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Five-Factor Model personality disorder prototypes in a community sample: Self- and informant-reports predicting interview-based DSM diagnoses

Erin M. Lawton, Andrew J. Shields, and Thomas F. Oltmanns

Department of Psychology, Washington University in St. Louis

Abstract

The need for an empirically-validated, dimensional system of personality disorders is becoming increasingly apparent. While a number of systems have been investigated in this regard, the five-factor model of personality has demonstrated the ability to adequately capture personality pathology. In particular, the personality disorder prototypes developed by Lynam and Widiger (2001) have been tested in a number of samples. The goal of the present study is to extend this literature by validating the prototypes in a large, representative community sample of later middle-aged adults using both self and informant reports. We found that the prototypes largely work well in this age group. Schizoid, Borderline, Histrionic, Narcissistic, and Avoidant personality disorders demonstrate good convergent validity, with a particularly strong pattern of discriminant validity for the latter four. Informant-reported prototypes show similar patterns to self reports for all analyses. This demonstrates that informants are not succumbing to halo representations of the participants, but are rather describing participants in nuanced ways. Importantly, informant reports add significant predictive validity for Schizoid, Antisocial, Borderline, Histrionic, and Narcissistic personality disorders. Implications of our results and directions for future research are discussed.

Keywords

Personality disorder; prototypes; five-factor model; informant report; validity

Over the last few decades, dimensional models of personality disorders (PDs) have garnered a great deal of support and enthusiasm. Of the diagnoses in the *Diagnostic and Statistical Manual (DSM-IV)* (American Psychological Association, 1994), PDs are often considered the most problematic (e.g., in terms of reliability and co-occurrence). However, there are a number of reasons to be hopeful that a dimensional model may yield a dramatic improvement in dealing with these issues. First, evidence has demonstrated that personality pathology is continuously distributed (Livesley, 1998; Widiger, 1992). It appears that, rather than asking whether a PD is or is not present, researchers and clinicians should be asking about the *degree* to which features are present. Dimensional models of PDs have also gained support through the consistent finding that abnormal personality is highly related to normal personality functioning, which has long been conceptualized as continuous (Costa & Widiger, 2002; O'Connor, 2002). Finally, Skodol et al. (2005) found that dimensional models of four PDs – Schizotypal, Borderline, Avoidant, and Obsessive-Compulsive PDs – accounted for more variance in functional impairment (e.g., work or interpersonal functioning) than did the *DSM-IV* categories or simply measures of normal personality. Each

of these areas of research seems to suggest that identifying and implementing a dimensional model of PDs would provide a much-needed empirical base for the diagnosis and study of personality pathology.

Of the various dimensional models that have been proposed, the five-factor model (FFM) of personality has received the most attention, and research suggests that the FFM is largely able to depict the ten *DSM-IV* PDs (Costa & Widiger, 2002; Saulsman & Page, 2004; Schroeder, Wormworth, & Livesly, 1992). This model is based on lexical analyses of trait descriptors and suggests five higher-order domains of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. The NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992), the most widely used measure of the FFM, further separates each of these five broad domains into six facets.

Using item response theory, Samuel, Simms, Clark, Livesley and Widiger (2010) examined the relationship between the NEO-PI-R and two measures of personality pathology (the Schedule for Nonadaptive and Adaptive Personality; Clark, 1993; and the Dimensional Assessment of Personality Pathology; Livesley & Jackson, 2009). Results from these analyses demonstrate a shared dimensional structure among measures of normal and pathological personality, with four of the five domains emerging (openness was not consistently found). Moreover, this study found that, while the measures of pathological personality typically provided more information at higher levels of the latent trait dimensions, there was a large degree of overlap between assessment instruments. This provides strong evidence that features of personality disorders can indeed be conceptualized as extreme variants of general personality traits.

At the most basic level, high neuroticism and low agreeableness appear to be associated with most of the PDs. The exception is Dependent PD, which is characterized by both high neuroticism and high agreeableness (Saulsman & Page, 2004). However, more differentiating relationships between the NEO-PI-R and PDs are achieved at the facet level (Widiger, Trull, Clarkin, Sanderson, & Costa, 1994). Lynam and Widiger (2001) proposed a more disorder-specific approach using expert consensus to determine a distinct subset of facets characteristic of each PD. This approach enjoys a number of benefits such as an aggregation of judgments and the identification of facets not overtly identified in *DSM-IV* criteria.

Since their development, these prototypical profiles have been validated in a number of samples. Miller, Reynolds, and Pilkonis (2004) found generally good agreement between the expert consensus prototypes and NEO-PI-R profiles in a clinical sample, with the exception of Obsessive-Compulsive PD and Dependent PD. These authors also found overall good convergent and discriminant validity with respect to two measures of personality pathology. The same study reported high temporal stability and adequate predictive validity with regard to these prototypes across 6- and 12-month periods in a second clinical sample. Again, Obsessive-Compulsive PD had the lowest similarity scores. This and other studies have indicated that this prototype does not seem to be working as well as the others, and more generally, a number of studies have reported that the FFM is not able to describe Obsessive-Compulsive PD consistently (Haigler & Widiger, 2001; Miller, Bagby, & Pilkonis, 2005).

