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The FFOCI and Other Measures and Models of OCPD

Cristina Crego[1], Douglas B. Samuel[2], and Thomas A. Widiger[1]

Abstract

The Five Factor Obsessive Compulsive Inventory (FFOCI) was developed in part to facilitate a shift from the categorical classification of personality disorder to a dimensional trait model, more specifically, the five-factor model (FFM). Questions though have been raised as to whether obsessive–compulsive personality disorder (OCPD) can be understood as a maladaptive variant of FFM conscientiousness. The present study provides a further validation of the FFOCI, emphasizing in particular its association with FFM conscientiousness, as well as comparing alternative measures and models of OCPD. A total of 380 undergraduates (obtained in two samples of 274 and 106), including 146 oversampled for OCPD traits (93 for the first sample and 53 for the second), completed the FFOCI, measures of general personality, OCPD trait scales, and alternative measures of OCPD. Results supported the validity of the FFOCI as a measure of OCPD and maladaptive variants of FFM traits, as well as identifying substantive differences among the alternative measures of OCPD, particularly with respect to their relationship with FFM conscientiousness, antagonism, and introversion.

Keywords

five-factor model, obsessive-compulsive, personality, personality disorder, *DSM-5*, validity

Obsessive–compulsive personality disorder (OCPD) is characterized by such features as perfectionism; devotion to work to the exclusion of other important activities; preoccupation with details, order, and organization; rigidity; and difficulty expressing warmth or affection (American Psychiatric Association [APA], 2013). OCPD was not one of the personality disorders originally proposed for deletion from the APA's *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*; APA, 2013). Nevertheless, there has been considerable criticism of the APA categorical model of personality disorder classification (Clark, 2007; Krueger & Eaton, 2010; Widiger & Trull, 2007). These criticisms include an excessive diagnostic co-occurrence, arbitrary and inconsistent diagnostic boundaries, insufficient coverage, and the use of a single diagnostic term to describe a heterogeneous constellation of maladaptive personality traits. For instance, any four of eight criteria are required for the diagnosis of *DSM-5* OCPD (APA, 2013). Therefore, there are 163 different combinations of criteria that could yield an OCPD diagnosis. Because only half of the criteria are required, it is technically possible that two individuals could be provided with this diagnosis yet not share a single feature.

In light of the limitations of the APA categorical model, several alternative dimensional models have been proposed (Widiger & Simonsen, 2005). One such proposal is to consider the *DSM-5* personality disorders to be maladaptive variants of general personality structure as described within the five-factor model (FFM; McCrae & Costa, 2008). The FFM has become arguably the predominant dimensional model of general personality structure within psychology due in part to its considerable empirical support across a wide array of research concerns, including multivariate behavior genetics, childhood antecedents, temporal stability across the life span, and cross-cultural replication (John, Naumann, & Soto, 2008; Widiger, Samuel, Mullins-Sweatt, Gore, & Crego, 2012). FFM traits have also been shown to be useful in predicting a substantial number of important life outcomes, both positive and negative, such as subjective well-being, social acceptance, relationship conflict, criminality, unemployment, physical health, mortality, and occupational satisfaction (Ozer & Benet-Martínez, 2006).

The FFM, as conceptualized by McCrae and Costa (2008), consists of five broad domains of neuroticism versus emotional stability, extraversion versus introversion, openness versus closedness, agreeableness versus antagonism, and conscientiousness versus disinhibition. Each of these domains were further differentiated into six more specific facets by McCrae and Costa (2008) on the basis of

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their research concerning and construction of the NEO Personality Inventory–Revised (Costa & McCrae, 1992). For example, their six facets for conscientiousness are competence, order, dutifulness, achievement-striving, self-discipline, and deliberation.

There has been a significant amount of research using the FFM to effectively differentiate among different forms of psychopathology (e.g., Bagby et al., 1997; Bienvenu et al., 2001), including the personality disorders (Bagby, Costa, Widiger, Ryder, & Marshall, 2005; Miller, Bagby, Pilkonis, Reynolds, & Lynam, 2005). There is also an extensive body of research to suggest that the *DSM*-5 personality disorders, including OCPD (Samuel & Widiger, 2010, 2011), can be understood as maladaptive variants of the domains and facets of the FFM (Samuel & Widiger, 2008; Widiger, Samuel, et al., 2012). To the extent that a *DSM-5* personality disorder can be understood as a maladaptive variant of FFM personality structure, a natural step is to develop a measure of that personality disorder from this theoretical perspective (Lynam, 2012). Researchers are indeed now developing measures that are focused on maladaptive variants of the domains and facets of the FFM (e.g., De Clerq, De Fruyt, Van Leeuwen, & Mervielde, 2006; Piedmont, Sherman, Sherman, Dy-Liacco, & Williams, 2009; Simms et al., 2011). A recent special issue of *Journal of Personality Assessment* was devoted to the presentation and initial validation of such measures (Widiger, Lynam, Miller, & Oltmanns, 2012), including the Five Factor Obsessive Compulsive Inventory (FFOCI; Samuel, Riddell, Lynam, Miller, & Widiger, 2012).

The construction of the FFOCI as well as other comparable measures (e.g., the Five Factor Schizotypal Inventory; Edmundson, Lynam, Miller, Gore, & Widiger, 2011), was developed using a different rationale than was used, for instance, for the construction of the Computerized Adaptive Test of Personality Disorder (Simms et al., 2011) or for the Dimensional Personality Symptom Item Pool (De Clerq et al., 2006). The Dimensional Personality Symptom Item Pool, modeled after the Structured Interview for the Five Factor Model (Trull et al., 1998), was constructed by developing maladaptive variants of existing FFM facet scales. The FFOCI used a similar approach, but each maladaptive variant was intended to cover a particular component of OCPD (the Five Factor Schizotypal Inventory, in turn, covers schizotypal traits). The FFM of personality disorder does not suggest or imply that the personality traits included within the *DSM-IV-TR* (now *DSM-5*) do not exist, only that they might be better understood dimensionally rather than categorically and, more specifically, as maladaptive variants of the more normal traits within the FFM (Widiger, Lynam, et al., 2012). The approach taken for each of the FFM-based personality disorder measures follows from the hypothesis that each *DSM-IV-TR* (now *DSM-5*) personality disorders can be understood as maladaptive variants of the FFM (Widiger, Samuel, et al., 2012), and the manner in which these scales have been developed helps to ensure that all the maladaptive personality traits included within the respective *DSM-IV-TR* personality disorders are adequately covered. It is evident that there remains considerable interest in these personality syndromes (Mullins-Sweatt, Bernstein, & Widiger, 2012; Shedler et al., 2010). The FFOCI provides a bridge, or a means of translation, between the *DSM-IV-TR* syndrome of OCPD and the FFM. It is true that if future research with the FFOCI is confined to just its total score, the FFOCI will recreate much of the problems for the existing categories (e.g., heterogeneity of membership and diagnostic overlap), but the FFOCI can also be broken down into its subscales, thereby dismantling the heterogeneous syndromes into more distinctive component parts. The approach taken for the FFOCI is indeed comparable in some respects to the approach taken for the development of the *DSM-5 PID-5*, in which maladaptive traits representing the existing diagnostic categories were selected and then subsequently assigned to these respective syndromes (Krueger, Derringer, Markon, Watson, & Skodol, 2012).

Based on a survey of researchers (Lynam & Widiger, 2001), a survey of clinicians (Samuel & Widiger, 2004), and empirical research relating the FFM to OCPD (Samuel & Widiger, 2008, 2011), Samuel et al. (2012) identified twelve facets of the FFM as being particularly relevant for the assessment of OCPD, such as Perfectionism (an hypothesized OCPD variant of FFM competence), Workaholism (an hypothesized OCPD variant of FFM achievement-striving), Ruminative Deliberation (FFM deliberation), Detached Coldness (low FFM warmth), Risk Aversion (low FFM excitement-seeking), Constricted (low FFM openness to feelings), and Inflexibility (low FFM openness to actions). The FFOCI scales were subsequently validated against measures of OCPD and the FFM. In this initial validation study, the twelve FFOCI scales obtained coefficient alpha values (Cronbach, 1951) ranging from .77 to .87 and correlated from .50 to .70 with traditional measures of OCPD (Samuel et al., 2012). Most important from the perspective of the FFM, each FFOCI subscale correlated significantly with its parent NEO Personality Inventory-R (Costa & McCrae, 1992) facet scale, ranging from a low of .45 for FFOCI Perfectionism with NEO PI-R Competence, to a high of .82 for FFOCI Excessive Worry with NEO PI-R Anxiousness. Median convergent validity was .72.

