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THE CONVERGENT AND DISCRIMINANT VALIDITY OF FIVE-FACTOR TRAITS: CURRENT AND PROSPECTIVE SOCIAL, WORK, AND RECREATIONAL DYSFUNCTION

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Abstract

The convergent and discriminant validity of Five Factor Model (FFM) personality traits with concurrent and prospective social, work, and recreational dysfunction was assessed in a large, longitudinal clinical sample. Consistent with five factor theoretical expectations, neuroticism is broadly related to dysfunction across domains; extraversion is primarily related to social and recreational dysfunction; openness to recreational dysfunction; agreeableness to social dysfunction; and conscientiousness to work dysfunction. Findings support five factor theory and the clinical assessment of normative personality traits.

Five-Factor Model (FFM: Neuroticism = N, Extraversion = E, Openness to Experience = O; Agreeableness = A; Conscientiousness = C) personality traits have demonstrated validity in predicting a range of important behaviors such as physical health (Caspi, Roberts, & Shiner, 2005; Grucza & Goldberg, 2007; Goodwin & Friedman, 2006), social dysfunction (Bornstein & Huprich, 2006; Donnellan, Conger, & Bryant, 2004; Eisenberg, Fabes, Guthrie, & Reiser, 2000; Karney & Bradbury, 1995; Schmitz, Hartkamp, Baldini, Rollnik, & Tress, 2001; Watson, Hubbard, & Weise, 2000), work performance (Barrick & Mount, 1991; Judge, Higgins, Thoreson, & Barrick, 1999), and recreational dysfunction (Burnett, 2006; Kircaldy, 1990; Wild, Kuiken, & Schoopflocker, 1995) even after controlling for factors such as intelligence and socioeconomic status (Roberts et al., 2007) and psychiatric diagnosis (Hopwood, Morey, Shea et al., 2007). FFM traits have also demonstrated utility predicting clinical outcomes. For example, FFM traits relate to clinically relevant outcomes such as suicidal (Kerby, 2003) and aggressive behavior (Skeem, Miller, Mulvey, Tiemann, & Monahan, 2005), substance use (Hopwood, Morey, Skodol et al., 2007; Ruiz, Pincus, & Schinka, 2008), and the effectiveness of treatment for other disorders (Bottlender & Soyka, 2005). Increasing evidence for the clinical utility of the FFM has led some to argue for their routine use in clinical assessment (e.g., Costa, 2008; Widiger & Trull, 2007).

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Demonstrations that FFM traits bear specific relations to domains of dysfunction predicted by five factor theory (FFT; McCrae & Costa, 1996; 1999) would strengthen the argument for including personality traits in clinical assessment. FFT proposes that the FFM traits represent the broadest level of basic tendencies in a comprehensive and universal description of human personality. These basic tendencies are thought to predispose characteristic adaptations (e.g., attitudes and self-concept). For example, the basic tendency to be agreeable may lead to adaptations such as forgiveness and an inclination to cooperate in social circumstances; the basic tendency to be open to experience may lead to adaptations such as travelling or having many hobbies (McCrae & Costa, 1999).

The functionality of characteristic adaptations is a critical concern of clinical assessment because maladaptations are often therapeutic targets. Maladaptivity can be organized into broad domains that denote when and where dysfunction occurs. For example, *social dysfunction*, which occurs between people, is a major potential source of stress for the clinically impaired, both because psychopathology disturbs relationships and interventions designed to ameliorate psychiatric distress are often interpersonal (i.e., occur in the context of a therapeutic relationship) or focus on outside relationships. *Occupational dysfunction* is an important domain because work engagement provides both material and psychological resources toward greater adaptation. *Recreational dysfunction* denotes the extent to which a person struggles to participate in pleasurable aspects of life, and thus potentially indicates the lack of positive, rather than the existence of negative, behaviors.

Social, occupational, and recreational dysfunction can be considered broad categories of characteristic adaptations, thus linking them to FFT. FFT supports hypotheses about specific relations between FFM traits and each of these sets of adaptations. For instance, neuroticism would be expected to globally and positively relate to all three kinds of dysfunction because it indicates generalized distress and dysfunction. As extraversion and agreeableness capture interpersonal content, they would be anticipated to have a specific and inverse relationship to social dysfunction. Extraversion should relate negatively to recreational dysfunction as well because of its association with the reward-sensitive system of personality. Openness to Experience, which taps interest in a broad domain of activities (e.g., the arts), should also negatively relate to recreational dysfunction. Finally, conscientiousness indicates responsibility and dutifulness, and thus could be expected to negatively predict occupational dysfunction.

