PREDICTIVE VALIDITY OF THE FIVE-FACTOR MODEL PROFILES FOR ANTISOCIAL AND BORDERLINE PERSONALITY DISORDERS

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by
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The undersigned, appointed by the Dean of the Graduate School, have examined the dissertation entitled

PREDICTIVE VALIDITY OF THE FIVE-FACTOR MODEL PROFILES FOR ANTISOCIAL AND BORDERLINE PERSONALITY DISORDERS

Presented by Stephanie Stepp

A candidate for the degree of Doctor of Philosophy

And hereby certify that in their opinion it is worthy of acceptance.

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INTRODUCTION

Current trends in classifying personality disorders

The current manual for diagnosing psychopathology classifies personality disorders as categorical constructs (DSM-IV-TR; APA, 2000). Many problems exist with this classification scheme in which personality disorders are diagnosed as either present or absent. First, within this categorical framework, it is difficult to delineate where normality ends and pathology begins (Widiger & Frances, 2002). Also, the arbitrary distinction between absence and presence of pathology leads to overlapping disorders. Many personality disorders are highly co-morbid with other personality disorders and axis I conditions. Although it is recognized that individuals may experience more than one psychological disorder at any one time, the high rates of comorbidity highlight the lack of empirical evidence for the boundaries that exist between disorders (Trull & McCrae, 2002). For example, the national epidemiological survey on alcohol and related conditions (NESARC) examined the co-occurrence of seven out of ten DSM-IV-TR personality disorders in the US population using a face-to-face interview in 2001-2002 (N = 43,093). This study found that all personality disorders were highly related. Not only were disorders related within DSM-IV personality disorder clusters, groupings of personality that are believed to have descriptive similarities, but personality disorders were also highly related across clusters. For instance, histrionic personality disorder (Cluster B) was strongly related to paranoid personality disorder (Cluster A; OR = 23.5) and obsessive-compulsive personality disorder (Cluster C) was

significantly related to schizoid personality disorder (Cluster A; *OR* = 11.1; Grant et al., 2005a).

In a separate study using the NESARC sample, researchers estimated the co-occurrence of DSM-IV-TR personality disorders with axis I conditions (Grant et al., 2005b). Researchers found that nearly half of all respondents with a current mood or anxiety disorder met criteria for at least one personality disorder in their lifetime. Specifically, of individuals with a current mood disorder, 46.8% met criteria for at least one personality disorder, and of individuals with a current anxiety disorder, 41.8% of individuals met criteria for at least one lifetime personality disorder (Grant et al., 2005b).

In addition to blurry boundaries among different disorders, clinicians often find that the current classification scheme does not provide accurate coverage of personality pathology. When a clinician encounters a patient with an atypical symptom presentation or personality problems that do not meet the full criteria for a personality disorder, she or he may provide a diagnosis of *Personality Disorder, Not Otherwise Specified* (PD-NOS; APA, 2000). High rates of this "garbage can" diagnosis might suggest that the current diagnostic system is not adequately representing personality pathology. Westen and Arkowitz-Westen (1998) reported on ratings from 238 clinicians describing the presenting problems of their patients (N = 714). They found that over half of these patients suffered from personality problems that warranted clinical attention but did not meet criteria for a DSM-IV personality disorder. Some of these problems included problems with intimacy, authority problems, and difficulty with assertiveness. Additionally, Morey (1992) found that 22.3% of a national sample of patients was best described as PD-NOS on the basis of a check-list completed by their treating clinicians

(as cited in Clark, Watson, & Reynolds, 1995). These findings have led some researchers to conclude that the current axis II of the DSM-IV fails to account for the broad range of personality problems for which people seek treatment and are serious enough to necessitate clinical attention (Shedler & Westen, 2004; Clark et al., 1995). A dimensional model of personality would provide more comprehensive information about patients' personality functioning (Widiger & Frances, 2002).

Due to the problems found in the current categorical classification scheme, a task force has been established to investigate the merits of adopting a dimensional framework for classifying personality disorders in the next diagnostic manual (Widiger & Simonsen, 2005a). In a recent paper, Widiger & Simonsen (2005b) highlight a common hierarchical structure found across 18 different, proposed dimensional models of personality functioning. The authors categorized these varying models into four groups. The first group of models proposes to maintain the current diagnostic constructs with an added dimensional profile (e.g., Westen & Shedler, 2000). The second group of models recommends re-organizing the current personality disorder symptoms into dimensional profiles of personality disorder symptoms (e.g., Livesley, 2003). The advantage of the first two groups is retaining a familiar structure which may be received with less resistance. However, these models may not identify the underlying domains of personality problems that would account for the lack of validity in the current diagnostic nomenclature (Widiger & Simonsen, 2005b). The third group suggests integrating axis I and axis II by the common constructs that underlie both spectra of pathology (Siever & Davis, 1991; Krueger, 2002). This proposed re-organization would account for the high comorbidity between axis I and axis II conditions (Widiger & Simonsen, 2005b). The

last group suggests integrating axis II with dimensional models of normal personality structure (e.g., Costa & McCrae, 1992). This class of re-organization models posits that personality dysfunction is an extreme variant of normal personality functioning (Widiger & Simonsen, 2005b). Understanding personality disorders as extreme variants of normal personality dimensions would elucidate connections between axis I and axis II disorders. For example, the fact that borderline personality disorder (BPD) is often highly comorbid with mood and anxiety disorders can be explained by their shared relations to Neuroticism (Trull & McCrae, 2002).

Before a dimensional model of personality disorders can be adopted, several issues must be addressed (Widiger & Frances, 2002; Widiger & Simonsen, 2005a). As mentioned previously, selecting the dimensional model which best represents personality pathology requires much careful deliberation. It is important to ensure that the diagnostic manual provides adequate coverage of personality disorders. Dimensional models address this concern by identifying broad domains of personality that underlie a broad range of personality problems. Additionally, it is important that clinicians are able to make decisions based on a dimensional classification scheme. Decisions that clinicians make, such as "Would this patient benefit from psychotherapy?" or "Should this patient be hospitalized?" lend themselves readily to a categorical classification scheme. For example, if the patient has X diagnosis, then she or he should be treated with Y treatment. A dimensional classification model would need to provide cut-offs to allow clinicians to make these types of decisions (e.g., Trull, 2005; Widiger & Frances, 2002).

Five Factor Model of Personality

One of the dimensional models of normal personality that has received much research attention is the Five Factor Model (FFM; Costa & McCrae, 1985). This personality model began with the idea that to understand personality structure, one might examine the language which had evolved to describe it (McCrae & John, 1992). In the 1930s, researchers in this lexical tradition examined the English language in hopes of identifying the fundamental dimensions of personality (Allport & Odbert, 1936). Then, in the 1960s and 1970s, researchers had participants rate others on lists of adjectives that had been taken from the dictionary and extracted five factors that accounted for a substantial portion of the variance (e.g., Norman, 1963). These five factors have been reliably extracted across cultures and in a wide array of samples (e.g., Yoon, Schmidt, & Ilies, 2002; McCrae, Costa, Del Pilar, Rolland, & Wayne, 1998). Additionally, the five factors appear to have a heritable component (Jang, Livesley, & Vernon, 1996).

These robust factors have been labeled Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness (McCrae & John, 1992). Extraversion assesses an individual's proclivity to experience positive emotions and to be outgoing and sociable. Agreeableness assesses a person's interpersonal style with those high on this trait being trusting, straightforward, and empathic while those low on this trait being arrogant, manipulative, and callous. The domain of Conscientiousness refers to the ability to delay gratification and complete tasks. Neuroticism refers to a lack of emotional adjustment and stability. Lastly, Openness to Experience assesses a person's interest in culture and new experiences. Each of the factors represents one end of the bipolar spectrum (e.g., the opposite pole of Neuroticism is emotional stability).

Additionally, each of the five higher-order dimensions includes first-order personality trait facets (McCrae & John, 1992).

Specific measures have been developed to assess the FFM. In the 1980s, the NEO Personality Inventory (NEO-PI; Costa & McCrae, 1985) was developed to specifically measure these five broad domains and some of the facets. This questionnaire was revised in 1992 to include all of the 30 facets (NEO-PI-R; Costa & McCrae, 1992). Additionally, Trull and Widiger (1997) developed a semistructured interview to assess the five factor domains and facets (Structured Interview for the Five Factor Model; SIFFM).

Five Factor Model of Personality Disorders

A prominent and prolific group of personality researchers (e.g., Costa & McCrae, 1994; Trull & Widiger, 1997; Widiger, 1993) has suggested that the Five-Factor Model of personality may be the scheme of choice for the dimensional classification of axis II disorders. A substantial literature has begun to accrue on the relationship between various personality disorders and the domains and facets of the FFM (e.g., Costa & McCrae, 1994; Duijsens & Diekstra, 1996; Trull, Widiger, & Burr, 2001). A five-factor model perspective assumes that personality pathology is an extreme variant of normal personality functioning. This broader conceptualization will enable researchers to translate what is known about normal personality functioning to understanding personality disorders (Lynam & Widiger, 2001).

Widiger & Costa (2002) describe 56 studies that have explicitly examined the relationship between personality disorders and the FFM. The first-wave of this research studied personality disorders from the perspective of the five broad domains of the FFM

(e.g., Costa & McCrae, 1994; Trull, 1992; Wiggins & Pincus, 1989). For example, Wiggins and Pincus (1989) found associations between the five factors and personality disorder symptoms: (1) Openness was related to schizotypal symptoms; (2) high Agreeableness was related to dependent symptoms while low Agreeableness was related to antisocial, narcissistic, and paranoid symptoms; (3) Neuroticism was related to borderline symptoms; (4) Extraversion was related to histrionic and narcisstic symptoms; and (5) Conscientiousness was related to symptoms of obsessive-compulsive personality disorder. In all, these studies concluded that personality disorders could be conceptualized within the domains of normal personality functioning.

To better differentiate between the different personality disorders, Widiger, Trull, Clarkin, Sanderson, & Costa (1994; 2002) provided facet-level predictions concerning the relationship between personality disorders and the FFM. For example, these authors proposed that DSM-IV paranoid personality disorder was best captured by high scores on the angry-hostility facet and low scores on the trust, straightforwardness, and compliance facets. Since these predictions were made, several studies have been published confirming many of the proposed relationships (e.g., Axelrod, Widiger, Trull, & Corbitt, 1997; Dyce & O'Connor, 1998; Paunonen & Ashton, 2001; Quirk, Christiansen, Wagner, & McNulty, 2003; Reynolds & Clark, 2001; Trull, Widiger, & Burr, 2001). In one study, Dyce & O'Connor (1998) reported that the facet-level predictions accounted for 52% to 76% of the total variance for DSM-III-R personality disorders in a large sample of undergraduate students (N=614). The authors concluded that the facets of the NEO-PI-R were highly valuable in differentiating between the disorders. In another study, Quirk et al. (2003) examined the ability of the NEO-PI-R facets to describe the DSM-IV

personality disorders in a large inpatient sample (N = 1,342) over and above that of the MMPI-2 personality disorder scales. These authors reported that the facet-level personality disorder predictions accounted for an additional 7% to 23% of the variance in personality disorder symptomatology beyond the MMPI-2 scale scores.

Miller, Reynolds, & Pilkonis (2004) note that even though this research has shown that the FFM facet-level predictions can describe personality disorders, this line of research is not without its limitations. First, it is important to establish that the content domain covered by the FFM adequately covers the personality disorders currently described in the DSM-IV. Although this demonstration is important, the DSM-IV is just one way to conceptualize personality pathology (Trull, 2005). Second, researchers note that clinicians may be reluctant to toss out DSM nomenclature, (such as antisocial personality disorder), for FFM facet terms, (such as low in straightforwardness and low in deliberations), to describe patients. Mapping the dimensional classification system onto existing nomenclature may help with this transition (Miller et al., 2004).

In order to overcome these obstacles, authors have proposed that the FFM can provide meaningful assessments of the DSM personality disorders by rating an individual's similarity to an expert-generated FFM prototype (Lynam 2002; Lynam & Widiger, 2001; Miller & Lynam, 2003; Miller, Lynam, Widiger, & Leukefeld, 2001). Miller et al. (2001) first used this method to evaluate the ability of the FFM to describe psychopathy. The authors asked 15 experts in the field of psychopathy (*not* FFM researchers) to rate a prototypical psychopath on each of the 30 facets of the FFM. The average rating for each facet was calculated. This yielded the prototypic facet

psychopath profile which can be used to measure the degree to which an obtained FFM profile matches the prototype.

Lynam and Widiger (2001) subsequently collected expert ratings of FFM facet profiles for each personality disorder and developed prototypes (see Table 1 for FFM descriptions of borderline personality disorder and antisocial personality disorder). Between 25 and 30 experts were identified for each disorder, and they were asked to rate the prototypic case of a specified personality disorder on a 1-to-5 scale, where 1 indicates that the prototypic person would be extremely low on this trait, 2 indicates that the prototypic person would be low, 3 indicates that the protoypic person does not differ from the average person on this trait, 4 indicates that the prototypic person would be high, and 5 indicates that the prototypic person would be extremely high on this trait.

Most recently, Miller et al. (2004) studied the validity of all 10 prototypes in two clinical samples. In the first clinical sample ($N = 94$) the authors found good agreement between DSM symptom profiles and the FFM facet profiles (median correlation $r = .75$). The second clinical sample ($N = 132$) was measured at six and twelve months after the initial assessment. The authors reported that the FFM prototype scores were highly stable across the three assessment points (*ICC*s = 0.80, 0.85, and 0.82 at Times 1 to 2, Times 2 to 3, and Times 1 to 3, respectively). Additionally, the association between the DSM symptoms counts and the FFM prototype scores remained stable across the assessment points (median *r's* = 0.33, 0.36, and 0.44 at Time 1, Time 2, and Time 3, respectively). This preliminary study suggests that the expert-generated prototypes were able to describe the DSM personality disorders accurately.

