A Meta-Analytic Review of the Relationships Between the Five-Factor Model and *DSM-IV-TR* Personality Disorders: A Facet Level Analysis

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Abstract

Theory and research have suggested that the personality disorders contained within the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV-TR*) can be understood as maladaptive variants of the personality traits included within the five-factor model (FFM). The current meta-analysis of FFM personality disorder research both replicated and extended the 2004 work of Saulsman and Page (The five-factor model and personality disorder empirical literature: A meta-analytic review. *Clinical Psychology Review, 23*, 1055-1085) through a facet-level analysis that provides a more specific and nuanced description of each *DSM-IV-TR* personality disorder. The empirical FFM profiles generated for each personality disorder were generally congruent at the facet level with hypothesized FFM translations of the *DSM-IV-TR* personality disorders. However, notable exceptions to the hypotheses did occur and even some findings that were consistent with FFM theory could be said to be instrument specific.

Keywords

Personality disorders are currently conceptualized within the American Psychiatric Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV-TR*; APA, 2000) as "qualitatively distinct clinical syndromes" (p. 689) such that they are distinct from one another and from normal personality. However, researchers have increasingly noted the limitations of this categorical system (Clark, 2005, 2007; Krueger, Markon, Patrick, & Iacono, 2005; Livesley, 2003; Trull & Durrett, 2005; Watson, 2005; Widiger & Samuel, 2005) and have suggested alternative dimensional models of personality disorder (Clark, Simms, Wu, & Casillas, in press; Livesley, 2003; Shedler & Westen, 2004; Widiger & Costa, 2002). One such alternative is to integrate the classification of personality disorder with a dimensional model of general personality structure, such as the five-factor model (FFM; Widiger & Trull, 2007).

The FFM has its historical roots in a lexical paradigm, which posits that all trait terms that are important for describing the personality functioning of oneself and others will have been

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encoded into language (John & Srivastava, 1999). Although the FFM was first derived from studies of the English language, it has since been reported within numerous other languages and cultures (Ashton & Lee, 2001). These studies have reasonably confirmed the presence of five broad bipolar domains of extraversion (vs. introversion), agreeableness (vs. antagonism), conscientiousness (vs. impulsivity), neuroticism (vs. emotional stability), and openness (vs. closedness to experience).

However, recognizing the need for a more fine-grained, detailed assessment than was provided by these five factors, Costa and McCrae (1995) further divided each of the five broad domains into six underlying facets based on their development of and research with the NEO Personality Inventory-Revised (NEO PI-R; Costa & McCrae, 1992). For example, they suggested that the domain of extraversion (vs. introversion) could be usefully differentiated into the more specific facets of warmth (vs. coldness, indifference), gregariousness (vs. withdrawal, isolation), assertiveness (vs. unassuming, resignation), activity (vs. passivity, lethargy), excitement seeking (vs. caution), and positive emotions (vs. anhedonia).

In constructing these facets, they sought to make the facets similar in breadth and scope so that the entire domain could be covered with equivalent precision. Additionally, although it would be impossible (not to mention perhaps unwise) to construct facets that were entirely independent of others from the same domain (as they represent components of a common underlying disposition), Costa and McCrae (1995) did seek to develop facets that would "represent the more closely covarying elements within the domain, not arbitrary combinations of elements" (p. 25) to maximize the facets' discriminant validity. Finally, and perhaps most importantly, they also attempted to have the identified facets be as consistent as possible with traits already recognized as important within the existing psychological literature.

The facet selections of Costa and McCrae (1995) have received some criticism. Some lament that their development occurred outside of the lexical tradition. Additionally, because the FFM domains themselves are not entirely orthogonal it is not surprising that some facets are related to more than a single domain (e.g., impulsiveness within neuroticism is correlated with conscientiousness; and angry hostility is correlated with antagonism; Costa & McCrae, 1992). Indeed, there are certainly other ways to divide the five domains into their component parts (e.g., DeYoung, Quilty, & Peterson, 2007; Lee & Ashton, 2004; Saucier & Goldberg, 2002).

Instructive and informative critiques of the FFM domains have also been provided (Block, 1995; Westen, 1995); however, empirical support for the FFM as assessed by the NEO PI-R is extensive, including convergent-discriminant validity across self, peer, and spouse ratings (Costa & McCrae, 1992); temporal stability within community samples (Costa, Herbst, McCrae & Siegler, 2000); multivariate behavior genetic support for the domain and facet structure across Canadian, Japanese, and German twin samples (Yamagata et al., 2006); and etic cross-cultural support using the self-report version of the NEO PI-R in 36 different countries (McCrae & Allik, 2002) and the informant, peer-report version in 51 different countries (McCrae et al., 2005). Additionally, the NEO PI-R has recently been validated and shown to be stable within clinical populations (De Fruyt, Van Leeuwen, Bagby, Rolland, & Rouillon, 2006; Costa, Bagby, Herbst, & McCrae, 2006). Beyond the administration of the NEO PI-R, the FFM has also been used successfully as a structural model for integrating a multitude of diverse personality research concerning temporal stability across the life span (Roberts & DelVecchio, 2000), gender differences in personality (Feingold, 1994), childhood temperament (Caspi, Roberts, & Shiner, 2005), and the relationship of personality to important life outcomes, such as happiness, physical and psychological health, longevity, and occupational success (Ozer & Benet-Martinez, 2006).

There is also now a rich literature concerning the FFM as a structural model for describing and understanding disorders of personality, including (but not limited to) those within the *DSM-IV-TR* (APA, 2000). As of 2002, there were over fifty published studies relating the FFM to personality disorders (Widiger & Costa, 2002). Since that time, quite a number of additional studies have expanded on this research base and provided further empirical support for understanding the *DSM-IV-TR* personality disorders in terms of the FFM domains and facets (Mullins-Sweatt & Widiger, 2006; Clark, 2007; Widiger & Trull, 2007). Although most of these study have explicitly looked at the relationships between the FFM and the DSM personality disorders, there are also studies which have related the FFM to clinically important personality traits and syndromes that fall outside the 10 categories included within *DSM-IV-TR*, such as psychopathy (Miller & Lynam, 2003), sociotropy (Zuroff, 1994), and alexithymia (Bagby, Taylor, & Parker, 1994). The 10 categories of *DSM-IV-TR* do not provide a fully comprehensive list of all maladaptive personality traits (Livesley, 2003; Trull, 2005), and any truly comprehensive model of personality disorder should include traits beyond those provided within *DSM-IV-TR*. In sum, in her seminal review of the personality disorder literature, Clark (2007) asserted that "the five-factor model of personality is widely accepted as representing the higher-order structure of both normal and abnormal personality traits" (p. 246).

Widiger, Trull, Clarkin, Sanderson, and Costa (1994, 2002) provided a hypothetical translation of the *DSM-IV-TR* personality disorders into the language of the FFM by judging whether each respective personality disorder would be expected to have either a high, low, or neutral standing on each of the facets of the FFM, as assessed by the NEO PI-R. For example, paranoid personality disorder was characterized as high on the neuroticism facet of angry hostility as well as low on the agreeableness facets of trust, straightforwardness, and compliance, while being neutral with respect to all other NEO PI-R facets. They arrived at these translations on the basis of coding each of the *DSM-IV-TR* (APA, 2000) diagnostic criteria in terms of a respective facet of the NEO PI-R. These translations have been utilized as FFM hypotheses for each of the *DSM-IV* personality disorders in many subsequent empirical studies (e.g., Morey et al., 2002; Dyce & O'Connor, 1998).

Saulsman and Page (2004, 2005) reported, in this journal, the results of a meta-analysis of a portion of this empirical literature. They located twelve studies containing a total of 15 independent samples that included a measure of both the five FFM domains and the ten *DSM* personality disorders (hereafter we use the term *DSM* to refer to the diagnostic manual, in general, unless a given edition is specified). The most commonly located measure of the FFM was the NEO Personality Inventory (NEO PI; Costa & McCrae, 1985) and the most prevalent measure of the *DSM* personality disorders was the Millon Clinical Multiaxial Inventory (MCMI; Millon, Millon, & Davis, 1996). Following carefully outlined statistical procedures, Saulsman and Page concluded that the "results of this meta-analysis are consistent with the view that personality disorders can be conceptualized using the five-factor model of normal personality" (p. 1075). Beyond this support for the conceptualization of personality disorders from the perspective of the FFM, the authors went on to state that "the five-factor model is related to each individual personality disorder category in meaningful and predictable ways" (p. 1081).

O'Connor (2005) conducted a similar investigation into the combined structure of the FFM and the *DSM* personality disorders using interbattery factor analysis. O'Connor noted that this technique is useful because "it permits factor analyses to be conducted on the associations between two sets of variables (such as the FFM and PDs), while excluding the covariation that is contained in the within-set data (such as the intercorrelation between PDs)" (p. 326). O'Connor first calculated the consensus factor structure of the *DSM* personality disorders based on 33 studies which had reported this 10×10 correlation matrix. He then calculated the consensus factor structure using 20 correlation matrices that reported correlations between the

DSM PDs and the five domains of the FFM. The results of these procedures indicated that a four-factor structure (the domain of openness did not appear to be represented) provided the best fit for both analyses. O'Connor (2005) concluded that "the dimensions that underlie PDs can be understood by reference to dimensions that have emerged from research on normal personality" (p. 340).