An alternative trait list for OCPD is provided by the dimensional trait model included within Section III of *DSM-5* (APA, 2013). *DSM-5* includes a 5-domain, 25-trait model that is also said to be aligned with the FFM. As stated in *DSM-5*, "these five broad domains are maladaptive variants of the five domains of the extensively validated and replicated personality model known as the 'Big Five,' or the Five Factor Model of personality" (APA, 2013, p. 773). The

DSM-5 Section III traits for OCPD are rigid perfectionism, perseveration, restricted affectivity, and intimacy avoidance (APA, 2013). It is indicated that a diagnosis of OCPD would require three of these four traits.

The purpose of the present study was threefold: (a) to further validate the FFOCI by replicating and extending the findings of Samuel et al. (2012), (b) to further address the question of whether compulsivity (and OCPD) can be understood as a maladaptive variant of conscientiousness, and (c) to compare and contrast alternative self-report measures of OCPD. With respect to the second question, whether or not OCPD, and compulsivity in particular, can be accurately understood as a maladaptive variant of conscientiousness is fundamental to the validity of the FFOCI, as virtually half of the FFOCI scales are from conscientiousness.

In their initial proposal for a *DSM-5* dimensional trait model, Clark and Krueger (2010) concluded that a sixth domain of compulsivity was needed for this model because "Obsessive-Compulsive Personality Disorder [OCPD] is not well-covered by the FFM (Saulsman & Page, 2004)" (p. 2). More specifically, they argued that OCPD traits are not well understood as maladaptive variants of FFM conscientiousness. "Therefore, we added a domain of compulsivity" (Clark & Krueger, 2010, p. 2). Saulsman and Page (2004) and Samuel and Widiger (2008) had reported in their meta-analyses of FFM-personality disorder research a relatively weak relationship of OCPD with conscientiousness (Cohen, 1992). On the other hand, Samuel and Widiger also reported that the magnitude of this effect differed markedly depending on the instrument used to assess both constructs. To address this issue, the current study included four alternative personality scales that align conceptually and empirically with FFM conscientiousness (none of which were included in Samuel et al., 2012), including the Dependability scale from the Inventory of Personal Characteristics–5 (IPC-5; Tellegen & Waller, 1987), the Activity scale from the Zuckerman–Kuhlman–Aluja Personality Questionnaire (ZKA-PQ; Aluja, Kuhlman, & Zuckerman, 2010), all the scales from the International Personality Item Pool-NEO (IPIP-NEO; Goldberg et al., 2006), and the 5-Dimensional Personality Test (5DPT; van Kampen, 2009). The IPIP-NEO was constructed to align conceptually and empirically with the FFM. The alignment of the 5DPT with the FFM would not be considered as strong, as the 5DPT represents an extension and modification of the three-factor model of Eysenck (1994), with a particular emphasis on "vulnerability factors associated with psychopathology" (van Kampen, 2012, p. 92) rather than simply personality traits within the normal range of functioning.

In a complementary fashion, the current study also includes measures specific to compulsivity, including the Compulsivity scale from the Dimensional Assessment of Personality Pathology-Basic Questionnaire (DAPP-BQ; Livesley & Jackson, 2009), and, new to this study, the Propriety and Workaholism scales from the Schedule for Nonadaptive and Adaptive Personality–2 (SNAP-2; Clark, Simms, Wu, & Casillas, in press). These scales are useful in confirming that the relationship of compulsivity scales with conscientiousness are not specific to the FFOCI.

An additional purpose of this study was to compare and contrast the FFOCI conceptualization and assessment of OCPD with alternative measures, particularly the Personality Inventory for *DSM-5* (PID-5; Krueger et al., 2012), the self-report measure of the *DSM-5* dimensional trait model (see Bagby, 2013, for a special issue of *Assessment* concerning the PID-5). As noted earlier, the authors of this model suggested that a failing of the FFM conceptualization of OCPD was the absence of an adequate relationship of conscientiousness with traits of compulsivity (Clark & Krueger, 2010). The initial proposal for *DSM-5* therefore included a domain of compulsivity (along with five additional domains of negative emotionality, introversion, antagonism, disinhibition, and schizotypy; APA, 2010). The compulsivity domain included such traits as perfectionistic, preoccupied with organization, perseveration, workaholic, and rigidly principled (Krueger et al., 2011). However, this 6-domain, 37-trait, model was eventually reduced on the basis of a factor analysis to a 5-domain, 25-trait, model (Krueger et al., 2012). The domain of compulsivity was deleted, despite its apparent importance for the conceptualization of OCPD, and only the traits of perfectionism and perseveration from this domain were retained.

In other words, it would appear that the FFOCI trait conceptualization of OCPD places considerably more emphasis on compulsivity than does the *DSM-5*. Nevertheless, it is also important to note that the FFOCI conceptualization of OCPD is not confined simply to conscientiousness (Lynam & Widiger, 2001; Samuel & Widiger, 2008, 2011). Included as well are facets of low extraversion (i.e., low warmth and low excitement-seeking), high neuroticism (i.e., high anxiousness), and low openness (i.e., low openness to feelings, actions, and values).

In the current study, the FFOCI conceptualization and assessment of OCPD is compared not only with the PID-5 but also with the SNAP-2 (Clark et al., in press), the Millon Clinical Multiaxial Inventory (MCMI-III; Millon, Millon, Davis, & Grossman, 2009), and, new to this study, the Coolidge Axis II Inventory (CATI; Coolidge & Merwin, 1992) and the OMNI Personality Inventory (OMNI; Loranger, 2001). The FFOCI, PID-5, SNAP-2, MCMI-III, CATI, and OMNI assessments of OCPD are first compared directly with one another, then with respect to their relationship with DAPP-BQ Compulsivity, and finally with respect to their relationship with the domains of the FFM. The FFM has been used successfully in a number of prior studies as a basis for comparing and contrasting alternative measures of the same construct. Goldberg (1993) likened the domains of

the FFM to the coordinates of latitude and longitude that cartographers used to map the world, suggesting that the FFM might be similarly useful in comparing and contrasting different personality measures with respect to their relative saturation of the fundamental Big Five domains. The FFM has indeed been shown to be useful in comparing and contrasting different conceptualizations and measures of personality disorder (Widiger, Costa, Gore, & Crego, 2013), including OCPD (Samuel & Widiger, 2010). A recent example of such a comparison was provided by Poy, Segarra, Esteller, Lopez, and Molto (in press) in their comparison of psychopathy scales with respect to their relationship to FFM domains.

In sum, the purpose of the present study was threefold: (a) Further validate the FFOCI by replicating and extending the findings of Samuel et al. (2012), including such additional measures as the complete IPIP-NEO (Goldberg et al., 2006), the complete 5DPT (van Kampen, 2009), the Dependability scale from the IPC-5 (Tellegen & Waller, 1987); the Activity scale from the ZKA-PQ (Aluja et al., 2010); the Propriety and Workaholism scales from the SNAP-2 (Clark et al., in press); and the OCPD scales from the CATI (Coolidge & Merwin, 1992), the OMNI (Loranger, 2001), and the PID-5 (Krueger et al., 2012). (b) Further address the question of whether compulsivity (and OCPD) can be understood as a maladaptive variant of conscientiousness, including four alternative measures of conscientiousness not previously studied with the FFOCI: the Dependability scale from the IPC-5 (Tellegen & Waller, 1987); the Activity scale from the ZKA-PQ (Aluja et al., 2010); the Conscientiousness scale from the IPIP-NEO (Goldberg et al., 2006); and the Orderliness scale from the 5DPT (van Kampen, 2009). (c) Finally, compare and contrast six alternative self-report measures of OCPD (i.e., FFOCI, MCMI-III, SNAP and, new to this study, PID-5, CATI, and OMNI) with respect to their relationship to one another, with compulsivity, and with the domains of the FFM.

Method

Participants

Participants signed up for the study via the SONA system, a web-based system for students to enroll in experiments for course credits. A subsample of individuals were recruited who endorsed at least four items on the OCPD scale of the Personality Diagnostic Questionnaire–4 (Bagby & Farvolden, 2004) that was administered to more than 1,800 potential participants at the start of the spring and fall semesters. The 300 highest scorers on the OCPD scale were invited to participate (146 of whom participated).

Once all data were collected, participants were first deleted if they had not adequately completed at least 80% of each of the administered questionnaires. In addition, 17 participants with elevated scores on the validity scale were also removed. This left a total 380 participants (including 146 from the oversampled group), 280 of whom were female and 100 were male. Participants had a mean age of 19.4 years (SD = 2.5). Fifty-seven percent were freshman, 26% sophomores, 13% juniors, and 4% seniors. For ethnicity, 81% were White/Caucasian, 9% Black/African American, 2% Hispanic/Latino, 3% Asian, and 6% were other. Thirteen percent of the participants in this study were currently receiving or had received mental health treatment.

