Personality Organization, Five-Factor Model, and Mental Health

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Abstract: Otto Kernberg has developed a model of personality and psychological functioning centered on the concept of personality organization. The purpose of this study is to empirically examine the relationships between this model, the five-factor model, and mental health. The Personality Organization Diagnostic Form (Diguer et al., *The Personality Organization Diagnostic Form-II (PODF-II),* 2001), the NEO Five-Factor Inventory (Costa and McCrae, *Revised NEO Personality Inventory* (*NEO-PI-R*) *and NEO Five-Factor Inventory* (*NEO-FFI*) *Professional Manual.* 1992a), and the Health-Sickness Rating Scale (Luborsky, *Arch Gen Psychiatry.* 1962;7: 407–417) were used to assess these constructs. Results show that personality organization and personality factors are distinct but interrelated constructs and that both contribute in similar proportion to mental health. Results also suggest that the integration of personality organization and factors can provide clinicians and researchers with an enriched understanding of psychological functioning.

Key Words: Personality, personality organization, psychopathology, mental health, Five-Factor model.

(*J Nerv Ment Dis* 2007;195: 819–829)

Traditionally, personality disorders (PD) and personality theories have evolved in 2 different worlds: clinical psychology and academic psychology. However, in the last decade, an increasing number of works have examined their interrelationships, and increasing efforts have been made to bridge them (Costa and Widiger, 2002; Krueger and Tackett, 2006; Lenzenweger and Clarkin, 2005; Shedler and Westen, 2004; Widiger and Frances, 2002). The 2 models that are the most often examined are the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) PD (American Psychiatric Association, 2000) and the Five-Factor model of personality (FFM; Costa and Widiger, 2002). The DSM-IV-TR system conceptualizes PD as 10 exclusive categories. The FFM conceptualizes normal personality in terms of 5 higher level factors: neuroticism (N), extraversion (E), openness (O), agreeableness (A), and conscientiousness (C), and PD are conceived as extreme variants of normal personality traits (Widiger and Frances, 2002). Numerous studies have examined the relations between DSM PD and FFM factors and facets. Correlations between PD and FFM profiles are often weak or moderate, although generally consistent (Lenzenweger and Clarkin, 2005; Saulsman and Page, 2004). Further, several studies show that behavioral features of PD tend to merge into few dimensions that encompass normal and pathologic conditions (Depue and Lenzenweger, 2005; Lenzenweger and Clarkin, 2005; Livesley, 2001a). In brief, the main conceptual issues that characterize current discussions on PD and personality are: (a) the dimensional versus categorical nature of PD; (b) the distinction between normal and pathologic personality features; and (c) the nature of the basic processes or dimensions that underlie both PD and normal personality (Lenzenweger and Clarkin, 2005).

Kernberg's Model of Personality Organization

Over the last 30 years, Otto F. Kernberg has developed a model of personality functioning and disorders centered on the concept of Personality Organization (PO). A PO (also referred to as personality structure; see Westen et al., 2006) is a stable, mostly unconscious and dynamically organized structure that incorporates innate characteristics such as temperament, early experiences, and phase-specific motivational structures into a coherent organization (Kernberg, 1975, 1984). The PO performs the function of stabilizing the mental apparatus, mediating between etiologic factors and direct behavioral manifestations of illness (Kernberg, 1984, p 5). It refers to repetitively activated, functionally defined processes involved in motivation, regulation of mood, and regulation of impulses, which normally serve adaptive functions, but can become dysfunctional (Westen et al., 2006). We believe that this model may shed a new light on the 3 aforementioned issues that characterize discussions on PD and personality. In fact, this model: (a) is hybrid, for it defines a PO taxonomy using a dimensional approach; (b) encompasses normal and personality-disordered functioning; and (c) defines some basic processes and structures that underlie normal and patho-

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Supported by research grants from the Quebec government (FCAR 96-NC-1277) and the Canada government (CRSH 410-93-1388, 410-97-1433, 752-2003-1405, and 767-2004-1917) (to L.D., D.G., and O.L.).

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ISSN: 0022-3018/07/19510-0819
DOI: 10.1097/NMD.0b013e318156815d

logic conditions, namely the PO dimensions. Actually, the model includes 3 levels of PO (psychotic [PPO], borderline [BPO], and neurotic [NPO]), which are defined by a few major underlying dimensions: identity (integration vs. diffusion), defense mechanisms (primitive and mature ones), reality testing, and object relations (which are mental representations of self and other in interaction).

Kernberg's model encompasses normal and pathologic conditions in the sense that it ranges from extremely disturbed PPO, through relatively reality-oriented adaptive BPO and high-level functioning NPO to normal functioning. Subjects presenting with BPO often meet DSM-IV-TR Axis II criteria for PD, although POs do not have a one-to-one correspondence with DSM-IV-TR Axis II disorders. Individuals with PPO present a loss of reality testing, severe identity diffusion, and use of primitive defenses, mainly denial. BPO is characterized by identity diffusion, predominance of primitive defense mechanisms based on splitting, maintenance of reality testing in spite of transitory and ego-dystonic psychotic manifestations, presence of nonspecific ego weaknesses (absence of or severely impaired anxiety tolerance, impulse control, and channels of sublimation), and lack of superego integration. The BPO includes several PO subtypes: schizotypal, schizoid, paranoid, antisocial, malignant narcissistic, borderline, narcissistic, sadomasochistic, histrionic, and dependent. The NPO is characterized by identity integration, predominance of mature defenses based on repression, stable reality testing, capacity for deep, caring, and intimate relationships with others, good anxiety tolerance, impulse control, and effectiveness and creativity in work. It includes the depressive-masochistic, obsessive-compulsive, and hysterical subtypes. Normal personality has the same characteristics as the NPO but at higher levels and with more flexibility (Kernberg and Caligor, 2005).