Taken together, the O'Connor (2005) and Saulsman and Page (2004) studies provide compelling support for understanding the *DSM* personality disorders as maladaptive or extreme variants of the domains of the FFM. However, one criticism that has been leveled against the FFM of personality disorder is that the five domains are simply too broad to have any diagnostic utility (Clark, 1993a). The description of each *DSM* personality disorder provided by Widiger, Trull, et al. (1994, 2002) were at the facet level and research has indicated that a facet-level assessment is necessary to adequately differentiate the FFM profiles of the *DSM* personality disorders from one another (Axelrod, Widiger, Trull, & Corbitt, 1997; Reynolds & Clark, 2001). For example, some personality disorders are hypothesized to be associated with the same domain of the FFM (e.g., schizotypal and avoidant with low extraversion) but for largely different reasons (schizotypal and avoidant sharing the facet of low gregariousness but schizotypal being associated with low warmth and low positive emotions, and avoidant being associated with low assertiveness and low excitement-seeking). In addition, some personality disorders are predicted to be associated with only one or two facets of a particular domain (e.g., schizotypal with the facet of low trust from agreeableness, antisocial with angry hostility from neuroticism, and narcissism with high achievement-striving from conscientiousness). These more specific aspects of a respective personality disorder would be missed by an analysis confined to the domains of the FFM, yet they can be quite important and fundamental to the description or understanding of a respective personality disorder.

Saulsman and Page (2004) acknowledged this limitation of their meta-analysis, indicating that "when each personality dimension is broken down into their respective facets, finer detail regarding within-disorder and across-disorder observations will emerge for the personality disorders" (p. 1077). However, this particular limitation was unavoidable. At the time Saulsman and Page were retrieving the studies for their meta-analysis, most had used measures of the FFM that were confined to domain assessments. In fact, 11 of the 12 studies included within their meta-analysis utilized a measure of the FFM that did not even provide facet level assessments for agreeableness and conscientiousness as only one used the NEO PI-R. Additionally, only one of the 6 studies that used the NEO PI (Costa & McCrae, 1985) provided facet level data for neuroticism, extraversion, and openness (i.e., Hyer et al., 1994). However, the ensuing years have seen the literature continue to expand such that many new datasets are now available.

These new datasets can first be used to replicate the findings of Saulsman and Page (2004, 2005) at the domain level. The weighted effect sizes calculated from all studies published since Saulsman and Page can then be compared directly to the findings from that previous meta-analysis to provide a confirmation of their findings. More importantly, the literature has also expanded to the point that a sufficient number of facet-level studies are now available, yielding the potential to extend their work to the facet level.

There are also now two additional FFM measures that provide assessments of the 30 facets of the FFM as defined originally by the NEO PI-R (Costa & McCrae, 1992): the Structured Interview for the Five Factor Model (SIFFM; Trull & Widiger, 1997) and the Five Factor Model Rating Form (FFMRF; Mullins-Sweatt et al., 2006). Regrettably, there are few other measures of the FFM that provide assessments at the facet level (De Raad & Perugini, 2002) and none of these alternative measures have yet been correlated with the *DSM* personality disorders.

There are also alternative dimensional models of personality structure that have been associated conceptually with the *DSM* personality disorders (Clark, 2007; Trull & Durrett, 2005; Widiger & Simonsen, 2005), such as the three factor model of Tellegen, as assessed by the Multidimensional Personality Questionnaire (MPQ; Tellegen, in press) the seven factor model of Cloninger, as assessed by the Temperament and Character Inventory (TCI; Cloninger, Przybeck, Svrakic, & Wetzel, 1994), and the six polarity model of Millon, as assessed by the Millon Index of Personality Styles (MIPS; Millon, Weiss, & Millon, 2004). However, there have been very few studies empirically relating the MIPS or the MPQ to the *DSM* personality disorders. Although, there might be a sufficient number of relevant TCI studies to support a meta-analysis of this instrument, this would be beyond the scope of the current study. One purpose of this study is to first replicate the domain level findings of Saulsman and Page (2004, 2005) using datasets not included within their analyses. A second, more primary aim is to extend these analyses to include the facet level. As such, the current study is confined to a meta-analysis of the FFM facets as assessed by the NEO PI-R, SIFFM, and FFMRF. The meta-analytically derived facet level profiles will be compared to hypotheses at the facet level for each personality disorder. Finally, effect sizes will be calculated for FFM and *DSM* personality disorder instruments and examined as potential moderating variables.

Method

Study Selection and Retrieval

The initial pool of potential studies was drawn from those included in the reviews by Saulsman and Page (2004), O'Connor (2005), and Mullins-Sweatt and Widiger (2006). However, it is worth noting that only one of the studies included within Saulsman and Page was included in the current meta-analysis (i.e., Dyce & O'Connor, 1998) as this was the only study at that time to include a facet level assessment of the FFM. Beyond these initial sources, electronic literature searches were also conducted using the Psycinfo database for all studies published before October of 2006. In order to ensure an exhaustive search for relevant studies, the keywords *DSM, personality disorder, PD, MCMI, MMPI, SCID, PDQ, SNAP, CATI, WISPI, SCID-II, PDI-IV, and SIDP* were entered individually to identify studies that had administered personality disorder measures. These results were then cross-searched with the keyword terms *FFM, big five, five factor, five-factor model, NEO, NEO PI-R*, and *SIFFM* to ensure that a measure of the FFM had also been included. Studies identified by these search terms were then examined individually to determine their relevance.

In order to be included within the meta-analysis, studies were required to meet two criteria. First, each study needed to include a measure of the thirty facets of the FFM, as assessed (for example) by the NEO PI-R, the SIFFM, or the FFMRF. Additionally, the studies were required to have assessed all of the *DSM-III, DSM-III-R,* or *DSM-IV-TR* personality disorders (APA, 2000). No published studies that met these two criteria were excluded. There are FFM inventories other than the NEO PI-R, SIFFM, or FFMRF that include an assessment of the 30 facets of interest in this meta-analysis (e.g., scales derived from the International Personality Item Pool; Goldberg et al., 2006) but none of these other inventories have yet been correlated with the *DSM* personality disorders. There were also studies that assessed only a small subset of the disorders and were excluded on this basis (e.g., Morey et al., 2002). In addition, some studies used the NEO PI rather than the NEO PI-R, thereby excluding the facet scales for agreeableness and conscientiousness. Of those studies that used the NEO PI, only rarely were the results for the facets of neuroticism, extraversion, and openness reported (e.g., Hyer et al., 1994; Miller, Pilkonis, & Clifton, 2005). Finally, a few studies included relevant measures but did not provide the full set of correlations between the *DSM* personality disorders and the thirty facets (e.g., Bagby, Marshall, & Georgiadas, 2005; Carlson & Furr, 2007; Reynolds & Clark, 2001; Trull et al., 1998; Skodol et al., 2005). However, the full matrix of correlations was

obtained in some instances upon request from the first author (e.g., Bagby et al., 2005; Carlson & Furr, 2007)

This retrieval effort yielded a final pool of 16 empirical studies that contained a total of 18 independent samples with a combined 3,207 participants. This is comparable to the earlier meta-analysis of Saulsman and Page (2004), which was based on the findings reported in 12 studies with 15 independent samples. Because a number of studies included more than one measure of the *DSM* personality disorders and/or the FFM, these samples provided a total of 38 unique correlation matrices, which compares well to the 18 correlation matrices included in Saulsman and Page. These studies and their sample characteristics are summarized in Table 1. For the domain level replication of Saulsman and Page (2004, 2005) all studies were included except for Huprich (2003), which did not report domain level data, and Dyce and O'Connor (1998). The Dyce and O'Connor data were excluded from this particular analysis so that the domain level estimates would be completely independent of that reported by Saulsman and Page.

Procedure

The meta-analytic procedures utilized in the current study followed the recommendations of Lispsey and Wilson (2001) for calculating effect sizes of correlations between two continuous variables. Because there were 350 effect sizes (30 facets and 5 domains × 10 disorders) per matrix, the 38 matrices were first entered into separate spreadsheets where the values were checked by an independent observer to avoid transcription errors. The portion of these matrices concerning each personality disorder were then transposed into separate spreadsheets such that each matrix provided an effect size for the relationship between only that disorder and the 35 FFM variables from all applicable studies. All correlations were then subjected to Fisher's *r*-to-*z* transformation. Because many studies contributed more than one correlation matrix (i.e., included multiple measures of *DSM* and/or FFM constructs) the resulting values were averaged to yield a set of independent effect sizes for each sample. These independent effect sizes were then multiplied by the inverse variance weight of the respective sample (which in the case of Pearson correlation is *n*-3). These weighted effect sizes were summed for each facet by disorder combination and then divided by the summed inverse variance weights to arrive at the mean weighted effect sizes. Significance testing was conducted on the resulting values by calculating a *z*-score for each effect size. Finally, the mean weighted effect sizes were returned to Pearson correlations using a *z*-to-*r* transformation.

The literature relating the FFM to the *DSM* personality disorders were concerned with determining the existence and extent of correlation between the FFM variables and the 10 personality disorders. For this reason, there would not seem to be an inherent publication bias against any particular values and a tolerance analysis to assess for the possible presence of a "file drawer" problem was not conducted. However, because Saulsman and Page (2004) did note moderating effects within their meta-analysis, homogeneity of the effect sizes was analyzed using the *Q* statistic (Lipsey & Wilson, 2001). In order to determine if the effect sizes varied among samples at a rate greater than would be expected by chance, this procedure was conducted for each PD by FFM facet relationship. Because this involved calculating the *Q* statistic for 300 relationships, alpha was conservatively set at .001 in order to avoid type I error.

The relationships identified as significantly heterogeneous were then examined to determine whether this could be explained by systematic differences across the individual assessment instruments. Due to the mixed nature of these data (i.e., multiple measures of a construct per sample), calculating the potential moderating effects using the Hedges and Olkin (1985) analog to ANOVA was not feasible, as this method requires independence of units. As a proxy to this technique, a set of independent effect sizes were calculated for each of the FFM and PD measures so that they could be visually compared to one another. For example, all samples in

which the NEO PI-R was administered were meta-analyzed separately to determine this instrument's specific relationships with the *DSM* personality disorders. This same technique was repeated for all *DSM* and FFM measures that were utilized in at least three samples. In cases where samples reported multiple effect sizes for the same measure, the construct not currently being investigated were averaged together. For example, when the NEO PI-R was correlated with two unique PD instruments within the same sample, these values were averaged to arrive at an independent NEO PI-R effect size for the sample.

