



Do narcissists make better decisions? An investigation of narcissism and dynamic decision-making performance

Kaileigh A. Byrne, Darrell A. Worthy*

Texas A&M University, United States

ARTICLE INFO

Article history:

Received 18 November 2012
Received in revised form 13 February 2013
Accepted 16 February 2013
Available online 28 March 2013

Keywords:

Decision-making
Personality
Ego threat

ABSTRACT

We investigated whether narcissism affected dynamic decision-making performance in the presence and absence of misleading information. Performance was examined in a two-choice dynamic decision-making task where the optimal strategy was to forego an option providing larger immediate rewards in favor of an option that led to larger delayed rewards. Information regarding foregone rewards from the alternate option was presented or withheld to bias participants toward the sub-optimal choice. The results demonstrated that individuals high in narcissistic traits performed comparably to low narcissism individuals when foregone reward information was absent, but high narcissism individuals outperformed individuals low in narcissistic traits when misleading information was presented. The advantage for participants high in narcissistic traits was strongest within males, and, overall, males outperformed females when foregone rewards were present. While prior research emphasizes narcissists' decision-making deficits, our findings provide evidence that individuals high in narcissistic traits excel at decision-making tasks that involve disregarding ambiguous information and focusing on the long-term utility of each option. Their superior ability at filtering out misleading information may reflect an effort to maintain their self-view or avoid ego threat.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

The self-loving, center of the universe, arrogant egomaniac: narcissist or decision-making extraordinaire? Narcissists are continuously searching for ways to flaunt their abilities and demonstrate their superiority. They crave external exaltation to maintain their lofty self-image. Because of their motivation to boost their self-view, narcissists exhibit a cognitive bias toward ego-enhancing opportunities. They actively pursue self-enhancing situations and expect to excel in tasks with the potential for self-glory (Farwell & Wohlwend-Lloyd, 1998; Morf & Rhodewalt, 2001). While narcissism can be used in reference to the clinical construct of Narcissistic Personality Disorder (NPD) listed in the DSM-IV-TR (American Psychiatric Association, 1994), it has also been widely studied as a non-clinical individual difference trait (e.g., Foster & Campbell, 2007; Morf & Rhodewalt, 2001; Raskin & Terry, 1988).¹ Narcissism as a “normal” individual trait, as measured by relatively high scores

on the Narcissistic Personality Inventory (Raskin & Terry, 1988), can be both beneficial and disadvantageous. On the one hand, narcissists' desire for self-enhancement may allow them to focus better on a task and succeed (Morf & Rhodewalt, 2001; Wallace & Baumeister, 2002). However, narcissists' success can be hindered by their own overconfidence.

The irony of narcissists' confidence in their abilities but failure to live up to their own expectations is well documented. In achievement domains, narcissists tend to over-rate their overall intelligence and cognitive ability (Campbell, Goodie, & Foster, 2004; Campbell, Rudich, & Sedikides, 2002; Gabriel, Critelli, & Ee, 1994; Paulhus, Harms, Bruce, & Lysy, 2003; Robins & Beer, 2001). In social settings, narcissists overestimate how well they are liked by their peers (Paulhus, 1998). They also believe that they contribute more in group discussions (John & Robins, 1994) and creativity tasks than others in the group (Farwell & Wohlwend-Lloyd, 1998). Overall, narcissists' overconfidence does not seem to be limited to any particular domain or buttressed by their actual abilities. Although narcissists approach self-enhancing opportunities with confidence, their inflated perception of their abilities does not predict their success.

While research supports the detrimental consequences of narcissistic traits on achievement and social success, the effect of narcissism on decision-making processes is less explored. One way narcissists can be thwarted in decision-making success is in their

* Corresponding author. Address: Department of Psychology, Texas A&M University, 4235 TAMU, College Station, TX 77843-4235, United States.

E-mail address: worthyda@tamu.edu (D.A. Worthy).

