Validation of the Narcissistic Admiration and Rivalry Questionnaire short scale (NARQ-S) in convenience and representative samples

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Abstract

Due to increased empirical interest in narcissism across social sciences, there is a need for inventories that can be administered quickly while also reliably measuring both the agentic and antagonistic aspects of grandiose narcissism. In this study, we sought to validate the factor structure, provide representative descriptive data and reliability estimates, assess the reliability across the trait spectrum, and examine the nomological network of the short version (NARQ-S) of the Narcissistic Admiration and Rivalry Questionnaire (Back et al., 2013). We used data from a large convenience sample (total $N = 11,937$) as well as data from a large representative sample (total $N = 4,433$) that included responses to other narcissism measures as well as related constructs, including the other Dark Triad traits, Big Five personality traits, and self-esteem. Confirmatory factor analysis and Item Response Theory were used to validate the factor structure and estimate the reliability across the latent trait spectrum, respectively. Results suggest that the NARQ-S shows a robust factor structure and is a reliable and valid short measure of the agentic and antagonistic aspects of grandiose narcissism. We also discuss future directions and applications of the NARQ-S as a short and comprehensive measure of grandiose narcissism.

Word count: 198

Keywords: narcissism, short scale, representative sample, validation, personality

Public Significance Statement:

The present study suggests that the Narcissistic Admiration and Rivalry short scale (NARQ-S) is a reliable and valid short measure of the agentic and the antagonistic aspects of grandiose narcissism, which is suitable for application in a wide variety of research contexts and study designs.

Validation of the Narcissistic Admiration and Rivalry Questionnaire short scale

(NARQ-S) in convenience and representative samples

In recent years, it has been increasingly recognized that grandiose narcissism (henceforth 'narcissism') is best understood as a multidimensional construct (Back et al., 2013; Brown, Budzek, & Tamborski, 2009; Miller & Campbell, 2008; Paulhus, 2001; Miller et al., 2011). Specifically, narcissism incorporates agentic aspects such as dominance, charm, self-assuredness, and humor (Back, Schmukle, & Egloff, 2010; Küfner, Nestler, & Back, 2013; Paulhus, 1998) as well as antagonistic aspects, such as selfishness, hostility, entitlement, and arrogance (e.g. Bushman & Baumeister, 1998; Reidy, Foster, & Zeichner, 2010).

The Narcissistic Admiration and Rivalry Concept (NARC) is a self-regulatory process model of grandiose narcissism that differentiates these two inter-related dimensions of narcissism: narcissistic admiration (agentic aspects driven by self-enhancement) and narcissistic rivalry (antagonistic aspects driven by self-defense). Contrary to previously introduced models of grandiose narcissism, the NARC is a two-dimensional process model that explicitly incorporates agentic (admiration) and antagonistic (rivalry) aspects of grandiose narcissism. Further, it describes the underlying motivational, resulting behavioral, and interpersonal dynamics of both narcissistic admiration and rivalry. The NARC, thus, follows from literature characterizing grandiose narcissism as a mix of both agentic and antagonistic aspects: grandiose narcissism has been described as incorporating well-adaptedness and malignancy (Kernberg, 1975), extraversion and disagreeableness (Paulhus, 2001), adaptive interpersonal and maladaptive intrapersonal aspects (Brown et al., 2009). Grandiose narcissism has been shown to be associated with positive consequences such as positive self-views, emergent leadership, and interpersonal success (short-term) as well as negative consequences such as relationship trouble, aggression, and cheating (Campbell & Campbell, 2009). Going beyond existing process models (e.g. Campbell & Campbell, 2009;

Morf & Rhodewalt, 2001), the NARC not only includes dynamic processes, but also explicitly acknowledges and considers the two dimensions of grandiose narcissism and places them in a coherent process model. Generally speaking, with respect to consequential outcomes of narcissism, the agentic aspects facilitate positive short-term effects (e.g. higher levels of state self-esteem; Geukes et al., in press; peer popularity at zero and short-term acquaintance, Back et al., 2010; Lange, Crusius, & Hagemeyer, 2016; Leckelt, Küfner, Nestler, & Back, 2015; being rated as attractive, Oltmanns, Friedman, Fiedler, & Turkheimer, 2004; dating success, Wurst et al., 2016) whereas the antagonistic aspects are linked to negative effects in the long run (e.g., higher self-esteem fragility, Geukes et al., in press; increasingly negative peer evaluations, Leckelt et al., 2015; Paulhus, 1998; higher number of divorces and romantic relationship conflict, Cramer, 2011; Wurst et al., 2016; see also Campbell & Campbell, 2009).

Given the important consequences associated with both aspects of narcissism across a variety of domains including psychological health as well as social and occupational functioning, it is important to study the effects of agentic and antagonistic aspects of narcissism not only in convenience samples but also in large representative samples (e.g. panel surveys) and more naturalistic settings (e.g. field studies using mobile devices, ambulatory assessment in general). In these settings, the length of measurement tools is a major concern due to time limitations and respondents' fatigue. It is, therefore, crucial to have shorter, time-efficient measures available that are able to reliably and validly assess both the agentic and antagonistic aspects of narcissism.

