Empirical Paper

EUROPEAN JOURNAL OF Personality

European Journal of Personality
2023, Vol. 0(0) 1–15

DOI: 10.1177/08902070231212313
journals.sagepub.com/home/ejop
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I feel smart today! A daily diary study on narcissism and self-assessed intelligence

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Abstract

While the objective level of intelligence is not associated with narcissism, relations to self-assessed intelligence (SAI) have been repeatedly reported. Existing research suggests that different facets of narcissism may have different associations with SAI. In the current daily diary study (N = 176; N = 3975 total observations), we employed dynamic structural equation modeling to examine the relationships between facets of trait and state narcissism (i.e., agentic, antagonistic, and neurotic) and the level, variability, and instability of SAI assessed over 28 consecutive days. Both trait and state narcissism were consistently related to SAI: agentic narcissism showed a positive relationship, whereas antagonistic and neurotic narcissism showed negative relationships with SAI. Trait agentic and state antagonistic narcissism predicted greater variability of SAI scores throughout the study, while neither trait nor state narcissism predicted the instability of SAI. Finally, we found that experiencing increased agentic narcissism on one day, predicted perceiving oneself as more intelligent on the next day, but feeling smarter did not predict feeling narcissistic over time. Moreover, we demonstrated that differentiating between narcissism facets yielded more theoretically accurate results compared to distinguishing between grandiose and vulnerable narcissism.

Keywords

narcissism, personality, self-assessed intelligence, daily diary, variability

Received 1 March 2023; Revised 3 October 2023; accepted 19 October 2023

Introduction

Objective intelligence (i.e., measured with standard intelligence tests) is typically described as a general mental capability that involves abstract thinking, quick learning, comprehending complex ideas, and adaptation to novel situations (Gottfredson, 1997). Among the variety of psychological characteristics, intelligence is one of the strongest predictors of important real-life outcomes, such as work performance (Schmidt & Hunter, 2004), educational attainment (Deary et al., 2007), income (Zagorsky, 2007), or health and longevity (Deary, 2008). Thus, it is not surprising that the construct of intelligence is associated with agency (which can be briefly defined as the exertion of control over one's environment; Moore et al., 2012). However, research findings indicate that not only people's actual level of cognitive ability but also what they think about their intelligence influences various life domains. This subjective perception of one's own intelligence is labeled as self-assessed intelligence (SAI), and its assessment provides a window into understanding how people perceive and experience their intellectual abilities, which includes elements beyond objective intelligence. Although SAI is most frequently perceived as an indicator of perceptual bias (Syzmanowicz & Furnham, 2011), it seems that SAI is more central to the self than often considered (Howard & Cogswell, 2018). Existing research provided robust evidence that SAI is associated with a range of variables beyond objective intelligence such as personality, positive self-regard, emotional intelligence, well-being, self-confidence, educational achievements, and educational performance (Chamorro-Premuzic & Furnham, 2006; Howard & Cogswell, 2018). Within the current paper, we scrutinize the relation to one of the most robust

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and consistent correlates of SAI, which is narcissism (Howard & Cogswell, 2018; Zajenkowski & Dufner, 2020). We aim to provide the first comprehensive assessment to date of the interplay between SAI and the various facets of trait and state narcissism, seeking to answer the question of which factor—narcissism or SAI—comes first.

Because objective intelligence is generally regarded as a prototypical agentic trait (Abele & Wojciszke, 2014), it is also a desired attribute for individuals scoring high in narcissism who tend to view themselves as intellectually superior compared to others (Zajenkowski & Dufner, 2020). In personality and social psychology, narcissism, in its broadest sense, is defined by an entitled sense of self-importance (Krizan, 2018). Narcissism is conceptualized as a continuous trait that individuals within the population possess to varying degrees (Miller & Campbell, 2010; Wetzel et al., 2016). Only individuals at the very high end of this continuum could be considered for the diagnosis of narcissistic personality disorder. Recent advancements on the structural organization of narcissism illustrated that this construct is not unitary, but rather has a hierarchical structure composed of two dimensions and three lower-order facets (Miller et al., 2021). As a result, positive self-views of one's intelligence might be especially related to some of the facets of narcissism, but not to the others (Gignac & Zajenkowski, 2021; Leniarska et al., 2023; Zajenkowski et al., 2020a). Existing studies on this topic have focused only on a single (i.e., one-time) assessment of either narcissism or SAI. On the upside, such studies provide valuable information on the general characteristic of a person. Nevertheless, they fall short of heeding how individuals perceive themselves across time. Scholars have pointed out that addressing this research gap would improve our understanding of the dynamics of such a relation (Kandler & Rauthmann, 2021). Regarding narcissism, this claim seems to be especially important as previous findings suggest that narcissistic self-views (including those of intelligence) might be in fact unstable and fluctuate over time (e.g., Edershile & Wright, 2021; Geukes et al., 2017). To address this gap within the literature, the current study aimed to intensively assess narcissism and SAI across days.

Structural Organization of Narcissistic Personality

Two Dimensions of Narcissism. Traditionally, narcissism can be conceived as a construct composed of two distinct dimensions: grandiose and vulnerable narcissism (GN and VN, respectively; Wink, 1991). These two dimensions show some marked differences. For instance, GN is related to the ability to being positively perceived by others (especially with unacquainted others; Back et al., 2010; Jauk et al., 2016; Paulhus, 1998), while VN is related to chronic feelings of shame and anxiety leading to social isolation (Cain et al., 2008; Di Sarno et al., 2020; Rogoza et al., 2022a) and negative anticipated emotions for social rejection (Di Pierro et al., 2022). Yet, these two manifestations of narcissism also show similarities. For example, when facing potential self-esteem threats, both GN and VN are associated with defensive and aggressive reactions (Di Pierro et al., 2023; Krizan & Herlache, 2018; Miller & Campbell, 2008). Generally speaking, the shared core between the two dimensions stands in an entitled attitude toward others (Krizan, 2018).

Three Facets of Narcissism. There is a broad agreement now that the two narcissistic dimensions can be decomposed into three specific facets—agentic, antagonistic, and neurotic narcissism (Ackerman et al., 2019; Back, 2018; Krizan & Herlache, 2018; Miller et al., 2021; Rogoza et al., 2019; Wright & Edershile, 2018). The agentic facet of narcissism is characterized by assertiveness, charmingness, beliefs of personal greatness, and self-promotion. In contrast, the antagonistic facet is characterized by arrogance, aggressiveness, entitlement, and exploitativeness. Finally, the neurotic facet is characterized by anxiety, hypersensitivity, shame, and shyness (Back, 2018; Di Sarno et al., 2020; Grapsas et al., 2020; Rogoza et al., 2022a). In the structural organization of narcissistic personality, the antagonistic facet is hypothesized to represent the commonalities between GN and VN (Krizan & Herlache, 2018; Miller et al., 2021), while the agentic and the neurotic facets capture specific features of GN and VN, respectively.