Kernberg's model (Kernberg, 1984) has extensively been used to describe personality pathology at the BPO level. The main feature of BPO is the syndrome of identity diffusion, which is characterized by the fragmentation rather than the integration of the representations of self and others. This lack of internal integration derives from the pervasive use of primitive defenses, i.e., mainly splitting, but also denial, projective identification, and omnipotent control. These defenses aim at protecting positive representations of self and others from the danger of destruction by the negative emotionality and the aggression associated with the negative representations. The fragmented representations of self and others are believed to engender the instability (mood swings, disruptive impulses, contradictions and inconsistencies in self-concept) generally recognized in BPO, as well as self-destructive behaviors and lapses in reality testing (Clarkin et al., 2006). Kernberg's group has developed a psychological treatment called transference-focused psychotherapy (TFP), which draws directly from this model. TFP aims to integrate the contradictory self- and others representations by a more reflexive understanding of oneself, which can contain impulsive actions and allow a better behavioral regulation. TFP for BPO has been manualized (Clarkin et al., 2006) and studies have shown good results in terms of its effectiveness (Clarkin et al., 2001). Further analyses revealed that TFP was associated with significant changes in terms of attachment type, narrative coherence, and reflective functioning (Levy et al., 2006). A manual of TFP for NPO patients has also been recently developed (Caligor et al., 2007). More recently, results from a randomized clinical trial comparing TFP, dialectical behavior therapy, and modified psychodynamic supportive psychotherapy showed the efficacy of TFP in reducing suicidality, anger, anxiety, aggression, and depression, and also in improving global functioning and social adjustment (Clarkin et al., 2007).

Although Kernberg's model of PO has a strong influence on clinical work, no empirical study has looked at its relations with other models of personality or mental health. The purpose of this paper is to contribute to fill this gap by examining the relationship between this model and the FFM, as well as their respective contribution to mental health.

FFM and PO

The FFM, or the Big Five, is the dominant model in trait psychology. The five broad factors (and their facets) are as follows: extraversion (warmth, gregariousness, assertiveness, activity, excitement-seeking, and positive emotions); agreeableness (trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness); conscientiousness (competence, order, dutifulness, achievement, self-discipline, and deliberation); neuroticism (anxiousness, angry hostility, depressiveness, self-consciousness, impulsivity, and vulnerability); and, finally, openness (fantasy, esthetics, feelings, actions, ideas, and values) (Costa and McCrae, 1992a). Widiger and Frances (2002) provided a FFM theoretical description of all DSM-IV PD. For example, borderline personality disorder (BPD) is hypothesized to be represented by an elevation on all neuroticism facets (except for self-consciousness) and by low trust and compliance (agreeableness facets). A great deal of empirical work has been dedicated in the last decade to the application of the FFM to Axis I and II pathology; considerable efforts were made to establish profiles of PD according to FFM factors and raise this model as an alternative to DSM diagnosis (Costa and Widiger, 2002; Durrett and Trull, 2005; Trull and Sher, 1994; Widiger, 2005; Wiggins, 2003). From this extensive body of research, convincing evidences show a systematic relationship between diagnoses and the 5 factors (Livesley, 2001b). However, despite this consistency, these relationships range from weak to moderate (Saulsman and Page, 2004). Also, some authors argue that the factors are too broad for any diagnostic utility (Clark, 1993).

At first glance, Kernberg's PO model and the FFM seem to have a lot in common. Both are hierarchical since they define a set of a few dimensions that underlie behaviors, attitudes, and inner experience. Both encompass normal and disordered functioning, PD being conceptualized as extremes of normal personality variants rather than as discrete qualitatively distinct constructs. One reason why no empirical study has yet examined the relations between these 2 models may be that they have evolved in separate fields, i.e., clinical and academic psychology; another related reason is probably

that their early development was linked to different populations, i.e., clinical versus nonclinical or normal.

Despite these similarities, Kernberg and Caligor (2005) believe that this model differs from theories of personality such as the FFM because these theories seem to pertain to a more observable, social, and conscious level of functioning than the PO model. It seems that FFM factors represent more conscious aspects of identity and relationships with others, adjustment strategies and coping style, whereas PO dimensions conceptualize more unconscious psychological structures. Some other investigators argue that unconscious motivational processes and structures are not conceptualized in theories of personality such as the FFM (Block, 2001; Lenzenweger and Clarkin, 2005). Others have also suggested that most mental processes, including affective, cognitive, and motivational processes, as well as behavioral skills, are implicit, and that they are activated and expressed outside of awareness and beyond conscious volitional control (Bargh and Bandollar, 1996; Reber, 1992; Schacter, 1992; Seger, 1994; Shevrin et al., 1996; Westen, 1998). However, as previously mentioned, no empirical study has yet examined the relationship between Kernberg's PO model and the FFM, and no study has either compared their respective contribution to mental health.

PO and Mental Health

Mental health is a wide and central concept in clinical and academic psychology. A host of similar-sounding terms have been used: adjustment, ego strength, personality integration, emotional stability, psychiatric severity, adequacy of personality functioning, and mental health (Luborsky et al., 1993). According to Luborsky (1962, 1975), mental health can be defined and evaluated according to these few functional criteria: a person's need for protection or support, a person's effect on his environment, the degree of making use of his abilities, the quality of interpersonal relationships, and the breadth and depth of interests. Many authors have considered that psychological structures like PO could simply be inferred from an examination of symptoms and behavioral manifestations. This viewpoint was supported by authors such as Malan who observed strong correlations between psychodynamic changes and symptom ratings (Malan, 1976; Malan et al., 1968, 1976). However, more recent observations suggest that PO and mental health, although closely interconnected, are 2 different constructs. The experimental approach developed by Shevrin et al. (1996), which integrates psychoanalytic, cognitive, and neuropsychological dimensions, supports this viewpoint. Sundin and Armelius (1998) report a correlation of 0.63 between PO and mental health, and they conclude that these 2 concepts are different although correlated. To them, claims that psychic structure is a completely independent concept from mental health, as well as claims that psychic structure equals mental health, are oversimplifications. Their results have recently been replicated by Daoust (2003), who reports an almost identical correlation ($r = 0.64$) between PO and mental health.