Materials

Five Factor Obsessive Compulsive Inventory. The FFOCI (Samuel et al., 2012) includes 12 subscales, each containing 10 items answered on a 5-point scale ranging from *strongly disagree* to *strongly agree*. Six subscales assess hypothesized OCPD variants of FFM conscientiousness (i.e., Perfectionism, Fastidiousness, Punctiliousness, Workaholism, Doggedness, and Ruminative Deliberation); two assess OCPD facets of low extraversion (i.e., Detached Coldness and Risk Aversion); one assesses an OCPD variant of neuroticism (i.e., Excessive Worry); and three assess OCPD facets of low openness to experience (i.e., Constricted, Inflexibility, and Dogmatism). Coefficient alpha values for the scales in the current study (Cronbach, 1951) ranged from .73 (Inflexible) to .86 (Perfectionism and Orderliness), with a median alpha of .80.

Five Factor and Conscientiousness Related Scales

International Personality Item Pool NEO. The IPIP-NEO (Goldberg et al., 2006) is a 300-item self-report inventory designed to assess FFM personality domains and facets modeled after the NEO PI-R (Costa & McCrae, 1992). It uses a 5-point Likert-type scale (from *strongly disagree* to *strongly agree*). Coefficient alpha for domain scales in the current study ranged from .74 (Agreeableness) to .92 (Conscientiousness), with a median of .91 (Extraversion).

5-Dimensional Personality Test. The 5DPT (van Kampen, 2009) is a 100-item self report inventory designed to assess five domains of normal personality functioning (i.e., neuroticism, extraversion, absorption, insensitivity, and orderliness). The 5DPT uses a True/False response format. Alpha coefficients ranged in the current study from .77 (Insensitivity) to .86 (Neuroticism), with a median of .85 (Absorption).

Zuckerman–Kuhlman–Aluja Personality Questionnaire. The ZKA-PQ (Aluja et al., 2010) is a 200-item self-report inventory designed to assess five domains of normal personality functioning (i.e., neuroticism, extraversion, aggressiveness, activity, and sensation seeking) that represent an alternative five-factor model. ZKA-PQ Activity (which includes

subscales assessing work compulsion, general activity, restlessness, and work energy) aligns with FFM conscientiousness (Aluja et al., 2010). The ZKA-PQ uses a 4-point Likert-type scale (from *disagree strongly* to *agree strongly*). Only the 38 items from the ZKA-PQ Activity scale were included. Coefficient alpha for Activity in the current study was .90.

Inventory of Personal Characteristics–5. The IPC-5 (Tellegen & Waller, 1987) is a 160-item questionnaire designed to assess the dimensional model of personality developed by Tellegen and Waller (1987). Items are assessed on a 4-point Likert scale (from *definitely true* to *definitely false*). The present study included only the 24 IPC-5 items assessing the domain of dependability. Coefficient alpha in the current study was .91.

Obsessive–Compulsive Personality Disorder and OCPD Component Scales

Millon Clinical Multiaxial Inventory-III. The MCMI-III (Millon et al., 2009) is a 175-item true–false self-report inventory that assesses the *DSM-IV* (now *DSM-5*) personality disorders (APA, 2013). The present study included only the 17 MCMI-III items pertaining to OCPD. Coefficient alpha in the current study was .74.

Coolidge Axis II Inventory. The CATI (Coolidge & Merwin, 1992) is a 225-item questionnaire designed to measure personality and other mental disorders, using a 4-point Likert scale (from *strongly false* to *strongly true*). The present study included only the 32 CATI items pertaining to OCPD. Coefficient alpha in the current study was .68.

OMNI Personality Inventory. The OMNI (Loranger, 2001) is a 375-item self-report questionnaire designed to assess normal and abnormal personality traits and personality disorders. Responses are given using a 7-point Likert-type scale (from *definitely disagree* to *definitely agree)*. This study included only the 18 OMNI items pertaining to OCPD. Coefficient alpha in the current study was .65.

Schedule for Nonadaptive and Adaptive Personality-2. The SNAP-2 (Clark et al., in press) is a 390-item, true–false self-report inventory designed to measure both normal and abnormal personality, although its primary usage has been as a measure of maladaptive personality functioning. The present study included only the 25 items pertaining to OCPD and 38 items forming the Workaholism and Propriety trait scales. Coefficient alpha values in the current study were .63, .87, and .75 for the OCPD, Workaholism, and Propriety scales, respectively.

Dimensional Assessment of Personality Pathology-Basic Questionnaire. The DAPP-BQ (Livesley & Jackson, 2009) is a 290-item self-report inventory consisting of 18 scales designed to measure aspects of personality pathology (e.g., compulsivity and affective instability). Responses are given using a 5-point Likert-type scale ranging from *strongly disagree* to *strongly agree*. This study included only the 16-item DAPP Compulsivity scale. Coefficient alpha in the current study was .92.

Personality Inventory for DSM-5. The PID-5 (Krueger et al., 2012) is a 220-item questionnaire designed to measure the *DSM-5* dimensional trait model. Using a 4-point Likert-type scale (from *very false or often false* to *very true or often true*) participants rate how well the statements describe them. The present study included only the 32 PID-5 items pertaining to the assessment of perseveration (9 Items), rigid perfectionism (10 items), restricted affectivity (7 items), and intimacy avoidance (6 items), which obtained in the current study Coefficient alpha values of .84, .92, .89, and .92, respectively.

Validity Scale. A five-item validity scale was also administered. Each item describes a behavior that was very unlikely to be true (e.g., "I am currently in the Guinness Book of World Records" and, reverse coded, "I have used a computer in the past 2 years"); thus an endorsement suggests the individual is not attending to the item's content. The items are rated on a 5-point Likert-type scale whose values range from *strongly disagree* to *strongly agree*.

Procedures

All measures were administered via SurveyMonkey, a secure online survey service. Given the online format, individuals indicated their informed consent by selecting the appropriate box. After providing informed consent, participants completed selected scales from personality and personality disorder instruments; the order of administration was standard across all participants. Participants were allowed as much time as necessary to complete the materials (which required approximately 3 hours), and were able to temporarily suspend participation whenever necessary. Upon completion, each participant received a debriefing document and research participation credits. The 5DPT and ZKAPQ were administered only in the fall semester (N = 274); PID-5 Restricted Affectivity and Intimacy Avoidance were administered only in the spring semester (N = 106).

Results

Convergence Among FFOCI Scales

Table 1 provides the correlations among the 12 FFOCI scales. These findings closely paralleled the findings reported by Samuel et al. (2012), including the strong convergence among the FFOCI conscientiousness subscales.

Table 1. Convergence Among FFOCI Subscales.

	N1	E1	E5	O3	O4	O6	C1	C2	C3	C4	C5
N1	—										
E1	.14	—									
E5	.33	.44	—								
O3	−.14	.62	.03	—							
O4	.29	.56	.66	.33	—						
O6	.10	.33	.37	.25	.48	—					
C1	.36	.10	.33	−.04	.34	.26	—				
C2	.34	.16	.38	−.03	.42	.26	.82	—			
C3	.32	.22	.45	.03	.48	.50	.69	.69	—		
C4	.23	.17	.34	.09	.41	.30	.68	.61	.70	—	
C5	.08	.06	.21	.08	.28	.28	.61	.56	.64	.74	—
C6	.50	.25	.56	−.01	.49	.32	.57	.60	.61	.56	.54

Note. N = 380. FFOCI = Five Factor Obsessive Compulsive Inventory; N1 = Excessive Worry; E1 = Detached Coldness; E5 = Risk Aversion; O3 = Constricted; O4 = Inflexible; O6 = Dogmatism; C1 = Perfectionism; C2 = Orderliness; C3 = Punctiliousness; C4 = Workaholism; C5 = Doggedness; C6 = Ruminative Deliberation.

Table 2. Convergent and Discriminant Validity of the FFOCI Subscales With Measures of General Personality.