These separate values were then examined within the categories of FFM and PD instrument. For instance, the mean effect sizes relating the NEO PI-R to the personality disorders were visually compared to the mean effect sizes relating all other FFM measures to the same personality disorder. It is important to note that these values were only compared to one another for overall effect sizes that obtained a *Q*-value indicating significant heterogeneity.

Results

Independent Effect Size Calculations

Table 2 presents the independent weighted mean effect sizes between the personality disorders and the domains of the FFM from the current analysis. For ease of comparison, the original values reported in Saulsman and Page (2005) are also provided in this table. A glance at the values within Table 2 suggests that the patterns of correlations within these two separate analyses are quite similar. However, to provide a more empirical comparison, the values down each column, specifying the relationship between a given FFM domain and the PDs, were correlated across the two meta-analyses to arrive at an estimate of similarity. These similarity correlations are presented at the bottom of each column of Table 3. The similarity values for the domains of neuroticism, extraversion, and conscientiousness were all .99, while the values for agreeableness and openness were .96 and .89, respectively. Taken together, these correlations suggest that the pattern of relationships obtained across these two meta-analyses were quite similar at the domain level.

Table 3 presents the independent mean effect size correlations for each personality disorder and FFM facet relationship. When the results are viewed vertically they specify the relationship between a given personality disorder and the facets of the FFM. When the results are viewed horizontally they specify the relation between each facet and the ten *DSM-IV-TR* personality disorders. Due to the large number of studies and high total *n* of the samples, virtually all values within this table are significant at *p* < .05. In fact, values as low as |.07| are significant at *p* < .0001. Cohen (1992) has suggested that for studies within the social sciences a correlation effect size of .10 is small, .30 is medium, and .50 is large. While most of the effects in the current study may be classified as small by this heuristic, those small effects remain quite meaningful. Nonetheless, in the current study we elect to take a somewhat more conservative route when interpreting results as well as facilitate comparison to the earlier analyses of Saulsman and Page (2004). For this reason, the example of Saulsman and Page was followed and all correlations larger than .20 were marked with boldface type within Table 3. This strategy provides at least some method of differentiating among the many relationships that reach statistical significance as well as Cohen's (1992) threshold for small effect sizes. For example, when using this cutoff the borderline diagnosis is related positively to all six facets of neuroticism, negatively to the extraversion facets of warmth and positive emotions, negatively to the agreeableness facets of trust, straightforwardness, and compliance, as well as negatively to the conscientiousness facets of competence, dutifulness, self-discipline, and deliberation.

Looking across Table 3 it is clear that the facets from the domains of neuroticism, extraversion, agreeableness, and conscientiousness have much to offer in the way of describing the personality disorders. The facets from the domain of openness, however, did not appear to be

particularly useful, as evidenced by the solitary boldface correlation between openness to actions and avoidant PD. It should be noted that several other correlations with the facets of openness reached statistical significance and were above the magnitude for a small effect size (e.g., correlation of schizotypal with openness to fantasy). However, the fact that only fourteen of them reached this threshold indicates that openness did not have a strong relationship to the *DSM-IV-TR* personality disorders.

Following the procedures outlined previously, the homogeneity of all 300 effect sizes presented in Table 3 was then assessed using the *Q*-statistic. Using a conservative alpha of $p < .001$, there were a total of 110 effect sizes (from the total of 300) for which the assumption of homogeneity was rejected. In other words, the reported values for these particular relationships do not estimate a common effect size, but instead represent an average of discrepant values obtained within various studies. These values are underlined within Table 3. When the pattern of these violations was organized by personality disorder it became clear that these were largely confined to the relationships within a few select diagnoses. The obsessive-compulsive, histrionic, and avoidant diagnoses had 22, 19, and 16 effect sizes respectively, for which the assumption of homogeneity were rejected, while a majority of the personality disorder diagnoses had only a handful of effect sizes that were significantly heterogeneous (albeit, at times, they concerned key facets for a respective personality disorder).

Correspondence with Widiger, Trull, et al. (2002) Hypotheses

When the values within Table 3 are read vertically down each column they represent a meta-analytically derived FFM profile for each of the *DSM* personality disorders. In other words, this profile specifies the empirical relationship of each personality disorder to all 30 facets of the FFM. These meta-analytic FFM profiles for each PD can then be compared to the hypothetical *DSM-IV-TR* translations put forth by Widiger, Trull, and colleagues (2002). For example, they hypothesized that the antisocial personality disorder would be characterized by high levels on only one facet of neuroticism (i.e., angry hostility). The meta-analysis did confirm the expected relationship with angry hostility, but also obtained a .27 effect size with impulsiveness, which is perhaps due in part to the complex nature of this construct (Whiteside & Lynam, 2001). Only the facet excitement seeking from extraversion was predicted to correlate with APD, consistent with the findings reported in Table 3. No relationships were predicted with any facet of openness, nor were any obtained. Four of the six facets of antagonism were predicted to correlate with APD (i.e., low straightforwardness, altruism, compliance, and tender-mindedness). Three of these were confirmed and another facet (i.e., trust) also reached significance. Finally, APD was predicted to correlate negatively with the conscientiousness facets of dutifulness, self-discipline, and deliberation. Again, these three findings were confirmed by the findings of the current meta-analysis, while the facet of competence also emerged.

To provide a more quantitative summary of these findings, the hypotheses by Widiger, Trull, and colleagues were quantified such that facets predicted to be high were assigned a value of 1, those predicted to be low were assigned a -1 and those with no predictions were left as a 0. This allowed the hypothesized profiles to be correlated with the profiles from the current meta-analysis. As seen in Table 4, these correlations ranged from a low of .42 for the histrionic profiles to a high of .80 for the borderline profiles, with a mean value of .62.

Convergence with Previous Consensus Profiles

Additional points of comparison for the results of the current meta-analysis are the empirically derived consensus FFM profiles provided by researchers (Lynam & Widiger, 2001) and clinicians (Samuel & Widiger, 2004). The researchers surveyed by Lynam and Widiger (and the clinicians subsequently surveyed by Samuel and Widiger) were asked to describe a

prototypic case of a given personality disorder on all 30 facets of the FFM using a 1 (extremely low) to 5 (extremely high) Likert scale. Those ratings were then averaged across observers to arrive at a consensus FFM profile for each personality disorder. In order to compare the consensus profiles to the results from the current meta-analysis, the FFM descriptions were first subjected to a linear transformation (i.e., $[v - 3] / 2$, where v is the consensus rating) so that they would be on the same -1.00 to 1.00 metric as the correlation effect sizes. The first and third columns of Table 4 provide the standard Pearson correlations of the current study's meta-analytically derived profiles with those provided by the researchers and clinicians. These correlations were generally strong, ranging from a low of .60 for the dependent profile with that of Lynam and Widiger (2001) to a high of .92 for the obsessive-compulsive prototype with that of Samuel and Widiger (2004). However, because Pearson correlations only assess the degree to which the profiles share the same shape (i.e., pattern of relationships), intraclass correlations (ICC) were also calculated to compare the absolute agreement of the profiles in terms of both their shape and magnitude. These ICC values were lower, with a mean ICC of .55 across the clinician consensus profiles and a mean of .50 across the researcher consensus profiles. The values ranged from a low .34 with the Lynam and Widiger histrionic profile to a high of .73 for the Lynam and Widiger borderline and avoidant profiles.

Personality Disorder and FFM Instrument Comparison

In order to examine the degree to which different assessment instruments moderated the relationships between the FFM facets and the *DSM* PDs, separate effect sizes were calculated for each instrument that was administered within at least three samples. At least three studies administered the NEO PI-R, the SIFFM, or the FFMRF. There were four *DSM* personality disorders instruments that were administered in at least three of the studies, including the Personality Diagnostic Questionnaire (PDQ-4; Hyler, 1994), the Schedule for Nonadaptive and Adaptive Personality (SNAP; Clark, 1993b), and the Millon Clinical Multiaxial Inventory third edition (MCMI-III; Millon et al., 1996). Additionally, the Structured Clinical Interview for *DSM-IV* Axis II (SCID-II; First, Gibbon, Spitzer, Williams, & Benjamin, 1997a) and its companion self-report instrument, the SCID-II Questionnaire (SCID-II-PQ) were collapsed for the purposes of these calculations.

It would be well beyond the space limitations to provide the effect sizes for all seven instruments for each of the ten personality disorders. For this reason, the presentation is confined to personality disorders for which the assumption of homogeneity of effect sizes was rejected frequently (i.e., histrionic and obsessive-compulsive) and for which this heterogeneity was central to an FFM hypothesis (i.e., schizotypal).

Table 5 presents the set of effect sizes for each of these seven instruments for the histrionic PD. The first three columns of Table 5 present the correlations between histrionic PD and the 30 facets of the FFM as assessed by the NEO PI-R, SIFFM, and the FFMRF, respectively. The last four columns present the correlations between the 30 facets of the FFM and histrionic PD scales from the PDQ, SNAP, SCID-II, and MCMI-III. The values obtained for the FFM instruments may be compared to one another and the values obtained for the four PD instruments may also be compared to determine if these measures are specifying different relationships. For example, within Table 5 the relationships specified between the facets of neuroticism and the histrionic diagnosis do appear to vary substantially across different instruments. Specifically, the correlations found for the MCMI-III appear to be clear outliers, as five of the facets actually correlate *negatively* with neuroticism, while nearly all of the facets correlate significantly *positively* with the other instruments. These negative correlations for the MCMI-III stand in particularly stark contrast to those found for the PDQ-4, which were all greater than .15. In other words, these two instruments appear to conceptualize the histrionic diagnosis' relationship with neuroticism in an almost opposite manner.

