

**COMPARING BRIEF MEASURES OF NARCISSISM—INTERNAL
CONSISTENCY, VALIDITY, COVERAGE**

by

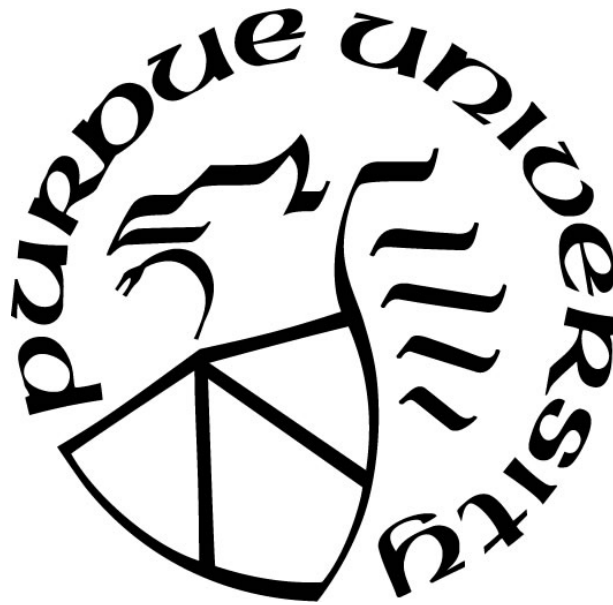
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ABSTRACT

Narcissism is a personality construct linked to dysfunction in several domains. It encompasses grandiose and vulnerable variants as well as antagonism, agentic extraversion, and neuroticism higher-order factors. Many measures that vary in breadth and length have been constructed to measure narcissism. In recent years, super-short forms have become popular in research settings. Although brief measures hold some advantages, their brevity can come at psychometric costs. The comparative limitations of these short narcissism forms have received relatively little empirical examination. The goal of the current project was to fill this gap by determining the potential costs and benefits of using short measures of narcissism rather than longer measures in an online community sample ($N = 473$). This examination included assessing short form completion time, psychometric properties, structure, and measurement invariance across gender. Generally, the short forms demonstrated adequate internal consistency, variable convergence with each other, and mostly moderate to strong convergence with long forms. Short forms with long form counterparts performed well in terms of accounting for the variance of their long form counterparts. The short form items used for the bass-ackward analysis successfully replicated the factor structure of narcissism found by Crowe et al. (2019) using longer narcissism measures at both the two- and three-factor level, which showed measurement invariance across gender, generally at the scalar invariance level. Taken together, these findings suggest that it is still likely most advantageous to use the long forms whenever possible but that some short forms could be used when efficiency of survey administration is particularly important without significant psychometric cost.

INTRODUCTION

Narcissism is a personality construct that has long been the subject of theory and research in multiple subfields of psychology. Narcissism comprises two variants: grandiose narcissism and vulnerable narcissism. The grandiose variant includes features such as self-assuredness, manipulativeness, and entitlement, while the vulnerable variant includes features such as distrust, reactive anger, shame, and need for admiration (Miller et al., 2017). Analyses have invariably shown that grandiose and vulnerable narcissistic variants are unified by interpersonally antagonistic characteristics, such as noncompliance, egotism, and entitlement (Crowe et al., 2019; Miller et al., 2017; Miller & Campbell, 2008; Wink, 1991). In the past several years, researchers have further elucidated the multi-faceted structure of narcissism (Crowe et al., 2019; Krizan & Herlache, 2018; Miller et al., 2016, 2017) by empirically investigating its underlying facets. Factor analyses of narcissism measures have revealed three higher-order factors: agentic extraversion/grandiosity; antagonism/entitlement; neuroticism/vulnerability (Crowe et al., 2019; Krizan & Herlache, 2018; Miller et al., 2016, 2017). These factors have been conceptualized as the trifurcated model of narcissism (Miller et al., 2016, 2017) and the narcissistic spectrum model (Krizan & Herlache, 2018). While the grandiose and vulnerable narcissism variants embody distinctive presentations of narcissism, they are connected by mutual antagonistic traits (Crowe et al., 2019). The non-antagonistic characteristics that typically show minimal commonality across the two narcissism presentations (e.g., authoritativeness and exhibitionism in grandiose narcissism; shame and need for admiration in vulnerable narcissism) are then deemed exterior elements particular to grandiose or vulnerable narcissism presentations (Crowe et al., 2019; Miller et al., 2017).

Many measures that vary in breadth and length have been constructed to measure narcissism, and in recent years, super-short forms (e.g., The Hypersensitive Narcissism Scale; HSNS; Hendin & Cheek, 1997; 10 items; The Narcissistic Personality Inventory-13; NPI-13; Gentile et al., 2013; 13 items) have become popular in research settings. Although brief measures hold some advantages, their brevity can come at psychometric costs (e.g., in internal consistency and validity; Credé et al., 2012; Nunnally & Bernstein, 1994; Sleep et al., 2021; Soto & John, 2019), particularly in construct validity (Smith et al., 2000). Smith et al. (2000) argue that these costs are realized depending on how short forms are developed, such as failing to demonstrate that

a short form preserves each factor's content coverage or replicates the factor structure from the parent measure and not testing the short form's validity in an independent sample from that used for the parent measure. The comparative limitations of these short narcissism forms have received relatively little empirical examination, in terms of both comparing super-short forms to one another and to their longer counterparts.

The goal of the current project was to fill this gap by determining the potential costs and benefits of using short measures of narcissism rather than longer measures. To accomplish this aim, the present study compared the time to complete measures, their general psychometric properties, and their convergence with each other and with longer measures. The second aim of the project was to examine whether the three-factor structure of narcissism identified by Crowe et al. (2019) using full-length narcissism measures replicates when short form narcissism measures are employed. Crowe et al. (2019) further clarified the structure of narcissism using the bass-ackward factor analytic approach (see Crowe et al., 2019; Goldberg, 2006), which produced a hierarchical model of narcissism based on how current narcissism scales measure and thus define narcissism. The current study examined whether the Crowe et al. (2019) structure replicated using a subset of the items in a different sample. The bass-ackward method served as a means of checking coverage among short forms as a whole, comparing their relations to external criteria (e.g., self-esteem, psychopathy), and comparing our factor loadings for each level to those of Crowe et al. (2019). Like Crowe et al. (2019), we used an a-theoretical approach and sought to represent how the literature rather than a single measure defines narcissism by including extant commonly used narcissism measures with variable conceptualizations of narcissism.

Studies investigating gender differences in narcissism have found that men show significantly higher mean levels of narcissism (e.g., (Dowgwillo & Pincus, 2017; Grijalva et al., 2015; Jonason et al., 2009, 2016; Paulhus & Williams, 2002). However, few studies have tested whether this difference is a true gender difference or a measurement artifact. It is possible that men and women endorse narcissism items differently due to differential social acceptability of endorsing certain items and/or due to gender roles. For example, some research has found men to be hesitant to endorse items pertaining to emotional sensitivity (Smith & Reise, 1998), and women might give lower endorsements on leadership/authority-type narcissism measure items due to a relative lack of women in positions of authority. No study to our knowledge has tested measurement invariance of narcissism across gender using an a-theoretical approach (i.e., using

items across extant commonly used narcissism measures as opposed to a single measure representing just one of several conceptualizations of narcissism in the literature). Thus, a third aim of the current study was to test for measurement invariance across gender using the factor structure rendered from our back-analysis on the a-theoretical narcissism item pool.

These research questions were investigated using an online community sample. Participants with a psychological treatment history were recruited to constitute at least a third of the sample to increase the generalizability of our results given that narcissism is a topic of substantial interest in clinical settings.

We hypothesized that we would see the most loss of coverage in short narcissism measures compared to their longer counterparts in the vulnerable dimension of narcissism and in the neuroticism factor. We also hypothesized that we would replicate the 3-factor structure of narcissism (i.e., antagonism, agentic extraversion, neuroticism) found by Crowe et al. (2019) using longer narcissism measures.

METHOD

The primary hypotheses and methodological approach for the present study were preregistered before commencing data collection and can be found at: https://osf.io/fds3r/?view_only=2d626aab988b4f07a04e74494bc96886. Each study below received approval from its corresponding Institutional Review Board (IRB) prior to data collection, and informed consent was obtained from research participants.

Participants and Data

The sample for the current study comprises data from 473 adults residing in the United States. Participants were recruited from Amazon's Mechanical Turk (MTurk) platform and were compensated \$3.00 for completion of an approximately 30-minute online survey operated through Qualtrics. Given that completion time of individual measures was an important variable for the current study, participants were instructed to complete the survey in one sitting. All narcissism measures were presented in a randomized order and in their complete form. In other words, narcissism measure items were not dispersed, and even measures with redundant items, such as the FFNI-SF and FFNI-SSF, remained intact and were presented in a randomized order. We required an MTurk worker HIT rating of at least 95% with 500 minimum HITs. As preregistered, the study implemented a two-step recruitment process once 300 of the 450 planned sample size was recruited and began to use a prescreener to garner enough participants with a history of psychological treatment to obtain a clinical subsample accounting for at least one third of the total sample. Individuals were compensated \$0.25 for completing the prescreener, and those who endorsed a psychological treatment history and passed a validity check were given access to the full online study. Because the prescreener's validity check proved to be highly useful in predicting whether participants would also pass the main survey's validity checks, we continued to use the prescreener after we obtained our clinical subsample in order to make the data collection process more efficient and minimize rejection of MTurkers' work at the main-survey-stage. In total, 1048 completed surveys were obtained, 466 of which were rejected for failing one or more of the following validity checks (note: most respondents were rejected for more than one reason, so the following numbers have overlap): failing ≥ 1 of the botchas (reverse order botcha: $n = 228$; favorite

teacher botcha: $n = 410$, failing ≥ 3 of eight attentional checks (e.g., “Please select Rarely for this item”; $n = 7$), responding “No” to an item that asked whether they answered honestly and paid attention to the survey items ($n = 3$), their response time indicated invalid responding (≤ 8 -minute completion time; $n = 18$), they completed less than 90% of the survey ($n = 1$), or they showed evidence of virtual private server (VPS) usage ($n = 204$). After these exclusions, additional validity checks were run to determine data to exclude from analyses. We started with 582 completed surveys at this stage; additional responses were excluded for exhibiting an invalid response style based on elevated scores on the Infrequency (≥ 4 score; $n = 43$) and/or Virtue (≥ 3 score; $n = 94$) scales of the Elemental Psychopathy Assessment (Lynam et al., 2011) and for exhibiting a singular response style (e.g., responding to the survey with all 1s) on 85% or more of the items ($n = 1$). After this final stage of data exclusion, self-report data were available for 473 individuals (49.5% female, 49.9% male, .2% other, .4% prefer not to say; 77.4% White, 7.6% Black, 7.2% Asian, 5.3% Hispanic or Latino, 1.1% Native American or American Indian, 1.5% Other; 58.6% with a Bachelor’s degree or above; 71% employed for wages; mean age = 42; $SD = 12.12$), 172 of whom endorsed a history of psychological treatment (36.4%). Institutional review board approval was obtained for all aspects of the study.

Measures

Internal consistency on the narcissism measures is reported in Table 1 while that of the criterion measures is reported in each measure description below.

Table 1. Descriptive Statistics of Narcissism Measures

Narcissism Measure	α	Ω	M	Med	SD	Time S	Time SD	IIC Min	IIC Max	IIC Med
FFNI-SF*	.97	—	2.43	2.38	.63	217.90	149.46	0	.82	.26
Grandiose	.98	—	2.34	2.25	.76			.01	.82	.35
Vulnerable	.93	—	2.67	2.69	.83			0	.73	.33
Antagonism	.97	—	2.11	1.94	.76			0	.81	.39
Agentic extraversion	.95	—	2.77	2.81	.93			.16	.82	.44
Neuroticism	.93	—	2.95	2.92	.97			.13	.79	.28
NARQ ^a	.92	.92	2.56	2.39	.97	61.33	47.67	.01	.85	.39
Admiration	.91	.92	2.97	2.78	1.18			.25	.75	.57
Rivalry	.90	.90	2.16	1.89	1.05			.19	.85	.51
NPI ^d	.96	.96	2.66	2.61	.80	119.13	86.94	.02	.83	.38
FFNI-SSF ^{a,c}	.80	.81	2.44	2.40	.66	62.02	95.73	0	.60	.25
Grandiose	.84	.83	2.39	2.36	.78			.05	.59	.32
Vulnerable	.70	.71	2.60	2.50	.98			.23	.60	.37
Antagonism	.84	.84	2.03	1.88	.81			.24	.59	.41
Agentic extraversion	.76	.76	2.95	3.00	1.06			.35	.56	.45
Neuroticism	.78	.78	2.94	3.00	1.17			.51	.60	.52
NVS ^{e,f,g}	.92	.93	2.60	2.36	1.32	34.63	41.93	.29	.72	.55
HSNS ^{a,c}	.82	.82	2.73	2.80	.78	60.48	64.92	.13	.64	.29
NPI-13 ^e	.92	.92	2.42	2.38	.91	38.92	44.51	.29	.86	.46

Table 1 continued

Narcissism Measure	α	Ω	M	Med	SD	Time S	Time SD	IIC Min	IIC Max	IIC Med
NARQ-S ^b	.85	.85	2.27	2.17	1.12	24.03	31.68	.29	.70	.49
Admiration	.87	.87	2.51	2.33	1.38			.65	.70	.69
Rivalry	.74	.76	2.04	1.67	1.13			.41	.54	.52
NGS	.97	.97	2.80	2.50	1.53	45.48	42.81	.49	.87	.68
PES ^{e,f}	.93	.93	3.15	3.11	1.45	37.63	38.29	.35	.79	.59
B-PNI ^d	.94	.94	1.79	1.75	.92	130.69	197.98	0	.77	.34
Grandiose	.87	.86	2.14	2.17	1.01			.09	.77	.32
Vulnerable	.93	.93	1.53	1.41	1.05			.18	.71	.48
SD3-N ^{b,e,f,g}	.85	.85	2.55	2.44	.83	33.83	85.48	.06	.58	.09
DD-N	.87	.88	2.49	2.50	1.10	17.66	30.02	.5	.79	.66
SINS**	—	—	2.52		2.10	11.10	32.26	—	—	—

Note. α = Alpha; ω = Omega; Time S = Mean completion time in seconds; Time SD = standard deviation for completion time in seconds; IIC = inter-item correlation; Min = minimum; Max = maximum; Med = median; FFNI-SF, Five-Factor Narcissism Inventory-Short Form; NARQ, Narcissistic Admiration and Rivalry Questionnaire; NPI, Narcissistic Personality Inventory; FFNI-SSF, Five-Factor Narcissism Inventory-Super Short Form; NVS, Narcissistic Vulnerability Scale; HSNS, Hypersensitive Narcissism Scale; NPI-13, Narcissistic Personality Inventory-13; NARQ-S, Narcissistic Admiration and Rivalry Questionnaire Short Scale; NGS, Narcissistic Grandiosity Scale; PES, Psychological Entitlement Scale; B-PNI, Brief Pathological Narcissism Inventory; SD3, Short Dark Triad, Narcissism items; DD, Dirty Dozen, Narcissism items; SINS, Single Item Narcissism Scale. The subscripts denote which measures were not significantly different from each other in terms of average completion time. *Omega was not calculated for the FFNI-SF because internal consistency was computed using linear composites. **SINS is a one-item measure, so α and ω were not calculated for it. We employed a p -value of $\leq .01$ for all analyses.

