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Douglas B. Samuel
Purdue University, dbsamuel@purdue.edu

Thomas A. Widiger

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Running Head: Conscientiousness and OCPD

Conscientiousness and Obsessive-Compulsive Personality Disorder

Douglas B. Samuel

Department of Psychiatry, Yale University School of Medicine

VA New England MIRECC

and

Thomas A. Widiger

Department of Psychology, University of Kentucky

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Correspondence regarding this article should be directed to Douglas B. Samuel at VA Connecticut Healthcare, 950 Campbell Avenue 151-D, Building 35, West Haven, CT 06516.
Email: douglas.samuel@yale.edu

Abstract

A dimensional perspective on personality disorder hypothesizes that the current diagnostic categories represent maladaptive variants of general personality traits. However, a fundamental foundation of this viewpoint is that dimensional models can adequately account for the pathology currently described by these categories. While most of the personality disorders have well established links to dimensional models that buttress this hypothesis, obsessive-compulsive personality disorder (OCPD) has obtained only inconsistent support. The current study administered multiple measures of 1) conscientiousness-related personality traits, 2) *DSM-IV* OCPD, and 3) specific components of OCPD (e.g., compulsivity and perfectionism) to a sample of 536 undergraduates who were oversampled for elevated OCPD scores. Six existing measures of conscientiousness-related personality traits converged strongly with each other supporting their assessment of a common trait. These measures of conscientiousness correlated highly with scales assessing specific components of OCPD, but obtained variable relationships with measures of *DSM-IV* OCPD. More specifically, there were differences within the conscientiousness instruments such that those designed to assess general personality functioning had small to medium relationships with OCPD, but those assessing more maladaptive variants obtained large effect sizes. These findings support the view that OCPD does represent a maladaptive variant of normal-range conscientiousness.

Keywords: obsessive-compulsive personality disorder, compulsivity, conscientiousness, persistence, achievement

Conscientiousness and Obsessive-Compulsive Personality Disorder

Personality disorders are currently conceptualized as “qualitatively distinct clinical syndromes” in the American Psychiatric Association’s (APA) *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)*; APA, 2000, p. 689). However, researchers have highlighted the limitations of this categorical model and have suggested that a dimensional model of personality disorder (PD) might provide a viable alternative (Krueger, Skodol, Livesley, ShROUT, & Huang, 2007; Trull & Durrett, 2005; Widiger & Samuel, 2005). One such proposal is to consider PDs maladaptive variants of the five-factor model (FFM; Widiger & Trull, 2007).

The FFM has compelling support as a model of general personality (John, Naumann, & Soto, 2008; McCrae & Costa, 2008) and a considerable body of evidence also suggests that the *DSM-IV-TR* PDs can be understood as maladaptive variants of the FFM (Clark, 2007; O’Connor, 2005; Samuel & Widiger, 2008). However, less consistent support has been obtained for obsessive-compulsive personality disorder (OCPD).

DSM-IV-TR describes the essential feature of OCPD as “a preoccupation with orderliness, perfectionism, and mental and interpersonal control, at the expense of flexibility, openness, and efficiency” (p. 669) and includes such symptoms as perfectionism, preoccupation with order and organization, workaholism, and overconscientiousness (APA, 2000). Within dimensional models, this appears similar to a “domain concerned with the control and regulation of behavior” that has been “referred to as constraint, compulsivity, or conscientiousness” (Widiger & Simonsen, 2005, p. 116). The FFM domain of conscientiousness includes traits such as dutifulness, self-discipline, deliberation, and order (McCrae & Costa, 2003). Persons within a normal range of conscientiousness would be organized, ordered, reliable, businesslike, industrious, punctual, and disciplined (Roberts, Jackson, Fayard, Edmonds, & Meints, 2009). It

is reasonable to hypothesize that persons who are excessively conscientious will be overconscientious; will engage in excessive deliberation; will be excessively devoted to their work to the detriment of social and leisure activities; will be perfectionistic to the point that tasks are not completed; or will be preoccupied with order, organization, rules, and details (APA, 2000; Widiger, Trull, Clarkin, Sanderson, & Costa, 2002).

Nevertheless, FFM conscientiousness has not obtained consistent correlations with OCPD. Saulsman and Page (2004) meta-analyzed 15 independent samples reporting correlations between the FFM and PDs and computed a weighted mean effect size of .23 ($p < .0001$) for the relationship between OCPD and conscientiousness. Moderator analyses indicated that this effect was dependent upon the PD instrument as the mean weighted effect size was .52 for a version of the Millon Clinical Multiaxial Inventory (e.g., MCMI-III; Millon, Millon, & Davis, 1997), but only .03 when all other PD instruments were considered.

This specificity of the finding to the MCMI-III is further troubling in light of the poor convergence of the MCMI-III with other measures of OCPD. Widiger and Boyd (2009) reported that the median convergent validity of any two self-report measures of OCPD was .45 when the MCMI was excluded, whereas the median convergence of any other OCPD measure with the MCMI was -.14. In sum, the predominant support for the relationship of FFM conscientiousness with OCPD is derived largely from a measure of OCPD that relates negatively to other measures of the same construct.

Samuel and Widiger (2008) replicated the meta-analysis of Saulsman and Page (2004) using 18 independent samples (16 of which were novel). At the domain level they reported a mean weighted effect size of .24 between OCPD and conscientiousness and also found a moderating effect of PD instrument. For example, the average correlation between the facets of

conscientiousness and OCPD was .45 for the MCMI-III, but only .01 with the Personality Diagnostic Questionnaire (PDQ-4; Hyler, 1994). However, they noted that the OCPD scale from the Schedule for Nonadaptive and Adaptive Personality (SNAP; Clark, 1993) also obtained a correlation of .21, suggesting that the relationship between OCPD and conscientiousness was particularly strong with the MCMI-III, but was not entirely specific to that instrument.

