

The Big Seven Model of Personality and Its Relevance to Personality Pathology

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ABSTRACT Proponents of the Big Seven model of personality have suggested that Positive Valence (PV) and Negative Valence (NV) are independent of the Big Five personality dimensions and may be particularly relevant to personality disorder. These hypotheses were tested with 403 undergraduates who completed a Big Seven measure and markers of the Big Five and personality pathology. Results revealed that PV and NV incrementally predicted personality pathology dimensions beyond those predicted by multiple markers of the Big Five. However, factor analyses suggested that PV and NV might be best understood as specific, maladaptive aspects of positive emotionality and low agreeableness, respectively, as opposed to independent factors of personality. Implications for the description of normal and abnormal personality are discussed.

Tracing back to Allport and Odbert's (1936) early dictionary study of American English, the lexical tradition in personality psychology has resulted in a large and robust literature showing that five broad factors can, at a global level, account for much of the personality variation observed among individuals (e.g., Goldberg, 1990, 1993; John, 1990; John & Srivastava, 1999; McCrae & Costa, 1997, 1999). Although "Big Five" factor models have varied somewhat over time and across studies, the overall robustness of the model has been

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remarkable. The Big Five includes broad trait dimensions labeled Extraversion (or Surgency), Agreeableness, Conscientiousness, Neuroticism (vs. Emotional Stability), and Openness to Experience (or Intellect/Culture). However, the Big Five model is not without its critics (e.g., Block, 1995; Waller, 1999), who argue, among other things, that the pool of dictionary descriptors used to derive the Big Five was too limited to yield a comprehensive model of personality.

The roots of the Big Five model are embedded in a natural language tradition that favored certain types of descriptive terms over others. Allport and Odbert (1936) rationally sorted their initial list of nearly 18,000 dictionary terms from the second unabridged edition of *Webster's New International Dictionary* into four categories comprised of (a) 4,504 personal trait terms, (b) 4,541 temporary mood or state terms, (c) 5,226 social evaluation terms, and (d) 3,682 obscure and/or miscellaneous terms that could not be readily sorted into one of the previous three categories. Notably, Allport and Odbert believed that only the first group of terms represented genuine personality trait descriptors, and it is these terms—as well as an updated set identified by Norman (1967)—that have served as the foundation for much of the factor-analytic work that followed, leading to the Big Five model of personality. Clearly, we now understand much more about the associations between mood states (i.e., Allport & Odbert's second category) and traditional personality dimensions (e.g., Tellegen & Waller, in press; Watson & Clark, 1992). There is much less consensus, however, as to the relevance of social evaluative terms (i.e., Allport & Odbert's third category) to our understanding of personality structure.

Tellegen and Waller (1987, in press; Waller & Zavala, 1993) sampled 400 personality descriptors from the 1985 edition of the *American Heritage Dictionary of the English Language* but did so without the restrictive exclusionary criteria that characterized previous natural language studies of personality (i.e., they permitted evaluative and mood-related terms into their pool of personality descriptors). They then collected self-ratings on the sampled terms and reported the first evidence that using less restrictive criteria resulted in seven higher-order dimensions. Five of their “Big Seven” factors were similar but not identical to those of the Big Five. Two were labeled Negative Emotionality and Positive Emotionality, reflecting the broader cognitive, emotional, and behavioral aspects of the Big Five factors of Neuroticism and Extraversion, respectively. In

addition, the structure included factors of Agreeableness and Conscientiousness (then called Dependability) similar to the like-named factors of the Big Five model, as well as an Unconventionality factor that loosely tapped content similar to the Openness factor of the Big Five. The two new dimensions—labeled *Positive Valence* (PV) and *Negative Valence* (NV) by Tellegen and Waller (1987)—represented dimensions reflecting extremely positive (e.g., describing oneself as exceptional, important, smart) and negative (e.g., describing oneself as evil, immoral, disgusting) self-evaluations, respectively.

Since Tellegen and Waller's (1987) original study, a number of researchers have identified similar seven-factor structures across samples (Benet & Waller, 1995; Saucier, 1997; Waller 1999) and in a number of different languages, including Spanish (Benet & Waller, 1995), Hebrew (Almagor, Tellegen, & Waller, 1995), and Tagalog (Church, Katibak, & Reyes, 1998). In addition, some recent work has been conducted trying to identify the specific facets that comprise the domain of evaluative personality descriptors (Benet-Martinez & Waller, 2002). Although these studies have not yielded identical seven-factor structures, they all identified dimensions similar to the PV and NV factors identified by Tellegen and Waller (1987), as well as factors closely resembling four of the Big Five markers (all but the Openness/Unconventionality factor emerge consistently across studies and languages).

However, the Big Seven model is not without its critics (Ashton & Lee, 2001; McCrae & Costa, 1995; Widiger, 1993; Widiger & Trull, 1992), who have argued that PV and NV may represent (a) valenced response style dimensions, (b) artifactual factors resulting from the covariance among highly skewed descriptive terms, (c) global indices of positive and negative self-esteem processes reflecting some combination of substantive and evaluative variance (e.g., Ashton & Lee, 2001), or (d) maladaptive or extreme variants of the existing Big Five factors, as opposed to personality traits independent of the Big Five (e.g., McCrae & Costa, 1995). The last interpretation is most relevant to the present study. In a joint principal component analysis of scales representing the Big Five and Big Seven models, McCrae and Costa (1995) found that five components provided the most compelling and parsimonious account of the relations among all of the variables. In their analysis, PV loaded moderately on components labeled Extraversion and Openness by the authors, and NV loaded most strongly (and negatively) on an Agreeableness component but

also moderately on a Neuroticism component and negatively on components labeled Extraversion and Conscientiousness. Taken together, McCrae and Costa (1995) interpreted these results as evidence that PV and NV shared variance with the Big Five but also offered some specific, unique variance not tapped by the broad Big Five factor scales. However, finding that PV and NV tap unique variance is not necessarily evidence that they represent higher-order dimensions of personality at the same level of generality as those of the Big Five. Rather, lower-order traits exist within the Big Five—as evidenced by hierarchical measures of the Big Five such as the NEO Personality Inventory-Revised (NEO-PI-R; Costa & McCrae, 1992)—only a portion of whose variance can be reliably explained by the overarching Big Five factors (McCrae & Costa, 1992, 1995). To date, no consensus has emerged as to the proper place for evaluative dimensions such as PV and NV in relation to the Big Five model.

Regardless of whether PV and NV are best conceptualized as independent dimensions or as extreme, maladaptive variants of the Big Five, their content has led some to hypothesize that PV and NV are importantly related to various manifestations of personality disorder (Benet-Martinez & Waller, 2002; Waller, 1999, Waller & Zavala, 1993). In particular, Benet-Martinez and Waller (2002) suggested that “[PV and NV] may help elucidate the maladaptive self-evaluative processes involved in narcissism . . . borderline personality . . . or avoidant personality” (p. 16). This claim is supported by the description of personality disorders provided by the most recent edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000)*. For example, *DSM-IV-TR* describes those with Narcissistic Personality Disorder as individuals who “have a grandiose sense of self-importance” and who “routinely overestimate their abilities and inflate their accomplishments . . . [and] believe that they are superior, special, or unique . . .” (p. 714), characteristics that are quite consistent with the defining features of the PV dimension. Likewise, *DSM-IV-TR* appears to suggest that NV characterizes some individuals with Borderline Personality Disorder, saying that “there may be an identity disturbance characterized by markedly and persistently unstable self-image or sense of self” and “[those with Borderline Personality Disorder] usually have a self-image that is based on being bad or evil” (p. 707).

