

An examination of the factor structure of *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, narcissistic personality disorder criteria: one or two factors?

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Abstract

A growing body of research has suggested that narcissistic personality disorder (NPD) contains 2 factors or types: overt/grandiose and covert/vulnerable. A recent factor analysis of *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)*, NPD symptoms supported a similar 2-factor model. The present research tested this proposed 2-factor solution against a 1-factor solution ($N = 289$; 72% patients) using both confirmatory factor analysis and an examination of associations between the resultant factors and theoretically relevant criteria (other personality disorders; depression, anxiety). The results of the confirmatory factor analysis supported a 1-factor solution. Likewise, the 2 factors each yielded a similar pattern of correlations with relevant criteria. Together, these results argue against a 2-factor structure for the current *DSM-IV* NPD symptoms. Given the broader research literature suggesting a 2-factor structure of narcissism, strategies for assessing both overt/grandiose and covert/vulnerable forms of narcissism in *DSM-V* are discussed. © 2008 Elsevier Inc. All rights reserved.

Narcissistic personality disorder (NPD) is characterized by a “pervasive pattern of grandiosity, need for admiration, and lack of empathy” ([1], p 714). Although narcissism and NPD have attracted the attention of prominent personality theorists such as Freud [2], Kernberg [3], Kohut [4], and Millon [5], NPD has received little empirical attention. This is at odds with the sizable body of research that exists on the study of narcissism as a “normal” trait (eg, reference [6,7]). Unfortunately, the degree of concordance between these conceptually similar constructs (eg, trait narcissism, as measured by the Narcissistic Personality Inventory [8], vs NPD, as assessed by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition [DSM-IV]*) is unclear [9]. As a result, it is difficult to be certain that the substantial body of empirical work from the social-personality literature generalizes directly to the study of NPD.

One specific area of interest with regard to NPD is its underlying factor structure. Research using alternative measures of narcissism has suggested that there may be 2 forms of narcissism, which have been labeled “overt” vs “covert” or “grandiose” vs “vulnerable” [9–12], that may primarily “share a cognitive orientation to pathologic entitlement” ([12], p 205). However, the 2 variants are thought to differ with regard to their relation to self-esteem, negative emotionality, and extraversion/dominance [9–12], with the overt/grandiose “types” scoring high on the aforementioned traits (with the exception of negative emotionality) and covert/vulnerable “types” scoring low (with the exception of negative emotionality). It has been argued that the *DSM-IV* captures overt/grandiose narcissism [12], although others [9] have suggested that *DSM-IV* text (as opposed to the symptoms) also emphasizes the “vulnerable” aspects of the disorder. Empirically, only one study has examined this issue using explicit measures of the *DSM-IV* NPD criteria. Fossati et al [13] examined the factor structure of the *DSM-IV* NPD symptoms, as assessed by a semistructured interview, in a sample of 641 outpatients in Milan, Italy. Using confirmatory factor analysis (CFA), Fossati et al found that a 2-factor model with correlated factors best fit their data. The 2 factors, which were strongly interrelated ($r = 0.77$), were named “overt” (made up of 6

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items) and “covert” (made up of 3 items: fantasies of unlimited success, requires excessive admiration, often envious of others or believes others are envious of him or her).

In the current study, we use data from 2 samples (total $N = 298$) to examine whether a 1- or 2-factor structure better fits *DSM-IV* NPD diagnostic criteria. In addition to examining the general fit of these models, we also examine the convergent and discriminant validity of each model in relation to other *DSM-IV* personality disorders (PDs), as well as depression and anxiety scores. If there are 2 factors in the NPD diagnostic criteria, then one would expect that the “covert” factor should be more strongly related to other PDs with a strong component of negative affectivity such as borderline, avoidant, and dependent PDs [9], as well as depression and anxiety scores. Alternatively, an “overt” factor, if it exists, should show more specific relations with other cluster B PDs such as antisocial and histrionic PDs and show nonsignificant or negative relations with depression and anxiety scores. It is important to note that current analyses are focused solely on the NPD symptoms as they are operationalized in the *DSM-IV* and cannot speak to the underlying factor structure of the narcissism/NPD construct(s) as discussed in the broader research literature [9,10,12].

