

A latent structure analysis of *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, Narcissistic Personality Disorder criteria

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Abstract

The aim of this study was to examine the latent structure of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV), Narcissistic Personality Disorder (NPD) criteria in a group of 641 outpatients. The consecutively admitted outpatients were administered the Structured Clinical Interview for DSM-IV Axis II Personality Disorders, Version 2.0, and the Personality Questionnaire. Both confirmatory and exploratory factor analyses (CFA and EFA, respectively) were used to evaluate whether the NPD criteria measure a single latent trait. Latent class analysis was used to assess the diagnostic accuracy of the individual DSM-IV NPD criteria. Mean above minus below a cut (MAMBAC) and maximum covariance (MAXCOV) taxometric analyses were used to evaluate whether the latent distribution of the DSM-IV NPD features is actually discrete.

Both CFA and EFA results showed that the 9 DSM-IV NPD criteria loaded on 2 correlated factors. The latent class analysis results suggested a 3-class solution for NPD criteria; relevant differences in diagnostic efficiency were observed among the NPD criteria. MAMBAC and MAXCOV analyses provided consistent evidence of taxonic (ie, discrete) latent structure for NPD.

This study gave only partial support to the validity of the DSM-IV NPD construct. Taxometric analyses indicated that a typological model is appropriate for describing NPD, but CFA and EFA suggested the existence of 2 distinct—albeit correlated—clusters of narcissistic features. As a whole, the DSM-IV criteria discriminated NPD from other personality disorders, but diagnostic accuracy statistics did not replicate the rank order of diagnostic efficiency of NPD criteria proposed by the DSM-IV.

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1. Introduction

The issue of whether personality disorders (PDs) should be described as categories or dimensions is still highly controversial [1,2]. In the case of Narcissistic Personality Disorder (NPD), the controversy between categorical and dimensional conceptualizations of PD diagnoses lies at the heart of a broader debate on the construct validity of this PD. Although the last 3 editions of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) included NPD as a discrete nosological entity, it has been suggested that pathological narcissism should be described as a range of personality pathology common to several PDs, or as a severity dimension ranging from normal assertiveness to pathological narcissism, rather than as a separate PD diagnosis [3,4]. Indirect

support for this hypothesis comes from the few psychometric studies that have been carried out on NPD, which have indicated that several *Diagnostic and Statistical Manual of Mental Disorders, Third Edition*, and *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition*, NPD criteria show low discriminant validity [5,6], particularly with respect to Passive-Aggressive, Histrionic, Borderline, and Antisocial PDs (PAPD, HPD, BPD, and ASPD, respectively). Despite this ongoing debate, no taxometric studies of NPD features have been conducted.

A second strongly debated issue concerning the latent structure of *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV), NPD criteria is the adequacy of DSM 1-factor model of pathological narcissism. The DSM-IV, as well as its 2 preceding editions, places the 9 NPD criteria into a single latent construct. In contrast, clinical and empirical evidence [7–9] suggests the existence of 2 different NPD constructs, which are usually referred to as “overt” (a variant of NPD in which exaggerate sense of

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self-importance and exhibitionism are central) and “covert” (a variant of NPD that is characterized by hypersensitivity, inhibition, and social withdrawal), respectively. The DSM-IV model of NPD has been criticized because on the one hand, it emphasizes only the overt manifestation of NPD, whereas on the other hand, it includes 3 criteria—grandiose fantasies, needs for admiration, and envy—that are better descriptors of the covert variant [8,10].

The primary aims of this study were to (1) evaluate the validity of the individual DSM-IV NPD criteria; (2) test the DSM-IV 1-factor model of NPD against the alternative 2-factor model using both confirmatory and exploratory factor analyses (CFA and EFA, respectively); and (3) examine whether the latent structure of the DSM-IV NPD features is taxonic (ie, discrete), using statistical procedures designed specifically to answer questions of this type [11,12].

