

Narcissism, Confidence, and Risk Attitude

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ABSTRACT

The present research addresses whether narcissists are more overconfident than others and whether this overconfidence leads to deficits in decision making. In Study 1, narcissism predicted overconfidence. This was attributable to narcissists' greater confidence despite no greater accuracy. In Study 2, participants were offered fair bets on their answers. Narcissists lost significantly more points in this betting task than non-narcissists, due both to their greater overconfidence and greater willingness to bet. Finally, in Study 3, narcissists' predictions of future performance were based on performance expectations rather than actual performance. This research extends the literature on betting on knowledge to the important personality dimension of narcissism. Copyright © 2004 John Wiley & Sons, Ltd.

KEY WORDS risk taking; overconfidence; decision making; narcissism; personality; adults

Individual differences matter in decision making. Gigerenzer and Hoffrage (1995), among many others, have pointed out that average decision strategies can be misleading, as they may reflect decision strategies that no single decision-maker employs. It is often better to explore the decisions that individuals reach. Furthermore, reliable differences in which kinds of people make which kind of decisions are important. Stanovich and West (2000), for example, have defended the reality of various cognitive illusions by demonstrating that people who violate conventionally defined norms tend to be those who perform less well in other domains. Looking at the same base of data, Funder (2000) argued that the observed correlation constitutes standard validation of the test items, and that the ability of some people to solve the problems correctly indicates an absence of systematic irrationality. Beyond theoretical concerns, there are also clear practical applications of such findings, as, for example, organizations could use individual differences measures to avoid hiring individuals who are more likely to be error-prone, when hiring for important decision-making positions. In this paper, we examine how the well-validated personality construct of narcissism is predictive of confidence, risk taking, and performance on a task in which confidence and risk taking are central parts.

Approaching these questions is facilitated by the recent reinvigoration of decision-making research using bets that are based on confidence in knowledge (e.g., Goodie, 2003, in press; Heath & Tversky, 1991). In these

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tasks, participants make decisions about bets that are determined by the participants' uncertain knowledge and the confidence they place in it. In such tasks, typical confidence calibration results—underconfidence at low confidence and overconfidence at high confidence—produces bets that are positively valued at low confidence and negatively valued at high confidence. Yet, participants typically become more willing to accept risk as confidence increases, a finding that has been termed “paradoxical betting” (Goodie, 2003). Because of the possibility that narcissists are both more overconfident and more risk-taking than others, such a betting-on-knowledge task is an inviting target for exploring individual differences on the dimension of narcissism.

The construct of narcissism

The present research is concerned with the personality variable of narcissism (sometimes referred to as “normal narcissism”) rather than the far less common clinical disorder of narcissistic personality disorder (NPD). The scale used to measure normal narcissism (the narcissistic personality inventory, or NPI, Raskin & Terry, 1988) was adopted from the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) criteria for NPD (American Psychiatric Association, 1980), to explore potential effects and correlates in nonclinical populations of a trait that, in extreme forms, constitutes a distinct mental disorder. Consistent with convention, we use the terms “narcissists” and “non-narcissists” to describe individuals scoring higher and lower on measures of normal narcissism. We do this for ease of presentation; we do not intend to create a typology where none exists. Nor do we intend to create the impression that narcissism is more than a theoretical personality construct.

Narcissism is a dynamic, socially defined construct with two key elements: a positive, inflated, and agentic view of the self; and a self-regulatory strategy to maintain and enhance this positive self-view (for a review, see Morf & Rhodewalt, 2001). Narcissists' positive self-views have been demonstrated empirically in several ways. Narcissists differentially think that they are special and unique (Emmons, 1984), that they are entitled to more positive outcomes in life than are others (Campbell, Bonacci, Shelton, Exline, & Bushman, 2004), that they are more intelligent and physically attractive than they actually are (e.g., Gabriel, Critelli, & Ee, 1994), and that they are better than others on agentic traits (e.g., dominance, power) but not on communal traits (caring, morality; Campbell, Rudich, & Sedikides, 2002).

In terms of self-regulatory strategies, empirical research demonstrates that narcissists use both intrapsychic and interpersonal strategies to maintain their positive self-views. On the intrapsychic side, narcissists fantasize about fame (Raskin & Novacek, 1991) and strategically attribute responsibility for their own success to abilities (e.g., Campbell, Reeder, Sedikides, & Elliot, 2000; Farwell & Wohlwend-Lloyd, 1998). On the interpersonal side, narcissists differentially brag and draw attention to the self (Buss & Chiodo, 1991), and strive to compete with and dominate others (e.g., Carroll, 1987). Narcissists also desire to associate with high-status others in order to gain esteem (Campbell, 1999). Not surprisingly, narcissists shift the blame for failures onto colleagues (John & Robins, 1994) or evaluators (Kernis & Sun, 1994).