1. Method

1.1. Participants and procedures

1.1.1. Sample 1

The goal of this study was to investigate the potential value of self-report screening tools for identifying cases of PD. As such, the sample ($n = 151$) was composed of 70 psychiatric patients and 81 nonpsychiatric participants. The nonpsychiatric patients were recruited from 2 sources: diabetic patients ($n = 23$) or university faculty or staff ($n = 58$). This sample was part of a larger sample ($n = 624$) that was first screened for PDs. The larger sample was stratified on the basis of initial scores, and individuals were randomly selected to participate in the interview portion of the study. The goal was to create a sample that had a 50% prevalence rate for PD. The psychiatric patients were solicited from an adult outpatient clinic at Western Psychiatric Institute and Clinic, Pittsburgh, PA. Patients with psychotic disorders, organic mental disorders, and mental retardation were excluded, as were patients with major medical illnesses that influence the central nervous system and might be associated with organic personality disturbance. Written voluntary informed consent was obtained before participation.

Of the 151 individuals, 103 were women (68%), 131 were whites (86.8%), 16 were African Americans (10.6%), and 4 were Asian Americans (2.6%), and the mean age was 38.85 years (range, 20–60 years; SD, 11.18 years). Ninety-six participants (64%) had a current axis I diagnosis. The most frequently diagnosed classes of disorder were affective disorders ($n = 31$, 21%), comorbid affective and anxiety

disorders ($n = 19$, 13%), and “other” complex disorders, which included anxiety and affective disorders that were comorbid with less prevalent disorders (eg, somatoform disorders, eating disorders; $n = 17$; 11%).

1.1.2. Sample 2

This sample was composed of 138 psychiatric outpatients. The primary research focus of this sample was to investigate the interpersonal functioning in contrasting psychiatric groups with a specific focus on borderline PD. The goal was to recruit 3 groups: patients with borderline PD, patients with avoidant PD, and patients with axis I disorders (primarily depression and anxiety) but no PD. The rule-outs used in sample 1 were also used in this study. Written voluntary informed consent was obtained before participation.

Of the 138 participants, 105 (76%) were women, 102 (74%) were white, and 33 were African American (24%). The mean age was 37.92 years (range, 21–60 years; SD, 10.6 years). One hundred thirty-five participants met criteria for a current axis I disorder (98%); the most frequent classes of disorder were comorbid affective and anxiety disorders ($n = 53$, 38%), “other” disorders (eg, disorders in which affective, anxiety, or substance use disorders were comorbid with other less prevalent disorders such somatoform or eating disorders; $n = 30$; 22%), and affective disorder ($n = 19$, 14%).

Both studies were approved by the University of Pittsburgh’s institutional review board, and the samples were collected over a number of consecutive years (sample 1, February 1998 to March 2002; sample 2, November 2002 to December 2006).

1.2. Measures

1.2.1. Consensus ratings of *DSM-IV* PD criteria

Complete details of the assessment methodology are provided elsewhere [14]. At intake, participants were interviewed for 6 to 10 hours in a minimum of 3 assessment sessions. The assessments included structured symptom ratings, structured interviews for axis I and axis II disorders (eg, the Structured Clinical Interview for *DSM-IV* Axis I Disorders [SCID-I], Structured Clinical Interview for *DSM-IV* Axis II Personality Disorders [SCID-II], or Structured Interview for *DSM-IV* Personality [SIDP-IV]), and a detailed social and developmental history. After the evaluation, the primary interviewer presented the case at a 2-hour diagnostic conference with colleagues from the research team. All available data were reviewed and discussed at the conference: current and lifetime axis I information, symptomatic status, social and developmental history, and traits acknowledged on the axis II interviews. Each PD symptom was rated on a scale of 0 to 2. The symptom counts used are the addition of these scores across symptoms for each PD. α for the PDs ranged from .57 (dependent) to .87 (avoidance) with a median of .72. The α for NPD was .81.