Beyond differences among OCPD scales, there may also be variations among assessments of conscientiousness that impact the relationship. A majority of the studies within these meta-analyses have relied upon the NEO Personality Inventory - Revised (Costa & McCrae, 1992) to assess the FFM. The NEO PI-R is, by far, the most commonly used measure of the FFM and has extensive validity (McCrae & Costa, 2008). Nevertheless, a potential limitation of using it to test the hypothesis that OCPD relates to conscientiousness is that the NEO PI-R was developed as a measure of normal personality functioning. The NEO PI-R does contain a few items assessing maladaptive conscientiousness (e.g., "I'm something of a 'workaholic'"), but Haigler and Widiger (2001) indicated that 90% of the conscientiousness items are keyed in the direction of adaptive rather than maladaptive functioning and suggested the inconsistent relationship with OCPD is due to the NEO PI-R.

Haigler and Widiger experimentally manipulated each NEO PI-R conscientiousness item by adding terms such as "excessively," "too much," or "preoccupied." It is important to note that they did not manipulate the NEO PI-R items to become indicators of OCPD, but rather, more maladaptive conscientiousness. For example, the item "I keep my belongings neat and clean" became "I keep my belongings *excessively* neat and clean." They found that the original NEO PI-R conscientiousness domain correlated .27 with the OCPD scale from the SNAP (Clark, 1993), -.15 with the MMPI-2 OCPD scale (Morey, Waugh, & Blashfield, 1985), and -.02 with the PDQ-

4 OCPD scale (Hyler, 1994). The experimentally manipulated conscientiousness scale increased the correlations with the OCPD scales to .69, .47, and .69 with the SNAP, MMPI-2, and PDQ-4, respectively.

There are, of course, several other measures of conscientiousness beyond the NEO PI-R, such as the HEXACO Personality Inventory-Revised (HEXACO PI-R; Ashton & Lee, 2008), the Temperament and Character Inventory-Revised (TCI-R; Cloninger, 1999; 2008), the Five Factor Model Rating Form (FFMRF; Mullins-Sweatt, Jamerson, Samuel, Olsen, & Widiger, 2006), and the Multidimensional Personality Questionnaire (MPQ; Tellegen & Waller, 2008). Factor analytic research supports considering these measures as alternative conceptualizations of a common higher order construct (Markon, Krueger, & Watson, 2005; Widiger & Simonson, 2005) and a more complete understanding of the hypothesized relationship between conscientiousness and OCPD would be provided by an examination of these measures.

The HEXACO PI-R provides an alternative conceptualization of conscientiousness. The primary difference between the HEXACO PI-R and FFM is that the former includes a sixth domain (labeled honesty-humility) that the FFM includes as aspects of agreeableness. The HEXACO PI-R and the NEO PI-R both include a domain of conscientiousness but the HEXACO PI-R includes different facets (i.e., organization, diligence, perfectionism, and prudence). No study has correlated the HEXACO PI-R with any OCPD scale.

The MPQ assesses eleven primary trait scales that are combined, using factor weights, into four higher-order domains, including constraint (Tellegen & Waller, 2008). However, because the calculation of constraint requires the administration of eight trait scales, we focused specifically on the achievement scale, which appeared most conceptually related to the aims of

the current study. No previous study has investigated the relationship between the MPQ and OCPD.

The Temperament and Character Inventory (TCI) assesses a dimensional model that was developed to cover both normal and abnormal personality functioning (Cloninger, Przybeck, Svrakic, & Wetzell, 1994). Of particular relevance to the current study is the domain of persistence which aligns with FFM conscientiousness (Markon et al., 2005). Unlike the MPQ and HEXACO PI-R, there have been at least 10 studies that have provided correlations between persistence and OCPD. The relationship has ranged from .08 (Svrakic, Whitehead, Przybeck, & Cloninger, 1993) to .51 (Bagby, Marshall, & Georgiades, 2005), with a mean weighted correlation of .20. While the magnitude of this relationship is not large, it should be noted that these studies all used the TCI, rather than the TCI-R (Cloninger, 1999; 2008). This is potentially quite important as a primary revision for the TCI-R was the expansion of persistence from a single 8-item scale to a 35-item scale consisting of four subscales that are closely related to aspects of OCPD (i.e., eagerness of effort, work-hardened, ambitious, and perfectionist). It is possible that the revised version provides a more comprehensive assessment of the domain and might obtain a larger relationship with OCPD.

Finally, the FFMRF (Mullins-Sweatt et al., 2006) is a one-page instrument with an item corresponding to the six facets for each domain described by the NEO PI-R. For their meta-analysis, Samuel and Widiger (2008) identified six studies that had included the FFMRF and reported the mean weighted effect sizes between OCPD and the facets of conscientiousness ranged from .15 (deliberation) to .23 (achievement striving).

The overarching aim of the current study is an examination of the empirical relationship between conscientiousness and OCPD that transcends the idiosyncrasies of individual

instruments that assess both constructs. This will be accomplished by considering multiple scales assessing 1) conscientiousness, 2) *DSM-IV* OCPD, and 3) specific components of OCPD. The conscientiousness-related scales will include not only the NEO PI-R, but also the experimentally manipulated version of NEO PI-R by Haigler and Widiger (2001), the HEXACO PI-R, the TCI-R, the MPQ, and the FFMRF. Recognizing that prior studies have suggested differences among measures of OCPD and their relationship with conscientiousness (Samuel & Widiger, 2008), we also include seven OCPD scales. We hypothesize that the conscientiousness-related instruments will obtain significant and substantial relationships with OCPD scores.