	FFOCI subscales											
Personality measures	(N1)	(E1)	(E5)	(O3)	(O4)	(O6)	(C1)	(C2)	(C3)	(C4)	(C5)	(C6)
IPIP NEO domain	.58***	−.57***	−.56***	−.43***	−.33***	−.26***	.70***	.67***	.64***	.63***	.69***	.52***
5DPT	.64***	−.48***	−.56***	−.09	−.07	−.01	.64***	.74***	.62***	.56***	.54***	.60***
ZKAPQ							.60***	.51***	.55***	.67***	.65***	.37***
IPC-5							.56***	.63***	.59***	.48***	.52***	.51***
IPIP NEO facet[a]	.76***	−.64***	−.72***	−.54***	−.49***	−.42***	.45***	.72***	.53***	.60***	.71***	.54***
Disc Same[b]	.38***	−.32***	−.27***	−.25***	−.17***	−.12***	.53***	.44***	.48***	.44***	.46***	.35***
Disc Other[c]	.14	.19	.19	.20	.20	.12	.13	.12	.14	.23	.15	.14

Note. N = 274 for 5DPT and ZKAPQ results; N = 380 for all others. N1 = Excessive Worry; E1 = Detached Coldness; E5 = Risk Aversion; O3 = Constricted; O4 = Inflexible; O6 = Dogmatism; C1 = Perfectionism; C2 = Orderliness; C3 = Punctiliousness; C4 = Workaholism; C5 = Doggedness; C6 = Ruminative Deliberation; FFOCI = Five Factor Obsessive Compulsive Inventory; IPIP NEO = International Personality Item Pool NEO; 5DPT = 5-Dimensional Personality Test; ZKAPQ = Zuckerman–Kuhlman–Aluja Personality Questionnaire; IPC-5 = Inventory of Personal Characteristics–5.
a. Corresponding IPIP NEO facet for each FFOCI trait scale.
b. Discriminant validity between the FFOCI and the average correlation of noncorresponding IPIP NEO facets within the same domain.
c. Discriminant validity between the FFOCI and the average correlation of noncorresponding IPIP NEO facets outside of each scale's domain.
*p < .05. **p < .01. ***p < .001.

Convergent and Discriminant Validity of FFOCI With Measures of General Personality

Table 2 provides the correlations of the FFOCI subscales with the measures of general personality. Consistent with expectations, each of the FFOCI subscales correlated significantly with other measures of its respective domain. The correlations were particularly high for the FFOCI conscientiousness subscales, with values for IPIP-NEO Conscientiousness ranging from .52 for FFOCI Ruminative Deliberation to .70 for Perfectionism, with a median convergence of .65. This convergence with conscientiousness was largely replicated across three alternative measures of this domain. For 5DPT Orderliness, FFOCI conscientiousness subscales correlated from .54 for Doggedness to .74 for Fastidiousness (*Mdn* = .61). For ZKAPQ Activity, the convergence for FFOCI Ruminative Deliberation was only .37, but the other five FFOCI conscientiousness subscales correlated from .51 (Fastidiousness) to .67 (Workaholism), with a median value (across all six subscales) of .67. For IPC-5 Dependability, the correlations ranged from .48 (Workaholism) to .63 (Fastidiousness), with a median of .54.

Convergence was also obtained for the FFOCI neuroticism and extraversion subscales with the IPIP-NEO Neuroticism and Extraversion (ranging from −.56 to .58) and with the 5DPT Neuroticism and Extraversion (ranging from −.48 to .64). Convergent correlations of the FFOCI Openness subscales with the IPIP-NEO were significant, but relatively weaker than was obtained for the FFOCI scales from other domains. The correlations with 5DPT Absorption were nonsignificant.

Although the convergence of the FFOCI openness scales with IPIP-NEO openness scales was relatively weaker than

Table 3. Convergent and Discriminant Validity of IPIP-NEO and FFOCI Conscientiousness Subscales.

	IPIP C1	IPIP C2	IPIP C3	IPIP C4	IPIP C5	IPIP C6
IPIP C1	—					
IPIP C2	.40	—				
IPIP C3	.57	.45	—			
IPIP C4	.71	.50	.54	—		
IPIP C5	.52	.50	.45	.60	—	
IPIP C6	.26	.45	.41	.31	.42	—
FFOCI C1	.45	.62	.43	.63	.51	.42
FFOCI C2	.35	.72	.39	.52	.51	.42
FFOCI C3	.37	.52	.53	.54	.48	.45
FFOCI C4	.38	.45	.36	.60	.56	.43
FFOCI C5	.45	.44	.42	.61	.71	.37
FFOCI C6	.21	.46	.34	.36	.39	.54

Note. $N = 380$. IPIP-NEO = International Personality Item Pool-NEO (Goldberg et al., 2006); FFOCI = Five Factor Obsessive Compulsive Inventory (Samuel et al., 2012); IPIP C1 = Self-Efficacy; IPIP C2 = Orderliness; IPIP C3 = Dutifulness; IPIP C4 = Achievement Striving; IPIP C5 = Self-Discipline; IPIP C6 = Cautiousness; FFOCI C1 = Perfectionism, FFOCI C2 = Orderliness, FFOCI C3 = Punctiliousness, FFOCI C4 = Workaholism, FFOCI C5 = Doggedness, FFOCI C6 = Ruminative Deliberation.

was obtained for FFOCI scales from other domains, convergence remained strong at the facet level, with moderate to large effect size relationships (Cohen, 1992). These ranged from −.42 for FFOCI Inflexibility with IPIP-NEO Liberalism to −.54 for FFOCI Constricted with IPIP-NEO Emotionality. The FFOCI subscales of neuroticism, extraversion, and conscientiousness also obtained good convergent validity with their corresponding facet scales of the IPIP-NEO, ranging from .45 for Perfectionism with IPIP-NEO Self-efficacy to .76 for Excessive Worry with IPIP-NEO Anxiety.

Significant covariation is desired among scales hypothesized to be within the same FFM domain, but convergence should be relatively higher for a respective FFOCI subscale with its respective "parent" facet. Table 2 provides the averaged correlation of each FFOCI subscale with the other IPIP-NEO facet scales within the same domain. The convergent validity correlations were higher than the averaged covariation with the other facet scales with only one exception: FFOCI Perfectionism. However, it is evident that the convergence for FFOCI Punctiliousness was not much higher than its averaged correlation with the other facets. Discriminant validity outside of the respective FFM domains was strong for all the FFOCI subscales (the discriminant validity correlations provided in Table 2 with facets outside of the respective FFM domain are averages of the absolute values; weak discriminant validity can be hidden if high positive and negative correlations are averaged).

Table 3 provides further detail regarding the convergent and discriminant validity of the FFOCI conscientiousness subscales with the IPIP conscientiousness subscales. It is evident from Table 3 that the convergent validity for four of the six FFOCI subscales with its corresponding facet scale from conscientiousness was consistently higher than their convergence with the other facet scales within the same domain of conscientiousness. However, it should be acknowledged that FFOCI Workaholism did not correlate significantly higher with IPIP-NEO Achievement-Striving ($r = .60$) than it did with IPIP-NEO Self-Discipline ($r = .56$; $t = 1.14$; $p > .05$, $df = 377$), nor did FFOCI Ruminative Deliberation correlate significantly higher with IPIP-NEO Cautiousness (.54) than it did with IPIP-NEO Orderliness (.46; $t = 1.18$; $p > .05$, $df = 377$). The most problematic findings occurred for FFOCI Perfectionism (which failed to correlate more highly with any one of the five IPIP-NEO facet scales and correlated significantly more highly with two of them) and FFOCI Punctiliousness (which correlated as highly with two other IPIP-NEO facet scales).

Convergent Validity Among OCPD Scales

Table 4 provides the correlations among the five OCPD scales as well as with DAPP-BQ Compulsivity. There is evidence of convergent validity but not as high as one would expect for instruments using the same method to assess the same construct. More specifically, the FFOCI total score correlated with the SNAP-2, MCMI-III, CATI, and PID-5 assessments of OCPD, as well as with DAPP-BQ Compulsivity. The PID-5 correlated substantially with the CATI but was uncorrelated with the MCMI-III and weakly with DAPP-BQ Compulsivity and SNAP-2 OCPD. The MCMI-III assessment of OCPD failed to correlate even significantly with the CATI, OMNI, or PID-5. The SNAP-2 correlated with the FFOCI and the DAPP-BQ, but to a lesser extent with the MCMI-III, CATI, OMNI, and PID-5.

Convergence of OCPD Scales With IPIP-NEO Domains

Table 5 provides the correlations of the five OCPD scales and DAPP-BQ Compulsivity with the IPIP-NEO domain scales. It

Table 4. Convergence of OCPD Scales.