¹ In the present work we examine narcissism as a “normal” individual difference trait, as measured by relatively high scores on the Narcissistic Personality Inventory (Raskin & Terry, 1988), rather than the clinically diagnosed personality disorder. We will refer to individuals high or low in narcissistic tendencies, or to high and low NPI participants when distinguishing between groups of participants in our study.

willingness to take risks due to their inflated view of the potential benefits associated with risks (Foster, Shenese, & Goff, 2009). Increased willingness to accept risks has direct consequences in situations like gambling. In a task that assessed willingness to bet, participants were offered a chance to bet on their answers on a general knowledge test. Correct answers were given after participants' answers and bets had been selected. Even with performance feedback provided, narcissists were still more overconfident in their answers, more likely to take bets, and lost more points on the task (Campbell et al., 2004). Thus, narcissists' cognitive bias to maintain their self-concept seems to blind them from adverse betting costs.

In addition to risk-taking, narcissists also have an increased sensitivity for immediate gratification and reward (Rose & Campbell, 2004). To test narcissists' proclivity for choosing immediate rewards, Lakey, Rose, Campbell, and Goodie (2008) assessed performance on the Georgia Gambling Task (GGT) and the Iowa Gambling Task (IGT). As predicted, narcissists were more overconfident and accepted more bets in the GGT. On the IGT, narcissists and non-narcissists chose equally from the decks on the initial block of twenty draws. Thereafter, however, narcissists consistently chose the disadvantageous decks that had larger gains but also larger losses and an overall negative expected value more often than non-narcissists.

Overall, prior research indicates that the characteristic cognitive biases of narcissism, including self-enhancement, reward focus, and risk-taking, negatively affects their performance and success. There is evidence, however, that narcissism can boost performance in some situations. For example, narcissists have been shown to perform better under pressure on tests of motor coordination and math ability (Wallace & Baumeister, 2002). Moreover, narcissists' magnified self-focus can also impact their cognitive-perceptual style. Konrath, Bushman, and Grove (2009) found that narcissists demonstrated a superior ability at locating figures in the Embedded Figures Task, which reflects their field independent cognitive style. Narcissists are less likely to be influenced by others' beliefs and information when making decisions under ambiguous circumstances, so it is plausible that their disregard of social information carries over to the cognitive domain (Witkin & Goodenough, 1977). The combination of their disregard for external information and their superior ability in field independent conditions may benefit narcissists in decision-making situations involving uncertainty.

The present study uses a dynamic decision-making task that has been previously employed to study individuals' ability to discern the optimal decision strategy when each choice affects both the immediate and delayed rewards received from each option (Gureckis & Love, 2009; Worthy, Gorlick, Pacheco, Schnyer, & Maddox, 2011; Worthy, Otto, & Maddox, 2012). The dynamic aspect of the task refers to the *choice-history dependent* reward structure, meaning that the payoff on each trial is dependent on individuals' sequence of choices on previous trials. This choice-history dependent task reflects real-life decision-making situations in which the consequences of subsequent decisions hinge on those made previously. For example, choosing to study for an exam, rather than socialize with friends, is not immediately rewarding, but in the long-term it may boost a student's GPA and ultimately future job prospects. Similarly, a college graduate may make more money by taking a job immediately, but attending graduate or law school may lead to more income earned over the course of one's life. In the task the option that provides a larger immediate reward on each trial is the sub-optimal choice because selecting it causes future rewards for both options to decline. Good performance in the task requires forgoing the option that provides larger immediate rewards in favor of an option that provides smaller immediate rewards, but leads to larger long-term, cumulative reward.

Prior research on narcissism and decision-making has been limited to tasks that examine risk-taking and attraction to immediate reward, and there has been little emphasis on whether narcissism enhances the ability to ignore misleading information. Furthermore, prior research with other decision-making tasks, like the GGT and IGT, has shown that individuals high in narcissistic tendencies performed worse relative to those low in narcissistic tendencies (Lakey et al., 2008). The task used in the present work will allow us to investigate whether narcissistic personality tendencies can be an advantage in decision-making situations involving uncertainty and misleading information. Because narcissists tend to be less influenced by social and external information (Witkin & Goodenough, 1977), high narcissism individuals may perform better on a decision-making task when provided with information about the option that they did not select on each trial. The presentation of information regarding both the chosen and foregone reward has been shown to bias participants toward the sub-optimal choice by making immediate rewards more salient (Otto & Love, 2010). If individuals high in narcissistic tendencies are focused on immediate reward, then they should perform worse when presented with information showing them the more immediately rewarding deck, relative to non-narcissists. On the other hand, narcissists' indifference toward social information may extend to decision-making strategies. If they are more distrusting of the information about foregone rewards, then individuals with high narcissistic tendencies should ignore the information and persist in figuring out the optimal decision-making strategy without regard to the external information.