2. Method

2.1. Subjects

Participants were 641 outpatients admitted consecutively to the Clinical Psychology and Psychotherapy Unit of the San Raffaele Hospital, Milan, Italy, from January 2000 to September 2003. All volunteered to participate in the study after a detailed description was presented. The study group included 248 (38.7%) men and 393 (61.3%) women. The mean age was 33.5 years (SD = 10.6). Participants could not meet any of the following exclusionary criteria: (1) an IQ less than 75 as assessed by the official Italian version of the Wechsler Adult Intelligence Scale-Revised [13]; (2) a diagnosis of Schizophrenia, Schizoaffective Disorder, Schizophreniform Disorder, Delusional Disorder, Dementia, or Organic Mental Disorder according to the diagnostic criteria listed in the DSM-IV as assessed by the Italian translation of the Mini International Neuropsychiatric Interview [14]; and/or (3) an education level lower than elementary school. Of the 641 participants, 319 (49.8%) received at least one current DSM-IV Axis I diagnosis. Current Axis I disorder diagnoses were assessed by the clinicians who followed the participants in treatment. The most frequently diagnosed Axis I syndromes were Anxiety Disorders (N = 126, 19.7%), Substance Abuse/Dependence Disorders (N = 83, 12.9%), Eating Disorders (N = 51, 8.0%), and Mood Disorders (N = 44, 6.9%). Comorbidity rates with other Axis I syndromes were 12.7%, 27.3%, 11.8%, and 14.5% for Anxiety Disorders, Mood Disorders, Eating Disorders, and Substance Abuse/Dependence Disorders, respectively.

2.2. Assessment instruments

The Structured Clinical Interview for DSM-IV Axis II Personality Disorders, Version 2.0 (SCID-II) [15], was used to assess the DSM-IV NPD criteria, as well as the other DSM-IV PDs. The SCID-II is a 140-item semistructured clinical interview organized by diagnosis that yields both a categorical and a dimensional (ie, number of symptoms)

assessment of DSM-IV PDs. Participants with Axis I diagnoses were administered the SCID-II by expert trained raters after acute symptom remission according to the judgment of the clinicians who were following them in treatment. Interrater reliability of the DSM-IV NPD criteria was assessed on the first 50 consecutively admitted participants using a pairwise interview design. Cohen's κ values for the individual NPD criteria ranged from 0.67 to 0.94 (median κ = 0.78). Moreover, both categorical (κ = 0.98) and dimensional (intraclass r = 0.97) NPD diagnoses showed adequate reliability. Intraclass correlations ranged from 0.79 (Depressive PD) to 0.95 (Avoidant PD) for the other SCID-II PD dimensional scores.

All subjects also received and completed the SCID-II Personality Questionnaire (PQ) [15]. The PQ is a 117-true/false item, self-report questionnaire designed to screen several DSM-IV PD symptoms. The PQ items are listed sequentially with no evident item sections or groupings; the PQ does not provide categorical diagnoses of DSM-IV PDs. The PQ provides at least one question for each DSM-IV PD criterion, with the exception of 3 criteria for Schizotypal PD, 2 criteria for HPD, and all of the adult criteria for Antisocial PD, which are probed directly during the interview. In the case of NPD, the number of PQ items directly corresponds to the number of criteria listed in the DSM-IV. The PQ items are simply listed sequentially with no evident item sections or groupings. The PQ does not provide categorical diagnoses of the DSM-IV PDs; it simply screens for the presence of the individual symptoms. In the present study, the PQ was administered roughly 7 days before the SCID-II; SCID-II interviews were performed blind to PQ scores, probing all DSM-IV PD criteria. The receiver operating characteristic curve indicated that PQ scores had moderate convergent validity with the SCID-II NPD categorical diagnosis (area under the curve = 0.65; 95% confidence interval [CI], 0.60–0.71).

2.3. Data analyses

Sensitivity, specificity, negative and positive predictive power, and negative and positive likelihood ratios of the DSM-IV NPD criteria could not be computed from standard formulae on the basis of contingency tables because of violations of the assumptions—namely, lack of a “gold standard” for NPD diagnosis, independence of diagnostic criteria, and no overlap between diagnosis and predictors—underlying these statistics; thus, they were computed using the appropriate formulas on the basis of latent class analysis [16,17]. Both likelihood ratio (LR) and Cressie-Read (CR) χ^2 tests were used to evaluate model fit [18]. The Akaike (AIC) and corrected AIC (CAIC) information criteria were used to compare models on the basis of different numbers of latent classes; according to these indices, the model with the smallest AIC and CAIC values should be chosen [18]. To examine the occurrence of local likelihood maxima, 10 different start values were used for each analysis.