These findings will also be buttressed by considering more specific components of OCPD measured by the compulsivity scale from the Dimensional Assessment of Personality Pathology-Basic Questionnaire (DAPP-BQ; Livesley & Jackson, 2009) and the propriety and workaholism scales from the SNAP (Clark, 1993). Both the SNAP and the DAPP-BQ were separately developed using “bottom up” approaches. Their authors compiled exhaustive lists of PD symptoms and used iterative processes, including factor analysis, to identify the lower-order facets that define personality pathology. These three scales will provide a means of assessing whether the relationship between conscientiousness and OCPD is stronger with respect to more specific components of OCPD.

Method

Procedure

The study was approved by the appropriate institutional review board and the sample was drawn from the introductory psychology student participant pool at the University of Kentucky. Existing taxometric evidence suggests that OCPD exists on a continuum rather than a taxon (Arntz et al., 2009) indicating that it can be fruitfully studied within a general population sample.

Nonetheless, in order to maximize the presence of *DSM-IV* OCPD symptomatology, the OCPD scale from the PDQ-4 was included in a packet of pre-screening measures that were completed by the entire pool of potential participants. Individuals who endorsed at least five of the eight PDQ-4 items were formally invited (via email) to participate in the current study. After 150 from this group had participated to ensure the oversampling for OCPD pathology, the study was opened to the entire subject pool in order to expand the range. In total, 559 participants provided informed consent and completed selected scales from personality and personality disorder instruments over the course of approximately two hours. The order of these scales was standard across all participants¹. Of the total sample, twenty-three (4%) of the participants provided incomplete protocols and were dropped from the study, yielding a final sample of 536 participants, 155 (29%) of whom had been pre-screened for elevated OCPD symptomatology.

Participants

The sample was largely female (62.7%) and predominantly Caucasian (91.0%). Four percent of the sample was African-American, 1.7 percent Asian-American, and additional 3.2 percent described themselves as “multiracial” or “other.” Two percent of the sample listed their ethnicity as Latino/a. The participants ranged in age from 18 to 27, with a mean of 18.8 (SD = 1.0) and consisted primarily of students (68.4%) in their first semester of college. Two hundred and thirteen (40.9%) of the participants reached the diagnostic threshold for OCPD on the PDQ-4 and 50.4% met criteria using the SCID-II PQ. Given the tendency of these screening instruments to diagnose at much higher rates than structured interviews (Bagby & Farvolden, 2004), one should not conclude that 40% or 50% of the sample would or should be diagnosed with OCPD. However, these results do suggest that the pre-screening was successful in sampling an adequate range of OCPD symptomatology.

Assessments and Measures

The current study includes six alternative measures of the domain of conscientiousness, seven alternative measures of OCPD, and three scales assessing specific components of OCPD.

Conscientiousness-related scales.

NEO Personality Inventory-Revised (NEO PI-R). The NEO PI-R (Costa & McCrae, 1992) is a measure of the five-factor model of personality and contains 240 items that are rated on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This instrument is composed of five broad domain scales, which are each, in turn, assessed by six underlying facet scales. For example, the conscientiousness scale contains the facets of competence, order, dutifulness, achievement-striving, self-discipline, and deliberation. The entire NEO PI-R was administered in the current study.

Experimentally Manipulated NEO PI-R (EXP-NEO). Haigler and Widiger (2001) conducted an experimental manipulation of the items from the NEO PI-R, in which they systematically transformed each item into a more extreme variant by adding words such as “excessive.” For example, the conscientiousness item “I strive for excellence in everything I do” became “My tendency to strive for excellence in everything I do often becomes excessive.” Only the 48 items from the conscientiousness domain were administered.

HEXACO Personality Inventory – Revised (HEXACO PI-R). The HEXACO-PI-R (Ashton & Lee, 2008) is measure of general personality that contains 200 items rated on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This instrument assesses six broad domains of general personality functioning (each containing four facets) as well as a single “interstitial” facet. Only the 32 items from the conscientiousness domain, containing the facet scales labeled organization, diligence, perfectionism, and prudence were administered.

Multidimensional Personality Questionnaire (MPQ). The MPQ (Tellegen & Waller, 2008) is a 276-item, true/false measure that assesses 4 broad traits via 11 scales. The current study included the 20-item achievement scale, which assesses one's tendency to push hard for achievement and strive for excellence and perfection (e.g., "I push myself to my limits").

Temperament and Character Inventory – Revised (TCI-R). The TCI-R (Cloninger, 1999; 2008) assesses a seven-factor model with 240-items rated on a 1 ("definitely false") to 5 ("definitely true") scale, where a response of 3 indicates "neither true nor false." The 35-item persistence scale and its four subscales (i.e., eagerness of effort, work-hardened, ambitious, and perfectionist) were administered in the present study.

Five-Factor Model Rating Form (FFMRF). The FFMRF (Mullins-Sweatt et al., 2006) is a one page rating form that has been used to record descriptions of the FFM using one-item for each of the 30 facets. Each facet includes 2-3 adjective anchors at each pole and is rated on a 1 (low) to 5 (high) metric. The entire instrument was administered.

Obsessive-Compulsive Personality Disorder Scales.