While narcissism has been shown to be detrimental in some decision-making situations involving immediate reward and risk-taking, we predict that it may be an advantage when it involves ignoring misleading information. Examining the possible effects of narcissism on dynamic decision-making performance may enhance our knowledge of how narcissistic traits can positively or negatively impact behavior in real-world situations. To our knowledge, no study has investigated how narcissists respond to misleading information and how that may influence their decision-making ability. The results of the current investigation may broaden our understanding of the effects of narcissism and its associated traits, like overconfidence, disregard for social information, and self-enhancement seeking, and determine if those traits transfer to decision-making domains.

2. Methods

2.1. Participants

One hundred and sixteen (73 female, 43 male) undergraduate students at Texas A&M University participated in the experiment for course credit. In our between-subjects design, participants were randomly assigned to a condition in which foregone rewards were either present or absent. There were 55 participants in the foregone rewards present condition and 61 participants in the foregone rewards absent condition. Participants were divided into high NPI ($n = 59$) or low NPI ($n = 57$) personality groups based on a median split of scores from the NPI ($Mdn = 16$).

2.2. Materials and procedure

Participants completed the NPI and decision-making task on PC computers using Psychtoolbox for Matlab (version 2.5). Participants first completed the 40-item NPI in which they selected between one of two statements, a narcissistic statement and a neutral statement, that best described their personality. The NPI (Raskin & Terry, 1988) is a widely used research assessment designed for non-clinical populations to measure individual

differences in the general concept of narcissism. The NPI has been shown to be a reliable measure of the narcissism construct with high internal consistency ($\alpha = .83$). The normative mean narcissism score for non-clinical population samples is 15.55 ($SD = 6.7$; Raskin & Terry, 1988). In the present study, the mean NPI score was 16.45, $SD = 6.6$. Using a norm mean ($M = 15.55$), sample mean ($M = 16.45$) or median ($Mdn = 16$) split to divide participants into high or low narcissistic tendency groups yielded the same split. The overall reliability of the NPI for our sample across both conditions coincides with the norm ($\alpha = .83$). Moreover, internal consistency of the NPI items is similar between conditions (foregone rewards present condition, $\alpha = .86$; foregone rewards absent condition, $\alpha = .81$).

After completing the NPI, participants were given instructions for the two-option choice history-dependent dynamic decision-making task. Fig. 1a shows the rewards given based on the number of times participants had selected the Increasing option over the past ten trials. The Increasing option gave a smaller immediate reward than the Decreasing option on each trial, but rewards for both options increased as the Increasing option was selected more often. If participants had selected the Increasing option on all of the ten previous trials, then they would earn 80 points, whereas if they had selected the Decreasing option on all ten of the preceding trials then they would earn only 40 points. Thus, the optimal strategy was to repeatedly select the Increasing option even though it always provided a smaller immediate reward.

Experimental conditions were based on the presence or absence of foregone rewards. In the foregone reward present condition,

participants were shown the points they would have received if they had chosen the alternative deck (Fig. 1b). The presence of foregone rewards was expected to bias participants toward the sub-optimal Decreasing option because participants observed that the Decreasing option always led to a larger immediate payoff (Otto & Love, 2010).

Participants completed a total of 250 trials. They were given a goal of earning at least 16,000 points on the task, which required them to select the optimal Increasing option on more than 60% of the trials. They were told nothing about the rewards provided for each option or the choice-history dependent nature of the reward structure of the task.