	FFOCI	SNAP-2	MCMI-III	CATI	OMNI	PID-5
SNAP-2	.54***					
MCMI-III	.45***	.26***				
CATI	.47***	.29***	.10			
OMNI	.28***	.35***	−.08	.49***		
PID-5	.37***	.29**	−.14	.65***	.50***	
Mean correlation with other OCPD scales	.42	.35	.12	.40	.31	.33
DAPP-BQ	.64***	.48***	.36***	.26***	.17**	.22*

Note. N = 106 for PID-5 results; Otherwise N = 380. FFOCI = Five Factor Obsessive Compulsive Inventory; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality-2; MCMI-III = Millon Clinical Multiaxial Inventory-III; CATI = Coolidge Axis II Inventory; OMNI = OMNI Personality Inventory; PID-5 = Personality Inventory for *DSM-5*.
*p < .05. **p < .01. ***p < .001.

Table 5. Convergence of OCPD Scales With IPIP NEO Domains.

	IPIP NEO domains				
	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
FFOCI	.13*	−.25***	−.11*	.06	.58***
SNAP-2	.18**	.03	−.07	−.01	.35***
MCMI-III	−.26***	−.03	.01	.27***	.60***
CATI	26***	−.40***	−.36***	−.21***	.04*
OMNI	.28***	−.07	−.20***	−.31***	−.11
PID-5	.26**	−.32**	−.22*	−.31**	−.09
DAPP-BQ	−.07	.09	.09	.17**	.67***

Note. N = 106 for PID-5 results; Otherwise N = 380. IPIP NEO = International Personality Item Pool NEO; FFOCI = Five Factor Obsessive Compulsive Inventory; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality-2; MCMI-III = Millon Clinical Multiaxial Inventory-III; CATI = Coolidge Axis II Inventory; OMNI = OMNI Personality Inventory; PID-5 = Personality Inventory for *DSM-5*.
*p < .05. **p < .01. ***p < .001.

is evident from Table 5 that there are striking differences among the measures of OCPD. The FFOCI and MCMI-III correlated substantially with conscientiousness, as did the DAPP-BQ Compulsivity. The SNAP-2 obtained a moderate effect size relationship with conscientiousness (Cohen, 1992). In contrast to these other measures, the PID-5 OCPD total score did not correlate significantly with conscientiousness. The significant correlations for the PID-5 were instead with low extraversion, high neuroticism, low openness, and low agreeableness. The FFOCI and CATI also obtained negative correlations with extraversion (no such correlations with extraversion were obtained for the SNAP-2, OMNI, or MCMI-III).

Convergence of FFOCI Subscales With Measures of OCPD and Compulsivity

Table 6 provides the correlations of the FFOCI subscales with the four OCPD scales and DAPP-BQ Compulsivity. It is evident from Table 6 that the six FFOCI subscales from the domain of conscientiousness correlated substantially with DAPP-BQ Compulsivity and moderately high with the SNAP-2 and MCMI-III OCPD scales. DAPP-BQ Compulsivity correlated weakly or not at all with the scales from the other domains of the FFM. The six FFOCI conscientiousness subscales correlated at best weakly with the PID-5. The PID-5 findings were paralleled by the OMNI. The OMNI correlated only weakly with the FFOCI conscientiousness subscales; the highest correlations were with Detached Coldness, Constricted, and Inflexibility.

Table 6 also provides the correlations of the 12 FFOCI subscales with the four PID-5 subscales. It is evident that FFOCI Perfectionism and Detached Coldness converged well with PID-5 Rigid Perfectionism and Restricted Affectivity, respectively; but there was little convergence of any FFOCI subscale with PID-5 Perseveration or Intimacy Avoidance, with the exception of FFOCI Constricted (low openness to feelings) with PID-5 Restricted Affectivity and Intimacy Avoidance.

Convergence of SNAP-2 and PID-5 Trait Scales With Measures of OCPD and Compulsivity

The PID-5 assessment of OCPD includes four subscales. Table 7 provides the correlations of these PID-5 trait scales as well as the SNAP-2 Propriety and Workaholism scales, with the OCPD and DAPP-BQ Compulsivity scales. The FFOCI, SNAP-2, and MCMI-III OCPD scores were uncorrelated

Table 6. Convergent Validity of FFOCI Subscales With OCPD and Related Measures.

	FFOCI subscales											
OCPD measures	N1	E1	E5	O3	O4	O6	C1	C2	C3	C4	C5	C6
SNAP-2	.30***	.18**	.27***	.10*	.40***	.30***	.44***	.47***	.46***	.47***	.39***	.39***
MCMI-III	−.01	.06	.39***	−.07	.24***	.26***	.39***	.41***	.48***	.45***	.52***	.40***
CATI	.21***	.51***	.36***	.39***	.49***	.30***	.25***	.28***	.24***	.23***	.14*	.32***
OMNI	.15**	.34***	.07	.37***	.34***	.26***	.07	.08	.16**	.22***	.06	.08
PID-5	.14	.51***	.02	.55***	.34***	.13	.20*	.19	.14	.20*	.11	.05
Perseveration	.24***	.24***	.11*	.20***	.31***	.17**	.07	.12*	.07	.06	−.02	.13*
Rigid Perfect	.29***	.24***	.30***	.13*	.44***	.21***	.57***	.56***	.45***	.45***	.38***	.43***
Intimacy Avoid[a]	−.22*	.22*	−.18	.40***	.02	−.04	−.08	−.10	−.10	−.01	−.02	−.02
Restr Affect[a]	−.16	.43***	−.20*	.73***	.08	.07	.01	−.10	−.02	.02	.02	−.06
DAPP-BQ	.29***	.13*	.26***	.01	.35***	.24***	.68***	.70***	.60***	.55***	.57***	.51***

Note. FFOCI = Five Factor Obsessive–Compulsive Inventory; N1 = Excessive Worry, E1 = Detached Coldness, E5 = Risk Aversion, O3 = Constricted, O4 = Inflexible, O6 = Dogmatism, C1 = Perfectionism, C2 = Orderliness, C3 = Punctiliousness, C4 = Workaholism, C5 = Doggedness, C6 = Ruminative Deliberation; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality-2; MCMI-III = Millon Clinical Multiaxial Inventory-III; CATI = Coolidge Axis II Inventory; OMNI = OMNI Personality Inventory; PID-5 = Personality Inventory for *DSM-5*; Rigid Perfect = Rigid Perfectionism; Intimacy Avoid = Intimacy Avoidance; Restr Affect = Restricted Affectivity; DAPP-BQ = Dimensional Assessment of Personality Pathology-Basic Questionnaire.

a. $N = 106$; otherwise $N = 380$.

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 7. Convergent Validity of SNAP-2 and PID-5 Subscales With OCPD and Related Measures.

	SNAP-2 subscales			PID-5 subscales		
OCPD measures	Propriety	Workaholism	Perseveration	Rigid Perfectionism	Intimacy Avoidance	Restricted Affectivity
FFOCI	.45***	.58***	.21***	.58***	−.02	.11
SNAP-2	.32***[a]	.32***[a]	.21***	.46***	.16	.02
MCMI-III	.13**	.25***	−.17*	.22***	−.19	−.16
CATI	.26***	.33***	.34***	.44***	.43***	.48***
OMNI	.30***	.43***	.48***	.37***	.29**	.29**
PID-5	.44***	.38***	41***[b]	.39***[b]	.47***[b]	.37***[b]
DAPP-BQ	.38***	.53***	.21***	.61***	−.23*	−.09

Note. $N = 106$ for PID-5 Intimacy Avoidance and Restricted Affectivity; otherwise $N = 380$. FFOCI = Five Factor Obsessive Compulsive Inventory; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality-2; MCMI-III = Millon Clinical Multiaxial Inventory-III; CATI = Coolidge Axis II Inventory; OMNI = OMNI Personality Inventory; PID-5 = Personality Inventory for *DSM-5*; DAPP-BQ = Dimensional Assessment of Personality Pathology-Basic Questionnaire.

a. SNAP-2 correlations do not include items from Propriety or Workaholism.

b. PID-5 scales for these correlations do not include the items from the respective PID-5 subscale.

*$p < .05$. **$p < .01$. ***$p < .001$.

with PID-5 Intimacy Avoidance and Restricted Affectivity (and weakly with PID-5 Perseveration). The FFOCI and SNAP-2 correlated primarily with SNAP-2 Propriety, SNAP-2 Workaholism, and PID-5 Rigid Perfectionism. In contrast to the FFOCI, SNAP-2, and MCMI-III, the CATI did correlate well with PID-5 Intimacy Avoidance and Restricted Affectivity. The PID-5 trait scale of Rigid Perfectionism though correlated substantially with compulsivity.