Millon Clinical Multiaxial Inventory – III (MCMI-III). The MCMI-III (Millon et al., 1997) is a 175-item true/false self-report inventory, developed in accordance with the *DSM-IV*, which assesses 14 PDs as well as ten other clinical syndromes. The MCMI-III is among the most frequently used self-report inventories in clinical practice (Camara, Nathan, & Puente, 2000) and its 17-item OCPD scale was administered.

Minnesota Multiphasic Personality Inventory – 2 (MMPI-2). The MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) is a 567-item true/false self-report inventory that provides scores on ten clinical scales as well as supplemental scales. Morey, Waugh, and Blashfield (1985) selected those items from the inventory that appeared to represent *DSM-III*

(APA, 1980) OCPD and demonstrated good internal consistency. The resulting scale contained 13 items. Somwaru and Ben-Porath (1995) subsequently created their own OCPD scale from the MMPI-2 utilizing 10 of the items from Morey and colleagues as well as 10 additional items. All 23 items were collapsed and administered in the current study.

OMNI Personality Inventory. The OMNI (Loranger, 2001) consists of 375 items designed to assess both normal and abnormal personality traits, including ten scales corresponding to the *DSM-IV* PDs. Items are scored on a scale ranging from 1 (definitely agree) to 7 (definitely disagree). The OCPD scale containing 18 items was administered.

Personality Diagnostic Questionnaire – 4 (PDQ-4). The PDQ-4 (Hyer, 1994) is a 99-item true/false self-report inventory that assesses 12 PDs according to the *DSM-IV*. The PDQ-4 is commonly used within clinical research (Bagby & Farvolden, 2004; Widiger & Boyd, 2009). The OCPD scale with eight items, corresponding to each diagnostic criterion for the disorder. The entire instrument was administered in the current study.

Structured Clinical Interview for DSM-IV – II - Personality Questionnaire (SCID-II-PQ). The SCID-II-PQ (First, Gibbon, Spitzer, Williams, & Benjamin, 1997) is a self-report, screening instrument for the SCID-II clinical interview, which assesses each of the *DSM-IV* PDs. It contains a total of 117 items that are answered as either true or false. The nine items corresponding to the diagnostic criteria for OCPD were administered.

Wisconsin Personality Inventory- IV (WISPI-IV). The WISPI-IV (Klein & Benjamin, 1996) consists of 204 items that are scored along a scale that ranges from 1 (“not at all, never applies to me”) to 10 (“extremely, always applies to me”). The WISPI-IV OCPD scale containing 18 items was administered.

Schedule for Nonadaptive and Adaptive Personality (SNAP). The SNAP (Clark, 1993) is a 375-item true/false instrument that assesses a dimensional model of personality disorder containing 3 temperament and 12 primary trait scales, as well as the *DSM-III-R* (APA, 1987) PDs. The present study administered the propriety and workaholism trait scales as well as the OCPD scale. The propriety scale consists of 20 items and assesses one's tendency to be concerned with proper standards of conduct and social conventions (e.g., "I like to keep my dignity at all costs"). The workaholism scale contains 18 items and measures one's tendency to put work above leisure pursuits (e.g., "My work is more important to me than anything else"). The OCPD scale from the SNAP contains 23 items, 9 of which are also scored for workaholism (5) and propriety (4).

Dimensional Assessment of Personality Pathology – Basic Questionnaire (DAPP-BQ). The DAPP-BQ (Livesley & Jackson, in press) contains 290 statements to which an individual responds on a 5-point Likert-type scale ranging from "strongly disagree" to "strongly agree." The DAPP-BQ includes 18 scales assessing aspects of personality pathology. In the current study we included the 16-item compulsivity (e.g., "I do jobs thoroughly even if no one will ever see them") scale.

Results

Descriptive Statistics

Table 1 presents the descriptive statistics for the conscientiousness and OCPD component scales. With the exception of FFMRF conscientiousness (.73), all the Cronbach's alpha values presented in Table 1 were above .80. Descriptive statistics for the OCPD scales within this sample have been reported elsewhere (Samuel & Widiger, 2010) and so are not reproduced here. The OCPD scales had Cronbach's alpha values that were lower, ranging from .44 (PDQ-4) to .90

(WISPI-IV). A previous report from this data set study focused explicitly on differences among the OCPD scales and reported that although most converged well with one another (i.e., median correlation was .49), the MCMI-III was a notable exception (Samuel & Widiger, 2010). Whereas the *lowest* convergent correlation among the other measures was .40 (MMPI-2 with WISPI-IV), the *highest* convergent correlation for the MCMI-III was .26 (with the SNAP).

Correlations among Conscientiousness Measures

Table 2 presents the correlations of the conscientiousness scales with one another. Because we examined a number of comparisons we chose a Bonferroni correction to limit the chance of Type I error. The total number of experiment-wise comparisons was 275, yielding a corrected alpha value (.05 /275) of .00018. All correlations within Table 2 were significant at this threshold. The individual correlations ranged from a low of .51 (MPQ achievement with FFMRF conscientiousness) to a high of .84 (HEXACO PI-R and NEO PI-R conscientiousness). The final row of Table 2 presents the median correlations of each measure with all other measures. These median values ranged from .59 (MPQ achievement) to .70 (HEXACO PI-R), indicating that the instruments converged quite highly.