FFM and Mental Health

Results on the relations between FFM and mental health or psychopathology are quite consistent. Emery et al. (1996) showed that N predicts significantly ($R^2 = 0.10$) psychological functioning in a longitudinal study over 7 years. In another longitudinal study, Soldz and Vaillant (1999) found that N is associated with global adjustment, Health-Sickness Rating Scale (HSRS; Luborsky, 1962), substance abuse, mood-altering drug use, and depression, whereas E is associated with global adjustment; O was positively related to psychiatric usage and depression, and A with adjustment and social support. In a study of nonclinical population, Furnham and Cheng (1999) also showed that mental health was significantly correlated with N ($r = 0.63$) but not with E. Daoust (2003) showed that N was moderately correlated with all measures of mental health (including HSRS [$r = -0.50$]) and psychological distress (correlation coefficients varying between 0.38 and 0.74, with a mean of 0.54). Costa and McCrae (1992b) observed that the 5 factors are correlated with numerous scales evaluating psychopathology from Jackson's Basic Personality Inventory (1989) and Morey's Personality Assessment Inventory (1991). However, relationships between FFM and PD are not so consistent. Saulsman and Page's (2004) metaanalytic review examined 10 empirical studies on PD and the FFM factors; they report weak to moderate correlations between FFM factors (mainly N, E, and A) and PD. Correlations between well-being and FFM were also examined; some negative correlations were found between well-being and N and, in some instance, a positive correlation with E was reported (Compton, 1998; Diener, 1984; Watson and Clark, 1992). A, O, and C were at times associated with well-being, but with smaller effect sizes (e.g., Costa and McCrae, 1991). Nonetheless, as Schmutte and Ryff (1997) noted, assessment of well-being may not approximate conceptually driven formulations of mental health, and the underlying structure of well-being is probably more complex. For example, the relation between mental health and well-being is likely to be muddled by illusory mental health, a term coined by Shedler et al. (1993) to describe individuals reporting psychological health based on a defensive denial of distress.

OBJECTIVE

The objective of the present study is to investigate the relationships between PO, FFM, and mental health. To achieve this goal, we estimate the multivariate correlations between these constructs and we identify their main contributors. We also recalculate these correlations partialing out the influence of 1 construct on the 2 others, to estimate the unique contribution of a single construct in predicting another one.

METHODS

Participants

Sixty participants (37 women, 23 men) were included in this study; all were French-speaking Caucasians. Thirty of them were seen in outpatient settings in the Quebec City area. During intake, patients were informed that a study on per-

sonality, human relationships, and psychological difficulties was being conducted, and they were asked to participate. The other 30 participants came from the nonclinical population, and responded to an announcement notice in a local newspaper for a study on personality. Our inclusion of clinical and nonclinical participants was motivated by the desire to encompass a wide range of psychological functioning. The average age of participants was 34.0-year-old (SD = 11.38). About one-quarter (27.1%) of the participants were married or living with a partner. On average, participants had 14.97 years of education (SD = 2.76) and an annual personal income of $16,800 Canadian dollars (SD = $1100). Approximately one-third (35%) of our participants worked full-time or part-time, 29% were attending school, 19% did housekeeping or were retired, 12% were unemployed, and 5% were on welfare. DSM-IV examination (see the Procedure below) revealed that 39 of the 60 participants (65%) had an Axis I or an Axis II disorder. Twenty-two participants suffered from mood disorder, 19 from anxiety disorder, 5 from eating disorder, and 5 had a history of psychotic disorder. Half the participants (n = 30) had a PD: 6 cluster A, 18 cluster B, and 19 cluster C (total exceeds 30 because of comorbidity).

The PO Diagnostic Form (PODF; Diguer et al., 2001) was used to evaluate PO level (i.e., PPO, BPO, or NPO) and dimensions (see below). Twenty-eight (47%) participants had a normal or neurotic PO (the PODF does not discriminate between normal and neurotic PO; see below for further explanations), 29 (48%) had a BPO, and 3 (5%) had a PPO. The distribution of PO in the clinical and the nonclinical subsamples was not significantly different (p = 0.30, Fisher exact test).

Clinical and nonclinical subsamples were compared on all variables of interest: PO dimensions, FFM factors, and mental health (Table 1). Compared with the nonclinical subsample, the clinical subsample shows higher scores of FFM N factor, lower scores of FFM O factor, and lower scores of mental health. Such differences are expected, and well-documented, because people seeking psychological help usually report more psychological distress and negative affects, as well as a poorer psychosocial functioning (Costa and McCrae, 1992a).

TABLE 1. Group Differences Between the Clinical (N = 30) and the Nonclinical Subsamples (N = 30) for the Personality Organization Diagnostic Form (PODF) Dimensions, the NEO Five-Factor Inventory (NEO-FFI) Factors, and the Health-Sickness Rating Scale (HSRS)

Variables	Subsamples	*M*	*SD*	*t*	*p*
1. Identity	Nonclinical	0.97	0.97	1.77	0.0815
	Clinical	−4.18	10.29		
2. Primitive defenses	Nonclinical	5.33	4.49	−1.51	0.1363
	Clinical	6.96	3.82		
3. Mature defenses	Nonclinical	6.70	3.75	1.35	0.1809
	Clinical	5.32	4.15		
4. Reality testing	Nonclinical	0.55	1.33	−0.78	0.4410
	Clinical	0.86	1.72		
5. Object relations	Nonclinical	4.25	.97	1.33	0.1889
	Clinical	3.88	1.20		
6. Neuroticism	Nonclinical	46.57	8.03	−2.09	0.0411
	Clinical	51.05	8.57		
7. Extraversion	Nonclinical	51.81	9.39	1.25	0.2174
	Clinical	48.79	9.34		
8. Openness	Nonclinical	54.52	7.43	2.37	0.0211
	Clinical	48.78	10.98		
9. Agreeableness	Nonclinical	51.66	10.11	0	1
	Clinical	51.66	9.07		
10. Conscientiousness	Nonclinical	52.82	7.52	1.37	0.1767
	Clinical	49.85	9.22		
11. HSRS global scales	Nonclinical	73.53	18.49	2.7325	0.0083
	Clinical	61.10	16.71		

Variables 1 to 5 are dimensions of the Personality Organization Diagnostic Form. Variables 6 to 10 are factors of the NEO Five-Factor Inventory.
HSRS indicates Health-Sickness Rating Scale.