1.3. Clinical ratings of depression and anxiety

Ratings of psychological distress were conducted with the Hamilton Rating Scale for Depression (HAM-D) and the

Table 1
Model fit statistics for structural models (N = 289)

	<i>df</i> (Δdf)	χ^2 ($\Delta\chi^2$)	ECVI	RMSEA	TLI	CFI
Models of narcissism						
Two-factor	26	66.35	0.36	0.073	0.94	0.96
One-factor (constrained)	27 (1)	68.90 (2.55, NS)	0.36	0.073	0.94	0.96
Significant differences among overt and covert NPD factors and other PDs						
	<i>df</i> (Δdf)	χ^2 ($\Delta\chi^2$)	Overt <i>r</i>	Covert <i>r</i>	Total <i>r</i>	
Paranoid	104 (1)	266.33 (0.01, NS)	0.24	0.23	0.23	
Schizoid	104 (1)	266.43 (0.10, NS)	0.02	0.02	0.02	
Schizotypal	104 (1)	271.15 (4.81, $P < .05$)	0.27	0.13	0.21	
Antisocial	104 (1)	269.98 (3.64, NS)	0.23	0.13	0.19	
Borderline	104 (1)	266.31 (0.03, NS)	0.21	0.21	0.20	
Histrionic	104 (1)	266.19 (0.15, NS)	0.44	0.51	0.48	
Avoidant	104 (1)	266.37 (0.03, NS)	−0.22	−0.24	−0.22	
Dependent	104 (1)	266.63 (0.29, NS)	−0.04	0.01	−0.02	
Obsessive-compulsive	104 (1)	266.34 (0.00, NS)	0.28	0.23	0.25	
Anxiety (HAM-A)	104 (1)	266.30 (0.04, NS)	0.11	0.13	0.11	
Depression (HAM-D)	104 (1)	266.32 (0.02, NS)	0.11	0.13	0.12	

Hamilton Rating Scale for Anxiety (HAM-A). For both samples, intraclass correlation coefficients (ICCs), computed with all available reliability data, documented good to excellent levels of reliability within our own group of judges. The ICCs for the HAM-D were 0.96 (sample 1) and 0.98 (sample 2). The ICCs for the HAM-A were 0.97 (sample 1) and 0.94 (sample 2).

2. Statistical analyses

In the current study, we examine the fit of 1- and 2-factor models using CFAs. The 2-factor model is specified on the basis of results from the study of Fossati et al [13]. We then examine the nomological network of these 2 models with regard to the factors' relations with other *DSM-IV* PD, as well as depression and anxiety scores. Support for the usefulness and validity of the 2-factor (ie, overt vs covert) model would be demonstrated by finding evidence of a priori specified significantly different correlations across the NPD factors.

3. Results

The mean NPD symptom count (addition of scores of 0, 1, and 2) in the combined sample was 2.81 (SD, 3.50). Overall, 9 individuals met *DSM-IV* criteria for an NPD diagnosis (ie, 5 or more NPD symptoms), which corresponds to 3.1% of the combined sample.

We fit 2 CFA models to test the dimensionality of narcissism using LISREL 8.5 [15]. The evaluation of the appropriateness of the models focused on an evaluation of relevant fit indices. Specifically, model evaluation incorporated 5 overall fit indices, including χ^2 test, Steiger's [16] root mean square error of approximation (RMSEA), the Tucker-Lewis Nonnormed Fit Index (TLI) [17], the

Comparative Fit Index (CFI) [18], and the ECVI of Browne and Cudeck [19], which is an indication of model fit that incorporates both model fit and the number of parameters used. Consequently, it is particularly useful to compare alternative models by ranking the models according to their ECVI value and choosing the model with the smallest value as providing the best representation of the data. Browne and Cudeck suggest that RMSEA represents a measure of lack of fit per degree of freedom and that a value of 0.05 or less represents close fit, whereas values up to 0.08 represent reasonable fit. Both the TLI and CFI are relative fit indices that (a) evaluate model fit relative to a null model and (b) take into account the overall number of model parameters estimated. Rules of thumb suggest that CFI and TLI values between 0.90 and 0.95 indicate acceptable model fit, and values above 0.95 indicate good fit. Finally, because each of the models was tested in a parameter-nested sequence, a difference in χ^2 test was used for model evaluation. In such analyses, it is preferable to accept the most restricted model (the model with the largest degrees of freedom) that does not result in a significant reduction in fit over less restricted models [20].