To avoid the time consuming and demanding method of prototype matching, Miller, Bagby, Pilkonis, Reynolds, and Lynam (2005) developed a simplified scoring technique. This technique (known as the PD count method) creates a summed score of all relevant NEO-PI-R facets for each PD. The PD count score technique yields correlations comparable to those between similarity scores and PD symptom counts (Miller, Bagby, et al.). These count scores can then be compared to the North American, French, or Dutch-Flemish normative

scores developed and validated by Miller et al. (2008). The FFM PD count scores have also been validated when assessed via Structured Interview for the Five-Factor Model of Personality, as well as when rated by clinicians (Miller, Bagby, & Pilkonis, 2005; Miller, Maples, et al., 2010).

One limitation of many of the aforementioned studies is their reliance on self-report. Although some attempt has been made to explore the utility of other-report (Miller, Pilkonis, & Clifton, 2005; Miller, Pilkonis, & Morse, 2004), the use of informants with respect to the PD prototypes is largely absent despite being recognized as an important pursuit (e.g., Widiger & Samuel, 2005). It is commonly recognized in the literature that individuals with personality pathology often lack insight due to the ego-syntonic nature of these disorders (Klonsky, Oltmanns, & Turkheimer, 2002). Indeed, research using peer-report of PD features has suggested that this source seems to be adding a unique perspective; although informant report appears to differ appreciably from self report, informants tend to agree with each other (Klonsky, et al.; Oltmanns & Turkheimer, 2009). The fact that others agree suggests that meaningful constructs are being captured.

This begs the question: are there systematic differences with regard to the constructs that the self versus an informant can draw upon when reporting? Much of this literature has focused on the observability of traits. In terms of the FFM, neuroticism is typically associated with low observability, while extraversion is linked to high observability. Because it relies heavily on knowledge of internal thoughts and feelings, neuroticism should produce somewhat lower self-other agreement. Conversely extraversion is, by definition, more observable and should therefore result in higher levels of self-other agreement. Indeed a number of studies have demonstrated this pattern (e.g., Harkness, Tellegen, & Waller, 1995; Naumann, Vazire, Rentfrow, & Gosling, 2009), though agreement on traits of neuroticism appear to increase somewhat as level of acquaintance between the target and the observer increases (Vazire, 2010). In general then we see that the observability of traits plays an important role in the study and interpretation of other reports.

Beyond the realm of normal personality, different sources appear to provide varied information regarding PDs and functioning. Using FFM domain and facet scores, rather than prototypes, Miller, Pilkonis, and Clifton (2005) found that other report generally provided additional information with respect to a target's personality pathology in a clinical sample, particularly within Paranoid PD and the Cluster B disorders (Antisocial, Borderline, Histrionic, and Narcissistic). Miller, Pilkonis, and Morse (2004) found a median correlation of .47 between self- and informant-reported PD prototype scores in another sample of psychiatric patients. Informant-reported prototypes demonstrated incremental validity in the prediction of functional and interpersonal impairment in this study. This pattern was particularly strong for Paranoid, Antisocial, Borderline, Histrionic, and Avoidant PDs. Additionally, their analyses indicated that self-other agreement increased as the observability of maladaptive traits increased. This may provide an explanation for why informants are proving particularly useful as a source of information regarding Cluster B disorders, pathologies for which criteria tend to be more externalizing than the other PD diagnoses. Ultimately, Miller, Pilkonis, and Morse suggest that while internal distress is better predicted by self report, interpersonal dysfunction is better predicted by informants.

A suggested advantage of a dimensional model is the ability to account for and handle the considerable diagnostic co-occurrence seen with PDs (Lynam & Widiger, 2001; Trull & McCrae, 2002; Widiger & Frances, 2002). Research studies consistently show that individuals diagnosed with one PD frequently meet criteria for at least one other (e.g., Oldham et al., 1992; Widiger & Chaynes, 2003). However, as noted by Lynam and Widiger, a great deal of PD comorbidity may be explained using the FFM, as "disorders are expected

to co-occur to the extent that they assess common FFM domains and facets” (p. 403). Because the FFM allows a wide variety of personality profiles, latent PD constructs may be more accurately represented. Before such a system can be implemented, its relationship to the existing system must be examined.

In addition to the benefits of any dimensional model (e.g., consistent empirical support that personality pathology is continuous, their potential to better handle diagnostic co-occurrence), because they are based on normal personality, the NEO prototypes may prove particularly useful when examining age. In her review on stability and variability in PDs, Clark (2009) noted an overall decrease in personality pathology over time. However, Balsis, Gleason, Woods and Oltmanns (2007) found that a number of the *DSM-IV* criteria contain age bias. An older adult in their sample was more likely to endorse the Dependent PD criterion, “feels uncomfortable and helpless when alone because of exaggerated fears of being unable to care for himself or herself” than a younger adult with the same level of underlying latent variable. The NEO-PI-R, on the other hand, has been used extensively in later middle-aged and older adults, and has demonstrated good temporal stability (Costa & McCrae, 1994; Widiger & Trull, 2007). For these reasons, the prototypes may be better indicators of levels of latent pathology in older adults than the *DSM-IV* diagnoses.