A weighted least square CFA of the tetrachoric correlation matrix of the DSM-IV NPD criteria was used to test the

following models: (1) DSM-IV 1-factor model; (2) 2-factor model of NPD in which the DSM-IV NPD criteria that are usually considered as indicators of covert NPD (NPD criteria 2 “grandiose fantasies,” 4 “excessive admiration,” and 8 “often envious”) were assigned to a covert factor, and the remaining criteria were forced to load on an overt factor; the 2 factors were allowed to correlate each other; (3) the same 2-factor model as above, but with orthogonal (uncorrelated) factors. A 2-factor model on the basis of the frequency of endorsement of the NPD criteria in which the 3 NPD criteria with the highest frequency of endorsement defined one factor, and the remaining criteria defined the other factor, was also tested. Using a 2-index strategy, in addition to the goodness-of-fit χ^2 test, model fit was evaluated using the root mean square error of approximation (RMSEA) and standardized root mean squared residual (RMR) [19]. Cutoff values close to 0.08 for RMR and to 0.06 for RMSEA usually indicate good fit. The AIC and CAIC information criteria were used as measures of incremental fit. In addition, we also performed a principal axis factor analysis of the NPD item tetrachoric correlation matrix.

To examine whether the latent structure of the DSM-IV NPD criteria is dimensional or discrete (taxonic), we used the 2 most frequently applied taxometric procedures, mean above minus below a cut (MAMBAC) and maximum covariance (MAXCOV) [12]. Results from extensive Monte Carlo simulations suggest that MAMBAC and MAXCOV are unlikely to produce false positives and therefore can falsify taxonic conjectures; moreover, they are robust in the face of considerable distributional overlap, significant nuisance covariance, and moderate distributional skew [12]. Converging evidence for discrete groups from both MAMBAC and MAXCOV provides increased confidence in the validity of taxonic results [12].

The PQ and SCID-II total scores (ie, number of criteria that has been scored as present by the subject and the observer, respectively) were entered in turn as the x variable and the y variable in MAMBAC analyses. The goal of MAMBAC [12] is to identify the point on the x variable that results in the greatest mean difference on the y variable. When the latent structure is taxonic, the MAMBAC curve will resemble a hill or a convex parabola. Importantly, if the latent structure is not taxonic, it will take the form of a concave parabola. In the case of a low base-rate latent taxon, the peak of the MAMBAC function may be markedly shifted to the right; in this case, only the ascending branch of the convex parabola is observed. In this study, the results of MAMBAC analyses were also compared with MAMBAC curves that were generated by applying MAMBAC to dimensional data having similar distributional properties of the real data that were observed in our sample.

Next, we performed separate MAXCOV analyses of the SCID-II dichotomous ratings of the DSM-IV NPD diagnostic criteria. MAXCOV [11,12] is a taxometric technique that relies on differences in within-groups and between-groups covariances toward detecting discrete latent groups;

when 2 indicators (the output variables) are sorted along the range of a third indicator (the input variable), the covariance of the 2 variables, calculated within successive intervals of the third indicator, is maximized at the point that best differentiates the taxon from the nontaxon groups.

To perform the MAXCOV analyses, we removed 2 criteria (i and j) from the total number of NPD criteria and calculated a score for each subject on the basis of the 7 remaining criteria, thus obtaining 8 subsamples for NPD. We then calculated the covariance of i and j for each subsample and repeated this procedure for all possible pairs of criteria. Thus, we obtained 36 MAXCOV curves for NPD; we also computed an average MAXCOV curve.

In this study, several consistency tests were performed for assessing the verisimilitude of a taxonic model [11]. The first consistency test was the variation of the 36 taxon base-rate estimates that were obtained for NPD. When the variation is small, the taxonic conjecture is supported [11]. The goodness-of-fit index (GFI) was used as an additional measure to evaluate taxonic fit; taxonic data usually produce GFI values greater than 0.90 [11]. We also computed the posterior probabilities of belonging to the taxon class [11]. Given discrete latent distributions and a sufficient effect size, estimated Bayesian probabilities will aggregate near the limits of the (0,1) probability interval [11,12]. Finally, because taxonic findings on the basis of SCID-II data might be biased by observers’ expectations [12], we performed MAXCOV analyses also on the PQ self-report ratings of the individual DSM-IV NPD criteria and tested how consistently the NPD latent structure could be replicated across observer and self-report data.