The most frequently used measure of narcissism to date is the 40-item version of the Narcissistic Personality Inventory (NPI; Raskin & Terry, 1988). In recent years, the NPI has been criticized for its ambiguous factor structure (e.g., Corry, Merritt, Mrug, & Pamp, 2008), low coverage of the more maladaptive aspects of narcissism (Rosenthal & Hooley, 2010; Rosenthal, Montoya, Ridings, Rieck, & Hooley, 2011), and unreliability of scores on some of

its facets. This especially applies to the only antagonistic facet, Entitlement/Exploitativeness (e.g., αs ranging from .44 to .47, Studies 2-4, Ackerman et al., 2011; see also, del Rosario & White, 2005; Trzesniewski, Donnellan, & Robins, 2008). While the NPI is not without merits regarding the global assessment of narcissism (e.g., Miller & Campbell, 2011; Miller, Lynam, & Campbell, 2016), it may not be well suited for a differentiated assessment of narcissism, especially in restrictive settings such as panel surveys or repeated assessments in the field. There are other short measures of narcissism available, but these do not systematically differentiate the antagonistic and agentic aspects of narcissism. Such short narcissism scales can be found in inventories designed to measure the Dark Triad (Paulhus & Williams, 2002), such as the Dirty Dozen (Jonason, & Webster, 2010) and the Short Dark Triad (SD3; Jones & Paulhus, 2014), the Narcissism Grandiosity Scale (Crowe, Carter, Campbell, & Miller, 2016) or short versions of the NPI (e.g. NPI-16: Ames, Rose, & Anderson, 2006; NPI-13: Gentile et al., 2013). Short versions of other inventories created to assess a breadth of narcissistic aspects (including pathological narcissism) may be unfeasible in length for research designs with time restrictions (brief version of the Five Factor Narcissism Inventory, 60 items, Sherman et al., 2015; short form of the Pathological Narcissism Inventory: 28 items; Schoenleber, Roche, Wetzel, Pincus, & Roberts, 2015; Grandiose Narcissism Scale: 33 items; Foster, McCain, Hibberts, Brunell, & Johnson, 2015).

Recently, Back and colleagues (2013) developed the Narcissistic Admiration and Rivalry Questionnaire (NARQ) that assesses the agentic (admiration) and antagonistic (rivalry) aspects of narcissism according to the NARC. In their paper, Back and colleagues showed that the NARQ can reliably measure and distinguish between the agentic and antagonistic aspects of narcissism. Additionally, the authors introduced a short version of the NARQ (NARQ-S), comprising 6 items. While such an ultra-brief assessment of agentic and antagonistic narcissism seems desirable for use in time-restricted settings, the NARQ-S has

not yet been formally validated regarding its factor structure, reliability of its test scores, and situation in a broader nomological network.

The Present Study

The present study seeks to (1) validate the two-dimensional structure of the NARQ-S, (2) provide representative descriptive data and reliability estimates, (3) investigate the reliability across the trait spectrum, and (4) examine its theoretically derived relations to other narcissism measures as well as related constructs, including the other Dark Triad traits, Big Five personality traits, and self-esteem. We expect the NARQ-S to show the two correlated factors-structure as derived from the NARC, to be as reliable as well-established ultra-short personality measures with similar number of items per dimension (e.g., the 15-item GSOEP Big Five Inventory, BFI-S; Gerlitz & Schupp, 2005; Hahn, Gottschling, & Spinath, 2012), to differentiate between individuals across a sufficiently large spectrum of narcissism, and to exhibit a nomological network pattern similar to the full NARQ.

To address these aims, we used data from several large-scale samples including both convenience samples as they are predominantly used in psychological research and large, representative samples.

Method

Samples

We used one convenience sample (hereafter Sample C) and one representative sample (hereafter Sample R) in the present study. Each of these samples is a combination of several smaller samples that were aggregated. We describe these two combined samples below and direct readers to the supplementary online material (SOM)[1] accompanying this article for detailed information on all the individual samples.

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[1] Detailed sample descriptions and sampling information can be found in the SOM. All information and files described in this and the following footnotes can be found online at the Open Science Framework website under the link osf.io/pb43s

Convenience sample. We collected various German (20 samples, $N = 9,125$, 31% male, $M_{age} = 27.01$, $SD_{age} = 8.36$) and English (7 samples from the US and UK; $N = 2,812$, 37% male, $M_{age} = 25.19$, $SD_{age} = 10.96$) convenience samples[2]. Combined, this sample (Sample C) includes 11,937 participants (33% male, $M_{age} = 26.57$, $SD_{age} = 9.08$, $range_{age} = 14$ to 75 years).

Representative sample. This sample is a combination of two representative German samples. One of these representative samples is the Innovation Sample of the Socio-economic Panel (SOEP-IS; Richter & Schupp, 2012) and comprises 1,920 participants (48% male, $M_{age} = 52.22$, $SD_{age} = 18.06$, range = 17 to 96). The SOEP-IS is an ongoing, nationally representative longitudinal study of private households in Germany. The sample consists of respondents with differing levels of education, work situations, and marital statuses. Besides containing a relatively short set of core questions, the SOEP-IS incorporates innovative content that is purely user-designed and selected through an annual competitive refereed process to identify top-quality research questions and operationalizations. All data have been collected by a professional high-quality fieldwork organization (TNS Infratest Social Research, Munich).