The presence of the three facets was demonstrated empirically (e.g., Crowe et al., 2019; Rogoza et al., 2022b) and, more importantly, differentiating between these facets has shed new light on the narcissistic personality. For instance, while agentic and neurotic facets are related to self-esteem (positively and negatively, respectively), the antagonistic facet is unrelated to the level of self-esteem but related to its variability (Geukes et al., 2017). Furthermore, these facets can be meaningfully embedded within broader and unifying personality models (Rogoza et al., 2019). The agentic facet is defined by high extraversion, the antagonistic facet is related to low agreeableness, and the neurotic facet overlaps substantially with high neuroticism and low extraversion (Jauk et al., 2017; Miller et al., 2017b; Rogoza et al., 2018). Finally, the identification of the antagonistic facet provides an answer to why, despite many and sometimes radical discrepancies between GN and VN exist (e.g., self-promotion vs. self-withdrawal), they should still be treated as two sides of a same coin.

Narcissism and Intelligence

Empirical literature shows that narcissism and objective intelligence are essentially unrelated (Zajenkowski et al., 2020a). This null correlation was found when considering both the two dimensions as well as the three facets of narcissism (Gabriel et al., 1994; Gignac & Zajenkowski, 2021; Zajenkowski et al., 2020a). Narcissism, however, consistently correlates with SAI. The most solid conclusion across the existing studies is that agentic narcissism is associated with SAI (Gabriel et al., 1994; Zajenkowski & Dufner, 2020). In contrast, the antagonistic and neurotic facets do not reveal significant associations with SAI (Leniarska et al., 2023; Zajenkowski et al., 2020a), although these relationships were studied less frequently. As a result, scholars have suggested that maintaining a sense of agency is a crucial goal for individuals scoring high on agentic narcissism (Zajenkowski & Dufner, 2020). In other words, thinking positively about one's intelligence (which itself is also an agentic attribute) plays a vital role in the life of

people with high levels of agentic narcissism as it might help them to maintain positive feelings (Zajenkowski & Czarna, 2015; Zajenkowski & Dufner, 2020).

Most previous studies operationalized narcissism and SAI as relatively stable traits (e.g., Zajenkowski & Czarna, 2015; Zajenkowski & Dufner, 2020). However, narcissism can also be conceptualized as a temporary state, as people may vary in the extent to which they feel and manifest narcissistic characteristics over time (Edershile et al., 2019; Giacomin & Jordan, 2018). Studying such changes across time is considered to be essential to understand narcissism (Kandler & Rauthmann, 2021). For instance, previous studies demonstrated that the variability in narcissistic states is only moderately associated with trait narcissism (Edershile & Wright, 2021). Individuals with high trait GN, however, also show higher trait VN, pointing to potential state changes (Jauk et al., 2022). Moreover, trait antagonistic narcissism has been shown to specifically predict variability in state self-esteem (Geukes et al., 2017). Taken together, these results suggest that various factors may influence state narcissism, emphasizing that a one-time measurement of trait narcissism is rather insufficient to address such within-person changes across situations (Giacomin & Jordan, 2018; Kandler & Rauthmann, 2021). In this vein, Zajenkowski and Gignac (2021) experimentally examined whether feedback about participants' intelligence influenced state narcissism. The results revealed that positive intelligence feedback indeed was associated with increased states of agentic narcissism. The authors attributed these results to the fact that lay concepts of intelligence incorporate some narcissistic elements (e.g., feelings of superiority; Zajenkowski & Gignac, 2021). Hence, the temporary positive evaluation of one's cognitive ability may foster agentically narcissistic self-representations. Also, such results further emphasize the profound need to capture state narcissism.

Summing up, existing research on narcissism and SAI predominantly conceptualized narcissism and SAI as stable constructs. However, literature is rich in evidence that state narcissism might also be a substantial predictor of various outcomes both on the between- and within-person level (Di Sarno et al., 2020; Edershile & Wright, 2021; Giacomin & Jordan, 2018; Zajenkowski & Gignac, 2021). Likewise, SAI might be also conceptualized as a state as it changes in response to situational stimuli (Zajenkowski et al., 2022; Zajenkowski & Gignac, 2021). Thus, in the current research, we sought to acknowledge the multidimensional structure of narcissism (Miller et al., 2021) and aimed at expanding and clarifying prior findings on the relationship between narcissism and SAI through assessing both trait and state narcissism in their relation to state SAI.

Current Study: Aims and Hypotheses

In the current study, we distinguish trait, between- (i.e., mean of all states) and within-person state narcissism (agentic, antagonistic, and neurotic), in their relation to level, variability, and instability of SAI. To our knowledge, the current study is the first to test state SAI during such a long period of time (e.g., Gold & Kuhn, 2017 measured SAI only on three occasions). Based on previous studies (e.g., Zajenkowski et al., 2020a, 2020b), we expected that neither of the narcissism facets (trait and state) would be related to objectively assessed intelligence (H1). However, we expected differences in how narcissism would be related to SAI. Given the robust findings on the relations between trait agentic narcissism and SAI, we expected not only to replicate the previously established positive relationship at the trait level (in line with existing findings, see Zajenkowski & Dufner, 2020), but also to find a similar pattern at the state level (H2). That is, we hypothesized that on days when participants reported higher levels of agentic narcissism, they would also perceive themselves as more intelligent. The existing evidence about the antagonistic facet mostly suggests it is unrelated to SAI (Zajenkowski et al., 2020b). As such, we did not expect antagonistic narcissism (neither trait nor state) to be related to SAI (H3). Even less is known on the relationship between the neurotic facet and SAI. On the one hand, neuroticism—a fundamental trait for VN (Miller et al., 2017b)—is a negative predictor of SAI (Chamorro-Premuzic & Furnham, 2005) but on the other, VN itself appears unrelated to SAI (Zajenkowski et al., 2020a). Such a result might be explained by the fact that VN comprises elements of both neurotic and antagonistic facets (Crowe et al., 2019): the identification of a null or a negative relationship with SAI may depend on the weighting of each of these facets within a composite score of VN (Zajenkowski et al., 2020b). As a result, we expected the neurotic facet (either trait or state) to be negatively related to SAI (H4).

Next, we examined if trait between-person state narcissism predicted not only the level of SAI, but also its variability (i.e., gross variability, which is a measure of dispersion in scores without considering temporal ordering) and instability (i.e., how much individuals change in their levels of SAI from day to day). Existing literature suggests that only trait antagonistic narcissism is a significant predictor of the variability of state self-esteem (Geukes et al., 2017; which is correlated with SAI, (Dufner et al., 2012), we also expected antagonistic narcissism to positively predict individuals' gross variability in SAI. Yet, we did not expect any relation between SAI's variability to neither agentic nor neurotic narcissism (H5). To date, no study assessed the relationship between narcissism and instability in SAI.[1] Thus, we did not formulate any hypotheses about the relationship between narcissism facets to SAI instability.