Table 1. Five Factor Model ratings for antisocial and borderline personality disorders

Domain & Facets	Antisocial	Borderline
Neuroticism	2.80	4.12
Anxiousness	1.82	**4.04**
Angry hostility	**4.14**	**4.75**
Depressiveness	2.45	**4.17**
Self-Consciousness	1.36	3.17
Impulsivity	**4.73**	**4.79**
Vulnerability	2.27	**4.17**
Extraversion	3.53	3.18
Warmth	2.14	3.21
Gregariousness	3.32	2.92
Assertiveness	**4.23**	3.17
Activity	**4.00**	3.29
Excitement seeking	**4.64**	3.88
Positive emotions	2.86	2.63
Openness	2.93	3.39
Fantasy	2.82	3.29
Aesthetics	2.36	2.96
Feelings	2.27	**4.00**
Actions	**4.23**	**4.00**
Ideas	2.91	3.21
Values	3.00	2.88
Agreeableness	1.50	2.40
Trust	1.45	2.21
Straightforwardness	1.41	2.08
Altruism	1.41	2.46
Compliance	1.77	2.00
Modesty	1.68	2.83
Tendermindedness	1.27	2.79
Conscientiousness	1.91	2.35
Competence	2.09	2.71
Order	2.41	2.38
Dutifulness	1.41	2.29
Achievement striving	2.09	2.50
Self-discipline	1.81	2.33
Deliberation	1.64	1.88

Note: Characteristic items defined as less than or equal to 2 (low; underlined), or greater than or equal to 4 (high; in bold). From Lynam & Widiger (2001). See Appendix 1 for FFM ratings for other personality disorders.

Borderline personality disorder (BPD) and antisocial personality disorder (ASPD) are the two most widely researched personality disorders (Blashfield & Intoccia, 2000). As a result, much is known about their etiology, course, and treatment compared to other personality disorders. Additionally, these mental illnesses are also some of the most widely prevalent personality disorders. In clinical settings, BPD is the most frequently encountered personality disorder; with prevalence estimates ranging from 9 to 30% (e.g., Zimmerman, Rothschild, Chelminski, 2005; see Linehan, 1993 for a review). It is also one of the most frequent personality disorder diagnoses found in community samples, with prevalence estimates of BPD ranging from 1% to 5% (e.g., Ekselius, Tillfors, Furmark, & Fredrikson, 2001; Samuels, Eaton, Bienvenu, Brown, Costa, & Nestadt, 2002). Estimates for the prevalence of ASPD range from 1.8% to 4.5% in community samples (e.g., Eskelius et al., 2001; Samuels et al., 2002). The substantive nomological networks for both ASPD and BPD make them preferable constructs to investigate. Also, these disorders are likely to be well represented in any community sample. Given these reasons, ASPD and BPD will be the foci for the present study.

Borderline personality disorder and the FFM. Borderline personality disorder (BPD) is characterized by affective instability, cognitive deficits, impulsive acts, and dysfunctional interpersonal relationships (APA, 2000). See Table 2 for DSM-IV-TR criteria for BPD. BPD is often comorbid with other personality and mood disorders and is associated with poor short-term treatment outcomes (Skodol et al., 2002). Furthermore, individuals exhibiting significant BPD features are likely to experience negative outcomes in several areas of functioning, including occupational, academic, and interpersonal (Trull, Useda, Conforti, & Doan 1997; Zweig-Frank & Paris, 2002).

Table 2. *DSM-IV-TR* diagnostic criteria for borderline personality disorder

Borderline Personality Disorder DSM-IV-TR Criteria
(1) frantic efforts to avoid real or imagined abandonment. Note: Do not include suicidal or self-mutilating behavior covered in Criterion 5.
(2) a pattern of unstable and intense interpersonal relationships characterized by alternating between extremes of idealization and devaluation
(3) identity disturbance: markedly and persistently unstable self-image or sense of self
(4) impulsivity in at least two areas that are potentially self-damaging (e.g., spending, sex, substance abuse, reckless driving, binge eating). Note: Do not include suicidal or self-mutilating behavior covered in Criterion 5.
(5) recurrent suicidal behavior, gestures, or threats of self-mutilating behavior
(6) affective instability due to a marked reactivity of mood (e.g., intense episodic dysphoria, irritability, or anxiety usually lasting a few hours and only rarely more than a few days)
(7) chronic feelings of emptiness
(8) inappropriate, intense anger or difficulty controlling anger (e.g., frequent displays of temper, constant anger, recurrent physical fights)
(9) transient, stress-related paranoid ideation or severe dissociative symptoms

Five studies have specifically investigated the ability of the FFM to describe borderline personality disorder (Clarkin, Hull, Cantor, & Sanderson, 1993; Morey & Zanarini, 2000; Trull et al., 2003; Wilberg, Urnes, Friis, Pedersen, & Karterud, 1999; Zweig-Frank & Paris, 1995). Clarkin et al. (1993) measured DSM personality disorder symptoms and NEO-PI-R personality traits in 62 female BPD inpatients. They found that these patients were characterized by high Neuroticism and low Agreeableness and Conscientiousness scores. Additionally, all of the Neuroticism facets were positively associated with all of the DSM BPD symptoms. Wilberg et al. (1999) replicated these findings in a sample of 63 outpatients. These authors confirmed 8 out of 12 FFM BPD facet level predictions of Widiger et al. (1994).

Zweig-Frank and Paris (1995) examined the NEO-PI-R profiles of 59 prior patients, 29 of which had been given a BPD diagnosis and 30 of which had been given other diagnoses two years earlier. The authors found few differences on the five factors between the two groups of patients. However, the authors only examined differences between the broad domains not between the facets. As noted previously, research has shown that the FFM facets are better able to discriminate between diagnostic constructs (e.g., Lynam & Widiger, 2001). Morey and Zanarini (2000) examined the ability of the FFM to describe BPD in a sample of 362 patients with personality disorders (290 met DSM criteria for BPD while 72 met criteria for another personality disorder). The authors replicated the relationship between high Neuroticism and BPD, finding that it also differentiated the best between BPD and other personality disorders. The authors found that the domains of the FFM were strong predictors of dysphoria and social functioning outcomes. However, they reported that impulsive actions, such as episodes

of self-mutilation and number of suicide attempts were not fully captured by the FFM domains. Again, these authors only examined the domains of the FFM to describe BPD. Examining the facet-level predictions may yield a more accurate depiction of the BPD construct. Most recently, Trull, Widiger, Lynam, and Costa (2003) examined the validity of the FFM BPD prototypes across two clinical samples and one sample of undergraduate students. The authors reported that the FFM borderline index correlated highly with other measures of BPD. The FFM borderline index also discriminated between BPD and measures of avoidant personality disorder and antisocial personality disorder better than more traditional measures of BPD. This index demonstrated strong criterion validity; it was significantly associated with measures of poor global functioning, interpersonal dysfunction, and higher likelihood of experiencing childhood physical and sexual abuse, paternal substance abuse disorders, and maternal mood disorders. This work provides initial support for the validity of the FFM BPD prototype.

Antisocial personality disorder and the FFM. Antisocial personality disorder (ASPD) is characterized by impulsivity, repeatedly violating others' rights, and engaging in criminal behavior. Additionally, the presence of conduct disorder prior to age 15 is required for one to meet criteria for this disorder (APA, 2000; see Table 3). Three studies have specifically examined the ability of the FFM to describe antisocial personality disorder symptoms or the related construct, psychopathy (Miller & Lynam, 2003; Miller, Lynam, & Leukefeld, 2003; Miller, Lynam, Widiger, & Leukefeld, 2001). Miller et al. (2003) examined the relationship between specific FFM personality facets and several self-report measures of antisocial behavior, including aggression, conduct problems, onset of conduct problems, and antisocial personality disorder symptoms in a community

Table 3. *DSM-IV-TR* diagnostic criteria for antisocial personality disorder

Antisocial Personality Disorder DSM-IV-TR Criteria

A. There is a pervasive pattern of disregard for and violation of the rights of others occurring since age 15 years, as indicated by three (or more) of the following:

   (1) failure to conform to social norms with respect to lawful behaviors as indicated by repeatedly performing acts that are grounds for arrest

   (2) deceitfulness, as indicated by repeated lying, use of aliases, or conning others for personal profit or pleasure

   (3) impulsivity or failure to plan ahead

   (4) irritability and aggressiveness, as indicated by repeated physical fights or assaults

   (5) reckless disregard for safety of self or others

   (6) consistent irresponsibility, as indicated by repeated failure to sustain consistent work behavior or honor financial obligations

   (7) lack of remorse, as indicated by being indifferent to or rationalizing having hurt, mistreated, or stolen from another

B. The individual is at least 18 years of age.

C. There is evidence of Conduct Disorder with onset before age 15 years.

D. The occurrence of antisocial behavior is not exclusively during the course of Schizophrenia or a Manic Episode.

sample of 481 young adults. Based on previous work, Agreeableness, Conscientiousness, and Neuroticism facets were hypothesized to be related to the antisocial behavior outcome variables. For the domain of Neuroticism, angry hostility was the facet most strongly correlated to the outcome variables. The domain of Agreeableness showed the strongest relation, with 4 out of the 6 facets significantly correlating with all of the outcome variables (i.e., trust, straightforwardness, altruism, and compliance). Finally, for the domain of Conscientiousness, the deliberation facet demonstrated the strongest correlation with the antisocial behavior outcome variables. In order to illustrate which facets uniquely contributed to the antisocial behavior construct, the authors performed hierarchical regression analyses with those facets that were demonstrated to be correlates of the outcome variables. The results of these analyses showed that low straightforwardness, low compliance, and low deliberation consistently and uniquely predicted antisocial behaviors.

Miller et al. (2001) investigated the ability of the FFM to characterize psychopathy using the same community sample mentioned previously. Psychopathy can be characterized by traits such as manipulativeness, superficial charm, lack of remorse, irresponsibility, egocentricity, lack of empathy, and shallow affect (Cleckley, 1988). The behavioral disinhibition that is characteristic of antisocial personality disorder is also a hallmark of this construct (Harpur, Hart, & Hare, 2002). Miller et al. (2001) first calculated a Psychopathy Resemblance Index (PRI) that was used in later analyses. The PRI was developed by evaluating the similarity between the average of the 15 expert ratings of the FFM psychopath profile with each participant's score on the NEO-PI-R. This prototype corresponded with Widiger and Lynam's (1998) predictions as to which

FFM facets would best capture the psychopath construct. Generally, the FFM psychopath profile is low in all Agreeableness facets, many Conscientiousness facets (i.e., dutifulness, self-discipline, deliberation), several facets of Neuroticism (i.e., anxiety, depression, self-consciousness, vulnerability), and one Openness to Experience (openness to feelings). The profile also reveals that the psychopath is high on one facet of Neuroticism (impulsiveness), one facet of Openness to Experience (actions), one facet of Conscientiousness (competence), and two facets of Extraversion (assertiveness and excitement-seeking). Initial validity of this prototype was provided when the authors demonstrated that the PRI was positively correlated with total number of ASPD symptoms, symptoms of alcohol abuse and dependence, and a self-report measure of psychopathy. Additionally, the PRI was negatively associated with the number of internalizing disorder symptoms, (i.e., generalized anxiety disorder, depressive disorder, and social phobia), demonstrating discriminant validity.

Miller and Lynam (2003) replicated these results in a sample of 211 undergraduate students. They reported that the PRI was positively related to externalizing problems, such as amount of alcohol used in the past year, risky sexual behavior, aggressive behavior, and variety of property crimes. Additionally, they provided further validation of the psychopath FFM profile by demonstrating the positive relation between the PRI and laboratory measures of aggression and impulsivity. To demonstrate that the pattern of results that emerged was specifically due to the psychopath construct and not due to general personality dysfuntion, the relationship between the measured variables and the FFM dependent personality disorder (DPD) profile was examined. An opposite pattern of relationships emerged between the FFM

DPD profile and the examined variables than was observed with the PRI. These results provide evidence in support of the specificity of the PRI. The PRI also demonstrated incremental validity by accounting for additional variance in the measures of externalizing problems, aggression, and impulsivity when controlling for previous criminal and deviant behavior.

The current study

This study aims to further extend the FFM personality disorder research using expert-generated prototypes of BPD and ASPD. The procedure for obtaining the specific BPD and ASPD index will be modeled after the Miller et al. (2001) and Trull et al. (2003) method for compiling a psychopathy and BPD FFM profile, respectively. The FFM BPD and ASPD prototype reported by Lynam and Widiger (2001) will be matched against an individual's NEO-PI-R profile to yield a similarity score, i.e., an intra-class correlation coefficient. These similarity indexes will then be used as a FFM measure of BPD and ASPD. The main aim of this study is to demonstrate the predictive validity of the BPD and ASPD FFM profiles. By employing this innovative assessment technique, this study will connect the measurement of general personality to that of personality disorder nosology.

Specifically, it is expected that these indexes will uniquely predict health behaviors, disinhibitory behaviors, and measures of psychopathology in meaningful ways over a six-year period in a large community sample. This study will provide several unique contributions. Primarily, this study will be the first to examine the validity of these profiles over such a long period of time. This is an important aspect of construct validity for personality disorders. One of the defining characteristics of personality

disorders is that they are *enduring* patterns of perceiving and behaving. Therefore, it is important to show that these profiles predict expected outcomes several years after the initial assessment period before fully embracing a FFM conceptualization of personality disorders.

Second, this will be the first study to examine the incremental validity of the ASPD and BPD profiles. It will be assessed whether BPD and ASPD FFM profiles predict outcomes of interest even after controlling for Cluster A (i.e., Schizoid (SDPD), Paranoid (PPD), and Schizotypal (SLPD)) and Cluster C (i.e., Avoidant (AVPD), Dependent (DPD), and Obsessive-Compulsive (OCPD)) FFM personality disorder profiles. After demonstrating specificity at the cluster level, it is predicted that the BPD and ASPD FFM profiles will predict health behaviors and substance use variables after controlling for other Cluster B (i.e., Borderline (BPD), Antisocial (ASPD), Histrionic (HPD), and Narcissistic (NPD)) personality disorders. Lastly, it is expected that ASPD and BPD profiles will uniquely predict measures of psychopathology in meaningful ways. By controlling for other FFM personality disorder profiles, this study will demonstrate that the BPD and ASPD FFM profiles are specific in their prediction of these variables and that the variance explained cannot be better accounted for by personality pathology in general.

Third, the large size of this sample allows this study to test for potential moderating effects of age group and sex on the relationships between ASPD and BPD profiles and outcomes of interest. The sample will be divided into three groups based on age at the initial assessment to examine cohort effects: (1) participants aged 18-45, (2) participants aged 46-64, (3) and participants aged 65 and older (i.e., 65-89). Age was

divided in this way to make the number of participants relatively equal across groups. Additionally, separating the variable into these three groups roughly maps onto stages of adult development (e.g., Erikson, 1975; Levinson, 1978). This is the first study that will examine cohort effects on the validity of this assessment technique. The relationship that sex has with the personality disorders (pd) profiles and outcome measures will also be assessed. Specifically, the potential moderating effect of sex will be examined in the regression analyses.

Lastly, this study also aims to demonstrate the stability of the personality profiles over time. The NEO-PI-R scores will be correlated with personality scores from a similar measure (HEXACO Personality Inventory; Lee & Ashton, 2004) that was administered 9 years later. The inclusion of these analyses will address the question of whether or not changes in personality trait scores over time could account for the findings. For example, is the lack of relationship between the BPD FFM score and substance use variables 3 years later due to changes in personality traits over time?