In the simplest terms, one can think of narcissists as individuals for whom enhancing the positivity of the self (specifically, to achieve status and esteem) is overwhelmingly important. Much of their psychological and social lives is directed toward this goal. In the present research, we look at decision making as one of the domains of narcissists' behavior that may be differentially distorted by the striving for status and esteem. One might suspect that narcissists have a particular long-term interest in making reasonable and measured decisions, based on the causal reasoning: good decisions → success → status and esteem, and the fact that status and esteem have heightened salience for narcissists. However, we suspected that narcissists' decisions may be undermined by their short-term interest in maintaining an inflated self-image (cf. Robins & Beer, 2001). Narcissists' grandiose self-views may preclude the realistic appraisal of one's likelihood of success needed for successful decisions, resulting in overconfidence and risk-taking.

We propose that individuals with elevated scores on the trait of narcissism (i.e., narcissists) are more likely than others to be overconfident in their judgments and to turn their poor judgments into costly decisions.

Why might narcissists be expected to make bad decisions? Two elements of decision making that have been emphasized in the personality literature are the accurate assessment of one's abilities, and appropriate strivings toward success (Baumeister, Heatherton, & Tice, 1993). Narcissists are susceptible to deficits in both of these domains: They are likely to overestimate their own abilities and also to make inappropriately risky decisions, with the conflict between maintaining the positivity of their self-concept and performing well at the tasks in which they engage. Narcissists need to feel that they are superior to others. To maintain this feeling they must outperform others. However, if they approach a performance task with an inflated self-opinion and a willingness to "swing for the fences (i.e., take big risks)," their performance may ultimately suffer.

Decision making: Overconfidence and risk-taking

Overconfidence. Overconfidence refers to an inflated subjective probability of a particular outcome occurring. In an achievement setting, this is observed as a positive difference between assessed confidence and observed achievement. In a typical paradigm, many factual questions are asked, and confidence in each answer is assessed. Overconfidence is defined as a positive difference between average confidence and average accuracy. A negative difference is called underconfidence, whereas zero difference is idealized calibration. In general, overconfidence has been observed in a large literature (Budescu, Wallsten, & Au, 1997), particularly when confidence is relatively high (Lichtenstein & Fischhoff, 1977), although various means have been devised to diminish or even eliminate it (e.g., Gigerenzer, 1991; Juslin, 1994). At low confidence, underconfidence is typically observed.

Risk-taking. The overconfidence literature has occasionally branched from the domain of judgment to that of decision making (e.g., Fischhoff, Slovic, & Lichtenstein, 1977; Goodie, 2003; Heath & Tversky, 1991). Overconfidence has deleterious consequences when the interval between judged probability and actual probability contains the boundary between a winning bet and a losing one. For example, when faced with an even-money bet with a 40% chance of winning, which is a losing proposition, the well-calibrated Bettor A will reject it. In contrast, the overconfident Bettor B may view it as having a 60% chance of succeeding, and accept the bet.

Such borderline conditions of betting on one's confidence were used by Goodie (2003, in press). Participants, after answering and assessing confidence in many questions, were given the opportunity to bet on each of the answers, with bets that were individually constructed to be fair (having zero average marginal value) if confidence was well-calibrated. These bets were positively valued if underconfident, and negatively valued if overconfident. For all answers, participants faced a choice between accepting a certain outcome and betting on the correctness of their answer. It was found that people were increasingly willing to accept the bets as they became more confident, despite average bet values that steadily declined with increasing confidence. This finding has been dubbed "paradoxical betting" (Goodie, 2003).

Narcissism, overconfidence, and risk-taking

As noted, there are at least two potential pitfalls in narcissists' performance when they make bets on their knowledge. Heightened overconfidence may reflect narcissists' inflated estimates of skill and ability, and the desire to maintain these estimates. And heightened risk-taking may be a manifestation of narcissists' focus on success.

Narcissists might be expected to display elevated degrees of overconfidence. They have high self-opinions in important, achievement-oriented self-concept domains. Do narcissists' self-opinions reflect actual success? The available data are mixed, but more consistent with the conclusion that narcissists' performance does not exceed that of non-narcissists. Narcissists, for example, rate their intelligence as being higher than

do non-narcissists, but there are no significant IQ differences between the two groups (Gabriel et al., 1994). Likewise, narcissists rate their performance on group tasks more highly than do non-narcissists, but ratings by neutral judges find no actual performance differences (John & Robins, 1994). In the present research, we predicted that in a confidence calibration task, narcissists would rate their own performance highly, but that their performance would be equivalent to that of non-narcissists. That is, narcissists would display more overconfidence.

A second pitfall in narcissists' decision making may be their willingness to take risks. Risk-taking, of course, is not always a poor decision. However, when coupled with overconfidence over many bets in the task setting used in the present research, risk-taking systematically leads to losses unless it is focused exclusively on low-confidence items. What is the available evidence that narcissists take bigger risks than non-narcissists? First, narcissists display a distinctive approach orientation. They are focused on success and achievement, and display little conscious avoidance orientation or fear of failure (see Elliot & Thrash, 2001). This greater focus on success could lead them to place bets on successful outcomes with less worry about poor performance. Also, there is empirical evidence for narcissists' elevated reports of sensation-seeking (Emmons, 1991). Research has also demonstrated a link between threatened self-esteem and risk-taking (Baumeister, et al., 1993). In a series of experiments, individuals with high self-esteem were asked to perform on a novel computer flight game that included betting on one's own performance in one condition. Self-esteem had a negative impact on performance when ego-threat was induced. To the extent that high self-esteem is reflected in narcissism, this result is consistent with the prediction that narcissists will display more risk-taking on tasks involving their own knowledge.