Finally, we also analyzed the tendency to "switch" between within-person states of narcissism and SAI. These tendencies are conceptualized as how the state of variable X could predict the state of variable Y at a subsequent time point (i.e., cross-state effect). More specifically, we assessed if state narcissism and/or state SAI on one day could predict changes in state SAI and narcissism on the next day, respectively (Edershile & Wright, 2021). Prior research on the relations between state narcissism and SAI provided mixed evidence; however, they converged in that state agentic narcissism is related to SAI (Zajenkowski et al., 2022; Zajenkowski & Gignac, 2021). On one hand, experimentally induced narcissism (i.e., recalling an autobiographical memory when participants felt narcissistic) increase the level of SAI (Zajenkowski et al., 2022), while on the other,

positive feedback on intelligence increase state agentic narcissism (Zajenkowski & Gignac, 2021). The results of these studies do not unambiguously determine whether seeing oneself as more intelligent/agentically narcissistic on one day might predict seeing oneself as more agentically narcissistic/intelligent on the next day. Thus, while we expected a positive link between state agentic narcissism and SAI from day to day (H6), we did not explicitly expect the direction of this relation. Furthermore, we did not expect any cross-state effects to occur for antagonistic nor neurotic state narcissism. The basis for this contention was that agentic narcissism is most consistently linked to self-enhancement, especially within the agentic domain (and thus in the domain of intelligence as well; Mielke et al., 2021; Zajenkowski et al., 2022).

Method

Power Considerations

Given that our data are hierarchically structured, daily observations (Level 1) being nested within individuals (Level 2), and that some of our hypotheses regarded either Level 1 or Level 2, we conducted two types of power considerations. First, we considered the power only for the between-person associations (e.g., H1). The required sample size to detect a population effect size in a linear regression model with one predictor (f^2 = .05) with the level of alpha = .05 (2-tailed), and beta = .80, was N = 159 participants. This consideration applies to the analyses concerning the zero-order relations, but also to the predictions of gross variability, and instability, as these also could be basically considered as Level 2 variables. Our hypotheses, however, also considered Level 1 relations (e.g., the relationship between state narcissism to SAI), and the instability of SAI. Given that estimation of a priori power in such hierarchically structured data is a challenging task (due to many assumptions about within- and between-person effects), we followed the results of a Monte Carlo simulation specifically dedicated to dynamic structural equation modeling (DSEM; Schultzberg & Muthén, 2017). We considered the most complex model as a reference to our data (i.e., Model 6) with three random coefficients: mean, autoregressive coefficient, and residual variance regressed on a Level 2 variable. The recommended sample size for attaining a good-quality estimation of a weak effect size with power above .80, relative biases less than 10% away from one, and SE/SD less than 15% away from one can be achieved by measuring 150 individuals 25 times or 200 individuals 20 times (see Schultzberg & Muthén, 2017, Figure 19c).

Procedure and Participants

According to our power considerations, we aimed to gather data from at least 200 individuals for at least 20 days. To account for potentially missing data points, we set the length of the study to 28 days. The data collection effort lasted from June to September 2021 (i.e., during semester break). The study consisted of two stages: baseline measurement (via Google Forms) and daily measurements (mobile application FillItApp, available for download on Google Play). The present study is a part of a larger data collection effort, which included other measures gathered either at the baseline (for a codebook, please see OSF project site) and during the daily part of the study (including a measure of pathological narcissism and self-esteem). The study was advertised as a study devoted to the assessment of various personality traits. We purposely did not explicitly mention intelligence or narcissism in the advertisements to avoid self-selection bias. The invitation to participate in the survey was published on the project profile on Facebook and on the project website. Links to these pages were posted on social media and made available to students at two Polish universities.

Participants were presented first with the information about the study, the terms of participation, and the financial compensation. After providing informed consent, participants completed questionnaires in the order presented below. Within 48 hours they received an email about the second stage of the study. The email contained (a) an anonymous ID number, (b) information about the application, (c) two short videos on how to download and use the mobile application, (d) the survey ID number, and (e) terms of participation and conditions for obtaining the financial compensation. Subsequently, participants received for 28 days at 6 p.m. a notification to complete the survey in the app until midnight. After 28 days, respondents received an email informing them that they had completed the second stage of the study and that they could uninstall the app. Those who completed the baseline measurements and 60% of the daily measurements received an online gift voucher worth 35PLN/∼7.5EUR. In addition, among people who completed at least 80% of the daily measurements, six vouchers worth 500 PLN/∼111EUR were given.

The initial sample comprised of 228 participants who completed the baseline measures. Out of this initial pool, 43 participants did not participate in daily diary part of the study, while nine participants provided too few responses to be considered for the study (i.e., less than 10 as previously done in similar studies examining variability in narcissism, Edershile & Wright, 2021). The final sample comprised 176 participants aged 18–61 years (M = 28.47, SD = 9.42; 84% females). Most of the participants declared secondary (66.5%) or higher (33.0%) levels of education. Due to the extensive longitudinal nature of our data and the fact that we did not register a clear criterion of invalid responses, we refrained from employing typical screening measures used for dealing with careless responding, such as detecting invariant response patterns (i.e., straightlining), examination of the Mahalanobis distance, or the inclusion of bogus items (Ward & Meade, 2023). Nonetheless, our daily survey was designed to be concise, minimizing the likelihood of participant boredom. Furthermore, the high response rate observed in our study (i.e., participants provided an average of more than 20 responses; M = 23.52; SD = 4.28) suggests a strong motivation among participants to actively engage in the research. Thus, although we fall slightly short from the intended 200 participants, given the average response rate was close to 25, the sample can be considered as adequately powered to address the formulated hypotheses. Attrition analyses of trait variables revealed no differences

between participants who did not participate in daily diary part versus those who did in all main study variables (Agentic narcissism: $t = 1.91$; $p = .058$; $d = .30$; Antagonistic narcissism: $t = 1.06$; $p = .292$; $d = .17$; Neurotic narcissism: $t = .87$; $p = .383$; $d = .14$; Intelligence: $t = 1.91$; $p = .057$; $d = .30$).

Measures

Baseline (Trait) Measures. Trait narcissism was assessed using the Polish adaptation (Rogoza et al., 2021) of the Five Factor Narcissism Inventory – Short Form (FFNI; Sherman et al., 2015). Participants rated 60 statements on a five-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Items were averaged to create indices for three facets of narcissism: agentic (16 items, e.g., "*I tend to take charge of most situations*"; α = .91), antagonistic (16 items, e.g., "*I'm not big on feelings of sympathy*"; α = .89), and neurotic (16 items, e.g., "*I feel ashamed when people judge me*"; α = .89).