The present study addresses several issues. First, we attempt to validate the PD prototypes in a later middle-aged adult sample. Through the use of informants, we are able to examine self-other agreement among the prototypes, as well as to identify the areas in which other report may be particularly useful. Very few studies look at informant-generated prototypes, particularly in a community sample. Additionally, this study expands upon earlier work by shedding light on the relation between age and self-other congruence using the FFM and prototypes, as opposed to pathological personality measures. Finally, we examine convergent and discriminant validity, looking both at the relationships among the prototypes as well as between each prototype and an interview-based measure.

Method

Participants—Results in this manuscript are reported as part of an ongoing, prospective study of the trajectory of personality pathology in later middle-age (Oltmanns & Gleason, 2011). This community sample was recruited using standard epidemiological methods and consisted of 898 adults between the ages of 55 and 64 years living in the St. Louis Metropolitan area (demographic characteristics are reported in Table 1). Though we do not possess data regarding the specific racial/ethnic break-down for this age group, census data for St. Louis city and county indicate a 65% white and 29% black population. Therefore, this sample is representative of St. Louis’ racial/ethnic composition. Data from males and females were analyzed together for this paper, as it is neither our purpose to examine gender differences, nor are findings consistent with respect to established gender differences in the prevalence of specific PDs (with the exception of Antisocial PD; e.g., Grant et al., 2004; Lenzenweger, Lane, Loranger, & Kessler, 2007; Torgersen, Kringlen, & Cramer, 2001). Analyses conducted separately by gender revealed that correlations for each group were typically very close to those reported for the whole sample, and there did not appear to be any systematic differences. When they differed, correlations for males were frequently slightly smaller than those for women. Similarly, no systematic differences emerged when analyses were stratified by participant race/ethnicity and these too were very close to the entire sample correlations. In general, the prototypes seemed to be functioning approximately equivalently in both groups, supporting the analysis of the overall sample.

We employed a community sample for a number of reasons. Perhaps most important is the fact that most middle-aged people who would meet the diagnostic criteria for a personality disorder are likely not in treatment. Studies that focus on clinical samples have the

advantage of including people with more pronounced personality pathology, but there is no way to determine whether those problems are representative of the nature or extent of personality disorders in the general population. While the NEO PD prototypes have been used with informants in clinical samples (e.g., Miller, Pilkonis, et al., 2005), the relationship between self and other reports has not yet been examined in a community sample.

Participants were recruited using a pool of randomly-selected, listed phone numbers for households with at least one inhabitant in our age range. Specific information regarding residents was provided by a sampling company that cross-referenced households with census data. Households were asked to identify all eligible residents between the ages of 55 and 64 years. If a household contained more than one eligible resident, the Kish method (Kish, 1949) was used to randomly select a target. We did not recruit other eligible residents if the target refused to participate (sampling without replacement). Participants were paid \$60 to complete a three-hour assessment.

Informants—Each participant was asked to identify someone who would be able to provide the best description of the participant's personality characteristics. We preferred that the participant identify a spouse or romantic partner as their informant. If a romantic partner was unavailable or refused to participate, the participant was asked to identify another person who knew them well. For this sample, data were collected from 760 informants, comprised of 47.4% romantic partners, 24.8% family members, 23.0% close friends, and 4.8% other.

Measures

Structured Interview for DSM-IV Personality (SIDP-IV): The SIDP-IV (Pfohl, Blum, & Zimmerman, 1997) is a semi-structured interview designed to assess each criterion of the ten *DSM-IV* personality disorders. Questions on the SIDP-IV are arranged by themes (e.g. emotions, self-perception, stress and anger) rather than by disorder. Items are written in nonpejorative, lay language. The SIDP-IV utilizes a five-year rule, meaning participants were asked to describe personality traits that predominated over the most recent five year period. PD criteria are rated on a 0 to 3 scale, from *not present* to *strongly present*. Diagnoses can be obtained using the SIDP-IV by simply dichotomizing the item scores (i.e., 0 and 1 indicate that the criterion is not present, while a 2 or a 3 would indicate presence). However, we maintained the dimensional nature of the scoring by simply creating a summed score of the total points for each disorder for the analyses in the current study.

NEO Personality Inventory-Revised (NEO-PI-R): The NEO-PI-R (Costa & McCrae, 1992) is a 240-item questionnaire measuring the FFM of personality. It provides a systematic assessment of emotional, interpersonal, experiential, attitudinal, and motivational styles. The NEO-PI-R is a concise measure of the five major domains of personality (neuroticism, extraversion, openness, agreeableness, and conscientiousness), as well as six facets assessing more specific traits comprising each domain. Parallel forms of the NEO-PI-R were used for self-(form S) and informant-reports (form R). Items are rated on a 5-point Likert scale, with responses ranging from *strongly disagree* to *strongly agree*. Taken together, the five domains and 30 facet scales of the NEO-PI-R provide a comprehensive and detailed assessment of adult personality.