Measures

PO

The PODF (Diguer et al., 2001) is an observer-rated measure of PO that draws from Kernberg's model (Kernberg, 1975, 1984; Kernberg and Caligor, 2005). It can be scored on the basis of different types of material, including intake and therapy sessions, object and self-descriptions, psychological and psychiatric evaluations, relationship narratives, etc. It was shown to have fair to excellent interrater reliability, good construct validity, and good internal consistency with participants presenting a large range of psychological functioning, from severely disturbed PPO to highly functioning and well-adapted NPO and normal individuals (Daoust, 2003; Diguer et al., 2001; Gamache, 2003; Hébert, 2004; Hébert and Diguer, 1999; Hébert et al., 2003; Gamache et al., 2004). The PODF is a 21-scale instrument and it evaluates 5 PO dimensions: identity, primitive defense mechanisms, mature defense mechanisms, reality testing, and object relations. Each dimension includes a certain number of scales. The identity dimension includes 6 scales: subjective experience of self-identity, self perceptions (split vs. integrated), subjective experience of the self in time, behavior-emotions integration, object perceptions (split vs. integrated), and perceptions of others (shallow, flat vs. empathic). The primitive defense mechanism dimension includes 5 scales: denial, splitting, primitive idealization of self and others, omnipotent control, and primitive devaluation of self and others. Five scales evaluate mature defense mechanisms: mature idealization, mature devaluation, isolation, rationalization or intellectualization, and denegation or suppression. The reality testing dimension includes 4 scales: Lack of differentiation between self and others, failure to identify the origins of perceptions, lack of the capacity to evaluate one's experience in terms of ordinary social norms, and presence of grossly inappropriate affects, thoughts or behaviors. The fourth dimension pertains to object relations (OR). It has only 1 ordinal scale comprising 5 levels: (a) psychotic OR with fear of annihilation; (b) low-level borderline OR with fear of the object; (c) low-level borderline OR with exploitation and control of the object; (d) high-level borderline OR with fear of abandonment and aloneness; and (e) neurotic OR with fear of retaliation. Once

all scales are rated, dimensional scores are calculated by adding up the scores of scales inside each dimension. Finally, a global PO diagnosis (GPO) is obtained (i.e., psychotic, borderline, or neurotic PO), according to the dimensional scores. In brief, PPO is scored when identity diffusion, primitive defenses, impaired reality testing, and symbiotic object relation are present (a dimension is considered present when its dimensional score exceeds midpoint). BPO is scored when there is identity diffusion, primitive defenses, good reality testing, and 1 of the 3 subtypes of borderline object relation. NPO is scored in the presence of identity integration, mostly mature defenses, good reality testing, and neurotic object relation. The PODF does not yet discriminate normal PO from NPO. Both present identity integration, mature defenses, good reality testing, and neurotic object relations, although normal individuals should reach higher scores on these dimensions than NPO; normative data that would allow us to calculate dimensional cutting points between these 2 populations is not yet available. This limitation does not invalidate the current study, which does not compare clinical and nonclinical samples but rather examines the relationships between psychological constructs in a sample that extends from participants presenting with severe PD to high-functioning nonclinical ones. Because a complete description of the PODF is far beyond the limits of this article, interested readers should consult Gamache et al. (2004) or the PODF Scoring Manual (available upon request; Diguer et al., 2006) for more information. Four independent raters scored the PODF based on SCID-I and II, 10 relationship narratives and significant others and self-descriptions. Interrater reliability was estimated with intraclass correlations (ICC [2, 1]; Shrout and Fliess, 1979) for a random subsample of 20 participants (33% of the total sample) on the dimensions and the GPO (Global PO: NPO, BPO, or PPO): identity: ICC = 0.85; primitive defenses: ICC = 0.85; mature defenses: ICC = 0.50; reality testing: ICC = 0.90; object relation: ICC = 0.88; GPO: ICC = 0.80. According to the criteria set by Cicchetti and Sparrow (1981), these estimates show excellent reliability, except for Mature defenses, which present fair reliability.

FFM Factors

The FFM factors were assessed with the NEO Five-Factor Inventory (NEO-FFI; Costa and McCrae, 1992a). The NEO-FFI is a 60-item questionnaire designed to provide a self-report measure of the FFM. Participants rate each item on a five-point Likert-type scale. The instrument evaluates the 5 FFM factors. Neuroticism (N) refers to the chronic level of emotional maladjustment and instability. Extraversion (E) refers to the quantity and intensity of preferred interpersonal interactions, activity level, need for stimulation, and capacity for enjoyment. Openness (O) involves the active seeking and appreciation of experiences for their own sake. Agreeableness (A) is an interpersonal factor and refers to the kinds of interactions a person prefers along a continuum from compassion to antagonism. Conscientiousness (C) assesses the degree of organization, persistence, control, and motivation in goal-directed behavior. Twelve items evaluate each of the 5 factors. The psychometric properties of the instrument are robust and well demonstrated: coefficient [*alpha*] reliabilities range between 0.68 (agreeableness) and 0.86 (neuroticism) (Costa and McCrae, 1992a). The French-Canadian translation that was used here also presents sound psychometric properties (Sabourin and Lussier, 1991).