As in previous research (e.g., Condon & Revelle, 2014), objectively assessed intelligence was measured with 11 Matrix Reasoning items from the International Cognitive Ability Resource (ICAR; The International Cognitive Ability Resource Team, 2014). Matrix Reasoning items are a public-domain tool for assessing cognitive abilities and contain stimuli similar to Raven's Progressive Matrices (Raven, 2000). Matrix reasoning is considered to be a good proxy for people's general intelligence (Martinez, 2013) and the empirical results support this claim as it is positively related to a range of intelligence tasks such as three-dimensional rotation, letter and number series, and verbal reasoning (Condon & Revelle, 2014).[2] ICAR matrices include eleven 3 × 3 arrays of geometric shapes with one of the nine shapes missing and six geometric shapes displayed below them as response choices. Participants are asked to identify which of the six shapes (five distractors) will complete the array logically correctly. The total score was calculated as a sum of correct identifications. The scale appeared to be internally consistent (α = .74).

Daily (State) Measures. To measure state narcissism, we used the super short-form of the FFNI (Packer West et al., 2021). We have changed the instruction asking participants to rate their level of agreement with each statement in respect to today. According to previous reports on the FFNI scoring (Rogoza et al., 2021) as well as the evaluation of the multilevel structure through confirmatory factor analysis, we used three items to model each narcissism facet (for more details, see evaluation of the multilevel structure of the FFNI, including the assessment of measurement invariance across within- and between-person structure, is available at the OSF project site).

Reliability of daily narcissism was computed with multilevel confirmatory factor analysis using packages *lavaan* (Rosseel, 2012) and *semTools* (Jorgensen et al., 2021) in the R environment (R Core Team, 2021). Between- and within-person alphas (and omegas) were, respectively, .65 (ω = .68) and .38 (ω = .40) for agentic, .75 (ω = .76) and .31 (ω = .32) for antagonistic, and .89 (ω = .89) and .39 (ω = .40) for neurotic narcissism. Although within-person estimates were only fair (Shrout, 1998), Nezlek (2017) suggested relaxing standards for within-person reliability due to a number of reasons (e.g., reduced number of items compared to trait-level scales and different ways to account for unreliability in multilevel models). Furthermore, we put greater emphasis on the between-person reliability, as scholars have pointed out that, within frameworks of classical test theory, reliability pertains to the population and not the individual (Bovaird & Embretson, 2008). Moreover, the multilevel latent structure of the three FFNI items was found to be satisfactory on both the within- and between-person levels, the reported structures being equivalent on both levels (for more details, see OSF project site). Hence, within-person internal consistency was deemed acceptable, and the scales were retained for further analyses.

To measure SAI, we used a one-item indicator as in previous research (see Zajenkowski et al., 2020a): "Rate your intelligence level today." Participants were asked to assess their overall intelligence on a ten-point scale ranging from 1 = *low* to 10 = *high.* Although we did not provide people with a classic definition of intelligence, previous research shows that laypersons' and experts' conceptions of intelligence are quite similar (e.g., Sternberg et al., 1981).

Statistical Analyses

We used Pearson's zero-order correlations to analyze relationships between trait and between-person state narcissism, objective intelligence (H1), and SAI. We used intraclass correlation coefficients (ICCs) to compute the percentage of variance in state variables explained by the between-person differences (e.g., Lorah, 2018). Considering the hierarchical structure of the data (i.e., observations nested within a given person), to test all the remaining hypotheses, we used the DSEM approach, which integrates features from multilevel modeling within the Structural Equation Modeling framework (Asparouhov et al., 2018; McNeish, 2021; H2-H6). All these analyses were carried out in Mplus v. 8.3 using the Bayes estimator (McNeish & Hamaker, 2020; Muthén & Muthén, 2017). Given that narcissism was assessed either as a trait or as a state variable, the hypotheses were tested across many levels, that is, we assessed the predictions of trait narcissism and between- and within-person state narcissism. The statistical procedure could be therefore outlined as (1) how trait and state narcissism (within- and between-person) predicts SAI level; (2) how trait and between-person state narcissism predict SAI level, variability, and instability; and (3) how daily (within-person) state narcissism/SAI predicts SAI/narcissism level on the next day.

To test 1), we analyzed trait and state narcissism. In analyzing state narcissism, both between-person and within-person contemporaneous associations were investigated: for this purpose, each participant's mean state score on a given narcissism scale was grand-mean centered to obtain a between-person (Level 2) variable. Also, participants' raw state scores were person-mean centered to obtain a within-person (Level 1) variable (e.g., Curran & Bauer, 2011; Wang & Maxwell, 2015). Both were included in the models simultaneously to estimate unique between-person

(fixed) effects and within-person (fixed and random) effects. In the model with trait narcissism, we included all three trait narcissism scores as Level 2 predictors of SAI. To test 2), due the fact that variability indices are correlated with state levels (see Baird et al., 2006), we estimated two path models in which we included all trait or between-person state narcissism facets predicting SAI variability (computed as person standard deviations (SDs) and SAI instability (which is reflected by the lagged-1 autocorrelation in the subsequent SAI's scores; McNeish, 2021; Nestler, 2022), controlling for the SAI level. To test 3), we estimated three multilevel cross-lagged models (separately for each narcissism facet)[3] and analyzed the cross-state estimates (e.g., how narcissism/SAI on one day predicts change in SAI/narcissism on the next day).

Results

Zero-Order Relations Between Narcissism and Intelligence

The ICCs for SAI indicated that 66% of the SAI variance was due to between-person differences. Similarly, most of the variance in narcissism was due to between-person differences ($ICC_{Agentic}$ = .86; $ICC_{Antagonistic}$ = .81; $ICC_{Neurotic}$ = .83). Table 1 details descriptive statistics and zero-order correlations for all variables, including trait and between-person state narcissism. As expected, objective intelligence was unrelated to trait and between-person state narcissism, providing support for H1 (except for an unexpected small, but significant [p = .015] negative correlation with trait antagonistic narcissism). All trait narcissism scores were highly related to their respective average scores at the state level (rs ≥ .60). At the zero-order level, trait scores of agentic narcissism were related positively to the SAI person-mean scores pooled across observations, while the antagonistic and neurotic facets were negatively related with state SAI. A similar pattern emerged for between-person state narcissism, except that the antagonistic facet was unrelated to SAI.

Trait and State Narcissism and the Associations With Subjectively Assessed Intelligence

Next, as presented in Table 2, within two DSEM models we regressed SAI level onto (a) trait narcissism and (b) between- and within-person scores in state narcissism, respectively. We found that agentic narcissism was consistently across levels (trait and state) linked to higher levels of SAI, while antagonistic and neurotic were negatively related to it (although the relation of antagonistic narcissism at the between-person level was at the boundary of significance). Thus, we found a consistent and replicable pattern of relations between the facets of narcissism (trait, between-person, and within-person) and SAI, which supports H2 and H4 but rejects H3 as antagonistic narcissism was expected to be unrelated to SAI level.