The present research

In three studies, we examined the links between narcissism, overconfidence, risk-taking, and performance. We predicted that narcissists would perform worse than non-narcissists on a knowledge-based betting task, as a result of their greater overconfidence in their own abilities and their greater willingness to take risks. We also predicted that narcissists' self-beliefs would prove resilient in the face of poor performance. *Study 1* examined the relationship between narcissism and overconfidence on a knowledge-based task. *Study 2* examined narcissists' willingness to bet on their performance in the same task. *Study 3* replicated *Study 2* and also assessed predictions about performance before the task, estimates of performance after the task, and estimates of future performance.

STUDY 1

Study 1 examined the link between narcissism and overconfidence, using a computer-administered question task. Several additional individual difference constructs were also measured, including self-esteem, self-control, and self-efficacy. This allowed us to distinguish the effects of narcissism from these other individual differences.

Method

Participants. One hundred four participants (78 women and 26 men, median age 18) were recruited from the Research Pool of the University of Georgia Psychology Department. Participants volunteered in exchange for course credit.

Materials. The study was conducted in a room divided into three individual workstations, each equipped with a personal computer. In addition to the overconfidence task (described below) and a demographic questionnaire asking for sex, age, and racial/ethnic self-identification, we assessed narcissism with the NPI

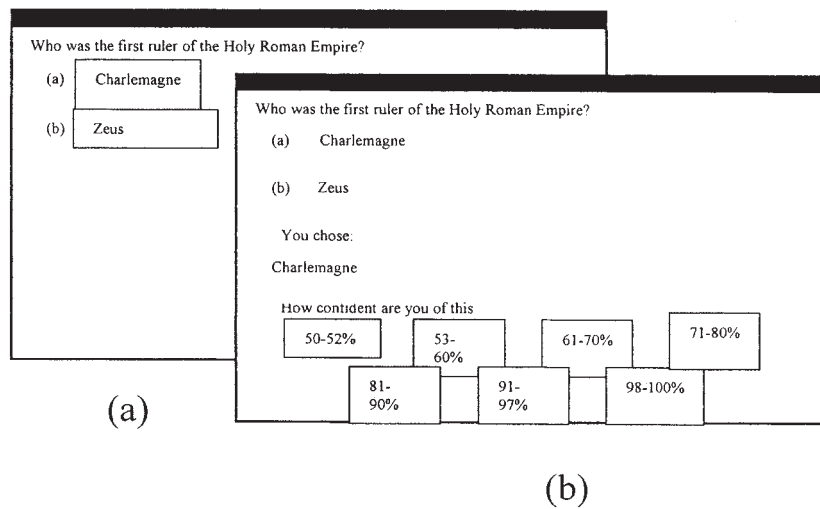


Figure 1. The two types of questions asked in Study 1: (a) general knowledge question; (b) confidence assessment

(Raskin & Terry, 1988). The NPI is derived directly from the clinical criteria for NPD as contained in the DSM-III and has been validated in clinical settings (Prifitera & Ryan, 1984); however, it is intended for use as a measure of normal narcissism in normal populations. The NPI has been validated extensively (e.g., Emmons, 1984; Raskin & Terry, 1988; Rhodewalt & Morf, 1995). These validation studies include not just self-reports, but observer ratings (e.g., Raskin, Novacek, & Hogan, 1991) and behavioral measures (e.g., Robins & John, 1997). The NPI contains 40 forced-choice items with a range of possible scores from 0 to 40. Sample narcissistic items include: “If I ruled the world it would be a better place;” “I think I am a special person;” “I know that I am a good person because everybody keeps telling me so;” and “I will be a success.” The NPI is the most widely-used measure of narcissism in normal populations. Measures of self-esteem (Rosenberg, 1965), self-efficacy (Sherer, Maddux, Mercandante, Prenticedunn, Jacobs, & Rogers, 1982) and self-control (Tangney, Baumeister, & Boone, 2004), as well as other personality measures for a separate study (Schaefer, Williams, Goodie, & Campbell, in press) were presented to participants on the computer.

Procedure. After giving informed consent, participants completed the personality inventories. The confidence calibration task was then administered.

This task employed two kinds of questions, depicted in the two panels of Figure 1, which also illustrates the format in which stimuli were presented on a computer screen to participants. The first kind of question, depicted in Figure 1a, is a two-alternative forced choice version of a general knowledge question (GKQ). The questions were adapted from a set of 299 questions compiled by Nelson and Narens (1980).¹ Separately for each participant, 150 of these questions were randomly selected and presented in a random order. The second kind of question (Figure 1b) asked for confidence in each answer to be placed in one of the following categories: 50–52%; 53–60%; 61–70%; 71–80%; 81–90%; 91–97%; and 98–100%. For all analyses, confidence was taken as the midpoint of the selected confidence category.