Although initial results support the FFM in clinical predictions, these data are often not considered with regard to FFT, have rarely been longitudinal, have tended to address a limited variety of functional domains, and have often not included all five FFM traits. To address this gap, we investigated the validity of FFM traits in predicting concurrent and prospective social, occupational, and recreational dysfunction using data from the Collaborative Longitudinal Personality disorder Study (CLPS). Several previous CLPS studies have investigated the validity of FFM traits with regard to dysfunction. Skodol, Oldham, et al. (2005) showed that the FFM traits, as a group, incremented DSM-IV personality disorder symptom counts in two of seven assessed domains, whereas the personality disorders incremented FFM traits in five of seven domains. Morey et al. (2007) extended these findings by testing the validity of FFM traits, again considered as a group, to predict retrospective, concurrent, and prospective outcomes and using a wider range of outcome variables, including both interview and self-report assessed social, recreational, and occupational functioning. Importantly, Morey et al. showed that FFM predictive validity was more stable than that of personality disorders, and that, in contrast to the baseline results reported by Skodol et al., it tended to substantially increment the personality disorders in predicting prospective functioning. Hopwood, Morey, Shea, et al. (2007) showed that FFM traits, considered individually, significantly predicted concurrent and prospective GAF,

whether or not participants had a personality disorder. However, no previous CLPS study has examined the relations between each of the FFM traits and specific domains of dysfunction, as a formal test of FFT-based hypotheses would require, and as the current study does.

METHOD

PARTICIPANTS

Participants were recruited from multiple clinical sites for the CLPS project (Gunderson et al., 2000). For this report, the original sample of 653 individuals with complete baseline data attenuated over time and across some measures because of attrition and incomplete data. These factors reduced the sample to 455 individuals at two years and 308 at five years. The sample included individuals with personality disorder or major depressive disorder with no personality disorder by study design, although cooccurring Axis I and II disorders were common (see McGlashan et al., 2000 for CLPS baseline diagnostic characteristics). At baseline, 62% of participants were women; 68% were Caucasian, 14% African-American, 13% Hispanic, 2% Asian, and the rest reported another or no ethnicity. Baseline ages ranged from 18 to 45, with the average age being 32.50 (*SD* = 8.11).

MEASURES

NEO Personality Inventory, Revised (NEO-PI-R, Costa & McCrae, 1992). The NEO-PI-R was designed to comprehensively assess the five factors of the FFM. Internal consistency reliabilities for the five domains in this sample ranged from .87 to .92.

Longitudinal Interval Follow-up Examination (LIFE; Keller et al., 1987). The LIFE is a structured interview that measures, among other variables, social, occupational, and recreational dysfunction. The occupational and recreational dysfunction markers are derived from single items. Social functioning was indexed by averaging ratings across several kinds of relationships (i.e., romantic partner, friends, and family members).

Social Adjustment Scale—Self-report (SAS-SR; Weissman & Bothwell, 1976). The SAS-SR is a 54-item self-report measure of clinically relevant functioning with scales that measure work, recreational, and social functioning. As with the LIFE, SAS-SR social functioning in this study represents a composite from scales measuring functioning in the family, with romantic relationships, and with friends. The median baseline internal consistency across SAS-SR scales was .70 in the current sample. All LIFE and SAS-SR indicators were scaled such that higher scores meant greater dysfunction.

Principal axis factor scores were computed to collapse self-report and interview measured scores for each of the three domains of dysfunction at baseline, two-year, and five-year follow-ups. To compute these scores, scales depicting the same functional domains from different instruments were factored, and the score was retained. Summing standardized factor scores across domains at each assessment interval created a global dysfunction score. The use of two measures of the same domains of dysfunction, one based on interview data and one on self-report, likely yields more reliable estimates than would observed scores on a single instrument. In particular, applying measures that used two methods limits the potential that results could be explained by shared method variance between the NEO-PI-R and self-reported dysfunction.

ANALYSES

Initial analyses were conducted to assess the influence of time on study variables. To test study hypotheses, baseline NEO-PI-R domain scores were correlated with dysfunction

scores across domains of dysfunction at each assessment interval. Partial coefficients representing the contribution of each FFM score independent of the remaining four FFM scores in multiple regression models, as well as overall model validity, were then computed for each dysfunction score. Effect sizes and statistical significance at .01 and .001 type I error rates were computed for all analyses.

RESULTS

Individuals who only had baseline data had lower neuroticism scores than others and participants who provided data at all assessment intervals had higher levels of work functioning than those who only provided data through two years (both $p < .01$). There were no significant differences on other baseline variables.