3. Results

3.1. Behavioral analyses

The total proportion of trials in which the Increasing option was selected was computed and used as the dependent variable. As stated above, participants were divided into high and low narcissistic tendency groups based on a median split for NPI scores ($Mdn = 16$, range = 3–36). Fig. 2 shows the proportion of trials in which participants selected the Increasing option in each condition. A 2 (Narcissistic Traits: Low vs. High) \times 2 (Condition: Foregone Rewards: Present vs. Absent) ANOVA revealed a significant main effect for condition, $F(1, 112) = 24.36$, $p < .001$, partial $\eta^2 = .179$. Participants in the foregone rewards absent condition ($M = 0.647$, $SD = 0.311$) selected the Increasing option significantly more often than those in the foregone rewards present condition ($M = 0.419$, $SD = 0.195$). A main effect for narcissistic traits was also present ($F(1, 112) = 8.26$, $p = .005$, partial $\eta^2 = .069$) in which individuals high in narcissistic traits ($M = 0.599$, $SD = 0.284$) selected the Increasing option significantly more often than individuals low in narcissistic traits ($M = 0.467$, $SD = 0.263$). Fig. 2 illustrates these effects by showing the proportion of Increasing options selected based on pressure condition and narcissistic tendency group.

There was also a marginally significant interaction between condition and narcissism, $F(1, 112) = 2.77$, $p = .099$. To examine the locus of the interaction, we performed pairwise comparisons between individuals low and high in narcissistic traits within each task condition. Because the interaction was only marginally significant, we performed a Bonferroni correction and used a critical value of $p = .025$ to control for multiple comparisons. Within the foregone absent condition there was no difference between participants high ($M = 0.675$, $SD = 0.179$) and low ($M = 0.619$, $SD = 0.210$) in narcissistic traits, $t(59) = -1.12$, $p > .10$. However, there was a significant difference between participants high ($M = 0.524$, $SD = 0.321$) and low ($M = 0.315$, $SD = 0.269$) in narcissistic traits in the foregone present condition, $t(53) = -2.62$, $p = .011$.

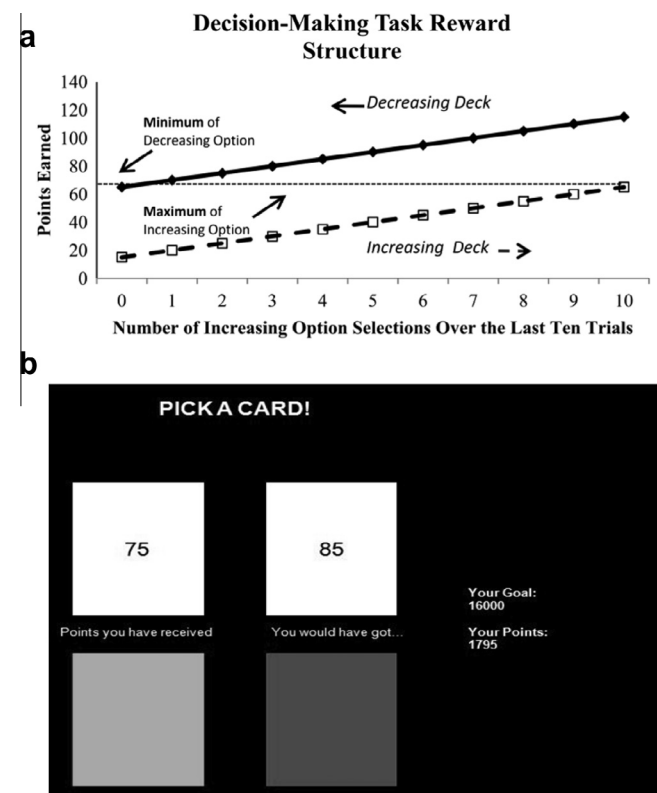


Fig. 1. (a) Decision-making task reward structure. Rewards were a function of the number of times participants had selected the Increasing option over the previous ten trials. If participants had selected the Increasing option on all of the ten of the previous trial then they would be at the right-most point on the x-axis, while if they had selected the Decreasing option on all ten of the previous ten trials then they would be at the left-most point on the x-axis. (b) Sample screenshot from the foregone present condition of the decision-making task. In the foregone present condition participants were shown what they “would have got” had they selected the other option, and in the foregone absent condition only the card that was selected was overturned on each trial.