Full Scales

The Narcissistic Admiration and Rivalry Questionnaire¹ (NARQ; Back et al., 2013) is an 18-item assessment that is designed to measure a theoretical process model of narcissism, the Narcissistic Admiration and Rivalry Concept (NARC). The NARC model posits two related but distinct narcissistic social processes used to maintain a grandiose self: Admiration (i.e., assertive self-enhancement) and Rivalry (i.e., antagonistic self-protection). The 9-item admiration subscale measures the agentic aspects of grandiose narcissism (sample item: “I manage to be the center of attention with my outstanding contributions”) whereas the 9-item rivalry subscale measures the antagonistic aspects of grandiose narcissism (sample item: “I want my rivals to fail”). Participants endorse the extent to which they agree with each item ranging on a scale of 1 (not agree at all) to 6 (agree completely).

The Five-Factor Narcissism Inventory Short Form (FFNI-SF; Sherman et al., 2015) is a 60-item shortened form of the FFNI (Glover et al., 2012) that measures 15 facets that can be combined to form measures of grandiose and vulnerable narcissism as well as three empirically derived higher order factors: Agentic Extraversion, Antagonism, and Neuroticism.

The Narcissistic Personality Inventory (NPI; Raskin & Terry, 1988) is a 40-item forced-choice (from 2 choices) measure of grandiose narcissism. The current study used the 40-item Likert (non-forced-choice) version (see Miller et al., 2018). The measure can yield three factors: Leadership/Authority, Grandiose Exhibitionism, and Entitlement/Exploitativeness.

Brief Scales

The Five-Factor Narcissism Inventory Super-Short Form (FFNI-SSF; Packer West et al., 2021) is a 15-item abbreviated form of the FFNI-SF (Sherman et al., 2015) and measures 15 facets that can be combined to form measures of grandiose and vulnerable narcissism as well as three empirically derived higher order factors: Agentic Extraversion, Antagonism, and Neuroticism.

The Hypersensitive Narcissism Scale (HSNS; Hendin & Cheek, 1997) comprises 10 items and measures narcissistic vulnerability, entitlement, and hypersensitivity.

The Narcissistic Personality Inventory-13 (NPI-13; Gentile et al., 2013) is a shortened 13-item self-report measure of trait narcissism with subscales that measure Leadership/Authority, Grandiose Exhibitionism, and Entitlement/Exploitativeness. In the current study, a Likert version

of the measure was used in which participants respond on a 1 to 5 scale, where 1 = Strongly Disagree and 5 = Strongly Agree, as it renders more reliable factors.

The Narcissistic Admiration and Rivalry Questionnaire Short Scale (NARQ-S; Leckelt et al., 2018) comprises 6 items total from two three-item subscales, one concerning narcissistic admiration and the other to narcissistic rivalry. The 3 narcissistic admiration items assess the admiration facets of grandiosity (sample item: “I deserve to be seen as a great personality”), charmingness (“I manage to be the center of attention with my outstanding contributions”), and uniqueness (“Being a very special person gives me a lot of strength”). The 3 narcissistic rivalry items assess the facets of supremacy (“I want my rivals to fail”), devaluation (“Most people are somehow losers”), and aggressiveness (“I react annoyed if another person steals the show from me”). Items are rated on a 6-point Likert scale ranging from 1 (does not apply at all) to 6 (applies completely).

The Narcissistic Grandiosity Scale (NGS; Rosenthal et al., 2007) comprises 16 adjective-based items that measure a grandiose sense of self-importance without excessively confounding the construct with normative self-esteem. The NGS has demonstrated that it is a unidimensional measure of narcissistic grandiosity with strong discriminant and convergent validity (Crowe et al., 2016).

The Psychological Entitlement Scale (PES; Campbell et al., 2004) comprises 9 items and measures psychological entitlement.

The Brief-Pathological Narcissism Inventory (B-PNI; Schoenleber et al., 2015) is a 28-item scale that assesses narcissistic grandiosity and narcissistic vulnerability. The items are rated on a 6-point Likert scale ranging from 0 (not at all like me) to 5 (very much like me). The measure has demonstrated structural validity, convergent validity, and internal consistency (Schoenleber et al., 2015).

The Short Dark Triad (SD3; Jones & Paulhus, 2014) measures the “Dark Triad” (DT; i.e., Machiavellianism, narcissism, psychopathy) using 27 items. Only the nine narcissism items from the measure were used in the current study.

The Dirty Dozen (DD; Jonason & Webster, 2010) is a 12-item questionnaire designed to efficiently measure the DT components. Each DT construct is assessed by four items using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Only the four narcissism items were used for the current study.

The Single Item Narcissism Scale (SINS; Konrath et al., 2014) is a single-item measure of narcissism in which respondents indicate their agreement to one item, “I am a narcissist,” using a 1 = strongly disagree to 10 = strongly agree scale.

The Narcissistic Vulnerability Scale (NVS; Crowe et al., 2018) is an 11-item measure of narcissistic vulnerability.

Criterion Measures

The Self-Liking and Self-Competence Scale Revised (SLCS-R; Tafarodi & Swann, 2001) measures two dimensions of self-esteem, Self-Competence (SC) and Self-Liking (SL), using 16 items (eight items for each of the two dimensions). Items are rated using a 5-point Likert scale. Subscale scores can range from 8 to 40, with higher scores signifying higher self-competence or higher self-liking (SC $\alpha = .87$; SC $\omega = .87$; SL $\alpha = .94$; SL $\omega = .94$).

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) is a 10-item measure of global self-esteem in which the items (e.g., “On the whole, I am satisfied with myself”) are rated on a 1 (Disagree strongly) to 4 (Agree strongly) scale ($\alpha = .94$; $\omega = .94$).

Elemental Psychopathy Assessment-Super Short Form (EPA-SSF; Collison et al., 2016) is an 18-item version of the EPA (Lynam et al., 2011). It measures psychopathy, and its items represent higher order factors (Few et al., 2013): antagonism, emotional stability, and disinhibition.² Items are rated on a 5-point Likert scale ranging from 1 (Disagree strongly) to 4 (Agree strongly; $\alpha = .77$; $\omega = .75$).

The Five Factor Machiavellianism Inventory-Super Short Form (FFMI-SSF; Du et al., 2021) consists of 15 items that are rated on a 5-point Likert scale ranging from Disagree strongly to Agree strongly. The FFMI comprises three higher-order factors (i.e., Antagonism, Planfulness, Agency) and 13 lower-order subscales, each characterizing a facet of the five factor model (FFM) that was identified as characteristic of Machiavellianism according to experts ($\alpha = .65$; $\omega = .65$).

The Crime and Analogous Behavior Scale (CAB; Lynam et al., 1999; Miller & Lynam, 2003) is a 24-item self-report inventory that measures a variety of externalizing behaviors, including antisocial behavior and substance use.³ The antisocial behavior variable is calculated by counting the number of different antisocial behaviors endorsed. The violence variable is calculated by counting the number of different violent behaviors endorsed. The substance use variable is

calculated by counting the number of different substances participants endorse trying ($\alpha = .82$; $\omega = .82$).

The Big Five Inventory-2 (BFI-2; Soto & John, 2017) is a 60-item hierarchical measure of the Big Five personality domains (E= extraversion, A = agreeableness, C = conscientiousness, N = neuroticism, O = openness) and 15 more specific facet traits. Respondents rate each item using a 5-point scale (disagree strongly to agree strongly). Soto and John (2017) demonstrated support for the reliability, structure, and validity of the BFI-2 domain and facet scales (Internal consistency for domain scores: (E $\alpha = .91$, E $\omega = .91$; A $\alpha = .87$, A $\omega = .87$; C $\alpha = .92$, C $\omega = .92$; N $\alpha = .94$, $\omega = .94$; O $\alpha = .89$, O $\omega = .90$)).

The International Personality Item Pool representation of the Revised NEO Personality Inventory-60-item version (IPIP-NEO-60; Maples-Keller et al., 2019) comprises 60 items taken from the International Personality Item Pool (IPIP) to assess the FFM. Respondents rate items on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Maples-Keller et al. (2019) reported good convergent validity and reliability of the IPIP-NEO-60 scores in both community and undergraduate samples as well as strong correspondence with other FFM measures. The current study only used the 12 agreeableness/antagonism items from this measure ($\alpha = .83$; $\omega = .83$).

The Patient-Reported Outcomes Measurement Information System Anxiety (PROMIS-A) and PROMIS Depression (PROMIS-D) short form scales (Pilkonis et al., 2011) comprise seven and eight items, respectively. These two scales can be combined to make a single 15-item measure of emotional distress ($\alpha = .97$; $\omega = .97$).

Ten questions regarding psychiatric treatment history were collected. The first question (i.e., *Have you ever received treatment, such as counseling or medication, for mental health issues?*) was used to screen for clinical status in order to recruit the clinical subsample, and the remaining questions will be used for a different project outside of the current study.

Analyses

Short Form Comparisons

After subjects were excluded for invalid responding, we inspected descriptive statistics, including alphas and omegas, as both are widely used to measure internal consistency, inter-item

correlations, time taken for completion, means, and standard deviations of all narcissism measures used in our study. We also compared the time that it takes to complete each narcissism measure by using the Qualtrics record participant completion time and conducted a repeated measures analysis of variance with Fisher's⁴ LSD pairwise comparisons to test for differences in completion time for each measure against each other. Then, we examined bivariate correlations between all of the short measures of narcissism according to the subscales we calculated for each measure; for example, we included the total, grandiose, vulnerable, antagonism, agentic extraversion, and neuroticism scores for the FFNI-SSF. Next, we inspected the short measures' relations with the longer measures of narcissism. For example, we examined how the short measure subscales correlate with the FFNI-SF subscales (e.g., total, grandiose, vulnerable, antagonism, agentic extraversion, and neuroticism scores). We also tested the correlations obtained using short forms against each other to see if one short form better predicts a long form than another. Next, we tested the extent to which the short narcissism measures account for the variance of the domains of the long narcissism measures using regression analyses in which domain scores from each long measure were regressed onto domain scores of the short measures hierarchically (short form counterpart first, then brief measures of the same construct, then remaining brief measures); we inspected the resultant changes in R^2 .

Bass-ackward Analysis

Responses to the narcissism measures were subjected to a bass-ackward analysis to compare the short forms' factor structure to other narcissism measures and to external criteria that have been used in previous investigations of narcissism measures (e.g., Crowe et al., 2019; Packer West et al., 2021; Weiss et al., 2021; Weiss et al., 2018) and that we predicted would relate to narcissism at the 3-factor level. For example, we expected that criterion measures of internalizing behavior would strongly relate to vulnerable narcissism and neuroticism (e.g., the PROMIS scales), that criterion measures of externalizing behavior would strongly relate to agentic extraversion and antagonism, and that self-esteem scales would strongly relate to grandiose narcissism.

All relevant items were correlated with each other to find any duplicate or excessively overlapping items in order to decrease the probability of extracting bloated specific factors. For any item pairs with correlations greater than .65, an item from each of those pairs was removed from the item pool.

A principal-axis factor analysis was then conducted on this item pool to determine which items loaded poorly (i.e., items with factor loadings less than .30 on the first unrotated factor were removed for not being representative of the general factor; Osborne, 2008). Next, a structural analysis was conducted with the remaining items: all factor solutions were identified employing the principal axis factoring method with promax rotation. A single unrotated factor was extracted, and then rotated solutions of progressively more factors were extracted until one of the factors was either too narrow to be meaningful or was no longer interpretable (e.g., had no primary loadings on it; too few items). The factor scores for each progressive factor analysis were saved so that various factor structure levels could be correlated and compared. The identified factors were correlated with narcissism measures as well as pertinent external criteria measures. Additionally, after determining the optimal factor structure, we conducted a multigroup confirmatory factor analysis to see if the structure was similar across gender. To do so, we selected the cleanest loading items from each level of the bass-ackward analysis (i.e., the 10 highest loadings for each factor), conducted tests of invariance across gender, and compared the resultant pattern of loadings.

We also compared the similarity of short-form versus long-form composition (extracted factors) between our sample and Crowe et al.'s (2019) sample using Tucker's congruence coefficients. This was done by pulling the subset of items that were used in both studies as well as their weights from each level of the factor analyses conducted in both studies and comparing their weights. We also examined the extent to which our items fall in the same factors as Crowe et al.'s (2019) items. This was done by assigning each item a weight of 1 or 0—a 1 for the factor where the item has its highest loading and a 0 for the remaining factors. Those weights were then compared via percent agreement.

Missing responses were handled by calculating mean total scores that require that a subject have at least 75% of the data needed for that score in order to be included in that calculation. For example, for calculating psychopathy scores, if a participant responded to 75% or more of the items needed to calculate the total psychopathy score, that participant was included for that calculation.

RESULTS

Alphas, omegas, inter-item correlations, and descriptive statistics for all narcissism measures are presented in Table 1. Internal consistency was good across narcissism measures, with alphas ranging from .70 (FFNI-SSF Vulnerable) to .98 (FFNI-SF Grandiose) with a median of .90. Completion time for narcissism measures ranged from 1.06 (SINS) to 3952.94 seconds (B-PNI; an outlier), with a mean completion time of 63.92 seconds. The mean completion time for even the longest scale, the FFNI-SF, was fewer than four minutes. A repeated measures analysis of variance revealed significant differences among completion times, $F(4.35, 2005.88) = 210.44, p < .001$. Follow-up LSD pair-wise comparisons indicated that most measures differed from all other measures in terms of completion time; measure pairs that did not significantly differ in completion time are indicated by superscripts in Table 1.⁵ In terms of time differences between long forms and short forms, NARQ did not significantly differ from FFNI-SSF or HSNS in average completion time, and NPI did not significantly differ from B-PNI in average completion time. Thus, some brief forms would not save time if used instead of some long forms.

Bivariate Relations Between Brief Narcissism Measures

Relations according to Pearson's r correlations among brief narcissism measures varied (see Table 2), ranging from 0 (FFNI-SSF Vulnerable and FFNI-SSF Agentic Extraversion) to .93 (B-PNI and B-PNI Vulnerable) with a median r of .54. Correlations for indices that capture narcissism broadly (i.e., NARQ, FFNI-SSF, B-PNI, SD3-N, DD-N, and SINS) were variable, with just over half (9 out of 15) of the correlations over .60. The correlations ranged from .35 (SD3-N and SINS) to .78 (NARQ-S and FFNI-SSF) with a median r of .66. Among the remaining strongest correlations were FFNI-SSF and B-PNI: .75, and NARQ-S and SD3-N: .70. Among the remaining weakest correlations were B-PNI and SINS: .42, and NARQ-S and SINS: .44.