3. Results

According to the SCID-II, 427 (66.6%) participants received at least one DSM-IV PD diagnosis; the average number of PD diagnoses was 1.00 (SD = 0.94). However, all subjects with no Axis I diagnosis received at least one Axis II diagnosis. One hundred fifteen participants (17.9%) received a DSM-IV NPD diagnosis; the mean number of NPD symptoms was 2.08 (SD = 2.10). No significant associations were observed between NPD and age, school level, or Axis I diagnoses. However, a significant association was observed between NPD diagnosis and male sex (Yates-corrected $\chi^2_1 = 27.94$, $P < .001$; odds ratio (OR) = 3.04; 95% CI, 2.01–4.61).

Sixty-six (57.4%) subjects who received DSM-IV NPD diagnoses also received one or more additional PD diagnoses; after Bonferroni correction of the nominal P level, NPD was significantly associated only with HPD (Yates-corrected $\chi^2_1 = 7.97$, $P < .0045$; OR = 2.23; 95% CI, 1.30–3.82) and PAPD (Yates-corrected $\chi^2_1 = 71.66$, $P < .001$; OR = 7.26; 95% CI, 4.42–11.92). The association between NPD and PAPD remained significant when the effect of the overlapping feature of envy was controlled for (conditional independence $\chi^2_1 = 41.66$, $P < .001$; OR = 5.92; 95% CI, 3.46–10.07). There was no effect of sex on the association

Table 1
DSM-IV narcissistic personality disorder criteria: diagnostic validity and factor structure

DSM-IV NPD criteria	Convergent and discriminant validity coefficients								Diagnostic accuracy statistics ^a				CFA factor loadings (SE)		EFA factor loadings	
	N (%)	r_{i-t}	ASPD ^b r_{p-bis}	BPD ^b r_{p-bis}	HPD ^b r_{p-bis}	PAPD ^b r_{p-bis}	Cluster C PDs ^b median r_{p-bis} (min to max)	Cluster A PDs ^b median r_{p-bis} (min to max)	SENS	SPEC	NPP (LR-)	PPP (LR+)	Overt	Covert	Overt	Covert
1. Grandiose sense of self-importance	93 (14.5)	0.41	0.07	0.06	0.08	0.27	-0.14 (-0.19 to -0.08)	-0.02 (-0.06 to 0.12)	0.481	0.935	0.883 (0.56)	0.637 (7.36)	0.72 (0.04)		0.55	
2. Fantasies of unlimited success	177 (27.6)	0.35	0.03	0.05	0.22	0.22	-0.10 (-0.11 to -0.08)	-0.05 (-0.06 to -0.05)	0.547	0.789	0.879 (0.57)	0.382 (2.59)		0.70 (.05)		0.44
3. Special and unique	131 (20.4)	0.47	0.13	0.06	0.20	0.27	-0.15 (-0.21 to -0.08)	-0.07 (-0.12 to 0.09)	0.642	0.900	0.913 (0.40)	0.606 (6.43)	0.75 (0.04)			0.62
4. Excessive admiration	233 (36.3)	0.32	0.05	0.07	0.25	0.17	-0.09 (-0.16 to -0.05)	-0.11 (-0.13 to -0.01)	0.601	0.693	0.879 (0.58)	0.319 (1.96)		0.57 (0.05)		0.90
5. Sense of entitlement	218 (34.0)	0.51	0.11	0.10	0.25	0.43	-0.23 (-0.24 to -0.21)	-0.06 (-0.11 to 0.08)	0.886	0.790	0.967 (0.14)	0.502 (4.22)	0.80 (0.03)			0.75
6. Interpersonally exploitative	135 (21.1)	0.48	0.11	0.16	0.15	0.31	-0.16 (-0.20 to -0.12)	-0.01 (-0.06 to 0.03)	0.649	0.893	0.914 (0.39)	0.593 (6.09)	0.76 (0.04)			0.55
7. Lacks empathy	108 (16.8)	0.47	0.10	0.11	0.13	0.30	-0.16 (-0.19 to -0.10)	-0.02 (-0.09 to 0.11)	0.626	0.941	0.913 (0.40)	0.716 (10.54)	0.81 (0.04)			0.78
8. Often envious	189 (29.5)	0.38	0.05	0.10	0.13	0.29	-0.08 (-0.09 to -0.08)	-0.02 (-0.07 to 0.09)	0.600	0.778	0.891 (0.51)	0.393 (2.71)		0.68 (0.05)		0.40
9. Arrogant, haughty behaviors	50 (7.8)	0.32	0.07	0.02	0.17	0.19	-0.13 (-0.14 to -0.10)	-0.04 (-0.04 to 0.07)	0.314	0.979	0.857 (0.70)	0.777 (14.63)	0.68 (0.05)			0.90