A growing number of studies have reported the Big Five correlates of personality disorder (e.g., Clark & Livesley, 2002; Miller, Reynolds, & Pilkonis, 2004; Morey et al., 2002; Reynolds & Clark, 2001), generally showing that personality disorders as they currently are conceptualized by the *DSM* can be meaningfully and reliably described within a Big Five framework. In fact, some writers have used these data to argue for replacing the current categorical classification scheme for personality disorders with a dimensional system based on the Big Five model of personality (e.g., Widiger, 1993, 2005; Widiger, Costa, & McCrae, 2002).

Notably, however, despite assertions by Big Seven proponents that such evaluative dimensions may be incrementally helpful in the description of personality pathology, only a single study examining the relations between traits of the Big Seven model—PV and NV in particular—and personality pathology has been reported in the literature (Durrett & Trull, 2005). In that study, the authors found mixed evidence for the relevance of PV and NV to personality pathology in an undergraduate sample that was oversampled for personality pathology: Although NV and PV showed some incremental utility in predicting interview ratings of personality disorder symptom counts, the pattern of relations did not match their expectations or those of previous writers. In their analyses, NV was nonspecifically related to most personality disorders, which they concluded might limit the utility of this dimension in applied clinical practice. Moreover, PV failed to predict Narcissistic Personality Disorder beyond the dimensions of the Big Five, which ran contrary to one of their specific *a priori* hypotheses and those of previous writers. Clearly, additional studies are needed before any firm conclusions are drawn regarding the proper role for PV and NV in models of normal and abnormal personality.

Thus, a primary aim of the present study was to test the hypothesis that PV and NV predict personality pathology beyond that predicted by the Big Five. Specifically, I expected PV incrementally to predict scores on measures of narcissism and traits relevant to narcissism (e.g., entitlement, self-esteem) beyond that predicted by markers of the Big Five. In addition, I hypothesized that NV would incrementally predict scores on measures of several negatively valenced personality disorders—such as Borderline and Antisocial Personality Disorders—as well as related traits such as self-harm, manipulativeness, and aggression.

In addition, because consensus has not yet emerged regarding the hierarchical position of PV and NV in relation to the Big Five model, a second aim of this study was to examine the factor structure of normal and abnormal personality traits when measures of PV and NV are included with measures of the Big Five and dimensions of personality pathology. Because these particular variables have never been factored together in the same study, I adopted an exploratory approach to the factor analyses. At least two outcomes were possible. First, based on the theory and previous data underlying the Big Seven model, one might expect that seven factors would emerge from the analyses—with PV and NV anchoring independent factors—so long as sufficient numbers of markers were included for each factor. Alternatively, based on the findings of McCrae and Costa (1995), one might expect a solution with fewer factors to be more appropriate, with PV and NV failing to define independent dimensions and instead loading with one or more of the Big Five dimensions. The data were allowed to drive the structure.

METHOD

Participants and Procedures

A total of 446 undergraduate students at the University at Buffalo participated in this study in exchange for course research credit. Of these, 43 (9.6%) were excluded from the primary analyses because they either omitted more than 10% of the items or scored more than three standard deviations above the normative mean on the Invalidity Index (an index which is sensitive to a wide range of response anomalies, such as random, haphazard, or otherwise inconsistent responding) of the Schedule for Nonadaptive and Adaptive Personality-2nd Edition (SNAP-2; Clark, Simms, Wu, & Casillas, in press). Thus, the final sample included 403 participants. The mean age was 19.5 ($SD = 3.2$); 54.5% were female; and 63.5% identified “Caucasian/European American” as their primary ethnicity. Those excluded due to problematic data were more likely to be male (67.4% vs. 45.4% of the final sample; $\chi^2(1) = 7.59, p < .01$), but did not differ with respect to any other demographic variable.

Trained undergraduate research assistants conducted study sessions in groups of 8 to 12 participants. In each session, the research assistant briefly described the nature of the study, obtained written informed consent, and administered a series of measures of the Big Five model, Big

Seven model, and personality pathology, as well as a brief demographic questionnaire. Participants were fully debriefed after completing the measures. All study procedures were approved in advance by the appropriate institutional review board at the University at Buffalo.

Measures

Inventory of Personal Characteristics #7. (IPC-7; Tellegen, Grove, & Waller, 1991; Benet & Waller, 1995). The IPC-7 was included as the primary measure of the Big Seven. The full IPC-7 (Tellegen, Grove, and Waller, 1990) includes 161 items. It later was abbreviated to 70 items by choosing the 10 strongest loading items per factor from the full measure (Benet & Waller, 1995), resulting in seven scales labeled Negative Emotionality (NEM), Positive Emotionality (PEM), Conscientiousness (CON), Agreeableness (AGR), Unconventionality (UNC), Positive Valence (PV), and Negative Valence (NV). The 70-item version was used for the present study, adopting a 5-point Likert scale for participant responses (1 = *very uncharacteristic of me*; 5 = *very characteristic of me*). Benet and Waller (1995) did not report descriptive statistics or reliability data for this version of the IPC-7 but did report evidence supporting its seven-factor structure in both English- and Spanish-language versions.

Big Five Inventory. (BFI; John & Srivastava, 1999). The BFI is a 44-item instrument that uses a 5-point Likert rating scale (1 = *strongly disagree*; 5 = *strongly agree*) and provides scores for the domains of the Big Five model of personality (Neuroticism, Extraversion, Conscientiousness, Agreeableness, and Openness). Benet-Martinez and John (1998) reported alpha coefficients of .84, .88, .82, .79, and .81, respectively, for the traits listed above in a sample of 711 English-speaking participants. They also reported good convergence with two other measures of the Big Five model. John and Srivastava (1999) further summarized that internal consistency reliabilities of BFI scales typically range from .75 to .90 in North American samples and 3-month, test-retest reliabilities typically range from .80 to .90.

Schedule for Nonadaptive and Adaptive Personality-2nd Edition. (SNAP-2; Clark et al., in press). The SNAP-2 is a factor analytically derived, self-report instrument designed to assess trait dimensions relevant to personality disorder. It includes 390 true-false items that form twelve trait scales assessing specific or primary traits (Mistrust, Manipulativeness, Aggression, Self-harm, Eccentric Perceptions, Dependency, Exhibitionism, Entitlement, Detachment, Impulsivity, Propriety, and Workaholism) and three broader temperament scales (Negative Temperament, Positive

Temperament, and Disinhibition). The scales have been shown to be internally consistent across several sample types (*Med* $\alpha = .83$, range = .72 to .92), have acceptable retest reliabilities (*Med* $r = .87$, range = .75 to .90, *M* interval = 49 days), and have shown good convergent and discriminant relations with other relevant self-report measures, including measures of the three- and five-factor models of personality (see Clark et al., in press, for details). The SNAP-2 also includes diagnostic scales keyed to the *DSM-IV-TR* personality disorders (PDs). Scored dimensionally, the diagnostic scales are reliable—with median alphas of .81 and .82 across community and patient samples, respectively (range = .65 to .89)—and have shown moderate to good convergence with interview ratings of PD. In a mixed patient sample ($N = 93$), for example, Clark et al. (in press) reported a median correlation of .61 (range = .42 to .76) between the SNAP-2 diagnostic scales and the corresponding scales of the Structured Interview for *DSM-IV* Personality Disorders (SIDP-IV; Pfohl, Blum, & Zimmerman, 1997).