Trait and Between-Person State Narcissism and the Variability and Instability of State Self-Assessed Intelligence Controlling for Self-Assessed Intelligence Level

The results of the DSEM model predicting variability and instability in SAI by trait narcissism are presented in Figure 1 and by between-person state narcissism in Figure 2. For trait narcissism, SAI variability was only positively predicted by agentic narcissism and negatively by SAI level. The estimate for antagonistic narcissism was at the boundary of the assumed threshold of significance, while neurotic narcissism was a non-significant predictor. SAI instability, which was negatively related to SAI variability, was related to neither of the trait narcissism facets nor to objective intelligence. The predictions to SAI level were congruent with the previous analyses. The results for between-person state narcissism were largely congruent, except that it was agentic narcissism predicting SAI variability which was at the boundary of significance, while antagonistic narcissism was a significant and positive predictor of it. Furthermore, while antagonistic narcissism was also negatively related to SAI level, this relation was at the boundary of significance. The remaining results were as in the trait narcissism model. Thus, the analyses provided mixed support for H5, as between-person state antagonistic narcissism was related to SAI's variability as predicted, while it was at the boundary of significance at the trait level. Also, surprisingly, trait agentic narcissism appeared as a significant predictor of SAI variability. Neurotic narcissism, according to our expectations, was unrelated to variability in SAI.[4]

Table 1. Descriptive Statistics and Zero-Order Relations Between Trait and State Variables.

	M	*SD*	1	2	3	4	5	6	7
Trait									
1 Agentic	2.92	.83	-						
2 Antagonistic	2.08	.69	.33***	-					
3 Neurotic	3.13	.78	−.09	.11	-				
4 Objective intelligence	6.24	2.80	−.06	−.18*	.10	-			
State (person means)									
5 Agentic	3.13	.97	.75***	.11	−.04	−.03	-		
6 Antagonistic	2.01	.81	.37***	.60***	.09	−.08	.43***	-	
7 Neurotic	2.85	1.01	−.11	.14	.77***	.09	−.03	.23**	-
8 SAI	6.92	2.36	.21**	−.28***	−.37***	.01	.20**	−.12	−.42***

Note. SAI = self-assessed intelligence. * p < .05; ** p < .01; *** p < .001 (all 2-tailed).

Table 2. Standardized Estimates of Trait and State Narcissism Predicting Level of State Subjectively Assessed Intelligence.

	Estimate	Posterior *SD*	*p*	95% CI
Trait effects				
Agentic	.29	.07	<.001	.14, .40
Antagonistic	−.35	.06	<.001	−.44, −.17
Neurotic	−.30	.07	<.001	−.42, −.16
Intelligence	.00	.07	.488	−.11, .11
Between-person state effects				
Agentic	.25	.07	<.001	.11, .39
Antagonistic	−.15	.08	.029	−.30, .00
Neurotic	−.39	.07	<.001	−.51, −.25
Within-person state effects				
Agentic	.11	.02	<.001	.08, .13
Antagonistic	−.04	.02	.010	−.07, −.01
Neurotic	−.05	.02	<.001	−.09, −.02
Intelligence	.04	.07	.304	−.10, .18

Note. We also tested two models in which we regressed SAI level on GN and VN. Results of these analyses can be found at the OSF project site. Trait and state VN were significant negative predictors of SAI, while GN was a significant positive predictor but only at the within-person level.

Cross-Lagged Effects of Within-Person State Narcissism and Self-Assessed Intelligence

The results of the three tested DSEM models (separately for each within-person state narcissism facet), in which we predicted whether changes in state narcissism predicted changes in SAI next day (and vice versa) are presented in Figure 3.[5] In all tested models, all of the autoregressive estimates were significant, meaning that both narcissism and SAI are characterized by a certain level of inertia. In other words, the level of narcissism and SAI reported on the previous day, respectively, predicted its level on the next day. Of all analyzed cross-state effects, we found one cross-state effect only in a model with state agentic narcissism, thus, confirming H6.[6] This cross-state effect had a specific direction as only state agentic narcissism on a certain day predicted higher levels of SAI on the next day (i.e., state SAI on a given day predicting state agentic narcissism on the subsequent assessment).

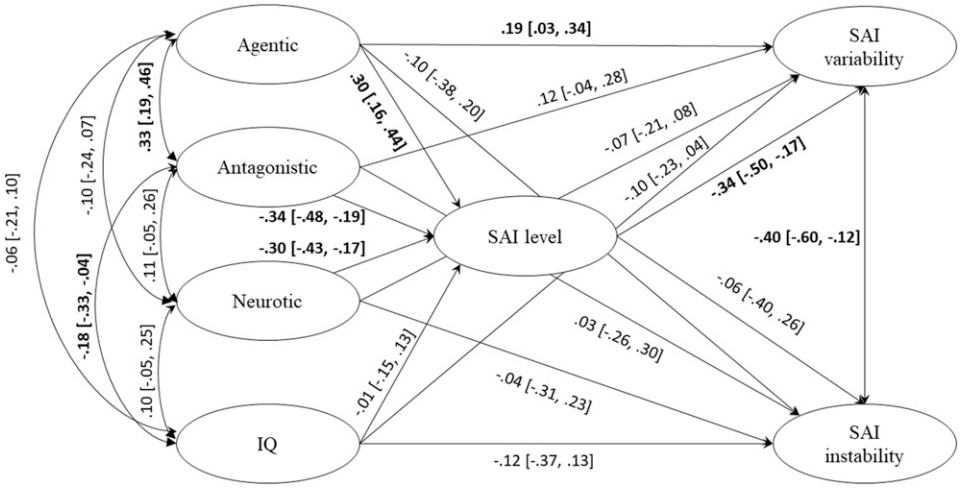

Figure 1. Trait narcissism predicting SAI variability and instability controlling for SAI person mean.

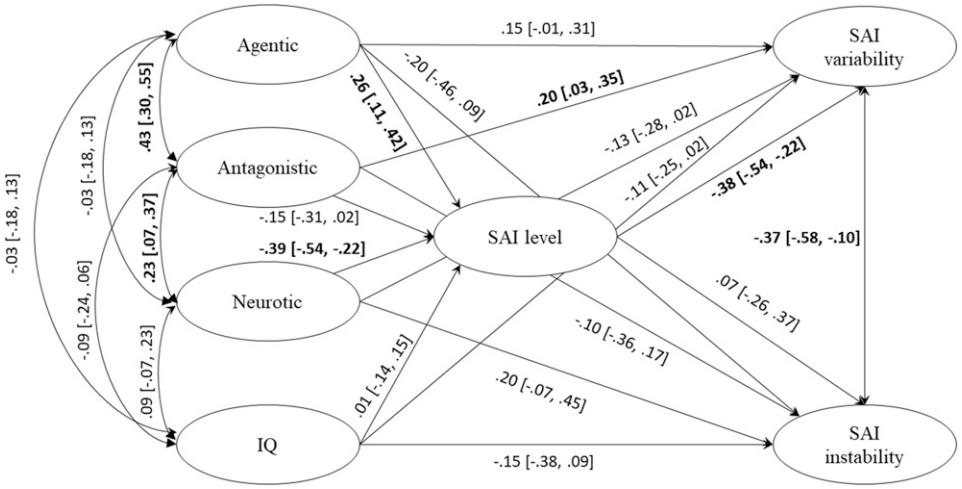

Figure 2. Between-person state narcissism predicting SAI variability and instability controlling for SAI person mean.

