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2 **An examination of the factor structure of *Diagnostic and Statistical***

3 ***Manual of Mental Disorders, Fourth Edition*, narcissistic personality**

4 **disorder criteria: 1 or 2 factors?<sup>☆</sup>**

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8 **Abstract**

9 A growing body of research has suggested that narcissistic personality disorder (NPD) contains 2 factors or types: overt/grandiose and  
 10 covert/vulnerable. A recent factor analysis of *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)*, NPD  
 11 symptoms supported a similar 2-factor model. The present research tested this proposed 2-factor solution against a 1-factor solution (N = 298;  
 12 72% patients) using both confirmatory factor analysis and an examination of associations between the resultant factors and theoretically  
 13 relevant criteria (other personality disorders; depression, anxiety). The results of the confirmatory factor analysis supported a 1-factor  
 14 solution. Likewise, the 2 factors each yielded a similar pattern of correlations with relevant criteria. Together, these results argue against a  
 15 2-factor structure for the current *DSM-IV* NPD symptoms. Given the broader research literature suggesting a 2-factor structure of narcissism,  
 16 strategies for assessing both overt/grandiose and covert/vulnerable forms of narcissism in *DSM-V* are discussed.  
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19 Narcissistic personality disorder (NPD) is characterized

20 by a “pervasive pattern of grandiosity, need for admiration,

21 and lack of empathy” ([1], p 714). Although narcissism and

22 NPD have attracted the attention of prominent personality

23 theorists such as Freud [2], Kernberg [3], Kohut [4], and

24 Millon [5], NPD has received little empirical attention. This

25 is at odds with the sizable body of research that exists on the

26 study of narcissism as a “normal” trait (eg, reference [6 7]).

27 Unfortunately, the degree of concordance between these

28 conceptually similar constructs (eg, trait narcissism, as

29 measured by the Narcissistic Personality Inventory [8], vs

30 NPD, as assessed by the *Diagnostic and Statistical Manual*

31 *of Mental Disorders, Fourth Edition [DSM-IV]*) is unclear

32 [9]. As a result, it is difficult to be certain that the substantial

33 body of empirical work from the social-personality literature

34 generalizes directly to the study of NPD.

35 One specific area of interest with regard to NPD is its

36 underlying factor structure. Research using alternative

37 measures of narcissism has suggested that there may be

38 2 forms of narcissism, which have been labeled “overt” vs

39 “covert” or “grandiose” vs “vulnerable” [9–12], that may

40 primarily “share a cognitive orientation to pathologic entitle-

41 ment” ([12], p 205). However, the 2 variants are thought to

42 differ with regard to their relation to self-esteem, negative

43 emotionality, and extraversion/dominance [9–12], with the

44 overt/grandiose “types” scoring high on the aforementioned

45 traits (with the exception of negative emotionality) and

46 covert/vulnerable “types” scoring low (with the exception of

47 negative emotionality). It has been argued that the *DSM-IV*

48 captures overt/grandiose narcissism [12], although others [9]

49 have suggested that *DSM-IV* text (as opposed to the

50 symptoms) also emphasizes the “vulnerable” aspects of the

51 disorder. Empirically, only one study has examined this issue

52 using explicit measures of the *DSM-IV* NPD criteria. Fossati

53 et al [13] examined the factor structure of the *DSM-IV* NPD

54 symptoms, as assessed by a semistructured interview, in a

55 sample of 641 outpatients in Milan, Italy. Using confirmatory

56 factor analysis (CFA), Fossati et al found that a 2-factor

57 model with correlated factors best fit their data. The 2 factors,

58 which were strongly interrelated ( $r = 0.77$ ), were named

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“overt” (made up of 6 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 because 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. 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, (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 SCID-I, SCID-II, or 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.  $\alpha$  for the PDs ranged from .57 (dependent) to .87 (avoidance) with a median of .72. The  $\alpha$  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 Hamilton Rating Scale for Anxiety (HAM-A). For both

t1.1 Table 1

t1.2 Model fit statistics for structural models (N = 289)