Narcissistic Personality Inventory. (NPI; Raskin & Terry, 1988). The NPI was included to provide another direct measure of narcissism hypothesized to be related to PV. The NPI is a 40-item, true-false measure that can be scored either as a single scale or as seven correlated component scales. Because the internal consistency reliability estimates for the component scales were less than ideal in Raskin and Terry (1988; median $\alpha = .54$), only the full-scale score ($\alpha = .83$) was used in the present study.

Rosenberg Self-Esteem Scale. (RSES; Rosenberg, 1965). Because of its conceptual similarity to PV, self-esteem was included as a variable and assessed using the RSES, a widely used measure of global feelings of self-worth. The RSES includes 10 items (e.g., “I feel that I have a number of good qualities”) that participants rate on a 4-point Likert scale (1 = *strongly disagree*; 4 = *strongly agree*). Higher scores reflect higher levels of self-esteem. The RSES has been found to have good reliability and validity (Blascovich & Tomaka, 1991; Rosenberg, 1965).

RESULTS

The results are presented in two parts, corresponding to the primary aims of the study. In the first part, I present results to identify the personality and personality pathology correlates of PV and NV as well as to test the hypothesis that PV and NV provide incremental utility beyond the Big Five with respect to the prediction of personality disorder. Second, I report analyses aimed at revealing

the optimal place for PV and NV in the personality hierarchy when factored along with additional measures of personality and personality pathology.

First, however, to aid in the interpretation of the primary results and add to the rather limited psychometric literature regarding the 70-item version of the IPC-7, descriptive statistics and scale inter-correlations for the IPC-7 are presented in Table 1. Two items are notable from this table. First, although the internal consistency estimates for the scales were largely adequate (*Med* alpha = .79; range = .65 to .87), two scales—UNC (alpha = .65) and AGR (alpha = .70)—were somewhat less reliable. However, the PV and NV scales of the IPC-7—the only scales for which there is no direct redundancy built into the study—were much more reliable (alphas = .87 and .84, respectively). A second notable point is the pattern of generally low intercorrelations among the scales, suggesting good discriminant validity for the scales. However, PV and NV did not fit this pattern completely. For example, PEM correlated moderately with both PV ($r = .41$) and NV ($r = -.36$), and NV also correlated moderately with low AGR ($r = -.30$). Also, although not the focus of the present study, UNC was moderately (negatively) correlated with CON. These results suggest that the PV, NV, and UNC scales may not be as independent from the remaining four scales as would be expected from the item-level factor analyses that originally helped form them (Benet & Waller, 1995; Waller, 1999).

Table 1
Descriptive Statistics for and Intercorrelations Among IPC-7 Scales

Scale	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Negative Emotionality	2.78	0.71	(.79)						
2. Positive Emotionality	3.65	0.75	-.17	(.87)					
3. Conscientiousness	3.23	0.67	.06	-.04	(.78)				
4. Agreeableness	3.31	0.59	-.14	-.01	.15	(.70)			
5. Unconventionality	2.74	0.55	-.03	-.04	-.37	-.09	(.65)		
6. Positive Valence	3.42	0.70	-.25	.41	.11	-.18	-.05	(.87)	
7. Negative Valence	1.45	0.52	.21	-.36	-.10	-.30	.20	-.21	(.84)

Note. $N = 403$. All $r_s > |.13|$ are significant, $p < .01$. Correlations $\geq |.30|$ are presented in **boldface**. Cronbach's alpha coefficients are presented on the diagonal.

Relevance of PV and NV to Personality Pathology

Pearson correlations between the scales of the IPC-7 and those of the BFI, SNAP-2, RSES, and NPI appear in Table 2. To aid the reader in interpreting these correlations, the correlations have been marked in accordance with Cohen's (1988) recommendations for evaluating the strength of correlational effects: Medium/moderate (r s between .30 and .49) and large/strong (r s \geq .50) effects are presented in bold-face type, and large effects are further designated with an asterisk. PV and NV were broadly related to many of the variables included in the protocol. In fact, PV and NV each correlated moderately to strongly with 17 (50.0%) of the 34 variables contained in Table 2, compared to 11 (32.4%), 14 (41.2%), 6 (17.6%), 2 (5.9%), and 2 (5.9%) of the effects for the NEM, PEM, CON, AGR, and UNC scales, respectively.

More specifically, correlations between the IPC-7 and the BFI revealed that four of the Big Five traits were well represented in the IPC-7, with the NEM, PEM, CON, and AGR scales showing moderate to strong convergence with the Neuroticism, Extraversion, Conscientiousness, and Agreeableness scales of the BFI, respectively (r s ranged from .53 to .84). UNC, however, was only weakly related to BFI Openness ($r = .24$), which suggests significant differences in the content included on these two scales. PV and NV related non-specifically to several BFI scales. PV correlated strongly with BFI Extraversion and moderately with BFI Conscientiousness, Openness, and Neuroticism (negatively). NV correlated moderately and negatively with BFI Agreeableness and Conscientiousness.

In relation to the SNAP-2 trait and temperament scales, PV correlated strongly with Entitlement and Positive Temperament, moderately with Exhibitionism, and negatively with Detachment and Self-Harm (and the more specific Low Self-Esteem component of this scale). In addition, PV was moderately associated with 4 of the 10 SNAP-2 diagnostic scales, correlating positively with Narcissistic PD and negatively with Avoidant, Schizoid, and Dependent PDs. Similarly, PV correlated strongly with both the Rosenberg Self-Esteem Scale and the NPI. Thus, PV appears to be related, as hypothesized, to a broad range of dimensions related to self-evaluative processes, such as self-esteem and narcissism, but also with several other dimensions that, presumably, include an appreciable PV component. In addition, the negative associations with markers of detachment and dependency in-

Table 2
Correlations Between the IPC-7 and Other Measures of Personality
and Personality Pathology

Scale	NEM	PEM	CON	AGR	UNC	PV	NV
<i>Big Five Inventory:</i>							
Neuroticism	.80*	-.22	.07	-.14	-.07	-.32	.19
Extraversion	-.19	.84*	-.07	-.14	.05	.50*	-.27
Conscientiousness	-.21	.19	.60*	.04	-.29	.36	-.31
Agreeableness	-.23	.32	.13	.53*	-.19	.15	-.43
Openness	-.21	.29	-.07	-.01	.24	.40	-.17
<i>SNAP-2 Trait & Temperament Scales:</i>							
Negative Temperament	.68*	-.20	.08	-.17	-.01	-.22	.23
Mistrust	.34	-.27	.01	-.21	.02	-.19	.32
Manipulativeness	.12	-.15	-.22	-.23	.18	-.12	.38
Aggression	.21	-.15	-.07	-.49	.10	-.04	.39
Self-Harm	.33	-.34	-.10	-.04	.13	-.42	.43
Low Self-Esteem	.30	-.37	-.14	-.02	.07	-.45	.38
Suicide Proneness	.28	-.23	-.05	-.04	.16	-.28	.38
Eccentric Perceptions	.16	-.16	-.10	-.05	.21	-.04	.36
Dependency	.40	-.15	.01	.15	-.04	-.31	.14
Positive Temperament	-.18	.53*	.12	-.07	-.04	.53*	-.20
Exhibitionism	-.05	.54*	.04	-.07	.05	.44	-.11
Entitlement	-.15	.26	.15	-.13	-.05	.59*	-.01
Detachment	.14	-.71*	.05	-.07	.03	-.34	.38
Disinhibition	.01	-.02	-.43	-.17	.31	-.17	.29
Impulsivity	-.03	.09	-.52*	-.15	.28	-.12	.14
Propriety	.17	.09	.40	.06	-.42	.18	-.06
Workaholism	.09	.01	.27	-.16	-.09	.21	.08
<i>SNAP-2 Diagnostic Scales:</i>							
Paranoid PD	.32	-.34	.04	-.26	.01	-.20	.36
Schizoid PD	.07	-.63*	-.06	-.08	.10	-.39	.39
Schizotypal PD	.29	-.38	-.03	-.09	.15	-.20	.44
Antisocial PD	-.02	-.09	-.33	-.25	.27	-.12	.35
Borderline PD	.32	-.23	-.17	-.29	.21	-.19	.45
Histrionic PD	.19	.42	.05	-.08	.04	.29	.00
Narcissistic PD	-.01	.20	.11	-.15	.00	.46	.13
Avoidant PD	.43	-.56*	.06	.06	-.04	-.44	.32
Dependent PD	.46	-.17	.03	.08	-.04	-.31	.21
Obsessive-Compulsive PD	.19	-.02	.37	-.21	-.16	.22	.11