The results from this study will extend previous research on the validity of the FFM dimensional personality disorder classification system. Demonstrating validity for this assessment technique will have implications for the conceptualization, assessment, and treatment of personality disorders.

Hypotheses

Convergent validity. It is hypothesized that the FFM BPD and ASPD indexes will be related in meaningful ways to three classes of variables: health behaviors, disinhibitory behaviors, and measures of psychopathology. First, it is hypothesized that the FFM borderline and antisocial indexes will be negatively correlated to a measure of

health-related risk avoidance. In this study, risk avoidance measures an individual's tendency to be cautious and avoid situations that might be dangerous to one's health. It includes items such as driving after drinking, wearing a seatbelt, and obeying traffic signals when crossing the street. Risk avoidance can be conceptualized as a dimensional construct with compulsivity and impulsivity at either end (Hollander, 1998). Impulsivity is a core feature of both BPD and ASPD (e.g., Siever & Davis, 1991). Thus, these profiles should be negatively associated with a measure of risk avoidance.

Since both BPD and ASPD are associated with high levels of impulsiveness, it is also expected that these disorders will be related to items assessing disinhibitory behaviors, i.e., alcohol and drug use and gambling behavior. The personality trait of impulsiveness has been implicated as one pathway between these personality disorders and alcohol and drug abuse / dependence (e.g., Bornovalova, Lejuez, Daughters, Rosenthal, & Lynch, 2005; Lynam, Leukefeld, & Clayton, 2003). Substance use disorders occur frequently in people with ASPD and BPD (e.g., Zanarini, et al. 1998; Kanzler & Rosenthal, 2003; Sher & Trull, 1994; Trull, Sher, Minks-Brown, Durbin, & Burr, 2000). Trull et al. (2000) performed a review of 17 studies published from 1987 to 1997 and concluded that 57.4% of individuals diagnosed with BPD also met diagnostic criteria for a substance use disorder. In the National Comorbidity Survey, 80% of participants with a diagnosis of ASPD also met criteria for a lifetime substance use disorder (Kessler et al., 1996).

Gambling is another disinhibitory behavior that is hypothesized to be related to ASPD and BPD FFM profiles. Researchers have consistently found that the rate of ASPD among individuals with a history of problem gambling is considerably higher than

the rate of ASPD in the general population (e.g., Petry, Stinson, & Grant, 2005; Slutske et al., 2001). Although no study has yet investigated the prevalence rate of problem gambling in individuals with a diagnosis of BPD, one of the hallmark features of this disorder is engaging in impulsive behaviors, such as gambling (APA, 2000). One reason that individuals with BPD might have difficulty inhibiting responding toward impulsive stimuli is their impaired decision-making abilities (Bazanis et al., 2002). Bazanis et al. (2002) designed an experimental manipulation that required participants to "gamble" on their accuracy of a previous decision to compare the decision-making ability of individuals with BPD to normal controls. Patients with BPD were characterized as responding in an impulsive manner when gambling on the outcome of their decision.

Lastly, these profiles should be related to measures of psychopathology. Specifically, the BPD FFM profile is expected to be positively related to another measure of borderline personality disorder organization and depression. Borderline personality organization is related to the DSM-IV conceptualization of BPD. Borderline personality organization was defined by three main features: identity diffusion, primitive defense operations, and intact reality testing (Kernberg, 1984). These features are related to the intrapersonal, interpersonal, and behavioral dyfunction that characterizes BPD. Additionally, affective instability is a defining feature of BPD (APA, 2000). Given that individuals with BPD are prone to experience dysphoric mood states, it is not surprising that this disorder frequently co-occurs with major depressive disorder (see Gunderson & Phillips, 1991 for a review). For example, in a longitudinal clinical sample, 70.9% of participants with a diagnosis of BPD also met criteria for lifetime diagnosis of major depressive disorder (McGlashan et al., 2000).

It is expected that the ASPD FFM prototype will have a different pattern of associations to measures of psychopathology than the BPD index. Specifically, it is hypothesized that the ASPD index is related to the measure of psychopathy. Psychopathy is defined as a particular constellation of affective, interpersonal, and behavioral characteristics. These include narcissism, impulsiveness, shallow emotions, lack of empathy, manipulativeness, and consistent infringement on the rights of others (Cleckley, 1988). The behavioral dimension of psychopathy, including engaging in disinhibitory behaviors and violating the rights of others, has much overlap with the DSM-IV criteria for ASPD. Since ASPD and BPD are related constructs, it is expected that the ASPD FFM prototype score should be somewhat related to the borderline personality measure and that the BPD FFM prototype score should be somewhat related to the measure of psychopathy. However, each FFM prototype score should be more strongly related to the respective measure of personality dysfunction.

Depression will serve to test the discriminant validity of the ASPD FFM index. It is hypothesized that the ASPD profile will have no relation to depression. Antisocial personality disorder has a low rate of co-occurrence with depressive disorders in the general population when compared to the comorbidity rates of other personality disorders (e.g., Grant et al., 2005). Additionally, in a clinical sample of males with either BPD or ASPD diagnoses, rates of major depressive disorder were higher for the BPD group (Hatzitaskos, Soldatos, Sakkas, & Stefanis, 1997).

Furthermore, the BPD and ASPD FFM profiles are expected to be related to the convergent validity variables above and beyond other FFM personality disorder profiles. This will be the first known study examining the ability of the BPD and ASPD profiles to

uniquely predict related constructs above and beyond other personality pathology. The potential moderating effects of sex and cohort will be examined on the relationship between the personality disorder profile and outcome variable of interest.

Discriminant validity. In contrast, the FFM borderline and antisocial indexes are not expected to be associated with measures of good health practices or health concerns. The good health practices construct includes items relating to eating a balanced diet, taking vitamins, and using dental floss regularly. The health concerns construct includes items relating to discussing health concerns with friends and family and gathering health-related information. BPD and ASPD FFM profiles are not expected to be related to ordinary activities, such as frequency of chewing gum, frequency of going to a public library, and frequency of going to a street fair or outdoor market. Additionally, these indexes will not be related to time spent reading newspapers, books, or magazines. Lastly, these indexes are not expected to be related to preferences for leisure activities, including preference for country music, pop music, and non-fiction reading material.

METHOD

Participants and Procedures

All participants were from the Eugene-Springfield Community Sample, which was recruited by mail solicitation in 1993 from a list of homeowners in Oregon (see Goldberg & Strycker, 2002). Subjects agreed to participate in this study for at least 5 to 10 years. At time of recruitment, the participants' ages ranged from 18 to 89 years, with a median of 49; 57% were women. At the time of recruitment, 25.2% of the sample was in the 18-45 year-old category, 50.8% in the 46-64 year-old category, and 23.9% in the 65 year-old and older category. Over a period of 10 years, participants completed measures of personality, health practices, and other behavioral acts (e.g., drug use). Each questionnaire was sent separately by mail to the research participants, and they returned their completed questionnaires in preaddressed postage-paid envelopes.

In 2003, 757 participants had completed two of the previous four surveys (88% retention rate over the 10-year period). The present data are based on the original sample, but because some participants did not complete some of the questionnaires, sample sizes for the analyses reported below range from 636 to 857. Based on the participant's responses in 1993 regarding highest level of educational achievement, 1.2% reported not graduating from high school, 8.9% reported graduating from high school, 28.0% reported attending some college, 20.7% reported graduating from college, 11.3% reported receiving some post-college education, and 23.9% reported earning a post-college degree. In response to questions about marital status in 1999, 76.6% of this current sample reported being married, 8.3% reported being divorced, and 8.2% reported

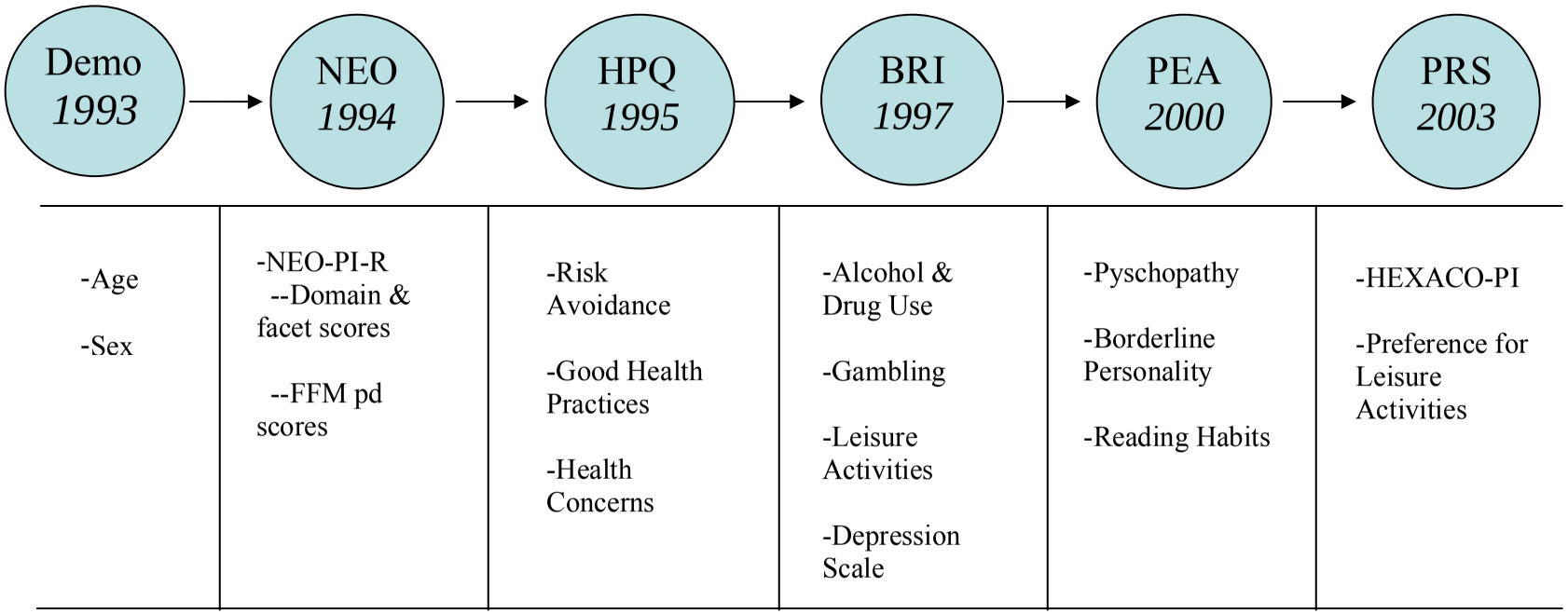
being widowed. In 1999 respondents also completed questions regarding current employment, and 44% of respondents indicated they were working full-time, 32% indicated they were retired, 16% were working part-time, and 9% were homemakers.

Measures

Revised NEO Personality Inventory. The Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992) is a self-report measure that assesses the personality traits of the FFM. It consists of 240 statements for which participants rate their level of agreement on a 5-point scale, with 1 indicating *strongly agree* and 5 indicating *strongly disagree*. Each of the five broad domains is divided into six facets and each facet is assessed by eight items. Costa and McCrae (1992) reported on the large amount of data supporting the reliability and validity of this instrument. This measure was administered to this sample in the summer of 1994. See Figure 1 for the timeline of administration of questionnaires assessing constructs of interest.

FFM personality disorder similarity scores. Similarity scores for BPD and ASPD will be calculated using intraclass correlations (ICCs) between participants' obtained NEO-PI-R facet scale scores and the expert-generated facet profiles of the BPD and ASPD prototypes (see Table 1), as described by Lynam and Widiger (2001). These researchers compiled expert ratings of the prototypical patient for each personality disorder. This resulted in a prototypic facet profile. The average interrater correlation, which is the average correlation of one rater's profile with every other profile, ranged from 0.48 for schizotypal personality disorder to 0.66 for obsessive compulsive personality disorder. The average interrater correlation was 0.53 and 0.65 for BPD and

Figure 1. Timeline of Data Collection



ASPD, respectively. This prototypic facet profile will be matched with subjects' actual facet profile to yield an obtained facet profile. An intraclass correlation will be used to calculate the obtained facet profile because this statistic considers both the shape and the elevation of individual scores, not just the shape as does the Pearson correlation. Thus, this provides a more rigorous assessment of agreement on exact-ratings. Additionally, similarity scores for the 8 additional DSM-IV personality disorders will be calculated in order to control for general personality pathology (See Appendix 1 for these FFM ratings). [1]

Health Practices Questionnaire. The Health Practices Questionnaire (HPQ) was administered in the spring of 1995 and included 39 items from earlier health-related

[1] Subsequent to the proposal of this project, another methodology was developed to assess the FFM personality disorder profiles (Miller, Bagby, Pilkonis, Reynolds, & Lynam, 2005). This technique uses the simple sum of selected FFM facets identified by the Lynam and Widiger (2001) ratings for each personality disorder. Facets were deemed prototypically high with a score of ≥ 4 and deemed prototypically low with a score ≤ 2 from the Lynam and Widiger (2001) ratings. After selecting the facets that were considered prototypically high or low for each pd, the prototypically low facets were reverse-scored. Lastly, the selected facets were summed. Miller et al. (2005) compared the validity of this technique to that of the more traditional prototype matching technique and concluded that the correlations between pd symptoms and FFM pd indexes were similar across both scoring methodologies. See Appendix 2 for more information about how to score the FFM pd counts and for results using the FFM pd simple sum technique.

Table 4. Reliability coefficients for composite items

Risk Avoidance (12 items: Alpha = 0.80)	
I carefully obey traffic rules.	I cross busy streets in the middle of the block. (R)
I do not drink.	I take chances crossing the street. (R)
I avoid high crime areas.	I cross the street against the stop light. (R)
I throw away old or unused medicines.	I take more chances doing things than the average person. (R)
I wear a seat belt when in a car.	I drive after drinking. (R)
I speed while driving. (R)*	
I engage in hobbies or activities where accidents are possible. (R)	
Health Concerns (15 items: Alpha = 0.74)	
I gather information on things that affect my health.	I keep emergency numbers near the phone.
I discuss health with friends, neighbors, and relatives.	I have a first-aid kit in my home.
I avoid areas with high pollution.	I take vitamins.
I take health food supplements.	I learn first-aid techniques.
I watch for possible signs of major health problems.	I avoid getting chilled.
I stay away from places where I might be exposed to germs.	I get shots to prevent illness.
I check the condition of gas and electrical appliances to avoid accidents.	I fix broken things around my home right away.
	I choose my spare time activities to help me relax.
Good Health Practices (12 items: Alpha = 0.74)	
I exercise to stay healthy.	I use dental floss regularly.
I eat a balanced diet.	I see a doctor for regular check-ups.
I see a dentist for regular check-ups.	I brush my teeth regularly.
I limit my intake of foods like coffee, sugar, and fats.	I don't take chemical substances that might injure my health.
I watch my weight.	I get enough sleep.
I don't smoke.	I avoid over-the-counter medicines.
Alcohol and Drug Use (14 items: Alpha = 0.89)	
Smoked marijuana.	Became intoxicated.
Drank wine.	Had a hangover.
Drank alcohol during working hours.	Drank in a bar.
Went to a nightclub.	Drank beer.
Drank alcohol or drugs to make myself feel better.	Took a hard drug (for example, cocaine, LSD, or heroin.
Drove a car after having a few alcoholic drinks.	Drank whiskey, vodka, gin, or other hard liquor.
Had an alcoholic drink before breakfast or instead of breakfast.	Tried to stop using alcohol or other drugs.