The second representative sample was originally collected for a survey on mental health and includes 2,513 participants (45% male, $M_{age} = 48.79$, $SD_{age} = 18.11$, range = 14 to 94). This sample, which is representative for the general population of Germany (regarding age, sex, region of residence, and education), was selected by a demographic consulting company (USUMA, Berlin, Germany). The survey was conducted in concordance with the Declaration of Helsinki, met ethical guidelines of the international code of Marketing and Social Research practice by the International Chamber of Commerce and the European Society for Opinion and Marketing Research and was approved by the IRB of the University

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[2] We tested for weak factorial measurement invariance across the English and German samples. Results confirmed that weak factorial invariance held (Table S1)

of Leipzig. The combined representative sample (Sample R) includes 4,433 participants (46% male, $M_{age} = 50.28$, $SD_{age} = 18.17$, range$_{age}$ = 14 to 96 years).

Measures

      Narcissistic Admiration and Rivalry. Narcissism was assessed with the full (NARQ) and the 6-item short form of the Narcissistic Admiration and Rivalry Questionnaire (NARQ-S; Back et al., 2013). The full version of the NARQ is an 18-item measure of grandiose narcissism, distinguishing the agentic (admiration) and antagonistic (rivalry) parts of grandiose narcissism. Each dimension has three subscales that are measured by three items each and contain content addressing narcissists' *affective-motivational*, *cognitive*, and *behavioral* processes. For admiration, these subscales are *grandiosity*, *strive for uniqueness*, and *charmingness*. A typical item reads "Being a very special person gives me a lot of strength". The rivalry dimension consists of the subscales *devaluation*, *strive for supremacy*, and *aggressiveness*. A typical item reads "I want my rivals to fail". Items are answered on a 1 (not agree at all) to 6 (agree completely) scale. The NARQ-S has six items, three for each dimension and one from each subscale. Items were selected so that the admiration and rivalry brief scales contained items of all three NARQ subscales and content domains (affective-motivational, behavioral, and cognitive). For each dimensions, item inclusion was based on the highest factor loading of the respective subscale (Back et al., 2013). An overview of the items, their means and standard deviations, inter-correlation, and factor loadings can be found in Table 1. In the present research, most samples used the full NARQ from which NARQ-S items were selected, while others only applied the NARQ-S (see SOM). Both representative samples exclusively applied the short 6-item version. We would like to point out that a total score of the NARQ-S can also be calculated in cases where researchers are interested in a global assessment rather than the differential influence of agentic and antagonistic aspects of grandiose narcissism. However, we would recommend calculating and using the admiration

and rivalry dimensions because they provide a more nuanced insight into the, at times, paradoxical effects of narcissism.[3]

NPI-Narcissism. The Narcissistic Personality Inventory (NPI; Raskin & Terry, 1988) is a 40-item, forced-choice, self-report measure of grandiose narcissism. In addition to the NPI total score, we calculated the three NPI subscales (LA: Leadership/Authority, GE: Grandiose Exhibitionism, EE: Entitlement/Exploitativeness) identified by Ackerman et al. (2011). Data on the 40-item version were available for 16 of the smaller convenience samples (see SOM). One of the smaller convenience samples used the German NPI-15 (Schütz, Marcus, & Sellin, 2004).

Dark Triad. Data on the Dark Triad traits (psychopathy, narcissism, Machiavellianism) were available for seven of the smaller convenience samples and one of the representative samples. All subsamples of the convenience sample used the German version of the Dirty Dozen (Küfner, Dufner, & Back, 2015). For one subsample of the representative sample, a 9-item version of the German Dirty Dozen, the Naughty Nine (Küfner et al., 2015), was used.

Big Five. The Big Five personality traits of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness were measured using different instruments across the various samples. Six of the smaller samples used in Sample C did not have data on the Big Five. Of the remaining 19 smaller samples, all but two used the Big Five Inventory (BFI; John, Donahue, & Kentle, 1991) or a shortened version of the BFI. The remaining two samples used the NEO-PI-R (Costa & McCrae, 1992) and the 50-item IPIP (Goldberg et al., 2006), respectively (see SOM). In Sample R, Big Five data was only available for the SOEP-IS, which used the BFI-S (Gerlitz & Schupp, 2005).

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[3] Correlational results for the NARQ total score can be found in Table S4.

Self-esteem. Self-esteem data was available for 19 of the smaller samples that make up Sample C. In all but two cases, the Rosenberg Self-esteem Scale (RSES, Rosenberg, 1965) was used. The remaining two studies used the complete German multidimensional self-esteem scale or a shortened 12-item version of it (MSWS; Schütz & Sellin, 2006). In Sample R, self-esteem data was only available for the SOEP-IS, which uses a single item measure of self-esteem. The item reads "I have a positive attitude towards myself" and was assessed on a 7-point scale ranging from 1 "does not apply at all" to 7 "applies completely".