(Continued)

Table 2 (Cont.)

Scale	NEM	PEM	CON	AGR	UNC	PV	NV
<i>Other Scales:</i>							
Rosenberg Self-Esteem	-.51*	.40	.15	-.05	-.16	.64*	-.41
Narcissistic Personality Inventory	-.20	.36	.06	-.29	.03	.58*	.02

Note. $N = 403$. All $r_s > |.13|$ are significant, $p < .01$. Correlations $\geq |.30|$ are presented in **boldface**. Correlations $\geq |.50|$ are further denoted with an asterisk. NEM = Negative Emotionality; PEM = Positive Emotionality; CON = Conscientiousness; AGR = Agreeableness; UNC = Unconventionality; NV = Negative Valence; PV = Positive Valence; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality-2nd Ed.; PD = personality disorder.

dicating that these constructs are at least partially characterized by a relative absence of positive self-evaluation.

NV also was associated with a number of SNAP-2 scales. NV correlated moderately with Self-Harm (including both components of Low Self-Esteem and Suicide Proneness), Aggression, Manipulativeness, Mistrust, Detachment, and Eccentric Perceptions, all scales that could be expected to include an appreciable NV component. NV also correlated moderately with 6 of 10 diagnostic scales, including Borderline, Schizotypal, Schizoid, Paranoid, Antisocial, and Avoidant PDs. These results confirm the two hypothesized relations expected with Borderline and Antisocial PDs. Interestingly, however, additional correlates of NV were identified, particularly among the Cluster A PDs, which potentially extend the proposed relevance of NV to a broader range of PDs than has been hypothesized previously.

Incremental Utility of PV and NV

However, zero-order correlations provide an incomplete picture of the data. A reasonable next question is whether PV and NV provide information relevant to personality pathology beyond that already provided by the Big Five dimensions. To test this, I conducted a series of hierarchical multiple regression analyses. In each analysis, a SNAP-2 diagnostic or trait scale served as the dependent measure, and the Big Five trait dimensions—as measured by both the BFI and IPC-7—were entered as a block as the first set of predictors. Both

sets of Big Five markers were included at Step 1 to reduce the likelihood that measure-specific factors would influence our assessment of the Big Five. Next, for each dependent measure, the regressions were conducted twice, with either PV or NV entered at Step 2, in order to test independently the incremental predictive effect of each evaluative dimension. To guard against chance findings due to Type I error, a conservative Bonferroni-corrected significance level was established for these analyses by dividing the typical p -value of 0.05 by 27, the number of dependent variables, which equaled 0.00185. This value was rounded to a final p -value significance level of 0.002 to match the level of precision provided by the statistical program.

A summary of these analyses is presented in Table 3. The first notable result is that all of the Step 1 blocks were significant, confirming previous work showing that the Big Five personality dimensions explain a good amount of the variability observed in dimensions of personality pathology. However, these relations were far less than unity (median $R^2 = .296$), and there was significant variability in the amount of variance for which the Big Five could account (range = .123 to .559). Among the diagnostic scales, the Big Five accounted for the least variance in Narcissistic PD ($R^2 = .149$) and the most variance in Avoidant PD ($R^2 = .487$) and Schizoid PD ($R^2 = .479$). Among the SNAP-2 trait and temperament scales, the Big Five were least predictive of Eccentric Perceptions ($R^2 = .123$; a scale tapping unusual perceptions and beliefs) and Suicide Proneness ($R^2 = .174$), and most predictive of Detachment ($R^2 = .559$; a measure of interpersonal and emotional distance) and Negative Temperament ($R^2 = .535$; akin to negative emotionality). Thus, for some dimensions of personality pathology, there is significant room for improvement in prediction beyond that afforded by the Big Five.

When entered at Step 2, PV significantly improved the prediction of 2 of 10 diagnostic scales—Narcissistic PD ($\Delta R^2 = .126$) and Histrionic PD ($\Delta R^2 = .024$)—as well as 6 of 17 trait and temperament scales. Most notably, PV incrementally predicted Entitlement ($\Delta R^2 = .148$)—a scale relevant to narcissism measuring an unrealistically positive self-regard and the feeling that one should be treated as a special person—and, more modestly, Positive Temperament, Exhibitionism, and Self-Harm (negatively) (ΔR^2 s ranged from .020 to .039). Thus, consistent with predictions, PV significantly predicted narcissism and entitlement beyond that predicted by the Big Five. In addition, although not hypothesized a priori, PV added incremen-

Table 3
Hierarchical Regression-Based Predictions of Personality Pathology Dimensions

Dependent Measure	Step 1: Five-Factor Model		Step 2: Positive Valence		Step 2: Negative Valence	
	R^2	$F(10,392)$	ΔR^2	$F(1,391)$	ΔR^2	$F(1,391)$
<i>SNAP-2 Diagnostic Scales:</i>						
Paranoid PD	.296	16.46*	.001	0.60	.012	6.97
Schizoid PD	.479	35.98*	.009	7.19	.014	10.89 (+)
Schizotypal PD	.253	13.28*	.001	0.46	.057	32.41 (+)
Antisocial PD	.310	17.61*	.001	0.41	.019	11.21 (+)
Borderline PD	.285	15.60*	.000	0.07	.049	28.64 (+)
Histrionic PD	.295	16.44*	.024	14.08 (+)	.011	6.23
Narcissistic PD	.149	6.85*	.126	16.87 (+)	.027	12.62 (+)
Avoidant PD	.487	38.78*	.006	4.54	.012	9.77 (+)
Dependent PD	.318	18.30*	.002	1.40	.015	8.75
Obsessive-Compulsive PD	.274	14.78*	.016	8.58	.014	7.89
<i>SNAP-2 Trait & Temperament Scales:</i>						
Negative Temperament	.535	45.16*	.000	0.04	.002	1.39
Mistrust	.204	11.33*	.003	1.50	.015	8.23
Manipulativeness	.245	12.72*	.000	0.03	.027	14.33 (+)
Aggression	.354	21.51*	.000	0.01	.016	10.12 (+)
Self-Harm	.293	16.28*	.036	21.10 (-)	.064	38.73 (+)
Low Self-Esteem	.329	19.18*	.038	23.13 (-)	.035	21.23 (+)
Suicide Proneness	.174	8.24*	.020	9.91 (-)	.068	35.07 (+)
Eccentric Perceptions	.123	5.48*	.005	2.06	.072	35.16 (+)
Dependency	.298	16.60*	.005	2.84	.004	2.38
Positive Temperament	.460	33.45*	.025	19.36 (+)	.001	0.88
Exhibitionism	.373	23.33*	.039	25.70 (+)	.002	1.38
Entitlement	.241	12.43*	.148	94.80 (+)	.008	3.90
Detachment	.559	49.59*	.001	0.68	.010	9.24
Disinhibition	.390	25.04*	.005	2.96	.010	6.66
Impulsivity	.359	21.92*	.007	4.47	.001	0.56
Propriety	.293	16.28*	.014	7.69	.007	3.83
Workaholism	.260	13.77*	.004	1.88	.023	12.74 (+)

Note. $N = 403$. Hierarchical regressions computed separately for positive and negative valence. Significant R^2 increments appear in **boldface**. SNAP-2 = Schedule for Nonadaptive and Adaptive Personality-2nd edition.