The first model was consistent with prior research specifying a 2-factor structure of narcissism including overt and covert narcissism [13]. The first factor, labeled *overt NPD*, included the following *DSM-IV* NPD symptoms as manifest indicators: grandiosity, special and unique, entitlement, exploitative, lack of empathy, and arrogant behavior. The second factor, labeled *covert NPD*, included the remaining 3 *DSM-IV* NPD symptoms as manifest indicators: fantasies of success, requires excessive admiration, and envy. Table 1 shows the summary results of the CFA results of the models tested. The 2-factor model demonstrated an adequate fit with the data ($\chi^2 = 66.35$, ECVI = 0.36, RMSEA = 0.073, TLI = 0.94, CFI = 0.96).

Next, an alternate (more restricted) model fixed the correlations among the 2 factors equal to 1.00, which is tantamount to fitting a 1-factor model. Results suggest that the 1-factor model provides an adequate fit with the data and fits the data in a similar manner to the 2-factor model ($\chi^2 = 66.35$, ECVI = 0.36, RMSEA = 0.073, TLI = 0.94, CFI = 0.96). Importantly, a difference in χ^2 test between the 2-factor and 1-factor model revealed that the 2-factor model did not fit the data significantly better than the 1-factor model ($\Delta\chi^2 = 2.55$, NS; $\Delta df = 1$). Because the 1-factor model is more parsimonious than the 2-factor model, these findings support a unidimensional structure of narcissism.

Despite the support for the 1-factor model provided by the CFA, the 2 models tested evidenced a similar fit with the data. Thus, a second test for the distinctness of overt and covert narcissism entailed estimation of the relations between the 2 factors and 11 constructs theoretically related to NPD in the broader nomological network (eg, remaining *DSM-IV* PDs; depression, anxiety). To this end, 11 constructs were added to the model such that each variable served as a single manifest indicator of a latent factor in this model. Where possible, each of the single manifest indicator factors was constrained such that the factor loading (λ_x) was set to the square root of the reliability of each of the relevant scales. The differential relations between overt and covert NPD and each of the 11 additional constructs making up part of NPD's nomological network were examined using the latent factor correlations provided by LISREL 8.5. To do so, the correlations between a single nomological network construct and each of the 2 narcissism factors were set to be equivalent (eg, the latent factor correlation between borderline and overt and covert NPD was set to be equivalent). To determine whether the relations between the 11 nomological network variables and the 2 NPD factors differed significantly, we conducted a difference in χ^2 test for each of the 11 variables. The results of this set of analyses are presented in Table 1. As indicated in Table 1, the magnitude of the correlations between overt and covert NPD factors and each of the individual difference variables is highly similar. Indeed, the difference in χ^2 test indicated that the correlations between overt and covert narcissism and 10 of the 11 nomological network constructs did not differ significantly. Only schizotypal PD was significantly differently related to the overt ($r = 0.27$) and covert NPD factors ($r = 0.13$). These results suggest that the nomological networks of the 2 NPD factors are extremely similar, providing further support for a unidimensional interpretation of NPD.

4. Discussion

There has been some debate of late as to the nature of NPD and the degree to which the *DSM-IV* construct (a) assesses only an overt grandiose version of NPD [12], (b) includes symptoms that are mainly overt but a description that integrates a description of covert vulnerable narcissism

[9], or (c) includes symptoms of both an overt and covert nature [13]. This debate is important because there is empirical data to suggest that these 2 variants, which have been found in a number of studies [9–12], have substantially different nomological networks with regard to basic personality traits, psychologic distress, and etiologic factors such as parenting styles [9,10,12,21,22]. It is noteworthy, however, that both types are related to impairment, particularly of an interpersonal nature [9,23].