Mental Health

The HSRS (Luborsky, 1962) was used to evaluate participants' mental health. The HSRS global scale consists of a large continuum of mental health; a score of 100 represents an ideal state of complete functioning integration, of resiliency in the face of stress, of happiness and social effectiveness, whereas a score of 0 is attributed for the worst mental condition (i.e., if unattended, it would quickly result in the patient's death; Luborsky, 1975). Reliability of the HSRS is well-established (Luborsky, 1962, 1975). Two judges (graduate students in clinical psychology with 2 years of clinical experience) rated the scale in its validated French version (Daoust et al., 2003). The HSRS was scored on the basis of information gathered during intake sessions. In terms of interrater reliability, the ICC (2, 1) is 0.78, which represents excellent reliability according to Cicchetti and Sparrow (1981). It was calculated from 18 randomly selected participants (30% of the total sample).

Procedure

All participants were evaluated on DSM-IV (American Psychiatric Association, 1994) Axes I and II by licensed psychologists or graduate students under supervision. For Axis I, only major disorders of SCID-I (First et al., 1997a) were assessed (mood, anxiety, eating, and psychotic disorders). For Axis II, all PDs were evaluated with the SCID-II (First et al., 1997b). SCID evaluations were videotaped, and the diagnoses were revised and discussed with at least 1 other evaluator. The participants were also asked to recount 10 narratives relating incidents or events in relation to another person, according to the Relationship Anecdotes Paradigm interview method (RAP; Luborsky, 1998), which has been shown to be a valid method of eliciting relationship narratives (Barber et al., 1995). Then, participants were asked to describe their parents and a significant other, as well as themselves, according to Blatt's method for gathering others and self-descriptions (Blatt et al., 1992, 1993). All descriptions and relationship narratives were audio-recorded and transcribed. These descriptions and narratives, along with SCID-I and II, were used to score the PODF. Finally, participants completed a demographic questionnaire and the NEO-FFI (Costa and McCrae, 1992a). The entire procedure lasted about 4 hours. Judges who scored the PODF were different from those who scored the HSRS, and all judges were unaware of any other information regarding the participants.

Statistical Analyses

Relationships between the 3 constructs were estimated through multiple correlation and regression analyses (Cohen et al., 2003). The relationship between PODF dimensions and NEO-FFI factors were examined through canonical correlation, which allows us to evaluate the multivariate relationships between sets of correlated variables. This analysis suits

our data very well given the correlations between PODF dimensions and NEO-FFI factors (Table 2). Because the relationship between these 2 sets of variables was not yet empirically examined, it is difficult to have a precise expectation about its value to compute the power analysis. However, given that both constructs pertain to personality characteristics, a rather strong correlation is expected. Stevens (2002) shows that with strong canonical correlations (0.7), a sample of 50 participants is sufficient to detect a significant correlation 90% of the time; the power of our study ($N = 60$) is therefore adequate. Variables that had a correlation greater than 0.30 with their canonical variate were identified as contributors to their variate. Relationships between the HSRS global score of mental health and either PODF dimensions and NEO-FFI factors were examined through regression analyses, and for the stepwise procedure variables were included in the models when they had a $p < 0.05$. Given the results of Sundin and Armelius (1998) and Daoust (2003), a correlation (R) of approximately 0.64 was expected between HSRS and PODF dimensions. According to Cohen (1988), with an α of 0.05 and a sample size of 60 such as ours, the power of a multiple regression analysis is of 0.99. Green's (1991) rule of thumb ($N = [8/f^2] + [m - 1]$, where $f^2 = R^2/[1 - R^2]$ and m is the number of independent variables) provides an estimated required sample size of 16 participants, for a power of 0.80. The expected correlation between HSRS and FFM factors is around 0.50 (Daoust, 2003; Furnham and Cheng, 1999). With an α of 0.05 and a sample size of 60, Cohen's power tables provide a power estimate of 0.93. Green's formula (1991) yields a minimal required sample size of 28, for a power of 0.80.

RESULTS

The canonical correlation analysis between PODF dimensions and NEO-FFI factors yields 5 functions with canonical correlations of 0.63, 0.54, 0.21, 0.09, and 0.06 respectively. The full five-function model is statistically significant according to Wilks' criterion: $F(25, 187.24) = 2.05$, $p = 0.0037$, $R = 0.77$, $R^2 = 0.59$. Only the first function is statistically significant: $\chi^2(25) = 48.08$, $p = 0.0037$, $R = 0.63$, $R^2 = 0.40$. However, given that the second function explains a considerable amount of shared variance ($R^2 = 0.29$, $\chi^2[16] = 21.18$, $p = 0.17$), we considered it useful for the understanding of the relationships between the 2 constructs. Actually, as statistical significance test in canonical correlation proceeds in a hierarchical fashion (e.g., significance test of the full model, then function 2 to 5), and that there is no direct way to test separately the significance of each function, we rely on the magnitude of shared variance to select functions to interpret. The last 3 equations explain only 4%, 1%, and 0% of shared variance.

Table 3 presents the correlations of variables with their canonical variate and the standardized canonical function coefficients for the first 2 functions. A rotation was performed to improve the interpretability of canonical correlations. For the first function, the correlations reveal that the relevant PO criterion variables are primarily identity and primitive defenses with mature defenses and object relations making secondary contributions. This set of variables could be labeled neurotic-borderline continuum. For NEO-FFI factors, the correlations indicate contributions of agreeableness, neuroticism, and marginally conscientiousness. In brief, the more a person is situated on the borderline segment of the PO neurotic-borderline continuum, the more likely he or she will present NEO emotional instability, poor interpersonal functioning as well as unreliability or disorganization.