*Significant Step 1 block.

(-) Significant Step 2 block, negative relation.

(+) Significant Step 2 block, positive relation.

All $p \leq .002$ (Bonferroni adjusted for 27 simultaneous regressions [i.e., $p = .05/27 = .002$]).

tally, but more modestly, to the prediction of a number of other dimensions relevant to personality pathology.

When NV was entered at Step 2, it incrementally predicted 6 of 10 diagnostic scales and 7 of 17 trait and temperament scales of the SNAP-2. Most notably, NV added incrementally to the prediction of Schizotypal PD ($\Delta R^2 = .057$) and Borderline PD ($\Delta R^2 = .049$), as well as to the dimensions of Eccentric Perceptions ($\Delta R^2 = .072$) and Self-Harm ($\Delta R^2 = .064$), particularly its Suicide Proneness component ($\Delta R^2 = .068$). In addition, NV added significantly but more modestly to the prediction of Schizoid, Antisocial, Narcissistic, and Avoidant PDs (ΔR^2 s ranged from = .012 to .027), as well as the dimensions of Manipulativeness, Aggression, Low Self-Esteem, and Workaholism (ΔR^2 s ranged from = .016 to .035). Thus, the findings confirmed the hypothesized impact of NV on prediction of dimensions relevant to Borderline PD and, to a lesser extent, Antisocial PD. In addition, the results highlighted an unexpected role for NV in the prediction of Schizotypal PD and trait dimensions relevant to it.

PV and NV in the Personality Hierarchy

The second goal of this study was to examine the location of PV and NV in the factor structure of normal and abnormal personality traits. To that end, I conducted joint, scale-level factor analyses of the IPC-7, BFI, and trait and temperament scales of the SNAP-2. As the above analyses attest, the SNAP-2 includes a number of scales with significant PV and NV components. Also, the RSES and NPI were included in these analyses to provide additional variance hypothesized to be relevant to PV. Finally, because multiple direct measures of PV and NV were not included in this study, I created parallel, 5-item half-scales of PV and NV from the items in the IPC-7, using both psychometric and rational methods, to include in the factor analyses. The half-scales were designed to balance content while maintaining adequate reliability. The resultant PV half-scales—Positive Valence 1 (PV1) and Positive Valence 2 (PV2)—correlated .77 and yielded internal consistency estimates of .74 and .81, respectively. Likewise, the NV half-scales—Negative Valence 1 (NV1) and Negative Valence 2 (NV2)—correlated .76 and yielded alpha coefficients of .73 and .70, respectively. Thus, the inclusion of multiple indicators of PV and NV as well as the SNAP-2, NPI, and

RSES should provide greater opportunity for positively and negatively valenced factors to emerge, if warranted by the data.

To help determine the maximum number of factors to extract, I conducted parallel analyses (Horn, 1965) of the eigenvalues generated from two initial principal factor analyses. The first analysis was conducted using the observed response data for each of the variables listed above, with squared multiple correlations (SMCs) entered as the prior communality estimates. The second analysis was conducted by, instead, factoring simulated scale-level data sampled randomly from a normal distribution, with the mean SMC from the first analysis entered for all prior communality estimates in order to place both sets of eigenvalues on the same metric. The eigenvalues of ten simulated datasets were averaged to yield more reliable estimates, and a 95% confidence interval was calculated around each mean eigenvalue.

Although not definitive with regard to the number of factors to extract, parallel analyses provide an upper bound on the number of viable factors to extract. The basic logic is that one should not extract factors that account for less variance than would be obtained by factoring random data (e.g., Horn, 1965; Preacher & MacCallum, 2003), and the parallel scree plot is the best way to demonstrate this point. In Figure 1, the plot of observed-data eigenvalues crosses the random-data plot between the fifth and sixth factors, and the fifth observed eigenvalue falls clearly above the 95% confidence interval surrounding the fifth random eigenvalue. This suggests that no more than five factors should be extracted from these data. Alternatively, a traditional scree test—in which one identifies the number of eigenvalues that lie before that last big drop in the plot—would suggest four factors as the most viable solution. However, more parsimonious two-factor (e.g., Digman, 1997) and three-factor (e.g., Clark et al., in press; Tellegen & Waller, in press) models have also appeared in the literature and, thus, were examined in this study. Varimax-rotated factor loadings on two, three, four, and five factors are presented in Tables 4, 5, 6, and 7, respectively.¹

1. Both orthogonal (varimax) and oblique (promax) rotations were conducted and revealed highly similar results. Thus, I chose to present varimax-rotated solutions here because (a) most common trait personality models hypothesize independent factors, and (b) orthogonal rotations involve one degree less of subjectivity than do oblique rotations (i.e., the amount of correlation among factors in an oblique rotation can be directly manipulated by the experimenter).

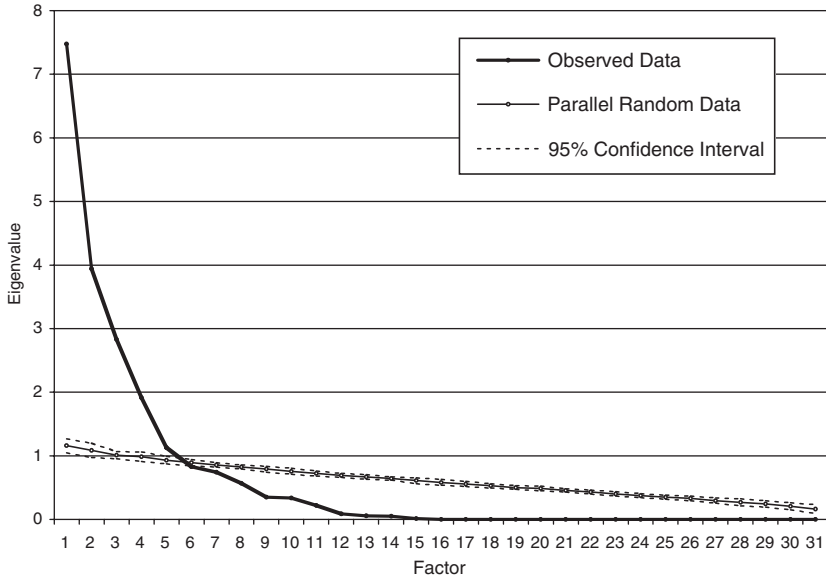


Figure 1
Scree Plot.