Table 2. Bivariate Relations Between Brief Narcissism Measures

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. NARQ-S																
2. NARQ-S A	.91															
3. NARQ-S R	.86	.57														
4. FFNI-SSF	.78	.70	.69													
5. FFNI-SSF G	.76	.74	.60	.92												
6. FFNI-SSF V	.31	.15	.43	.51	.13											
7. FFNI-SSF A	.73	.58	.73	.91	.80	.53										
8. FFNI-SSF E	.60	.68	.35	.71	.82	.00	.41									
9. FFNI-SSF N	.03	-.07	.13	.11	-.23	.78	.06	-.14								
10. NPI-13	.74	.78	.51	.77	.83	.13	.63	.76	-.12							
11. HSNS	.44	.27	.53	.52	.29	.70	.59	.08	.47	.25						
12. PES	.74	.75	.53	.68	.70	.17	.60	.60	-.07	.74	.29					
13. B-PNI	.69	.59	.65	.75	.58	.63	.68	.47	.40	.59	.66	.53				
14. B-PNI G	.67	.67	.51	.73	.68	.35	.56	.68	.18	.71	.40	.57	.86			
15. B-PNI V	.59	.43	.63	.64	.41	.72	.64	.24	.48	.40	.73	.41	.93	.61		
16. SD3-N	.70	.79	.42	.68	.78	.01	.51	.78	-.18	.86	.14	.70	.49	.65	.28	
17. DD-N	.69	.69	.52	.68	.64	.32	.55	.72	.19	.70	.38	.62	.65	.65	.54	.66
18. NVS	.32	.14	.46	.40	.15	.68	.44	.02	.52	.08	.68	.17	.61	.33	.70	.02
19. NGS	.70	.75	.46	.73	.80	.10	.62	.70	-.17	.79	.19	.69	.49	.61	.32	.76
20. SINS	.44	.37	.42	.53	.49	.26	.50	.33	.08	.41	.33	.31	.42	.37	.39	.35

Table 2 continued

	17	18	19
18. NVS	.28		
19. NGS	.60	.06	
20. SINS	.45	.33	.37

Note. Convergent *rs* are in bold. NARQ A = Narcissistic Admiration and Rivalry Questionnaire Admiration; NARQ R = Narcissistic Admiration and Rivalry Questionnaire Rivalry; FFNI-SF G = Five-Factor Narcissism Inventory-Short Form Grandiose; FFNI-SF V = Five-Factor Narcissism Inventory-Short Form Vulnerable; FFNI-SF A = Five-Factor Narcissism Inventory-Short Form Antagonism; FFNI-SF E = Five-Factor Narcissism Inventory-Short Form Agentic Extraversion; FFNI-SF N = Five-Factor Narcissism Inventory-Short Form Neuroticism; FFNI-SSF G = Five-Factor Narcissism Inventory-Super Short Form Grandiose; FFNI-SSF V = Five-Factor Narcissism Inventory-Super Short Form Vulnerable; FFNI-SSF A = Five-Factor Narcissism Inventory-Super Short Form Antagonism; FFNI-SSF E = Five-Factor Narcissism Inventory-Super Short Form Agentic Extraversion; FFNI-SSF N = Five-Factor Narcissism Inventory-Super Short Form Neuroticism; B-PNI G, Brief Pathological Narcissism Inventory Grandiose; B-PNI V, Brief Pathological Narcissism Inventory Vulnera

Grandiose narcissism scales (i.e., NARQ-S Admiration, NARQ-S Rivalry, FFNI-SSF Grandiose, NPI-13, PES, B-PNI Grandiose, and NGS) were generally moderately to strongly correlated, with r s ranging from .46 (NARQ-S Rivalry and NGS) to .83 (FFNI-SSF Grandiose and NPI-13) and a median of .69. Among the remaining strongest correlations were FFNI-SSF Grandiose and NGS: .80, NPI-13 and NGS: .79, and NARQ-S Admiration and NPI-13: .78. Among the remaining weakest correlations were NARQ-S Rivalry and B-PNI Grandiose: .51 and NARQ-S Rivalry and NPI-13: .51.

Vulnerable narcissism scales (i.e., FFNI-SSF Vulnerable, HSNS, B-PNI Vulnerable, and NVS) were generally strongly correlated, with r s ranging from .68 (FFNI-SSF Vulnerable and NVS; HSNS and NVS) to .73 (HSNS and B-PNI) and a median of .70. The remaining correlations were $r = .72$ (FFNI-SSF Vulnerable and BPNI-Vulnerable) and $r = .70$ (FFNI-SSF Vulnerable and HSNS; BPNI-Vulnerable and NVS). Though grandiose and vulnerable narcissism scale correlations had nearly the same median, grandiose correlations were more spread. Specifically, grandiose correlations showed a .37-point range while vulnerable correlations showed a .05-point range. Grandiose narcissism scales showed weak correlations with vulnerable narcissism scales: e.g., NVS and NGS: .06; NVS and NPI-13: .08; FFNI-SSF Vulnerable and NGS: .10; and FFNI-SSF Vulnerable and NPI-13: .13.

Correlations between the three higher-order factors of narcissism (i.e., FFNI-SSF Agentic Extraversion, Neuroticism, and Antagonism), which are assessed by only one of the narcissism measures, and other indices ranged from .02 (FFNI-SSF Agentic Extraversion and NVS) to .78 (FFNI-SSF Agentic Extraversion and SD3-N) with a median r of .51. Among the remaining strongest correlations were FFNI-SSF Agentic Extraversion and NPI-13: .76; FFNI-SSF Antagonism and NARQ-S: .73; and FFNI-SSF Antagonism and NARQ-S Rivalry: .73. Among the remaining weakest correlations were FFNI-SSF Neuroticism and NARQ-S: .03; FFNI-SSF Neuroticism and PES: -.07; and FFNI-SSF Neuroticism and NARQ-S Admiration: -.07.

Bivariate Relations Between Brief and Longer Narcissism Measures

Next, we examined the bivariate relations (Pearson's r correlations) between brief and longer narcissism measures (see Table 3). The correlations obtained using short forms were tested against each other to see if one short form better predicts a long form than another using Steiger's $Z1^*$ formula (Steiger, 1980).

Table 3. Bivariate Relations Between Brief and Longer Narcissism Measures

	NARQ Tot	A	R	FFNI-SF Tot	G	V	A	E
NARQ-S	0.87	0.74 ^a	0.72 ^a	0.82 ^a	0.79 ^a	0.37 ^a	0.79 ^a	0.66 ^a
NARQ-S A	0.79 ^a	0.83^b	0.52 ^b	0.74 ^b	0.77 ^{a,b}	0.19 ^b	0.65 ^b	0.75 ^b
NARQ-S R	0.75 ^{a,b}	0.44 ^c	0.88	0.71 ^{b,c}	0.61 ^c	0.51 ^c	0.76 ^{a,c}	0.38 ^c
FFNI-SSF	0.82 ^a	0.71 ^{a,d}	0.72 ^c	0.93	0.87 ^d	0.48 ^{c,d}	0.89	0.70 ^{a,d}
FFNI-SSF G	0.80 ^{a,c}	0.78	0.59 ^d	0.88	0.94	0.16 ^{b,c}	0.82 ^a	0.80 ^e
FFNI-SSF V	0.33 ^d	0.97 ^e	0.52 ^{b,d,e}	0.42 ^d	0.14 ^e	0.86	0.45 ^d	0.02 ^f
FFNI-SSF A	0.76 ^{a,b,e}	0.56 ^f	0.78	0.85 ^{a,e}	0.77 ^{a,b,f}	0.51 ^{c,d}	0.92	0.46 ^g
FFNI-SSF E	0.62 ^f	0.74 ^{a,d,g}	0.30 ^f	0.68 ^{c,f}	0.76 ^{a,b,f,g}	0.04 ^f	0.50 ^{d,e}	0.89
FFNI-SSR N	0.02	-0.15	0.19 ^f	0.04	-0.21	0.67 ^g	0.04	-0.16
NPI-13	0.77 ^{a,b,c,e,g}	0.82 ^{b,h}	0.50 ^{b,e,g}	0.82 ^{a,e}	0.86 ^d	0.17 ^{b,e,h}	0.72 ^{c,f}	0.83
HSNS	0.43 ^h	0.17	0.60 ^{b,d,h}	0.53 ^g	0.3	0.75 ⁱ	0.58 ^{b,e,g}	0.1
PES	0.74 ^{b,e,g,i}	0.73 ^{a,d,g,i}	0.53 ^{b,d,e,g,h,i}	0.72 ^{b,c,f,h}	0.73 ^{f,g,h}	0.22 ^{b,e,h,i}	0.67 ^{b,h}	0.65 ^{a,d,h}
B-PNI	0.70 ^{b,i,j}	0.53 ^f	0.70 ^{c,j}	0.77 ^{b,h,i}	0.61 ^c	0.68 ^{g,k}	0.72 ^{c,f,h,i}	0.51 ^g
B-PNI G	0.70 ^{b,i,j,k}	0.67 ^{d,i,j}	0.54 ^{b,d,e,g,h,i,k}	0.75 ^{b,c,h,i,j}	0.70 ^{h,i}	0.39 ^{a,l}	0.63 ^{b,g,h,j}	0.70 ^{a,b,d,h,i}
B-PNI V	0.58 ^f	0.33 ^k	0.67 ^{c,j}	0.65 ^f	0.43 ^j	0.77 ^{i,m}	0.66 ^{b,f,h,j,k}	0.28 ^j
SD3-N	0.71 ^{b,e,i,j,k,i}	0.82 ^{b,h,l}	0.39 ^l	0.74 ^{b,c,h,i,j,k}	0.82 ^{a,k}	0.06 ^{f,n}	0.61 ^{b,g,j,k,l}	0.87
DD-N	0.69 ^{i,j,k,l}	0.66 ^{d,j}	0.53 ^{b,d,e,g,h,i,k,l}	0.71 ^{b,c,f,h,j,k,l}	0.68 ^{c,h,i}	0.34 ^{a,l,o}	0.61 ^{b,g,h,j,k,l}	0.69 ^{a,d,h,i}
NVS	0.29	0.04 ^e	0.49 ^{b,d,e,g,l,k,l,m}	0.38 ^d	0.14 ^e	0.73 ^{g,i,k,m}	0.41 ^{d,e}	0.01 ^f
NGS	0.78 ^{a,b,c,e,g,l}	0.84 ^{b,h,l}	0.49 ^{b,e,g,l,k,m,n}	0.76 ^{b,c,h,i,j,k,l}	0.83 ^{a,k}	0.11 ^{e,f,n}	0.68 ^{b,f,h,l,j,k}	0.77 ^{b,e}
SINS	0.44 ^h	0.36 ^{c,k}	0.41 ^{l,n,o}	0.52 ^g	0.49 ^j	0.26 ^{b,e,h,j,o}	0.52 ^{d,e,g,l}	0.35 ^{c,j}
Mean <i>r</i>	0.63	0.55	0.56	0.67	0.62	0.41	0.63	0.53

Table 3 continued

	FFNI-SF	NPI	
	N	Tot	Mean <i>r</i>
NARQ-S	0.02 ^a	0.73 ^a	0.65
NARQ-S A	-0.10 ^b	0.79 ^b	0.59
NARQ-S R	0.16 ^c	0.48 ^c	0.58
FFNI-SSF	0.05 ^{a,d}	0.76 ^{a,b,d}	0.69
FFNI-SSF G	-0.27 ^{e,i}	0.84 ^e	0.67
FFNI-SSF V	0.72	0.06 ^f	0.39
FFNI-SSF A	0.05 ^{a,d,f}	0.60 ^g	0.63
FFNI-SSF E	-0.20 ^g	0.89 ^{b,h}	0.53
FFNI-SSR N	0.88	-0.18	0.26
NPI-13	-0.18 ^g	0.92	0.63
HSNS	0.50 ^h	0.2	0.44
PES	-0.09 ^b	0.72 ^{a,d,i}	0.56
B-PNI	0.4	0.54 ^{c,g}	0.62
B-PNI G	0.14 ^{c,f}	0.71 ^{a,d,i,j}	0.58
B-PNI V	0.52 ^{h,j}	0.33 ^k	0.55
SD3-N	-0.23 ^{e,g,k}	0.88	0.58
DD-N	0.15 ^{c,f,i,l}	0.68 ^{i,j}	0.56
NVS	0.58 ^j	0.03 ^f	0.34
NGS	-0.24 ^{e,g,k}	0.84 ^{e,h}	0.61
SINS	0.05 ^{a,d,f,i,l}	0.40 ^{c,k}	0.38
Mean <i>r</i>	0.58	0.57	

Table 3 continued

Note. $|\text{.12}| = \text{significant at } p \leq .01$. Convergent r s are in bold. Significant differences ($p \leq .01$) across brief measures are represented by different superscript numbers (i.e., down columns). Tot = Total. NARQ A = Narcissistic Admiration and Rivalry Questionnaire Admiration; NARQ R = Narcissistic Admiration and Rivalry Questionnaire Rivalry; FFNI-SF G = Five-Factor Narcissism Inventory-Short Form Grandiose; FFNI-SF V = Five-Factor Narcissism Inventory-Short Form Vulnerable; FFNI-SF A = Five-Factor Narcissism Inventory-Short Form Antagonism; FFNI-SF E = Five-Factor Narcissism Inventory-Short Form Agentic Extraversion; FFNI-SF N = Five-Factor Narcissism Inventory-Short Form Neuroticism; FFNI-SSF G = Five-Factor Narcissism Inventory-Super Short Form Grandiose; FFNI-SSF V = Five-Factor Narcissism Inventory-Super Short Form Vulnerable; FFNI-SSF A = Five-Factor Narcissism Inventory-Super Short Form Antagonism; FFNI-SSF E = Five-Factor Narcissism Inventory-Super Short Form Agentic Extraversion; FFNI-SSF N = Five-Factor Narcissism Inventory-Super Short Form Neuroticism; B-PNI G, Brief Pathological Narcissism Inventory Grandiose; B-PNI V, Brief Pathological Narcissism Inventory Vulnerable.

All correlations were positive except for some involving FFNI-SF or -SSF Neuroticism, and the majority of correlations significantly differed from each other. Superscripts in Table 3 indicate correlations that did *not* significantly differ, some of which include NARQ-S Admiration, NARQ-S Rivalry, FFNI-SSF, FFNI-SSF Grandiose, FFNI-SSF Antagonism, NPI-13, and NGS in their relations with NARQ Total (all r s between .75 and .82). The highest correlations between each long form and all brief forms were each long form's counterparts (e.g., NARQ and NARQ-S; NPI and NPI-13); these convergent r s ranged from .83 (NARQ Admiration and NARQ-S Admiration) to .94 (FFNI-SF Grandiose and FFNI-SSF Grandiose) with a median r of .89. Correlations between brief measure domain scores and those of NARQ ranged from .02 (NARQ and FFNI-SSF Neuroticism) to .88 (NARQ Rivalry and NARQ-S Rivalry) with a median r of .64. Among the remaining strongest correlations were NARQ Admiration and NGS: .84; NARQ Admiration and SD3-N: .82; and NARQ Admiration and NPI-13: .82. Among the remaining weakest correlations were NARQ Admiration and FFNI-SSF Vulnerable: .07 and NARQ Admiration and FFNI-SSF Neuroticism: -.15. Correlations between brief measure domain scores and those of FFNI-SF ranged from .01 (FFNI-SSF Agentic Extraversion and NVS) to .94 (FFNI-SF Grandiose and FFNI-SSF Grandiose) with a median r of .61. Among the remaining strongest correlations were FFNI-SF Agentic Extraversion and SD3-N: .87; FFNI-SF Grandiose and NPI-13: .86; and FFNI-SF Agentic Extraversion and NPI-13: .83. Among the remaining weakest correlations were FFNI-SF Neuroticism and NARQ-S: .02 and FFNI-SF Neuroticism and SINS: .05. Correlations between brief measure domain scores and those of NPI ranged from .03 (NPI and NVS) to .92 (NPI and NPI-13) with a median r of .70. Among the remaining strongest correlations were NPI and SD3-N: .88; NPI and NGS: .84; and NPI and FFNI-SSF Grandiose: .84. Among the remaining weakest correlations were NPI and FFNI-SSF Vulnerable: .06 and NPI and FFNI-SSF Neuroticism: -.18.

