column 5 was not shown. A power utility function of the form $U(x) = \frac{x^{1-r}}{1-r}$ is assumed (Eckel & Grossman, 2008).

TABLE A2 Gächter–Johnson–Herrmann task

Lottery		Accept	Reject	Range of loss aversion coefficient (λ) if switching to reject in this row
1		2	3	4
1	If the coin turns up heads, then you lose 12 cents; if the coin turns up tails, you win 60 cents	()	()	$5.00 \leq \lambda \leq \infty$
2	If the coin turns up heads, then you lose 15 cents; if the coin turns up tails, you win 60 cents	()	()	$4.00 \leq \lambda \leq 5.00$
3	If the coin turns up heads, then you lose 20 cents; if the coin turns up tails, you win 60 cents	()	()	$3.00 \leq \lambda \leq 4.00$
4	If the coin turns up heads, then you lose 25 cents; if the coin turns up tails, you win 60 cents	()	()	$2.40 \leq \lambda \leq 3.00$
5	If the coin turns up heads, then you lose 30 cents; if the coin turns up tails, you win 60 cents	()	()	$2.00 \leq \lambda \leq 2.40$
6	If the coin turns up heads, then you lose 35 cents; if the coin turns up tails, you win 60 cents	()	()	$1.71 \leq \lambda \leq 2.00$
7	If the coin turns up heads, then you lose 40 cents; if the coin turns up tails, you win 60 cents	()	()	$1.50 \leq \lambda \leq 1.71$
8	If the coin turns up heads, then you lose 50 cents;			
	if the coin turns up tails, you win 60 cents	()	$1.20 \leq \lambda \leq 1.50$	
9	If the coin turns up heads, then you lose 60 cents; if the coin turns up tails, you win 60 cents	()	()	$1.00 \leq \lambda \leq 1.20$
10	If the coin turns up heads, then you lose 70 cents; if the coin turns up tails, you win 60 cents	()	()	$0.80 \leq \lambda \leq 1.00$

Note: Column 4 was not shown. As in Gächter et al., (2007), equal curvature parameters in the gain and the loss domain are assumed for deriving λ .

TABLE A3 Conducted Holt and Laury-task

Lottery	Please choose one of the following		Range of relative risk aversion for $U(x) = \frac{x^{1-r}}{1-r}$
	2*Lottery A	2*Lottery B	
1	€4 (10% chance) / €3.20 (90% chance)	€7.70 (10% chance) / €0.20 (90% chance)	$r < -0.95$
2	€4 (20% chance) / €3.20 (80% chance)	€7.70 (20% chance) / €0.20 (80% chance)	$-0.95 < r < -0.49$
3	€4 (30% chance) / €3.20 (70% chance)	€7.70 (30% chance) / €0.20 (70% chance)	$-0.49 < r < -0.15$
4	€4 (40% chance) / €3.20 (60% chance)	€7.70 (40% chance) / €0.20 (60% chance)	$-0.15 < r < -0.15$
5	€4 (50% chance) / €3.20 (50% chance)	€7.70 (50% chance) / €0.20 (50% chance)	$-0.15 < r < -0.41$
6	€4 (60% chance) / 3.20 (40% chance)	€7.70 (60% chance) / €0.20 (40% chance)	$-0.41 < r < -0.68$
7	€4 (70% chance) / €3.20 (30% chance)	€7.70 (70% chance) / €0.20 (30% chance)	$-0.68 < r < -0.97$
8	€4 (80% chance) / €3.20 (20% chance)	€7.70 (80% chance) / €0.20 (20% chance)	$0.97 < r < 1.37$
9	€4 (90% chance) / €3.20 (10% chance)	€7.70 (90% chance) / €0.20 (10% chance)	$1.37 < r$

Note: Column 4 was not shown. Ranges of relative risk aversion are as in Holt and Laury (2002).

Only the winner will pay the price and receive the certificate.

If you win the auction, we will deduct the price (the second-highest bidding price from your current balance).

Please answer the following question, which is designed to help you understand the design of the auction.

If your x Taler bid is the highest, and the second-highest bid is 3,000 Taler, what price will you pay for the certificate?

Your maximum bid / current balance is: **12.350** Talers.

Please enter your bid for the certificate?

TABLE A4 Personality test—Part 1

I consider myself to be dependable or self-disciplined.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I tend to manipulate others to get my way.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I am anxious or easily upset.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I maintain definite standards of performance.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I am disorganized or careless.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I have a desire to be admired.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I tend to lack remorse.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
How seriously do you take this study? Choose "Disagree strongly" if you read this question.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I enjoy my successes very much.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I consider myself to be extraverted or enthusiastic.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I consider myself to be friendly and polite.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I consider myself to be great.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I tend to be unconcerned with the morality of his/her actions.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I tend to use deceit or lies to get his/her way.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I show others how special I am				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I consider myself to be sympathetic or warm.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I consider myself to be open to new experiences.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
Mostly, I am very adept at dealing with people.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly
I tend to be callous or insensitive.				
◦ Disagree strongly	◦ Disagree moderately	◦ Neither agree nor disagree	◦ Agree moderately	◦ Agree strongly

Note: This survey included the big five measurement (Gosling et al., 2003), The dirty dozen measure (Back et al., 2013), and the honesty–humility part of the HEXACO model (Ashton et al., 2014).

TABLE A5 Personality test—Part 2

I use flattery to get my way.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I consider myself to be reserved or quiet.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
This is a quality check. Please choose “Agree moderately.”				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I keep to myself.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I will someday be famous.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I tend to be critical or quarrelsome.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I am willing to make changes.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I consider myself to be conventional or uncreative.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I tend to seek prestige and status.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I tend to be cynical.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I tend to exploit others toward my own end.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
Being a very special person gives me a lot of strength.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I tend to expect special favors from others.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I want others to pay attention to me.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I consider myself to be calm or emotionally stable.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I consider myself to be confident.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
Most of the time I am able to draw people's attention to myself in conversations.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I manage to be the center of attention with my outstanding contributions.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I wouldn't pretend to like someone just to get that person to do favors for me.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I would never accept a bribe, even if it were very large.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I manage to be the center of attention with my outstanding contributions.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
Having a lot of money is not especially important to me.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly
I wouldn't want people to treat me as though I were superior to them.				
<input type="radio"/> Disagree strongly	<input type="radio"/> Disagree moderately	<input type="radio"/> Neither agree nor disagree	<input type="radio"/> Agree moderately	<input type="radio"/> Agree strongly

Note: This survey included the big five measurement GoslingA2003, The dirty dozen measure BackNarcisitic2013, and the honesty-humility part of the HEXACO model ashton2014.