Table 4 (continued). Reliability coefficients for composite items.

Gambling (3 items: Alpha = 0.69)	
Gambled on a slot machine or video poker game.	Bet money on a game or other event (not cards or dice).
Gambled with cards or dice.	
Psychopathy (24 items: Alpha = 0.81)	
Think that most of my problems are due to the fact that other people just don't understand me.	I believe that success is based on survival of the fittest, and I am not concerned about the losers.
Quickly lose interest in the tasks I start.	Tell other people what they want to hear so that they will do what I want.
Admire a really clever scam.	Even if I were trying to sell something, I wouldn't lie about it. (R)
Believe that cheating is wrong because it is unfair to others. (R)	In today's world, I feel justified in doing anything that I can get away with.
Find myself in the same kind of trouble, time after time.	Looking out for myself is my top priority.
Don't plan anything very far in advance.	When I get frustrated, I often let off steam by blowing my top.
Am often bored.	Making a lot of money is my most important goal.
Enjoy manipulating other people's feelings.	For me, what's right is whatever I can get away with.
Find that I am able to pursue one goal for a long time. (R)	I let others worry about higher values – my main concern is the bottom line.
Make a point of trying not to hurt others in pursuit of my goals. (R)	Would be upset if my success came at someone else's expense. (R)
Feel badly if my words or actions cause someone else to feel badly. (R)	
Get in shouting matches with other people.	
Think that love is overrated.	
Think that people who are stupid enough to get ripped off deserve it.	
Borderline Personality Inventory (47 items: Alpha = 0.89)	
Experience panic spells.	Steal things.
Have the feeling of being directed or controlled from outside.	Find it difficult to tell whether something really happened.
Feel a special sense of destiny or prophecy.	Waste money, or lose it gambling.
Have attacked someone physically.	Feel a sense of worthlessness or hopelessness.
Act or feel in a way that does not fit me.	Feel a sense of not being real.
Have frightening dreams.	Act spontaneously without thinking about the consequences.
Often have the feeling that others laugh or talk about me.	Am unsure about questions concerning politics and religion.
Have felt the presence of another person when he was not there.	Hear voices talking about me when nobody is really there.
Have had the feeling that my thoughts were audible.	Have murderous ideas.
Wonder who I really am.	

Table 4 (continued). Reliability coefficients for composite items.

Don't know what I really want.	If a relationship gets close, I feel trapped.
Have had the feeling that people have injected thoughts.	Recently there has been something that affected me emotionally.
Take risks that could cause trouble for me.	Feel guilty as if I had committed a crime, although I did not.
Get in trouble with the law.	People often appear to me to be hostile.
Feel that other people are out to get me.	My body or parts of my body seem strange or somehow changed.
Feel smothered when others show deep concern for me.	If a relationship becomes too close, I break them off.
Have intentionally done myself physical harm.	Another person appears inside me that does not belong to me.
Feel that people or things change in their appearance.	In romantic relationships, I am often uncertain about the kind of relationship I want.
See strange figures or visions when nothing is really there.	My feelings towards other people quickly change into opposite extremes (for example, from love and admiration to hate and disappointment).
Have had intense religious experiences.	In close relationships, I am hurt again and again.
Believe that I have a serious disease.	Feel that my body is dissolving.
Enjoy having control over someone.	Feel like I am "falling apart."
Feel that people and things around me are not real.	
Feel that I am living in a dream.	
Feel that I am someone special.	
Experience pangs of hunger that cause me to devour everything.	
Depression (24 items: Alpha = 0.93)	
Was bothered by things that usually don't bother me.	Had restless sleep.
Had a poor appetite.	Felt sad.
Felt that I could not shake off the blues, even with help from my family.	Felt happy. (R)
Felt that I was just as good as other people. (R)	Felt lonely.
Did not feel like eating, even though I should have been hungry.	Enjoyed life. (R)
Had trouble keeping my mind on what I was doing.	Was told that I wasn't acting like myself.
Felt depressed.	Could not get going.
Felt that everything I did was an effort.	Felt fearful.
Felt hopeful about the future. (R)	Felt that people disliked me.
Thought that my life had been a failure.	Had thoughts about death.
	Talked less than usual.
	Had crying spells.
	Was down in the dumps.
	Thought about killing myself.

* (R) indicates that the item was reverse-scored.

inventories. Goldberg (2005) reported a clear three-factor structure: (1) *Risk Avoidance* (10 items [e.g., I cross busy streets in the middle of the block]); (2) *Good Health Practices* (12 items [e.g., I eat a balanced diet]); (3) *Health Concerns* (15 items [e.g., I gather information on things that affect my health]). This questionnaire asks participants to rate on a 5-point scale how typical these behaviors are with a 1 indicating *not at all like me* and a 5 indicating *very much like me*. Table 4 presents the specific items included in each of these scales and its coefficient alpha reliability estimate. The coefficient alpha reliability estimate was 0.74 for *Good Health Practices* and *Health Concerns* and it was 0.80 for *Risk Avoidance*.

Behavioral Report Inventory. The Behavioral Report Inventory (BRI) included activity descriptions to which each of the participants indicated its frequency of occurrence in the past year on a 5-point scale with the following response options: (1) Never in my life. (2) Not in the past year. (3) Once or twice in the past year. (4) Three or more times in the past year, but not more often than 15 times (such as once or twice a month). (5) More than 15 times in the past year. Items of interest to this study include the frequency with which participants indicated that they used alcohol or other drugs. The alcohol and drug use variable was created by combining 14 items that assess alcohol and drug use into a composite score (Grucza & Goldberg, unpublished manuscript). Table 4 presents the specific behaviors included in the alcohol and drug use variable and the coefficient alpha reliability estimate which was 0.89 for alcohol and drug use. Three items were combined to create a variable assessing the frequency of gambling behavior. The coefficient alpha reliability estimate for this variable was 0.69 (see Table 4).

The BRI survey also included a measure of depressive symptoms. The *Center for Epidemiological Studies Depression Scale* (CES-D; Radloff, 1977) is a 24-item measure assessing depressive symptoms for the past week. It has been widely used as a screener for major depressive disorder and was designed to estimate prevalence rates of depression in the general population (Devins, et al., 1988). The coefficient alpha reliability estimate was 0.93.

Other items of interest from this measure include those that assess ordinary life activities. Items were chosen that were hypothesized to have no relation to ASPD or BPD and that had variance to predict. For example, although TV watching should have no relation to ASPD or BPD, the frequency of watching television was not chosen as an outcome variable because the vast majority of participants rated this item with the response option "5," indicating that they had engaged in the activity 15 or more times in the past year. The following three items were chosen as ordinary life activities: (1) Chewed gum. (2) Went to the public library. (3) Went to a street fair or outdoor market.

Personality, Emotions, and Attitudes Survey. The Personality, Emotions, and Attitudes Survey (PEA) was administered in the spring of 2000 and included several measures of psychopathology and an item assessing reading frequency that are relevant to this study. Two measures of psychopathology were administered in the PEA survey:

(1) *Borderline personality inventory* (BPI; Leichsenring, 1999). The BPI consists of 47 statements for which participants rate their level of agreement on a 5-point scale, with 1 indicating *very inaccurate* and 5 indicating *very accuarate*. This measure was developed to assess Kernberg's (1984) theory of borderline personality organization. In

the initial study on the development of this measure, the author demonstrated that it could identify patients using Kernberg's theory of borderline personality organization with measures of sensitivity ranging from 0.85 to 0.89 and measures of specificity ranging from 0.78 to 0.89 (Leichsenring, 1999). In this study the coefficient alpha reliability estimate was 0.89.

(2) *Levenson Self-Report Psychopathy Scale* (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995). This measure consists of 24 items for which participants rate their level of agreement on a 5-point scale, with 1 indicating *very inaccurate* to 5 indicating *very accurate*. This measure was developed to measure psychopathic relational style and has been shown to be correlated with measures of delinquency and to negatively relate to computer tasks measuring passive avoidance (Lynam, Whiteside, & Jones, 1999). The coefficient alpha reliability estimate was 0.80 in this study.

Personal Reactions Survey. The Personal Reactions Survey (PRS) included two sections that are relevant to this study: (1) the *HEXACO Personality Inventory* and (2) preference ratings for *pop music*, *country music*, and *nonfiction reading material*. The HEXACO Personality Inventory consists of 192 statements for which participants rate their level of agreement on a 5-point scale, with 1 indicating *strongly disagree* and 5 indicating *strongly agree*. Five of these personality dimensions are conceptually related to the FFM assessed by the NEO-PI-R. Participants also indicated their preferences for country music, pop music and non-fiction reading materials on a 7-point scale with a score of 1 indicating *strongly dislike* and 7 indicating *like strongly.* This questionnaire was administered in 2003.

Statistical Analyses

Correlational Analyses. A series of correlational analyses was conducted first. Specifically, correlations were computed to assess the bivariate relationhip between ASPD and BPD FFM indexes and all outcome variables. Appendix 3 provides the correlation coefficients between the personality disorders of interest and the convergent validity items by sex and cohort. Additionally, to assess the stability of personality scores, correlations were computed between NEO-PI-R scores and HEXACO scores. This analysis will address the possibility that the findings were due to a change in personality trait scores. Correlational analyses between the NEO-PI-R and HEXACO were also conducted by sex and by age group.

Regression Analyses. A series of regressions were performed where the FFM index served as the predictor variable and risk avoidance, disinhibitory behaviors, and measures of psychopathology were the outcome variables. These analyses were run for the FFM ASPD and BPD index separately. Then, to test specificity, Cluster A and Cluster C FFM personality disorder indexes were entered first to control for a general personality pathology accounting for the variance explained in the outcome variables. After demonstrating this level of specificity, all other FFM personality disorder indexes were entered before ASPD and BPD prototype scores. Sex and cohort were controlled for in all equations. To examine the effects of age group and sex on the relationships of interest, two sets of dummy variables were created. The interaction of the dummy variables with the pd prototype score was then tested to reveal any potential moderating effects.

RESULTS

Prior to analyses, all FFM pd prototype scores and dependent variables were examined through various SPSS programs for accuracy of data entry, missing values, and fit between their distributions and the assumptions of multiple regression analysis. To improve linearity and to reduce the extreme skewness and kurtosis, two variables were logarithmically transformed: (1) depression total and (2) borderline personality inventory.

Descriptive Statistics

Table 5 presents descriptive statistics for the FFM pd prototype scores. (This table also contains acronyms for the personality disorders.) The mean score is also reported by sex (Table 6). Differences in mean scores between males and females were found for the following prototypes: PPD, SDPD, ASPD, NPD, AVPD, and DPD. Mean scores for males were higher for all prototypes except AVPD and DPD. Planned comparisons were conducted between cohort and FFM pd prototype score. The mean score for the FFM pd prototype scores is also presented by cohort (Table 7). The three cohorts are divided by age at initial assessment period: 18-45, 46-64, and 65 and older. The means for five FFM pd prototype scores were (1) higher for cohort 1 than for cohort 3 and (2) higher for cohort 2 than for cohort 3: PPD, ASPD, BPD, HPD, and NPD. The mean of the BPD prototype score was higher for cohort 1 when compared to cohort 2. For the SDPD prototype score, the mean for cohort 3 was higher when compared with the mean score for cohort 1 and when compared with the mean score for cohort 2. The means of OCPD and DPD were higher for cohort 3 than for cohorts 1 and 2.

Table 5. Descriptive statistics for FFM PD prototype scores (*n* = 857)

Personality Disorder	**Mean (*SD*)**	**Range**	**Skewness**	**Kurtosis**
Paranoid (PPD)	-0.34 (0.23)	-0.82 – 0.48	0.75	0.55
Schizoid (SDPD)	-0.28 (0.21)	-0.75 – 0.45	0.51	0.02
Schizotypal (SLPD)	-0.33 (0.24)	-0.77 – 0.55	0.86	0.46
Antisocial (ASPD)	-0.37 (0.19)	-0.83 – 0.20	0.41	0.09
Borderline (BPD)	-0.40 (0.27)	-0.88 – 0.65	0.94	0.51
Histrionic (HPD)	-0.18 (0.24	-0.80 – 0.62	0.17	-0.29
Narcisstic (NPD)	-0.32 (0.20)	-0.80 – 0.36	0.37	-0.05
Avoidant (AVPD)	-0.12 (0.25)	-0.68 – 0.76	0.55	0.10
Dependent (DPD)	0.04 (0.24)	-0.66 – 0.69	0.14	-0.44
Obsessive-Compulsive (OCPD)	0.04 (0.25)	-0.71 – 0.76	-0.04	-0.28

Note: Higher scores indicate a closer match to the expert prototype scores.