PD counts were computed by summing scores on FFM facets that were deemed prototypically high or low as reported by Lynam and Widiger (2001). Prototypically low facet scores were reverse coded, and summed with prototypically high facet scores. For example, the Schizotypal PD prototype was computed by summing two facets of neuroticism (anxiety and self-consciousness), one facet of openness (ideas), three reverse-

scored facets of extraversion (warmth, gregariousness, and positive emotions), and one reverse-scored facet of conscientiousness (order). Count scores were created for each of the ten PDs, and separate scores were computed for self- and informant-ratings. We used the revised scoring method for the Dependent PD count (Miller & Lynam, 2008).¹

Results

Nine percent of the participants in our sample qualify for a diagnosis of at least one PD. This prevalence rate is comparable to those reported in other epidemiological studies, which consistently find estimates of 9–13% (e.g., Ekselius, Tillfors, Furmark, & Fredrikson, 2001; Samuels et al., 2002; Torgerson, 2005). An additional 8.6% of our participants (i.e., those who did not qualify for a PD) fell short of a diagnosis by only one criterion.

We began our analyses by considering self-other agreement on the NEO-PI-R, both at the domain and the facet level. As demonstrated in Table 2, bivariate correlations were generally moderate and all were significant at the $p < .01$ level. Domain correlation coefficients ranged from .35 (agreeableness) to .51 (both extraversion and openness). Facet-level r s ranged from .23 (altruism, from the agreeableness domain) to .57 (aesthetics, from the openness domain). Median r s within each domain were .37 (neuroticism), .47 (extraversion), .46 (openness), .32 (agreeableness), and .38 (conscientiousness).

We then examined the relations among interview-based PD scores pathology, self-reported prototypes, and informant-reported prototypes using bivariate correlations (see Table 6). The self-reported prototypes correlate significantly ($p < .01$) with SIDP scores for nine of the ten PDs, the exception being Obsessive-Compulsive PD. Of these nine significant findings, correlation coefficients ranged from .22 (Schizotypal PD) to .50 (Avoidant PD), with a median r of .34. We found the same pattern of correlations between informant-reported prototypes and SIDP scores, again with the only non-significant result being Obsessive-Compulsive PD. Significant correlations ranged from .14 (Schizotypal PD) to .39 (Borderline PD), with a median r of .24. The correlations between self-reported prototypes and informant-reported prototypes were as follows: Paranoid (.42), Schizoid (.51), Schizotypal (.50), Antisocial (.45), Borderline (.43), Histrionic (.47), Narcissistic (.43), Avoidant (.55), Dependent (.44), Obsessive-compulsive PD (.52). All were significant at the $p < .01$ level.

Next, we examined the connection between self-reported NEO prototypes and the SIDP after controlling for the variance accounted for by neuroticism and agreeableness using partial correlations. This analysis was conducted to ensure that these prototypes provided incremental validity beyond the broad personality domains that are most obviously associated with PDs. As can be seen in Table 3, the prototypes continue to correlate significantly ($p < .01$) with SIDP pathology for all ten PDs even after partialling these two related higher-order factors, demonstrating the incremental validity of the prototypes. Partial correlation coefficients range from .09 (Paranoid) to .36 (Schizoid) with a median partial r of .16.

We also used partial correlations to explore the association between informant-reported prototypes and the SIDP while controlling for self-reported prototypes. As Table 4 shows, five of the ten informant prototypes maintain a significant relationship with the SIDP at $p < .05$. The Obsessive-Compulsive and Schizotypal informant prototypes do not appear to account for additional variance in SIDP-rated pathology after controlling for self-reported prototype. Interestingly, all four Cluster B PDs are significant, with Schizoid PD yielding

¹Although a prototype exists for psychopathic personality, the discussion surrounding its relationship to Antisocial PD lies beyond the scope of the current study. For this reason, it is not included in these analyses.

the final significant result. Among the significant partial correlations, coefficients range from .08 (Schizoid PD) to .24 (Borderline PD).

We subsequently examined the associations among the self-reported prototypes as the first step in evaluating their convergent and discriminant validity. As can be seen in Table 5, correlations are mostly moderate with a few in the high range. Significant correlations among self-reported prototypes range from .07 (between Antisocial and Schizotypal PD, $p < .05$) to .86 (between Antisocial and Narcissistic PD). The median r was .43. The analysis was repeated for the informant-reported prototypes, and the results show a similar pattern. Significant correlations among informant prototypes range from .08 (Borderline with Schizoid, $p < .05$) to .90 (Antisocial with Narcissistic, $p < .01$). The median r was .40. Additionally, Cronbach's alphas were largely good to very good. The lowest alpha was obtained for Schizotypal PD (.54 and .53 for self- and informant- report, respectively) and the highest was obtained with Dependent PD (.87 for self-report and .86 for informants). The median alpha for self-reported prototypes was .67 and for informant-reported prototypes was .76.

We concluded our analyses by extending the examination of the validity of the self- and informant-reported prototypes using SIDP ratings as the criteria. The heterotrait-heteromethod matrix (as defined by Campbell & Fiske, 1959) for self-report in Table 6 shows that each of the values in the validity diagonal are significant, with the exception of Obsessive-Compulsive PD. Five of the ten PDs demonstrate good convergent validity. The Schizoid, Borderline, Histrionic, Narcissistic, and Avoidant prototypes each show their highest correlation with their corresponding SIDP PD ratings. Of the five prototypes showing convergent validity, four demonstrate a particularly strong pattern of discriminant validity (Borderline, Histrionic, Narcissistic, and Avoidant). Median discriminant r across all PDs was .13 ($p < .01$). Furthermore, expected relationships among the PDs emerged across measurement type. Interestingly, the presence of numerous negative correlations suggests that a simple "halo effect," or tendency to endorse, is unlikely.