r_{i-t} indicates item-total point-biserial correlation corrected for part-whole overlap; r_{p-bis} , point-biserial correlation; SENS, sensitivity; SPEC, specificity; NPP, negative predictive power; PPP, positive predictive power; LR-, negative likelihood ratio, that is, $(1 - \text{sensitivity})/\text{specificity}$; LR+, positive likelihood ratio, that is, $\text{sensitivity}/(1 - \text{specificity})$.

r_{i-t} and r_{p-bis} coefficients greater than 0.14 in absolute value are significant at Bonferroni-corrected P level (ie, $P < .0005$).

^a Likelihood ratios reflect an item ability to rule in (LR+) or rule out (LR-) disease independent of pretest disease probability, because higher LR+ will result in higher posttest disease odds, whereas lower LR- will result in lower posttest odds at any given pretest odds.

^b Dimensional assessment.

between NPD and HPD (conditional independence $\chi^2_1 = 15.04, P < .001$; OR homogeneity $\chi^2_1 = 2.47, P > .10$) and PAPD (conditional independence $\chi^2_1 = 65.66, P < .001$; OR homogeneity $\chi^2_1 = 0.96, P > .30$).

3.1. Convergent and discriminant validity of DSM-IV NPD criteria

The frequencies of endorsement and the convergent (ie, item-total correlations corrected for part-whole overlap) and discriminant validity (ie, point-biserial correlations between each NPD criterion and the other dimensionally assessed DSM-IV PDs) coefficients of the individual DSM-IV NPD criteria are listed in Table 1. The internal consistency (Cronbach α) of the set of criteria was 0.73 (median inter-item $\phi = 0.24$). Convergent validity coefficients were moderate yet significant. With the exception of HPD and PAPD, the discriminant validity coefficients were trivial and/or negative. When formal comparisons were performed, convergent validity coefficients of the NPD criteria were significantly larger (Bonferroni-adjusted $P < .0028$) than the corresponding point-biserial correlations with HPD, with the only exception of NPD criterion 4 (“requires excessive admiration”) (Hotelling $t_{638} = 1.66, P = .10$). In the case of PAPD, only NPD criteria 5 (“sense of entitlement”) and 8 (often envious) did not show item-total correlations significantly greater than the corresponding correlations with PAPD.

3.2. Confirmatory and exploratory factor analyses

To assure adequate variances, as well as covariances, of the 9 DSM-IV NPD criteria, we started performing both CFA and EFA in the full sample. According to CFA results, the 1-factor model of DSM-IV NPD criteria did not provide an adequate fit ($\chi^2_{27} = 55.23, P < .002$; RMSEA = 0.040, close fit $P > .80$, RMR = 0.09; AIC = 91.23, CAIC = 189.56), nor did the model on the basis of frequencies of endorsement ($\chi^2_{26} = 54.63, P < .001$; RMSEA = 0.041, close fit $P > .80$, RMR = 0.09; AIC = 92.63, CAIC = 196.43). It should be noted that this model produced a factor correlation of 1.00. The 2-factor model on the basis of the covert vs overt distinction with orthogonal factors was the worst fitting model ($\chi^2_{27} = 194.09, P < .001$; RMSEA = 0.098, close fit $P < .001$, RMR = 0.23; AIC = 230.09, CAIC = 328.43). In comparison, the 2-factor model on the basis of the covert vs overt distinction with correlated factors reproduced the data adequately and represented the best fitting model ($\chi^2_{26} = 39.94, P < .05$; RMSEA = 0.029, close fit $P > .90$, RMR = 0.068; AIC = 77.94, CAIC = 181.74). The correlation among factors was substantial ($r = .77, P < .001$). Factor loadings and standard errors of the best fitting model are listed in Table 1.