Table 6. Descriptive statistics for FFM PD prototype scores by sex

Variable	**Men (*n*=378) Mean (*SD*)**	**Women (*n*=478) Mean (*SD*)**	**Total Sample (*n*=857) Mean (*SD*)**
Paranoid (PPD)*	-0.29 (0.22)	-0.39 (0.22)	-0.34 (0.23)
Schizoid (SDPD)	-0.26 (0.21)	-0.29 (0.21)	-0.28 (0.21)
Schizotypal (SLPD)	-0.32 (0.24)	-0.33 (0.24)	-0.33 (0.24)
Antisocial (ASPD)*	-0.31 (0.19)	-0.41 (0.17)	-0.37 (0.19)
Borderline (BPD)	-0.38 (0.28)	-0.41 (0.26)	-0.40 (0.27)
Histrionic (HPD)	-0.17 (0.23)	-0.19 (0.25)	-0.18 (0.24)
Narcissistic (NPD)*	-0.26 (0.20)	-0.38 (0.18)	-0.32 (0.20)
Avoidant (AVPD)*	-0.15 (0.24)	-0.10 (0.26)	-0.12 (0.25)
Dependent (DPD)*	-0.02 (0.23)	0.09 (0.23)	0.04 (0.24)
Obsessive-Compulsive (OCPD)	0.05 (0.23)	0.03 (0.26)	0.04 (0.25)

* Mean is significantly different by sex

Table 7. Descriptive statistics for FFM PD prototype scores by cohort

Variable	**Cohort1 (*n*=194) Mean (*SD*)**	**Cohort2 (*n*=430) Mean (*SD*)**	**Cohort3 (*n*=232) Mean (*SD*)**
Paranoid (PPD)	-0.31 (0.26)	-0.34 (0.22)	-0.38 (0.20)
Schizoid (SDPD)	-0.32 (0.21)	-0.28 (0.22)	-0.25 (0.19)
Schizotypal (SLPD)	-0.32 (0.26)	-0.32 (0.24)	-0.35 (0.23)
Antisocial (ASPD)	-0.33 (0.18)	-0.35 (0.19)	-0.42 (0.17)
Borderline (BPD)	-0.33 (0.30)	-0.38 (0.26)	-0.49 (0.23)
Histrionic (HPD)	-0.16 (0.24)	-0.17 (0.25)	-0.23 (0.22)
Narcissistic (NPD)	-0.30 (0.19)	-0.31 (0.20)	-0.37 (0.18)
Avoidant (AVPD)	-0.13 (0.26)	-0.13 (0.26)	-0.11 (0.23)
Dependent (DPD)	0.02 (0.24)	0.02 (0.24)	0.10 (0.23)
Obsessive-Compulsive (OCPD)	0.01 (0.25)	0.03 (0.25)	0.07 (0.24)

Table 8 provides descriptive statistics for each dependent variable. Descriptive statistics are also presented for each dependent variable by sex (Table 9). On average, males scored higher than females on the following variables of interest: drug and alcohol use, gambling, and psychopathy. Females scored higher on average when compared to males on risk avoidance and depression. These statistics are also presented for each cohort (Table 10). The mean of cohort 1 scores were higher when compared to cohort 3 scores for the following variables: borderline personality inventory, gambling behavior, and alcohol and drug use. The mean of alcohol and drug use for cohort 2 was higher when compared to cohort 3. The mean of risk avoidance was higher for cohort 3 when compared to cohort 2 and when compared to cohort 1. Lastly, descriptive statistics for the personality measures, NEO-PI-R and HEXACO-PI scales, are presented in Table 11.

Correlational Analyses

The bivariate relationship between all the FFM pd prototype scores is presented in Table 12. The ASPD FFM prototype score had a strong positive relationship with other cluster B personality disorders, BPD, HPD, and NPD. This score had a strong negative association with cluster C personality disorders, AVPD, DPD, and OCPD. The ASPD prototype score had a weaker association with cluster A personality disorder scores. The BPD FFM prototype score was less consistent in its' relationship to the personality disorder scores. Specifically, the BPD score was strongly correlated with SLPD, ASPD and HPD scores, r's = 0.60, 0.59, and 0.50, respectively. The BPD FFM prototype score also had a strong negative association with the OCPD score.

Table 8. Descriptive statistics for each dependent variable

Variable	*n*	Mean (*SD*)	Range	Skewness	Kurtosis
Health Practices					
Risk Avoidance	706	45.37 (7.50)	19 – 60	-0.48	-0.10
Good Health Practices	706	50.84 (8.03)	24 – 74	-0.07	-0.00
Health Concerns	706	45.72 (6.89)	23 – 59	-0.48	0.03
Disinhibitory Behaviors					
Alcohol & Drug Use	736	25.82 (7.60)	12 – 50	0.29	-0.33
Gambling	778	8.18 (2.70)	4 – 19	0.67	0.35
Psychopathology Measures					
Psychopathy Scale Total	729	43.97 (9.98)	24 – 79	0.54	0.06
Borderline Personality Inventory Total	694	80.53 (18.76)	48 – 162	1.15	1.73
(log of) Borderline Personality Inventory Total	694	1.90 (0.09)	1.68 – 2.21	0.47	0.13
Depression Scale Total	752	40.93 (13.47)	24 – 98	1.40	2.09
(log of) Depression Scale Total	752	1.59 (0.13)	1.38 – 1.99	0.65	-0.07
Leisure Activities and Interests					
Chewed gum	776	3.57 (1.19)	1 – 5	-0.12	-1.43
Went to a street fair / outdoor market	776	3.15 (0.81)	1 – 5	0.01	-0.76
Went to a public library	776	3.21 (1.09)	1 – 5	0.24	-1.22
Reading frequency	730	22.37 (4.46)	9 – 35	0.03	-0.08
Pop music	712	5.03 (1.34)	1 – 7	-0.79	0.40
Country music	731	4.70 (1.82)	1 – 7	-0.59	-0.84
Nonfiction reading	719	5.42 (1.24)	1 – 7	-0.90	0.97

Table 9. Descriptive statistics for dependent variables by sex

Variable	Males (*n*=303-327) Mean (*SD*)	Females (*n*=402-449) Mean (*SD*)	Total (*n*=694-776) Mean (*SD*)
Health Practices			
Risk avoidance	42.31 (7.32)	47.66 (6.78)	45.36 (7.50)
Good health practices	48.96 (8.17)	52.26 (7.63)	50.85 (8.03)
Health concerns	44.26 (6.84)	46.82 (6.73)	45.72 (6.89)
Disinhibitory Behaviors			
Alcohol & drug use	28.42 (7.47)	23.92 (7.13)	25.81 (7.60)
Gambling	7.40 (2.48)	5.96 (2.32)	6.56 (2.49)
Psychopathology			
(log of) Depression	1.57 (0.11)	1.60 (0.14)	1.59 (0.13)
Psychopathy	46.54 (10.33)	42.06 (9.23)	43.97 (9.98)
(log of) Borderline personality inventory	1.90 (0.09)	1.89 (0.09)	1.89 (0.09)
Leisure activities and interests			
Chewed gum	3.44 (1.14)	3.67 (1.21)	3.57 (1.19)
Went to a street fair / outdoor market	3.08 (0.75)	3.19 (0.84)	3.15 (0.81)
Went to a public library	3.12 (1.07)	3.27 (1.10)	3.21 (1.09)
Reading frequency	22.46 (4.65)	22.29 (4.54)	22.36 (4.56)
Pop music preference	4.95 (1.32)	5.08 (1.36)	5.03 (1.34)
Country music preference	4.68 (1.75)	4.72 (1.88)	4.70 (1.82)
Nonfiction reading	5.42 (1.20)	5.43 (1.28)	5.42 (1.24)

Table 10. Descriptive statistics for each dependent variable by cohort

	Cohort 1		Cohort 2		Cohort 3	
Variable	***n***	**Mean (*SD*)**	***n***	**Mean (*SD*)**	***n***	**Mean (*SD*)**
Health Practices						
Risk Avoidance	139	43.62 (7.68)	358	44.84 (7.51)	208	47.43 (6.92)
Good Health Practices	139	49.96 (8.24)	358	50.27 (7.82)	208	52.42 (8.07)
Health Concerns	139	43.58 (7.26)	358	44.96 (6.59)	208	48.47 (6.32)
Disinhibitory Behaviors						
Alcohol & Drug Use	148	28.16 (8.84)	387	26.46 (7.42)	201	22.85 (5.91)
Gambling	157	7.01 (2.87)	404	6.54 (2.31)	217	6.30 (2.49)
Psychopathology						
Depression Scale	152	44.56 (15.44)	389	40.15 (13.35)	211	39.77 (11.69)
Log transformed	152	1.63 (0.14)	389	1.58 (0.13)	211	1.58 (0.12)
Psychopathy Scale	160	58.68 (7.42)	376	58.22 (7.16)	193	57.74 (6.88)
Borderline Personality Inventory	155	83.25 (21.01)	360	80.72 (18.80)	179	77.81 (16.18)
Log transformed	155	1.91 (0.10)	360	1.90 (0.10)	179	1.88 (0.09)
Leisure Activities and Interests						
Chewing gum	157	4.25 (0.95)	402	3.57 (1.18)	217	3.08 (1.12)
Went to a street fair or outdoor market	157	3.26 (0.79)	402	3.18 (0.80)	217	2.99 (0.81)
Went to a public library	157	3.33 (1.05)	403	3.20 (1.07)	215	3.13 (1.15)
Reading frequency	162	21.95 (4.59)	376	25.56 (4.45)	192	22.33 (4.35)
Pop music	165	4.48 (1.91)	385	5.09 (1.28)	162	4.90 (1.62)
Country music	165	5.33 (1.31)	392	4.70 (1.87)	174	4.56 (1.41)
Nonfiction reading	162	5.48 (1.18)	388	5.36 (1.32)	169	5.52 (1.10)

Table 11. Descriptive Statistics for personality measures

Scale	Mean (*SD*)	Range	Skewness	Kurtosis
NEO-PI-R Factors (*n* = 857) ***Administered 1993***				
Neuroticism	80.04 (23.19)	16 – 163	0.48	0.36
Extraversion	107.01(19.90)	42 – 166	-0.18	0.09
Openness	113.64 (21.34)	51 – 174	-0.09	-0.06
Agreeableness	124.72 (17.42)	56 – 175	-0.46	0.52
Conscientiousness	123.33 (19.28)	44 – 180	-0.30	0.45
HEXACO-PI Domains* (*n* = 736) ***Administered 2003***				
Honesty-Humility	3.89 (0.46)	2.22 – 5.00	-0.18	-0.07
Emotionality	3.17 (0.46)	1.47 – 4.63	-0.15	0.01
Extraversion	3.22 (0.52)	1.53 – 4.75	-0.18	-0.04
Agreeableness	3.14 (0.47)	1.59 – 4.44	-0.38	0.15
Conscientiousness	3.56 (0.45)	2.00 – 4.75	-0.24	0.26
Openness to Experience	3.43 (0.52)	1.28 – 4.81	-0.22	0.12

* . HEXACO-PI Domain scores are mean facet scores. Each domain has 4 facets. Facets are also calculated as means of the respective items. NEO-PI-R Factors are summed scores.

Table 12. Bivariate correlations between FFM personality disorder scores (n = 857)

	PPD	**SDPD**	**SLPD**	**ASPD**	**BPD**	**HPD**	**NPD**	**AVPD**	**DPD**	**OCPD**
PPD	1.00									
SDPD	0.62**	1.00								
SLPD	0.56**	0.67**	1.00							
ASPD	0.16**	-0.41**	-0.05	1.00						
BPD	0.36**	-0.08*	0.60**	0.59**	1.00					
HPD	-0.44**	-0.75**	-0.19**	0.72**	0.50**	1.00				
NPD	0.28**	-0.35**	-0.18**	0.90**	0.35**	0.55**	1.00			
AVPD	0.52**	0.81**	0.81**	-0.54**	0.20**	-0.63**	-0.58**	1.00		
DPD	-0.09*	0.47**	0.46**	-0.73**	-0.05	-0.43**	-0.88**	0.77**	1.00	
OCPD	0.56**	0.62**	0.01	-0.50**	-0.48**	-0.89**	-0.26**	0.44**	0.20**	1.00

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Table 13 presents the correlations between the dependent variables. Risk avoidance was strongly negatively correlated with drug and alcohol use, r = -0.61. Gambling was also moderately related to risk avoidance and drug and alcohol use. The borderline personality inventory was strongly related to psychopathy and depression scores, r's = 0.64 and 0.46, respectively. The variable health concerns was moderately associated with psychopathy, borderline personality, and health practices. Psychopathy was moderately related to risk avoidance, r = -0.43. Additionally, psychopathy had a small positive relationship to drug and alcohol use, and gambling. Surpisingly, this variable had a small positive correlation with depression, r = 0.26.

FFM pd prototype scores and health practices. The purpose of conducting bivariate correlations between the FFM pd prototype scores and health practices was to test hypotheses that BPD and ASPD scores were (1) negatively associated with risk avoidance and (2) not related to health concerns and good health practices. Table 14(A) presents the correlations between ASPD and BPD indexes and all convergent validity items, while table 14(B) presents their correlations with all discriminant validity items. Table 15 presents the correlations between all FFM personality disorder prototype scores and health practices variables.

First, the correlations between ASPD and BPD scores and risk avoidance will be presented. For the total sample, ASPD and BPD FFM prototype scores were correlated -0.49 and -0.28 with risk avoidance, respectively (see Tables 14 and 15). The correlations between risk BPD and ASPD FFM prototype scores and risk avoidance were also conducted within cohort and sex (see Appendix 3).