Correlations between Conscientiousness and OCPD

Table 3 presents the correlations of each conscientiousness-related measure (and their respective facets) with seven measures of OCPD. When looking down the columns, it is apparent that the MCMI-III OCPD scale achieved a significant (and often quite large) correlation with every conscientiousness scale included in the current study. The MMPI-2 scale, on the other hand, related weakly, achieving significant positive correlations with only EXP-NEO conscientiousness (as well as 3 facets). Even these significant relationships were generally lower in magnitude than the EXP-NEO scales' correlations with other OCPD measures.

When looking across the rows, Table 3 provides the range of correlations between the individual conscientiousness-related scales and each OCPD measure. In order to summarize this information, the final columns provide the median correlation across the OCPD measures as well as an indicator as to whether this median effect size is considered small ($> .10$), medium ($> .24$), or large ($.37$) according to Cohen (1992). The median effect sizes for the NEO PI-R were all considered small except for the facets of order and self-discipline which did not even reach this threshold. Similarly, the domain and three facets from the HEXACO PI-R obtained small effect sizes. The HEXACO PI-R facet of perfectionism, however, actually achieved a large median effect size ($r = .37$), suggesting that this facet has unique variance related to OCPD. The MPQ achievement, FFMRF conscientiousness, and TCI-R persistence scales all achieved significant correlations with each of the OCPD measures except the MMPI-2 and obtained median effect sizes with that were in the medium range. The TCI-R subscales of perfectionist and ambitious also had medium effect sizes, while the correlations for the other two subscales were small. The EXP-NEO conscientiousness domain correlated significantly with all seven of the OCPD measures and had a median value of $.52$. The facets of competence ($.42$) and achievement-striving ($.38$) also garnered large effect sizes, while the remaining facets ranged from $.28$ to $.35$ and were considered medium.

Table 4 presents the correlations of the conscientiousness-related scales with specific components of OCPD pathology assessed by the SNAP scales of workaholism and propriety as well as DAPP-BQ compulsivity. These provide a finer grained assessed of specific aspects of OCPD. All values within this table were significant at the Bonferroni-corrected threshold ($p < .00018$). SNAP workaholism showed the greatest specificity, obtaining the strongest convergence with facets from each measure that are most theoretically related to the construct.

For example, within the HEXACO PI-R, it correlated .58 and .51 with the diligence and perfectionist facets, respectively, but only .18 and .17 with organization and prudence. Similarly, SNAP workaholism obtained the highest correlation with the achievement striving facets from both the NEO PI-R and the EXP-NEO.

The effects were not as specific for the SNAP propriety and DAPP-BQ compulsivity scales as they typically correlated most highly with the domain measures (i.e., conscientiousness) rather than individual facets. Nonetheless, these symptom scales still obtained strong correlations with the measures of conscientiousness. For instance, even the lowest correlation for DAPP-BQ compulsivity (.38 with NEO PI-R competence) would still be considered a large effect size.

Discussion

Despite the acknowledged limitations inherent to the current categorical model of personality disorder, it is important to recognize that the symptoms encoded within the *DSM-IV-TR* (APA, 2000) personality disorder categories do represent important aspects of personality pathology (Livesley, 2001). As such, a fundamental and primary step for any proposed dimensional model is to demonstrate that it can reasonably account for the symptoms and disorders included in the current nomenclature.

However, there has been inconsistent support for the accounting of OCPD symptomatology within the FFM, leading the authors of the DSM-5 Personality Disorders Work Group to state that “meta-analyses indicate that Obsessive-Compulsive PD is not well-covered by the FFM (Saulsman & Page, 2004)” (DSM-5 Personality and Personality Disorders Work Group, 2010). Regrettably, the Work Group did not acknowledge the subsequent meta-analysis of Samuel and Widiger (2008) in which clear support was in fact reported, albeit confined to the MCMI-III and SNAP assessments of OCPD. In addition, there was also no mention of the findings of Haigler

and Widiger (2001), who indicated empirically that the weak support for other OCPD scales is due largely to the fact that the NEO PI-R lacks adequate fidelity for the assessment of maladaptive conscientiousness. In any case, the current study found a consistent and strong relationship of DAPP-BQ compulsivity with all of the measures of conscientiousness, which counters the DSM-5 Work Group's conclusion that their compulsivity dimension is unrelated to conscientiousness.

OCPD would appear most similar to a "domain concerned with the control and regulation of behavior" that is included in most dimensional models and has been "referred to as constraint, compulsivity, or conscientiousness" (Widiger & Simonsen, 2005, p. 116). The results of the present study provide compelling support for this hypothesized link. The correlations within Table 3 demonstrated that the six conscientiousness-related scales correlate significantly with all but one OCPD scale, consistent with theoretical expectations. This further supports the notion that general personality models can adequately account for OCPD as described within *DSM-IV*.

It is also noteworthy that these measures of conscientiousness all correlated strongly with specific components of OCPD assessed by the SNAP and DAPP-BQ. It is perhaps not surprising that the three scales assessing components of OCPD correlated more strongly with conscientiousness than did the full OCPD measures. The DAPP-BQ and SNAP scales do bespeak more clearly facets of conscientiousness, including workaholism and propriety. The full syndrome of OCPD, in contrast, includes some components of personality beyond conscientiousness, such as high neuroticism and low openness (Lynam & Widiger, 2001; Samuel & Widiger, 2008; Samuel & Widiger, 2010).

The relationship of conscientiousness with workaholism, propriety, and compulsivity also echoes previous factor analyses suggesting that they all fall along a common latent dimension

(Markon et al, 2005; O'Connor, 2005) as well as recent IRT findings indicating that the SNAP and DAPP-BQ assess more extreme levels of the traits measured by the NEO PI-R (Samuel, Simms, Clark, Livesley, & Widiger, 2010). However, the current study also goes further to indicate that a scale such as SNAP workaholism is most closely related to specific facets that are conceptually linked (e.g., HEXACO PI-R diligence and NEO PI-R achievement striving).