Variance Accounted for by Brief Measures

We tested the extent to which the short narcissism measures account for the variance of the domains of each long narcissism measure using hierarchical regression analyses⁶ (see Tables 4-6). For all measure domains except for the FFNI-SF three factors, three steps were carried out. For the first step, the long form domain was regressed onto its short form counterpart. For the second step, domains of the other short forms measuring the same construct as the long form domain were

entered. For the third step, all other brief domains were added. For the FFNI-SF three factors, two steps were carried out: the long form domain was regressed onto its short form counterpart; the second model included the domain from each remaining brief measure that most strongly correlated with the factor being regressed. This method was used to minimize the number of predictors used and multicollinearity.

NARQ-S explained the vast majority of the variance of its long form equivalent, NARQ Total ($R^2 = .76$; see Table 4). The variance accounted for statistically significantly rose with the addition of other short forms measuring the same construct ($\Delta R^2 = .06$; i.e., other brief form total scores of general narcissism) and then with remaining brief measures ($\Delta R^2 = .03$). From dividing the variance accounted for at the first step by that from the third step, we found that NARQ-S, on its own, accounted for 89% of the variance explained.

Table 4. Multivariate Relations Between Brief and Longer Narcissism Measures: NARQ

NARQ	Tot	A	R
Step 1 R^2	.76*	.69*	.78*
Step 2 $R^2 \Delta$	.06*	.14*	.02*
Step 3 $R^2 \Delta$	.03*	.01	.05*
Step 1 R^2 / Step 3 R^2	.89	.83	.92

Note. Tot = Total. NARQ A = Narcissistic Admiration and Rivalry Questionnaire Admiration; NARQ R = Narcissistic Admiration and Rivalry Questionnaire Rivalry.

* $p \leq .01$.

Like the total score's counterpart, NARQ-S Admiration accounted for most of the variance of its parent counterpart, NARQ Admiration ($R^2 = .69$). The explained variance statistically significantly increased when the other short forms measuring the same construct ($\Delta R^2 = .14$; i.e.,

other brief form measures of grandiose narcissism) were added but not with the addition of the remaining brief measures ($\Delta R^2 = .01$). By itself, NARQ-S Admiration accounted for 83% of the variance explained.

NARQ-S Rivalry explained a large portion of the variance of NARQ Rivalry ($R^2 = .78$). The variance explained statistically significantly augmented with the inclusion of construct-similar short forms ($\Delta R^2 = .02$; i.e., other brief form measures of grandiose narcissism) and when the remaining brief measures ($\Delta R^2 = .05$) were added. Alone, NARQ-S Rivalry accounted for 92% of the variance explained.

FFNI-SSF accounted for a large portion of the variance of its parent equivalent, FFNI-SF Total ($R^2 = .86$; see Table 5). The variance captured statistically significantly increased with the inclusion of other short forms measuring the same construct ($\Delta R^2 = .04$; i.e., other brief form total scores of general narcissism) and with the added remaining brief measures ($\Delta R^2 = .02$). Alone, FFNI-SSF accounted for 93% of the variance explained.

Table 5. Multivariate Relations Between Brief and Longer Narcissism Measures: FFNI-SF

FFNI-SF	Tot	G	V	A	E	N
Step 1 R^2	.86*	.88*	.74*	.85*	.80*	.78*
Step 2 $R^2 \Delta$	.04*	.04*	.07*	.05*	.09*	.05*
Step 3 $R^2 \Delta$	.02*	.01*	.02*			
Step 1 R^2 / Step 3 R^2	.93	.95	.89			

Note. Tot = Total. FFNI-SF G = Five-Factor Narcissism Inventory-Short Form Grandiose; FFNI-SF V = Five-Factor Narcissism Inventory-Short Form Vulnerable; FFNI-SF A = Five-Factor Narcissism Inventory-Short Form Antagonism; FFNI-SF E = Five-Factor Narcissism Inventory-Short Form Agentic Extraversion; FFNI-SF N = Five-Factor Narcissism Inventory-Short Form Neuroticism.

* $p \leq .01$.

FFNI-SSF Grandiose and FFNI-SSF Vulnerable accounted for a large amount of the variance of their long counterparts: $R^2 = .88$ and $.74$, respectively. In each of these models, the variance explained statistically significantly rose with other construct-similar short forms added ($\Delta R^2 = .04$ and $.07$, respectively) and with the inclusion of the remaining brief measures ($\Delta R^2 = .01$ and $.02$, respectively). By itself, FFNI-SSF Grandiose accounted for 95% of the variance explained. On its own, FFNI-SSF Vulnerable accounted for 89% of the variance explained.

FFNI-SSF Antagonism, Agentic Extraversion, and Neuroticism explained much of the variance of their long form equivalents: $R^2 = .85$, $.80$, and $.78$, respectively. In each of these three models, the variance accounted for statistically significantly increased with the addition of the highest correlates from each remaining short form: $\Delta R^2 = .05$, $.09$, and $.05$, respectively.

NPI-13 accounted for a large portion of variance of its long counterpart, NPI ($R^2 = .85$; see Table 6). The variance accounted for statistically significantly rose when including other short forms measuring the same construct ($\Delta R^2 = .04$; i.e., other brief measures of grandiose narcissism) and with the addition of the remaining brief measures ($\Delta R^2 = .02$). By itself, NPI-13 accounted for 93% of the variance explained.

Table 6. Multivariate Relations Between
Brief and Longer Narcissism Measures:
NPI

NPI	Tot
Step 1 R^2	.85*
Step 2 $R^2 \Delta$	.04*
Step 3 $R^2 \Delta$	.02*
Step 1 R^2 / Step 3 R^2	.93

Note. Tot = Total.

* $p \leq .01$.

Bass-ackward Analysis Results

Correlations of the 122 brief narcissism measure items were inspected to find any identical or excessively overlapping (i.e., $r_s \geq .65$) items. One hundred and thirty-six item pairs (out of 14,762 possible pairs) were identified with correlations greater than 0.65 (see Crowe, Lynam, & Miller, 2018 for explanation of similar method). In order to minimize bias and maximize the final number of saved items, we deleted the items with the most correlations above .65 and worked our way down until there were no correlations greater than .65. Forty-three items were removed, leaving 79 items in the pool. A principal axis factor analysis was then conducted on this item pool to determine which items load poorly (i.e., items with factor loadings less than .30 on the first unrotated factor were removed for not being representative of the general factor; Osborne et al., 2008; $N = 7$). The final item pool consisted of 72 items (see Table 12 for items, their factor loadings, and descriptive statistics).

Next, a structural analysis was conducted with the remaining items; all factor solutions were identified employing the principal axis factoring method. A single unrotated factor was extracted, which accounted for 29% of the total variance. The first 10 eigenvalues were as follows: 21.13, 8.79, 3.26, 1.96, 1.77, 1.65, 1.34, 1.32, 1.21, and 1.16. Then, promax rotated solutions of progressively more factors were extracted until one of the factors was either too narrow to be meaningful or was no longer interpretable (e.g., had no primary loadings on it; too few items). The factor scores for each progressive factor analysis were saved so that various factor structure levels could be correlated and compared.

In the five-factor solution, no items had their highest loading on the fifth factor. Only eight items had their highest loading on the fourth factor of the four-factor solution, and seven of those items were from the B-PNI. When the content of the four-factor solution was examined, it became apparent that the same three factors were present as in the three-factor solution but that the fourth factor consisted almost entirely of items from the B-PNI pertaining to a need for admiration (i.e., items from the Contingent Self-esteem and Self-Sacrificing Self-Enhancement subscales) and thus was considered too narrow and specific to be useful for capturing narcissism latent content. The three-factor solution was therefore the largest model given consideration. The content of each of the factors through the three-factor solution was interpretable, and the item loadings were generally high. The three-factor solution was chosen as the base of the narcissism hierarchy. The three-factor

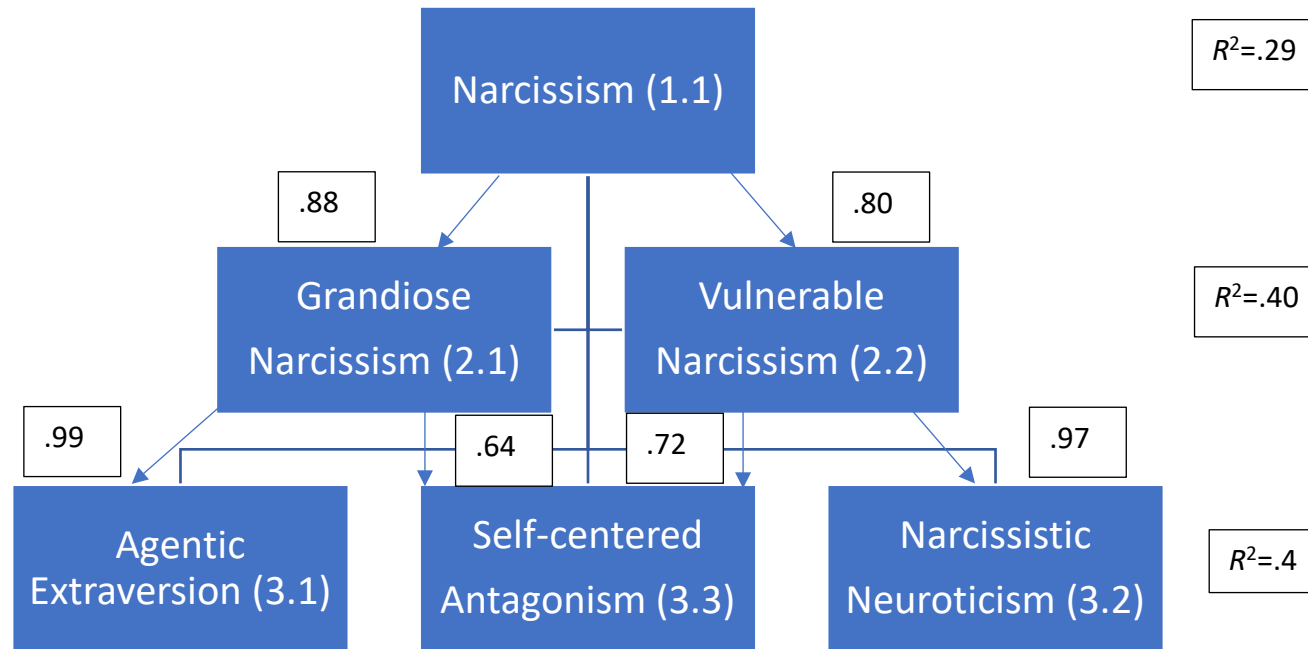
solution accounted for 44% of the variance in narcissism scores. Inclusion of the fourth factor increased the variance accounted for by 2%.

A Hierarchy of Narcissism Factors

The final hierarchy from one to three factors is portrayed in Figure 1. Loadings for all items are given in Table S1. To elucidate factor content, scores from each solution were correlated with each scale score from the narcissism measures (Table 7).

The first identified factor (F1.1) was identified as Narcissism, as it captures the commonalities among all of the item content. F1.1 showed strong relations with nearly all narcissism measure total scores, with scale-level correlations ranging from $r = 0.53$ (SINS) to $r = 0.93$ (FFNI-SF). At the facet-level, correlations ranged from $r = 0.19$ (FFNI-SF Neuroticism) to $r = 0.89$ (FFNI-SF Antagonism). The median correlation between F1.1 and all narcissism measure domains was $r = 0.76$.

The two-factor solution uncovered two correlated ($r = 0.42$) factors in line with grandiose (F2.1) and vulnerable narcissism (F2.2). The top loading items for F2.1 were predominantly associated with entitlement (e.g., “It may seem unfair, but I deserve extra (i.e., attention, privileges, rewards),” FFNI-SSF), arrogance (e.g., “Being a very special person gives me a lot of strength,” NARQ-S), and acclaim-seeking (e.g., “I tend to seek prestige or status,” DD-N). The most representative items for the Vulnerable Narcissism factor (F2.2) pertained to reactive anger (e.g., “To what degree do you currently feel resentful,” NVS), shame (e.g., “When others get a glimpse of my needs, I feel anxious and ashamed,” B-PNI), and need for admiration (e.g., “It irritates me when people don’t notice how good a person I am,” B-PNI).



Note. Only correlations going from one level of the hierarchy to the next are depicted.

Figure 1. Hierarchical structure of narcissism.

Table 7. Factor Score Correlations With Narcissism Measures Domains

	F1.1	F2.1	F2.2	F3.1	F3.2	F3.3
NARQ	<u>0.87</u>	0.87	0.56	0.84	0.46	0.73
NARQ A	0.71	0.88	0.26	0.88	0.19	0.47
NARQ R	0.79	0.61	0.74	0.55	0.63	<u>0.81</u>
NARQ-S	0.86	0.85	0.57	0.82	0.48	0.72
NARQ-S A	0.76	0.86	0.36	0.86	0.3	0.51
NARQ-S R	0.77	0.62	0.69	0.56	0.58	0.78
FFNI-SF	<u>0.93</u>	0.89	0.64	0.86	0.54	<u>0.79</u>
FFNI-SF G	0.82	<u>0.93</u>	0.41	<u>0.89</u>	0.28	0.71
FFNI-SF V	0.58	0.23	<u>0.83</u>	0.21	<u>0.84</u>	0.48
FFNI-SF A	<u>0.89</u>	0.80	0.69	0.73	0.55	<u>0.90</u>
FFNI-SF E	0.67	0.87	0.19	<u>0.89</u>	0.15	0.35
FFNI-SF N	0.19	-0.15	0.55	-0.11	0.66	0.01
FFNI-SSF	<u>0.91</u>	0.86	0.66	0.82	0.55	<u>0.80</u>
FFNI-SSF G	0.80	<u>0.90</u>	0.40	0.86	0.27	0.72
FFNI-SSF V	0.53	0.18	0.79	0.17	<u>0.81</u>	0.44
FFNI-SSF A	0.85	0.72	0.71	0.64	0.55	<u>0.93</u>
FFNI-SSF E	0.62	0.81	0.16	0.84	0.14	0.29
FFNI-SSF N	0.20	-0.09	0.51	-0.06	0.62	0.01
NPI	0.74	<u>0.92</u>	0.26	<u>0.92</u>	0.18	0.50
NPI-13	0.78	<u>0.94</u>	0.32	<u>0.93</u>	0.24	0.55
HSNS	0.65	0.32	<u>0.84</u>	0.27	0.79	0.65
PES	0.74	0.82	0.37	0.81	0.30	0.56
B-PNI	<u>0.89</u>	0.68	<u>0.86</u>	0.68	<u>0.86</u>	0.60
B-PNI G	0.8	0.77	0.54	0.80	0.55	0.43
B-PNI V	0.81	0.49	<u>0.93</u>	0.48	<u>0.93</u>	0.61
SD3-N	0.70	<u>0.90</u>	0.20	<u>0.91</u>	0.14	0.44
DD-N	0.76	0.76	0.48	0.77	0.45	0.48

Table 7 continued

	F1.1	F2.1	F2.2	F3.1	F3.2	F3.3
NVS	0.55	0.15	<u>0.86</u>	0.14	<u>0.88</u>	0.47
NGS	0.71	0.86	0.28	0.84	0.18	0.55
SINS	0.53	0.45	0.43	0.41	0.35	0.53

Note. |.12| = significant at $p \leq .01$. The five largest facet-level correlations for each factor are underlined and in bold. NARQ A = Narcissistic Admiration and Rivalry Questionnaire Admiration; NARQ R = Narcissistic Admiration and Rivalry Questionnaire Rivalry; FFNI-SF G = Five-Factor Narcissism Inventory-Short Form Grandiose; FFNI-SF V = Five-Factor Narcissism Inventory-Short Form Vulnerable; FFNI-SF A = Five-Factor Narcissism Inventory-Short Form Antagonism; FFNI-SF E = Five-Factor Narcissism Inventory-Short Form Agentic Extraversion; FFNI-SF N = Five-Factor Narcissism Inventory-Short Form Neuroticism; FFNI-SSF G = Five-Factor Narcissism Inventory-Super Short Form Grandiose; FFNI-SSF V = Five-Factor Narcissism Inventory-Super Short Form Vulnerable; FFNI-SSF A = Five-Factor Narcissism Inventory-Super Short Form Antagonism; FFNI-SSF E = Five-Factor Narcissism Inventory-Super Short Form Agentic Extraversion; FFNI-SSF N = Five-Factor Narcissism Inventory-Super Short Form Neuroticism; B-PNI G, Brief Pathological Narcissism Inventory Grandiose; B-PNI V, Brief Pathological Narcissism Inventory Vulnerable.