Exploratory factor analysis results also supported the 2-factor structure of the DSM-IV NPD criteria. Only the first 2 factors of the tetrachoric correlation matrix of the NPD criteria had eigenvalues greater than 1.00 (these were 4.45 and 1.13); the scree plot indicated that the curve was flat after the second eigenvalue. The PROMAX-rotated factor loadings are listed in Table 1; factor intercorrelation was 0.56. The

EFA solution explained 62.0% of the variance (RMR = .04) and closely matched the CFA model, with factor score correlations of 0.98 and 0.90 for the overt and covert factors, respectively. The EFA 2-factor solution was consistently replicated across 2 random subgroups (N = 340 and N = 301), as indicated by correlations between sets of factor scores of 0.97 and 0.94 for the overt and covert factors. Moreover, the factor structure of NPD criteria that was obtained in the female subgroup (N = 393) was replicated the male subgroup (N = 248) (overt factor score $r = 0.88$; covert factor score $r = 0.90$). When factor analyses were carried out in the NPD subgroup (N = 115), the results closely matched the structure that was observed in the full sample (overt factor score $r = 0.96$; covert factor score $r = 0.91$).

3.3. Latent class analysis and diagnostic accuracy indexes

The 2-class model of NPD criteria (ie, NPD subjects vs non-NPD subjects) did not reproduce the data adequately (LR₄₉₂ = 543.13, $P = .05$, CR₄₉₂ = 589.98, $P < .001$; AIC = 5370.84, CAIC = 5474.64). When a third latent class was entered, both goodness-of-fit χ^2 tests became nonsignificant (LR₄₈₂ = 446.09, $P > .80$, CR₄₈₂ = 486.37, $P > .40$; AIC = 5293.80, CAIC = 5452.23). The third latent class was similar to the overt factor and was characterized by moderately large (range = 0.34–0.49) conditional probabilities of latent class membership (the probabilities of item endorsement for subjects belonging to the latent class for NPD criteria 2, 4, 5, and 8). Adding a fourth latent class did not improve the fit further (AIC = 5295.46, CAIC = 5508.51). The latent class base-rate estimate of NPD was 18.1%. As shown in Table 1, “arrogant, haughty behaviors” and “lacks empathy” were the diagnostic criteria with the best ability to rule in the NPD diagnosis. “Fantasies of unlimited success,” “excessive admiration,” and “often envious” were the worst predictors with respect to NPD latent class membership. Interestingly, grandiosity ranked only third in positive predictive power.

3.4. Taxometric analyses

Smoothed MAMBAC curves are presented in Fig. 1. Although none of the MAMBAC curves took the form of a convex parabola, they were compatible with a low base-rate taxon for both SCID-II (panel A) and PQ (panel B) ratings of NPD (Cronbach α for PQ ratings of NPD was 0.66). These curves were also different from MAMBAC curves obtained from nontaxonic random data having the same distributional properties of the real data. The 36 smoothed MAXCOV curves obtained from SCID-II NPD ratings are listed in panel C. In agreement with MAMBAC findings, they consistently indicated a taxonic latent structure of DSM-IV NPD criteria; the estimated taxon base rate was 21.0%. This conclusion was supported by the small variation of the taxon base-rate estimates across the 36 MAXCOV analyses (SD = 0.01, min = 0.19, max = 0.25; random data SD = 0.16, min = 0.00, max = 0.82). The taxonic conjecture was corroborated also by a GFI value of 0.97, as well as by a U-shaped profile of Bayesian