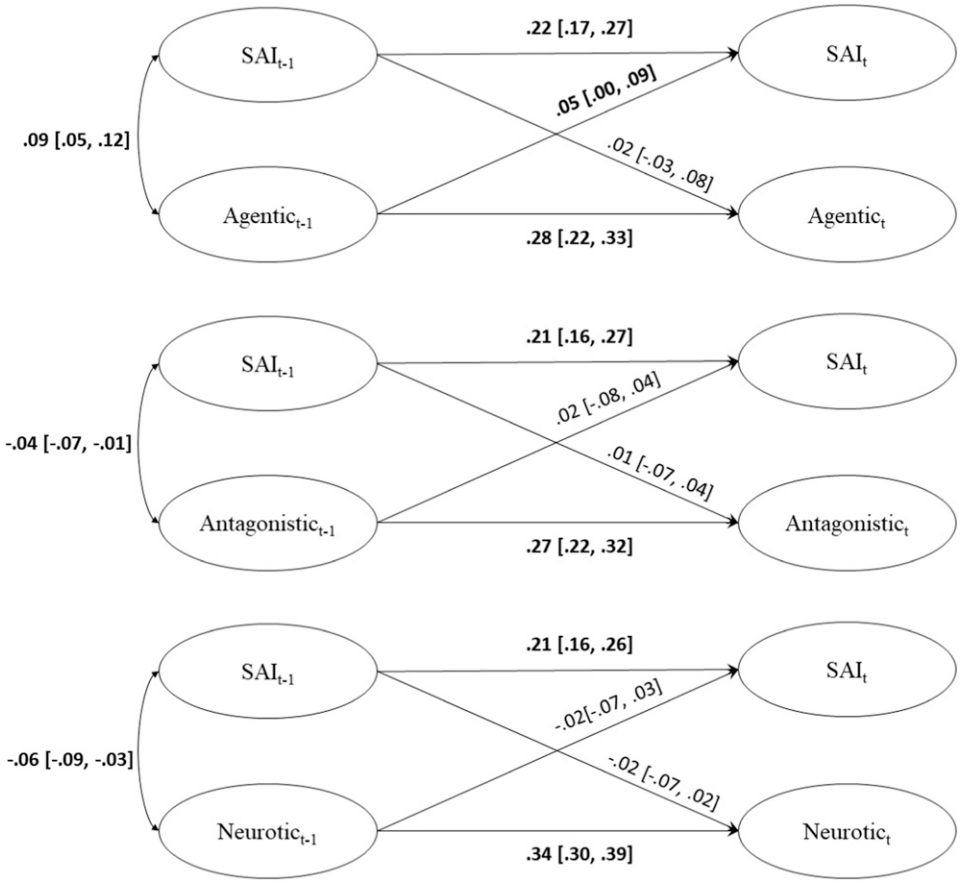

Figure 3. Cross-lagged effects of state narcissism and SAI.

Discussion

Existing research has consistently shown that SAI explains a broad range of variables beyond actual intelligence, with narcissism being one of its most robust outcomes (Chamorro-Premuzic & Furnham, 2006; Howard & Cogswell, 2018; Zajenkowski & Dufner, 2020). In line with the multidimensional structure of narcissism (Miller et al., 2021; Rogoza et al., 2022b), our study comprehensively measured narcissism as both a trait and a state variable. Our findings provided robust support that while the actual level of intelligence does not relate to narcissism, SAI does. Furthermore, we extended our analysis to examine how trait and state narcissism are associated with the level, variability, and instability of SAI. Our results demonstrated that differentiating between facets of narcissism has important implications for understanding the relation between SAI and narcissism. Finally, we scrutinized whether narcissism and SAI might mutually stimulate one another and found that while narcissism increases SAI, the latter does not increase narcissism.

Narcissism and Objective Intelligence (H1)

Our study confirms previous findings (e.g., Zajenkowski et al., 2020a) that neither trait nor state narcissism is related to objective intelligence. The only exception we found was that trait antagonistic narcissism was weakly negatively related to objective intelligence, which is in contrast to the findings from other studies (e.g., Zajenkowski et al., 2020b). The result obtained in the current study does not necessarily imply that antagonistic narcissism is linked to lower intelligence as this relation may be a result of the heightened levels of impulsivity and negative emotions embedded in the construct of antagonism (Back et al., 2013), which might hamper cognitive performance (Austin et al., 2002). Additionally, there is also some evidence suggesting that higher objective intelligence might reduce the chances of developing antagonistic narcissism (Gignac & Zajenkowski, 2021). It has been suggested that lower intelligence leads to more failures and frustrations, which, in turn, may fuel the development of antagonistic narcissism (Gignac & Zajenkowski, 2021). Nonetheless, the direct (negative) association between antagonistic narcissism and intelligence needs to be interpreted with caution and requires replication using a wider range of intelligence tests. The results of our subsequent analyses provided further support that within the domain of narcissism, while the actual level of intelligence is not necessarily important, what counts is how one feels about it.

Narcissism and Self-Assessed Intelligence (H2–H4)

The most consistent result is in the positive association between agentic narcissism and SAI. We found this relation not only at the trait but also, congruent with the state-trait isomorphism (Fleeson, 2001; Fleeson et al., 2002), at the state level, either at the between- or within-person level (supporting H2). This finding replicates previous results on trait narcissism and extends them by showing that state

agentic narcissism is a robust correlate of SAI (e.g., Howard & Cogswell, 2018; Zajenkowski et al., 2020, 2020b). In other words, on days when people rated themselves as higher in agentic narcissism, they also thought they were smarter. These findings suggest that daily measured SAI might express narcissism-related agency. That is, self-states of daily narcissistic agency entail a social perception of intelligence as a desired attribute to obtain high social status. Intelligence can therefore be conceived as a good instrument for self-enhancement (Mielke et al., 2021). Moreover, a belief that one possesses a high level of cognitive ability may stimulate approach behavior and exploration (Howard & Cogswell, 2018), which is consistent with the motivational tendencies present in agentic narcissism (Krizan, 2018).

Trait and state antagonistic narcissism have been found to be weakly and negatively related to SAI level. This finding is somewhat in contrast to our expectations as well as to previous reports which reported a null correlation between antagonistic narcissism and SAI (Leniarska et al., 2023; Zajenkowski et al., 2020b). These studies usually measured antagonistic narcissism and SAI at the same time, while we measured both constructs across many days, minimizing the risk that responses result from a specific situation (Kandler & Rauthmann, 2021). Thus, our results might be ultimately seen as more trustworthy given the robustness of our assessment. As compared to the other facets of narcissism, the association of trait antagonistic narcissism to the overall level of SAI was the strongest; however, the relation between state antagonistic narcissism and SAI level was the weakest. This might suggest that while antagonistic narcissism is weakly negatively related *on average* to how one thinks about one's own intelligence, there might be many situations where this relation is absent, resulting in non-significant results in different studies (Leniarska et al., 2023; Zajenkowski et al., 2020b).