The current study also goes beyond previous findings (Saulsman & Page, 2004; Samuel & Widiger, 2008) to demonstrate that the scale used to assess the personality trait of conscientiousness, as well as the instrument used to assess OCPD, have an appreciable impact on the magnitude of this relationship. While a number of studies have previously provided correlations between conscientiousness and OCPD, a vast majority of the prior research has been confined to the NEO PI-R. While the current study did demonstrate a relationship between OCPD and NEO PI-R conscientiousness, the finding was not particularly robust. For example, the median effect size between the NEO PI-R and seven measures of OCPD (i.e., .18) is considered small according to Cohen (1992). This suggests, perhaps ironically, that the NEO PI-R represents the measure of conscientiousness that is *least* related to OCPD symptoms. The results of the current study therefore suggest that the weak to inconsistent relationship of conscientiousness to OCPD reported in previous research (Saulsman & Page, 2004) is due in part to the reliance on the NEO PI-R's assessment of conscientiousness.

The current study is the first to correlate OCPD with HEXACO PI-R conscientiousness, TCI-R persistence, and MPQ achievement. Each of these scales obtained significant correlations with all but one of the OCPD measures (MMPI-2 was the lone exception). While several previous studies have provided these results for the TCI, this study is also the first to do so for the revised version of the persistence scale from the TCI-R. The TCI-R persistence scale obtained significant

correlations with the other OCPD measures ranging from .26 (PDQ-4) to .47 (SNAP), with an overall median of .29. This value was larger than those reported in previous research with the TCI suggesting that the expansion of the persistence scale was successful in capturing more extreme variants of the trait.

The MPQ evidenced a large correlation with SNAP workaholism and its median effect size with the OCPD measures (.34) was just below the cutoff for being considered large. This finding, though, is tempered by the fact that only the single achievement scale was administered. This particular scale assesses a more specific trait (that is conceptually well-aligned with OCPD) than do the more broad domains of TCI-R persistence and NEO PI-R, HEXACO PI-R, and EXP-NEO conscientiousness. The MPQ has a unique scoring strategy such that the administration of eight subscales is required to produce a score for the higher-order constraint domain. We felt that administering only one scale was preferable to abandoning the MPQ altogether and so we selected the single subscale we felt best captured OCPD pathology. Nonetheless, when viewed in hindsight, it is regrettable that the constraint domain was not included in the study. Clearly, it would be useful for future research to administer the entire MPQ, or at least the constraint domain, alongside one or more measures of OCPD.

It was clear from the present analyses that the conscientiousness scale from the EXP-NEO correlated more highly with the OCPD scales. While the NEO PI-R, HEXACO PI-R, TCI-R, and MPQ confine their assessments of conscientiousness largely to the normal, adaptive range of functioning, the EXP-NEO was an experimental manipulation of existing NEO PI-R items that converted the instrument into a maladaptive variant (Haigler & Widiger, 2001). The current study indicates, consistent with expectations, that maladaptive conscientiousness is even more strongly to OCPD symptomatology than is adaptive conscientiousness.

Although the results for the EXP-NEO demonstrate that the experimentally manipulated NEO PI-R conscientiousness items can account for OCPD, one might question whether it is appropriate to suggest that the experimentally manipulated items can be said to be still measuring conscientiousness. For example, one concern might be that the NEO PI-R items were simply revised to describe OCPD symptomatology. However, this was not the case. As indicated by Haigler and Widiger (2001), existing items were revised by inserting words such as “preoccupied,” “excessive,” “too much,” or “counterproductive” to reverse the direction of maladaptivity of the item without otherwise altering its content. For example, the NEO PI-R items “I’m known for my prudence and common sense,” “I’m a very competent person,” and “I work hard to accomplish my goals” (Costa & McCrae, 1992, p. 73) became “I have been told that I may at times display an excessive prudence and rigid common sense,” “I place too much emphasis on competence,” and “I work too hard to accomplish my goals” (respectively). It is possible that in some cases the insertion of words that made the item a more extreme and/or maladaptive variant of the original content did make the item closer in content to an OCPD symptom; however, this would itself support the position that OCPD can be understood as excessive or extreme conscientiousness. In any case, empirical support for the validity of the EXP-NEO as a measure of conscientiousness is provided by the finding that the EXP-NEO conscientiousness scale correlated strongly (median = .61) with other measures of conscientiousness (including .75 with HEXACO conscientiousness, .61 with TCI-R Persistence, and .59 with MPQ achievement). However, it would be of interest for future research to investigate the relationship of measures of adaptive and maladaptive conscientiousness with various outcome variables.

This would be particularly interesting as the relationship of OCPD with impairment has been mixed. Several studies have reported that OCPD is unrelated to psychosocial impairment (Ryder, Costa, & Bagby, 2005; Cramer, Torgersen, & Kringlen, 2007) and even associated with positive outcomes such as status/wealth (Ullrich, Farrington, & Coid, 2007). Such findings are not attributable to self-report measures within subclinical populations, as Skodol and colleagues (2005) reported a *negative* correlation between OCPD and employment impairment in a sample of patients with PDs carefully diagnosed via a structured interview. In sum, OCPD, as currently diagnosed and assessed, appears to be a mixture of adaptive and maladaptive conscientiousness (the MCMI-III is particularly strong in its representation of adaptive conscientiousness). On the other hand, there have been a number of studies indicating that FFM conscientiousness relates negatively to risky health behaviors, including substance abuse, and positively with familial satisfaction, longevity, and career success (see Ozer and Benet-Martinez [2006] for a review). It might be of interest for future studies to include a more explicit distinction between adaptive and maladaptive conscientiousness when assessing its relationship to successful and unsuccessful life outcomes (Mullins-Sweatt & Widiger, in press).