The three-factor solution unveiled factors in line with the trifurcated model of narcissism (Miller et al., 2016, 2017) and the narcissistic spectrum model (Krizan & Herlache, 2018). Items from Grandiose (F2.1) and Vulnerable (F2.2) Narcissism factors united to produce a new factor identified as Self-centered Antagonism (F3.3). The other two factors were labeled as Agentic Extraversion (F3.1) and Narcissistic Neuroticism (F3.2). Correlations between the three factors were low to moderate: $r = 0.33$ (F3.1 and F3.2), $r = 0.53$ (F3.2 and F3.3), and $r = 0.54$ (F3.1 and F3.3). The highest loaded items for F3.3 pertained to exploitativeness (e.g., “I’m willing to exploit others to further my own goals,” FFNI-SSF), arrogance/devaluation of others (e.g., “Most people are somehow losers,” NARQ-S), and a lack of empathy (e.g., “I am secretly “put out” or annoyed when other people come to me with their troubles, asking me for my time and sympathy,” HSNS). The other two factors that surfaced at this point in the analysis (F3.1 and F3.2) showed configurations of association that were notably like their analogues at the two-factor level. The highest loaded items for Agentic Extraversion (F3.1) pertained to acclaim-seeking (e.g., “I tend to seek prestige or status,” DD-N; “I like to get acquainted with important people,” SD3-N) and exhibitionism (e.g., “I will usually show off if I get the chance,” NPI-13). The highest loaded items

for Narcissistic Neuroticism (F3.2) concerned shame (e.g., “When others get a glimpse of my needs, I feel anxious and ashamed,” B-PNI), and need for admiration (e.g., “It irritates me when people don’t notice how good a person I am,” B-PNI).

Factor Solution Associations With External Criteria

To assess factor resemblance, we correlated each factor score with germane criterion variables, such as FFM personality characteristics, externalizing behaviors, self-esteem, and emotional distress (see Table 8). We observed relevant divergence among all factor solutions. Grandiose (F2.1) and Vulnerable (F2.2) Narcissism separated in their association with self-esteem ($r_{F2.1} = 0.17$, $r_{F2.2} = -0.57$), self-competence ($r_{F2.1} = 0.34$, $r_{F2.2} = -0.46$), self-liking ($r_{F2.1} = 0.25$, $r_{F2.2} = -0.54$), though the magnitude of Grandiose correlations with these criteria was lower than expected. Divergence was also seen for criteria pertaining to emotional distress: anxiety ($r_{F2.1} = -0.05$, $r_{F2.2} = 0.61$), depression ($r_{F2.1} = -0.10$, $r_{F2.2} = 0.59$), and FFM psychopathy emotional stability ($r_{F2.1} = 0.41$, $r_{F2.2} = -0.42$) as well as FFM (BFI-2) neuroticism ($r_{F2.1} = -0.16$, $r_{F2.2} = 0.63$), anxiety ($r_{F2.1} = -0.21$, $r_{F2.2} = 0.55$), depression ($r_{F2.1} = -0.18$, $r_{F2.2} = 0.59$), and emotional volatility ($r_{F2.1} = -0.03$, $r_{F2.2} = 0.59$). There was also meaningful F2.1 and F2.2 factor divergence for Machiavellianism ($r_{F2.1} = 0.41$, $r_{F2.2} = -0.25$) and FFM extraversion ($r_{F2.1} = 0.50$, $r_{F2.2} = -0.27$). The two factors showed similar associations with agreeableness/antagonism domains, including CAB externalizing behaviors, EPA-SSF antagonism, and BFI-2 and IPIP-NEO-60 Agreeableness (see Table 8). The three factors at the next level of analysis exhibited associations corresponding to those shown at the two-factor level. Agentic Extraversion showed strong relations with corresponding BFI-2 domains and facets, including BFI-2 Extraversion ($r = 0.54$) and Assertiveness ($r = 0.56$). Antagonism exhibited strong relations with agreeableness/antagonism domains and facets from BFI-2, including with Agreeableness: -0.71 , Compassion: -0.65 , and Respectfulness: -0.65 ; with EPA-SSF Total ($r = 0.74$) and Antagonism ($r = 0.83$); and with IPIP Agreeableness ($r = -0.83$). Neuroticism showed strong relations with corresponding BFI-2 domains and facets, including BFI-2 Neuroticism ($r = 0.69$), Anxiety ($r = 0.61$), Depression ($r = 0.64$), and Emotional Volatility ($r = 0.62$), and also PROMIS Anxiety ($r = 0.66$) and Depression ($r = 0.63$). Narcissistic Neuroticism (F3.2) diverged from Agentic Extraversion (F3.1) on self-esteem and emotional distress variables. Agentic Extraversion (F3.1) and Antagonism (F3.3) showed strong relations with some externalizing

behavior, as expected (e.g., F3.1 and F3.3 with EPA-SSF Disinhibition: $r = 0.49$ and $r = 0.61$, respectively). However, Neuroticism showed a similar relation with disinhibition ($r = 0.55$). Antagonism's relation with disinhibition was significantly stronger than that of Agentic Extraversion. No factors diverged in their association with CAB externalizing behaviors at the CAB subscale level, but Agentic Extraversion showed a significantly stronger relationship with the CAB total score ($r = 0.22$) than Antagonism ($r = 0.11$).

Table 8. Factor Score Correlations With External Criteria

	F1.1	F2.1	F2.2	F3.1	F3.2	F3.3
SLCSR Self-Competence	-0.02	0.34	-0.46	0.35	-0.50	-0.09
SLCSR Self-Liking	-0.12	0.25	-0.54	0.24	-0.60	-0.09
RSES	-0.18	0.17	-0.57	0.18	-0.61	-0.18
EPA-SSF	<u>0.73</u>	<u>0.75</u>	0.45	<u>0.69</u>	0.31	<u>0.74</u>
EPA-SSF Antagonism	<u>0.71</u>	<u>0.55</u>	<u>0.67</u>	<u>0.47</u>	0.53	<u>0.83</u>
EPA-SSF Emotional Stability	0.05	0.41	-0.42	0.42	-0.48	0.00
EPA-SSF Disinhibition	<u>0.67</u>	<u>0.53</u>	<u>0.61</u>	<u>0.49</u>	0.55	0.61
FFMI-SSF	0.14	0.41	-0.25	0.39	-0.35	0.19
CAB	0.21	0.21	0.15	0.22	0.15	0.11
CAB Antisocial	0.19	0.16	0.16	0.16	0.16	0.13
CAB Substance Use	0.08	0.07	0.06	0.08	0.08	0.01
CAB Violent	0.22	0.21	0.15	0.21	0.14	0.14
BFI-2 Extraversion	0.19	<u>0.50</u>	-0.27	<u>0.54</u>	-0.29	-0.02
BFI-2 Agreeableness	-0.52	-0.31	-0.60	-0.23	-0.48	<u>-0.71</u>
BFI-2 Conscientiousness	-0.29	-0.05	-0.48	-0.02	-0.46	-0.34
BFI-2 Neuroticism	0.23	-0.16	<u>0.63</u>	-0.16	<u>0.69</u>	0.18
BFI-2 Openness	-0.14	0.02	-0.29	0.08	-0.23	-0.33
BFI-2 Sociability	0.15	0.41	-0.22	0.43	-0.23	-0.02
BFI-2 Assertiveness	0.3	<u>0.55</u>	-0.12	<u>0.56</u>	-0.15	0.12
BFI-2 Energy Level	0.01	0.31	-0.37	0.35	-0.37	-0.17
BFI-2 Compassion	-0.41	-0.28	-0.43	-0.19	-0.29	<u>-0.65</u>
BFI-2 Respectfulness	<u>-0.53</u>	-0.37	-0.54	-0.31	-0.43	<u>-0.65</u>
BFI-2 Trust	-0.4	-0.16	-0.55	-0.11	-0.48	-0.52
BFI-2 Organization	-0.17	-0.02	-0.30	0.00	-0.28	-0.21
BFI-2 Productiveness	-0.23	0.03	-0.48	0.06	-0.47	-0.29
BFI-2 Responsibility	-0.37	-0.15	-0.53	-0.11	-0.5	-0.40
BFI-2 Anxiety	0.15	-0.21	0.55	-0.20	0.61	0.10

Table 8 continued

	F1.1	F2.1	F2.2	F3.1	F3.2	F3.3
BFI-2 Depression	0.18	-0.18	<u>0.59</u>	-0.18	<u>0.64</u>	0.16
BFI-2 Emotional Volatility	0.29	-0.03	<u>0.59</u>	-0.03	<u>0.62</u>	0.25
BFI-2 Intellectual Curiosity	-0.16	0.00	-0.3	0.04	-0.25	-0.3
BFI-2 Aesthetic Sensitivity	-0.11	-0.03	-0.16	0.02	-0.09	-0.3
BFI-2 Creative Imagination	-0.10	0.10	-0.32	0.14	-0.28	-0.26
PROMIS Anxiety	0.28	-0.05	<u>0.61</u>	-0.05	<u>0.66</u>	0.22
PROMIS Depression	0.24	-0.10	<u>0.59</u>	-0.11	<u>0.63</u>	0.21
IPIP A	<u>-0.67</u>	-0.55	-0.57	-0.46	-0.41	<u>-0.83</u>
Similarity with F1.1		0.70	0.75	0.62	0.67	0.95
Similarity with F2.1			0.11	0.99	0.00	0.59
Similarity with F2.2				0.03	0.99	0.79
Similarity with F3.1					-0.08	0.49
Similarity with F3.2						0.70

Note. |.12| = significant at $p \leq .01$. The five largest facet-level correlations for each factor are underlined and in bold. SLCS-R = Self-Liking and Self-Competence Scale Revised; RSES = Rosenberg Self-Esteem Scale; EPA-SSF = Elemental Psychopathy Assessment-Super Short Form; FFMI-SSF = Five Factor Machiavellianism Inventory-Super Short Form; CAB = Crime and Analogous Behavior Scale; BFI-2 = Big Five Inventory-2; PROMIS = Patient-Reported Outcomes Measurement Information System; IPIP = International Personality Item Pool representation of the Revised NEO Personality Inventory-60-item version. Similarity = similarity of correlation profiles with external criteria.

Factor Structure Similarity Between Current and Replication Sample

We compared the similarity of short-form versus long-form composition (extracted factors) between our sample and Crowe et al.'s (2019) sample using Tucker's congruence coefficients. This was done by pulling the subset of items that were used in both studies (56 out of the 72 items used in the current study's pool) as well as their weights from each level of the factor analyses conducted in both studies and comparing their weights. Tucker's congruence coefficients in the

range of 0.85–0.94 indicate a fair similarity, and values higher than 0.95 indicate that the two factors compared can be considered equal (Lorenzo-Seva & ten Berge, 2006). Tucker's congruence coefficients from the current study's factors compared to factors from Crowe et al. (2019) were all over 0.95 (F3.2 Neuroticism: 0.97; F1.1 Narcissism, F2.1 Grandiose Narcissism, F2.2 Vulnerable Narcissism, and F3.1 Agentic Extraversion: 0.98; and F3.3 Self-Centered Antagonism: 0.99).

We examined the extent to which our items fall in the same factors as Crowe et al.'s (2019) items. This was done by assigning each item a weight of 1 or 0—a 1 for the factor where the item had its highest loading and a 0 for the remaining factors. Those weights were then compared via percent agreement. Items fell in the same factors across both studies 89% of the time at the two-factor level and 89% of the time at the three-factor level.

Factor Structure Similarity Across Gender

We conducted a multigroup confirmatory factor analysis to see if the factor structure was similar across gender using AMOS (Version 27; Arbuckle, 2020). We selected the 10 highest loadings for each factor from each level of the backward analysis and conducted tests of invariance across gender. To do so, we first assessed the fit of the model in the overall sample and then evaluated whether the factor structure stayed invariant when progressing through more restrictive models (configural to metric to strong (scalar)). Tucker-Lewis Index (TLI), comparative fit index (CFI), and root mean square error of approximation (RMSEA) were used to assess model fit, with chi-square change being used to assess relative fit. RMSEA values less than 0.05 are generally considered indicative of a close-fitting model, values between 0.05 and 0.08 are considered acceptable, values between 0.08 and 0.1 are considered marginal, and values greater than 0.1 are considered indicative of a poor fitting model (Fabrigar et al., 1999). CFI and TLI values $\geq .90$ indicate an acceptable fitting model (Whittaker, 2016). Any modifications made to improve model fit can be found in Tables 9-11. We allowed factors to correlate in the models; the factor correlations were as follows: Grandiose and Vulnerable Narcissism: $r = .42$; Antagonism and Agentic Extraversion: $r = .54$; Antagonism and Neuroticism: $r = .53$; and Agentic Extraversion and Neuroticism: $r = .33$.