Convergence of FFOCI and PID-5 Subscales With IPIP-NEO and 5DPT Domains

Table 8 provides the correlations of the twelve FFOCI subscales and the four PID-5 trait scales with the IPIP-NEO domain scales. Consistent with the averaged discriminant validity, all the FFOCI scales from the domains of neuroticism, extraversion, and conscientiousness demonstrated good discriminant validity. Two exceptions though were the FFOCI openness scales: Constricted and Inflexibility. Although these two scales obtained median effect size convergent validity with the domain of openness, they also obtained comparable correlations with antagonism and introversion, respectively. These results were closely paralleled by their relationship with the 5DPT domain scales, with the exception of an absence of a relationship with 5DPT Absorption.

PID-5 Perseveration correlated primarily with neuroticism, Rigid Perfectionism with conscientiousness, and Risk

Table 8. Correlations of FFOCI and PID-5 Subscales With IPIP-NEO and 5DPT Domains.

FFOCI and PID-5 trait scales	IPIP-NEO domain scales					5DPT domain scales				
	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness	Neuroticism	Extraversion	Absorption	Insensitivity	Orderliness
Excessive Worry[a]	.58***	−.11*	.10	.19***	.19***	.64***	−.14*	−.02	.12*	.33***
Detached Coldness	.26***	−.57***	−.27***	−.33***	−.07	.20**	−.48***	−.04	.40***	.19**
Risk Aversion	.20***	−.56***	−.10	.21***	.31***	.30***	−.55***	−.05	.03	.49***
Constricted	.01	−.28***	−.43***	−.56***	−.21***	−.01	−.14*	−.10	.42***	.01
Inflexible	.26***	−.42***	−.33***	−.09	.18**	.28***	−.34***	−.08	.24***	.50***
Dogmatism	.02	−.17**	−.26***	−.09	.15**	.12	−.17**	−.04	.14*	.30***
Perfectionism	−.02	.06	.14*	.17**	.70***	.19**	−.04	.02	.01	.64***
Fastidiousness	−.03	−.01	.05	.19***	.67***	.19**	−.10	.03	.01	.74***
Punctiliousness	−.07	.04	.07	.21***	.64***	.14*	−.09	.01	.04	.61***
Workaholism	−.08	.08	.07	.11*	.63***	.07	−.01	−.01	.07	.56***
Doggedness	.26***	.19***	.01	.13*	.69***	−.03	.08	−.06	−.01	.54***
Ruminative Deliberation	.09	−.21***	.02	.17**	.52***	.29***	−.25***	−.04	.05	.60***
Perseveration[b]	.36***	−.13*	−.08	−.09	−.15*	.29***	−.01	.11	.31***	.13*
Rigid Perfectionism	.15	−.09	−.02	.01	.36***	.21***	−.06	.03	.12	.53***
Intimacy Avoidance	−.04	−.16	−.31**	−.32**	−.27*					
Restricted Affectivity	−.06	−.21*	−.31**	−.42***	−.13					

Note. $N = 274$ for 5DPT; $N = 106$ for PID-5 Intimacy Avoidance and Restricted Affectivity; otherwise $N = 380$. 5DPT and PID-5 intimacy Avoidance and Restricted not administered in same semester. FFOCI = Five Factor Obsessive–Compulsive Inventory; PID-5 = Personality Inventory for *DSM-5*; IPIP-NEO = International Item Pool NEO; 5DPT = 5-Dimensional Personality Test.

a. FFOCI subscales.

b. PID-5 subscales.*$p < .05$. **$p < .01$. ***$p < .001$.

Aversion with introversion, consistent with their location within the *DSM-5* dimensional trait model (APA, 2013). However, unexpectedly, PID-5 Intimacy Avoidance did not correlate with introversion, correlating instead with low openness and antagonism. Restricted Affectivity did not correlate with neuroticism and only weakly with introversion, obtaining its strongest correlation with antagonism.

Discussion

It is claimed that the FFOCI scales represent maladaptive variants of respective domains and facets of the FFM (Samuel et al., 2012), but significant skepticism has been raised regarding these alignments, particularly with respect to the relationship of OCPD traits with FFM conscientiousness (Clark & Krueger, 2010; Krueger et al., 2011). It is then important to put this to empirical test. The results of the current study support the hypothesis that the six FFOCI compulsivity scales can be understood as maladaptive variants of conscientiousness. The FFOCI OCPD conscientiousness scales (i.e., Perfectionism, Fastidiousness, Punctiliousness, Workaholism, Doggedness, and Ruminative Deliberation) obtained moderate to large effect size relationships (Cohen, 1992) with the personality domain of conscientiousness, replicated across four alternative measures: IPIP-NEO Conscientiousness (Goldberg et al., 2006); 5DPT Orderliness (van Kampen, 2009); IPC-5 Dependability (Tellegen & Waller, 1987); and ZKA-PQ Activity (Aluja et al., 2010). Furthermore, in support of the validity of these FFOCI conscientiousness subscales as measures of OCPD, they also obtained large effect size relationships with DAPP-BQ Compulsivity as well as with the MCMI-III and SNAP-2 assessments of OCPD (convergence with CATI OCPD was significant, but the magnitude of this relationship was weak; Cohen, 1992).

The FFOCI neuroticism, extraversion, and conscientiousness subscales demonstrated good discriminant validity with respect to their relationship with IPIP-NEO scales outside of their respective domains. In addition, their convergence with the IPIP-NEO domain scales was replicated with the 5DPT scales assessing neuroticism, extraversion, and orderliness, respectively. However, within the domain of conscientiousness, two of the six FFOCI conscientiousness subscales failed to correlate more highly with its parent IPIP-NEO facet scale than they did, on average, with the other IPIP-NEO conscientiousness facet scales (in addition, two other FFOCI conscientiousness subscales correlated as highly with one other conscientiousness facet scale). In sum, FFOCI Perfectionism and Punctiliousness may not be well understood as being specific to the individual conscientiousness facets of competence and dutifulness, respectively, inconsistent with the intention of the development of the FFOCI. Reasonable questions, however, have been raised as to whether the NEO PI-R (and by implication IPIP-NEO) does in fact provide the optimal choice of facet scales (Roberts, Chernyshenko, Stark, & Goldberg, 2005). In this regard, it is perhaps less important for the FFOCI subscales to be tied specifically to individual NEO PI-R facet scales as it is to be clearly and specifically tied to a respective FFM domain. The FFOCI conscientiousness subscales were indeed strongly correlated with alternative measures of conscientiousness and obtained little to no

relationship with the domains of neuroticism, extraversion, openness, or agreeableness.

There was also strong convergence among the FFOCI compulsivity scales. This is not surprising, as each of the FFOCI conscientiousness subscales assesses variants of the domain of compulsivity which represents a broad and distinct factor within some models of personality disorder (e.g., Livesley, 2011). It would be expected, for instance, that persons who are perfectionistic (e.g., will work long and hard to make things perfect, flawless, unblemished, and just right) will also be very orderly (e.g., will spend excessive time on organization, taking care of every detail) and will evidence workaholic behavior (e.g., devotion to work to the detriment of leisure activity).

Four of the *DSM-IV-TR* (APA, 2000) and now *DSM-5* (APA, 2013) diagnostic criteria for OCPD directly parallel four of the six FFOCI conscientiousness subscales. The first *DSM-5* criterion, "preoccupation with details, rules, lists, order, organization" (APA, 2013, p. 678), corresponds with FFOCI Orderliness. The second criterion, *DSM-5* perfectionism, corresponds with FFOCI Perfectionism. The third criterion, "excessively devoted to work and productivity" (APA, 2013, p. 678) corresponds with FFOCI Workaholism. The fourth criterion, "overconscientiousness, scrupulousness and inflexible about matters of morality" (APA, 2013, p. 678) corresponds with FFOCI Punctiliousness. Unique to the FFOCI, at least relative to *DSM-IV-TR* and *DSM-5*, is the inclusion of the traits of doggedness and ruminative deliberation (although the latter is suggested as an associated feature).

The results of the current study suggest that the discriminant validity among these different variants of compulsivity might be relatively weak (see Table 1), at least as to how they are assessed by the FFOCI. Some self-report measures of OCPD do not identify items specific for each diagnostic criterion (e.g., OMNI and MCMI-III). The PDQ-4 (Bagby & Farvolden, 2004) and the CATI (Coolidge & Merwin, 1992), however, can be scored for each specific OCPD diagnostic criterion, although the small number of items (i.e., 1-2) are unlikely to yield results of compelling fidelity. It will be of interest for future research to explore whether it is in fact useful to have separate diagnostic criteria and/or scales for each of the separate components of compulsivity.