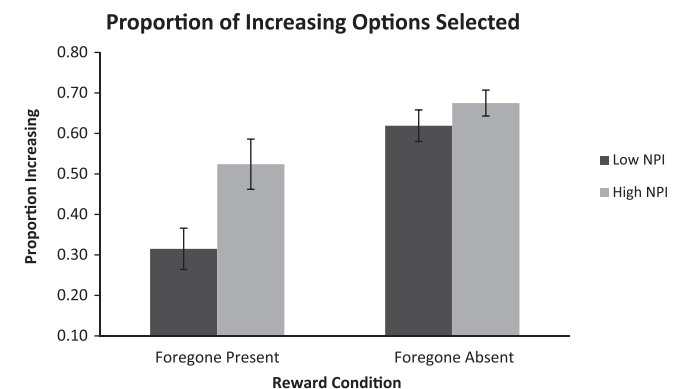


Fig. 2. Proportion of Increasing options selected based on condition and NPI group.

To assess whether possible fatigue effects occurred, the proportion of times the Increasing option was selected in the first and last 100 trials was computed and assessed. A 2 (Narcissistic Traits: Low vs. High) \times 2 (Condition: Foregone Rewards: Present vs. Absent) ANOVA for the first 100 trials showed that the main effects of condition ($F(1, 112) = 11.62, p = .001$, partial $\eta^2 = .301$) and narcissistic trait group ($F(1, 112) = 48.32, p < .001$, partial $\eta^2 = .094$) were still significant and revealed the same effect. The Condition \times Narcissism interaction was also significant in the first 100 trials of the task, $F(3, 112) = 7.53, p = .007$, partial $\eta^2 = .063$. For the final 100 trial block, the main effect of condition was still present ($F(1, 112) = 6.28, p = .014$, partial $\eta^2 = .053$), but the effect of narcissistic traits was not maintained ($F(1, 112) = 2.45, p = .12$), suggesting that trial fatigue dissolved the narcissistic trait advantage, or that low narcissistic trait individuals eventually learned the correct strategy in the task.

3.2. Gender effects

Next, we examined any possible effects of gender on decision-making performance. Our sample contained significantly more females ($n = 73$) than males ($n = 43$), $\chi^2(1) = 7.76, p = .005$, and A 2 (Narcissistic Traits: Low vs. High) \times 2 (Condition: Foregone Rewards: Present vs. Absent) chi square test indicated that males and females were unevenly distributed across low and high narcissistic trait groups, $\chi^2(1) = 7.52, p = .007$. There were significantly more males in the high narcissistic traits group ($n = 29$) compared to the low narcissistic traits group ($n = 14$), $\chi^2(1) = 5.23, p = .022$. However, there was no significant narcissistic trait group difference for females in the high ($n = 30$) compared to low narcissistic traits group ($n = 43$), $\chi^2(1) = 2.32, p > .10$.

We conducted A 2 (Narcissistic Traits: Low vs. High) \times 2 (Condition: Foregone Rewards: Present vs. Absent) \times 2 (Gender: Females vs. Males) three-way ANOVA to examine the role of gender on performance. The main effect for condition ($F(1, 108) = 19.13, p < .001$, partial $\eta^2 = .150$) and narcissistic traits remained significant, $F(1, 108) = 5.61, p = .02$, partial $\eta^2 = .049$. There was also a main effect for gender, $F(1, 108) = 8.01, p = .006$, partial $\eta^2 = .069$. Overall, males ($M = 0.64, SD = 0.21$) outperformed females ($M = 0.48, SD = 0.30$).