Factor Structures

The two-factor solution revealed two broad factors on which most scales had substantive loadings. Factor I included loadings for markers of narcissism, extraversion, positive emotionality, positive valence, self-esteem, and openness. In contrast, Factor II was marked by both NV half-scales, low agreeableness, and SNAP-2 Manipulativeness, Aggression, Mistrust, Disinhibition, and Eccentric Perceptions. These factors are similar to the higher-order Alpha and Beta factors identified in several previous investigations of personality structure (Digman, 1997; Markon, Krueger, & Watson, 2005), but with NV and PV marking each broad factor, respectively. However, several constructs—such as conscientiousness, unconventionality, and neuroticism—loaded weakly or inconsistently on these factors, which suggests that a more differentiated solution may be necessary to account for the covariation among these variables.

In the three-factor solution, the first factor included loadings for extraversion, positive emotionality, narcissism, positive valence, self-esteem, and openness. Factor II included markers of neuroticism, negative emotionality, low agreeableness, negative valence, and

Table 4
 Varimax-Rotated Factor Loadings on Two Principal Factors

Scale	Factor	
	I	II
Narcissistic Personality Inventory	.80	.25
IPC Positive Valence 2	.78	-.13
SNAP-2 Positive Temperament	.77	-.08
BFI Extraversion	.76	-.14
IPC Positive Valence 1	.70	-.10
SNAP-2 Entitlement	.70	.16
Rosenberg Self-Esteem	.68	-.36
IPC Positive Emotionality	.64	-.22
SNAP-2 Exhibitionism	.64	.11
SNAP-2 Detachment	-. 52	.35
BFI Openness	.46	-.09
BFI Neuroticism	-. 43	.39
SNAP-2 Dependency	-.33	.27
SNAP-2 Workaholism	.30	.14
SNAP-2 Propriety	.18	-.04
SNAP-2 Manipulativeness	.04	.71
SNAP-2 Aggression	.06	.66
IPC Negative Valence 2	-.24	.61
IPC Negative Valence 1	-.12	.60
SNAP-2 Disinhibition ^a	-.02	.59
SNAP-2 Mistrust	-.16	.58
SNAP-2 Negative Temperament	-.24	.57
SNAP-2 Self-Harm	-. 43	.56
BFI Agreeableness	.16	-. 56
SNAP-2 Eccentric Perceptions	.02	.54
IPC Agreeableness	-.23	-. 46
BFI Conscientiousness	.37	-. 44
SNAP-2 Impulsivity	.02	.42
IPC Negative Emotionality	-.33	.40
IPC Unconventionality	.01	.26
IPC Conscientiousness	.06	-.24
% of common variance	33.1	27.6

Note. $N = 403$. Loadings greater than $|\text{.35}|$ are presented in **boldface**. Solution accounts for 60.7% of the common variance. BFI = Big Five Inventory; IPC = Inventory of Personal Characteristics #7; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality.

^aItem overlap was removed from Disinhibition for these analyses.

Table 5
 Varimax-Rotated Factor Loadings on Three Principal Factors

Scale	Factor		
	I	II	III
Narcissistic Personality Inventory	.80	.25	.04
BFI Extraversion	.77	-.20	-.08
IPC Positive Valence 2	.76	-.08	.27
SNAP-2 Positive Temperament	.75	-.05	.21
IPC Positive Valence 1	.69	-.10	.10
SNAP-2 Entitlement	.69	.19	.17
Rosenberg Self-Esteem	.67	-.36	.12
IPC Positive Emotionality	.64	-.27	-.07
SNAP-2 Exhibitionism	.64	.08	-.04
SNAP-2 Detachment	-.52	.40	.07
BFI Openness	.46	-.12	-.03
SNAP-2 Dependency	-.33	.29	.01
SNAP-2 Negative Temperament	-.24	.66	.21
SNAP-2 Aggression	.08	.64	-.14
SNAP-2 Mistrust	-.16	.64	.10
SNAP-2 Manipulativeness	.07	.63	-.37
IPC Negative Valence 1	-.11	.59	-.13
IPC Negative Valence 2	-.22	.59	-.19
SNAP-2 Self-Harm	-.42	.55	-.16
SNAP-2 Eccentric Perceptions	.04	.54	-.07
BFI Agreeableness	.14	-.54	.17
IPC Negative Emotionality	-.34	.51	.25
BFI Neuroticism	-.44	.49	.22
IPC Agreeableness	-.24	-.45	.09
IPC Conscientiousness	.01	-.04	.70
BFI Conscientiousness	.33	-.28	.66
SNAP-2 Impulsivity	.07	.24	-.65
SNAP-2 Propriety	.14	.13	.61
SNAP-2 Disinhibition ^a	.03	.45	-.55
SNAP-2 Workaholism	.27	.29	.49
IPC Unconventionality	.05	.13	-.47
% of common variance	32.6	26.7	16.5

Note. $N = 403$. Loadings greater than $|\cdot35|$ are presented in **boldface**. Solution accounts for 75.8% of the common variance. BFI = Big Five Inventory; IPC = Inventory of Personal Characteristics #7; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality.

^aItem overlap was removed from Disinhibition for these analyses.

Table 6
Varimax-Rotated Factor Loadings on Four Principal Factors

Scale	Factor			
	I	II	III	IV
BFI Extraversion	.83	-.25	-.06	-.12
SNAP-2 Positive Temperament	.75	-.04	-.13	.21
IPC Positive Emotionality	.75	-. 38	.04	-.13
Narcissistic Personality Inventory	.73	.35	-.22	.10
SNAP-2 Exhibitionism	.71	.01	.06	-.07
IPC Positive Valence 2	.68	.03	-.32	.32
SNAP-2 Entitlement	.62	.29	-.21	.23
SNAP-2 Detachment	-. 62	.49	.00	.13
IPC Positive Valence 1	.61	.03	-. 35	.16
BFI Openness	.41	-.04	-.24	.00
IPC Negative Valence 1	-.16	.64	.07	-.09
IPC Negative Valence 2	-.28	.64	.07	-.14
SNAP-2 Aggression	.07	.64	.16	-.11
SNAP-2 Manipulativeness	.09	.61	.19	-.36
BFI Agreeableness	.19	-. 58	-.07	.13
SNAP-2 Mistrust	-.12	.56	.33	.09
IPC Agreeableness	-.19	-. 51	.03	.05
SNAP-2 Eccentric Perceptions	.05	.51	.18	-.06
SNAP-2 Self-Harm	-.34	.42	.42	-.19
BFI Neuroticism	-.22	.16	.78	.09
IPC Negative Emotionality	-.11	.18	.78	.12
SNAP-2 Negative Temperament	-.06	.38	.72	.11
SNAP-2 Dependency	-.15	.04	.57	-.10
Rosenberg Self-Esteem	.53	-.16	-. 54	.20
IPC Conscientiousness	.00	-.07	.06	.70
BFI Conscientiousness	.25	-.20	-.24	.69
SNAP-2 Impulsivity	.12	.21	.10	-. 66
SNAP-2 Propriety	.20	.03	.22	.57
SNAP-2 Disinhibition ^a	.07	.41	.17	-. 56
SNAP-2 Workaholism	.24	.30	.02	.52
IPC Unconventionality	.02	.19	-.10	-. 45
% of common variance	29.1	22.5	17.6	16.7

Note. $N = 403$. Loadings greater than $|\cdot35|$ are presented in **boldface**. Solution accounts for 85.9% of the common variance. BFI = Big Five Inventory; IPC = Inventory of Personal Characteristics #7; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality.

^aItem overlap was removed from Disinhibition for these analyses.