It might not be surprising then to note that the relationships between histrionic PD and the facets of neuroticism contributed six of the effect sizes for which the assumption of homogeneity was rejected. The FFM hypotheses specified that histrionic PD should obtain high scores on two facets of neuroticism (i.e., depressiveness and self-consciousness). These hypotheses would be soundly refuted if only the MCMI-III was administered and marginally supported only by the PDQ. Most central to the FFM conceptualization of histrionic PD, however, are the facets of extraversion (Widiger, Trull, et al., 2002), for which the FFM hypotheses are confirmed well by the SCID-II, the SNAP, and most strongly by the MCMI-III. As seen in Table 3, these six facets of extraversion for histrionic were instances for which the assumption of homogeneity was rejected. However, the instrument-specific values from Table 5 indicate that these differences were more a matter of degree (e.g., the PDQ generally provided values of lower magnitude) than of direction.

Table 6 provides the instrument-specific results for the obsessive-compulsive personality disorder (OCPD). Central to the FFM conceptualization of this personality disorder are the facets of conscientiousness (Widiger, Trull, et al., 2002). In this instance, the meta-analysis would suggest variability in the findings due in part to the FFM assessment, as the hypotheses were confirmed when the NEO PI-R and FFMRF were used, but not when the SIFFM was used. However, we would suggest that this variability was, in fact, largely due to the differences in the assessment of OCPD across measures, rather than the FFM. The MCMI-III obtained strong relationships with all six facets of conscientiousness (i.e., all were above .38), while the SNAP also obtained effect sizes ranging from .17 to .30 with these facets. Meanwhile, the largest relationship with these same facets across the PDQ and SCID-II assessments of OCPD was only .09. Thus, it appears that the primary hypotheses for OCPD were supported for both the MCMI-III and the SNAP, but refuted by the PDQ and SCID-II.

Table 7 presents the instrument-specific results for the schizotypal personality disorder. The hypotheses for high self-consciousness and anxiousness, and for low warmth, gregariousness, positive emotions, and trust were confirmed for all the instruments used, with perhaps a few scattered exceptions (e.g., the findings were generally less strong for the SCID). The largest variation across instruments for the hypotheses of schizotypal PD concerned the facets of openness. Central to the FFM conceptualization of schizotypal PD are elevations on the openness facets of fantasy, actions, and ideas. These elevations are particularly useful in distinguishing schizotypal from the schizoid PD, as they represent the cognitive and perceptual aberrations that characterize schizotypal PD (Widiger, Trull, et al., 2002). It is evident from Table 7 that the hypotheses for fantasy and ideas were confirmed when the SIFFM was used to assess the FFM, but not when the NEO PI-R or the FFMRF were employed.

Discussion

Saulsman and Page's (2004) meta-analysis examined the relationship between the domains of the FFM and the *DSM* personality disorders. The current meta-analysis replicated their findings at the domain level using 18, newly obtained, independent samples. The similarity between the findings from Saulsman and Page (2005) and the current meta-analysis suggest that their findings are robust and lend further confirmation to their conclusion that each of the *DSM* personality disorders shows meaningful and unique relationships to the domains of the FFM. The novel contribution of the current study was that it also extended their work to the level of the 30 facets of the FFM as assessed by the NEO PI-R, SIFFM, and FFMRF and again provided support (with some notable exceptions) for an empirical relationship between the *DSM-IV-TR* personality disorders and the FFM that was consistent with theoretical expectations. It is at the lower facet level of the trait hierarchy that an adequate understanding and description of personality disorders will be obtained (Clark, 2007; Widiger & Simonsen, 2005) and, as

suggested by Saulsman and Page (2004), the facet level descriptions do appear to provide a more vivid and useful description than is available from a domain level analysis.

For example, consider the FFM description of the antisocial personality disorder. Saulsman and Page (2004, 2005) reported a negative correlation with agreeableness and conscientiousness as the only meaningful associations with the FFM. However, the facet level analysis also reveals the additional single, but important, facet of excitement seeking from the domain of extraversion. While antagonism and low conscientiousness are the primary domains of the FFM in understanding this personality disorder (Lynam & Widiger, 2007), the thrill-seeking and excitement-seeking that contribute to a reckless disregard for the safety of oneself and others is also an important component (APA, 2000). In addition, it is not just that antisocial PD involves globally low conscientiousness; it is the particular facets of low dutifulness (immoral, unethical), low self-discipline (negligent, irresponsible), and low deliberation (hasty, acts without consideration of consequences). A strictly domain level analysis would similarly miss the suspiciousness and mistrust of the schizotypal PD (the only facet of antagonism predicted to relate to this disorder and the only facet that did relate). Schizotypal persons are not just introverted and anxious; they also display a suspiciousness and paranoid ideation (Bergman, Silverman, Harvey, Smith, & Siever, 2000; APA, 2000). Similarly, a domain level analysis might miss the relationship of the neuroticism facet of angry hostility with the antisocial and paranoid PDs or the conscientiousness facet of low competence with the borderline.

Personality disorders may also share a correlation with a respective FFM domain but do so for different reasons. For instance, Saulsman and Page (2004, 2005) found that five of the personality disorders were meaningfully related to the domain of neuroticism. However, the current facet level analysis indicated that only one of these five personality disorders correlated above .20 with the facet of impulsivity (i.e., borderline). Similarly, in Saulsman and Page the paranoid, schizotypal, antisocial, borderline, and narcissistic personality disorders all correlated with low agreeableness, but the facet level analysis indicated that only narcissistic PD involves the facet of low modesty. The antisocial and dependent personality disorders both correlated with neuroticism but for entirely different reasons. Antisocial personality disorder correlated only with the facets of angry hostility and impulsiveness, whereas the dependent PD failed to correlate with these two facets, correlating instead with the other four facets of neuroticism. Thus, antisocial persons will obtain elevated scores on neuroticism due to their impulsiveness and angry hostility, whereas dependent persons may obtain a similar domain score but it will be because of an anxiousness, depressiveness, self-consciousness, and/or vulnerability that is not evident in antisocial persons.

The FFM conceptualization of the *DSM* personality disorders suggests that some of them might be differentiated with respect to specific facets of the same domain. For example, it was predicted that the schizotypal and avoidant personality disorders would both correlate negatively with extraversion, but that only the avoidant would correlate negatively with assertiveness and excitement-seeking and only the schizotypal would correlate negatively with warmth and positive emotions. These specific facet hypotheses of extraversion were confirmed for schizotypal PD but not for avoidant.

It must be acknowledged though that a number of specific facet hypotheses were not confirmed, in addition to the specific extraversion facets for the avoidant. For instance, the narcissistic PD did not correlate with the achievement-striving facet of conscientiousness, the obsessive-compulsive did not correlate with the assertiveness facet of extraversion, and the histrionic did not correlate with the trust facet of agreeableness. In addition, there were a number of instances in which the obtained correlations were not confined simply to the one or two facets predicted for a particular domain. For example, paranoid PD correlated as predicted with the angry

hostility facet of neuroticism, but it also correlated with the additional facets of anxiousness, depressiveness, self-consciousness, and vulnerability that were not predicted by Widiger, Trull, et al. (2002). Antisocial personality disorder did correlate primarily with the low dutifulness, low self-discipline, and low deliberation facets of conscientiousness, but somewhat lower correlations were also obtained for order and achievement-striving.

While a majority of the effect sizes in Table 3 are small in magnitude (Cohen, 1992) there are also a great deal that can be considered medium. It would not be expected to find all of the effect sizes to be large, as measures of normal personality would not fully account for all the variance in a measure of abnormal personality (Trull et al., 2003). Nevertheless, the findings are consistent with the hypothesis that maladaptive personality traits can be understood as abnormal variants of general personality traits (Widiger & Trull, 2007).

A quantitative analysis of the findings does suggest support for the FFM conceptualization of the *DSM-IV-TR* personality disorders. Particularly strong confirmation was found for the borderline, antisocial, and avoidant disorders, as the hypothesized FFM profiles for these PDs correlated higher than .75 with the meta-analytic results. Significant correlations were obtained for all of the personality disorders and all but one obtained correlations above .50. The weakest results were obtained for the histrionic personality disorder, which achieved a correlation of only .42. Widiger, Trull, et al. (2002) hypothesized correlations with depressiveness, self-consciousness, openness to fantasy, openness to feelings, and trust, none of which were confirmed. Nevertheless, it should perhaps be noted that the hypotheses for the four facets of extraversion (warmth, gregariousness, excitement-seeking, and positive emotionality) were confirmed and it is these facets that are central to the FFM conceptualization of this personality disorder. "Histrionic personality disorder represents to a great extent an extreme variant of extraversion" (Widiger, Trull, et al., 2002, p. 94). Millon's (1981) original conceptualization of this personality disorder was as the "gregarious pattern" (p. 131). Histrionic is the only personality disorder considered to involve high levels of more than one facet of extraversion, and it is this aspect of the disorder that largely distinguishes it from the others (Lynam & Widiger, 2001).

The correlations between the expert consensus profiles and the empirically-based profiles were often higher across the ten personality disorders than were obtained for the hypotheses of Widiger, Trull, et al. (2002), including the histrionic (increasing from .42 to .79 and .63 for the clinicians' and researchers' descriptions, respectively), narcissistic (increasing from .54 to .86 and .82), and obsessive-compulsive (increasing from .52 to .92 and .91). This improvement in confirmation is principally due to the fact that the expert consensus profiles are substantially more extensive in the inclusion of FFM facets than were the FFM profiles generated by Widiger, Trull, et al. (2002). The latter were confined to FFM facets suggested by the limited number of diagnostic criteria provided for each respective personality disorder in *DSM-IV-TR* (APA, 2000). In contrast, the clinicians and researchers were free to consider all 30 facets of the FFM and in many instances their descriptions were more extensive and richer in content than the *DSM-IV-TR* criterion sets. For example, as noted by Samuel and Widiger (2004), "the clinicians' FFM descriptions of paranoid personality disorder went beyond the *DSM-IV-TR* description to include low positive emotionality, low openness to values, high anxiousness, low warmth, low gregariousness, low altruism, and low tender mindedness" (pp. 298-300), much of which was confirmed in the current meta-analysis.