Table 13. Bivariate correlations between dependent variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. risk avoidance	1														
2. drug & alcohol	-0.61**	1													
3. gambling	-0.27**	0.35**	1												
4. depression	-0.02	0.04	-0.02	1											
5. psychopathy	-0.43**	0.18**	0.21**	0.26**	1										
6. borderline personality	-0.15**	0.09*	0.11**	0.46**	0.64**	1									
7. health practices	0.40**	-0.23**	-0.16**	-0.01	-0.20**	-0.05	1								
8. health concerns	0.26**	-0.19**	-0.26**	-0.23**	-0.33**	-0.31**	0.40**	1							
9. chewed gum	0.02	0.07	0.14**	0.06	-0.04	0.07	0.10*	-0.03	1						
10. went to a street fair/outdoor market	-0.23**	0.21**	0.07*	-0.06	0.05	-0.07	0.05	0.06	0.07*	1					
11. went to a public library	-0.10*	0.08*	-0.15**	-0.02	-0.11**	-0.04	-0.10*	0.09*	-0.05	0.29**	1				
12. reading frequency	-0.06	0.13**	-0.01	-0.05	0.04	-0.08*	0.06	0.17**	-0.01	0.21**	0.19**	1			
13. country music preference	0.08	-0.08	0.12**	-0.03	0.13**	0.03	0.04	-0.06	-0.01	-0.15**	-0.16**	-0.11**	1		
14. pop music preference	-0.08	0.07	0.16**	-0.04	-0.05	-0.09*	0.05	-0.02	0.16**	0.09*	-0.04	0.02	0.04	1	
15. nonfiction reading preference	-0.08	0.06	0.01	-0.01	-0.14**	-0.04	-0.07	0.10*	0.00	0.09*	0.12**	0.24**	0.03	0.11**	1

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Table 14. Bivariate correlations between FFM personality disorder prototype scores and dependent variables

A. Bivariate correlations with convergent validity items

	Health Practices	Disinhibitory Behaviors		Psychopathology Measures		
Personality Disorder Prototype Score	Risk avoidance (*n*=637)	Alcohol and Drug Use (*n*=653)	Gambling (*n*=653)	Depression (*n*=677)	Psychopathy (*n*=613)	Borderline Personality Inventory (*n*=613)
ASPD	-0.49**	0.40**	0.29**	-0.04	0.40**	0.19**
BPD	-0.28**	0.23**	0.13**	0.36**	0.49**	0.54**

B. Bivariate correlations with discriminant validity items

	Health Practices		Leisure Activities and Interests						
Personality Disorder Prototype Score	Good Health Practices (*n*=637)	Health Concerns (*n*=637)	Chewing Gum (*n*=693)	Fair / Market (*n*=693)	Public Library (*n*=693)	Reading Frequency (*n*=651)	Pop Music (*n*=621)	Country Music (*n*=621)	Non-fiction material (*n*=621)
ASPD	-0.18**	-0.23**	0.05	0.08*	0.02	0.13**	0.05	-0.04	0.06
BPD	-0.15**	-0.36**	0.11**	0.01	0.01	0.01	-0.06	0.03	0.01

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Table 15. Bivariate correlations between personality disorder prototypes and HPQ scores (n = 637)

Personality Disorder	**Health Practices Questionnaire**		
	Risk Avoidance	**Good Health Practices**	**Health Concerns**
Paranoid (PPD)	-0.01	-0.08*	-0.23**
Schizoid (SDPD)	0.17**	-0.12**	-0.11**
Schizotypal (SLPD)	-0.02	-0.18**	-0.30**
Antisocial (ASPD)	**-0.49****	**-0.18****	**-0.23****
Borderline (BPD)	**-0.28****	**-0.15****	**-0.36****
Histrionic (HPD)	-0.41**	-0.08*	-0.08*
Narcisstic (NPD)	-0.42**	-0.10**	-0.11**
Avoidant (AVPD)	0.25**	-0.04	-0.13**
Dependent (DPD)	0.32**	0.02	0.01
Obsessive-Compulsive (OCPD)	0.34**	0.10**	0.11**

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Next, contrary to the hypotheses, ASPD and BPD FFM prototype scores were significantly associated to the discriminant health practices items. The personality disorder indexes had a small negative association with good health practices, r = -0.18 and -0.15, respectively (see Table 14 and Table 15). Lastly, in contradiction with the hypothesis, the ASPD and BPD scores were correlated -0.23 and -0.36 with health concerns, respectively (see Table 14 and Table 15).

FFM pd prototype scores and disinhibitory behaviors. The purpose of conducting bivariate correlations between the FFM pd prototype scores and disinhibitory behaviors was to test hypotheses that BPD and ASPD scores were (1) positively associated with items related to alcohol and drug use and (2) positively associated with gambling frequency. These analyses were also conducted within cohorts and sex. Table 14(A) presents the bivariate correlations between all convergent validity items and the ASPD and BPD indexes. Table 16 provides the correlation coefficients between all FFM prototype scores and disinhibitory behaviors. The correlations by cohort and sex for these variables are presented in Appendix 3.

First, results regarding the bivariate relationship between ASPD and BPD FFM prototype score and alcohol and drug use variables will be presented. For the total sample, there was a positive association between ASPD and BPD FFM prototype scores and alcohol and drug use variable (r = 0.40 and 0.23, respectively; see Tables 14 and 16).

To address the second part of this hypothesis, the bivariate associations between ASPD and BPD FFM prototype scores and gambling will be presented. For the total sample, there was a positive association between ASPD and BPD FFM prototype scores and gambling (r = 0.29 and 0.13, respectively; see Table 14 and Table 16).

Table 16. Bivariate correlations between personality disorder prototypes and disinhibitory behavior

	Behavioral Report Inventory (*n* = 653)	
Personality Disorder	**Alcohol & Drug Use**	**Gambling**
Paranoid (PPD)	0.02	0.04
Schizoid (SDPD)	-0.18**	-0.13**
Schizotypal (SLPD)	-0.02	-0.06
Antisocial (ASPD)	**0.40****	**0.29****
Borderline (BPD)	**0.23****	**0.13****
Histrionic (HPD)	0.33**	0.17**
Narcisstic (NPD)	0.36**	0.24**
Avoidant (AVPD)	-0.23**	-0.18**
Dependent (DPD)	-0.33**	-0.21**
Obsessive-Compulsive (OCPD)	-0.29**	-0.13**

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

FFM pd prototype scores and psychopathology measures. The purpose of conducting bivariate correlations between the FFM pd prototype scores and measures of psychopathology was to test the hypotheses that (1) the BPD score was positively related to a self-report measure of borderline personality and depression and (2) the ASPD score was positively associated with a self-report measure of psychopathy and had no relation to depression. Since ASPD and BPD are related constructs, it is expected that the ASPD should be somewhat related to a measure of borderline personality and that BPD should be somewhat related to a measure of psychopathy. However, each FFM pd prototype score should be more strongly related to the respective measure of personality dysfunction. Specifically, the BPD score should be more strongly associated to the measure of borderline personality than the ASPD score, while the ASPD score should be more strongly related to the measure of psychopathy than the BPD score. Table 17 presents the correlations between all FFM personality disorder prototypes and measures of psychopathology. The analyses between convergent validity items and ASPD and BPD prototype scores were also conducted within cohort and within sex and are presented in Appendix 3.

For the total sample, the relationship between BPD FFM prototype score and depression was of moderate magnitude (r = 0.36; see Table 14 and Table 17). The BPD score had a large association with the measure of borderline personality and measure of psychopathy r = 0.54 and 0.49, respectively. In the total sample, ASPD had a trivial association with depression as expected (r = -0.04; see Tables 14 and 17). The ASPD score had a slightly weaker association with psychopathy than did the BPD score (r = 0.40). The ASPD score had a correlation of 0.19 with borderline personality, lower than the relation between the BPD score and this measure.

Table 17. Bivariate correlations between personality disorder prototypes and psychopathology measures

	Behavioral Report Inventory (*n* = 677)	**Personality, Emotion, and Attitudes (*n* = 613)**	
Personality Disorder Prototype Scores	**Depression Score**	**Psychopathy**	**Borderline Personality Organization**
Paranoid (PPD)	0.19**	0.35**	0.25**
Schizoid (SDPD)	0.12**	0.02	0.05
Schizotypal (SLPD)	0.38**	0.28**	0.42**
Antisocial (ASPD)	**-0.04**	**0.40****	**0.19****
Borderline (BPD)	**0.36****	**0.49****	**0.54****
Histrionic (HPD)	-0.03	0.17**	0.14**
Narcisstic (NPD)	-0.12**	0.31**	0.07
Avoidant (AVPD)	0.33**	0.08*	0.26**
Dependent (DPD)	0.20**	-0.12**	0.11**
Obsessive-Compulsive (OCPD)	-0.07	-0.10**	-0.18**

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

FFM pd prototype scores and leisure activities and interests. The purpose of examining the bivariate correlations between FFM pd prototype scores and leisure activities and interests were to test the discriminant validity of the ASPD and BPD FFM prototype scores. Specifically it was hypothesized that ASPD and BBPD scores would not be related to the following variables: (1) frequency of chewing gum in the past year, (2) frequency of attending a street fair or outdoor market in the past year, (3) frequency of attending a public library in the past year, (4) frequency of reading books, catalogues, and magazines in the past few years, (5) preference for pop music, (6) preference for country music, and (7) preference for non-fiction reading materials. Table 14(B) presents the correlations between the discriminant validity items and the ASPD and BPD prototype scores. Table 18 provides the correlations between all FFM personality disorder prototype scores and the discriminant validity items.

For the total sample, ASPD and BPD FFM prototype scores had correlations with leisure activities and interest variables that ranged from trivial to small in magnitude. Specifically, the ASPD FFM score had correlations with these variables that ranged from -0.04 to 0.13 for country music preference to reading frequency, respectively (see Table 14 and Table 18). The BPD FFM score and leisure activities and interests variables ranged from -0.06 to 0.11 for pop music preference and frequency of chewing gum, respectively.

Correlations between NEO-PI-R and HEXACO-PI scales. The purpose of examining the bivariate relationship between NEO-PI-R and HEXACO-PI scales was to evaluate the stability of personality over time. The NEO-PI-R scores were correlated with scores from a similar measure, the HEXACO-PI, which was administered 9 years later.

Table 18. Bivariate correlations between personality disorder prototypes and leisure activities and interests

	Behavioral Report Inventory (*n* = 693)			**PEA[a] (*n* = 651)**	**Personal Reactions Survey (*n* = 621)**		
Personality Disorder Prototype Score	**Chewing Gum**	**Fair / Market**	**Public Library**	**Reading Freq**	**Pop Music**	**Country Music**	**Non-fiction**
Paranoid (PPD)	-0.03	-0.19**	-0.08*	-0.10**	-0.05	0.04	-0.07
Schizoid (SDPD)	-0.15**	-0.23**	-0.03	-0.18**	-0.13**	0.01	-0.08
Schizotypal (SLPD)	-0.05	-0.14**	0.04	-0.09*	-0.14**	0.01	-0.02
Antisocial (ASPD)	**0.05**	**0.08***	**0.02**	**0.13****	**0.05**	**-0.04**	**0.06**
Borderline (BPD)	**0.11****	**0.01**	**0.01**	**0.01**	**-0.06**	**0.03**	**0.01**
Histrionic (HPD)	0.08	0.21**	0.12*	0.18**	0.05	-0.06	0.10*
Narcisstic (NPD)	0.01	0.08*	0.04	0.17**	0.05	-0.06	0.08
Avoidant (AVPD)	-0.03	-0.18**	-0.03	-0.19**	-0.14**	0.06	-0.09*
Dependent (DPD)	0.01	-0.13**	-0.05	-0.22**	-0.09	0.06	-0.10*
Obsessive-Compulsive (OCPD)	-0.05	-0.22**	-0.16**	-0.19**	-0.01	0.08*	-0.11**

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

[a] . PEA = Personality, Emotions, and Attitudes survey.

The inclusion of these analyses aided in addressing the question of whether or not changes in personality trait scores over time could have accounted for the findings. These analyses were also conducted within cohorts and sex to examine the stability of personality trait scores within these groups. Fisher r to z transformations were conducted to determine if the correlations differed significantly by cohort or by sex.

In the total sample, the NEO-PI-R domains and corresponding HEXACO domains were correlated strongly, ranging from 0.46 to 0.77 for Neuroticism and Extraversion, respectively (Table 19). The correlations between the NEO-PI-R domains and HEXACO-PI domains did not differ significantly by cohort (Figure 2). Additionally, the correlations between the NEO-PI-R and corresponding HEXACO-PI domains were not significantly different between males and females (Table 20).

Regression Analyses

To test the specificity of the ASPD and BPD FFM prototypes in predicting related constructs, multiple regression analyses were performed. First, these analyses were run separately for the ASPD and BPD index (see *Model 1* on all regression tables). Next, if the index significantly predicted variance in the outcome measure, these analyses were run again, controlling for Cluster A and Cluster C FFM prototype scores (see *Model 2* on all regression tables). Finally, if the index demonstrated this level of specificity, the analyses were run again, this time entering all other FFM prototype scores before ASPD and BPD (see *Model 3* on regression tables).

The effect of sex and cohort was also tested in these models. Sex and cohort were controlled for in all regression analyses. Dummy variables were created for the cohort

Table 19. Correlations between NEO-PI-R and HEXACO-PI Scales (*n* = 656)

	Neuroticism	**Extraversion**	**Openness**	**Agreeableness**	**Conscientiousness**
Honesty-Humility	-0.12**	-0.18**	-0.07	0.54**	0.11*
Emotionality	**0.46****	0.01	0.02	0.21**	-0.12**
Agreeableness	-0.31**	0.04	0.03	**0.57****	0.02
Openness	-0.08*	0.18**	**0.75****	-0.07	-0.07
Extraversion	-0.20**	**0.77****	0.30**	-0.08*	0.13**
Conscientiousness	-0.20**	0.12**	-0.06	0.07	**0.72****

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Figure 2. Correlations between NEO-PI-R domains and HEXACO domains across cohorts

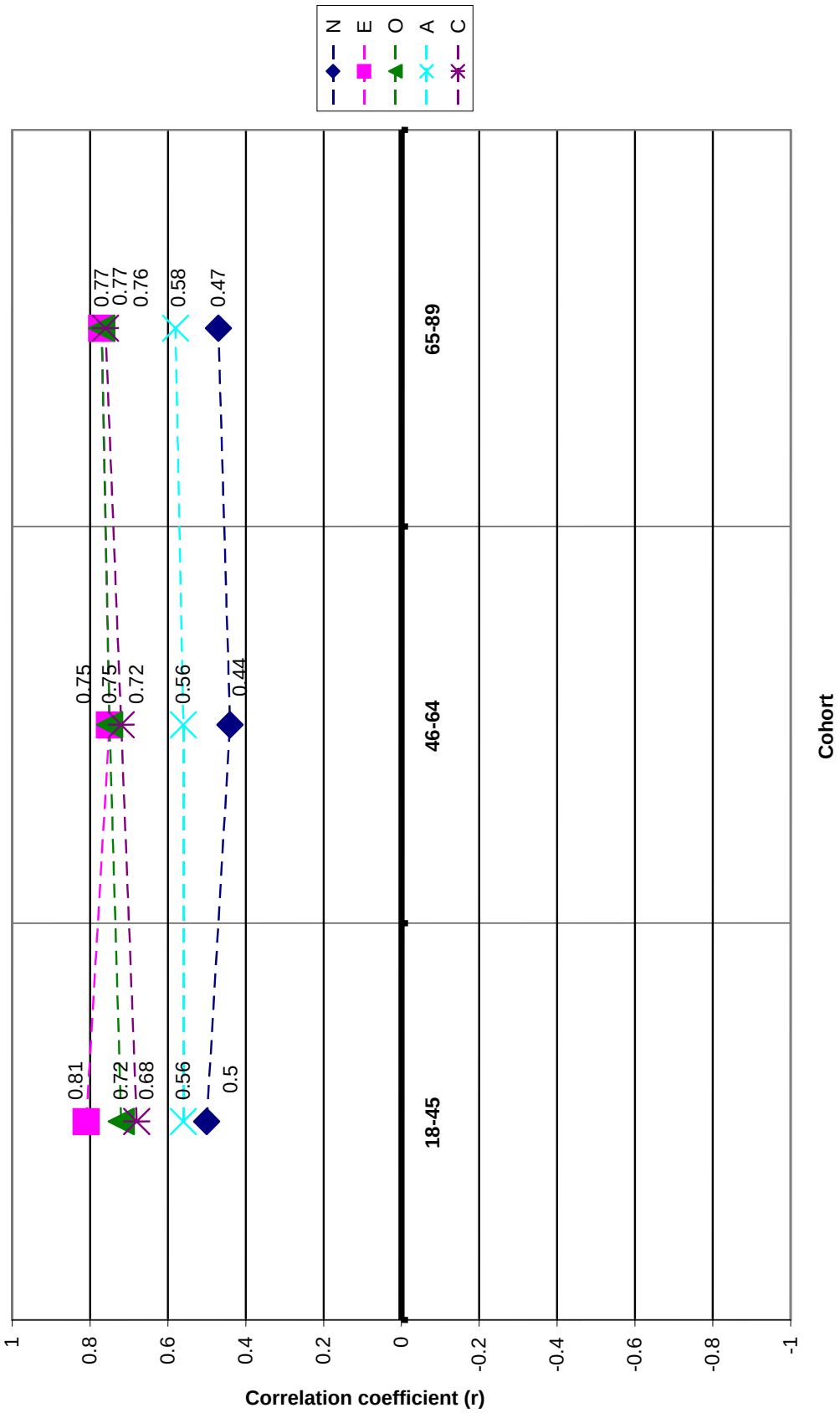


Table 20. Correlations between NEO-PI-R and HEXACO-PI scales by sex [a]