¹The use of arbitrarily selected test items is controversial (e.g., Juslin, Winman, & Olsson, 2000). We used them in the present studies in order to create a baseline of overconfidence. Anticipating, as we did, that narcissists would be more overconfident than others, we wanted to give them every opportunity to prove us wrong. By using a task in which typical people are typically overconfident, we made it possible for narcissists to be less overconfident than others, and even to do so while being somewhat overconfident.

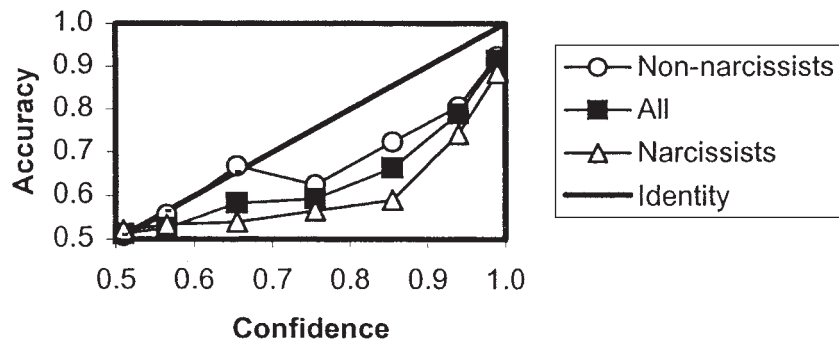


Figure 2. Confidence calibration (accuracy as a function of calibration) in Study 1. Perfect calibration would conform to the identity line. Two effects are evident: people are generally overconfident (accuracy falling below confidence); and narcissists (the top quartile on NPI) are more overconfident than non-narcissists (the bottom quartile on NPI)

Results and discussion

Descriptive statistics for the narcissism score were: $M = 16.58$, $sd = 7.04$. Average confidence was 0.801, and average accuracy was 0.721, resulting in average overconfidence of 0.080.

As predicted, narcissism was a significant predictor of overconfidence, $r = 0.28$, $p < 0.01$. This correlation is entirely due to the relationship between narcissism and confidence, $r = 0.29$, $p < 0.01$, and not to a negative relationship between narcissism and accuracy, $r = -0.04$, n.s. That is, narcissists were more confident in their answers than others, but they were no more accurate. In all but the lowest confidence category, the quartile of participants highest on the NPI was substantially more overconfident than the lowest quartile, as depicted in Figure 2.

The narcissism–overconfidence link remained significant in a regression that included self-esteem, self-efficacy, and self-control in the model: for narcissism, $b = 0.33$, $t(99) = 3.16$, $p < 0.01$. None of the other variables showed a significant relationship to overconfidence (all p 's > 0.30).

In sum, narcissism was positively linked to overconfidence in a laboratory-administered judgment task. The link remained significant when several other related individual differences variables were statistically controlled for.

STUDY 2

Study 1 demonstrated that overconfidence was positively associated with narcissism in a laboratory setting. Study 2 included a betting decision as well as a confidence judgment, which extends the research in two important ways. First, the decision to accept or reject a fair bet serves as a conservative measure of risk-taking. Second, and more importantly, it introduces a behavioral performance measure consisting of the outcomes of participants' bets.

We constructed bets that were exactly fair (having zero average value) if participants were well-calibrated. Participants won points if their trivia answer was correct, and lost points if their answer was incorrect. The gain-if-right was always 100 points, and the loss-if-wrong varied according to the participants' confidence in each answer. Specifically:

$$\text{loss-if-wrong} = 100 \times (\text{confidence} / (1 - \text{confidence})) \text{ points} \quad (1)$$

The bet is negatively valued when participants are overconfident, and positively valued when they are underconfident. Furthermore, the more overconfident one is, the more negative the average value of bets is (see Goodie, 2003).

We anticipated that narcissists, being more overconfident than non-narcissists, would be offered bets that were of lower average value than the bets offered to non-narcissists. Would they accept these lower-valued bets? We predicted that narcissists would be more risk-seeking than non-narcissists, leading to much lower point totals that result from both greater overconfidence and increased risk-taking.

Method

Participants. Ninety-seven participants (66 female and 31 male, median age 18) were drawn from the same population as Study 1.

Procedure. The study began with demographic data and the NPI, followed by the overconfidence task with 101 questions. After completing the confidence calibration task, participants were offered a bet on the basis of each question asked in the confidence calibration phase. Each question was re-posed, with a reminder of the participant's answer (but not of her confidence in the answer). A bet was offered on the same screen, as described above. Following each betting choice, participants were immediately informed of the correct answer, the outcome of the trial (any change in points) and their updated point total. This procedure provided the opportunity to compensate for overconfidence by rejecting bets. The methods in this phase of the study were essentially identical to those used in the betting-on-confidence studies of Goodie (2003, in press).