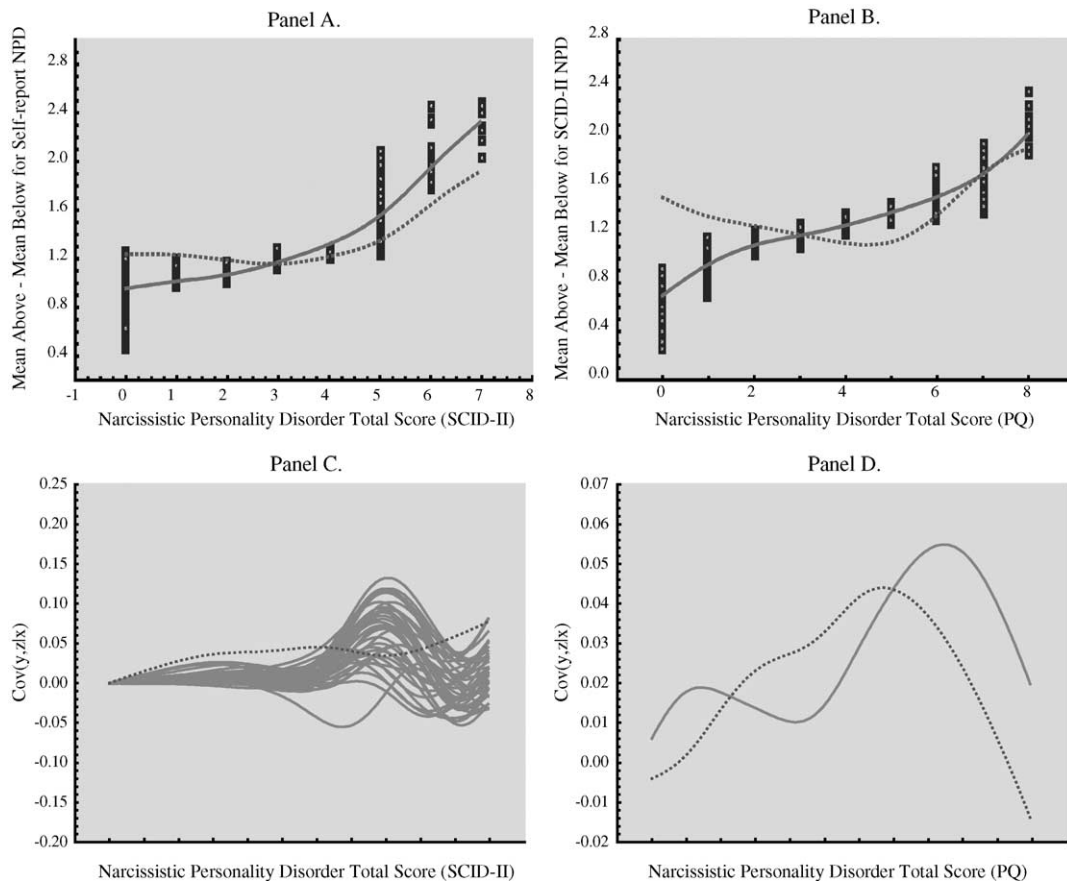


Fig. 1. Panels A and B contain the MAMBAC curves that were computed using the SCID-II and PQ ratings as the x variable for NPD, respectively. Panel C contains the smoothed MAXCOV curves that were computed using the SCID-II ratings for NPD, and panel D lists the average smoothed MAXCOV curve for PQ ratings of NPD. Solid lines indicate real data; dashed lines, nontaxonic random data.

probabilities of taxon membership, with 82.1% of the participants showing probabilities less than .10, and 17.9% showing probabilities greater than or equal to .90. The results of MAXCOV analyses conducted on PQ ratings were also consistent with the taxonic conjecture of DSM-IV NPD criteria. For ease of comparison and because of the high consistency of the individual curves, we reported the average MAXCOV curve for PQ data in panel D. The shape of this curve was clearly different from the most peaked curve obtained from nontaxonic random data. The GFI for PQ data was 0.96 and the estimated taxon base-rate estimate (17.0%) was only slightly lower than the MAXCOV estimate on the basis of SCID-II data.