Regarding neurotic narcissism, we found trait as well as state neurotic narcissism to be negative predictors of SAI. Although expected (H4), this result is in contrast to what has been found in the literature on narcissism (e.g., Zajenkowski et al., 2020a reported a non-significant relation), but corresponds to the results of other studies such as that the trait of neuroticism (which is a fundamental trait for neurotic narcissism; Miller et al., 2017b; Rogoza et al., 2019) was reported to be a significant (negative) predictor of SAI (Chamorro-Premuzic & Furnham, 2005). Neurotic narcissism is characterized by hypersensitivity, anxiety, and fear of social rejection (Miller et al., 2017a). Individuals scoring high on this facet are socially withdrawn, have low self-esteem, and frequently experience intense feelings of shame, inadequacy and fear of being criticized or ridiculed (Blasco-Belled et al., 2022; Crowe et al., 2019; Di Sarno et al., 2020; Rogoza et al., 2022a). As a result of seeing oneself as less competent than others (Ronningstam, 2016), it is not surprising that neurotic narcissism was negatively related to SAI in our study. Previous research (Zajenkowski et al., 2020a) based their findings using in fact a VN measure, which entailed aspects of both neurotic and antagonistic narcissism (Crowe et al., 2019). Our findings allow us to more clearly isolate the contribution of each specific facet, clarifying the relations between the neurotic narcissism and SAI.

Narcissism and the Variability and Instability of Self-Assessed Intelligence (H5)

We have found that agentic and antagonistic (but not neurotic) narcissism were both positively related to SAI's variability. The strength of this relation, however, varied depending on whether we analyzed trait or between-person state narcissism. In the former, agentic narcissism was a significant predictor of SAI's variability (while antagonistic narcissism was at the boundary) while in the latter, the situation was the opposite (i.e., significant antagonistic, and agentic at the boundary). Different results for trait and state variables support the claim that while there is a considerable trait–state isomorphism (Fleeson, 2001), they do not show a perfect convergence and that meaningful differences might emerge between them (Augustine & Larsen, 2012).

The relation between antagonistic narcissism and SAI variability was expected (H5), which is congruent with previous findings showing that antagonistic narcissism predicts variability in another construct related to SAI—self-esteem (Dufner et al., 2012; Geukes et al., 2017). This supports the within-person self-regulatory model of narcissism, which conceptualizes antagonistic narcissism as a strategy used in reaction to perceived threats (IF-THEN-contingency; Rogoza et al., 2022a). In other words, the fact that antagonistic narcissism explains variability in SAI also explains its role within the dynamic models of narcissistic personality (Back, 2018), especially as the estimates on the state level were stronger than those observed at trait level. For example, antisocial behavior might be used to actively derogate others in those high in GN and to soothe experiences of shame and inadequacy in those high in VN (Back et al., 2013; Rogoza et al., 2022a).

Those high in agentic narcissism were expected (and found) to hold stable and higher levels of SAI: here, however, we provided additional, albeit unexpected, evidence that those scoring high on agentic narcissism might be also more prone to changing their self-perceptions of intelligence. In other words, those scoring high on agentic narcissism hold positive self-regard related to intelligence, reflecting potentially exaggerated self-views (Rogoza et al., 2022a; Wetzel et al., 2016; Zajenkowski & Dufner, 2020). They may, on the other hand, temporarily assess themselves as less intelligent under certain circumstances, such as failures, criticism, and rebuke, including perceived lack of admiration from others (Grapsas et al., 2020). Those high in narcissism are indeed very sensitive to these events, which may affect short-term evaluations of one's intelligence (Back, 2018).

Of particular interest, neither of the trait and state narcissism facets nor even SAI level itself predicted the instability of SAI. That is, while these variables could explain an overall dispersion of SAI scores across the study, neither explained the day-to-day correlation in SAI's scores. To the best of our knowledge, this is the first study examining the associations of narcissism to an index of instability in a daily diary design.

Cross-State Effects of Narcissism on Self-Assessed Intelligence (H6)

Within our final hypothesis, we examined whether feeling narcissistic and intelligent on one day predicts feeling so on

the next day, and especially whether feeling agentically narcissistic on one day predicts feeling more intelligent on the next day and vice versa. Daily narcissism states and SAI states were stable across time which was reflected in self-predicting estimates. This could be interpreted as an indication that individuals have some tendency to remain "stuck" on their levels of state narcissism and SAI. Our hypothesis about cross-state effects was concentrated on agentic narcissism (H6). On the one hand, as intelligence is an agentic and socially desired attribute, it might serve as a tool to express narcissistic feelings of grandiosity (e.g., "*I'm great because I'm smart*"), while on the other hand, the lay concept of intelligence may incorporate some narcissistic attitudes (cf. Zajenkowski & Gignac, 2021). This was congruent with results supporting that recalling autobiographical memory when participants felt agentically narcissistic increased the level of SAI and that positive feedback on intelligence increased the level of agentic narcissism (Zajenkowski et al., 2022; Zajenkowski & Gignac, 2021). We found that feeling more intelligent does not necessarily evoke agentically narcissistic feelings; however, feeling agentically narcissistic predicts feeling more intelligent on the next day (Mielke et al., 2021). In other words, agentic narcissism predicted subsequent SAI (but SAI did not predict subsequent narcissism). This finding extends evidence on the importance of agentic narcissism for SAI: not only agentic narcissism entails feeling intelligent, but it may also promote the belief of being exceptionally smart. In fact, time-dependent (i.e., cross-lagged) associations are not just an index of co-variation but represent a hint to causality (Costantini & Perugini, 2018; Di Sarno et al., 2023), thus, extending the nature of the previous findings (Zajenkowski et al., 2022; Zajenkowski & Gignac, 2021). Thus, while it might be a hint to claim that feeling agentically narcissistic leads to thinking of oneself as smarter (but not vice versa), the mechanism of this association requires further investigation based on experimental and developmental evidence.

Limitations and Future Directions

Our research is the first to apply a longitudinal assessment of state narcissism in regard to state SAI. Nevertheless, it was not without limitations. For instance, it needs to be acknowledged that the within-person changes in SAI might be, to some extent, influenced by the single-item measure we used. This might increase the measurement error associated with SAI scores, which, in turn, might lead to some effect size underestimation. However, test–retest reliability of a single-item to assess SAI was relatively high over a period of 6 months (> .62; Swami, 2012). Moreover, multi-item measures of SAI seem to provide only modest incremental validity in comparison to single-item tools (Paulhus et al., 1998).