Results

Factor structure

We used confirmatory factor analyses with full information maximum likelihood estimation to validate the two-dimensional structure of the NARQ-S. One- and two-dimensional models with uncorrelated and correlated factors were fitted to the data of Samples C and R. The two best fitting models were then compared against each other. We used several indices of model fit: comparative fit index (CFI), chi-square test, root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Cut-off criteria for goodness of fit were based on Hu and Bentler (1999) with values of $\geq .95$ for the CFI, $\leq .08$ for the SRMR, and $\leq .06$ for the RMSEA indicating good fit. All analyses were performed in R version 3.2.2 (R Core Team, 2015). CFAs were run using the *lavaan* package (version 0.5-17; Rosseel, 2012).

Factor loadings can be found in Table 1 and the results of the CFAs can be found in Table 2. In both Samples C and R, the two-dimensional model with correlated factors (correlation of the latent factors = .60 and .74 in Samples C and R, respectively) fit the data significantly better than the one-dimensional model (Sample C: $\Delta\chi^2(1) = 1451.94$, $p < .001$; Sample R: $\Delta\chi^2(1) = 688.85$, $p < .001$) or the two-dimensional model with uncorrelated factors (Sample C: $\Delta\chi^2(1) = 1868.57$, $p < .001$; Sample R: $\Delta\chi^2(1) = 1761.19$, $p < .001$). The overall model fit was good as indicated by the CFI and SRMR (Sample C/R: CFI = .98/.95, SRMR =

0.02/0.04) and acceptable as indicated by the RMSEA (Sample C/R: RMSEA = 0.09, 90%

CI[0.08, 0.09]/0.07, 90% CI[0.06, 0.08]). In both samples, factor loadings were satisfactory.

Sample R showed continuously higher loadings and item 6 ("Most people are somehow

losers.") had the lowest factor loading of all items, in both samples. The magnitude of the

factor loadings for this item was acceptable (> .50).

Representative descriptive data, gender differences, and overall reliability

We provide means, standard deviations, gender differences, and overall reliability

estimates for test scores of the convenience and representative samples. Reliability was

estimated using conventional measures such as Cronbach's alpha (α) as well as with an

alternative index, omega hierarchical (ω_h), that addresses some of the conceptual and

methodological problems inherent in α (e.g., Zinbarg, Revelle, Yovel, & Li, 2005). In

comparison to α, ω_h is a better estimator of a scale's unidimensionality and can be interpreted

as the proportion of a scale's variance that is due to a general factor (Revelle & Zinbarg,

2009).

Information on means and standard deviations for both sexes and the overall samples

are summarized in Table 3. In both samples, similar gender differences were observed. Men

scored significantly higher on admiration (Sample C/R, $d = 0.28/0.22$) and rivalry (Sample

C/R, $d = 0.38/0.24$) than women. This pattern was identical to results for the full NARQ in

Sample C as well as to results reported in Back et al. (2013).

The reliability of the test scores of the admiration and rivalry scales was acceptable to

good in both samples, in spite of their brevity: In Sample C, both α and ω_h indicated

acceptable reliability for the test scores of admiration facet of the NARQ-S (α and $\omega_h = .74$)

while test scores on the rivalry facet showed acceptable values of reliability ($\alpha = .61$, $\omega_h =$

.63). Similarly, admiration scores showed very good reliability (α and $\omega_h = .84$) in Sample R,

while the reliability of rivalry scores was acceptable ($\alpha = .70$, $\omega_h = .71$). The mean inter-item

correlations were .48 and .63 for admiration, and .34 and .43 for rivalry, for Samples C and R

respectively. Compared to the results of the full NARQ as reported in Back et al. (2013), the reliability of scores on the full NARQ in Sample C was nearly identical. In both samples admiration and rivalry showed moderate to strong manifest correlations (Sample C: $r = .41$, $p < .001$; Sample R: $r = .58$, $p < .001$).

Reliability across the latent trait spectrum

As α and ω_h can be seen as overall reliability estimates of the scores on a test or scale, we also investigated the reliability of scores on the NARQ-S across the entire trait spectrum using item response theory (IRT). This allowed us to move beyond classic indicators of reliability that assume reliability to be the same for persons with different standings on the latent trait. These analyses also allowed us to investigate whether the NARQ-S could reliably capture variation in the latent trait of narcissism among individuals scoring high or low in narcissism. We extracted the test information functions for the admiration and rivalry dimensions and converted them to reliability estimates on a familiar scale according to Thissen (2000). In doing so, reliability can be estimated as a function of an individual's standing on the latent trait. To this end, we fitted the graded response model[4] (Samejima, 1969) to the responses to the NARQ-S items using the *mirt* package (Chalmers, 2012) version 1.14 for R. The graded response model is an extension of the two-parameter logistic model from dichotomous items to ordered/polytomous items and the most appropriate for these kind of data (Samejima, 2004).

Results of the IRT analyses are visualized in Figure 1. Similar to the overall reliability, admiration scores showed a higher reliability across the trait spectrum than rivalry scores in Sample C. While scores on both subscales showed acceptable values of reliability especially across the higher standings on the trait, admiration was also reliable in the lower trait standings (reliability of .60 at about 1.5 SD below the mean). The same pattern of results was

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[4] A more detailed description of the IRT-analyses can be found in the on pages 3-4 of the SOM and Tables S2/S3.

observed in Sample R, except that admiration and rivalry scores showed higher levels of

reliability compared to the results from Sample C. An additional noteworthy difference was

that despite showing very good reliability, admiration did not cover as much of the lower trait

spectrum in Sample R as in Sample C. However, when compared to the full NARQ - based on

data from Sample C - the NARQ-S and its subscales cover the trait spectrum from slightly

below the mean to 2.5 SD above the mean equally well in the representative sample (Sample

R). The NARQ-S test scores in Sample C covers these areas less well but still within

acceptable levels of reliability, particularly for a scale including only 3 items per dimension.