Limitations and Future Directions

While the current study provides evidence that general personality models can account for the personality pathology currently encoded in the OCPD construct, it is not without limitations. The current study compared exclusively self-report instruments, while semi-structured interviews are the preferred method of assessment within clinical research (McDermut & Zimmerman, 2005; Rogers, 2001). This particular limitation was partially unavoidable as there is only a single semi-structured interview for any dimensional model of personality (e.g., the Semi-structured Interview for the Five Factor Model; Trull & Widiger, 1997). Nonetheless, there are a number of

alternative interview measures for OCPD. Future research that employs an OCPD interview as a criterion would be helpful in extending the current findings.

Although evidence indicates that OCPD exists on continuum rather than as a taxon (e.g., Arntz et al., 2009), the relevance of the OCPD scales is typically understood in reference to psychiatric populations. There is reason to believe that OCPD may be studied effectively within an undergraduate population where traits such as workaholism and perfectionism may not be terribly uncommon. In fact, Blanco et al. (2008) reported that OCPD was the single most prevalent PD within the college population (8%) and Grant and colleagues (2004) found that rates of OCPD were significantly higher for persons with at least some college education. Additionally, Torgersen, Kringlen, and Cramer (2001) reported that within a large community sample, OCPD was the only PD that obtained a significant, *positive* relationship with education level. Our screening of well over 1,000 participants was likely successful in capturing clinically significant levels of OCPD symptomatology; nevertheless, it would be of interest to determine whether comparable findings would be obtained within outpatient clinical samples where persons diagnosed with OCPD are being treated.

Finally, the study administered specific scales, taken from larger inventories. We are not aware of evidence suggesting responses to these items are context dependent (i.e., an individual's response to a given item should be unaffected by the items that precede it). In fact, computer adaptive tests such as the Graduate Record Examination are predicated on the idea that item ordering is irrelevant and are widely recognized as valid measures. However, this is an empirical question and it is possible that these particular items might perform differently when removed from their standard ordering.

Conclusions

Amid the emerging likelihood that DSM-5 will incorporate a dimensional understanding of personality disorder, it is important that these dimensional models encompass the pathology currently encoded into the *DSM-IV-TR* categories. While most PDs have well established links to models of general personality, OCPD has garnered only inconsistent support. The current study compared six existing measures of conscientiousness-related personality traits and, contrary to the conclusions of the DSM-5 Personality Disorders Work Group, found that they converged well with measures of OCPD and quite strongly with specific components of OCPD pathology. These results support the hypothesis that OCPD is a maladaptive version of the normal personality trait of conscientiousness.

Footnote

¹ The exact order of administration was NEO PI-R, EXP-NEO, HEXACO, MCMI-III, MMPI-2, OMNI, WISPI, SCID-II PQ, SNAP, DAPP-BQ, MPQ, TCI-R, PDQ-4, and FFMRF.

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Table 1
Descriptive Statistics

	# items	<i>M</i>	<i>SD</i>	α
Conscientiousness-Related Scales				
NEO PI-R Conscientiousness	48	156.7	19.2	.91
EXP-NEO Conscientiousness	48	140.2	17.1	.88
HEXACO PI-R Conscientiousness	32	103.2	15.0	.90
FFMRF Conscientiousness	6	20.6	3.3	.73
TCI-R Persistence	35	116.1	18.7	.94
MPQ Achievement	20	10.7	5.0	.86
OCPD Component Scales				
SNAP Workaholism	18	6.4	4.0	.83
SNAP Propriety	20	11.7	4.3	.81
DAPP-BQ Compulsivity	16	50.9	9.7	.88

Notes: OCPD = Obsessive Compulsive Disorder; NEO PI-R = NEO Personality Inventory - Revised; EXP-NEO = Experimentally manipulated NEO PI-R items; HEXACO = HEXACO Personality Inventory - Revised; FFMRF = Five Factor Model Rating Form; TCI-R = Temperament and Character Inventory - Revised; MPQ = Multidimensional Personality Questionnaire; SNAP = Schedule for Nonadaptive and Adaptive Personality; DAPP-BQ = Dimensional Assessment of Personality Pathology - Basic Questionnaire.

Table 2

Correlations among Conscientiousness-Related Scales

	1	2	3	4	5	6
1. NEO PI-R Conscientiousness						
2. FFMRF Conscientiousness	.68					
3. HEXACO Conscientiousness	.84	.70				
4. TCI-R Persistence	.64	.56	.66			
5. MPQ Achievement	.59	.51	.60	.83		
6. EXP-NEO Conscientiousness	.70	.60	.75	.61	.59	
median correlation	.68	.60	.70	.64	.59	.61

Notes: $n = 536$. All correlations are significant at $p < .00018$ (two-tailed). Values along the diagonal, in parentheses are Cronbach's alpha for each scale. NEO PI-R = NEO Personality Inventory - Revised; EXP-NEO = Experimentally manipulated NEO PI-R items; FFMRF = Five Factor Model Rating Form; HEXACO = HEXACO Personality Inventory - Revised; MPQ = Multidimensional Personality Questionnaire; TCI-R = Temperament and Character Inventory - Revised.