The current paper provides an empirical illustration of the ways in which the trifurcated model of narcissism has the potential to move the field forward (Miller et al., 2021). The application of this more nuanced approach yielded more precise results, which otherwise would be missed or misinterpreted. For example, GN was unrelated to the SAI level, despite all the support we found for its link with agentic narcissism, either here or in previous studies (e.g., Leniarska et al., 2023; Zajenkowski & Dufner, 2020). This was most probably caused by the weight of the antagonistic component in the FFNI-assessed GN (Miller et al., 2016; Rogoza et al., 2021). The effects of blending agentic and antagonistic narcissism have been documented in many examples (e.g., in regard to self-esteem; Back et al., 2013; Geukes et al., 2017) and the results of the current study provide further support for this claim. Similar considerations also apply to our findings on the variability of SAI as neither GN nor VN were significant cross-state predictors, while agentic narcissism predicted higher levels of SAI on the next day. This finding might have a more general implication on research on narcissism, as it somewhat questions the utility of examining fluctuations in narcissism without taking into account the more nuanced theoretical model (e.g., Edershile & Wright, 2021).

Our findings were also limited by the fact that we did not control for the time needed to complete the administered test of objective intelligence. Some respondents might have carelessly gone through the test or selected random answers, which could have impacted the results (Silm et al., 2020). Such unmotivated respondents, however, should be characterized by achieving extremely low scores, yet within the current sample only 1.7% (i.e., three participants) failed to provide correct answers on any of the items. Given that, on average, a participant spent more than 20 days within our study, we can reasonably consider participants as well-motivated. Future studies should, however, control for the effects of response time and motivation effort. Another time-related limitation of our study is that the participants did not start the study at the same moment. While we attempted to address this limitation through executing the study during the semester break (i.e., between mid-June to mid-September), some participants' levels of SAI might have been impacted by specific experiences, such as enrolling for a holiday job.

Furthermore, it needs to be acknowledged that on the within-person level, the reliabilities of the FFNI were only fair. This issue may be closely related to the variability on the within-person level and points to a relative consistency in time of participants' self-perceptions to the FFNI. At the between-person level, reliability is most commonly estimated via inter-correlations among items on a test (e.g., α and ω). Transposing this procedure to the within-person level inherently yields that a perfectly reliable measurement will elicit a zero estimate of reliability on the within-level. To illustrate this counterintuitive relation, consider a participant who responded to every of the FFNI items the same way across the 28 days.[7] Within this participant, narcissism would be assessed perfectly reliable; at the same time, the non-existing variance within this participant's responses will expunge any item-correlations, and thus, common measures of reliability (e.g., α and ω) will attest to zero reliability. This problem is also in line with the fact that within frameworks of classical test theory, reliability is defined for populations (between-person level) and not their individuals (within-person level; Bovaird & Embretson, 2008). This issue was further catalyzed by the fact we used only a five-point response scale using full-length statements on the within-person level, whereas similar

studies tend to use much broader scales using adjective-based items (e.g., 0–100; Edershile & Wright, 2021). Consequently, future studies should collect more data on the ongoing events and experiences during the course of the study to see if participants assessed multiple times are indeed subjected to highly different situations and contexts.

Another limitation is that we did not find a significant relationship between objective and subjective intelligence, although prior studies show a correlation around .30 (Freund & Kasten, 2012). However, we measured objective intelligence with a relatively short, albeit typical, test. A single intelligence test might be associated with a non-negligible amount of test-specific method variance (Gignac, 2015). Thus, future studies should include a broader range of intelligence tests as well as self-assessed abilities to capture both constructs at the latent level.

Finally, in the current study, we measured only one agentic attribute—intelligence. Future studies might compare it with other agentic (and communal, for contrast) attributes. Although intelligence is considered as a good instrument for self-enhancement in narcissism (Mielke et al., 2021), research findings indicate that agentic narcissism is associated with self-enhancement also on other attributes related to agency, such as leadership or social influence (Grijalva & Zhang, 2016). Thus, it is likely that people with high narcissism hold positive views of themselves on various agentic characteristics on days they feel more agentic. Future studies could use a wider range of measures to examine potential differences between specific agentic and communal attributes.

Conclusion

Our study provides robust evidence for the association between narcissism and SAI level and variability, and for cross-lagged effects between narcissism and SAI; not only in general, but also across days. Furthermore, we provided evidence that while the relation of antagonistic narcissism to SAI is not as obvious as expected (Zajenkowski et al., 2020b), the role of antagonistic narcissism is additionally bonded to how much individuals varied in their levels of SAI. We have also clarified the mixed results concerning the association of SAI to neurotic narcissism (Zajenkowski et al., 2020a). Our results support that they are in general negatively related. Finally, we provided evidence that feeling agentically narcissistic might lead to feeling smarter in the future; however, feeling intelligent does not necessarily lead to feeling more agentically narcissistic.

Acknowledgements

The work of Radosław Rogoza was supported by National Science Centre, Poland (2020/39/B/HS6/00052). The work of Marcin Zajenkowski was partially funded by National Science Centre, Poland (2021/41/B/HS6/00117). This research was funded in whole, or in part, by the Austrian Science Fund (FWF): J 4344 (Emanuel Jauk).

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Austrian Science Fund (J 4344), Narodowe Centrum Nauki (2020/39/B/HS6/00052), and Narodowe Centrum Nauki (2021/41/B/HS6/00117).

Ethical Statement

Ethical Approval

The study has been approved in its entirety by the ethical board for scientific research of the first author's institution (decision number: #02/2021).

Open Science Statement

Methodological files, data, statistical code, and supplementary materials necessary for the reproduction of results reported within the current paper are available at: https://osf.io/vyac5. The hypotheses presented within the current manuscript were not preregistered.

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Notes

1. Although there is some evidence suggesting that antagonistic narcissism is related to the mean squared successive differences in narcissistic grandiosity (Edershile & Wright, 2021), which might suggest it is also related to the instability of SAI, these estimates could be considered rather as a blend of gross variability and instability (McNeish, 2021; Nestler, 2022), thus, limiting their utility in the formulation of our hypotheses.
2. The correlation between the G-factor as measured by the ICAR and WAIS equals .94 (Young & Keith, 2020). For a review of the existing studies using ICAR, please also see Dworak et al. (2021).
3. Given narcissism has been found to predict cross-state effects across its own facets (Edershile & Wright, 2021), we analyzed each facet separately to avoid partialing the shared variance (Sleep et al., 2017).
4. We also assessed the model for trait and between-person state GN and VN, finding that neither were related to SAI instability and only GN (both trait and between-person state) was related to SAI variability.
5. We also assessed the model for state GN and VN; neither cross-effect was significant.
6. We also assessed the model allowing all autoregressive effects but limiting the cross-effects to and from SAI (see OSF), finding that the cross-effect from agentic narcissism to SAI was still at the boundary of significance (p = .049).
7. Please note that in our data the most extreme case of consistent responding were two participants who gave the same responses on 10 of 12 items over the 28 days.

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