The 2 (Narcissistic Traits: Low vs. High) \times 2 (Condition: Foregone Rewards: Present vs. Absent) \times 2 (Gender: Females vs. Males) three-way interaction was not significant ($p > .10$). There was a significant two-way interaction for Condition \times Gender, $F(1, 108) = 5.80, p = .018$, partial $\eta^2 = .051$. Pairwise comparisons for gender within task group showed that males ($M = 0.61, SD = 0.23$) chose the Increasing option more than females ($M = 0.31, SD = 0.30$) in the foregone rewards present condition ($t(53) = -3.80, p = .086$), but performance between females ($M = 0.64, SD = 0.21$) and males ($M = 0.67, SD = 0.18$) did not differ in the foregone rewards absent condition, $t(59) = -.636, p > .10$. Although the main effect of narcissistic traits was retained ($p = .02$), the two-way Narcissistic Traits \times Condition interaction was attenuated when gender was included in the analysis, $F(1, 108) = 1.76, p = .187$, partial $\eta^2 = .016$. The effect of narcissistic traits influencing performance in the foregone rewards present task is present in both genders, but is stronger in males. High NPI males ($M = 0.70, SD = 0.12$) selected the Increasing option 27% more often than low NPI males ($M = 0.43, SD = 0.31$), whereas high NPI females ($M = 0.36, SD = 0.37$) selected the Increasing option 9% more often than low NPI females ($M = 0.27, SD = 0.25$).

4. Discussion

Overall, individuals who scored higher on the NPI outperformed low NPI individuals in a decision-making task that involved forgoing an option that provided larger immediate rewards and

selecting an option that provided smaller immediate rewards but larger delayed rewards. The advantage for individuals higher in narcissistic tendencies was most pronounced when participants had to ignore misleading information provided by foregone rewards. The fact that individuals high in narcissistic tendencies excelled at the task when foregone rewards were present suggests that they have a superior ability to ignore misleading, ambiguous information when making decisions. While past research has shown that narcissists are biased toward immediately rewarding options, the present study shows that they are actually better at disregarding information that explicitly reveals the option with higher immediate gains. The incongruence between narcissists' inflated self-view and their actual ability in achievement and decision-making tasks is absent in our findings. On the contrary, narcissists' superior perception of themselves based on NPI self-report was consistent with their decision-making performance.

It is reasonable to contend that high NPI individuals perform better on the foregone rewards task because they are high achievers and, as such, narcissism is a product of their success rather than a causal factor. If this were the case, however, we would expect high NPI individuals to excel in both the foregone present and absent conditions, but our results do not support this proposition. Although high NPI individuals performed slightly better in the foregone absent condition, there was a significant advantage for narcissists only in the foregone present condition.

Narcissists are not as tempted to choose immediate gains in this task, even though it is within their self-schema to approach reward (Lakey et al., 2008; Rose & Campbell, 2004). These results are surprising when one considers that narcissists are characteristically biased toward risk-taking and gain to enhance their self-image (Campbell et al., 2004; Foster et al., 2009). One possibility to explain these results could be that high NPI individuals focus more on the task because they expect themselves to do well. They may be more motivated to reach the goal because they view the task as an opportunity for self-enhancement. Consequently, because of their increased effort, they figure out the best strategy faster.

An alternative explanation for narcissists' superior performance at filtering information supports Konrath et al. (2009)'s finding that narcissism is linked to a field independent, analytical cognitive-perceptual style. Although narcissists are cognitively biased toward reward, this tendency is overridden by their ability to disembed information from its context. This capability helps them both in their goal of succeeding on the task and on a self-enhancement opportunity.

4.1. Gender and decision-making

Although the primary goal of our study was to examine how narcissistic traits affected decision-making, we also found that gender differences were evident. Consistent with previous findings in which males score higher on the NPI than females, more males were in the high NPI group in our study (e.g., Foster, Keith, & Twenge, 2003; Gabriel et al., 1994; Morf & Rhodewalt, 2001). We also found that males chose the optimal Increasing option more often overall. This result is consistent with prior research on the IGT in which males demonstrated a slight advantage over females on the decision-making card task (Reavis & Overman, 2001). However, we found a significant interaction between gender and task condition, and pairwise comparisons within each task condition demonstrated that males performed significantly better than females only in the foregone present condition.

Both male and female high narcissism participants outperformed low narcissism participants of the same gender when foregone rewards were present. However, the advantage for high narcissism participants was more pronounced in males than in females. The ability to identify and appropriately ignore misleading

information was most prevalent in males higher in narcissistic tendencies. Before over-generalizing the impact of gender on decision-making, however, it is important to note that the gender differences we found are exploratory, as we did not have any a priori hypotheses regarding the role of gender on decision-making behavior. Future research should examine the role of gender and possible interactions between gender and additional personality variables on decision-making performance.