	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Honesty-Humility	-0.13* / -0.18**	-0.20** / -0.19**	-0.16** / -0.05	0.51** / 0.50**	0.18** / 0.07
Emotionality	**0.41** / 0.49****	0.02 / -0.03	0.07 / -0.09	0.14* / 0.05	-0.18** / -0.10*
Agreeableness	-0.31** / -0.34**	0.10 / -0.01	0.01 / 0.02	**0.61** / 0.52****	0.01 / 0.02
Openness	-0.01 / -0.11*	0.17** / 0.19**	**0.79** / 0.74****	-0.15** / 0.02	-0.04 / -0.08
Extraversion	-0.18** / -0.23**	**0.73** / 0.79****	0.25** / 0.32**	-0.17** / -0.05	0.15* / 0.12*
Conscientiousness	-0.23 / -0.19**	0.16** / 0.09	0.02 / -0.11	0.11 / 0.04	**0.73** / 0.72****

[a] males (n = 283) / females (n = 373).

variables, using cohort 2 (individuals aged 46-64 at initial assessment) and males as the reference groups. Interaction terms between the dummy coded demographic variables and each personality disorder index were included in the regression models. This allowed for the examination of whether or not these characteristics moderated the relationships of interest.

Analysis was performed using SPSS REGRESSION for evaluation of assumptions. Multicollinearity among the independent variables was also examined. The tolerance statistic ranged between .01 and .20 for the ASPD and BPD FFM prototype scores when other pd scores were entered into the model. Given that all the FFM pd prototype scores are derived from the same measure, this level of multicollinearity is not surprising. It should be noted that this level of multicollinearity is acceptable and should not unduly influence the results (Neter, Kutner, Nachtsheim, & Wasserman, 1996).

Cases were examined for high standardized residuals. With such a large number of observations, it would be expected to have some high standardized residuals. Upon inspection, there were not more than 5 cases in any one model with standardized residuals greater than the absolute value of three, which is not more than expected given the size of the sample.

FFM prototype scores predicting health practices. The purpose of conducting regression analyses with ASPD and BPD FFM prototype scores as predictors and risk avoidance as an outcome variable was to test the hypothesis that these pd scores would predict this health practice variable controlling for sex and other FFM pd prototype scores.

First, regression analyses were run to test the specificity of the ASPD in predicting risk avoidance. ASPD FFM prototype score significantly predicted risk avoidance when controlling for demographic variables of interest, $\Delta R^2 = 0.16$, $F\Delta\ (1, 632) = 145.75$, $p < .001$

(see Table 21, Model 1). When additionally controlling for the Cluster A and Cluster C FFM indexes, ASPD FFM prototype significantly predicted risk avoidance, $\Delta R^2 = 0.02$, $F\Delta$ (1, 626) = 17.17, $p < .001$ (see Table 21, Model 2). Lastly, when controlling for demographic variables and all other FFM personality disorder indexes, the ASPD FFM prototype score continued to predict risk avoidance, $\Delta R^2 = 0.01$, $F\Delta$ (1, 623) = 10.29, $p < .001$ (see Table 21, Model 3). Neither cohort nor sex moderated the relationship between ASPD and risk avoidance (Table 21, Models 1 – 3).

As can be seen by Table 22, BPD FFM prototype score significantly predicted risk avoidance when controlling for sex and cohort variables, $\Delta R^2 = 0.06$, $F\Delta$ (1, 632) = 47.34, $p < .001$. Next, when Clusters A and Cluster C FFM indexes as well as the demographic variables were entered first, the BPD FFM prototype did not significantly predict risk avoidance. Since the BPD FFM index did not demonstrate this level of specificity, regression analyses controlling for all other FFM pd scores was not conducted. Again, the relationship between BPD prototype and risk avoidance was not moderated by cohort.

FFM prototype scores predicting disinhibitory behaviors. A series of regression analyses was performed to test the specificity of the ASPD and BPD FFM indexes in predicting (1) alcohol and drug use and (2) gambling behavior. ASPD FFM prototype significantly predicted alcohol and drug use when controlling for sex and cohort variables, $\Delta R^2 = 0.09$, $F\Delta$ (1, 654) = 76.29, $p < .001$ (Table 23). When controlling for Clusters A and C indexes, the block testing the significance of cohort moderating the relationship between ASPD FFM prototype and alcohol and drug use was not significant, but the individual standardized beta weight for the interaction between cohort 1 and ASPD prototype score was significant, $\beta = 0.16$, $p < .05$ (Table 23). When controlling for the additional Cluster B

Table 21. ASPD prototype score predicting risk avoidance

	Model 1				Model 2				Model 3			
Predictors	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	.16*				.23**				.22**			
cohort 1	-.06				-.10				.11			
cohort 3	.06	.15	37.63***	3, 633	.07	.15	37.63***	3, 633	.07	.15	37.63***	3, 633
Cluster A												
PPD					.05				-.15			
SDPD					-.19*				-.02			
SLPD					.25				.18			
Cluster C												
AVPD					-.26				-.53*			
DPD					.05				.11			
OCPD					.33*	.18	27.64***	6, 627	.31			
Cluster B												
HPD									-.29			
NPD									.18			
BPD									.38*	.19	19.97***	9, 624
ASPD	-.35***	.16	145.75***	1, 632	-.36***	.02	17.17***	1, 626	-.55**	.01	10.29***	1, 623
ASPD*sex	-.10				-.08				-.06			
ASPD*cohort 1	-.06				-.06				-.10			
ASPD*cohort 3	-.07	.00	.69	3, 629	-.06	.00	.51	3, 623	-.06	.00	.69	3, 620

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

Table 22. BPD prototype score predicting risk avoidance

	Model 1				Model 2			
Predictors	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	.40***				.32***			
cohort 1	.01				-.01			
cohort 3	.09	.15	37.63***	3, 633	.10	.15	37.63***	3, 633
Cluster A								
PPD					-.25			
SDPD					-.38**			
SLPD					.32			
Cluster C								
AVPD					.25			
DPD					-.04			
OCPD					.53**	.18	27.64***	6, 627
Cluster B								
HPD								
NPD								
ASPD								
BPD	-.29***	.06	47.34***	1, 632	-.22	.00	2.39	1, 626
BPD*sex	.08				.05			
BPD*cohort 1	.04				.03			
BPD*cohort 3	-.05	.00	.67	3, 629	-.03	.00	.28	3, 623

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

Table 23. ASPD prototype score predicting alcohol and drug use

	Model 1				Model 2				Model 3			
Predictors	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.15				-.22**				-.24**			
cohort 1	.20*				.21**				.21**			
cohort 3	-.26**	.15	38.15***	3, 655	-.24**	.15	38.15***	3, 655	-.24**	.15	38.15***	3, 655
Cluster A												
PPD					.10				.24			
SDPD					.24*				.20			
SLPD					-.60***				-.58**			
Cluster C												
AVPD					.66**				.89***			
DPD					-.34**				-.53**			
OCPD					-.63***	.14	21.06***	6, 649	-.51**			
Cluster B												
HPD									.42*			
NPD									.31			
BPD									-.24	.14	14.59***	9, 646
ASPD	.25***	.09	76.29***	1, 654	.10	.00	17.17	1, 648	.24	.00	1.69	1, 645
ASPD*sex	.09				.05				.03			
ASPD*cohort 1	.15				.16*				.17*			
ASPD*cohort 3	-.08	.00	2.27	3, 651	-.08	.00	.51	3, 645	-.09	.00	2.60	3, 642

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

indexes, this coefficient was again significant. These findings suggest that the effect of ASPD on alcohol and drug use differs across age groups. Specifically, the relationship between ASPD prototype and alcohol and drug use is stronger in cohort 1 when compared to cohort 2.

BPD FFM prototype significantly predicted alcohol and drug use when controlling for sex and cohort variables, $\Delta R^2 = 0.03$, $F\Delta\ (1, 654) = 34.37$, $p < .001$ (Table 24). However, when controlling for Clusters A and C indexes, the BPD prototype did not significantly predict alcohol and drug use. These results were not moderated by cohort or by sex.

Next, the specificity of ASPD and BPD FFM index was tested with the second disinhibitory behavior, gambling. The ASPD FFM index significantly predicted gambling even when controlling for all other FFM pd indexes and demographic variables, $\Delta R^2 = 0.02$, $F\Delta\ (1, 683) = 14.20$, $p < .001$ (Table 25). The block of interaction terms was not significant. However, the standardized beta weight was significant for the interaction term between ASPD and cohort 1, suggesting that this relationship differs across age groups. Specifically, the relationship between gambling and ASPD prototype is stronger in cohort 1 than cohort 2. However, multicollinearity appears to have been a problem in this series of equations as evidenced when looking at the beta weights for the ASPD prototype in Model 2 versus Model 3. Although both beta weights were significant, the beta weight in Model 3 is much larger (i.e., $\beta = .15$ in Model 2 and $\beta = .67$ in Model 3).

The BPD prototype score only predicted gambling behavior when controlling for sex and cohort, $\Delta R^2 = 0.01$, $F\Delta\ (1, 692) = 4.62$, $p < .05$ (Table 26). When controlling for other FFM pd indexes, BPD score no longer predicted gambling behavior. These results were not moderated by cohort or sex.

Table 24. BPD prototype score predicting alcohol and drug use

	Model 1				Model 2			
Predictors	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.30***				-.24***			
cohort 1	.10				.12*			
cohort 3	-.21**	.15	38.15***	3, 655	-.17*	.15	38.15***	3, 655
Cluster A								
PPD					.18			
SDPD					.32**			
SLPD					-.64***			
Cluster C								
AVPD					.50**			
DPD					-.32*			
OCPD					-.68***	.14	21.06***	6, 649
Cluster B								
HPD								
NPD								
ASPD								
BPD	.17**	.03	34.37***	1, 654	.06	.00	.55	1, 648
BPD*sex	-.01				.02			
BPD*cohort 1	.04				.06			
BPD*cohort 3	-.01	.00	.22	3, 651	.00	.00	.48	3, 645

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

Table 25. ASPD prototype score predicting gambling

Predictors	Model 1				Model 2				Model 3			
	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.17*				-.17*				-.13			
cohort 1	.20**				.19*				.17*			
cohort 3	.03	.09	21.36***	3, 693	.04	.09	21.36***	3, 693	.03	.09	21.36***	3, 693
Cluster A												
PPD					.34				.54*			
SDPD					.12				-.37*			
SLPD					-.33				-.22			
Cluster C												
AVPD					-.22				-.15			
DPD					.38**				.54			
OCPD					-.22	.06	7.55***	6, 687	-.49**			
Cluster B												
HPD									-.46*			
NPD									-.13			
BPD									-.46*	.07	5.96***	9, 684
ASPD	.13*	.04	34.33***	1, 692	.15	.01	4.56*	1, 686	.67***	.02	14.20***	1, 683
ASPD*sex	.07				.07				.10			
ASPD*cohort 1	.18*				.17*				.17*			
ASPD*cohort 3	.07	.00	1.87	3, 689	.10	.00	1.82	3, 683	.08	.00	1.94	3, 680

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

Table 26. BPD prototype score predicting gambling

	Model 1				Model 2			
Predictors	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.24***				-.19**			
cohort 1	.09				.07			
cohort 3	.01	.09	21.36***	3, 693	.02	.09	21.36***	3, 693
Cluster A								
PPD					.64**			
SDPD					.17			
SLPD					-.34			
Cluster C								
AVPD					-.52*			
DPD					.48***			
OCPD					-.43*	.06	7.55***	6, 687
Cluster B								
HPD								
NPD								
ASPD								
BPD	.02	.01	4.62*	1, 692	-.07	.00	.00	1, 686
BPD*sex	.05				.05			
BPD*cohort 1	.05				.03			
BPD*cohort 3	.08	.00	.47	3, 689	.08	.00	.43	3, 683

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

FFM prototype scores predicting psychopathology measures. A series of regression analyses was performed to test the specificity of the BPD FFM prototype in predicting depression and borderline personality organization. It was also expected that the BPD score would predict a measure of psychopathy given that BPD and ASPD are highly related \constructs. BPD FFM prototype significantly predicted depression when controlling for sex and cohort variables, $\Delta R^2 = 0.13$, $F\Delta\ (1, 672) = 101.47$, $p < .001$ (Table 27). When controlling for Cluster A and Cluster C indexes, BPD no longer predicted depression. However, the individual standardized beta weights were significant for the interaction term of sex and BPD prototype score, $\beta = .19$, $p < .01$. This term was significant again when controlling for Cluster B indexes, $\beta = .18$, $p < .05$. This finding suggests that the relationship between BPD and depression is stronger in females than males.

BPD significantly predicted a measure of borderline personality even when controlling for all other FFM pd indexes, $\Delta R^2 = 0.01$, $F\Delta\ (1, 610) = 5.30$, $p < .05$ (Table 28). BPD predicted psychopathy when controlling for demographic variables and Cluster A and C indexes, $\Delta R^2 = 0.01$, $F\Delta\ (1, 641) = 11.35$, $p < .001$ (Table 29). BPD FFM prototype score did not predict psychopathy when controlling for additional Cluster B indexes. These effects were not moderated by cohort or sex.