The current study, unlike that of Fossati et al, did not support 2 separate factors for NPD diagnostic criteria. Although both a 1- and 2-factor model fit the data, the more parsimonious choice is to assume a unidimensional structure. More importantly, an examination of the nomological network (ie, other *DSM-IV* PDs; depression, anxiety) for the 2-factor solution did not support their validity. For example, one would expect stronger correlations for the covert NPD factor with cluster C PDs (eg, avoidant, dependent) and depression and anxiety. This was not found, providing greater support for the unidimensional nature of the current data.

Why the discrepancy between the current findings and that of Fossati et al [13]? There are substantive differences in the samples and the assessment methodologies used in the 2 studies, which may contribute to the divergence in findings. First, the 2 samples differed substantially in the prevalence rates of NPD. In the current study, 3.1% of individuals received a diagnosis of NPD, whereas 17.9% of individuals in the Fossati et al sample were diagnosed with NPD. This lower prevalence rate could have been influenced by the fact that the current study included some individuals (28%) who were not patients. However, it is noteworthy that the prevalence of NPD in the current study is very similar to the prevalence rates found in other studies using outpatients (2.3%) [24] and community samples (median, .05%) [25]. In fact, the high prevalence rate of NPD in a treatment seeking population, as was used in the study of Fossati et al, is surprising and may have implications for the generalizability of their findings. Another important difference relates to the assessment methodologies used. Although both studies used semistructured interviews to assess NPD, the current study used the interview as only one part of the final determination of the PD ratings. The information was then used as part of the LEAD [26] model of diagnosis in which expert consensus ratings were used to determine PD ratings for each diagnostic criterion. Given previous evidence [27,28] that both clinicians and academicians think that prototypical NPD “looks” more like overt grandiose NPD (eg, high Extraversion, low Agreeableness, minimal role of Neuroticism), it is possible that these informal schemas play a stronger role when using a consensus rating approach. Finally, the samples used in the current study are somewhat heterogeneous (eg, inclusion of psychiatric patients, nonpsychiatric medical patients, and individuals from the broader community). An examination of the relations between NPD and other relevant

disorders (eg, other PDs), however, was highly consistent with the known nomological network of NPD (eg, highest correlations with other cluster B PDs and paranoid PD); nevertheless, the samples may have impacted our results in other ways, potentially limiting the generalizability of our findings.

Ultimately, our analyses suggest that there is only one underlying NPD factor using the *current DSM-IV* symptoms. This does not mean, however, that there is not more than one variant of narcissism that warrants attention and inclusion in future DSM editions; these results are relevant only to the structure of the current *DSM-IV* NPD construct. There is substantial evidence using other measures of narcissism and NPD [9–12] to support the existence of different variants of narcissism that have been previously labeled grandiose or overt vs vulnerable or covert. We suspect that these variants primarily share an antagonistic interpersonal approach but differ on traits related to extraversion (high, overt/grandiose) and neuroticism (high, covert/vulnerable). We have previously argued [9] that dimensional trait models of personality and/or personality pathology (rather than the current DSM model of PDs) are ideally suited, because of their inherent flexibility, for assessing both variants of NPD. If *DSM-V* does not use such a model, our results suggest that it will be necessary to create specific manifest indicators for the vulnerable variant of NPD, because they do not seem to exist (at least in sufficient numbers) in the current *DSM-IV* NPD criteria. The ability to assess and conceptualize both types of narcissism would give researchers and clinicians the tools necessary to identify, research, and treat these 2 forms of personality pathology that, although overlapping in terms of grandiosity and/or lack of empathy [9,12,13], may differ with regard to developmental experiences [9,12,22] and basic individual differences [9–11]. In addition, we believe that these 2 variants of NPD may manifest important differences with regard to treatment seeking, therapeutic rapport, and treatment outcome.