Instrumentation

The meta-analytic results also suggested that some of the findings varied across instruments and, in a few instances, appear to be instrument dependent. For example, a number of studies have supported the hypothesis that a maladaptive variant of openness to experience includes the cognitive and perceptual aberrations of schizotypal PD (e.g. Ross, Lutz, & Bailey, 2002;

Trull, Widiger, & Burr, 2001; Wiggins & Pincus, 1989). However, our meta-analysis of FFM PD research suggests this is not the predominant finding. Of the studies included within this meta-analysis, significant correlations of schizotypal PD with FFM openness were confined largely to the administration of the SIFFM (Trull & Widiger, 1997), particularly for the facets of openness to ideas and fantasy. This instrument specific finding is consistent with the fact that the SIFFM includes an explicit assessment of maladaptive variants of openness whenever a person endorses an openness item. Perhaps then, it provides a more sensitive assessment of these traits than is obtained by either the NEO PI-R or the FFMRF (Trull & Widiger, 2002).

A predominant finding of the studies included within this meta-analysis was a positive correlation of FFM conscientiousness facets with OCPD. However, even here the results can be said to be instrument specific, as the finding was confined largely to studies that administered the MCMI-III or the SNAP. Consistent with the earlier meta-analysis of Saulsman and Page (2004), the predominant measure of personality disorder being used in this research has been the MCMI-III (Millon et al., 1996), yet the predominant research finding from this instrument might not itself be reliable. It is perhaps worth questioning the result even though it was consistent with theoretical expectations (Widiger, Trull, et al., 2002) since the findings for the MCMI-III were so strikingly different from those obtained from the PDQ and SCID-II (e.g., negative rather than positive correlations with FFM neuroticism). Nonetheless, the fact that the SNAP also obtains positive relationships with neuroticism (consistent with the PDQ and SCID-II), but also confirms the positive relationships with conscientiousness indicates that this finding for the MCMI-III may be robust.

The inconsistencies of the FFM findings for the MCMI-III are consistent with a meta-analysis of the convergent validity of assessments of this particular PD. Widiger and Coker (2002) reported personality disorder convergent validity coefficients provided in 41 studies. The median convergent validity among the self-report inventories was generally good across nine of the ten personality disorders, ranging in value from .51 (paranoid) to .75 (avoidant). The one exception occurred for OCPD, which obtained a median convergent validity coefficient of -.12. However, this was largely due to the MCMI-III. The median convergent validity for the MCMI-III was -.28, whereas the median value between any other two OCPD self-report measures was .51. Nonetheless, it will be important for future studies to investigate the differences among the available assessments of OCPD, particularly the MCMI-III and SNAP, to further clarify how they relate to one another and to the domain and facets of conscientiousness.

Another predominant finding of the current meta-analysis was an absence of a strong relationship of FFM agreeableness with dependency, inconsistent with the hypotheses of Widiger, Trull, et al. (2002). Significant effect sizes for facets of agreeableness were obtained, but they were relatively small (ranging from .09 for tender-mindedness to .16 for modesty). These findings are congruent with a previous meta-analysis of FFM studies of dependency by Bornstein and Cecero (2000). Bornstein and Cecero identified 18 studies that had investigated the relationship between the FFM and dependency. Only one of these was included in the current meta-analysis (i.e., Dyce & O'Connor, 1998), as Bornstein and Cecero included studies confined to dependency, they did not require that the FFM measure provide a facet-level analysis nor did the measure of dependency have to concern the personality disorder as defined by *DSM-IV-TR*. They reported that "as hypothesized, high dependency scores were associated with high levels of neuroticism and agreeableness" (Bornstein & Cecero, 2000, p. 335). Nevertheless, they also emphasized that the magnitude of the effect size for agreeableness was, at best, modest (i.e., .08). One of the worst effect sizes from an individual study (i.e., Dunkley, Blankstein, & Flett, 1997) was actually miscoded (it was reported to be -.32 when it was in fact .32) but even when corrected the overall effect size increases to only .10.

One might have expected an effect of instrumentation for the relationship of dependency with agreeableness. Quite a number of studies have reported positive associations of agreeableness with dependency using methodologies not included within the current meta-analysis, such as clinicians' ratings of prototypic cases (Samuel & Widiger, 2004), researchers' descriptions of prototypic cases (Lynam & Widiger, 2001), clinicians' descriptions of actual cases (Blais, 1997), clinicians' ratings of case vignettes (Sprock, 2002), students' ratings of trait terms within the English language (Coker, Samuel, & Widiger, 2002), and other methodologies or measures not included in the current meta-analysis (e.g., Bagby et al., 2001; Costa & McCrae, 1990; Mongrain, 1993; Pincus, 2002; Wiggins & Pincus, 1989; Zuroff, 1994). There was one study included in the current meta-analysis that did obtain a substantial association of dependency with facets of agreeableness and this study used a relatively unique instrument (i.e., the SWAP-200; Shedler, 2002). However, as only one FFM-SWAP-200 study has been published (Mullins-Sweatt & Widiger, 2007a), a calculation of individual effect sizes for this instrument was not conducted.

An explicit demonstration of the effect of instrumentation on the relationship of FFM agreeableness with dependency was reported by Haigler and Widiger (2001). They reported correlations of only .04, .17, and .04 with NEO PI-R agreeableness for the SNAP, MMPI-2, and PDQ-4 dependent PD scales (respectively). However, they had also constructed an experimental version of NEO PI-R agreeableness scale by converting each item to its maladaptive variant (e.g., "I try to be courteous to everyone I meet" was revised to "I am overly courteous to everyone I meet," and "I would rather cooperate with others than compete with them" became "I cooperate with others even when it would be better to compete"). The correlations of SNAP, MMPI-2, and PDQ-4 dependent PD with this maladaptive version of NEO PI-R agreeableness were .57, .66, and .45, respectively.

In sum, the variation in results across instruments for the schizotypal, histrionic, and obsessive-compulsive personality disorders begs the question of which finding is providing the correct or most valid results. Even findings that appear to be predominant, such as the correlation of conscientiousness with OCPD or the absence of a correlation between agreeableness and dependency, can and perhaps should be questioned. Rather than argue for the validity of one particular finding relative to another, we would argue for more research on FFM and PD instrumentation. No single measure should be understood as providing an operational definition of an FFM or PD construct (Meehl, 1978) and a clear implication of the current meta-analysis is the need for further research on the effect of instrumentation on our understanding of the relationship of the FFM to *DSM* PD symptomatology.

Future research, for instance, should consider using additional measures of the FFM. The predominant measure in existing research is the NEO PI-R; and for good reason, as it has considerable empirical validation and a strong research foundation (Costa & McCrae, 1992; Widiger & Trull, 1997). The SIFFM and FFMRF facet assessments were modeled explicitly after the NEO PI-R (Mullins-Sweatt et al., 2006; Trull & Widiger, 1997). Nevertheless, reasonable questions have been raised regarding this particular structure for the FFM, including the selection and placement of facet scales (Saucier & Goldberg, 2002). An alternative measure that contains quite different facet scales is the HEXACO Personality Inventory (HEXACO-PI; Lee & Ashton, 2004, 2006). The first five scales of the HEXACO-PI align very closely with domains of the FFM (the HEXACO-PI includes a sixth scale assessing honesty-humility which they argue does not belong within agreeableness). It would be of interest for future research to compare the NEO PI-R and HEXACO-PI with respect to FFM PD relationships. For instance, schizotypal PD measures might correlate with the HEXACO-PI openness facet of unconventionality (contrary to the NEO PI-R, but consistent with the SIFFM). Additionally, one might expect a correlation of most OCPD measures (beyond simply the MCMI-III and SNAP) with the HEXACO-PI's conscientiousness facet of perfectionism. However,

comparable findings to the NEO PI-R are likely to be obtained for dependency. The HEXACO-PI actually includes a facet scale of dependency (i.e., explicitly including this PD construct as a maladaptive variant of a universal personality structure) but it is provided as a facet of emotional instability rather than agreeableness (or honest-humility).

Openness to Experience

The results of the current meta-analysis replicated Saulsman and Page's (2004) finding that openness to experience obtained little relationship with the *DSM* personality disorders. Saulsman and Page (2004) concluded that "openness to experience serves no prominent role" (p. 1076) in accounting for personality disorder symptomatology. O'Connor (2005) likewise reported on the basis of his meta-analysis that a four rather than five-factor model was really preferable, noting that "the fifth factor from the FFM, openness to experience, has typically not been strongly associated with personality disorders" (p. 339).

In fairness to the FFM, it should perhaps be acknowledged that a potential limitation of the current and prior meta-analyses is that the personality disorder symptomatology has been confined to the existing *DSM-IV-TR* nomenclature (APA, 2000). This could be problematic, as the nomenclature might not provide full coverage of maladaptive personality functioning. The personality disorder section of the diagnostic manual has not been entirely stable or settled, with diagnoses being added or deleted with each revision. Additionally, clinicians provide a diagnosis of not otherwise specified (NOS) when they determine that a person has that particular class of mental disorder but whose symptoms are not adequately represented by any of the ten diagnostic categories (APA, 2000). Personality disorder NOS is often the single most frequently used diagnosis in clinical practice, as indicated in studies of clinical records and in a meta-analysis of NOS usage across structured and unstructured assessments (Verheul & Widiger, 2004). It is not entirely clear how clinicians are using PDNOS within their practice, but many of these studies suggest that clinicians do not find the existing categories adequate in covering personality disorder symptomatology (Verheul & Widiger, 2004; Westen & Arkowitz-Westen, 1998).