Results and discussion

The narcissism scores were similar to those of Study 1, $M = 17.23$, $sd = 6.65$. Average confidence was 0.800, and average accuracy was 0.735, yielding average overconfidence of 0.065. Average bet acceptance was 63.1%. Consistent with the general overconfidence and robust betting observed by Goodie (2003), the average final point total was well below zero, $-18\,280$ points. Only 28 out of 97 participants finished with non-negative point totals.

Consistent with the results of Study 1, narcissism was associated positively with overconfidence, $r = 0.30$, $p < 0.01$. This reflected an association with confidence, $r = 0.32$, $p < 0.01$, and not with accuracy, $r = -0.03$, n.s. This is displayed in Figure 3. The lowest quartile on NPI (non-narcissists) was consistently less overconfident than the highest quartile. Also consistent with predictions, narcissism was positively related to risk-taking (i.e., bet acceptance), $r = 0.20$, $p < 0.05$. Finally and perhaps most importantly, narcissists lost more points than did non-narcissists, $r = -0.24$, $p < 0.05$.

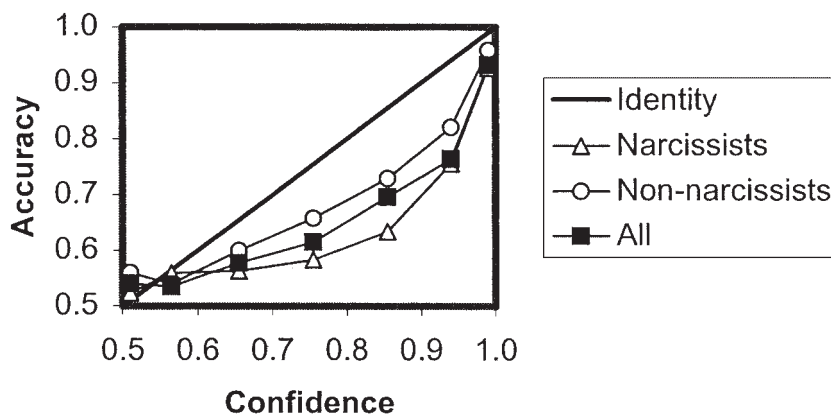


Figure 3. Confidence calibration in Study 2

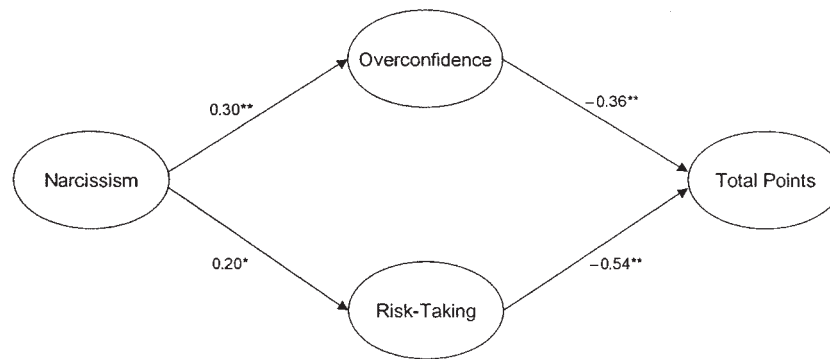


Figure 4. The relationships among narcissism, overconfidence, risk-taking, and total points in Study 2. Asterisks refer to statistically significant beta-weights (* $p < 0.05$; ** $p < 0.01$)

We predicted that narcissists' poor relative performance would be mediated (Baron & Kenny, 1986) by both overconfidence and risk-taking. Overconfidence ($b = -0.54$, $t(94) = -7.18$, $p < 0.01$) and risk-taking ($b = -0.36$, $t(94) = -4.79$, $p < 0.01$) simultaneously predicted performance negatively. Then we created a regression model with narcissism, overconfidence, and risk-taking as predictor variables and points as the outcome variable. Consistent with our mediational hypotheses, the standardized regression coefficient associated with narcissism dropped to non-significance in this model, $b = -0.01$, $t(93) = -0.12$, $p = 0.91$. The standardized regression coefficients associated with overconfidence ($b = -0.54$, $t(93) = -6.82$, $p < 0.01$) and risk-taking ($b = -0.36$, $t(93) = -4.68$, $p < 0.01$) remained significant. This mediation was confirmed statistically (using the Sobel test, z 's = 2.83, $p < 0.01$ and 1.87, $p = 0.06$, respectively) and is depicted graphically in Figure 4.

To summarize, narcissists displayed both greater overconfidence and heightened risk-taking in a task based on their own knowledge. This overconfidence and risk-taking resulted in diminished attainment by narcissists.

STUDY 3

In Study 3, we examined the links between self-beliefs and performance on our betting task. Previous research suggests that self-beliefs can greatly affect future performance estimates (e.g., Ehrlinger & Dunning, 2003). To examine this possibility with narcissists, we measured performance expectations before the betting task was initiated, as well as estimates of performance on the task (after completion), and estimates of performance on a similar future task. We hypothesized that narcissists enter the situation with positive expectations and maintain those positive beliefs even in the face of poor performance feedback. In a sense, we predicted that narcissists would use a "top-down" strategy for self-assessment: "I am good, therefore I will do well on this task, did do well, and will do well in the future." The implications of this strategy for decision making by narcissists are that narcissists might remain persistently overconfident regardless of how they perform.