Table 7
Varimax-Rotated Factor Loadings on Five Principal Factors

Scale	Factor				
	I	II	III	IV	V
BFI Extraversion	.84	-.03	-.12	-.25	.07
IPC Positive Emotionality	.76	.05	-.13	-.28	.23
SNAP-2 Positive Temperament	.75	-.14	.23	.04	.07
Narcissistic Personality Inventory	.72	-.23	.12	.30	-.21
SNAP-2 Exhibitionism	.71	.06	-.06	.07	.03
IPC Positive Valence 2	.68	-.30	.32	-.07	-.13
SNAP-2 Detachment	-. .64	-.03	.14	.39	-.28
SNAP-2 Entitlement	.61	-.23	.25	.30	-.11
IPC Positive Valence 1	.61	-.32	.15	-.09	-.15
Rosenberg Self-Esteem	.54	-. .52	.20	-.19	.03
BFI Openness	.41	-.25	.01	-.01	.04
BFI Neuroticism	-.22	.82	.08	.02	-.22
IPC Negative Emotionality	-.12	.80	.11	.06	-.20
SNAP-2 Negative Temperament	-.07	.71	.12	.35	-.19
SNAP-2 Dependency	-.16	.53	-.08	.22	.17
IPC Conscientiousness	-.01	.05	.71	-.03	.08
BFI Conscientiousness	.25	-.23	.69	-.22	.06
SNAP-2 Impulsivity	.12	.08	-. .65	.24	-.07
SNAP-2 Propriety	.18	.19	.59	.15	.12
SNAP-2 Workaholism	.22	.01	.53	.25	-.17
IPC Unconventionality	.02	-.10	-. .45	.13	-.15
SNAP-2 Eccentric Perceptions	.02	.11	-.03	.63	-.08
SNAP-2 Manipulativeness	.07	.14	-.33	.63	-.23
SNAP-2 Disinhibition ^a	.06	.11	-. .53	.55	-.03
SNAP-2 Mistrust	-.14	.29	.11	.54	-.25
SNAP-2 Self-Harm	-. .35	.37	-.17	.50	-.08
IPC Agreeableness	-.19	-.05	.08	-.02	.73
BFI Agreeableness	.19	-.13	.15	-.15	.69
SNAP-2 Aggression	.06	.19	-.12	.36	-. .55
IPC Negative Valence 2	-.29	.07	-.14	.45	-. .46
IPC Negative Valence 1	-.17	.07	-.08	.44	-. .47
% of common variance	29.4	17.0	16.6	16.5	12.5

Note. $N = 403$. Loadings greater than $|\cdot35|$ are presented in **boldface**. Solution accounts for 92.0% of the common variance. BFI = Big Five Inventory; IPC = Inventory of Personal Characteristics #7; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality.

^aItem overlap was removed from Disinhibition for these analyses.

negatively valenced personality pathology traits (e.g., SNAP-2 Aggression, Mistrust, Manipulativeness, and Eccentric Perceptions). The third factor was marked primarily by scales tapping conscientiousness versus disinhibition. Thus, this structure looks similar but not identical to that of common three-factor models of personality (e.g., Clark et al., in press; Markon et al., 2005; Tellegen & Waller, in press).

The four-factor solution was relatively clean. Factor I included prominent loadings for scales of extraversion, positive emotionality, narcissism, entitlement, both PV half-scales, and to a lesser extent, BFI Openness. The second factor was marked primarily by scales characteristic of high and low agreeableness, such as SNAP-2 Aggression and Manipulativeness, both Agreeableness scales, and both NV half-scales. Factor III appears to represent a clear neuroticism/negative emotionality factor, with salient loadings for all such scales in the analysis. Finally, the fourth factor appears to reflect individual differences in constraint/conscientiousness, with positive loadings for both conscientiousness scales and SNAP-2 Propriety and Workaholism, and negative loadings for the Disinhibition and Impulsivity scales of the SNAP-2. Thus, these factors appear to map relatively cleanly onto four of the Big Five dimensions, with PV and NV loading with positive emotionality and low agreeableness, respectively.

The five-factor solution was quite similar to the four-factor solution, but not as clean from a theoretical standpoint. The primary difference between the two was that Factor II from the four-factor solution split into two separate factors—Factors IV and V—in the five-factor solution, which appear to represent low and high agreeableness, or, perhaps, high and low NV, respectively. Factor IV included salient loadings for several SNAP-2 scales tapping both behavioral under-control (Manipulativeness, Disinhibition, and Self-Harm) and schizotypal characteristics (Eccentric Perceptions and Mistrust), whereas Factor V was marked primarily by both agreeableness scales, likely reflecting the higher specific correlation between these two variables. Notably, both NV half-scales and SNAP-2 Aggression split moderately across Factors IV and V in the five-factor solution.²

2. Despite the results of the parallel analysis and scree test, I also looked at six- and seven-factor solutions in order to provide an opportunity for distinct PV and

DISCUSSION

The results of this study suggest that the PV and NV dimensions of the Big Seven model tap significant variance relevant to dimensions of personality pathology beyond that accounted for by multiple measures of the Big Five personality markers. This finding confirms a key hypothesis discussed above and by others in the literature (Benet-Martinez & Waller, 2002; Waller, 1999, Waller & Zavala, 1993). In particular, PV added significantly to the prediction of Narcissistic PD as well as trait dimensions relevant to it, such as entitlement, self-esteem, and general positive emotionality. Notably, whereas the Big Five dimensions together accounted for 14.9% of the variance in Narcissistic PD—the lowest of all diagnostic scales—the addition of the single PV scale increased the total variance accounted for by another 12.6%.

Likewise, the expectations regarding NV were confirmed as well. NV added significantly to the prediction of Borderline PD and, to a lesser extent, Antisocial PD, as well as to a number of trait dimensions relevant to each, such as suicidality, manipulativeness, and aggressive thoughts, feelings, and behavior. Although the incremental effects of NV were somewhat smaller than those for PV, they nonetheless suggest that individuals with some personality disorders are characterized by negatively valenced disturbances in self-perception that go beyond the broad variance tapped by the Big Five dimensions.

Interestingly, NV also added significantly to the prediction of Schizotypal PD and the related SNAP-2 scale of Eccentric Perceptions, which, together, measure a range of unusual perceptions and beliefs. Although this result was not expected, post hoc examination

NV factors to emerge. In both solutions, Factors I, II, and III were relatively unchanged from the four- and five-factor solutions, but the remaining factors continued to shift and differentiate. In the six-factor solution, SNAP-2 Manipulativeness and Disinhibition broke from the other scales to form a small sixth factor with no other unique loadings. In the seven-factor solution, both NV half-scales separated to form Factor VI with no other unique markers, and BFI Openness was the lone clean marker of the Factor VII. However, both structures likely represent over-extractions, as too few clean markers emerged for these factors. Moreover, the seven-factor solution accounted for slightly more than 100% of the common variance, which is somewhat challenging to interpret. Taken together, the findings suggest that these structures reflect small shifts of specific variance that can be more cleanly explained within more parsimonious models.

of the content contained on the NV scale used in this study may help illuminate possible reasons for this finding. It appears that NV—which includes items such as “is mentally disturbed, sick” and “is wicked, evil”—taps a broad range of extremely negative self-perceptions that are endorsed more frequently by individuals who also report features related to Schizotypal PD. *DSM-IV-TR* defines Schizotypal PD as “a pervasive pattern of social and interpersonal deficits marked by acute discomfort with, and reduced capacity for, close relationships as well as by *cognitive or perceptual distortions* and *eccentricities of behavior*” (italics added; p. 697).