Nomological network

   We examined the NARQ-S's nomological network and compared the pattern of

associations with that found for the full version of the NARQ. Specifically, we analyzed

associations to the NPI and its subscales LA, GE, and EE, the Dark Triad traits, the Big Five,

and self-esteem. We used zero-order correlations as well as regression models—where

admiration and rivalry were simultaneously entered as predictors—to investigate these

associations. In doing so, the general nomological network as well as the incremental

contribution of each dimension (admiration vs. rivalry) was examined. Given that inventories

varied across samples, all measures were standardized within each of the smaller samples. As

not all traits were included in all samples, the sample sizes varied across analyses and this will

be indicated where appropriate.

   Results from correlational and regression analyses are depicted in Table 3 for the NPI,

Dark Triad traits, and self-esteem. Table 4 contains results for the Big Five personality traits.[5]

To establish convergent validity, we first compared the NARQ-S to the NPI and its facets.

The NARQ-S showed nearly identical correlational associations to the NPI total score, as did

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[5] Per request of an anonymous reviewer, we also provide results for a version of the NARQ
from which the NARQ-S items were removed (Tables S5/S6). Additional analyses and results
can be found in the document Supplementary Material – Additional analyses and results.

the full NARQ (Table 3). As expected, regression analyses showed that this relationship was stronger for the unique aspects of admiration compared to the unique aspects of rivalry. Likewise, both dimensions were related to the LA and GE facets, and the association was mainly due to narcissistic admiration rather than rivalry. Regarding the more antagonistic facets, the NARQ-S dimensions showed expected correlations with the E/E facet of the NPI. In accordance with theory, regression analyses revealed that this relationship was driven primarily by rivalry and to a lesser extent by admiration. These specific associations between admiration and rivalry with NPI facets were again highly similar to those found for the full NARQ (Table 3).

Regarding the Dark Triad, both admiration and rivalry showed moderate to strong correlations with psychopathy, Machiavellianism and the narcissism scale of the Dark Triad measures across both samples C and R. The relations were as expected for the Dark Triad as assessed by the Dirty Dozen and they were highly similar to relations found for the full NARQ (Table 3). When considering these NARQ-S scales simultaneously, the antagonistic aspects of narcissism (rivalry) were more strongly related to both psychopathy and Machiavellianism in both samples.

Correlations with the Big Five personality traits (Table 4) were largely consistent with previous research on the NARQ (Back et al., 2013; Rogoza, Wyszyńska, Maćkiewicz, & Cieciuch, 2016) and highly similar to analyses with the full NARQ within the current samples. Admiration was negatively related to neuroticism while rivalry showed a positive relationship. Similarly, admiration was positively and rivalry slightly negatively related to extraversion and openness. Both dimensions were negatively related to agreeableness, with rivalry's effect being larger than admiration's. Finally, rivalry showed a negative correlation with conscientiousness. Regression analyses confirmed this pattern of results and amplified the expected incremental relations of admiration and rivalry to the Big Five.

Finally, the NARQ-S scales showed mostly expected associations with self-esteem with a pattern similar to the full NARQ. In Sample C, admiration was positively and rivalry negatively related to self-esteem. These effects were amplified when controlling for the common variance between admiration and rivalry. In Sample R, however, results were less clear, potentially due to the fact that only a less reliable single item measure of self-esteem was available. Here, admiration was not correlated with self-esteem and rivalry only marginally negatively. Considering admiration and rivalry simultaneously in regression analyses rectified the NARQ-S relation to self-esteem somewhat: Admiration showed a small positive and rivalry a small negative association with self-esteem.[6]

Discussion

Using data from large convenience samples as well as two large nationally representative samples, we validated the NARQ-S by (1) confirming its two-dimensional structure, (2) providing representative descriptive data, overall reliability estimates, and gender differences, (3) showing its reliability across the latent trait spectrum using IRT, and (4) confirming its nomological network.

In line with previous results for the full NARQ (Back et al., 2013), the structure of grandiose narcissism as captured with the NARQ-S was best described by a model with two correlated factors. Scores on the admiration and rivalry scales representing these factors could, moreover, showed acceptable to good reliability across samples and across a relatively large spectrum of narcissism values, particularly regarding moderate to high levels of narcissism. This makes the NARQ-S particularly useful to researchers who are interested in narcissism's development in samples where a lower to moderate level of narcissism can already be assumed and space and time limitations play an important role. If researchers are interested in lower levels of grandiose narcissism and time and space limitations are not a

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[6] R^2 values for the regression analyses can be found in the SOM in Table S7 and estimates of the amount of specific variance of the NARQ-S scores can be found in Table S8.

major concern, the full NARQ with still only 18 items provides the best trade-off between length and reliable coverage of a large spectrum of grandiose narcissism.