Results depicted in Table 1 suggest that FFM traits are broadly associated with concurrent and prospective functioning in this clinical sample. Bivariate correlations between traits and functioning indicators were significant ($p < .01$) for 84% of nonredundant indicators (i.e., not including the overall composite) and were in the small to moderate range (Cohen, 1988). Moreover, as described in previous papers (Hopwood, Morey, Shea, et al., 2007;Morey, Hopwood, Gunderson, et al., 2007), trait validity tended to drop only slightly from baseline to five-year assessment, consistent with the notion that these traits reflect fairly stable dispositions to dysfunction.

Regression analyses that control for the influence of other traits clarify trait-dysfunction relations. These results, given in Table 2, show that FFM traits have differential patterns of validity that are clearly consistent with FFT. At a type I error rate of .01, the percentage of significant hypothesized regression coefficients was 79% (19/24), whereas the percentage of hypothesized nonsignificant coefficients was 90% (19/21; overall hit rate = 84%). To further assess the validity of FFM traits, we recomputed these regression coefficients after statistically controlling for the number of PD symptoms. Notably, the overall pattern of results continued to support the convergent and discriminant validity of FFM traits, even after controlling for personality pathology symptoms (results are available from the authors upon request).

With regard to the validity of specific FFM traits, higher neuroticism was generally and moderately associated with worse functioning. It correlated significantly with every indicator of dysfunction and incremented the other traits for all but two: 2-year work and 5-year recreational dysfunction.

Extraversion was negatively and specifically linked to social and recreational dysfunction. Like neuroticism, this trait was moderately correlated with dysfunction indicators, though relations were smaller with work functioning and all were negative. Further, these relations tended to remain significant, though small to moderate, when controlling other traits in models predicting global, social, and recreational dysfunction. In contrast, two of three coefficients were no longer significant in work dysfunction models.

Openness to experience was moderately and negatively associated with dysfunction in general, and was somewhat specifically associated with recreational dysfunction. Correlations between openness and dysfunction were in the moderate range for recreational dysfunction, whereas other correlations were small. In regression models predicting recreational dysfunction, all three recreation coefficients remained significant. Conversely, in models predicting work and social dysfunction, five of six openness coefficients were not significant.

Agreeableness demonstrated small and uniformly negative correlations to dysfunction, suggesting it was the least predictive of the four traits. It did not increment the other traits in models predicting work and recreational functioning. However, the association of agreeableness with social dysfunction was consistent, if small, before and after controlling the influence of other traits.

Conscientiousness was negatively and specifically related to work dysfunction. Again, bivariate correlations were significant in suggesting a general, negative relation of this trait to dysfunction. However, all but three of these relations remained significant in regression analyses controlling for the influence of other traits; two of these were in models predicting baseline and two-year work dysfunction.

DISCUSSION

The specific relations of personality traits to functional domains constitute an important clinical concern, and the correspondence of these relations to theoretical hypotheses is an important test of five-factor theory. The current study supports FFT in suggesting that FFM traits can predict concurrent and prospective characteristic maladaptations in fairly specific ways. In particular, neuroticism positively relates to global dysfunction, extraversion negatively predicts social and recreational dysfunction, openness is negatively associated with recreational dysfunction, agreeableness negatively predicts social dysfunction, and conscientiousness is negatively related to work dysfunction.

These findings reinforce recommendations to weave personality trait assessment into the diagnostic system (e.g., Krueger, Skodol, Livesley, Shrout, & Huang, 2007; Widiger & Trull, 2007) by demonstrating that it can provide specific information about patient functioning that might yield pragmatic clinical predictions. If a patient is extremely vulnerable and distressed, as indicated by a high neuroticism score, the clinician should expect pervasive difficulties in a range of areas, although they may also have certain strengths associated with elevations on one or more of the other four traits. A disagreeable and introverted patient will most likely have functional difficulties related to social behavior. Introverts may also demonstrate recreational difficulties. A patient with a low conscientiousness score may have difficulties at work but fare relatively well socially and engage in a variety of enjoyable, if poorly-planned, behaviors. The patient who is closed to experience may lead an overly-structured life devoid of leisure, but work effectively and maintain an adequate social network.