For the second function, the correlations suggest that object relations and reality testing were the only variables of relevance for PO, whereas neuroticism, extraversion, and openness are the most noteworthy NEO factors. The pertinent PO dimensions reveal a factor reflecting psychotic functioning or disturbances, which is associated with emotional instability, disengagement from the social world, and shunted interest. It is noteworthy that these results are consistent with the bivariate correlations between PO dimensions and NEO factors (Table 2).

Given that many PODF dimensions and NEO-FFI factors have significant correlations with HSRS (Table 2), it is possible that the PODF – NEO-FFI correlation is mainly a reflection of the correlations these 2 constructs have with

TABLE 2. Means, Standard Deviations, and Intercorrelations Among Variables ($N = 60$)

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. Identity	−1.61	11.46										
2. Primitive defenses	6.15	4.21	−0.92**									
3. Mature defenses	4.41	3.15	0.89**	−0.79**								
4. Reality testing	0.70	1.53	−0.42**	0.32*	−0.40**							
5. Object relations	4.06	1.10	0.76**	−0.70**	0.70**	−0.78**						
6. Neuroticism	25.60	8.64	−0.33**	0.28*	−0.18	0.25	−0.33*					
7. Extraversion	26.08	7.18	0.11	−0.08	0.11	−0.25	0.31*	−0.40**				
8. Openness	30.93	6.56	0.05	0.01	0.06	−0.15	0.15	0.27*	−0.16			
9. Agreeableness	33.20	5.38	0.43**	−0.45**	0.30*	0.05	0.16	−0.28*	0.24	−0.18		
10. Consientiousness	32.27	6.66	0.25	−0.15	0.08	0.03	0.06	−0.35**	0.25	−0.24	0.25	
11. HSRS	67.32	18.56	0.67**	−0.68**	0.58**	−0.30*	0.60**	−0.51**	0.43**	−0.05	0.47**	0.28*

Variables 1 to 5 are dimensions of the Personality Organisation Diagnostic Form. Variables 6 to 10 are factors of the NEO Five-Factor Inventory.
* $p < 0.05$; ** $p < 0.01$.
HSRS indicates Health-Sickness Rating Scale.

TABLE 3. Correlations, Standardized Canonical Coefficients, Percents of Variance, Redundancies, and Canonical Correlations for PO Dimensions and NEO-FFI Factors and Their Canonical Variates

	First Canonical Variate		Second Canonical Variate	
	Correlations	**Coefficients**	**Correlations**	**Coefficients**
PO				
Identity	−0.83	−1.59	−0.28	−1.47
Primitive defenses	0.80	0.46	0.01	−1.07
Mature defenses	−0.52	0.70	−0.21	0.82
Reality testing	−0.10	0.03	0.74	−0.12
Object relations	−0.41	1.00	−0.76	−1.13
Percentage of variance	0.22		0.38	Total = 0.60
Redundancy	0.09		0.11	Total = 0.20
NEO-FFI				
Neuroticism	0.56	0.28	0.56	0.77
Extraversion	0.04	0.62	−0.65	−0.41
Openness	0.03	0.01	−0.39	−0.60
Agreeableness	−0.83	−0.85	0.13	0.01
Conscientiousness	−0.34	−0.16	0.00	0.10
Percentage of variance	0.19		0.21	Total = 0.40
Redundancy	0.08		0.06	Total = 0.14
Canonical correlation	0.63		0.54	

$N = 60$.
PO indicates Personality Organization; NEO-FFI, NEO Five-Factor Inventory.

mental health. To test this hypothesis, we calculated the correlation between PODF dimensions and NEO-FFI factors when HSRS score is partialed out from both set of variables [i.e. PODF · HSRS vs. NEO-FFI · HSRS; following the notation of Cohen et al. (2003)]. Then, the multivariate correlation decreased to $R = 0.72$ ($R^2 = 52$, $F[25, 183.5] = 1.58$, $p = 0.046$). The first 2 canonical functions are again noteworthy of interpretation, explaining respectively 0.38 and 0.27 of shared variance. The composition of the canonical variates is not very different, the most important contributors remaining in the equation. For the first function, the relevant PO dimensions are identity (0.53) and primitive defenses (−0.43), whereas NEO factors are agreeableness (−0.68) and extraversion (0.62). The PO dimensions of relevance for the second equation are reality testing (−0.58), object relations (0.45) and primitive defenses (0.40), and neuroticism (−0.78) and openness (0.35) for NEO factors.

We then looked at the regressions between our personality measures (PODF and NEO-FFI) and mental health (HSRS). The multiple regression between the HSRS score and the 5 PODF dimensions yields a $R = 0.71$ ($R^2 = 0.50$, $F[5, 54] = 10.97$, $p < 0.0001$). The stepwise analysis shows that only 1 PO dimension, primitive defenses, suffices to explain 46% of the HSRS variance ($R = 0.68$, $R^2 = 0.46$, $F[1, 58] = 49.20$, $p < 0.0001$, $B = -2.99$), which is only 4% less of explained variance than the full five-predictor model. Given the relatively high correlations between PODF dimensions and NEO-FFI factors, we also calculated the regression between HSRS and PODF dimensions when NEO-FFI factors are partialled out from PODF dimensions; then the R is 0.48 ($R^2 = 0.23$, $F[5, 49] = 6.81$, $p < 0.0001$) and primitive defenses dimension remains the only predictor ($B = -0.39$, $p = 0.06$).

Regression analysis between the HSRS and the 5 NEO-FFI factors yields a $R = 0.66$ ($R^2 = 0.44$, $F[5, 54] = 8.47$, $p < 0.0001$). The stepwise analysis indicates that the best NEO-FFI predictors of HSRS are N ($B = -0.87$) and A ($B = 1.25$) ($F[2, 57] = 17.12$, $p < 0.0001$, $R = 0.61$, $R^2 = 0.37$). Again, given the correlations between PODF dimensions and NEO-FFI factors, we calculated this same regression when PODF dimensions are partialed out from NEO-FFI factors; then the correlation between HSRS and NEO-FFI is $R = 0.41$ ($R^2 = 0.17$, $F[5, 49] = 4.90$, $p < 0.001$). N remains the best predictor ($B = -0.22$), whereas E replaces A ($B = 0.22$).