Narcissists' self-beliefs, however, are not expected to be completely detached from reality. Estimates of performance by narcissists might be influenced by both expectations of performance prior to completing the task and actual performance on the task. We base this on the finding that it is more difficult to bias estimates of performance when objective assessments are readily available (Felson, 1981). On the other hand, because point totals by themselves (without any other participants' totals) do not directly reflect relative performance, it was possible—and would be normatively defensible—for the performance feedback used here to have no

impact on the performance assessment. In contrast, when performance estimates are made prior to completing the task, it should be relatively easy to bias one's performance projections. Likewise, estimates about future performance are likely to be biased. In other words, it may be easier for narcissists to bias thoughts about where they are going than where they have been.

Method

Participants. Six hundred seven participants (340 female and 267 male, median age 19) were drawn from the same population as Studies 1 and 2.

Procedure. As in both previous studies, demographic data and NPI scores were first attained. The betting-on-confidence task used in Study 2 was then administered. Three measures were added to this study, however, that assessed: (a) how well participants thought they would perform in the task ("Initial Performance Expectation"); (b) how well they thought they performed in the task ("Performance Assessment"); and (c) how well they thought they would perform on a similar task in the future ("Future Performance Expectation"). Each of these three measures was assessed on a 10-point scale, with low scores ("1") indicating they expected to surpass few (5%) others and high scores ("10") indicating they expected to surpass most (95%) others. The first measure was administered just prior to the beginning of the betting phase, and the others immediately following the betting phase. Thus, participants were aware of their scores before filling out the final two questions.

Results and discussion

Narcissism scores were similar to those reported in the first two studies, $M = 17.46$, $sd = 6.95$. Similar to Study 2, participants ended the task with an average of -19.027 points. Also similar to Study 2 were average levels of confidence (0.803), accuracy (0.744), and overconfidence (0.059).

As in Studies 1 and 2, narcissism was again correlated significantly with overconfidence, $r = 0.10$, $p < 0.05$. This reflected a statistically significant association with confidence, $r = 0.13$, $p < 0.01$, but not accuracy, $r = 0.02$, n.s. Also consistent with the previous two studies, narcissism was negatively correlated with the number of points earned, $r = -0.17$, $p < 0.001$. Surprisingly, however, narcissism, in this study, was not significantly correlated with risk-taking (i.e., bet acceptance), $r = 0.05$, n.s.

Because number of points was correlated with overconfidence, $r = -0.64$, $p < 0.001$, we tested a model in which overconfidence mediates the association between narcissism and points, as was done in Study 2. This model included narcissism and overconfidence as simultaneous predictors of points. Because of the large sample, even minor associations would be significant, and in this model overconfidence, $b = -0.63$, $t(604) = -20.43$, $p < 0.001$, and narcissism, $b = -0.11$, $t(604) = -3.39$, $p < 0.01$, remained significant predictors of points. However, the association between overconfidence and points was nearly unchanged, whereas the absolute association between narcissism and points dropped from $r = -0.17$ to $r = -0.11$. This represented a significant mediation, $z = 2.34$, $p < 0.05$. Consistent with Study 2, the relation between narcissism and points was partially mediated by overconfidence.

Participants reported mean initial performance expectations, performance assessments, and future performance expectations of 6.40, 4.32, and 6.45 percentiles, respectively. Narcissism was correlated significantly with all three performance estimates, r 's = 0.19, 0.09, and 0.21, p 's < 0.001, 0.05, and 0.001, respectively, suggesting that narcissists expected to do better, thought that they had done better, and predicted that they would do better on a similar future task. To examine whether narcissists inflated their performance estimates regardless of performance, we regressed each of the three performance estimates onto both narcissism and points simultaneously. Narcissism positively predicted performance estimates even after points were statistically controlled, including initial performance expectations ($b = 0.20$, $t(604) = 4.9$, $p < 0.001$),

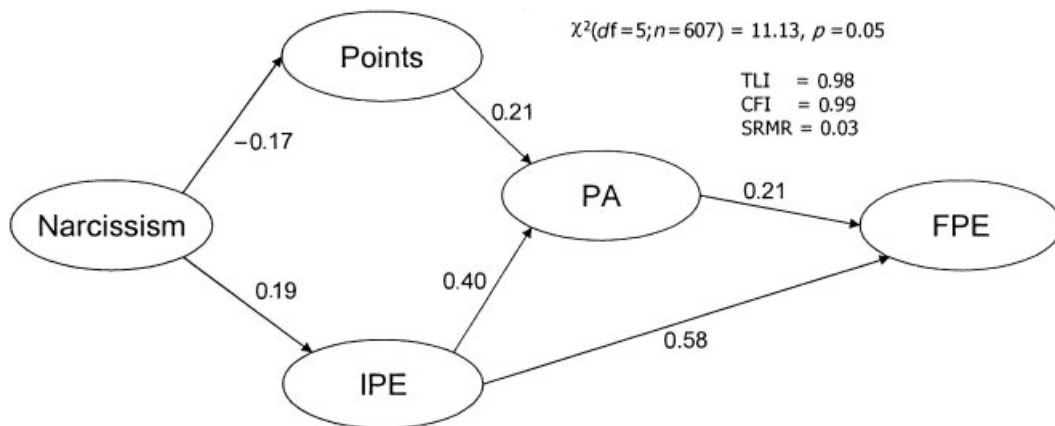


Figure 5. A theoretical model of the extent to which narcissists relied upon schema and observation when making assessments of performance in Study 3. *Note:* IPE = initial performance expectations; PA = performance assessments; FPE = future performance expectations