A potential advantage of the FFM, relative to the *DSM*, is that it was developed to provide a reasonably comprehensive description of general and universal personality structure (Costa & McCrae, 1992). Thus, to the extent that personality disorders are extreme or maladaptive variants of a universal personality structure it may also provide a reasonably comprehensive description of maladaptive personality functioning (Saulsman & Page, 2003; Trull, 2005). Alexithymia, for instance, is a maladaptive personality trait that has been of significant scientific and clinical interest (Taylor & Bagby, 2004) yet finds no representation within the current diagnostic manual. It is, however, well represented in the FFM as low openness to feelings (Luminet, Bagby, Wagner, Taylor, & Parker, 1999). Similarly, pathological bias (e.g., racism) has received some support within the clinical and research literature as a variant of personality disorder (Alarcon et al., 2002; Bell, 2004, 2006). There is currently no representation of prejudice within the *DSM-IV-TR* but, if one did want to conceptualize prejudice as a maladaptive personality trait, it is again readily represented within the FFM in large part as closed-mindedness toward ideas (along with facets of antagonism; Flynn, 2005). In sum, the failure of the openness to be heavily represented within the *DSM* personality disorder nomenclatures may say more about a limitation of the *DSM* than the FFM.

We noted earlier though that some of the failure of the contribution of openness to experience could reflect instrumentation. The hypotheses for the relationship of schizotypal PD to openness to fantasy and ideas were confirmed when the SIFFM was used. Haigler and Widiger (2001) reported correlations of only -.11, -.15, and -.06 with NEO PI-R openness for the SNAP, MMPI-2, and PDQ-4 schizotypal PD scales (respectively), consistent with the current findings. However, upon converting each openness item to a maladaptive variant (e.g., "I have a very

active imagination" was revised to "I have an excessive imagination" and "I enjoy playing with theories or abstract ideas" became "I become preoccupied with theories or abstract ideas") the correlations increased to .28, .24, and .33 (respectively).

Openness to experience may in fact be a domain of the FFM, as assessed by the NEO PI-R, that warrants further consideration regarding its conceptualization and assessment. The first three scales of the NEO PI-R (i.e., neuroticism, extraversion, and openness) were developed prior to an interest in assessing the lexical Big Five (Costa & McCrae, 1985) and the original conceptualization of openness within the NEO three-factor model was based on the work of Coan (1974) describing "the optimal personality," Rokeach (1960) describing "the open mind," and Loevinger and Wessler (1970) measuring an individual's level of ego development. High levels of openness were considered to be suggestive of persons with high levels of a self-actualizing or self-realizing psychological mindedness (Costa & McCrae, 1976, 1978), a formulation that is quite inconsistent with a maladaptive variant of high openness.

An alternative conceptualization of this domain was provided by Tellegen and Waller (1987), which they termed "unconventionality" and included such attributes as dwelling upon fantasies, having ideas or beliefs that have little basis within reality, or often engaging in activities that are bizarre, deviant, or aberrant. The APA sponsored a conference charged with setting a research agenda that would be most effective in leading the field toward a dimensional classification of personality disorder (Widiger, Simonsen, Krueger, Livesley, & Verheul, 2005). In their recommendation for a dimensional model of personality disorder that would represent a common ground among the many alternative dimensional models, Widiger and Simonsen (2005) proposed a four rather than a five-factor model (i.e., emotional dysregulation vs. emotional stability, extraversion vs. introversion, antagonism vs. compliance, and constraint vs. impulsivity). However, they indicated that such a model risked excluding important individual differences in maladaptive personality functioning (e.g., cognitive-perceptual aberrations, absorption, and eccentricity). They suggested a fifth domain could be unconventionality versus closedness to experience. Watson (2006) proposes a similar domain of "oddity," but suggests it be separated from the fifth factor of the FFM, inconsistent with Tellegen and Waller (1987), Lee and Ashton (2006), and Widiger, Costa, and McCrae (2002).

Future Directions

The next edition of the APA diagnostic manual will likely retain the existing diagnostic categories (Widiger, 2007). Understanding the extent to which the FFM can account for the *DSM-IV-TR* personality disorders may then remain an important line of investigation. Research relating the FFM to the *DSM-IV-TR* personality disorders is useful in assessing the validity of the hypothesis that these personality disorders represent extreme or maladaptive variants of the domains and facets of the FFM and determining whether the useful information included within the diagnostic categories can be recovered by the FFM. Researchers have even gone beyond simply indicating that the FFM correlates with personality disorders to using measures of the FFM as a proxy for assessing specific personality disorders, such as the antisocial or psychopathic (Miller & Lynam, 2003) and the borderline (Trull et al., 2003). However, the results of the current meta-analysis suggest that the findings of this research will not be unambiguous until matters of instrumentation, and even perhaps conceptualization, of the FFM are resolved. For example, the current meta-analysis suggests that comparable success in using the FFM as a proxy measure of a personality disorder is unlikely to be obtained for OCPD (unless the latter is assessed with the MCMI-III [Millon et al., 1996] or the SNAP [Clark, 1993]), schizotypal (unless the FFM is assessed with the SIFFM; Trull & Widiger, 1997), or dependent (unless the experimentally altered version of the NEO PI-R is used; Haigler & Widiger, 2001).

However, the ultimate goal or purpose of the FFM of personality disorder is not simply to develop an alternative means to reproduce the existing diagnostic categories (Clark, 2007). Future research needs to address whether the FFM succeeds as an alternative to the existing nomenclature. For example, an informative next step would be field trials, within clinical samples, that directly compare the FFM to the *DSM* with respect to clinical utility, as well as validity (First, 2005). Studies that directly compare the two models with respect to validity (Trull et al., 2003) and utility (Samuel & Widiger, 2006) have been conducted, but research on the application of the FFM within clinical settings is clearly needed. However, even here instrumentation may prove to be problematic.

Widiger, Costa, and McCrae (2002) proposed a four-step procedure for the diagnosis of a personality disorder from the perspective of the FFM. The first step is to assess the person in terms of the domains and facets of the FFM using, for instance, the NEO PI-R or the SIFFM. The second step is to determine whether the person has any impairments or problems in living associated with his or her personality traits. The second step is provided because the existing measures of the FFM do not systematically or comprehensively assess for impairments associated with each personality trait. For example, persons with elevations on NEO PI-R conscientiousness will be high in order, dutifulness, and achievement striving, but they may not possess maladaptive variants of these traits, which impede their functioning.

Future research might then be advised to include alternative measures of the FFM within comparative validity studies. For example, it is possible that the HEXACO-PI (Lee & Ashton, 2004) assessment of conscientiousness will obtain better validity and clinical utility than the NEO PI-R, given its inclusion of a facet scale for perfectionism. Another alternative is the Big Five Aspects Scale developed by DeYoung, Quilty, and Peterson (2007). DeYoung and colleagues identified two facet scales for each domain of the FFM (e.g., compassion and politeness for agreeableness and industriousness and orderliness for conscientiousness) that they suggest are consistent with the genetic structure of the FFM. Similarly, this line of research would also benefit from the inclusion of alternative dimensional assessments of general personality structure, such as the MPQ (Tellegen, 1982), the TCI (Cloninger et al., 1994), or the MIPS (Millon et al., 2004). More informative comparative validity studies would not only contrast the FFM to the *DSM-IV-TR*, but the ability of the FFM relative to alternative dimensional models of general personality structure. In addition, even if the FFM obtains more validity than a respective alternative model (e.g., Mullins-Sweatt & Widiger, 2007b), it is possible that the most valid dimensional model of general and universal personality structure would be obtained through an integration of the alternative choices.

Conclusions

In sum, there is a rapidly expanding literature investigating the relationships between the FFM and the *DSM* personality disorders. Although the summary of this literature within the current meta-analysis provides rather consistent support for the relationships specified by FFM theory, it also provides a clear indication that much work remains in the way of resolving (or at least improving) issues of instrumentation. Whether differences among alternative assessments of the FFM or those assessing the current *DSM-IV-TR* personality disorders, future research can and should compare the validity and utility of these differing conceptualizations. Only after this work has been completed can the full benefits of an alternative dimensional model be truly evaluated.

Acknowledgements

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Table 1
Studies selected for inclusion in the meta-analysis and their sample characteristics

Author(s)	*n*	sample type	PD instrument(s)	FFM instrument(s)
Bagby, Costa, et al. (2005)	115	outpatient	SCID-II-PQ	NEO PI-R, SIFFM
Bagby, Marshall, et al. (2005)	121	student	PDQ-4	NEO PI-R
Bagby & Vachon (2005)	204	gamblers	PDQ-4, SCID-II-PQ, SCID-II	NEO PI-R
Carlson & Furr (2007)	230	student	MCMI-III	NEO PI-R
De Fruyt et al. (2006)	130	inpatient	ADP-IV	NEO PI R
Dyce & O'Connor (1998)	614	student	MCMI-III	NEO PI-R
Farris et al. (2007)	192	student	PDQ-4	NEO PI-R
Huprich (2003)	51	outpatient	SCID-II	NEO PI-R
Mullins-Sweatt (in press)	90	student	MCMI-III	NEO PI-R
Mullins-Sweatt et al. (2006)	132	student	OMNI, PDQ-4	NEO PI-R, FFMRF
	189	student	SNAP	NEO PI-R, FFMRF
	145	student	PDQ-4, SNAP	FFMRF
Mullins-Sweatt & Widiger (2007a)	92	outpatient	SWAP	NEO PI-R
Mullins-Sweatt & Widiger (2007b)	188	student	MCMI-III	NEO PI-R, FFMRF
Samuel (2005)	247	student	SNAP	NEO PI-R, FFMRF
Samuel (2007)	85	inpatient	PDI-IV, SNAP	NEO PI-R, FFMRF, SIFFM
Samuel & Widiger (in press)	150	student	SNAP	NEO PI-R, FFMRF
Trull et al. (2001)	232	student (186) outpatient (46)	PDQ-R	SIFFM

Notes: PD = personality disorder; FFM = five factor model; SCID-II-PQ = Structured Clinical Interview for DSM-IV Axis II Personality Disorders self-report (First, Gibbon, Spitzer, Williams & Benjamin, 1997b); NEO PI-R = NEO Personality Inventory - Revised (Costa & McCrae, 1992); SIFFM = Structured Interview for the Five-Factor Model of Personality (Trull & Widiger, 1997); PDQ-4 = Personality Diagnostic Questionnaire-4 (Hyler, 1994); SCID-II = Structured Clinical Interview for DSM-IV Personality Disorders (First, Gibbon, Spitzer, Williams, & Benjamin, 1997a); ADP-IV (Schotte & De Doncker, 1994); MCMI-III = Millon Clinical Multiaxial Inventory- 3rd Ed. (Millon, Millon, & Davis, 1996); OMNI = OMNI Personality Inventory (Loranger, 2001); FFMRF = Five-Factor Model Rating Form (Mullins-Sweatt et al., 2006); SWAP = Shedler and Westen Assessment Procedure (Shedler, 2002); SNAP = Schedule for Nonadaptive and Adaptive Personality (Clark, 1993b); PDI-IV = Personality Disorder Interview - IV (Widiger, Mangine, Corbitt, Ellis, & Thomas, 1995); PDQ-R = Personality Diagnostic Questionnaire - Revised (Hyler & Rieder, 1987).