References

- [1] American Psychiatric Association. Diagnostic and statistical manual. 4th ed. Text Rev. Washington, DC: APA, 2000.
- [2] Freud S. Libidinal types. Standard edition of the psychological works of Sigmund Freud, vol 21. 1931.
- [3] Kernberg O. Borderline conditions and pathological narcissism. New York: Jason Aronson; 1975.
- [4] Kohut H. The restoration of self. Madison, CT: International Universities Press; 1977.
- [5] Millon T. Disorders of personality. New York: Wiley; 1981.
- [6] Emmons RA. Narcissism: theory and measurement. *J Pers Soc Psychol* 1987;52:11-7.
- [7] Morf CC, Rhodewalt F. Unraveling the paradoxes of narcissism: a dynamic self-regulatory processing model. *Psychol Inq* 2001;12:177-96.
- [8] Raskin RN, Terry H. A principle components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *J Pers Soc Psychol* 1988;54:890-902.
- [9] Miller JD, Campbell W. Comparing clinical and social-personality conceptualizations of narcissism. *J Pers* [in press].
- [10] Wink P. Two faces of narcissism. *J Pers Soc Psychol* 1991;61:590-7.
- [11] Rathvon N, Holmstrom RW. An MMPI-2 portrait of narcissism. *J Pers Assess* 1996;66:1-19.
- [12] Dickinson KA, Pincus AL. Interpersonal analysis of grandiose and vulnerable narcissism. *J Pers Disord* 2003;17:188-207.
- [13] Fossati A, Beauchaine TP, Grazioli F, Carretta I, Cortinovis F, Maffei C. A latent structure analysis of Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Narcissistic Personality Disorder criteria. *Compr Psychiatry* 2005;46:361-7.
- [14] Pilkonis PA, Heape CL, Proietti JM, Clark SW, McDavid JD, Pitts TE. The reliability and validity of two structured diagnostic interviews for personality disorders. *Arch Gen Psychiatry* 1995;52:1025-33.
- [15] Jöreskog K, Sörbom D. LISREL 8.70. Chicago: Scientific Software International Inc; 2004.
- [16] Steiger JH. Structural model evaluation and modification: an interval estimation approach. *Multivariate Behav Res* 1990;25:173-80.
- [17] Tucker LR, Lewis C. A reliability coefficient for maximum likelihood factor analysis. *Psychometrika* 1973;38:1-10.
- [18] Bentler PM. Comparative fit indexes in structural models. *Psychol Bull* 1990;107:238-46.
- [19] Browne MW, Cudeck R. Single sample cross-validation indices for covariance structures. *Multivariate Behav Res* 1989;24:445-55.
- [20] Bollen K. Structural equations with latent variables. New York: Wiley; 1989.
- [21] Miller JD, Campbell WK, Pilkonis PA, Morse JQ. Assessment procedures for narcissistic personality disorder: a comparison of the Personality Diagnostic Questionnaire-4+ and best estimate clinical judgments. [Manuscript under review].
- [22] Otway LJ, Vignoles VL. Narcissism and childhood recollections: a quantitative test of psychoanalytic predictions. *Pers Soc Psychol Bull* 2006;32:104-16.
- [23] Miller JD, Campbell WK, Pilkonis PA. Narcissistic personality disorder: relations with distress and functional impairment. *Compr Psychiatry* 2007;48:170-7.
- [24] Zimmerman M, Rothschild L, Chelminski I. The prevalence of DSM-IV personality disorders in psychiatric outpatients. *Am J Psychiatry* 2005;162:1911-8.
- [25] Torgersen S. Epidemiology. In: Oldham JM, Skodol AE, Bender DS, editors. Textbook of personality disorders. Washington, DC: American Psychiatric Publishing Inc; 2005. p. 129-41.
- [26] Spitzer RL. Psychiatric diagnosis: are clinicians still necessary. *Compr Psychiatry* 1983;24:399-411.
- [27] Samuel DB, Widiger TA. Clinicians' personality descriptions of prototypic personality disorders. *J Pers Disord* 2004;18:286-308.
- [28] Lynam DR, Widiger TA. Using the five-factor model to represent the DSM-IV personality disorders: an expert consensus approach. *J Abnorm Psychol* 2001;110:401-12.