The overall reliability of scores on the rivalry scale was somewhat lower in Sample C compared to Sample R. With a reliability of around .60, it might not meet classical standards of reliability (such as $\alpha \geq .70$ for 'acceptable' internal consistency; e.g., Schmitt, 1996). However, it has to be taken into consideration that the NARQ-S measures admiration and rivalry using only 3 items each. Test scores on comparable and well established inventories such as the BFI-S, that also only uses 3 items per dimension as well, reach reliability estimates between .50 (agreeableness) and .74 (openness; Gerlitz & Schupp, 2005). Furthermore, according to Aiken and Groth-Marnat (2006), reliability coefficients of .60 are evaluated as sufficient in nomothetic studies that are not aimed at individual assessment. In Sample R, test scores on both NARQ-S dimensions showed comparable or better reliability estimates when compared to the BFI-S reliability estimates based on representative data (Gerlitz & Schupp, 2005). The consistent performance of the NARQ-S across the latent state spectrum, especially in the moderate to high levels of narcissism is remarkable.

The nomological network of the NARQ-S was consistent with the conceptualization of narcissistic admiration and rivalry and to a large degree similar to the respective network of the original and longer version of the full NARQ. Admiration and its incremental contributions beyond rivalry were primarily associated with higher scores on the NPI and its more agentic facets, the narcissism scale from the Dirty Dozen/Naughty Nine, emotional stability (i.e., a negative association with neuroticism), extraversion, openness to experience, and self-esteem. Rivalry and its incremental contributions beyond admiration were mainly related to the antagonistic subscale of the NPI (i.e. E/E), all of the Dark Triad traits, neuroticism, as well as to lower extraversion, openness, agreeableness, conscientiousness, and self-esteem.

Despite the generally consistent results, it has to be noted that the associations with self-esteem were lower in Sample R compared to Sample C. This is potentially due to the fact that self-esteem was measured using a single item instead of a complete scale in Sample R. Moreover, the associations of the NARQ-S scales with the Big Five based on the representative data was somewhat lower when comparing it to results obtained in convenience samples, either with the full NARQ or the NARQ-S. These slight differences in the strength of associations with other constructs in convenience and representative samples warrant further investigation and should be considered when applying the NARQ-S. Future research should, moreover, build on the present analyses by investigating the temporal stability and criterion-related validity of the NARQ-S. It would, for instance, be interesting whether the short-form of the NARQ is as useful as the full NARQ in predicting intrapersonal dynamics and observable behavior as well as occupational (Dufner et al., 2015), social interaction and relationship outcomes (Back et al.. 2013; Geukes et al., in press; Lange, Crusius, & Hagemeyer, 2016; Küfner et al., 2013; Leckelt et al., 2015; Wurst et al., 2016).

In the future, researchers might make use of the NARQ-S to quickly and reliably measure both the agentic and antagonistic aspects of grandiose narcissism in research settings that do not allow for in-depth assessment or addition of lengthy inventories. Such settings include panel surveys that already feature a breadth of inventories, have limited space for additional measures, and have to seriously consider respondents' fatigue (Richter & Schupp, 2012). Similarly, field studies employing ambulatory assessment with repeated measurements during a single day and over a given period of time present an area of research of increasing interest, which is in need of valid and reliable short-form measures (Giacomin & Jordan, 2016; Wrzus & Mehl, 2015). Furthermore, the NARQ-S could readily be used in experimental settings where narcissism is of interest as a moderator. Due to its ability to reliably measure narcissism in moderate and higher trait levels, the NARQ-S might also prove useful for the investigation of this construct at the intersection of social-personality

psychology and clinical psychology. Still, it should be kept in mind that very short inventories may not provide sufficient accuracy for individual-based diagnostic purposes. Specifically, scores on very brief scales may be reliable, but can at the same time lack the measurement precision needed for individual-level assessment (Kruyen, Emons, & Sijtsma, 2013) and individual-level decisions suffer more from scale shortening than group-level decisions (Kruyen, Emons, & Sijtsma, 2012). Similarly, all high-stakes decisions made in a given setting should always be made under inclusion of additional information (Emons, Sijtsma, & Meijer, 2007). For now, we caution practitioners against the use of the NARQ-S for purposes of individual assessment until evidence for its validity in settings beyond group-level research has been obtained. The NARQ-S might also be used as an additional measure along with psychopathy and Machiavellianism inventories in situations where researchers are interested in the unique processes or the common core of the Dark Triad but are working with time and space restrictions. Finally, future research should build on our results and systematically analyze the joint and unique nomological networks using a larger set of different long and short narcissism measures. Possible avenues for this are, for instance, multi-trait-multi method models using short as well as full-length inventories of narcissism and other personality traits.

In sum, we have demonstrated that the NARQ-S is a reliable and valid short measure of the agentic and the antagonistic aspects of grandiose narcissism. With only 6 items, the NARQ-S can be quickly administered in a variety of research contexts and study designs while still reliably disentangling the bright(er) and dark(er) sides of grandiose narcissism.