performance assessments ($b = 0.13$, $t(604) = 3.2$, $p < 0.01$), and future performance expectations ($b = 0.23$, $t(602) = 5.6$, $p < 0.001$). These results suggest that narcissists estimate their abilities, at least partially, on the basis of factors unrelated to objective performance. That is, judgments of performance by narcissists appear to be at least partially schema-based.

We next tested a theoretical model of the extent to which narcissists rely upon schema and upon observation when making assessments of performance immediately following feedback about performance and when making predictions about future performance. Our model (see Figure 5) strongly fits the data, suggesting that higher narcissism contributes both to higher initial performance expectations and to fewer points. Both elevated number of points and initial performance expectations then contribute to elevated performance assessments. The impact of points on initial performance expectations confirms that participants' own point totals, without any comparative feedback regarding other participants' point totals, can affect relative self-ratings. Future performance expectations, however, are produced both by performance assessments (which are based partially on points earned) and initial performance expectations (which are not based on points earned). In summary, future performance expectations by narcissists are driven partially by assessments based upon performance, but also largely by predictions of performance made prior to awareness of actual performance. Predictions of future performance by narcissists are thus both schema and data-driven—data-driven in that they depend partially on their performance assessments, which are linked to actual performance, schema-driven in that they depend on their initial performance estimates, which are made prior to performing the task.

As predicted, performance by narcissists, though contributing directly to their performance appraisals, was not linked directly to their future performance expectations. This is depicted in the model by the absence of a path from points to future performance expectations. We tested a model with this path included, and the model fit was not significantly improved, $\Delta\chi^2(df = 1) = 0.54$, n.s. By comparison, the effect of removing the path from future performance expectations to future performance expectations on model fit was substantial, $\Delta\chi^2(df = 1) = 257.15$, $p < 0.05$.

The results of Study 3 help to explain why narcissists remain positive about their abilities and performance, even when faced with poor performance. Narcissistic performance beliefs are rooted in an inflated ego. Though narcissists in this study had no evidence that they performed better than others (indeed, they underperformed), they nevertheless rated their past and future performance as above average. Regardless of

actual performance, narcissists thought that they would: (a) do better than others on a task about to be completed; and (b) do better than others in the future on a task similar to one just completed. Only the performance assessment was influenced directly by actual performance, though even these assessments were also significantly affected by pre-existing beliefs. The underperforming narcissists reported that they overperformed. Their future performance expectations were driven heavily by their inflated performance estimates made prior to engaging in the task.

GENERAL DISCUSSION

We predicted that the socially defined personality construct of narcissism would be negatively predictive of judgments when judgmental accuracy could be objectively assessed, and of decision making in a setting with bets that were designed to be fair. Furthermore, we predicted that narcissists' decision making would be negatively predicted by both their overconfidence in their own abilities and their willingness to accept risky bets. Finally, we predicted that narcissists' inflated assessments of performance and expectations of future performance would be schema-driven, that is, based more on performance expectations prior to completing the task than on task performance.

These predictions were tested in three studies. Narcissists were found to be more overconfident than non-narcissists on a computer-administered confidence calibration task. This overconfidence was the result of inflated ability estimates that were not accompanied by greater ability (Study 1). Narcissists were then found to underperform (i.e., lose more points) on a betting task, reflecting narcissists' greater overconfidence and willingness to place risky bets (Study 2). Finally, we found evidence that narcissists assess their performance based less on how they actually perform and more on how they expect to perform (Study 3). This was especially true when narcissists predicted how well they would perform on a similar future task.

It is notable that a group of individuals who think they are smarter than others (and are notably willing to proclaim this publicly, e.g., Buss & Chiodo, 1991) performs so poorly in the betting-on-knowledge task. In "no-lose" situations where big bets are necessary, a narcissist may have a real advantage. Narcissists would be expected to outperform non-narcissists in these settings where there is no cost to overconfidence and risk-taking. Likewise, narcissists may outperform others in settings where, on average, individuals underestimate their own skills. For example, it is often said that "in a bull market everyone who buys is a genius." Essentially, the "irrational exuberance" of a bull market is a perfect complement to the unwarranted confidence of the narcissist.