4.2. Implications and future directions

The results from our study indicate that narcissism is not entirely detrimental in all decision-making circumstances. By ignoring external information, high NPI individuals make better choices in ambiguous decision-making situations and are less susceptible to being fooled by misleading information. Perhaps, narcissists realize that being deceived by misleading information could damage their ego, and, thus, they are especially attuned to situations that could detract from their grandiose self-view (Bushman & Baumeister, 1998; Farwell & Wohlwend-Lloyd, 1998; Morf & Rhodewalt, 2001). While individuals with narcissistic tendencies may be show-offs and risk-takers, there also appears to be an aspect of them that can focus well and effectively filter out relevant information from extraneous details.

The findings of our investigation build on prior research with the GGT and IGT that has found that higher narcissistic tendencies are associated with a poorer ability to discern the optimal decision-making strategy (Lahey et al., 2008). Our experiment was novel in that providing misleading information involved not only figuring out the best strategy, but also realizing that the foregone reward information being presented was misleading and would impair performance. Contrary to their performance on the GGT and IGT, high narcissism individuals in the present experiment actually demonstrated a significant performance advantage when the task entailed filtering through misleading information. While high narcissism individuals are characteristically self-focused and drawn to immediate reward, they were, in fact, more skilled at discerning the foregone reward information as deceptive in our experiment. Thus, it appears that their ability to ignore external information can be beneficial in decision-making. This finding is a step forward in understanding how narcissistic traits function and how they affect decision-making behavior in uncertain and misleading situations.

The ability to identify and ignore deceptive information is adaptive and evident in real-life situations. Often, misleading information is present when making decisions, for example, when making financial decisions or on academic multiple-choice tests. For instance, a credit card with immediately low interest rates that rapidly increase, or a test problem with two very similar choices are real-life decision-making scenarios with deceptive details that many individuals encounter. Further research should be aimed at investigating other domains in which narcissists' superior ability at perceiving misleading information as deceptive can be applied. While the present experiment examined how narcissistic traits affected performance in responding to misleading information during decision-making, other areas such as social situations, financial scenarios, commercial advertisements, and multiple-choice tests offer additional domains in which identifying and ignoring misleading information could be advantageous.

5. Limitations

As stated above, the narcissism construct investigated in this study is limited to individual differences in narcissism as an enduring trait, rather than a clinical pathology. In generalizing these

findings and comparing it to previous research, it should be noted that our sample was limited to undergraduate university students approximately 18–22 years old. Furthermore, the female to male ratio was skewed toward female participants. Additional research is needed to determine how the findings of the present study can be extended to other age demographics, clinical samples, or predominantly male populations.

While we investigated the narcissism construct as an individual difference factor that accounts for variability in decision-making, other underlying personality characteristics may also affect decision-making. Additional traits, such as the Big 5 personality factors, may interact with narcissism. Future work is needed on the interaction of narcissism with other personality traits in order to gain a fuller understanding of how personality differences as a whole can influence responses to misleading information and decision-making behavior.

Acknowledgements

We would like to thank Karla Gomez, Jordan Hall, Kaitlynn Goldman, Lindsey Ferris, Lucas Weatherall, Megan McDermott, Christy Ho, and Michael Pang for their help in conducting this study.