At this point of our analyses, it is clear that taken 2 by 2, PO dimensions, NEO factors and mental health are closely intertwined. The next logical step is to wonder how HSRS can be predicted by our total set of personality variables (i.e., PODF dimensions and NEO-FFI factors). Regression analysis for the overall model yields a $R = 0.82$ ($R^2 = 0.67$, $F[10, 49] = 9.92$, $p < 0.0001$). Stepwise analysis shows that a combination of only 3 variables (PODF Primitive defenses, NEO-FFI E and N) yields a $R = 0.80$ ($R^2 = 0.64$, $F[3, 56] = 33.58$, $p < 0.0001$).

Finally, a simpler way to look at the relations between PO and the 2 other constructs is to calculate the linear regressions between the PODF GPO score (PPO, BPO, or NPO) and the NEO-FFI factors and HSRS. This analysis also allows us to compare our results with those of Sundin and Armelius (1998) and Daoust (2003), who report correlations between GPO and HSRS. The correlation between GPO and HSRS is 0.56 ($p = 0.0001$), which is weaker than the

multivariate correlation ($R = 0.71$) between the PODF 5 dimensions and HSRS. A significant relationship ($R = 0.44$, $R^2 = 0.19$, $F[10, 49] = 2.61$, $p = 0.03$) is also obtained between GPO and NEO-FFI factors, which is also weaker than the multivariate correlation ($R = 0.77$) between PODF dimensions and NEO-FFI factors.

DISCUSSION

The canonical correlation between PO dimensions and FFM factors shows that these 2 sets of variables share a significant interface ($R^2 = 0.59$). The 2 first canonical correlations reveal PO variates that are similar to those obtained by Gamache et al. (2004): a first one labeled borderline-neurotic continuum of psychological functioning, and a second one reflecting psychotic functioning and disturbances. The first canonical function relies mainly on the correlation between PO identity and primitive defenses, and FFM A and N factors, and, to a lesser degree, C. These results seem to be in line with Kernberg's work (Kernberg and Caligor, 2005). Actually, in Kernberg's model, identity integration is conceived of as the capacity to harmoniously blend the multiple aspects of self and object representations, which yields a secure sense of self, as well as a capacity to relate empathetically with the experience of others. Actually, identity constitutes the underlying structure of conscious aspects and behavioral manifestations activated in relationships with others, and therefore it underpins psychological and social functioning. Primitive defenses such as splitting and its derivatives (e.g., primitive devaluation and idealization) compromise identity integration because they dissociate and actively keep apart contradictory experiences of the self and others (Kernberg, 1984). Therefore, quality of interpersonal relationships and general psychological functioning are largely dependent on identity integration, which is related to defenses since primitive defenses hinder identity integration (Kernberg and Caligor, 2005). The FFM factors associated with this PO continuum are consistent with those usually reported in the literature on BPD: disturbed relatedness, affective or emotional dysregulation, and behavioral dyscontrol or impulsivity (Clarkin et al., 1993; Fossati et al., 1999; Rosenberg and Miller, 1989; Sanislow et al., 2000, 2002). Whether identity and primitive defenses are, as hypothesized by Kernberg, the psychological processes that generate the phenotypic or observable patterns of BPD or other severe PD remains an open question to investigate.

The second canonical correlation shows an association between psychotic experiences and FFM N, E, and O factors. A metaanalysis by Berenbaum and Fujita (1994) highlighted the association between schizophrenia and neuroticism, extraversion and peculiarity, whereas the link with creativity remains unclear. Numerous studies found schizophrenia (Herran et al., 2006) and schizotypy (e.g., Kerns, 2006) to be associated with emotional instability, confusion, introversion, and disturbed cognitive functioning or peculiarities.

The fact that psychotic experiences and borderline-neurotic continuum are positioned on 2 distinct canonical functions may support the hypothesis that psychotic functioning occupies a particular status in the realm of psychopathology, and that it may qualitatively differ from other disorders, mainly because it entails a rupture with consensual reality. This idea has a long psychoanalytic tradition. It is also reflected in Kernberg's views (Kernberg and Caligor, 2005) that psychotic PO is a state of decompensation presented by individuals suffering from atypical forms of psychosis, and that it should be considered as an exclusion criterion from PD in a clinical sense. Westen (1990) also doubts that psychotic disorders can be included on the same developmental continuum than borderline and neurotic disorders.

The linear combination of all PO dimensions and FFM factors strongly correlates with mental health ($R = 0.82$), the strongest predictors of mental health being PODF Primitive defenses and NEO-FFI N and E factors. Partial correlations show that taken separately, PODF and NEO-FFI variables have similar correlations (partial $r = 0.48$ and 0.41, respectively) with mental health. This suggests that PO and FFM are 2 distinct constructs that both influence mental health, either in combination or independently. This observation is in line with a growing literature that promotes the integration of psychoanalytically oriented PO construct and trait-based models such as the FFM. Westen et al. (2006) have persuasively discussed the clinical benefits of such integration, given the limitations of trait models for clinical purposes (e.g., their relative inattention to context or activating processes, their failure to address internal psychological processes). First (2005) also argues that establishing the clinical utility of dimensional models, such as the FFM, remains 1 of the biggest challenges for the proponents of such models. We believe in a similar vein that complementing trait evaluation with a PO evaluation can considerably enhance clinical work, and vice versa.