Thus, the incremental effect of NV may reflect at least two explanations. First, the cognitive and perceptual distortions characteristic of those with Schizotypal PD may extend to self-perceptual processes such that they endorse negative characteristics about themselves more often than would be warranted by a more objective view of their personality. Alternatively, perhaps individuals with Schizotypal PD have accurate insight into their eccentricities and thus report higher levels of NV consistent with their accurate yet negative self-perceptions. Elements of both explanations likely have merit, but further research is necessary to replicate this finding and examine the reasons for it. In particular, a self-other study—in which the self-perceptions of those endorsing Schizotypal features are compared with perceptions of them provided by friends or family members—may help elucidate whether the negatively valenced self-perceptions identified herein represent accurate or biased perceptual processes.

Interestingly, the present findings are only partially consistent with those recently published by Durrett and Trull (2005). Although they also found that NV and, to a lesser extent, PV added incrementally to the prediction of interview-based personality disorder symptom counts above and beyond the Big Five, the pattern of these incremental effects was somewhat different from that presented here. In both studies, NV was found to be related incrementally to a majority of PDs (6 of 10 in the present study and 7 of 10 in Durrett & Trull, 2005), but the two studies converged on only 4 of 10 PDs: Borderline, Antisocial, Avoidant, and Schizoid. Likewise, whereas I identified a substantial incremental effect for PV in predicting Narcissistic PD, Durrett and Trull (2005) identified none despite their a priori expectations. The differences across studies could be related to differences in measurement of the primary personality and PD variables, as Durrett and Trull (2005) utilized the NEO-PI-R to capture

the Big Five and a structured interview to assess personality pathology, whereas I used multiple measures to assess the Big Five domains and a self-report measure of personality pathology. Thus, future studies using a more comprehensive and integrative set of measurements are necessary to clarify the relation of evaluative dimensions to personality pathology.

The second aim of this study was to identify the structural location of PV and NV in relation to measures of both normal and abnormal personality dimensions. A growing literature suggests that normal and abnormal personality dimensions can be described within the same structural model (e.g., Markon et al., 2005), and a number of competing structural models—ranging from two to seven factors—have been proposed to explain the higher order covariation among these dimensions (e.g., Clark, Livesley, Schroeder, & Irish, 1996; Digman, 1997; Goldberg, 1993; Markon et al., 2005; Tellegen & Waller, in press; Waller, 1999). However, for reasons described above, few studies have included evaluative dimensions such as PV and NV, and their influence on the structure of personality is an understudied area of the literature.

These data suggest several tentative conclusions with respect to the place for PV and NV in the broader personality trait structure. First, across factor solutions ranging from two to seven factors, PV failed to separate from the markers of extraversion and positive emotionality to form a distinct factor, suggesting that PV may be best understood as a specific facet or component of this broad domain. Likewise, NV failed to emerge as a distinct factor unless seven factors—which likely represent an overextraction—were extracted. Across the two- through five-factor structures, NV most consistently appeared alongside low agreeableness and several dimensions of personality pathology, including markers of behavioral under-control and schizotypy.

The two-, three-, and four-factor structures each offered relatively clean and theoretically interesting views on these data. At the highest level of generality, these data suggest that NV and PV cleanly mark two broad factors that look quite similar to the Alpha and Beta factors identified in previous studies by Digman (1997) and others (e.g., Markon et al., 2005). However, not all variables loaded substantively and consistently on these two factors—notably, markers of negative emotionality split significantly across these factors—suggesting that more factors may be needed to account fully for the

covariation among this particular sample of variables. Nonetheless, that NV and PV load substantively on Alpha and Beta, respectively, suggests (a) that some portion of variance in Digman's higher-order model may be evaluative in nature and (b) that it may be difficult to tease apart the variance associated with dispositional and evaluative components of personality description at such high levels of generality.

The three-factor structure roughly approximates that of common Big Three models (e.g., Clark et al., in press; Tellegen & Waller, in press), with factors tapping (I) Positive Emotionality/Positive Valence, (II) Negative Emotionality/Negative Valence/Low Agreeableness, and (III) Constraint versus Disinhibition. Interestingly, however, agreeableness coheres most closely with negative emotionality and NV in this structure, which runs counter to typical three-factor structures in which agreeableness more often loads with markers of constraint versus disinhibition.

The four-factor structure—with factors tapping (I) Positive Emotionality/Positive Valence, (II) Agreeableness versus Negative Valence, (III) Neuroticism/Negative Emotionality, and (IV) Conscientiousness versus Disinhibition—arguably was the cleanest and most theoretically consistent structure in these data. In this structure, PV and NV cleanly mark their respective factors, and the structure is consistent with other four-factor models identified in the personality-psychopathology literature (e.g., Livesley, Jang, & Vernon, 1998; Markon et al., 2005; Watson, Clark, & Harkness, 1994).

Summary and Implications

Taken together, the results suggest that although PV and NV offer some incremental advantage in the prediction of personality pathology, they may not reflect independent dimensions of personality. This conclusion is consistent with that of several writers (e.g., McCrae & Costa, 1995; Widiger, 1993), who believe that PV and NV represent extreme, maladaptive variants of traits—extraversion and low agreeableness, respectively—within a Big Five framework. It is possible, however, that PV and NV do not represent substantive personality traits at all, but rather positively and negatively valenced response style indicators or perhaps some combination of substantive and evaluative variance (e.g., Ashton & Lee, 2001). Given that PV did not correlate with all positively valenced scales and NV did not correlate with all negatively valenced scales (i.e., the scales show some

specificity), it seems reasonable to conclude that at least some portion of their variance is substantive rather than purely evaluative. However, future studies are needed to explore this distinction further.

These findings are particularly relevant in light of calls for a dimensional classification system for personality pathology in the next revision of the *DSM*. Some favor the adoption of the Big Five model as the basis for this system (e.g., Widiger, 1993, 2005; Widiger, Costa, & McCrae, 2002), but the present findings suggest that reliance on only those five broad domains, as currently defined, may ignore important variance relevant to personality disorder. Of course, proponents of the Big Five model might counter that facet models of the Big Five—such as that embodied by the NEO-PI-R—contain additional, specific variance that aids in the description of personality pathology and have been shown to better predict interview-based ratings of PDs than the Big Five domain scores alone (e.g., Reynolds & Clark, 2001). Thus, studies are needed to determine whether PV and NV continue to incrementally predict personality pathology even after accounting for both higher and lower order markers of the Big Five.

A potential limitation of the present study is the reliance on exploratory rather than confirmatory factor-analytic methods. However, this approach was motivated by several factors. First, the exact measures used in this study never have been included together in the same study. Furthermore, studies of PV and NV in relation to dimensions of personality disorder have not yet appeared in the literature. Thus, I adopted a data-driven, exploratory approach to the factor analyses because no clear and complete set of hypothesized relations could be extracted from the limited literature in this domain. Another potential limitation is the limited number of PV and NV markers used in the factor analyses. The use of PV and NV half-scales helped to ameliorate this concern to some extent; however, half-scales such as these are not as reliable as full scales, and using them in such analyses clearly is not as ideal as one might like. Rather, a minimum three markers typically are required to form a factor. Thus, future studies using multiple, independently derived markers of PV and NV are needed.

Finally, future studies are needed to extend these initial findings using confirmatory methods to test competing structural models of personality that include PV and NV and to replicate the present findings in additional sample types, such as community-based adults

and psychiatric patients. Patients, in particular, may provide a more appropriate population within which to address the present questions, given the higher base rate of extreme scores and personality pathology in such samples. Likewise, the purely self-report nature of the present study is a limitation that should be remedied in future work.

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