The results for FFOCI Perfectionism are perhaps worth noting in particular. This FFOCI subscale also obtained relatively weaker convergent and within-domain discriminant validity in Samuel et al. (2012). It was one of the more difficult scales to construct. It is self-evident that maladaptive functioning will almost invariably correlate negatively with adaptive functioning, often quite strongly so. This will naturally work against an effort to develop a scale assessing a maladaptive variant of an adaptive trait. FFOCI Perfectionism is conceptualized as a maladaptive variant of competence. The assessment of competence though will include items indicating the successful completion of tasks. Perfectionism will similarly involve placing considerable value on task completion, competence, and success, but to the point of failing to complete tasks efficiently. The moderate convergence of maladaptive perfectionism with adaptive competence is perhaps paralleled by a longstanding debate concerning the difficulty distinguishing and assessing adaptive versus maladaptive perfectionism (e.g., Cruce, Pashak, Handal, Munz, & Gfeller, 2012).

The FFOCI openness subscales obtained medium effect size relationships (Cohen, 1992) with IPIP-NEO Openness, but virtually no relationship with 5DPT Absorption. A weak relationship with 5DPT Absorption is not surprising given its differences from FFM openness (van Kampen, 2012). Samuel et al. (2012), however, reported correlations ranging from −.53 to −.78 for the relationship of the three FFOCI low openness scales with their respective NEO PI-R facet scales. Piedmont et al. (2009) developed Permeability Index (PI) scales for maladaptively high and low openness, one of which, Rigidity, is similar to FFOCI Inflexible. In their study, PI Rigidity correlated significantly but only −.24 with NEO PI-R Openness (−.30 with the facet Openness to Actions). In the current study, the FFOCI low openness scales correlated on average.48 with their respective IPIP-NEO facet scales, but this was still lower than the correlations obtained for the FFOCI neuroticism, introversion, and conscientiousness subscales (mean of .63).

It is apparent that the relationship of FFM openness with maladaptive personality functioning has been problematic (Krueger et al., 2011; Widiger, Samuel, et al., 2012). It is possible that the explanation for this is that there are no meaningful maladaptive variants of high or even low openness (Krueger et al., 2011). However, as suggested in recent papers, we suspect this relates in part to how openness is conceptualized and assessed (Chmielewski, Bagby, & Markon, in press; Gore & Widiger, 2013). In the last few years, a number of alternative models (as well as measures) of openness have been developed that stand in contrast to the NEO PI-R and IPIP-NEO (e.g., Connelly, Ones, Davies, & Birkland, in press; DeYoung, Quilty, & Peterson, 2007; Woo et al., in press). It will be useful to relate the PI, FFOCI, and other hypothesized measures of maladaptive openness to these other conceptualizations and assessments of openness.

The current study was confined to the FFOCI. However, the FFOCI is just one among a number of other FFM-based personality disorder measures that have been developed (Widiger, Lynam, Loehr, Miller, & Widiger, 2012). Additional measures include, for instance, the Five Factor Borderline Inventory (FFBI; Mullins-Sweatt et al., 2012), the Five Factor Avoidant Assessment (FFAvA; Lynam et al., 2012), and the Five Factor Dependency Inventory (FFDI; Gore, Presnall, Lynam, Miller, & Widiger, 2012). The FFOCI, FFBI, FFAvA, and FFDI include scales assessing different maladaptive variants of the same facet. For

example, for the facet of anxiousness the FFOCI includes Excessive Worry, the FFBI includes Anxious Uncertainty, the FFAvA includes Evaluation Apprehension, and the FFDI includes Separation Insecurity (Widiger et al., 2012). It is possible that these four scales will not demonstrate adequate discrimination. Scales that are within the same domain of neuroticism will correlate with one another. For example, anxiousness will correlate with angry hostility, even though these are clearly different forms of negative affectivity. Different variants of anxiousness are likely to correlate even more highly. We would predict that FFOCI Excessive Worry, FFBI Anxious Uncertainty, FFAvA Evaluation Apprehension, and FFDI Separation Insecurity will indeed correlate with one another, but each should also correlate relatively more highly with OCPD, borderline personality disorder, avoidant personality disorder, and dependent personality disorder, respectively, than with the other three personality disorders. This might be a useful focus of future research.

Alternative Conceptualizations and Assessments of OCPD

The association of compulsivity with FFM conscientiousness was not confined simply to the FFOCI. MCMI-III OCPD, SNAP OCPD, and perhaps most importantly, DAPP-BQ Compulsivity, all correlated with IPIP-NEO Conscientiousness, as demonstrated for some of these scales in prior research (Samuel & Widiger, 2010, 2011). The effect size was particularly strong for the DAPP-BQ, inconsistent with the suggestion that compulsivity does not align with FFM conscientiousness (Clark & Krueger, 2010). This is also noteworthy because compulsivity is one of the four fundamental domains of maladaptivity included within Livesley's (2011) four-domain dimensional model of personality pathology (the other three domains being emotional dysregulation, dissocial behavior, and inhibitedness). The most consistently obtained and typically strongest relationship of DAPP-BQ Compulsivity with DSM personality disorders has been with OCPD (Bagby, Marshall, & Georgiades, 2005; Bagge & Trull, 2003; Livesley, 2011; Pukrop et al., 2009). A failure to include compulsivity within one's conceptualization or assessment of OCPD might then largely fail to represent well one of the four domains of personality pathology emphasized within the Livesley dimensional model of personality pathology.

The initial version of the *DSM-5* dimensional trait model included a much stronger representation of compulsivity. One of the initial six domains was compulsivity, including such traits as perfectionism, preoccupation with organization, workaholism, and rigidly principled, all of which were included within the initial trait list for the assessment of OCPD (APA, 2010). It was suggested that this domain was important to include in order to address a purported absence of a relationship of compulsivity with the FFM (Clark & Krueger, 2010; Krueger et al., 2011). Ironically, however, this domain was ultimately removed as a result of a factor analysis (Krueger et al., 2012), the only OCPD traits remaining from this domain in the final list being rigid perfectionism (loading negatively on the domain of disinhibition) and perseveration (now placed within the domain of negative affectivity).

In contrast to the PID-5, but comparable to the FFOCI, the MCMI-III places considerable emphasis on conscientiousness. However, in stark contrast to the FFOCI (as well as every other measure of OCPD) MCMI-III OCPD correlated negatively with neuroticism whereas all the other scales correlated positively. It is also noteworthy that the emphasis given to conscientiousness by the FFOCI and MCMI-III, and to a lesser extent by the SNAP-2, is not shared by the CATI, OMNI, or the PID-5. Emphasis was placed instead on neuroticism, antagonism, low openness, and, for the CATI and PID-5, introversion. These alternative conceptualizations and assessments are perhaps due in part to the rationale for and process of the construction of these respective instruments.

The CATI, for example, was constructed in a manner comparable to the PDQ-4 (Bagby & Farvolden, 2004), including items to assess respective criterion sets from the APA diagnostic manual (Coolidge & Merwin, 1992). However, the CATI was developed to assess the *DSM-III-R* personality disorders (APA, 1987) and was never updated for *DSM-IV* (APA, 2000). One of the diagnostic criteria for OCPD in *DSM-III* was "restricted ability to express warm and tender emotions" (APA, 1980, p. 327). In *DSM-III-R* this criterion became "restricted expression of affection" (APA, 1987, p. 356). However, this criterion was not retained in *DSM-IV* (Pfohl & Blum, 1995). The CATI includes quite a few items to assess interpersonal coldness, such as, "I tend to hold back my emotions and tender feelings," "I am less emotional than other people," and "People tell me that I am an unemotional person."

A difficulty with expressing and accepting feelings of warmth and affection is still noted as an associated feature of OCPD in *DSM-5*: "Individuals with this disorder usually express affection in a highly controlled or stilted fashion and may be very uncomfortable in the presence of others who are emotionally expressive" (APA, 2013, p. 680). The FFOCI includes a scale for low warmth (i.e., Detached Coldness), along with an additional scale from introversion, Risk Aversion. Nevertheless, the FFOCI includes only 2 of 12 scales concerned with traits of introversion, whereas the PID-5 has arguably 2 of 4 scales.

A finding that was not expected, and perhaps difficult to explain, was the correlations of the PID-5, OMNI, and CATI with antagonism. This would not be expected, for instance, from the PID-5 dimensional trait model for OCPD (Krueger et al., 2012). Within the PID-5 dimensional trait

model, perseveration is placed within negative affectivity, restricted affectivity within detachment and/or low negative affectivity, rigid perfectionism within low disinhibition, and intimacy avoidance within detachment (APA, 2013; Krueger et al., 2012). The PID-5 includes a domain of antagonism (e.g., scales that assess for manipulativeness, deceitfulness, and grandiosity), but none of the PID-5 scales for OCPD are from this domain. The placements for perseveration and rigid perfectionism were supported in the current study (with respect to their correlations with the IPIP-NEO), but not the placements for intimacy avoidance or restricted affectivity, both of which correlated as highly with antagonism as they did with introversion. These results though parallel the findings reported recently by Watson, Stasik, Ro, and Clark (2013), who also reported that intimacy avoidance and restricted affectivity correlated with their FFM measure of antagonism.