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Table 1

NARQ-S item content, factor loadings, item numbers, descriptive information, and inter-item correlations

Item in NARQ-S	Item	M	SD	Factor loading	Dimension	Facet	Item in NARQ	Item 2	Item 3	Item 4	Item 5	Item 6
1	I react annoyed if another person steals the show from me.	2.25/1.89	1.23/1.17	.61/.70	Rivalry	Aggressiveness	4	.34/.45	.39/.53	.27/.40	.33/.46	.25/.34
2	I deserve to be seen as a great personality.	2.58/1.88	1.33/1.18	.68/.78	Admiration	Grandiosity	8		.25/.45	.51/.64	.42/.59	.22/.33
3	I want my rivals to fail.	2.38/1.65	1.39/1.07	.64/.75	Rivalry	Strive for supremacy	9			.20/.41	.22/.43	.39/.43
4	Being a very special person gives me a lot of strength.	2.73/2.08	1.43/1.31	.75/.82	Admiration	Strive for uniqueness	15				.52/.67	.24/.32
5	I manage to be the center of attention with my outstanding contributions.	2.66/2.13	1.32/1.28	.67/.80	Admiration	Charmingness	16					.21/.33
6	Most people are somehow losers.	1.70/1.78	1.09/1.08	.52/.54	Rivalry	Devaluation	17					

Note. Data for Samples C and R are separated by a forward slash, respectively. Factor loadings are standardized.

Table 2

Results from CFAs and model comparisons

Model	CFI	RMSEA	RMSEA 90%CI	SRMR	χ^2	df	p	ΔCFI (compared to next best-fitting model)	$\Delta\chi^2$ (compared to next best-fitting model)	Sample
One Factor	.84	0.14	0.14;0.15	0.07	2140.79	9	< .001			
Two Factors (uncorrelated)	.81	0.16	0.15;0.16	0.15	2557.42	9	< .001	-.03	-416.63	C
Two Factors (correlated)	**.95**	**0.09**	**0.08;0.09**	**0.04**	688.85	**8**	**< .001**	**.11**	**1451.94*****	
One Factor	.91	0.14	0.14;0.15	0.05	833.83	9	< .001			
Two Factors (uncorrelated)	.80	0.22	0.21; 0.23	0.23	1929.82	9	< .001	-.11	-1096.00	R
Two Factors (correlated)	**.98**	**0.07**	**0.06;0.08**	**0.02**	168.63	**8**	**< .001**	**.07**	**665.20*****	

Note. *** p < .001.

Table 3

Descriptive statistics, overall reliability, and associations of the NARQ-S with the NPI and its facets, the Dark Triad traits, and self-esteem

							NPI	LA	GE	EE	Psych	Mach	Narc	SE
Version	Sample	Dimension	M	SD	α/ω_h	d_{gender}	r/β	r/β	r/β	r/β	r/β	r/β	r/β	r/β
NARQ-S	C	Adm	2.64	1.11	.74/.74	0.27***	.56/.52	.45/.44	.42/.39	.25/.10	.27/.11	.30/.11	.45/.29	.22/.35
	R	Adm	2.03	1.09	.84/.84	0.22***	-	-	-	-	.42/.15	.50/.25	.65/.50	*.03*/.09
	C	Riv	2.11	0.94	.61/.63	0.39***	.32/.12	.21/.03	.22/.07	.41/.37	.41/.36	.51/.46	.49/.36	-.15/-.30
	R	Riv	1.77	0.88	.70/.71	0.24***	-	-	-	-	.53/.43	.57/.42	.55/.25	-.06/-.11
NARQ	C	Adm	3.01	0.91	.86/.77	0.30***	.63/.59	.51/.50	.48/.47	.24/.09	.28/.12	.31/.10	.47/.30	.34/.49
	Back et al. 2013	Adm	2.77	0.94	.87/-	0.32***	.63/-	.47/-	.46/-	.26/-	.33/.21	.17/-.10	-	.33/.49
	C	Riv	2.11	0.81	.82/.67	0.35***	.32/.11	.21/.03	.20/.04	44/.41	.44/.39	.54/.50	.54/.42	-.19/-.38
	Back et al. 2013	Riv	2.14	0.78	.83/-	0.38***	.32/-	.19/-	.18/-	.47/-	.39/.31	.64/.67	-	-.23/-.42

Note. Minimum n = 1249. Correlations and coefficients are significant at $p < .05$ unless indicated by italics. d_{gender} = Cohen's d for gender differences (men > women). Values left of the forward slash represent zero-order correlations, values on the right represent standardized regressions coefficients from models simultaneously regressing each criterion measure on admiration and rivalry. Psych = psychopathy, Mach = Machiavellianism, Narc = narcissism, SE = self-esteem.