Table 9. Modifications for Each Model: 3 Factors

Model	Entire Sample		Configural	Metric	Scalar
Modifications	Allowed 20 covariances and removed 4 items		None	None	None
Agentic Extraversion	NARQS 4	FFNISSF 9			
	FFNISSF 9	NPI-13 10			
	FFNISSF 9	NPI-13 11			
	FFNISSF 9	SD3N 5			
	FFNISSF 11	NPI-13 3			
	NPI-13 3	SD3N 5			
Neuroticism	BPNI 2	BPNI 16			
	BPNI 2	BPNI 22			
	BPNI 2	BPNI 28			
	BPNI 3	BPNI 28			
	BPNI 9	BPNI 18			
	BPNI 9	BPNI 28			
	BPNI 16	BPNI 18			
Antagonism	NARQS 3	NARQS 6			
	FFNISSF 3	HSNS 8			
	FFNISSF 3	HSNS 10			
	FFNISSF 3	BPNI 8			
	FFNISSF 10	BPNI 8			
	FFNISSF 10	NVS 11			
	HSNS 8	HSNS 10			
Removed NPI-13 12, NVS 4, PES 1, HSNS 7					

Table 10, Modifications for Each Model: 2 Factors

Model	Entire Sample		Configural	Metric	Scalar
Modifications	Allowed 10 covariances		None	None	Relaxed constraint for one intercept
Grandiose	FFNISSF 11	NPI-13 3			NVS 4 intercept
	FFNISSF 11	PES 1			
	NPI-13 3	PES 1			
	NPI-13 3	SD3N 5			
	PES 1	SD3N 5			
Vulnerable	FFNISSF 5	BPNI 22			
	BPNI 9	BPNI 28			
	BPNI 28	NVS 4			
	NVS 4	NVS 7			
	NVS 7	NVS 11			

Table 11. Modifications for Each Model: 1 Factor

Model	Entire Sample	Configural	Metric	Scalar
Modifications	Allowed 6 covariances	None	None	None
NARQS 1	BPNI 22			
NARQS 4	FFNISSF 14			
FFNISSF 11	PES 1			
BPNI 8	BPNI 22			
BPNI 8	BPNI 20			
BPNI 20	BPNI 22			

The fit indices for the three-factor model in the overall sample (i.e., across men and women) indicated that the model fit could be improved. CFI (.820) and TLI (.805) indicated inadequate fit; and the RMSEA (.087) and SRMR (.097) were over the .08 threshold. In order to improve model fit, error terms of the same construct were covaried based on high modification indices, and the four most problematic items according to the standardized residual covariances output were removed. In the modified model, CFI (.905) indicated adequate fit and the TLI (.888) was very close to the .90 threshold, and SRMR (.073) and RMSEA (.069) were under the .08 threshold.

In examining configural invariance at the three-factor level, CFI and TLI indices indicated that the overall fit of the model was nearly adequate (CFI = .899, TLI = .881). RMSEA was .041 in the current analysis, suggesting a close-fitting model. SRMR (.073) was also below the .08 threshold. Overall, the fit indices suggested configural invariance. The configural model fit was highly similar to the model fit for the overall sample; therefore, we concluded that the configural invariance of the three narcissism factors held across men and women.

The additional constraint of invariant factor loadings across men and women was added to test for metric invariance next. The results from the chi-square difference test indicated a non-significant decrease in fit as a result of adding in equality constraints ($\Delta\chi^2 = 23.651$, $p > .05$). Change in CFI ($\Delta\text{CFI} = .002$) indicated that the CFI for the metric invariance model demonstrated better fit (CFI = .901) than the configural model, as prior research (Cheung & Rensvold, 2002) proposes that a change in CFI of less than or equal to .01 lends support to the more constrained model. Thus, there was evidence of metric invariance, suggesting that the three-factor narcissism structure was similar across gender.

Strong (scalar) invariance, in which factor loadings and intercepts were held constant across men and women, was tested next. When compared to the metric invariance model, the chi-square difference test was non-significant ($\Delta\chi^2 = 47.986$, $p > .05$), lending support for the more constrained strong/scalar model. In addition, CFI remained the same, providing further support for the more constrained (i.e., strong model). Putatively, factorial invariance held at the strong level, suggesting that the latent factor means could be compared between men and women legitimately. Thus, we examined those differences in the strong invariance model.

Women were significantly lower on the Antagonism factor and the Agentic Extraversion factor than men ($Z = -3.03$, $p < .01$; $Z = -3.94$, $p < .001$, respectively). Women were also lower on the Neuroticism factor than men ($Z = -0.45$, $p > .05$), but non-significantly so.

The fit indices for the two-factor model in the overall sample (i.e., across men and women) indicated that the model fit could be improved. The CFI (.868) and TLI (.851) indicated inadequate fit, and RMSEA (.093) and SRMR (.082) were over the .08 threshold. In order to improve model fit, error terms of the same construct were covaried based on high modification indices. CFI (.929) and the TLI (.915) in the modified model indicated adequate fit. SRMR was slightly over the .08 threshold (.082), and the RMSEA (.069) was under the .08 threshold.

In examining configural invariance at the two-factor level, CFI and TLI indices indicated that the overall fit of the model was adequate (CFI = .926, TLI = .911). RMSEA remained at .041, suggesting a close-fitting model. SRMR remained at .082. Overall, the fit indices suggested configural invariance. The configural model fit was highly similar to the model fit for the overall sample; therefore, we concluded that the configural invariance of the two narcissism factors held across men and women.

The additional constraint of invariant factor loadings across men and women was added to test for metric invariance next. The results from the chi-square difference test indicated a non-significant decrease in fit as a result of adding in equality constraints ($\Delta\chi^2 = 27.161$, $p > .05$). Change in CFI ($\Delta\text{CFI} = .003$) indicated that CFI for the metric invariance model demonstrated better fit (CFI = .927) than the configural model. Thus, there was evidence of metric invariance, suggesting that the two-factor narcissism structure was similar across gender.

Strong (scalar) invariance, in which factor loadings and intercepts were held constant across men and women, was tested next. When compared to the metric invariance model, the chi-square difference test was significant ($\Delta\chi^2 = 67.111$, $p < .01$), indicating a significant decrease in model fit as a result of constraining all model intercepts to equality. CFI decreased but not significantly so ($\Delta\text{CFI} = .003$). Relaxing constraints for one impactful intercept significantly improved the strong invariance model fit ($\Delta\chi^2 = 27.654$, $p < .01$). Additionally, this modified model did not significantly differ from the metric invariance model ($\Delta\chi^2 = 39.457$, $p > .05$). We concluded that the metric invariance model fits the data best at the two-factor level but that partial strong invariance was obtained. Given that partial strong invariance was obtained from relaxing the constraint on only one intercept, we proceeded with comparisons of the latent factor means. Women were significantly lower on the Grandiose factor than men ($Z = -3.77$, $p < .001$) and non-significantly lower on the Vulnerable factor than men ($Z = -1.13$, $p > .05$).

The fit indices for the one-factor model in the overall sample (i.e., across men and women) indicated that the model fit could be improved. The CFI (.882) and TLI (.848) indicated inadequate fit, and RMSEA (.135) was over the .08 threshold while SRMR (.032) indicated adequate fit. In order to improve model fit, error terms of the same construct were covaried based on high modification indices. For the modified model, CFI (.977), TLI (.964), SRMR (.031), and RMSEA (.065) indicated adequate fit.

In examining configural invariance at the one-factor level, CFI and TLI indices indicated that the overall fit of the model was adequate (CFI = .974, TLI = .959). RMSEA (.040) and SRMR (.031) indicated a close-fitting model. Overall, the fit indices suggested configural invariance, and model fit closely matched that of the overall sample; therefore, we concluded that the configural invariance of the one narcissism factor held across men and women.

The additional constraint of invariant factor loadings across men and women was added to test for metric invariance next. The results from the chi-square difference test indicated a non-significant decrease in fit as a result of adding in equality constraints ($\Delta\chi^2 = 8.148$, $p > .05$). Change in CFI ($\Delta\text{CFI} = .002$) indicated that the CFI for the metric invariance model demonstrated better fit (CFI = .976) than the configural model. Thus, there was evidence of metric invariance, suggesting that the two-factor narcissism structure was similar across gender.

Strong (scalar) invariance, in which factor loadings and intercepts were held constant across men and women, was tested next. When compared to the metric invariance model, the chi-square difference test was non-significant ($\Delta\chi^2 = 13.220$, $p > .05$), indicating a non-significant decrease in model fit as a result of constraining all model intercepts to equality. Change in CFI ($\Delta\text{CFI} = .001$) indicated that the CFI for the strong invariance model demonstrated better fit (CFI = .977) than the metric invariance model. Taken together, there was evidence that factorial invariance held at the strong level, suggesting that the latent factor means could be compared between men and women meaningfully. We proceeded with such a comparison and found that women were significantly lower on the Narcissism factor than men ($Z = -3.30$, $p < .001$).

DISCUSSION & CONCLUSION

Narcissism is connected to dysfunction in several domains, including aggressive and risk-taking behavior (Kealy et al., 2017), cognitive biases (e.g., Rhodewalt & Morf, 1998), injured relationships (e.g., Miller et al., 2007), alcohol and drug overuse (Kealy et al., 2017), and psychopathology (Pincus et al., 2009). As such, valid and reliable measurement of narcissism is critical.

With the popularity of super-short forms in recent years and corresponding warnings that such forms may be convenient but incur psychometric costs, including losses in construct validity, it is important to investigate short measure performance. Narcissism short forms are important candidates for such investigation because 1) the literature lacks empirical comparisons among the short forms and in comparison to their longer counterparts and 2) narcissism is a multifaceted construct for which retaining measurement breadth and depth is particularly critical. The present study sought to evaluate short narcissism measures in terms of their time savings compared to long forms, internal consistency, convergent validity among themselves and compared to long measures, incremental validity, ability to exhibit previously found factor structure, and measurement invariance across gender.

Timing

While acknowledging that our sample came from MTurk, which includes semi-professional survey takers who may be compelled to work efficiently, respondents were able to complete the personality measures comparatively quickly. Even the longest measure, the 60-item FFNI-SF, took under 4 minutes, on average. The shorter measures ranged from only 11 seconds for SINS to just over 2 minutes for the B-PNI, on average. These outcomes indicate that the largest difference across the measures is a difference of just under 4 minutes. Among the shorter measures, which ranged from 1 to 28 questions, all were able to be completed in under 3 minutes. Bearing in mind that when compiling several measures into one survey, estimated completion time can add up quite quickly and perhaps be improved by selecting super-short forms, time savings of 4 minutes at most per measure may not outweigh the potential psychometric costs of using such

measures. One such cost is losing the ability to capture facet-level narcissism with so few items in a measure (e.g., SINS: 1 item; DD-N: 4 items).

Internal Consistency

Brief measures fared decently in terms of internal consistency. All alphas and omegas were at least .70 with the majority over .80, and several over .90 (e.g., NGS, B-PNI, PES). However, short forms tended to have lower internal consistency than their long form counterparts. For example, NARQ Admiration went from a Cronbach's alpha of .90 to .74 (NARQ-S Admiration) and FFNI-SF Vulnerable went from .93 to .70 (FFNI-SSF Vulnerable).

Convergent Validity

Among the brief measures, correlations for measures of the same construct varied. Across constructs (general narcissism, grandiose narcissism, vulnerable narcissism), the brief measures showed the lowest median convergence for general narcissism (median $r = .66$; range: .35-.68), followed by grandiose narcissism (median $r = .69$; range: .46-.83) and vulnerable narcissism (median $r = .70$; range: .68-.73). All but one of the low convergent correlations (i.e., below .50) seen for general narcissism was accounted for by SINS. All but one of the remaining general narcissism correlations were at least .65, indicating acceptable but not strong convergence. Overall, NARQ-S (median $r = .69$) and FFNI-SSF (median $r = .68$) showed the strongest construct convergence relative to other general narcissism measures.

Convergence among grandiose narcissism measures was also variable. NARQ-S Rivalry was responsible for most of the low convergent correlations. Overall, NPI-13 (median $r = .76$) and FFNI-SSF Grandiose (median $r = .74$) showed the strongest convergence with other grandiose measures. Vulnerable narcissism scales exhibited the best convergence out of the three constructs examined perhaps due to its relative specificity (e.g., FFNI Grandiose comprises 11 subscales whereas FFNI Vulnerable comprises 4 subscales), with r s ranging from .68 to .73 and a median of .70. Each vulnerable narcissism measure performed comparably (i.e., B-PNI median $r = .72$; FFNI-SSF Vulnerable median $r = .70$; HSNS median $r = .70$; NVS median $r = .68$).

For each construct, the overall convergence was on the cusp of what is likely an acceptable range, .70-.80 (Sleep et al., 2021), and what is consistent with convergence found across other

constructs in clinical psychology (e.g., anxiety, depression; Sleep et al., 2021; Watson et al., 1995). Thus, while bearing in mind that most constructs had at least one particularly non-convergent measure responsible for most low correlations (e.g., SINS for general narcissism and NARQ-S Rivalry for grandiose narcissism), the data suggest that the measures within each construct are not isomorphic. Additionally, long form convergent correlations were higher than those for short forms (i.e., NARQ and FFNI-SF: $r = .86$ versus NARQ-S and FFNI-SSF: $r = .78$; NARQ and NPI: $r = .79$ versus NARQ-S and NPI-13: $r = .74$; NPI and FFNI-SF: $r = .82$ versus NPI-13 and FFNI-SSF: $r = .77$), indicating some loss of convergence in short forms compared to long forms.

When comparing brief measures with the longer measures, we found that the briefer measures generally evinced moderate to strong convergent correlations with the longer measure domains of the same construct. The highest correlations between each long form and all brief forms were each long form's counterparts, with all rs at least .86 except for NARQ-S Admiration ($r = .83$). Besides the brief form counterparts, remaining measures of the same construct showed similar correlational patterns to when brief forms were compared to each other. Specifically, NARQ-S and FFNI-SSF showed the strongest convergent correlations with NARQ ($r = .82$) and FFNI-SF ($r = .82$) while SINS performed poorly (SINS and NARQ: $r = .44$; SINS and FFNI-SF: $r = .52$); correlations between NARQ Rivalry and brief grandiose narcissism forms were relatively weak, with rs ranging from .49 to .59. The remaining brief forms within each construct (not the top or the worse performing brief measures) showed moderate to strong correlations, with rs ranging from .69 to .77 for general narcissism, rs ranging from .67 to .86 for grandiose narcissism, and rs ranging from .73 to .77 for vulnerable narcissism. Overall, NARQ was best predicted by its short counterpart, NARQ-S ($r = .87$), and FFNI-SF ($r = .82$). FFNI-SF was best predicted by its short counterpart, FFNI-SSF ($r = .93$), and NARQ-S ($r = .82$). NPI was best predicted by its short counterpart, NPI-13 ($r = .92$), FFNI-SSF Grandiose ($r = .84$), and NGS ($r = .84$). Contrary to hypothesis, vulnerable narcissism and the neuroticism factor from FFNI-SF overall showed the least rather than the most loss of coverage in short narcissism measures compared to their longer counterparts relative to the other constructs (i.e., vulnerable narcissism median $r = .76$; neuroticism factor convergent $r = .88$; general narcissism median $r = .73$; grandiose narcissism median $r = .73$).

Variance Accounted for by Brief Measures

The hierarchical regressions revealed that the variance of the long form domains was accounted for quite well by their short form counterparts. By themselves, the short form counterparts accounted for variance in the long form domains ranging from 83% (NARQ-S Admiration) to 95% (FFNI-SSF Grandiose). While changes in R^2 were statistically significant across almost all steps within every model, the changes were quite small in magnitude, indicating that including other brief measures in addition to the long form's counterpart did not add much to the variance explained for the long measure domain in question.