The present studies also replicate the phenomenon of paradoxical betting (Goodie, 2003), and begin to explore which individuals may be more susceptible to it than others. Participants as a whole were underconfident at low confidence and overconfident at high confidence. With the arbitrarily selected items used here, overconfidence in the main prevailed. Yet, participants bet most of the time, and showed the increasing bet acceptance observed by Goodie (2003, in press) that stands in inverse relation to both the objective average value and subjective utility of bets. The fact that betting increased with subjective probability also suggests that tasks such as the betting-on-knowledge task, over which participants can exert some degree of control, may induce probability weighting curves that differ in their curvature from bets involving patently random events. This effect can be readily modeled using existing models of probability weighting (e.g., Gonzalez & Wu, 1999). Finally, the fact that both overconfidence and risk seeking (at least in Study 2) in this task correlated with narcissism suggests that they might be fruitfully related to other variables of interest to decision researchers that relate to narcissism, such as altruism (Kagan, 2002), commitment in a relational context (Buss & Shackelford, 1997; Campbell & Foster, 2002), and wealth effects (Kleefeld, 2001).

This research has several implications for the study of narcissism. It documents a tangible individual-level cost of narcissism. Narcissism has well-documented negative consequences for other individuals (e.g., narcissists' dating partners or co-workers). Narcissists themselves, however, seem to be relatively unfazed

by this state of affairs. Indeed, they are generally happier than others, with higher self-esteem, less anxiety, and less depression (e.g., Watson & Biderman, 1993). The present research demonstrates that, although narcissists' inflated self-beliefs may have emotional benefits for the narcissist, they also can have a measurable negative impact on performance (cf. Robins & Beer, 2001). Interestingly, this finding comes in a domain of intellectual performance, which narcissists prize above almost all others (Campbell et al., 2002).

Narcissism appears to be an individual difference variable that predicts a pattern of decision-making outcomes in the compound betting-on-knowledge task developed by Goodie (2003). The existence of such a variable suggests that decision-making biases that are found to exist on the average in participant samples may be best thought of as biases that are expressed more by some individuals than by others. Stanovich and West (2000) related performance on judgment tasks internally to each other and also to other achievement measures, marking relatively new progress in the decision literature. This research extends the analysis of individual differences in judgment and decision making by relating performance to non-achievement differences.

The role of narcissism in decision making also helps to reveal motivational factors that affect what are often viewed as cognitive processes. Narcissists' inflated self-conceptions are part of a larger motivational system, the goal of which is being better than others in agency domains, being powerful, and having their selfish needs met (e.g., Morf & Rhodewalt, 2001). It is perhaps not surprising that this greater self-regulatory constellation interjects itself into what should be relatively simple judgments. Despite some recent attention to the role of emotion and motivation in decision making (e.g., Baron, 1992; Mellers, Schwartz, & Ritov, 1999; Zeelenberg, 1999), progress on this topic has been relatively sparse.

Caveats

We employed a risk-taking measure that was constrained by bets that were exactly matched to confidence. The world does not always present us with risky decisions for which our own confidence marks the dividing line between positive and negative average outcomes. By and large, the world is indifferent to our confidence. The present approach is appropriate for making a statement about the existence of an effect, and took advantage of narrowly tailored tasks that provided a useful boundary condition between winning and losing bets. But the findings at this boundary may overstate the importance of confidence calibration for effective risk taking in natural contexts. Naturalistic studies would be appropriate to gauge more accurately the true extent of narcissists' risk taking and its deviation from that of non-narcissists. Indeed, given the lack of a significant risk-taking effect in Study 3, we urge caution in reaching conclusions about narcissism and risk taking until studies using additional measures of risk taking are conducted.

On the other hand, our betting-on-confidence paradigm may also have the potential to understate narcissists' risk taking. Participants were presented with many trials and thus had much opportunity, within a stable environment, to change their decision strategies. In a more naturalistic context, decision makers generally do not have so many massed opportunities to get it right. In a more naturalistic context, narcissists may display even greater overconfidence, and we hope that future research examines these effects. Finally, there is at least one class of environment in which the boundary between winning and losing is systematically set at the confidence of the average participant: stock markets, in which prices fluctuate to reflect the average sentiment of investors.

In Study 3 narcissists were not significantly more risk taking on bets that were systematically less favorable. However, the non-significant findings should not be taken as the final word on narcissists' risk-taking. Other research (Goodie, 2004) has shown that, in an equivalent task modified to make the value of bets independent of overconfidence, problem gamblers, who were more overconfident than others, were also more risk taking, even though they had not appeared to be when their greater overconfidence led to less favorable bets. The same may be true of narcissists as well as pathological gamblers.

CONCLUSION

In three studies, both overconfidence and, to a lesser extent, risk acceptance based on confidence were correlated with the social personality construct of narcissism. This was concordant with attributes of narcissists such as heightened self-enhancement concerns. It also replicates the finding of paradoxical betting (Goodie, 2003), wherein participants are increasingly willing to accept risk with increasing confidence despite the declining value of bets with increasing confidence, in a setting where bets are constructed to be fair (having zero average value) if participants are well calibrated but negatively valued if participants are overconfident. Narcissists were more overconfident than others, leading to less favorable bets, which were accepted at least as frequently as those faced by others. This may point the way to future research on the relationships between overconfidence and risk taking with other personality constructs, or with other variables that are known to be associated with narcissism.

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