Westen et al. (2006) propose that PO and personality traits (or factors) may represent 2 orthogonal dimensions. It is true that, in line with this hypothesis, personality factors, conceived as the conscious, observable and usual patterns of thoughts, emotions, and behaviors can express different levels of PO, the latter being conceived mainly in terms of unconscious processes (e.g., defenses) and contents (e.g., unconscious aspects of representations of self, others, and relationships). For example, a very extroverted, opened, self-assertive, and flamboyant personality style can be found in NPO (hysterical) as well as in BPO (narcissistic) patients. On the other hand, our empirical results, which are the first on this matter, are at odds with this hypothesis. They underline that PO and personality factor are two distinct, although interconnected, constructs and that in accordance with authors such as Block (2001) and Lenzenweger and Clarkin (2005), PO may well refer to some motivational processes that are linked to, but not conceptualized in, theories of personality such as the FFM. However, the precise nature of the relation between PO and personality factors remains unclear, e.g., whether FFM factors act like mediating variables between PO and mental health, or vice versa, and whether PO underpins personality factors. Studies using structural equations modeling could improve our understanding of these relations by allowing a test of the mediating or moderating role of variables, as well as direct and indirect

effects. Actually, such studies could test hypotheses such as Kernberg's (2004), which define PO dimensions as the core processes that organize and determine the particular dynamic organization of thoughts, behaviors, and affects patterns that are captured by models such as the FFM.

Our canonical analysis also reveals the presence of a few latent underlying factors in PO dimensions and FFM factors. It was elsewhere reported that the five-factor structure of the NEO is uncertain (Digman, 1997) and Block (1995) considers the factor structure "impressively nonorthogonal." Several studies reported appreciable intercorrelations among NEO factors. Digman (1997) and Blackburn et al. (2004) proposed that 2 higher order factors may subsume the 5 factors. The same is true for the PODF; as previously mentioned, a recent investigation (Gamache et al., 2004) suggests that 2 factors underlie PODF scales. Again, a following step should include structural modeling to better understand the underlying constructs of PO, personality factors and mental health, and their relationships.

We also observed that primitive defense mechanisms explain almost entirely the correlation between PO and mental health. Vaillant's longitudinal study on adult development shows that participants who used mainly primitive defenses had poorer HSRS scores and other life outcomes (alcohol use and abuse, sociopathy, and marital instability) (Soldz and Vaillant, 1999). In the same vein, the review by Bond (2004) on defense mechanisms highlighted the association of primitive defenses with severe PD and worse mental health. In his literature review, Perry (1993) also observed that mental health is associated with psychotic defenses ($r = -0.57$), immature defenses ($r = -0.32$), and image-distorting defenses ($r = -0.12$), all considered primitive defenses in Kernberg's model. All this is also in accordance with traditional views in psychodynamic psychology on the usage of defense mechanisms to adaptation ends according to reality requirements and individual dispositions. Defenses such as splitting, denial, omnipotent control, and primitive idealizations are said to be primitive because they operate in a global, undifferentiated way in a person's total sensorium, fusing cognitive, affective, and behavioral dimensions. These mechanisms are therefore very costly in terms of adaptive capacities: they impoverish self and object representations, hinder integration of emotional impact of behaviors, while inducing severe relational difficulties. Kernberg (1975, 1984) explains that primitive defenses protect the patient from intrapsychic conflict, but at the cost of weakening his ego functioning, thereby reducing his adaptive effectiveness and flexibility in his life in general.

The relationship between mental health and FFM factors is principally attributable to N and, in a lesser proportion, to A factor. The correlation with the N factor was expected because this factor refers to the chronic level of emotional maladjustment and instability. Moreover, several studies have reported similar results (Emery et al., 1996; Furnham and Cheng, 1999; Saulsman and Page, 2004; Soldz and Vaillant, 1999). The A factor refers to the capacity to link oneself to others as well as to the quality of interpersonal functioning. The correlation between this factor and mental health seems therefore to underline the central role of interpersonal relations for mental health. This correlation was also expected because the quality of interpersonal relationships is part of the HSRS (Luborsky, 1962, 1975) definition of mental health as it is of probably all measures of mental health and disorders, including the DSM (American Psychiatric Association, 2000).

We also report results on the GPO score, which is an ordinal PO scale (PPO, BPO, or NPO). We observed a significant correlation ($r = 0.56$) with the HSRS, whereas Sundin and Armelius (1998) and Daoust (2003) respectively found correlations of 0.64 and 0.63. The 3 empirical studies available on PO and mental health yield therefore quite similar results. We must, however, wonder what results would be obtained if other measures of mental health were used across different cultures, given that mental health is a very wide and multidimensional construct with many definitions and measures. It is also remarkable that the GPO-HSRS correlation is not much lower that the multivariate correlation ($r = 0.68$) between PO dimensions and HSRS. This suggests that the GPO is a valid synthesis of PO dimensions in terms of predicting mental health. However, this is not the case in terms of FFM factors. Indeed, the correlation between GPO and FFM factor (0.44) is clearly lower than the multivariate correlation between PO dimensions and FFM factors (0.77). It may well be that the interplay between personality dimensions and factors is too complex to be synthesized into the GPO-FFM correlation. It is also possible the PO dimensions capture some aspects of psychological functioning, which are not relevant to mental health, although they correlate with FFM factors. Interestingly, our results open a series of questions on the relationships between personality constructs and mental health; these questions should be examined later on through structural analyses.

A limitation of our study is that all participants were Caucasian and French-speaking. Future studies should also use larger samples to have a better representation of the variability of pathologic and normal personality profiles, and a better representation of PPO participants. Structural analyses could allow a more precise examination of the relationships between PO and FFM models; however, given the absence of any empirical data on the matter and given that PO evaluation is relatively complex and time-consuming (3-4 hours per participant), we believe that these analyses had to be preceded by examinations of their intercorrelations, which was the goal of the present study.

In conclusion, results give some support to the idea that PO is different although closely intertwined to personality factors and mental health. Results also allow a better understanding of how these 3 constructs are related and how their combination can provide us with an enriched understanding of psychological functioning.

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