References

- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders* (4th Ed.). Washington, DC: American Psychiatric Association.
- Bushman, B. J., & Baumeister, R. F. (1998). Threatened egotism, narcissism, self-esteem, and direct and displaced aggression: Does self-love or self-hate lead to violence? *Journal of Personality and Social Psychology*, 75(1), 219–229.
- Campbell, W. K., Goodie, A. S., & Foster, J. D. (2004). Narcissism, confidence, and risk attitude. *Journal of Behavioral Decision Making*, 17, 297–312.
- Campbell, W. K., Rudich, E. A., & Sedikides, C. (2002). Narcissism, self-esteem, and the positivity of self-views: Two portraits of self-love. *Personality and Social Psychology Bulletin*, 28(3), 358–368.
- Farwell, L., & Wohlwend-Lloyd, R. (1998). Narcissistic processes: Optimistic expectations, favorable self-evaluations, and self-enhancing attributions. *Journal of Personality*, 66(1), 65–83.
- Foster, J. D., & Campbell, W. K. (2007). Are there such things as "Narcissists" in social psychology? A taxometric analysis of the Narcissistic Personality Inventory. *Personality and Individual Differences*, 43(6), 1321–1332.
- Foster, J. D., Keith, C. W., & Twenge, J. M. (2003). Individual differences in narcissism: Inflated self-views across the lifespan and around the world. *Journal of Research in Personality*, 37(6), 469–486.
- Foster, J. D., Shenesey, J. W., & Goff, J. S. (2009). Why do narcissists take more risks? Testing the roles of perceived risks and benefits of risky behaviors. *Personality and Individual Differences*, 47(8), 885–889.
- Gabriel, M. T., Critelli, J. W., & Ee, J. S. (1994). Narcissistic illusions in self-evaluations of intelligence and attractiveness. *Journal of Personality*, 62(1), 143–155.
- Gureckis, T. M., & Love, B. C. (2009). Learning in noise: Dynamic decision-making in a variable environment. *Journal of Mathematical Psychology*, 53, 180–193.
- John, O. P., & Robins, R. W. (1994). Accuracy and bias in self-perception: Individual differences in self-enhancement and the role of narcissism. *Journal of Personality and Social Psychology*, 66(1), 206–219.
- Konrath, S., Bushman, B. J., & Grove, T. (2009). Seeing my world in a million little pieces: narcissism, self-construal, and cognitive-perceptual style. *Journal of Personality*, 77(4), 1197–1228.
- Lahey, C. E., Rose, P., Campbell, W. K., & Goodie, A. S. (2008). Probing the link between narcissism and gambling: The mediating role of judgment and decision-making biases. *Journal of Behavioral Decision Making*, 21(2), 113–137.
- Morf, C. C., & Rhodewalt, F. (2001). Unraveling the paradoxes of narcissism: A dynamic self-regulatory processing model. *Psychological Inquiry*, 12(4), 177–196.
- Otto, A. R., & Love, B. C. (2010). You don't want to know what you're missing: When information about foregone rewards impedes dynamic decision-making. *Judgment and Decision-Making*, 5(1), 1–10.
- Paulhus, D. L. (1998). Intrapersonal and intrapsychic adaptiveness of trait self-enhancement: A mixed blessing? *Journal of Personality and Social Psychology*, 74(5), 1197–1208.
- Paulhus, D. L., Harms, P. D., Bruce, M. N., & Lysy, D. C. (2003). The over-claiming technique: Measuring self-enhancement independent of ability. *Journal of Personality and Social Psychology*, 84(4), 890–904.
- Raskin, R., & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology*, 54(5), 890–902.
- Reavis, R., & Overman, W. H. (2001). Adult sex differences on a decision-making task previously shown to depend on the orbital prefrontal cortex. *Behavioral Neuroscience*, 115(1), 196–206.

- Robins, R. W., & Beer, J. S. (2001). Positive illusions about the self: Short-term benefits and long-term costs. *Journal of Personality and Social Psychology*, 80(2), 340–352.
- Rose, P., & Campbell, K. W. (2004). Greatness feels good: A telic model of narcissism and subjective well-being. In S. P. Shohov (Ed.), *Advances in Psychology Research* (Vol. 31, pp. 3–26). Huntington, N.Y.: Nova Science Publishers.
- Wallace, H. M., & Baumeister, R. F. (2002). The performance of narcissists rises and falls with perceived opportunity for glory. *Journal of Personality and Social Psychology*, 82(5), 819–834.
- Witkin, H., & Goodenough, D. (1977). Field dependence and interpersonal behavior. *Psychological Bulletin*, 84, 661–689.
- Witkin, H., & Goodenough, D. (2012). Working-memory load and temporal myopia in dynamic decision-making. *Journal of Experimental Psychology: Learning, Memory, and Cognition* [Advance online publication].
- Worthy, D. A., Gorlick, M. A., Pacheco, J. L., Schnyer, D. M., & Maddox, W. T. (2011). With age comes wisdom: Decision-making in younger and older adults. *Psychological Science*, 22, 1375–1380.