Criterion Validity

The factors that emerged from the bass-ackward analysis were correlated with narcissism measure domains and found to converge and diverge in expected ways. For example, F2.1 (Grandiose Narcissism) correlated highly with relevant measures like FFNI-SF Grandiose and NPI-13 while F2.2 (Vulnerable Narcissism) correlated with pertinent measures like FFNI-SF Vulnerable, HSNS, and NVS. Likewise, factors converged and diverged in mostly expected ways in their relations with other criterion measures. Grandiose and Vulnerable Narcissism diverged in their relations with criteria pertaining to self-esteem, though Grandiose Narcissism's relations with such criteria were not as strong as expected. F3.3 (Antagonism) showed strong negative relations with agreeableness scales while F2.2 (Vulnerable Narcissism) and F3.2 (Neuroticism) showed strong relations with criteria pertaining to emotional distress, such as anxiety, depression, emotional volatility, and BFI-2 Neuroticism.⁷ Contrary to expectation, the three factors did not consistently diverge in their relations with externalizing behavior, though Antagonism showed a significantly stronger association with disinhibition and a significantly weaker association with CAB Total than did Agentic Extraversion.

Structure Compared to Crowe et al. (2019)

The three-factor solution found by Crowe et al. (2019) using long narcissism measures was replicated in our current sample of brief measures, as hypothesized. Their two-factor solution was replicated as well and clearly fit the same factor labels given in the original study. The items that were retained in our narcissism item pool after removing overlapping items and those that loaded

poorly on the first unrotated factor were almost the same as those retained by Crowe et al. (2019), which is impressive given that the narcissism measures used in each study somewhat differed. Our final pool included 16 items not found in that of Crowe and colleagues (2019), but these mostly came from NVS and DD-N, two measures not used in their study. Our narcissism factors at each solution level showed similar relations to external criteria as those for Crowe et al. (2019). For example, no factors diverged in their association with CAB externalizing behaviors. The similarity of short-form versus long-form composition in terms of extracted factors between our sample and Crowe et al.'s (2019) sample can be considered equal, as all Tucker's congruence coefficients were over .95. Finally, the narcissism pool items in common with those used in Crowe et al. (2019) mostly fell in the same factors as in theirs, with 89% agreement at both the two- and three-factor levels.

Measurement Invariance Across Gender

Using multigroup confirmatory factor analysis (CFA), we assessed measurement invariance (MI) of our factor structures and loadings from our narcissism item pool across men and women to test whether they likely interpreted the narcissism items the same. For each factor solution (i.e., three factor, two factor, and one factor) after achieving an adequately fitting full-sample model, we tested MI for gender by increasing restriction at three levels: configural, metric, and strong/scalar. We found invariance at all levels for all factor solutions with the exception of strong invariance for the two-factor solution, for which we achieved partial strong invariance after relaxing just one intercept constraint. These results provide evidence that men and women endorse narcissism items in a similar manner. Thus, we concluded that latent factor scores between men and women could be meaningfully compared as gender differences in the latent constructs rather than deemed artifacts of the narcissism item pool used, with slight caution for the two-factor solution given its partial invariance. When latent factor scores were compared, we found that women were significantly lower on the Narcissism, Grandiose Narcissism, Antagonism, and Agentic Extraversion factors than men and non-significantly lower on the Vulnerable Narcissism and Neuroticism factors than men. These findings are in line with a 2015 meta-analytic review which found that men tended to have higher narcissism than women, scored higher on facets of the NPI (though some of those effect sizes were small), which is a measure of grandiose narcissism

(again, a composite of agentic extraversion and antagonism), and showed no difference in vulnerable narcissism (again, a composite of neuroticism and antagonism; Grijalva et al., 2015).

Conclusion Regarding use of Short Forms

The present results suggest that short forms do take less time to complete than the long forms overall but not significantly less. In terms of psychometric costs, internal consistency was lower for short forms compared to the long forms, but not problematically lower or lower than what one would expect when moving to a measure with fewer items. The short forms showed variable convergence, ranging from quite low to acceptable, but in part due to some problematically non-convergent forms (e.g., SINS and NARQ-Admiration). Convergence between short forms and long forms was generally moderate to strong; convergence was strongest between long forms and their short form counterparts. Short forms with long form counterparts performed well in terms of accounting for the variance of their long form counterparts. The short form items used for the bass-ackward analysis successfully replicated the factor structure of narcissism found by Crowe et al. (2019) using longer narcissism measures at both the two- and three-factor level, which suggests that coverage of narcissism in terms of structure and breadth was not adversely impacted by the short form items overall. The factors generated from the short form items also showed measurement invariance across gender, generally at the scalar invariance level.

Taken together, these findings suggest that it is still likely most advantageous to use the long forms whenever possible but that some of the short forms could be used when efficiency of survey administration is particularly important without significant psychometric cost. This would be especially true when using a long form's short form counterpart (e.g., FFNI-SSF instead of FFNI-SF). In general, if one wanted to use a short form to capture narcissism broadly, FFNI-SSF or NARQ-S would probably be the best choices, as they showed the strongest convergence with other general narcissism brief forms and long forms and showed good internal consistency; FFNI-SSF would also be best for its ability to capture narcissism at the three-factor level. Of note, however, there was not a significant difference between FFNI-SSF and NARQ in completion time. This makes sense given that they have a similar number of items. Thus, FFNI-SSF would not save time but would be a good substitute for NARQ specifically if one is wanting to capture narcissism at a more multi-faceted level without *adding* time. If one wanted to use a short form to capture grandiose narcissism, FFNI-SSF Grandiose or NPI-13 would probably be the best choices for their

convergent validity and good internal consistency. The brief vulnerable narcissism measures showed highly similar convergent validity; NVS and B-PNI Vulnerable evinced the best internal consistency so may be the best short substitutes for longer vulnerable narcissism scales.

The current study is not without limitations. First, the data used in this study were collected via self-report measures. Particularly when measuring a personality construct in which insight is often low, such as narcissism, it is useful to gather informant reports to instantiate survey responses. Second, the current study sample contained mostly Caucasian, “WEIRD” (i.e., White, Educated, Industrialized, Rich, and Democratic; Henrich et al., 2010) participants, which may limit the representativeness of our sample and findings. Future studies should further investigate the factor structure of narcissism in more diverse populations and conduct MI testing across other demographics. For example, it became apparent during data collection from reviewing responses to our prescreener questions assessing sufficient effortfulness and English proficiency that English was likely not a first language for many respondents. Differences in English proficiency could affect participants’ interpretations of survey items (e.g., NGS items including words such as “omnipotent,” “authoritative,” “unrivalled”) and would be an important issue to investigate using MI testing. Additionally, the current study conducted MI testing using a CFA approach, which makes assumptions that some consider to be too restrictive for the propensity of personality scales to be highly correlated (Chiorri et al., 2016; Collison et al., 2021; Samuel et al., 2015). Lending to this consideration is that the current study had to allow several error terms to covary and had to delete a few indicators in the 3-factor model in order to achieve adequate fit for the models tested. It would be useful to see if the current MI results hold using exploratory structural equation modeling, which is considered more conducive to personality research (Collison et al., 2021). Additionally, while measurement invariance analysis confers some defense against measurement bias, there are cultural matters that it may not fully explain. For example, early theoretical conceptualizations of narcissism (e.g., Freud deemed women more narcissistic due to a preoccupation with their physical appearance and obtaining possessions for themselves; Freud, 1914) that have informed the development of narcissism measures may intrinsically fold in gendered content. The items were evidently interpreted similarly by men and women in the current sample, but the items may not fully capture how narcissism might manifest differently or similarly in men and women. The study also did not examine test-retest reliability of the narcissism measures, which would have aided in our assessment of the performance of the brief narcissism

measures. Finally, the sample used for the current study comprised quasi-professional survey takers who are positively reinforced for efficiency and who have comparatively high educational attainment (i.e., over half of the sample endorsed at least a bachelor's degree). Thus, completion times for the current study should be considered the higher end of timing, and researchers should expect somewhat longer completion times in samples with lower education levels and less incentive for speed.

FOOTNOTES

1. The preregistration mistakenly excludes the NARQ total score among the narcissism measure indices to use in the current study's analyses whereas the researchers meant to include it and did use it for analyses.
2. The preregistration states that EPA-SSF includes a narcissism factor, but that is actually only true for the original EPA and EPA-SF.
3. The preregistration states that the intimate partner violence index of CAB will be included, but we did not use the version of CAB that has that index so instead used the general violence index.
4. The preregistration mistakenly attributes LSD tests to Tukey.
5. Boxplots revealed several outliers, and the data did not meet the assumptions of normality (Shapiro-Wilk's test: $p < .05$) and sphericity (Mauchly's test: $X^2(90) = 4441.87, p < .001$). The one-way repeated measures ANOVA is fairly robust to deviations from normality, especially in large sample sizes such as in the current study. Additionally, the assumption of sphericity is thought to be difficult not to violate (e.g., Weinfurt, 2000), and Mauchly's test of sphericity over-detects violations of sphericity in large samples (Kesselman et al., 1980). Furthermore, Maxwell and Delaney (2004) argue that the unadjusted test is hardly used in part due to the oversensitivity of the one-way repeated measures ANOVA to deviations from sphericity; they recommend ignoring the result of Mauchly's test of sphericity and using a Greenhouse-Geisser correction to interpret the result, as was done in the current study. However, as a precaution, the ANOVA was re-run with the five highest extreme outliers identified by SPSS for each narcissism measure's completion time to see if results were affected. The re-run test still revealed significant differences among completion times, $F(3.25, 1317.44) = 861.10, p < .001$. Pairwise comparisons results were the same as before with a few exceptions: NARQ-S and SD3, NPI-13 and SD3, NPI-13 and NVS, PES and SD3, and PES and NVS differed significantly in completion time ($p < .001$) whereas they did not in the original test. Given that it is not uncommon for MTurk workers to take breaks when completing surveys, the outliers in our data likely reflect true behavior of our study population and make sense to retain in our time completion analysis.
6. The preregistration states that predictors will be entered in the regression analysis simultaneously. We decided to conduct a hierarchical regression instead for each long form domain, as that would be more conducive to teasing apart accounted variance among different types of measures (i.e., short form counterparts, measures of the same construct, all brief measures together). Additionally, we decided not to include examination of sr^2 s and instead focus on changes in R^2 , as the latter would render more useful and less redundant information.
7. The preregistration states that we predicted that Vulnerable Narcissism (F2.2) and Neuroticism (F3.2) would also show strong relations with reactive aggression external

criteria, but we did not use such specific non-narcissism measures. The Emotional Volatility subscale from BFI-2 most closely relates to reactive aggression out of the external criteria used, and Vulnerable Narcissism and Neuroticism did, indeed, exhibit strong relations with it.

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APPENDIX A

Table 12. Content and Location of all Items Included in the Final Narcissism Item Pool

Item #	Scale	Original Item	Content	Min	Max	Mean	SD	F1.1	F2.1	F2.2	F3.1	F3.2
1	NARQ-S	1	I react annoyed if another person steals the show from me	1	6	2.10	1.40	0.69	0.45	0.37	0.38	0.25
2	NARQ-S	3	I want my rivals to fail	1	6	2.30	1.57	0.60	0.26	0.46	0.11	0.23
3	NARQ-S	4	Being a very special person gives me a lot of strength	1	6	2.70	1.64	0.65	0.75	-0.01	0.73	0.00
4	NARQ-S	6	Most people are somehow losers	1	6	1.70	1.19	0.57	0.27	0.42	0.01	0.08
5	FFNI-SSF	1	When someone does something nice for me, I wonder what they want from me	1	5	2.70	1.35	0.46	0.02	0.56	-0.10	0.35
6	FFNI-SSF	3	I don't worry about others' needs	1	5	2.00	1.09	0.43	0.30	0.20	-0.01	-0.19
7	FFNI-SSF	5	I hate being criticized so much that I can't control my temper when it happens	1	5	2.00	1.20	0.55	0.04	0.65	-0.08	0.44
8	FFNI-SSF	6	I will try almost anything to get my "thrills"	1	5	1.80	1.16	0.62	0.51	0.21	0.35	0.01
9	FFNI-SSF	8	I often fantasize about having lots of success and power	1	5	2.60	1.39	0.62	0.59	0.12	0.62	0.17
10	FFNI-SSF	9	I aspire for greatness	1	5	3.10	1.39	0.52	0.72	-0.13	0.77	-0.03
11	FFNI-SSF	10	I do not waste my time hanging out with people who are beneath me	1	5	1.80	1.08	0.57	0.41	0.26	0.16	-0.05
12	FFNI-SSF	11	It may seem unfair, but I deserve extra (i.e., attention, privileges, rewards)	1	5	1.90	1.18	0.73	0.67	0.18	0.50	-0.02
13	FFNI-SSF	12	I feel ashamed when people judge me	1	5	2.80	1.40	0.29	-0.26	0.65	-0.12	0.75
14	FFNI-SSF	13	I love to entertain people	1	5	3.00	1.38	0.39	0.67	-0.25	0.76	-0.09
15	FFNI-SSF	14	I'm willing to exploit others to further my own goals	1	5	1.80	1.12	0.70	0.44	0.39	0.19	0.06
16	NPI-13	1	I find it easy to manipulate people	1	5	2.20	1.26	0.56	0.48	0.17	0.31	-0.03
17	NPI-13	2	I know I am a good person because everybody keeps telling me so	1	5	2.60	1.24	0.47	0.71	-0.19	0.71	-0.15
18	NPI-13	3	I like having authority over other people	1	5	2.50	1.29	0.55	0.75	-0.13	0.71	-0.13

Table 12 continued

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Item #	Scale	Original Item	Content	Min	Max	Mean	SD	F1.1	F2.1	F2.2	F3.1	F3.2
19	NPI-13	6	I have a strong will to power	1	5	2.70	1.42	0.47	0.72	-0.20	0.71	-0.17
20	NPI-13	7	I expect a great deal from other people	1	5	2.70	1.28	0.61	0.58	0.12	0.57	0.12
21	NPI-13	8	I like to look at my body	1	5	2.20	1.24	0.50	0.65	-0.08	0.56	-0.16
22	NPI-13	10	I will never be satisfied until I get all that I deserve	1	5	2.50	1.37	0.64	0.67	0.07	0.64	0.05
23	NPI-13	11	I will usually show off if I get the chance	1	5	2.10	1.18	0.69	0.69	0.11	0.63	0.04
24	NPI-13	12	I am a born leader	1	5	2.70	1.37	0.46	0.79	-0.29	0.80	-0.22
25	HSNS	1	I can become entirely absorbed in thinking about my personal affairs, my health, my cares or my relations to others	1	5	3.40	1.14	0.38	0.16	0.31	0.15	0.27
26	HSNS	4	I dislike sharing the credit of an achievement with others	1	5	2.10	1.18	0.49	0.15	0.45	0.01	0.23
27	HSNS	5	I feel that I have enough on my hands without worrying about other people's troubles	1	5	2.70	1.29	0.41	0.10	0.41	-0.13	0.10
28	HSNS	6	I feel that I am temperamentally different from most people	1	5	2.90	1.21	0.44	0.15	0.39	0.08	0.26
29	HSNS	7	I often interpret the remarks of others in a personal way	1	5	2.80	1.30	0.42	-0.15	0.70	-0.10	0.69
30	HSNS	8	I easily become wrapped up in my own interests and forget the existence of others	1	5	2.50	1.28	0.51	0.10	0.54	-0.08	0.27
31	HSNS	9	I dislike being with a group unless I know that I am appreciated by at least one of those present	1	5	2.80	1.30	0.43	0.09	0.44	0.09	0.39
32	HSNS	10	I am secretly "put out" or annoyed when other people come to me with their troubles, asking me for my time and sympathy	1	5	2.00	1.14	0.51	0.14	0.48	-0.12	0.12
33	PES	1	I honestly feel I'm just more deserving than others	1	7	2.50	1.79	0.70	0.66	0.16	0.48	-0.06
34	PES	5r	*I do not necessarily deserve special treatment	1	7	2.59	1.74	0.45	0.55	-0.04	0.47	-0.10
35	PES	6	I deserve more things in my life	1	7	3.70	1.89	0.59	0.62	0.05	0.61	0.06
36	PES	8	Things should go my way	1	7	4.10	1.77	0.49	0.57	-0.01	0.57	0.01
37	B-PNI	1	I can usually talk my way out of anything	0	5	2.10	1.52	0.51	0.64	-0.07	0.54	-0.15