Table 4

Associations of the NARQ-S with the Big Five personality traits

Version	Sample	Dimension	N r/β	E r/β	O r/β	A r/β	C r/β
NARQ-S	C	Admiration	-.12/-.23	.24/.33	.18/.26	-.10/.08	.04/.13
	R	Admiration	*.00*/-.10	.10/.17	.17/.23	-.15/*.01*	-.10/*.01*
	C	Rivalry	.15/.24	-.07/-.21	-.08/-.19	-.39/-.42	-.16/-.21
	R	Rivalry	.13/.19	-*.03*/-.12	*.00*/-.12	-.28/-.29	-.19/-.20
NARQ	C	Admiration	-.21/-.33	.35/.45	.23/.31	-.07/.11	.08/.18
	Back et al. 2013	Admiration	-.16/-.25	.31/.39	.25/.31	-.04/.11	.08/.16
	C	Rivalry	.20/.32	-.11/-.28	-.10/-.22	-.42/-.46	-.19/-.26
	Back et al. 2013	Rivalry	.19/.28	-.11/-.24	-.08/-.18	-.42/-.46	-.19/-.25

Note. Minimum n = 1658. Correlations and coefficients are significant at *p* < .05 unless indicated by italics.
Values left of the forward slash represent zero-order correlations, values on the right represent standardized
regressions coefficients from models simultaneously regressing each criterion measure on admiration and
rivalry. N = neuroticism, E = extraversion, O = openness to experience, A = agreeableness, C =
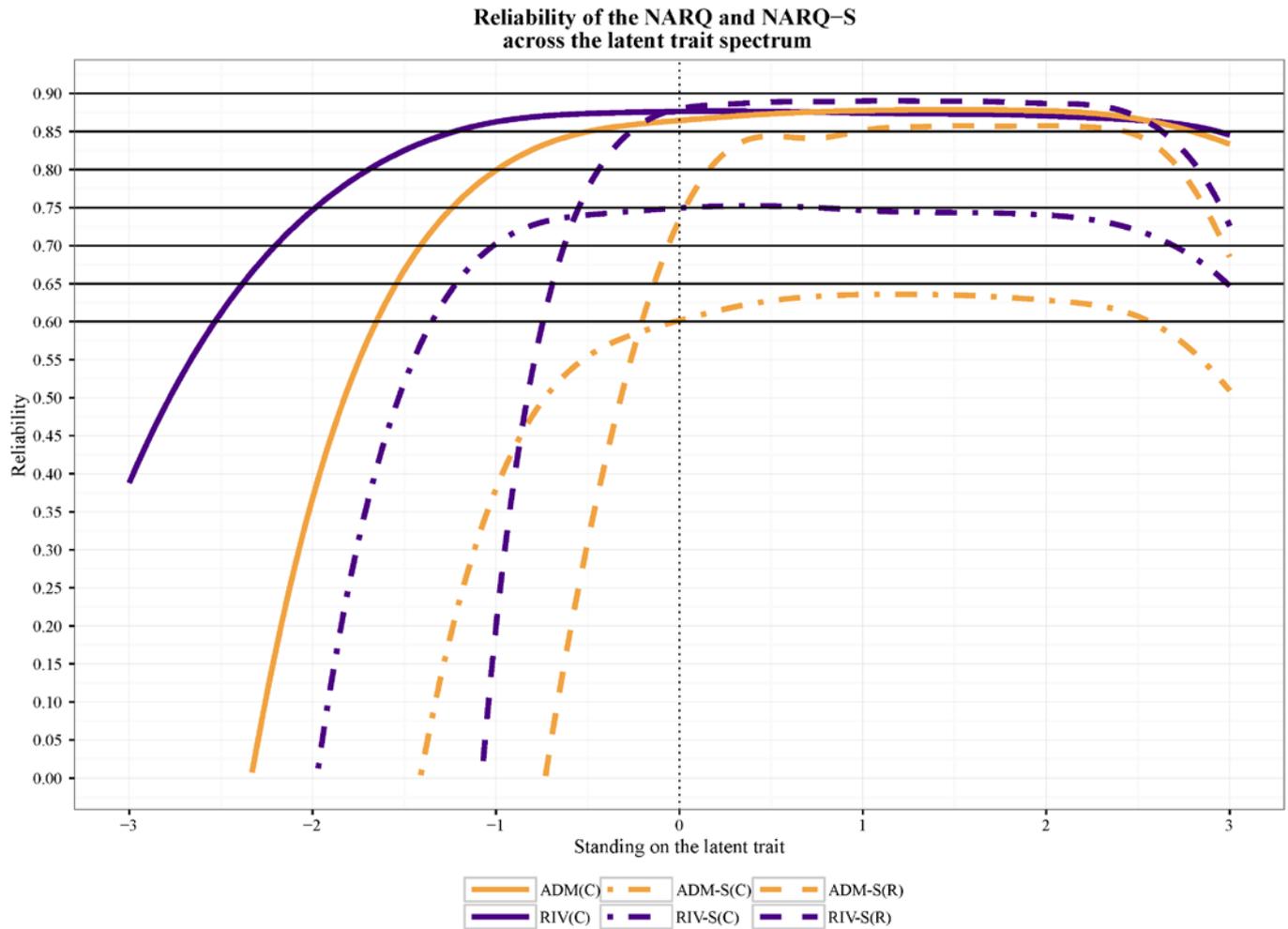conscientiousness.

Figure 1. Results of IRT analyses showing the reliability of the NARQ-S test scores across the latent trait

spectrum. Reliability estimates were calculated according to Thissen (2000): Reliability = 1 - (1/I), where I

is the test information extracted from the graded response model. Horizontal lines were added for easier

readability and indicate levels of reliability commonly regarded as acceptable. ADM = Admiration; RIV =

Rivalry. Samples are indicated in brackets, where C = convenience and R = representative. See the online

article for the color version of this figure.