Table 2

Weighted Effect Size Estimates for DSM and FFM Relationships

Current Meta-Analysis (16 Independent samples)

	N	E	O	A	C
Paranoid	**0.40**	**-0.21**	-0.04	**-0.34**	-0.11
Schizoid	**0.22**	**-0.46**	-0.11	-0.16	-0.10
Schizotypal	**0.38**	**-0.28**	0.09	-0.17	-0.14
Antisocial	0.18	0.04	0.08	**-0.36**	**-0.33**
Borderline	**0.54**	-0.12	0.10	**-0.24**	**-0.29**
Histrionic	0.10	**0.33**	0.15	-0.11	-0.11
Narcissistic	0.11	0.09	0.07	**-0.37**	-0.10
Avoidant	**0.52**	**-0.49**	-0.08	-0.07	-0.16
Dependent	**0.44**	-0.15	-0.03	0.08	**-0.20**
Obsessive	0.18	-0.12	-0.04	-0.05	**0.24**
Mean	0.31	-0.14	0.02	-0.18	-0.13
Median	0.30	-0.14	0.02	-0.17	-0.13

Saulsman & Page (2005) Results (15 Independent samples)

	N	E	O	A	C
Paranoid	**0.28**	-0.12	-0.04	**-0.34**	-0.07
Schizoid	0.13	**-0.43**	-0.12	-0.17	-0.03
Schizotypal	**0.36**	**-0.28**	-0.01	-0.21	-0.13
Antisocial	0.09	0.04	0.05	**-0.35**	**-0.26**
Borderline	**0.49**	-0.09	0.02	**-0.23**	**-0.23**
Histrionic	0.02	**0.42**	0.15	-0.06	-0.09
Narcissistic	0.04	0.20	0.11	**-0.27**	-0.05
Avoidant	**0.48**	**-0.44**	-0.09	-0.11	-0.10
Dependent	**0.41**	-0.13	-0.11	0.05	-0.14
Obsessive	0.08	-0.12	-0.07	-0.04	**0.23**
Mean	0.24	-0.09	-0.01	-0.17	-0.09
Median	0.20	-0.12	-0.02	-0.19	-0.09
Similarity	0.99	0.99	0.89	0.96	0.99

Note: N = Neuroticism, E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness; Similarity = the Pearson correlation between FFM domain results from current study to those from Saulsman & Page (2005).

Table 3

Independent Weighted Mean Effect Size Correlations

	FFM Facet	Paranoid	Schizoid	Schizotypal	Antisocial	Borderline	Histrionic	Narcissistic	Avoidant	Dependent	Obsessive
N	Anxiousness	**0.27**	0.13	**0.27**	0.00	**0.38**	0.00	0.02	**0.41**	**0.39**	0.16
	Angry Hostility	**0.41**	0.19	**0.29**	**0.27**	**0.48**	0.08	**0.23**	**0.29**	0.18	0.10
	Depressiveness	**0.35**	**0.28**	**0.39**	0.12	**0.50**	-0.06	0.03	**0.53**	**0.41**	0.09
	Self-consciousness	**0.29**	**0.23**	**0.32**	0.02	**0.35**	-0.11	-0.03	**0.56**	**0.42**	0.13
	Impulsiveness	0.15	0.00	0.17	**0.27**	**0.34**	0.17	0.14	0.14	0.17	-0.07
	Vulnerability	**0.22**	0.14	**0.25**	0.04	**0.39**	0.01	-0.01	**0.40**	**0.43**	0.03
E	Warmth	**-0.28**	**-0.42**	**-0.28**	-0.13	**-0.20**	**0.26**	-0.07	**-0.35**	-0.03	-0.07
	Gregariousness	**-0.20**	**-0.48**	**-0.25**	0.02	-0.12	**0.35**	0.04	**-0.42**	-0.03	-0.16
	Assertiveness	-0.08	**-0.22**	-0.13	0.06	-0.09	**0.27**	0.19	**-0.39**	**-0.21**	-0.01
	Activity	-0.08	**-0.25**	-0.13	0.02	-0.10	**0.25**	0.09	**-0.29**	-0.12	0.03
	Excitement seeking	-0.01	**-0.21**	-0.04	**0.25**	0.06	**0.27**	0.16	**-0.23**	-0.06	-0.12
	Positive emotions	**-0.27**	**-0.38**	**-0.26**	-0.09	**-0.26**	**0.23**	-0.02	**-0.39**	-0.15	-0.09
O	Fantasy	0.00	-0.05	0.14	0.10	0.13	0.16	0.11	0.00	0.05	-0.09
	Aesthetics	-0.05	-0.06	0.07	0.00	0.05	0.10	0.04	-0.03	0.01	0.01
	Feelings	-0.02	-0.17	0.03	-0.02	0.09	0.18	0.05	-0.04	0.05	0.01
	Actions	-0.10	-0.13	-0.06	0.10	-0.03	0.12	0.04	**-0.20**	-0.13	-0.12
	Ideas	-0.03	0.00	0.09	0.04	-0.01	0.04	0.07	-0.05	-0.12	0.03
	Values	-0.05	-0.05	0.01	0.08	0.05	0.04	-0.01	-0.05	-0.04	-0.09
A	Trust	**-0.45**	**-0.28**	**-0.31**	**-0.22**	**-0.29**	0.05	**-0.20**	**-0.29**	-0.07	-0.08
	Straightforwardness	**-0.24**	-0.09	-0.16	**-0.37**	**-0.21**	-0.10	**-0.31**	-0.06	0.00	0.04
	Altruism	**-0.21**	-0.19	-0.15	**-0.24**	-0.18	0.02	**-0.20**	-0.12	0.03	0.04
	Compliance	**-0.27**	-0.08	-0.13	**-0.32**	**-0.27**	-0.12	**-0.26**	-0.02	0.10	0.01
	Modesty	-0.06	0.08	0.05	-0.17	0.03	-0.16	**-0.37**	**0.20**	0.16	0.02
	Tender-mindedness	-0.18	-0.11	-0.05	-0.19	-0.09	0.02	-0.17	-0.02	0.09	0.00
C	Competence	-0.13	-0.13	-0.18	**-0.21**	**-0.29**	-0.01	0.01	**-0.23**	**-0.25**	0.19
	Order	0.00	-0.02	-0.06	-0.18	-0.10	-0.05	-0.03	-0.03	-0.06	**0.25**
	Dutifulness	-0.10	-0.08	-0.10	**-0.29**	**-0.22**	-0.08	-0.10	-0.09	-0.08	**0.25**
	Achievement striving	-0.07	-0.13	-0.13	-0.19	-0.19	0.04	0.02	-0.19	-0.16	**0.25**
	Self-discipline	-0.14	-0.12	-0.18	**-0.25**	**-0.29**	-0.04	-0.09	**-0.22**	**-0.23**	**0.21**
	Deliberation	-0.09	-0.02	-0.10	**-0.38**	**-0.27**	-0.16	-0.13	-0.01	-0.06	**0.24**

Note: All values larger than $r = .04$ are significant at $p < .05$; Correlations larger than .20 are marked in boldface type. Underlined values indicate those for which the assumption of homogeneity of variances was rejected.

Table 4

Correspondence of Meta-Analytic PD Profiles with Consensus Profiles

	Widiger, Trull, et al. (2002) Pearson r	Samuel & Widiger (2004)		Lynam & Widiger (2001)	
		Pearson r	ICC	Pearson r	ICC
Paranoid	0.61	0.75	0.58	0.71	0.50
Schizoid	0.61	0.81	0.54	0.73	0.41
Schizotypal	0.62	0.79	0.62	0.80	0.60
Antisocial	0.79	0.79	0.49	0.80	0.42
Borderline	0.80	0.77	0.66	0.84	0.73
Histrionic	0.42	0.79	0.51	0.63	0.34
Narcissistic	0.54	0.86	0.51	0.82	0.39
Avoidant	0.75	0.72	0.71	0.77	0.73
Dependent	0.54	0.64	0.45	0.60	0.44
Obsessive	0.52	0.92	0.48	0.91	0.41
mean	0.62	0.78	0.55	0.76	0.50

Note: ICC = intraclass correlation between the meta-analytically derived FFM profile and the consensus FFM profile drawn from Lynam & Widiger (2001) or Samuel & Widiger (2004) using the absolute agreement definition.