The heterotrait-heteromethod matrix for informant-report shows generally lower correlations, but largely the same pattern as that of the self. Nine of the ten coefficients in the validity diagonal (all but Obsessive-Compulsive PD) are significant. Similarly, the Schizoid, Borderline, Histrionic, Narcissistic, and Avoidant PD prototypes demonstrate good convergent and discriminant validity. The latter four again showed the strongest pattern of discriminant validity. Median discriminant r among informant prototypes across all disorders was .10 ($p < .01$). We find expected relationships among the PDs within informant report, as well.

Discussion

The transition to a dimensional model of PDs would afford many empirically supported benefits. This conceptualization provides more information, offers a way to describe diagnostic co-occurrence and within-disorder heterogeneity, and avoids the dichotomization of a consistently demonstrated continuous variable (Livesley, 1998; Widiger & Chaynes, 2003). Additionally, research has shown the distinction between normal and abnormal personality to be largely arbitrary (O'Connor, 2002). For instance, the *DSM-IV* PDs are largely able to be described within the framework of the FFM (Schroeder, et al., 1992; Widiger & Trull, 2007) and IRT analyses indicate a great deal of overlap among the NEO and measures of personality pathology (Samuel, et al., 2010). Lynam and Widiger (2001) proposed expert-generated NEO prototypes that, along with Miller, Bagby, Pilkonis, et al.'s (2005) count score method, have largely demonstrated good convergent and discriminant validity. These prototypes have also shown satisfactory predictive validity and strong temporal stability.

While previous studies have demonstrated the utility of the prototypes, most have done so in clinical samples. Our representative sample of community residents not only taps a typically overlooked population in PD research (the 55–64 age group), but also utilizes informant report. While informant report is likely to be useful for the assessment of many disorders and their associated functioning, we believe that it is particularly important for PDs due to their ego-syntonic nature. To our knowledge, this is the first study examining the informant-reported prototypes in an adult, community sample. The present study therefore takes advantage of a novel sample to broaden the scope of the prototypes' use.

In the current study, we first wanted to determine whether the prototypes were useful in our sample of later middle-aged adults. We found that, with the exception of Obsessive-Compulsive PD, the PD prototypes as reported by both self and informant were significantly correlated with ratings based on the SIDP interview. The SIDP was used as the validity criterion, because semi-structured diagnostic interviews are often considered the gold standard in personality disorder assessment. It is not our intention, however, to suggest that the *DSM-IV* or its related measures are without fault. Instead our goal was to compare two alternative approaches to the measurement of latent constructs associated with conventionally accepted definitions of personality pathology. Ultimately, the question will be which measure provides more value with regard to identifying current and future problems in social adjustment, health, and subjective well-being. In a far more stringent test of utility, we computed partial correlations while controlling for neuroticism and agreeableness. As expected, the strength of the associations decreased, but all ten relationships remained significant at the $p < .01$ level or below, with Obsessive-Compulsive PD actually becoming significant. Because neuroticism and agreeableness are the global personality domains most consistently associated with PDs (O'Connor, 2002), these results are a robust testament to the value of the prototypes, and demonstrate their utility in a middle-aged sample.

We also found levels of self-other agreement among the prototypes very similar to those reported by Miller, Pilkonis, et al. (2004). These authors reported a median correlation of .47, while we found a median correlation of .46. Of note, the self-other agreement between the prototypes (as reported here and in the Miller, Pilkonis, et al. study) is generally larger than that found using other measures of pathological personality (Klonsky, et al., 2002). Perhaps informants are more familiar with considering others' "normal range" traits and behaviors than those of a pathological nature. The fact that correlations between the prototypes and the SIDP are lower than those between self- and informant-reported prototypes is not surprising given the method variance of both interview versus questionnaire and normal versus abnormal personality functioning.

We next examined the contribution of informant report with respect to the prototypes. The informant report correlated moderately with self report for all ten PDs. An even more compelling argument for the use of informants in addition to self report is that, for five of the ten PDs, informants account for unique variance in the interviewers' ratings after controlling for the self. Other report adds significant predictive utility for Schizoid, Antisocial, Borderline, Histrionic, and Narcissistic PDs. The fact that all four Cluster B disorders emerge as significant is consistent with findings that the observability of the features may play a key role in the extent of self-other agreement (Miller, Pilkonis, et al., 2004). However, our results further suggest that observability may also play an important role in the ability of others to contribute additional information. It is therefore remarkable that informants account for unique variance in ostensibly more internalizing disorders, such as Schizoid ($p = .04$) and Avoidant ($p = .08$) PDs. Because both of these prototypes contain a number of facets of extraversion, we might have expected higher self-other agreement for these prototypes. However, we did not necessarily expect informants to provide more

information than the self. In this way, the performance of informant-reported prototypes somewhat exceeded our expectations. The replication of this finding and its interpretation within the self-other knowledge symmetry (SOKA) model (Vazire, 2010) will be an interesting direction for future research.