Table 3
Correlations Among Conscientiousness and OCPD Scales

	MCFI	MMPI	OMNI	PDQ	SCID-II	SNAP	WISPI	median	
NEO PI-R Conscientiousness ^a	.71	-.11	.18	.11	.21	.31	.17	0.18	S
Competence	.51	-.15	.09	.09	.13	.23	.05	0.09	
Order	.46	.02	.22	.08	.22	.22	.17	0.22	S
Dutifulness	.52	-.06	.17	.12	.23	.30	.16	0.17	S
Achievement-Striving	.49	-.10	.18	.10	.18	.32	.12	0.18	S
Self-Discipline	.57	-.24	.02	-.02	.05	.14	.02	0.02	
Deliberation	.61	-.01	.11	.11	.15	.22	.20	0.15	S
FFMRF Conscientiousness	.56	.07	.27	.17	.30	.36	.17	0.27	M
HEXACO Conscientiousness	.71	-.01	.22	.19	.28	.39	.22	0.22	S
Organization	.49	-.05	.18	.06	.18	.20	.13	0.18	S
Diligence	.52	-.06	.24	.16	.21	.37	.18	0.21	S
Perfectionism	.47	.16	.39	.33	.37	.47	.30	0.37	L
Prudence	.68	-.08	.05	.05	.09	.20	.09	0.09	
TCI-R Persistence	.45	.00	.29	.26	.31	.47	.29	0.29	M
Eagerness of Effort	.36	-.05	.15	.10	.19	.24	.20	0.19	S
Work Hardened	.37	-.05	.17	.18	.22	.36	.16	0.18	S
Ambitious	.40	.06	.29	.25	.29	.47	.26	0.29	M
Perfectionist	.38	.09	.35	.33	.34	.52	.35	0.35	M
MPQ Achievement	.42	.08	.34	.30	.32	.54	.34	0.34	M
EXP-NEO Conscientiousness	.56	.30	.52	.39	.48	.56	.53	0.52	L
Competence	.37	.29	.45	.33	.42	.48	.43	0.42	L
Order	.50	.08	.28	.14	.28	.32	.23	0.28	M
Dutifulness	.30	.21	.42	.31	.34	.43	.48	0.34	M
Achievement-Striving	.43	.16	.40	.31	.36	.49	.38	0.38	L
Self-Discipline	.48	.09	.38	.27	.32	.43	.34	0.34	M
Deliberation	.32	.40	.36	.31	.35	.34	.44	0.35	M

Notes: All correlations listed in boldface type are significant at $p < .00018$ (two-tailed); The final column indicates whether the median correlation is small (S; $> .10$), medium (M; $> .24$), or large (L; $> .37$) according to Cohen (1992). MCFI = Millon Clinical Multiaxial Inventory - 3rd Edition; MMPI = Minnesota Multiphasic Personality Inventory - 2nd edition; OMNI = OMNI Personality Inventory; PDQ = Personality Diagnostic Questionnaire - 4; SCID-II = Structured Clinical Interview for DSM-IV - Axis II - Personality Questionnaire; SNAP = Schedule for Nonadaptive and Adaptive Personality; WISPI = Wisconsin Personality Disorders Inventory - IV. NEO PI-R = NEO Personality Inventory - Revised; EXP-NEO = Experimentally manipulated NEO PI-R items; HEXACO = HEXACO Personality Inventory - Revised; FFMRF = Five Factor Model Rating Form; TCI-R = Temperament and Character Inventory - Revised; MPQ = Multidimensional Personality Questionnaire.

^a The findings for the NEO PI-R were adapted from Samuel and Widiger (2010).

Table 4
Correlations of Conscientiousness Scales with OCPD Symptom Scales

	SNAP Workaholism	SNAP Propriety	DAPP-BQ Compulsivity
NEO PI-R Conscientiousness	.42	.39	.63
Competence	.30	.31	.38
Order	.22	.29	.58
Dutifulness	.39	.38	.45
Achievement-Striving	.50	.27	.48
Self-Discipline	.32	.24	.45
Deliberation	.17	.30	.39
FFMRF Conscientiousness	.41	.39	.53
HEXACO Conscientiousness	.45	.44	.73
Organization	.18	.32	.63
Diligence	.58	.31	.54
Perfectionism	.51	.40	.60
Prudence	.17	.33	.41
TCI-R Persistence	.70	.39	.63
Eagerness of Effort	.50	.30	.46
Work Hardened	.52	.29	.47
Ambitious	.56	.39	.58
Perfectionist	.72	.37	.61
MPQ Achievement	.76	.38	.59
EXP-NEO Conscientiousness	.64	.49	.72
Competence	.46	.45	.49
Order	.32	.35	.64
Dutifulness	.55	.33	.48
Achievement-Striving	.62	.34	.55
Self-Discipline	.58	.37	.57
Deliberation	.27	.32	.38

Notes: All correlations are significant at $p < .00018$ (two-tailed). DAPP-BQ = Dimensional Assessment of Personality Pathology - Basic Questionnaire; SNAP = Schedule for Nonadaptive and Adaptive Personality; NEO PI-R = NEO Personality Inventory - Revised; FFMRF = Five Factor Model Rating Form; HEXACO = HEXACO Personality Inventory - Revised; TCI-R = Temperament and Character Inventory - Revised; MPQ = Multidimensional Personality Questionnaire; EXP-NEO = Experimentally manipulated NEO PI-R items. Minimum pairwise $n = 471$