Table 12 continued

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Item #	Scale	Original Item	Content	Min	Max	Mean	SD	F1.1	F2.1	F2.2	F3.1	F3.2
38	B-PNI	2	When people don't notice me, I start to feel bad about myself.	0	5	1.30	1.34	0.06	0.15	0.58	0.21	0.59
39	B-PNI	3	I often hide my needs for fear that others will see me as needy and dependent.	0	5	2.10	1.69	0.43	-0.15	0.71	-0.06	0.74
40	B-PNI	7	Sometimes I avoid people because I'm concerned that they'll disappoint me	0	5	1.70	1.53	0.51	0.02	0.62	-0.02	0.52
41	B-PNI	8	I typically get very angry when I'm unable to get what I want from others	0	5	1.10	1.34	0.72	0.27	0.61	0.15	0.41
42	B-PNI	9	When others don't meet my expectations, I often feel ashamed about what I wanted	0	5	1.30	1.35	0.57	0.02	0.69	0.06	0.66
43	B-PNI	10	I feel important when others rely on me	0	5	2.80	1.51	0.39	0.31	0.15	0.50	0.37
44	B-PNI	13	I often fantasize about accomplishing things that are probably beyond my means	0	5	2.40	1.68	0.51	0.33	0.28	0.39	0.35
45	B-PNI	15	It's hard to show others the weaknesses I feel inside	0	5	2.50	1.65	0.30	-0.23	0.62	-0.15	0.65
46	B-PNI	16	It's hard to feel good about myself unless I know other people admire me	0	5	1.30	1.43	0.59	0.14	0.58	0.20	0.59
47	B-PNI	18	I am preoccupied with thoughts and concerns that most people are not interested in me	0	5	1.30	1.49	0.59	0.09	0.64	0.13	0.61
48	B-PNI	19	I like to have friends who rely on me because it makes me feel important	0	5	2.00	1.61	0.54	0.39	0.24	0.55	0.43
49	B-PNI	20	Sometimes I avoid people because I'm concerned they won't acknowledge what I do for them	0	5	1.10	1.40	0.66	0.24	0.57	0.19	0.45
50	B-PNI	22	It irritates me when people don't notice how good a person I am	0	5	1.20	1.44	0.72	0.29	0.58	0.30	0.53
51	B-PNI	24	I try to show what a good person I am through my sacrifices	0	5	2.20	1.60	0.46	0.32	0.22	0.53	0.46
52	B-PNI	25	I often fantasize about performing heroic deeds	0	5	1.80	1.65	0.57	0.41	0.26	0.47	0.32
53	B-PNI	27	I can't stand relying on other people because it makes me feel weak	0	5	2.20	1.74	0.41	-0.02	0.54	-0.06	0.45
54	B-PNI	28	When others get a glimpse of my needs, I feel anxious and ashamed	0	5	1.80	1.66	0.44	-0.24	0.83	-0.19	0.80
55	SINS	1	To what extent do you agree with this statement: "I am a narcissist"	1	10	2.50	2.10	0.52	0.33	0.29	0.19	0.10
56	SD3-N	2r	*I hate being the center of attention	1	5	2.50	1.25	0.40	0.69	-0.26	0.72	-0.17
57	SD3-N	3	Many group activities tend to be dull without me	1	5	2.20	1.12	0.61	0.70	-0.01	0.62	-0.08
58	SD3-N	5	I like to get acquainted with important people	1	5	2.90	1.26	0.58	0.75	-0.09	0.82	0.03
59	SD3-N	7	I have been compared to famous people	1	5	2.20	1.29	0.52	0.55	0.04	0.46	-0.06

Table 12 continued

Item #	Scale	Original Item	Content	Min	Max	Mean	SD	F1.1	F2.1	F2.2	F3.1	F3.2
60	SD3-N	8r	*I am an average person	1	5	2.20	1.19	0.42	0.57	-0.10	0.52	-0.12
61	SD3-N	9	I insist on getting the respect I deserve	1	5	2.70	1.26	0.60	0.66	0.04	0.64	0.04
62	DD-N	3	I tend to seek prestige or status	1	5	2.40	1.36	0.70	0.68	0.13	0.67	0.13
63	NVS	1	To what degree do you currently feel ashamed	1	7	2.10	1.60	0.40	-0.15	0.68	-0.14	0.62
64	NVS	3	To what degree do you currently feel self-absorbed	1	7	2.50	1.68	0.55	0.17	0.49	0.04	0.28
65	NVS	4	To what degree do you currently feel fragile	1	7	2.60	1.83	0.35	-0.29	0.77	-0.20	0.78
66	NVS	5	To what degree do you currently feel underappreciated	1	7	3.10	1.89	0.37	-0.20	0.68	-0.12	0.70
67	NVS	7	To what degree do you currently feel resentful	1	7	2.40	1.66	0.53	-0.10	0.78	-0.13	0.66
68	NVS	9	To what degree do you currently feel irritable	1	7	2.80	1.81	0.32	-0.30	0.74	-0.29	0.66
69	NVS	10	To what degree do you currently feel misunderstood	1	7	3.10	1.92	0.38	-0.20	0.70	-0.16	0.67
70	NVS	11	To what degree do you currently feel vengeful	1	7	1.90	1.41	0.62	0.16	0.60	0.01	0.36
71	NGS	3	Indicate to what extent you feel this way <i>in general</i> , that is, <i>on the average</i> : brilliant	1	7	3.80	1.91	0.51	0.74	-0.17	0.67	-0.20
72	NGS	8	Indicate to what extent you feel this way <i>in general</i> , that is, <i>on the average</i> : heroic	1	7	2.70	1.85	0.61	0.77	-0.09	0.67	-0.17

Item #	Scale	Original Item	Content	F3.3	F4.1	F4.2	F4.3	F4.4
1	NARQ-S	1	I react annoyed if another person steals the show from me	0.24	0.25	0.11	0.25	0.31
2	NARQ-S	3	I want my rivals to fail	0.44	0.08	0.18	0.46	0.09
3	NARQ-S	4	Being a very special person gives me a lot of strength	0.04	0.66	-0.03	0.05	0.14
4	NARQ-S	6	Most people are somehow losers	0.65	-0.03	0.05	0.67	0.03

Table 12 continued

Item #	Scale	Original Item	Content	F3.3	F4.1	F4.2	F4.3	F4.4
5	FFNI-SSF	1	When someone does something nice for me, I wonder what they want from me	0.38	-0.07	0.33	0.39	0.03
6	FFNI-SSF	3	I don't worry about others' needs	0.74	0.01	-0.11	0.77	-0.21
7	FFNI-SSF	5	I hate being criticized so much that I can't control my temper when it happens	0.40	-0.19	0.27	0.42	0.32
8	FFNI-SSF	6	I will try almost anything to get my "thrills"	0.39	0.25	-0.06	0.41	0.17
9	FFNI-SSF	8	I often fantasize about having lots of success and power	-0.04	0.64	0.19	-0.03	0.03
10	FFNI-SSF	9	I aspire for greatness	-0.13	0.81	0.05	-.0.13	-0.07
11	FFNI-SSF	10	I do not waste my time hanging out with people who are beneath me	0.61	0.06	-0.12	0.63	0.11
12	FFNI-SSF	11	It may seem unfair, but I deserve extra (i.e., attention, privileges, rewards)	0.40	0.36	-0.12	0.42	0.23
13	FFNI-SSF	12	I feel ashamed when people judge me	-0.19	-0.18	-0.55	-0.20	0.41
14	FFNI-SSF	13	I love to entertain people	-0.25	0.70	-0.10	-0.25	0.11
15	FFNI-SSF	14	I'm willing to exploit others to further my own goals	0.64	0.11	0.00	0.67	0.10
16	NPI-13	1	I find it easy to manipulate people	0.40	0.40	0.09	0.43	-0.23
17	NPI-13	2	I know I am a good person because everybody keeps telling me so	-0.02	0.61	-0.18	-0.02	0.14
18	NPI-13	3	I like having authority over other people	0.06	0.77	-0.01	0.07	-0.18
19	NPI-13	6	I have a strong will to power	-0.01	0.67	-0.14	0.00	0.01
20	NPI-13	7	I expect a great deal from other people	0.05	0.53	0.10	0.06	0.10
21	NPI-13	8	I like to look at my body	0.19	0.47	-0.18	-0.20	0.09
22	NPI-13	10	I will never be satisfied until I get all that I deserve	0.08	0.60	0.05	0.09	0.08
23	NPI-13	11	I will usually show off if I get the chance	0.16	0.53	-0.02	0.17	0.19
24	NPI-13	12	I am a born leader	-0.08	0.86	-0.08	-0.07	-0.18
25	HSNS	1	I can become entirely absorbed in thinking about my personal affairs, my health, my cares or my relations to others	0.08	0.20	0.29	0.09	-0.02

Table 12 continued

Item #	Scale	Original Item	Content	F3.3	F4.1	F4.2	F4.3	F4.4
26	HSNS	4	I dislike sharing the credit of an achievement with others	0.40	-0.02	0.18	0.42	0.08
27	HSNS	5	I feel that I have enough on my hands without worrying about other people's troubles	0.58	-0.06	0.17	0.61	-0.19
28	HSNS	6	I feel that I am temperamentally different from most people	0.24	0.21	0.37	0.26	-0.21
29	HSNS	7	I often interpret the remarks of others in a personal way	0.02	-0.13	0.54	0.02	0.29
30	HSNS	8	I easily become wrapped up in my own interests and forget the existence of others	0.50	-0.02	0.30	0.52	-0.09
31	HSNS	9	I dislike being with a group unless I know that I am appreciated by at least one of those present	0.10	0.10	0.35	0.10	0.10
32	HSNS	10	I am secretly "put out" or annoyed when other people come to me with their troubles, asking me for my time and sympathy	0.69	-0.09	0.15	0.71	-0.12
33	PES	1	I honestly feel I'm just more deserving than others	0.44	0.30	-0.18	0.46	0.27
34	PES	5r	*I do not necessarily deserve special treatment	0.15	0.37	-0.15	0.16	0.15
35	PES	6	I deserve more things in my life	0.03	0.56	0.04	0.04	0.11
36	PES	8	Things should go my way	0.00	0.54	0.01	0.01	0.07
37	B-PNI	1	I can usually talk my way out of anything	0.20	0.61	-0.02	0.22	-0.22
38	B-PNI	2	When people don't notice me, I start to feel bad about myself.	-0.01	0.05	0.34	-0.01	0.53
39	B-PNI	3	I often hide my needs for fear that others will see me as needy and dependent.	-0.08	0.00	0.68	-0.08	0.15
40	B-PNI	7	Sometimes I avoid people because I'm concerned that they'll disappoint me	0.20	0.06	0.51	0.21	0.00
41	B-PNI	8	I typically get very angry when I'm unable to get what I want from others	0.37	0.06	0.28	0.39	0.27
42	B-PNI	9	When others don't meet my expectations, I often feel ashamed about what I wanted	0.07	-0.05	0.45	0.07	0.43
43	B-PNI	10	I feel important when others rely on me	-0.39	0.48	0.31	-0.40	0.20
44	B-PNI	13	I often fantasize about accomplishing things that are probably beyond my means	-0.09	0.50	0.42	-0.09	-0.07
45	B-PNI	15	It's hard to show others the weaknesses I feel inside	-0.05	-0.02	0.66	-0.06	-0.01

Table 12 continued

Item #	Scale	Original Item	Content	F3.3	F4.1	F4.2	F4.3	F4.4
46	B-PNI	16	It's hard to feel good about myself unless I know other people admire me	0.00	0.04	0.36	-0.01	0.51
47	B-PNI	18	I am preoccupied with thoughts and concerns that most people are not interested in me	0.06	-0.02	0.38	0.06	0.49
48	B-PNI	19	I like to have friends who rely on me because it makes me feel important	-0.31	0.40	0.22	-0.33	0.51
49	B-PNI	20	Sometimes I avoid people because I'm concerned they won't acknowledge what I do for them	0.23	0.04	0.25	0.24	0.41
50	B-PNI	22	It irritates me when people don't notice how good a person I am	0.11	0.15	0.32	0.11	0.45
51	B-PNI	24	I try to show what a good person I am through my sacrifices	-0.41	0.40	0.27	-0.44	0.47
52	B-PNI	25	I often fantasize about performing heroic deeds	-0.08	0.44	0.25	-0.08	0.19
53	B-PNI	27	I can't stand relying on other people because it makes me feel weak	0.18	0.08	0.51	0.19	-0.13
54	B-PNI	28	When others get a glimpse of my needs, I feel anxious and ashamed	0.04	-0.12	0.73	0.04	0.14
55	SINS	1	To what extent do you agree with this statement: "I am a narcissist"	0.37	0.21	0.13	0.39	-0.05
56	SD3-N	2r	*I hate being the center of attention	-0.11	0.70	-0.12	-0.11	-0.01
57	SD3-N	3	Many group activities tend to be dull without me	0.18	0.51	-0.14	0.19	0.16
58	SD3-N	5	I like to get acquainted with important people	-0.18	0.83	0.08	-0.18	0.01
59	SD3-N	7	I have been compared to famous people	0.22	0.44	-0.03	0.24	-0.02
60	SD3-N	8r	*I am an average person	0.08	0.54	-0.05	0.09	-0.10
61	SD3-N	9	I insist on getting the respect I deserve	0.04	0.62	0.06	0.05	0.03
62	DD-N	3	I tend to seek prestige or status	0.05	0.60	0.07	0.06	0.19
63	NVS	1	To what degree do you currently feel ashamed	0.10	-0.15	0.50	0.10	0.23
64	NVS	3	To what degree do you currently feel self-absorbed	0.40	0.12	0.34	0.43	-0.13
65	NVS	4	To what degree do you currently feel fragile	-0.05	-0.19	0.66	-0.05	0.25
66	NVS	5	To what degree do you currently feel underappreciated	-0.04	-0.01	0.69	-0.04	0.03
67	NVS	7	To what degree do you currently feel resentful	0.21	-0.07	0.61	0.22	0.09

Table 12 continued

Item #	Scale	Original Item	Content	F3.3	F4.1	F4.2	F4.3	F4.4
68	NVS	9	To what degree do you currently feel irritable	0.13	-0.16	0.66	0.13	-0.04
69	NVS	10	To what degree do you currently feel misunderstood	0.05	0.00	0.72	0.05	-0.09
70	NVS	11	To what degree do you currently feel vengeful	0.46	0.01	0.32	0.48	0.06
71	NGS	3	Indicate to what extent you feel this way <i>in general</i> , that is, <i>on the average</i> : brilliant	0.12	0.66	-0.13	0.13	-0.08
72	NGS	8	Indicate to what extent you feel this way <i>in general</i> , that is, <i>on the average</i> : heroic	0.21	0.55	-0.22	0.23	0.15