The interrelationships among the prototypes for both self and informant were also encouraging. Associations between disorders that we would expect to see (e.g., Schizoid and Avoidant, or Antisocial and Narcissistic) did emerge. Although within-cluster correlations are not specifically high, which might be expected, the associations between disorders are often intuitive. For example, the strong relation between Borderline and Dependent is likely driven by the intense fear of being left alone that is characteristic of both PDs. Conversely the insignificant relation between Histrionic and Narcissistic PD is also easily interpretable, as Histrionic PD is characterized by feelings of closeness toward many people while Narcissistic is characterized by feelings of superiority over others. Importantly, these relationships were mirrored in the informant-reported prototypes. This suggests that there is not simply a tendency to generalize positive or negative feelings toward a target, but rather informants are painting nuanced pictures of the participants.

We also find evidence of good convergent validity for the Schizoid, Borderline, Histrionic, Narcissistic, and Avoidant prototypes, and a particularly strong pattern of discriminant validity for the latter four disorders. Because a number of the PDs as we currently know them are facing potential elimination (including Schizoid, Histrionic, and Narcissistic), count scores such as these may be the method by which the constructs in question need to be assessed. The demonstration of convergent and discriminant validity in these PDs are therefore particularly encouraging. Among the five remaining prototypes that did not demonstrate convergent validity, four shared their largest correlation with an intuitive alternative, or were consistent with co-occurrence literature (e.g., Lenzenweger, et al., 2007; Oldham et al., 1992). Namely, the Paranoid prototype was slightly more strongly related to Schizoid SIDP ratings, Schizotypal was most strongly related to Avoidant, Antisocial most highly correlated with Narcissistic PD ratings, and Dependent's largest association was with Borderline PD. Unlike pathological personality measures that largely do not have items that contribute to multiple disorders, the PD prototypes necessarily contain overlap, as they are driven by the items.

Of particular interest is the relationship between Antisocial and Narcissistic PDs. These two disorders are consistently shown to be highly correlated (Gunderson & Ronningstam, 2001; Oldham et al., 1992), and the present study finds the Antisocial prototype more highly related to SIDP ratings of Narcissism than to those of Antisocial. One potential interpretation of this result is that as Antisocial individuals age, they find themselves unable to engage in the reckless or aggressive behaviors indicative of this disorder. Instead, they may turn to more subtle actions, such as manipulation. The concept of heterotypic continuity suggests that there may be a number of ways in which a latent trait can manifest, and this manifestation may be dependent upon context (e.g., across cultures or age). Thus, it is possible that antisocial behaviors shift toward a more narcissistic presentation as the person approaches later life. We mention this simply because the examination of potential heterotypic continuity will be an important direction for further research in the study of PDs in older adults.

Although expected relations emerge as stronger, a large number of the correlations among prototypes are significant. These, as well as the somewhat low discriminant validity of a few of the disorders, attest to the considerable overlap among the constructs (Lenzenweger, et al., 2007; Widiger & Chaynes, 2003). Because PDs are highly co-occurring syndromes, we would expect to – and do – find the same to be true for the prototypes.

One noticeable aspect of our results is the relatively weak evidence for the validity of the Schizotypal prototype. It has the lowest correlation with the SIDP for both self- and informant-report. Furthermore, the prototype correlates highly with Avoidant and Dependent PDs (.74 and .70, respectively for self report, and .73 and .69 for informants). Similarly when compared with the SIDP, the Schizotypal prototype shows poor convergent and discriminant validity. The strong relation with Avoidant PD particularly suggests that this prototype may be doing an adequate job of tapping interpersonal discomfort. However, because the NEO-PI-R was developed to assess general personality, aspects of Schizotypal PD such as odd perceptual experiences are not covered well. Krueger and Eaton (2010) instead argue that an alternative personality dimension, which they term peculiarity, is needed to obtain sufficient coverage of this disorder. Inquiries such as these are becoming increasingly important as DSM-5 discussions continue.

A potential limitation of the current study is that the strength of the associations depends upon the amount of variability in the sample. Because ours is a representative community sample of later middle-aged adults, we have limited variation with respect to the features of some disorders. As compared with the others, we found relatively poor convergent and discriminant validity for Schizotypal, Antisocial, and Dependent PDs. These disorders are less well represented in our sample, which may simply indicate that with greater heterogeneity, stronger patterns of validity may emerge.

Additionally, some aspects of the FFM have been criticized for their inability to describe pathological personality traits. Some researchers have questioned whether these prototypes are subject to a ceiling effect. For instance, one would expect a relationship between conscientiousness and Obsessive-Compulsive PD. However, this relationship is consistently reported as weak or absent (Miller, Bagby, Pilkonis, et al., 2005; Trull, 1992). Haigler and Widiger (2001) suggest that the NEO-PI-R uses considerably more adaptive behaviors to define the high end of conscientiousness, agreeableness, and openness in comparison to items that define the low ends of these dimensions. In an attempt to capture the more maladaptive extremes of the domains, Haigler and Widiger's study reworded items from the NEO-PI-R (e.g., by adding the word "excessively"). These authors found that correlations between Obsessive-Compulsive PD and conscientiousness increased markedly. In a similar vein, the Pathological Five Model (Krueger & Eaton, 2010) has been proposed for incorporation into the DSM-V as a means of assessing the maladaptive extremes of neuroticism, extraversion, agreeableness, and conscientiousness. Their proposed domains therefore consist of negative emotionality, introversion, antagonism, and disinhibition. As noted above, they label their fifth domain peculiarity. The relationship between peculiarity and openness is still relatively unexplored, but appears to be nonredundant. Investigating the relationship between the PD prototypes and models that specifically attempt to include pathological features will be an interesting and important avenue for future research.