t1.3		$df$ ( $\Delta df$ )	$\chi^2$ ( $\Delta \chi^2$ )	ECVI	RMSEA	TLI	CFI
t1.4	Models of narcissism						
t1.5	Two-factor	26	66.35	0.36	0.073	0.94	0.96
t1.6	One-factor (constrained)	27 (1)	68.90 (2.55, NS)	0.36	0.073	0.94	0.96
t1.7	Significant differences among overt and covert NPD factors and other PDs						
t1.9		$df$ ( $\Delta df$ )	$\chi^2$ ( $\Delta \chi^2$ )	Overt $r$	Covert $r$	Total $r$	
t1.10	Paranoid	104 (1)	266.33 (0.01, NS)	0.24	0.23	0.23	
t1.11	Schizoid	104 (1)	266.43 (0.10, NS)	0.02	0.02	0.02	
t1.12	Schizotypal	104 (1)	271.15 (4.81, $P < .05$ )	0.27	0.13	0.21	
t1.13	Antisocial	104 (1)	269.98 (3.64, NS)	0.23	0.13	0.19	
t1.14	Borderline	104 (1)	266.31 (0.03, NS)	0.21	0.21	0.20	
t1.15	Histrionic	104 (1)	266.19 (0.15, NS)	0.44	0.51	0.48	
t1.16	Avoidant	104 (1)	266.37 (0.03, NS)	−0.22	−0.24	−0.22	
t1.17	Dependent	104 (1)	266.63 (0.29, NS)	−0.04	0.01	−0.02	
t1.18	Obsessive-compulsive	104 (1)	266.34 (0.00, NS)	0.28	0.23	0.25	
t1.19	Anxiety (HAM-A)	104 (1)	266.30 (0.04, NS)	0.11	0.13	0.11	
t1.20	Depression (HAM-D)	104 (1)	266.32 (0.02, NS)	0.11	0.13	0.12	

165 samples, intraclass correlation coefficients (ICCs), computed  
 166 with all available reliability data, documented good to  
 167 excellent levels of reliability within our own group of judges.  
 168 The ICCs for the HAM-D were 0.96 (sample 1) and 0.98  
 169 (sample 2). The ICCs for the HAM-A were 0.97 (sample 1)  
 170 and 0.94 (sample 2).

## 171 2. Statistical analyses

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

## 182 3. Results

183 The mean NPD symptom count (addition of scores of 0,  
 184 1, and 2) in the combined sample was 2.81 (SD, 3.50).  
 185 Overall, 9 individuals met *DSM-IV* criteria for an NPD  
 186 diagnosis (ie, 5 or more NPD symptoms), which corresponds  
 187 to 3.1% of the combined sample.

188 We fit 2 CFA models to test the dimensionality of  
 189 narcissism using LISREL 8.5 [15]. The evaluation of the  
 190 appropriateness of the models focused on an evaluation of  
 191 relevant fit indices. Specifically, model evaluation incorpo-  
 192 rated 5 overall fit indices, including  $\chi^2$  test, Steiger's [16]  
 193 root mean square error of approximation (RMSEA), the  
 194 Tucker-Lewis Nonnormed Fit Index (TLI) [17], the

Comparative Fit Index (CFI) [18], and the ECVI of Browne 195  
 and Cudeck [19], which are an indication of model fit that 196  
 incorporates both model fit and the number of parameters 197  
 used. Consequently, it is particularly useful to compare 198  
 alternative models by ranking the models according to their 199  
 ECVI value and choosing the model with the smallest value 200  
 as providing the best representation of the data. Browne and 201  
 Cudeck suggest that RMSEA represents a measure of lack of 202  
 fit per degree of freedom and that a value of 0.05 or less 203  
 represents close fit, whereas values up to 0.08 represent 204  
 reasonable fit. Both the TLI and CFI are relative fit indices 205  
 that (a) evaluate model fit relative to a null model and 206  
 (b) take into account the overall number of model parameters 207  
 estimated. Rules of thumb suggest that CFI and TLI values 208  
 between 0.90 and 0.95 indicate acceptable model fit, and 209  
 values above 0.95 indicate good fit. Finally, because each 210  
 of the models was tested in a parameter-nested sequence, a  
 difference in  $\chi^2$  test was used for model evaluation. In such 212  
 analyses, it is preferable to accept the most restricted model 213  
 (the model with the largest degrees of freedom) that does not 214  
 result in a significant reduction in fit over less restricted 215  
 models [20]. 216

The first model was consistent with prior research 217  
 specifying a 2-factor structure of narcissism including 218  
 overt and covert narcissism [13]. The first factor, labeled 219  
*overt NPD*, included the following *DSM-IV* NPD symptoms 220  
 as manifest indicators: grandiosity, special and unique, 221  
 entitlement, exploitative, lack of empathy, and arrogant 222  
 behavior. The second factor, labeled *covert NPD*, included 223  
 the remaining 3 *DSM-IV* NPD symptoms as manifest 224  
 indicators: fantasies of success, requires excessive admira- 225  
 tion, and envy. Table 1 shows the summary results of the 226  
 CFA results of the models tested. The 2-factor model 227  
 demonstrated an adequate fit with the data ( $\chi^2 = 66.35$ , 228  
 ECVI = 0.36, RMSEA = 0.073, TLI = 0.94, CFI = 0.96). 229

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  $\chi^2$  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 ( $\lambda$ ) 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  $\chi^2$  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  $\chi^2$  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 nomological network 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 [9,21,23].

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 semi-structured 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.

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