Table 5

Instrument Comparison for Histrionic PD Relationships

FFM Facet		FFM Measures			PDQ	Personality Disorder Measures		
		NEO PI-R	SIFFM	FFMRF		SNAP	SCID-II	MCMI-III
(n1)	Anxiousness	-0.03	0.20	0.04	0.23	0.11	0.03	-0.29
(n2)	Angry Hostility	0.08	0.24	0.04	0.25	0.13	0.07	-0.15
(n3)	Depressiveness	-0.09	0.18	-0.09	0.19	0.00	-0.03	-0.37
(n4)	Self-consciousness	-0.15	0.15	-0.11	0.15	-0.09	-0.05	-0.40
(n5)	Impulsiveness	0.16	0.34	0.15	0.26	0.22	0.14	0.03
(n6)	Vulnerability	-0.01	0.23	-0.04	0.23	0.03	-0.01	-0.26
(e1)	Warmth	0.28	0.17	0.19	0.10	0.17	0.23	0.47
(e2)	Gregariousness	0.36	0.23	0.36	0.19	0.36	0.24	0.51
(e3)	Assertiveness	0.30	0.06	0.25	0.09	0.29	0.24	0.43
(e4)	Activity	0.27	0.09	0.25	0.10	0.28	0.23	0.36
(e5)	Excitement seeking	0.31	0.12	0.26	0.09	0.35	0.29	0.35
(e6)	Positive emotions	0.27	-0.04	0.21	0.03	0.20	0.21	0.44
(o1)	Fantasy	0.13	0.27	0.13	0.17	0.14	0.16	0.11
(o2)	Aesthetics	0.09	0.09	0.15	0.02	0.17	0.12	0.08
(o3)	Feelings	0.19	0.27	0.11	0.20	0.12	0.18	0.18
(o4)	Actions	0.13	-0.03	0.16	0.00	0.13	0.09	0.21
(o5)	**Ideas**	0.02	0.10	0.07	-0.02	0.04	0.05	0.09
(o6)	Values	0.01	0.13	0.09	-0.01	0.08	0.03	0.02
(a1)	Trust	0.06	-0.03	0.06	-0.06	0.00	0.00	0.23
(a2)	Straightforwardness	-0.16	-0.16	0.06	-0.11	-0.12	-0.15	-0.04
(a3)	Altruism	0.03	-0.04	0.01	-0.07	-0.05	0.01	0.17
(a4)	Compliance	-0.16	-0.03	-0.07	-0.14	-0.18	-0.11	-0.04
(a5)	Modesty	-0.19	-0.08	-0.17	-0.16	-0.24	-0.15	-0.09
(a6)	Tender-mindedness	0.00	0.14	0.01	0.03	-0.04	0.02	0.05
(c1)	Competence	0.01	-0.22	0.04	-0.14	-0.03	0.03	0.18
(c2)	Order	-0.06	-0.02	-0.01	-0.04	-0.05	0.02	-0.05
(c3)	Dutifulness	-0.09	-0.17	0.00	-0.14	-0.07	-0.14	0.03
(c4)	Achievement striving	0.06	-0.09	0.05	-0.05	0.03	0.08	0.16
(c5)	Self-discipline	-0.04	-0.17	0.00	-0.17	-0.03	-0.01	0.13
(c6)	Deliberation	-0.20	-0.14	-0.04	-0.15	-0.12	-0.13	-0.14

Table 6

Instrument Comparison for Obsessive Compulsive PD Relationships

FFM Facet		NEO PI-R	FFM Measures SIFFM	FFMRF	PDQ	Personality Disorder Measures SNAP	SCID-II	MCMI-III
(n1)	Anxiousness	0.13	0.22	0.16	0.23	0.24	0.18	-0.01
(n2)	Angry Hostility	0.09	0.29	0.10	0.27	0.19	0.27	-0.16
(n3)	Depressiveness	0.08	0.20	0.11	0.27	0.18	0.23	-0.16
(n4)	Self-consciousness	0.13	0.19	0.10	0.23	0.14	0.17	-0.03
(n5)	Impulsiveness	-0.11	0.17	-0.01	0.14	-0.01	0.14	-0.31
(n6)	Vulnerability	0.00	0.24	0.01	0.21	0.03	0.17	-0.16
(e1)	Warmth	-0.08	-0.09	-0.04	-0.14	-0.10	-0.11	0.07
(e2)	Gregariousness	-0.19	0.00	-0.12	-0.19	-0.15	-0.10	-0.10
(e3)	Assertiveness	0.00	-0.06	0.04	-0.09	0.05	-0.04	0.03
(e4)	Activity	0.07	-0.04	0.00	-0.03	0.05	0.07	0.08
(e5)	Excitement seeking	-0.12	0.00	-0.11	-0.06	-0.07	0.06	-0.19
(e6)	Positive emotions	-0.07	-0.19	-0.09	-0.16	-0.13	-0.13	0.05
(o1)	Fantasy	-0.14	0.18	-0.09	0.08	-0.08	0.07	-0.27
(o2)	Aesthetics	0.01	0.06	-0.06	0.04	0.00	0.04	-0.04
(o3)	Feelings	0.01	0.14	-0.04	0.07	-0.01	0.17	-0.02
(o4)	Actions	-0.13	-0.07	-0.12	-0.12	-0.11	-0.01	-0.15
(o5)	Ideas	0.04	0.17	-0.06	0.08	0.03	0.05	-0.06
(o6)	Values	-0.11	0.05	-0.09	-0.06	-0.11	-0.06	-0.13
(a1)	Trust	-0.08	-0.21	-0.05	-0.22	-0.14	-0.19	0.13
(a2)	Straightforwardness	0.05	-0.05	-0.01	-0.08	-0.08	-0.13	0.24
(a3)	Altruism	0.04	-0.06	0.00	-0.07	-0.05	-0.05	0.22
(a4)	Compliance	0.01	-0.05	-0.05	-0.12	-0.11	-0.15	0.22
(a5)	Modesty	0.01	0.01	0.00	0.02	-0.04	-0.07	0.08
(a6)	Tender-mindedness	0.00	-0.07	-0.03	-0.03	-0.07	-0.10	0.11
(c1)	Competence	0.21	-0.04	0.21	-0.04	0.22	0.00	0.38
(c2)	Order	0.28	0.01	0.18	0.06	0.18	0.09	0.47
(c3)	Dutifulness	0.27	0.07	0.17	0.04	0.17	0.04	0.45
(c4)	Achievement striving	0.30	-0.01	0.23	0.02	0.30	0.07	0.43
(c5)	Self-discipline	0.25	-0.11	0.20	-0.07	0.21	-0.13	0.50
(c6)	Deliberation	0.28	0.04	0.15	0.03	0.21	0.01	0.46

Table 7

Instrument Comparison for Schizotypal PD Relationships

FFM Facet		NEO PI-R	FFM Measures SIFFM	FFMRF	PDQ	Personality Disorder Measures SNAP	SCID-II	MCMI-III
(n1)	Anxiousness	0.27	0.37	0.22	0.27	0.21	0.19	0.32
(n2)	Angry Hostility	0.29	0.36	0.29	0.30	0.36	0.15	0.30
(n3)	Depressiveness	0.41	0.35	0.32	0.36	0.41	0.23	0.44
(n4)	Self-consciousness	0.34	0.38	0.20	0.31	0.24	0.22	0.37
(n5)	Impulsiveness	0.14	0.23	0.18	0.19	0.19	0.05	0.21
(n6)	Vulnerability	0.26	0.37	0.13	0.24	0.17	0.20	0.31
(e1)	Warmth	-0.30	-0.25	-0.19	-0.28	-0.29	-0.24	-0.25
(e2)	Gregariousness	-0.29	-0.13	-0.26	-0.11	-0.33	-0.31	-0.26
(e3)	Assertiveness	-0.15	-0.24	0.00	-0.09	-0.07	-0.18	-0.14
(e4)	Activity	-0.11	-0.22	-0.16	-0.08	-0.19	-0.09	-0.10
(e5)	Excitement seeking	-0.07	-0.07	0.03	0.00	-0.03	-0.04	-0.01
(e6)	Positive emotions	-0.26	-0.32	-0.24	-0.21	-0.31	-0.23	-0.23
(o1)	Fantasy	0.10	0.40	0.14	0.19	0.13	0.09	0.12
(o2)	Aesthetics	0.09	0.13	-0.03	0.08	0.03	-0.05	0.08
(o3)	Feelings	0.04	0.07	-0.05	0.11	-0.05	-0.03	0.05
(o4)	Actions	-0.09	-0.05	0.07	-0.03	0.00	-0.10	-0.10
(o5)	Ideas	0.04	0.26	0.14	0.15	0.14	-0.05	0.03
(o6)	Values	-0.03	0.10	0.07	0.01	0.02	-0.09	0.00
(a1)	Trust	-0.36	-0.30	-0.16	-0.33	-0.31	-0.24	-0.31
(a2)	Straightforwardness	-0.18	-0.10	-0.16	-0.15	-0.26	-0.07	-0.19
(a3)	Altruism	-0.19	-0.06	-0.08	-0.13	-0.16	-0.12	-0.17
(a4)	Compliance	-0.16	0.03	-0.14	-0.12	-0.21	0.00	-0.16
(a5)	Modesty	0.04	0.15	-0.03	0.03	-0.05	0.06	0.07
(a6)	Tender-mindedness	-0.05	0.01	-0.11	-0.05	-0.18	0.03	-0.03
(c1)	Competence	-0.21	-0.25	0.03	-0.15	-0.07	-0.14	-0.25
(c2)	Order	-0.06	-0.08	-0.01	-0.01	-0.04	-0.04	-0.09
(c3)	Dutifulness	-0.11	-0.05	-0.09	-0.12	-0.15	-0.03	-0.10
(c4)	Achievement striving	-0.13	-0.26	-0.02	-0.14	-0.06	-0.16	-0.16
(c5)	Self-discipline	-0.21	-0.19	-0.07	-0.16	-0.14	-0.08	-0.24
(c6)	Deliberation	-0.11	-0.09	-0.03	-0.09	-0.08	-0.08	-0.14