Conversely, one could argue that the use of DSM-IV PD conceptualizations as the validity criterion provides drawbacks of its own. In their examination of clinician-rated NEO PD prototypes, Miller et al. (2010) found that these prototypes accounted for unique variance (i.e., beyond that of DSM-IV categories) in occupation, social, and overall impairment, as well as distress caused to others. This research indicates that, while the predominant model, the current DSM is limited in its function as the point of comparison. It also highlights the importance of varied validation criteria.

Though the ten PDs as they are currently defined may not be retained in DSM-V, several principles appear to emerge from the present analyses. Indeed, these are precisely the issues raised by Krueger, Skodol, Livesley, Shrout, and Huang (2007) in their discussion of directions for DSM-V. Their review speaks specifically to the use of facet-level traits to

comprise prototypes to which individuals can be matched. Research investigating the relative validity of such models is of critical importance as the development of DSM-V proceeds.

As the field approaches a dimensional conceptualization, researchers will be charged with the task of defining a model and thus far all of the evidence seems to suggest that the FFM is doing a reasonably good job of capturing pathology. More specifically, Lynam and Widiger's (2001) PD prototypes have been useful in a variety of sample types and age ranges. These prototypes have also now demonstrated similarly good convergent and discriminant validity for informant report. And by using informants as well as self-report, we are able to explain significant additional variance in five of the ten PDs. Of course, the next question is concerned with construct validity. By establishing the prototypes as an empirically supported system of PDs, in which the benefits of a dimensional model can be coupled with meaningful informant report, we can begin to examine its relation to real life problems and functioning.

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Table 1

Sample demographic characteristics

	%
<i>Sex</i>	
Female	55.4
<i>Race/ethnicity</i>	
White	69.4
African American	29.4
Other	1.2
<i>Born in St. Louis</i>	58.7
<i>Education</i>	
High School	40.5
College	26.2
Advanced Degree	32.1
<i>Employment</i>	
Full-time	46.1
Part-time	19.4
Retired	32.4
Unemployed due to disability	9.7
<i>Median Household Income</i>	\$40,000–\$59,999

Note: Employment exceeds 100% due to those working part-time since retirement.

Table 2

Self-other agreement of NEO-PI-R domains and facets

	<i>r</i>
Anxiety	.39
Angry Hostility	.36
Depression	.46
Self-Consciousness	.32
Impulsiveness	.37
Vulnerability	.37
Neuroticism	.46
Warmth	.41
Gregariousness	.49
Assertiveness	.50
Activity	.48
Excitement Seeking	.45
Positive Emotions	.44
Extraversion	.51
Fantasy	.30
Aesthetics	.57
Feelings	.36
Actions	.43
Ideas	.48
Values	.54
Openness	.51
Trust	.35
Straightforwardness	.24
Altruism	.23
Compliance	.39
Modesty	.30
Tendermindedness	.34
Agreeableness	.35
Competence	.35
Order	.50
Dutifulness	.30
Achievement Striving	.43
Self-Discipline	.40
Deliberation	.27
Conscientiousness	.42

Note. n varies from 491 to 502 across correlations due to sporadic missing data. All correlations were significant at $p < 0.01$.

Table 3

Correlations between SIDP interview scores and self prototype after controlling for levels of neuroticism and agreeableness

	<i>pr</i>	<i>p</i>
Paranoid	.09	<.01
Schizoid	.36	<.001
Schizotypal	.13	<.001
Antisocial	.16	<.001
Borderline	.16	<.001
Histrionic	.32	<.001
Narcissistic	.13	<.001
Avoidant	.31	<.001
Dependent	.16	<.001
Obsessive-Compulsive	.10	<.01

Note. *N* = 862.

Table 4

Correlations between informant prototype and SIDP ratings after partialling self prototype

	<i>pr</i>	<i>p</i>
Paranoid	.07	.06
Schizoid	.08	.04
Schizotypal	.04	.33
Antisocial	.15	<.001
Borderline	.24	<.001
Histrionic	.09	.02
Narcissistic	.15	<.001
Avoidant	.07	.08
Dependent	.06	.10
Obsessive-Compulsive	-.00	.92

Note. *N* = 729.