4. Discussion

As a whole, the results of this study provided mixed support for the validity of the DSM-IV construct of NPD. Nevertheless, taxometric analyses consistently supported the DSM-IV typological description of NPD. Contrary to conceptualizations of NPD in a personality dimension ranging from normal assertiveness to pathological narcissism [3,4], in this study, both MAMBAC and MAXCOV results were indicative of a latent discontinuity in the distribution of

the DSM-IV NPD criteria. Interestingly, evidence of a discrete distribution was replicated when taxometric analyses were carried out on self-report ratings of NPD criteria. These data suggest that the NPD taxonic structure might not be a spurious outcome due to the rater's (ie, clinician's) biased expectations. Moreover, in this study group, the NPD latent class did not represent a rare phenomenon, because its estimated base rate ranged from 17.0% to 21.0%, depending on the assessment method and latent structure analysis technique. Notwithstanding the fact that roughly 57% of subjects with a DSM-IV NPD diagnosis received one or more additional PD diagnoses and the presence of substantial associations between NPD and, respectively, HPD and PAPD, as a whole, the 9 NPD criteria showed adequate convergent and discriminant validity coefficients. In contrast to previous observations [5,6], the results of this study point to the usefulness of maintaining NPD as a separate diagnostic category in the DSM nomenclature.

The strong association that was observed in this study between NPD and PAPD indicates that these PDs may share a common core of envy and sense of entitlement, because in this study, these characteristics did not significantly discriminate NPD from PAPD. Moreover, it is consistent with the hypothesis that NPD and aggressiveness are tightly

connected [20]. Thus, NPD subjects are likely not only to react with aggressive outburst when their egotism is threatened [20,21], but also to express long-lasting manifestations of covert indirect aggressiveness. We feel that future revisions of the DSM-IV should take into account the relationships between passive-aggressiveness and NPD. The lack of significant association between NPD and ASPD that was observed in the present study may be due to the low base rate of the latter diagnosis ($N = 14$, 2.2%) in our sample.

Finally, our results indicate that the DSM-IV NPD criteria set is factorially heterogeneous. In this study, a 2-factor structure of NPD criteria was consistently replicated across different methods and subgroups of participants. Moreover, this did not seem to be an artifact of low frequencies of endorsement of the NPD criteria, although CFA results indicated that the NPD criteria distributional properties had some effects on model fit. The 2-factor structure of NPD criteria that was observed in this study is consistent with the hypothesis of 2 dissociable expressions of narcissistic psychopathology [7-10]. Obviously, although our 2-factor structure was inspired by the distinction between overt and covert NPD, it did not correspond to the full description of these 2 conditions [7-10], because only a subset of the covert NPD features was listed among the DSM-IV criteria for NPD. Nonetheless, our results suggest that future revisions of the DSM-IV should take into account the existence of 2 different clusters of narcissistic symptoms, and provide a set of criteria for assessing also the covert factor. The need for rethinking the DSM-IV NPD diagnosis was supported also by the diagnostic accuracy statistics that neither replicated the rank order of diagnostic efficiency of NPD criteria proposed by the DSM-IV nor suggested that grandiosity is a core characteristic of NPD (in this sense, lack of empathy seemed to be much more important).

In our opinion, the results of this study should be considered in the light of several limitations, the most important of them being our assumption that a count of Axis II criteria for each categorical phenotype represents a dimensional assessment of NPD. Despite its widespread use in the research on PD latent structure, this approach assumes that the criteria represent an interval or ordinal scale. However, the problem of comparing one score with another score is problematic in the case of Axis II PD diagnoses; for instance, is a person who meets 6 NPD criteria less impaired than a person who meets 7 NPD criteria? Are 2 people who meet 6 NPD criteria equally impaired? Unfortunately, these questions still remain largely unanswered in the case of Axis II PDs. In turn, these unresolved issues suggest caution in considering our findings on NPD latent structure. Our results indicate that NPD appears to be discretely distributed among outpatients. These data do not give any indication of the base rate in the general population, or whether the same PD comprises a taxon in nonclinical subjects. Although SCID-II and PQ data were on the basis of semistructured interview and self-report ratings, respectively, the 2 instruments could not be considered independent, either conceptually or

empirically (SCID-II questions start with the same words of the corresponding PQ item). Thus, our findings need to be replicated with different instruments, more independent than the PQ and SCID-II.

These considerations, as well as the limitations of this study, strongly suggest the need for further studies before drawing definitive conclusions on the latent structure of DSM-IV NPD.

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