The current findings also suggest treatment targets and perhaps a framework for treatment matching in practice and research (Anderson, 1998; Singer, 2005). Therapies designed to treat individuals with the same diagnosis often target dysfunction in a particular domain. For example, interpersonal therapies (e.g., Benjamin, 1993; Klerman, Weissman, Rounsaville, & Chevron, 1984) focus on social behavior, cognitive-behavioral therapy (Beck, Rush, Shaw, & Emery, 1979) on internal thoughts and behaviors, and pharmacology on symptomatic aspects of functioning. Results from this study may suggest individuals with varying personality styles could differentially benefit from treatments that target the manner in which their psychopathology is expressed (Barber & Muenz, 1996; Horowitz, Rosenberg, & Bartholomew, 1993; Pincus et al., 2005). Therapist variables may also interact with patient personality to predict outcome, independent of treatment technique (e.g., Tracey, 1993). Future research should continue to explore the relevance of FFM personality traits for treatment matching.

Future research also needs to test finer-grained aspects of dysfunction. Although the current study extends previous investigations by depicting relationships between three broad

domains of living and the FFM in a large and longitudinal clinical sample, this study was limited insofar as each of these domains comprises an array of more specific areas of dysfunction. For example, it is possible that the predictive validity of traits for work performance interacts with the kind of work being done (Barrick & Mount, 1991). Five factor theory has linked specific characteristic adaptations to basic personality tendencies (i.e., FFM traits), providing a theoretical foundation for such future investigations (McCrae & Costa, 1996, 1999).

Research should also continue to investigate the optimal integration of FFM data with other diagnostic information. Current views on the relevance of normative traits in clinical assessment vary, even among researchers who support consideration of the FFM. For instance, those who see personality disorders as maladaptive variants of FFM traits suggest replacing the DSM personality disorders with the FFM (e.g., Costa, 2008; Widiger & Trull, 2007). This view is buttressed by evidence that personality disorders are associated with varying constellations of FFM traits (Samuel & Widiger, 2008). Others see FFM traits and DSM personality disorders as different (Skodol, Gunderson, et al., 2005). This view is supported by findings that (a) traits are more stable than personality disorders (Morey et al., 2007); (b) traits and disorders increment one another in the prediction of functioning, with traits being particularly incremental for prospective functioning (Morey et al., 2007); (c) whereas trait change predict changes in personality disorder severity, changes in personality disorders do not lead to changes in traits (Lenzenweger & Willett, 2007; Warner et al., 2004); and (d) disorders such as borderline personality can be differentiated from others based on their trait instability (Hopwood et al., in press). These alternative views have important implications for clinical practice: If traits and personality disorders are the same, then assessment should only comprise one or the other, whereas if they are different and both are important, assessment should comprise both. Importantly, results from this study support consideration of FFM traits in clinical assessment, regardless of one's views about the relationship of the FFM with personality disorders.

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TABLE 1

Correlations Between FFM Traits and Domains of Dysfunction Over time

	N	E	O	A	C
Overall					
Baseline	.41**	−.34**	−.22**	−.12	−.28**
2 years	.31**	−.34**	−.25**	−.18**	−.27**
5 years	.36**	−.34**	−.16*	−.12	−.18**
Social					
Baseline	.40**	−.25**	−.12*	−.19**	−.22**
2 years	.24**	−.28**	−.15**	−.19**	−.21**
5 years	.32**	−.34**	−.21**	−.19**	−.21**
Work					
Baseline	.28**	−.18**	−.04	−.02	−.30**
2 years	.24**	−.24**	−.10	−.15*	−.30**
5 years	.32**	−.20**	−.15	−.06	−.19**
Recreation					
Baseline	.37**	−.34**	−.28**	−.09	−.24**
2 years	.28**	−.32**	−.32**	−.15*	−.19**
5 years	.25**	−.36**	−.23**	−.06	−.15*

Note.

* $p < .01$;

** $p < .001$.

TABLE 2

Relations of FFM Traits to Concurrent and Prospective Dysfunction

		N	E	O	A	C
	R^2	Partial Coefficients				
Overall						
Baseline	.24	.32**	−.14**	−.16**		−.08**
2 years	.20	.19**	−.19**	−.17**	−.10*	
5 years	.19	.29**	−.20**			
Social						
Baseline	.19	.34**			−.11*	
2 years	.12	.15*	−.18**			
5 years	.19	.22**	−.19**	−.12*	−.13*	
Work						
Baseline	.12	.17**				−.21**
2 years	.13		−.14*			−.20**
5 years	.13	.30**				
Recreation						
Baseline	.23	.29**	−.14**	−.23**		
2 years	.20	.22**	−.16**	−.26**		
5 years	.16		−.27**	−.14*		

Notes.

Grayed areas were predicted to be significant.

* $p < .01$;

** $p < .001$.