Table 5

Bivariate correlations among self-reported prototypes and among informant-reported prototypes

	Self-reported NEO prototypes									
	Paranoid	Schizoid	Schizotypal	Antisocial	Borderline	Histrionic	Narcissistic	Avoidant	Dependent	Obsessive-Compulsive
Paranoid	(.79)									
Schizoid	.62**	(.79)								
Schizotypal	.61**	.68**	(.54)							
Antisocial	.48**	-.22**	.07*	(.60)						
Borderline	.41**	.05	.52**	.45**	(.74)					
Histrionic	-.50**	-.83**	-.44**	.40**	.24**	(.63)				
Narcissistic	.68**	.05	.21**	.86**	.28**	.01	(.60)			
Avoidant	.49**	.84**	.74**	-.38**	.30**	-.71**	-.20**	(.70)		
Dependent	.48**	.44**	.70**	.12**	.79**	-.17**	.07	.68**	(.87)	
Obsessive-Compulsive	.06	.20**	-.20**	-.51**	-.49**	-.57**	-.15**	.21**	-.33**	(.55)
Informant-reported NEO prototypes										
Paranoid	(.85)									
Schizoid	.60**	(.80)								
Schizotypal	.61**	.68**	(.53)							
Antisocial	.65**	-.03	.19**	(.74)						
Borderline	.48**	.08*	.54**	.54**	(.78)					
Histrionic	-.40**	-.75**	-.40**	.34**	.27**	(.63)				
Narcissistic	.80**	.17**	.28**	.90**	.40**	.01	(.74)			
Avoidant	.39**	.79**	.73**	-.28**	.30**	-.61**	-.15**	(.67)		
Dependent	.45**	.38**	.69**	-.27**	.83**	-.02	.18**	.61**	(.86)	
Obsessive-Compulsive	-.04**	.18**	-.15**	-.51**	-.43**	-.52**	-.22**	.28**	-.39**	(.65)

Note. Self-reported NEO prototype $N = 875$, and informant-reported $N = 760$. Values on the diagonals indicate internal consistency coefficients.

 $p < 0.01$ level
*
 $p < 0.05$

Table 6
Bivariate Correlations Among Self- and Informant-Reported NEO PD Prototypes and SIDP Ratings

SIDP ratings	Self-reported NEO PD prototypes							
	PRD	SZD	SZTL	ASPD	BDL	HSTR	NARC	AVD
PND	.33 [†]	.12 [†]	.22 [†]	.17 [†]	.24 [†]	-.14 [†]	.22 [†]	.16 [†]
SZD	.34 [†]	.39 [†]	.34 [†]	-.02	.08 [*]	-.33 [†]	.11 [†]	.32 [†]
SZTL	.26 [†]	.17 [†]	.22 [†]	.09 [†]	.13 [†]	-.16 [†]	.17 [†]	.14 [†]
ASPD	.20 [†]	.00	.07	.26 [†]	.20 [†]	.06	.22 [†]	-.01
BDL	.29 [†]	.08 [*]	.25 [†]	.25 [†]	.47 [†]	.02	.19 [†]	.17 [†]
HSTR	-.01	-.29 [†]	-.11 [†]	.26 [†]	.22 [†]	.29 [†]	.12 [†]	-.22 [†]
NARC	.17 [†]	-.14 [†]	.04	.34 [†]	.13 [†]	.14 [†]	.34 [†]	-.18 [†]
AVD	.27 [†]	.38 [†]	.45 [†]	-.16 [†]	.31 [†]	-.29 [†]	-.11 [†]	.50 [†]
DEP	.13 [†]	.15 [†]	.21 [†]	-.05	.27 [†]	-.05	-.09 [†]	.28 [†]
OCPD	.22 [†]	.11 [†]	.22 [†]	.05	.19 [†]	-.09 [†]	.06	.18 [†]
								.21 [†]
								.02

SIDP ratings	Informant-reported NEO PD prototypes							
	PRD	SZD	SZTL	ASPD	BDL	HSTR	NARC	AVD
PND	.20 [†]	.08 [†]	.13 [†]	.15 [†]	.18 [†]	-.04	.16 [†]	.07
SZD	.23 [†]	.25 [†]	.25 [†]	.05	.10 [†]	-.20 [†]	.11 [†]	.20 [†]
SZTL	.18 [†]	.09 [*]	.14 [†]	.14 [†]	.13 [†]	-.06	.15 [†]	.07
ASPD	.22 [†]	.05	.10 [†]	.24 [†]	.19 [†]	.04	.22 [†]	.02
BDL	.25 [†]	.10 [†]	.23 [†]	.24 [†]	.39 [†]	.05	.18 [†]	.13 [†]
HSTR	.03	-.17 [†]	-.05	.19 [†]	.18 [†]	.21 [†]	.12 [†]	-.13 [†]
NARC	.18 [†]	-.04	-.08 [*]	.29 [†]	.12 [†]	.08 [*]	.29 [†]	-.13 [†]
AVD	.15 [†]	.24 [†]	.25 [†]	-.06	.18 [†]	-.18 [†]	-.03	.33 [†]
DEP	.03	.05	.11 [†]	-.02	.19 [†]	.02	-.06	.16 [†]
OCPD	.14 [†]	.14 [†]	.18 [†]	.04	.07	-.11 [†]	.06	.14 [†]
								.11 [†]
								.00

Self, $N = 898$; Informant, $N = 743$. PND = Paranoid; SZD = Schizoid; SZTL = Schizotypal; ASPD = Antisocial Personality; BDL = Borderline; HSTR = Histrionic; NARC = Narcissistic; AVD = Avoidant; DEP = Dependent; OCPD = Obsessive-compulsive Personality Disorder.

[†] $p = 0.01$.

* $p = .05$.