This unexpected correlation of the PID-5 scales with antagonism is perhaps understandable through an inspection of items from the PID-5 and other related scales. For example, significant correlations with antagonism were also obtained for FFOCI Detached Coldness and FFOCI Constricted, both of which correlated in turn with PID-5 Restricted Affectivity. FFOCI Detached Coldness includes such items as, "I take a personal interest in the people I meet" (reverse keyed) and "Warmth and intimacy are not my strengths;" PID-5 Restricted Affectivity includes such items as, "When it comes to my emotions, people tell me I'm a 'cold fish'," "People tell me it's difficult to know what I'm feeling," and "I never show emotions to others;" and FFOCI Constricted includes such items as "I am not a person who is into how people feel about things," and "Strong emotions are not that important in my life." As intended, PID-5 Restricted Affectivity and FFOCI Detached Coldness correlated with FFM introversion, and FFOCI Constricted correlated with low openness, but perhaps they also correlate with antagonism because a restricted affect and disinterest in warm, feeling relationships conveys not only dispositions toward low positive affectivity, social withdrawal, and/or closedness to feelings, but also an appearance or perception of an antagonistic rejection of close, empathic, interpersonal relationships. A similar point could perhaps be made as well for the correlation of FFOCI Inflexibility with introversion. FFOCI Inflexibility correlated −.49 with its parent IPIP-NEO facet scale, but it also correlated as highly with IPIP Extraversion (−.42). It is perhaps not surprising that persons who are extremely low in openness to new activities will also be low in general activity and excitement-seeking, two facets of extraversion.

FFOCI and PID-5 Subscales

The *DSM-IV* (and now *DSM-5*) personality disorders are not homogeneous syndromes, defined by just one trait (Clark, 2007). This was perhaps evident in the current study by the relatively lower coefficient alpha values (Cronbach, 1951) for some of the traditional OCPD scales (e.g., OMNI, SNAP-2, MCMI-III, and CATI). OCPD from the perspective of the FFM is a heterogeneous construct including some traits that are unlikely to be highly correlated with one another. For example, in the current study, FFOCI Detached Coldness correlated weakly with all the FFOCI conscientiousness subscales. FFOCI Excessive Worry correlated moderately with FFOCI Ruminative Deliberation but weakly with all the other FFOCI conscientiousness subscales. Indeed, an important advantage of the FFOCI and PID-5, relative to the CATI, MCMI-III, and OMNI, is that their conceptualizations and assessments of OCPD can be readily disambiguated, or dismantled, into these various subcomponents (Krueger et al., 2012; Widiger et al., 2012), which allows for a more nuanced consideration of findings that will be obtained with these instruments.

For example, it would be an error to conclude from the current study that the PID-5 does not include any conscientiousness. The correlation for the total score of PID-5 OCPD with conscientiousness suggests no relationship, but the PID-5 does include a subscale for the assessment of rigid perfectionism, which correlates substantially with FFM conscientiousness. In fact, one of the PID-5 scales, Intimacy Avoidance, correlated negatively with conscientiousness, serving in part to work against Rigid Perfectionism's assessment of high conscientiousness. It is indicated in *DSM-5* that three of the four PID-5 scales be used to help render a diagnosis of OCPD. However, consistent with the dimensional trait model that dismantles the *DSM-IV* (and now *DSM-5*) syndromes into component parts, future research or clinical applications of the PID-5 for OCPD assessments, should perhaps be provided for the individual subscales, rather than, or at least in addition to, the total score.

The same point can be made with respect to the FFOCI assessment of OCPD. FFOCI total score does not correlate substantially with PID-5 OCPD. Nevertheless, the FFOCI does include subscales which align more strongly with specific subscales of the PID-5, such as FFOCI Detached Coldness aligning with PID-5 Restricted Affectivity as well as FFOCI Perfectionism aligning with PID-5 Rigid Perfectionism.

The FFOCI and PID-5 assessments of OCPD though do appear to include subscales unique to each respective instrument. For example, the FFOCI does not include a scale that aligns conceptually or empirically with either PID-5 Perseveration or PID-5 Intimacy Avoidance. PID-5 Perseveration concerns persistence at tasks long after the behavior has ceased to be functional or effective; Intimacy Avoidance concerns an avoidance of romantic attachments (Krueger et al., 2012). It is not clear whether this is a disadvantage of the FFOCI relative to the PID-5. Pfohl and Blum (1995) summarized alternative conceptualizations of OCPD

within the clinical and research literature and did not identify any reference to perseveration or intimacy avoidance. Lazare, Klerman, and Armor (1970) did refer to perseverance, but this was an adaptive trait that concerned a steady persistence in the face of adversity (more closely associated with doggedness or steadfastness). However, in support of the validity of these two PID-5 scales, they did correlate moderately with the CATI and OMNI assessments of OCPD (albeit not with the SNAP-2 or MCMI-III OCPD scales).

In a complementary fashion, the FFOCI includes subscales that do not appear to be represented in the PID-5 assessment of OCPD, such as FFOCI Excessive Worry, Risk Aversion, Dogmatism, and many of the FFOCI compulsivity scales (e.g., Fastidiousness, Punctiliousness, Doggedness, and Ruminative Deliberation). Some of the existing PID-5 scales could be added to the *DSM-5* Section III trait description of OCPD to broaden its description and assessment (e.g., Anxiousness and Risk Aversion). In any case, it is apparent that the PID-5 and FFOCI conceptualizations and assessment of OCPD are not strongly convergent, and it will be useful for future research to compare their convergent and incremental validity with respect to additional validators of OCPD to assess for their unique strengths and perhaps liabilities.

Limitations and Future Directions

One potential limitation of the current study was that the data were collected within a student population. Anticipating this concern, the PDQ-4 OCPD scale was administered to more than 1,800 potential participants to oversample those who obtained the highest scores on this measure of OCPD. Thirty-eight percent of the 380 participants were from this group, all of whom were above threshold for an OCPD diagnosis using the PDQ-4. Nevertheless, it will be important to replicate the current findings within a clinical sample in which a number of persons with OCPD are known to be present.

An additional potential concern is a possible method bias, wherein the correlations among scales are inflated when items assessing the same construct are completed in immediate proximity to one another (Podsakoff, MacKenzie, & Podsakoff, 2012). The current study did indeed include quite a few scales assessing traits of compulsivity. However, inconsistent with this concern was that in between the completion of the six FFOCI compulsivity scales and all the other compulsivity scales was the completion of the entire IPIP-NEO and 5DPT. The MCMI-III, SNAP-2, OMNI, and CATI OCPD scales were all completed in immediate proximity, yet their convergence was actually not particularly strong. Nevertheless, it might be useful for future research experimentally manipulating the order of scale administration to determine empirically whether the order does indeed have an effect (Podsakoff et al., 2012).

Another potential concern was the relatively smaller sample size for some of the analyses (i.e., $N = 106$). However, the sample size provided sufficient power (.80) to detect medium effect size relationships (Cohen, 1992). In addition, the convergent and discriminant findings were consistent with expectations. For example, PID-5 Restricted Affectivity correlated as expected with FFOCI Constricted Affect and with FFOCI Detached Coldness, and in turn did not correlate with any one of the FFOCI conscientiousness subscales. Nevertheless, it might be preferable to have larger sample sizes in future studies.

Conclusions

The results of the current study provided support for the convergent and discriminant validity of the FFOCI. The study also provided further support for conceptualizing measures of compulsivity (e.g., perfectionism, workaholism, fastidiousness, punctiliousness, doggedness, and ruminative deliberation) as maladaptive variants of FFM conscientiousness. Finally, the study also identified similarities and differences among existing measures of OCPD from the perspective of the FFM. It is apparent from the current study that the FFOCI (as well as the MCMI-III and to a lesser extent the SNAP-2) emphasizes in particular maladaptive variants of conscientiousness in its assessment of OCPD, whereas the PID-5, CATI, and OMNI total scores do not appear well related to conscientiousness. On the other hand, the PID-5 does include the one subscale of rigid perfectionism that is closely associated with compulsivity, but as it is only one of four scales assigned to OCPD, its impact on the overall construct is weak. This suggests that PID-5 research that fails to consider individually the distinct components of the dimensional trait model might potentially miss important aspects of the syndrome.

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