Another series of regression analyses were performed to test the specificity of the ASPD FFM prototype score in predicting psychopathy and borderline personality organization. Regression analyses were not performed for ASPD when predicting depression. Depression was used to examine the discriminant validity of ASPD. Since these variables were hypothesized to have no relationship, no test of specificity was performed. The ASPD score predicted psychopathy even when demographic variables and all other pd

Table 27. BPD prototype score predicting depression

Predictors	Model 1 β	Model 1 ΔR^2 (adj.)	Model 1 ΔF	Model 1 df_1, df_2	Model 2 β	Model 2 ΔR^2 (adj.)	Model 2 ΔF	Model 2 df_1, df_2	Model 3 β	Model 3 ΔR^2 (adj.)	Model 3 ΔF	Model 3 df_1, df_2
Sex	.25***				.19**				.17**			
cohort 1	.09				.09				.08			
cohort 3	.02	.03	7.41***	3, 673	.02	.03	7.41***	3, 673	.02	.03	7.41***	3, 673
Cluster A												
PPD					-.07				-.05			
SDPD					-.27*				-.16			
SLPD					.04				.01			
Cluster C												
AVPD					.77***				.26			
DPD					-.27				-.09			
OCPD					-.08	.21	30.86***	6, 667	-.29			
Cluster B												
HPD									-.42*			
NPD									.18			
ASPD									-.28	.22	21.26***	9, 644
BPD	.29***	.13	101.47***	1, 672	.05	.00	1.00	1, 666	.40	.01	6.02*	1, 663
BPD*sex	.19**				.19**				.18*			
BPD*cohort 1	-.03				-.02				-.03			
BPD*cohort 3	-.05	.00	2.42	3, 669	-.03	.00	2.33	3, 633	-.02	.00	2.09	3, 660

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

Table 28. BPD prototype score predicting borderline personality inventory

Predictors	Model 1 β	Model 1 ΔR^2 (adj.)	Model 1 ΔF	Model 1 df_1, df_2	Model 2 β	Model 2 ΔR^2 (adj.)	Model 2 ΔF	Model 2 df_1, df_2	Model 3 β	Model 3 ΔR^2 (adj.)	Model 3 ΔF	Model 3 df_1, df_2
Sex	.04				-.01				.01			
cohort 1	-.03				-.04				-.04			
cohort 3	-.04	.01	2.05	3, 620	-.04	.01	2.05	3,620	-.05	.01	2.05	3, 620
Cluster A												
PPD					-.05				-.23			
SDPD					-.35**				-.51**			
SLPD					.26				.31			
Cluster C												
AVPD					.33				.22			
DPD					-.11				.21			
OCPD					.10	.31	46.49***	6, 614	-.13			
Cluster B												
HPD									-.69***			
NPD									.46*			
ASPD									.08	.33	33.51***	9, 611
BPD	.53***	.28	247.54***		.34*	.01	7.19**	1, 613	.42*	.01	5.30*	1, 610
BPD*sex	.09				.09				.09			
BPD*cohort 1	-.04				-.03				-.03			
BPD*cohort 3	-.09	.00	.98		-.08	.00	.87	3, 610	-.07	.00	.88	3, 607

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

Table 29. BPD prototype score predicting psychopathy

Predictors	Model 1				Model 2				Model 3			
	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.26***				-.18**				-.14*			
cohort 1	.00				-.03				-.04			
cohort 3	.07	.05	11.19***	3, 648	.09	.05	11.19***	3, 648	.08	.05	11.19***	3, 648
Cluster A												
PPD					.53**				.27			
SDPD					.05				-.43**			
SLPD					-.15				.07			
Cluster C												
AVPD					-.40*				.08			
DPD					.34*				.51**			
OCPD					-.14	.26	41.03***	6, 642	-.19			
Cluster B												
HPD									-.51**			
NPD									.21			
ASPD									.66***	.31	33.79***	9, 639
BPD	.53***	.24	211.94***	1, 647	.46***	.01	11.35***	1, 641	.05	.00	.02	1, 638
BPD*sex	-.07				-.05				-.03			
BPD*cohort 1	-.01				-.03				-.02			
BPD*cohort 3	.03	.00	.44	3, 644	.05	.00	.53	3, 638	.04	.00	.23	3, 635

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

Table 30. ASPD prototype score predicting psychopathy

	Model 1				Model 2				Model 3			
Predictors	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.28***				-.20**				-.17*			
cohort 1	.09				.02				.01			
cohort 3	.06	.05	11.19***	3, 648	.07	.05	11.19***	3, 648	.06	.05	11.19***	3, 648
Cluster A												
PPD					.29				.26			
SDPD					-.30***				-.45**			
SLPD					.01				.10			
Cluster C												
AVPD					.25				.09			
DPD					.29*				.49**			
OCPD					.03	.26	41.03***	6, 642	-.16			
Cluster B												
HPD									-.49**			
NPD									.19			
BPD									.02	.29	31.64***	9, 639
ASPD	.45***	.14	109.66***	1, 647	.62***	.03	33.49***	1, 641	.69***	.01	13.33***	1, 638
ASPD*sex	-.22*				-.10				-.07			
ASPD*cohort 1	.08				.04				.04			
ASPD*cohort 3	.05	.00	2.06	3, 644	.02	.00	.50	3, 638	.02	.00	.31	3, 635

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

Table 31. ASPD prototype score predicting borderline personality inventory

Predictors	Model 1				Model 2				Model 3			
	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	.02				.01				.03			
cohort 1	.03				-.05				-.07			
cohort 3	-.13	.01	2.05	3, 620	-.14	.01	2.05	3,620	-.15	.01	2.05	3, 620
Cluster A												
PPD					.03				-.21			
SDPD					-.61***				-.52			
SLPD					.37*				.31**			
Cluster C												
AVPD					.61**				.19			
DPD					-.06				.24			
OCPD					.06	.31	46.49***	6, 614	-.16			
Cluster B												
HPD									-.72***			
NPD									.49*			
BPD									.45*	.33	34.14***	9, 611
ASPD	.20**	.03	19.83***	1, 619	.29*	.01	6.77**	1,613	.06	.00	.15	1, 610
ASPD*sex	.01				.08				.12			
ASPD*cohort 1	-.01				-.04				-.05			
ASPD*cohort 3	-.10	.00	.26	3, 616	-.13	.00	1.54	3, 610	-.18	.00	1.70	3, 607

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

indexes were entered into the equation, $\Delta R^2 = 0.01$, $F\Delta\ (1, 638) = 13.33$, $p < .001$ (Table 30). When controlling for demographic variables only, the interaction term of ASPD and sex was significant, indicating that this relationship is stronger for males than females. No other moderating effects were found. As can be seen by Table 31, The ASPD index predicted borderline personality organization when controlling for demographic variables and Clusters A and C indexes, $\Delta R^2 = 0.01$, $F\Delta\ (1, 613) = 6.77$, $p < .01$. ASPD FFM prototype did not predict borderline personality organization when controlling for the additional Cluster B indexes. As with BPD FFM prototype, these effects were not moderated by cohort or sex.

DISCUSSION

The main aim of this study was to test the predictive validity of the ASPD and BPD FFM prototype scores over a period of 6 years in a large community sample. This study provides several unique contributions. First, this was the first study to demonstrate that ASPD and BPD prototype scores could predict related constructs over such a long period of time. Previous studies have examined the predictive validity of these constructs either cross-sectionally or up to a 1-year period of time (e.g., Miller et al., 2004). Generally, the ASPD and BPD indexes demonstrated good convergent and discriminant validity over a 6-year period. Specifically, ASPD and BPD FFM prototype scores were related to the following constructs: risk avoidance, alcohol and drug use, gambling, psychopathy and borderline personality. These constructs were assessed at different time points after the initial NEO-PI-R assessment and include variables that were measured 1, 3, and 6 years later. As predicted, the BPD FFM prototype score was related to a measure of depression, while the ASPD FFM prototype was not. This finding suggests discriminant validity for the ASPD and BPD prototype scores and is especially impressive given that the measure of depression assesses symptoms for the past week only and was administered 6 years after the NEO-PI-R.

Additionally, these scores were not associated to items that were not expected to be related to ASPD or BPD FFM prototype scores: preference for pop music, preference for country music, preference for non-fiction reading material, and attendance at public

libraries. However, there were small associations between some of the leisure activities and interest variables and the FFM pd prototypes (i.e., BPD and chewing gum; ASPD and attending a street fair or outdoor market and reading frequency). In contradiction with the original hypothesis, the ASPD and BPD FFM prototype scores were moderately related to measures of health practices. Follow-up analyses revealed a positive association between the Conscientiousness FFM domain and good health practices and health concerns (r = 0.22 and 0.27, respectively). Since ASPD and BPD both have low ratings on the domain Conscientiousness, this might shed some light on their negative associations with good health practices and health concerns. Additionally, a negative association has been found between healthy lifestyle choices and obtaining preventative care, and BPD. Frankenburg & Zanarini (2005) reported that non-remitted BPD (n = 64) patients were more likely than remitted patients (n = 200) to engage in poor health-related lifestyle choices, (i.e., smoke at least one pack of cigarettes daily, use alcohol daily, lack of physical exercise, use of sleep medicine daily, and overuse pain medication). Although non-remitted patients obtained more medical services overall than did remitted patients, the non-remitted patient reported receiving less preventative care, such as an annual physical exam and regular dental care. As for ASPD, Farrington (1995) found a relationship between engaging in criminal offenses and poor health in a prospective study of 411 males living in London. He suggests that lack of preventative care is related to their poor health conditions. In this study, the variables health concerns and health practices measure health-related lifestyle choices and preventative care. Therefore,

results from this study are consistent with previous findings that BPD and ASPD are negatively associated with these health-related variables.

Secondly, this study controlled for other personality disorder prototype scores to rigorously test the specificity of the ASPD and BPD prototype scores. Previous studies have examined the discriminant validity of FFM BPD index in relation to measures of ASPD and AVPD (Trull et al., 2003) or the discriminant validity of the FFM psychopathy index relative to the DPD index (Miller & Lynam, 2003). However, no study has yet tested the incremental validity of the ASPD and BPD prototypes in predicting related constructs after controlling for all other pd prototypes. To this end, a series of hierarchical multiple regression analyses was performed with each model progressively testing for increasing levels of specificity. The first model only tested the prototype predicting the outcome variable of interest controlling for the demographic variables of sex and cohort, cohort interaction, and sex interaction. Then, prototypes for Clusters A and C personality disorders were entered prior to the prototype of interest. Finally, if the prototype of interest displayed this level of specificity, the model was run again controlling for the additional Cluster B personality disorders. Some of the outcome variables of interest had a unique relationship with either the ASPD or BPD prototype score. Specifically, the ASPD prototype score predicted risk avoidance even when controlling for all other personality disorder profiles. Additionally, ASPD uniquely predicted self-reported gambling behavior 6 years after the NEO-PI-R was administered. Lastly, the ASPD prototype uniquely predicted a self-report measure of psychopathy that

was also administered 6 years after the NEO-PI-R. As expected, the ASPD index did not uniquely predict a measure of borderline personality.

The BPD FFM prototype was also tested for specificity in predicting related constructs. Findings indicated that the BPD index uniquely predicted a measure of borderline personality that was administered 6 years after the NEO-PI-R. BPD FFM prototype predicted psychopathy above and beyond Clusters A and C prototype scores but not when controlling for the FFM ASPD index as expected. However, contrary to hypotheses, the BPD index did not uniquely predict risk avoidance, alcohol and drug use, gambling, or depression above and beyond Clusters A and C FFM prototype scores.

Finding that BPD FFM prototype did not uniquely predict depression could be explained by the high co-occurrence that has been reported between major depressive disorder and other personality disorders, especially AVPD (e.g., Alpert, Uebelacker, Mclean, et al., 1997). In the Collaborative Longitudinal Personality Disorders Study, researchers reported that 81.5% of cases meeting diagnostic criteria for AVPD also met lifetime criteria for major depressive disorder (n = 128). The co-occurrence between BPD and lifetime major depressive disorder was 70.9% (n = 124; McGlashan, Grilo, Skodol, Gunderson, Shea, Morey, et al., 2000). These findings suggest that depressive symptoms have a stronger relationship with AVPD than with BPD. The AVPD prototype also has a relatively high rating on the NEO-PI-R facet of depressiveness (3.95) and also had a moderate association with the measure of depression (r = 0.33) in this study which also might explain why BPD did not uniquely predict a measure of depressive symptoms.

To better understand why BPD did not uniquely predict risk avoidance and disinhibitory behaviors, other Cluster B prototypes were examined. Surprisingly, HPD and NPD prototypes were more strongly related to risk avoidance and disinhibitory behaviors than the BPD prototype. Examining the personality facets that define the HPD and NPD prototypes can help explain this finding. The HPD prototype includes high scores on the impulsiveness facet and low scores on the self-discipline and deliberation facets. Individuals with this particular configuration of traits will be more likely to engage in risky behaviors without forethought (Trull & Widiger, 1997). The NPD prototype shares much in common with the ASPD prototype (i.e., low scores on all Agreeableness facets, high scores on openness to actions, and high scores on overlapping Extraversion and Neuroticism facets). Flory, Lynam, Milich, Leukefeld, and Clayton (2002) found that symptoms of alcohol abuse / dependence had moderate negative associations with Agreeableness and small positive associations with Neuroticism and Extraversion in a sample of 19-21 year-olds ($N = 472$). NPD prototype is composed of low scores on facets of the Agreeableness domain, and some high Extraversion and Neuroticism facets. Therefore, these findings suggest that the relationship between the HPD and NPD prototypes and risk avoidance and disinhibitory behaviors are a function of the defining facets they share with the ASPD prototype.

A third unique aspect of this study is the size of the sample, which permitted testing potential moderating effects of age group on the relations between the prototype scores and related constructs of interest. Only two moderating effects with age were revealed. When controlling for other FFM pd profiles, the relationship between ASPD

and alcohol and drug use was moderated by cohort. The relationship between ASPD and gambling was also moderated by cohort. Examining the beta weights for these interaction terms yielded consistent findings. The relationship between FFM ASPD prototype score and these disinhibitory behaviors is stronger for young adults when compared to middle- and older-adulthood. This finding suggests that individuals with ASPD may be at higher risk for alcohol and drug use disorders and problem gambling in young adulthood. Except for these moderating effects with age, these results suggest that the relationship between BPD and ASPD FFM prototypes and related constructs is generally stable across the adult lifespan. One implication is that even older adults who suffer from personality pathology continue to experience the behavioral, social, and occupational deficits accompanying these psychiatric disorders.

Two moderating effects of sex were also found. First, the relationship between BPD and depression was moderated by sex in all three models. The association between BPD and depression is stronger for females than males. Second, the effect of ASPD on psychopathy is stronger for males than females, but not when controlling for other personality disorder profiles. (i.e., only significant in Model 1). Except for these two moderating effects with sex, these results imply that FFM personality disorder profiles perform indiscriminately across males and females.

Lastly, this study examined the stability of personality traits over a 9-year period. The domains of the NEO-PI-R were highly correlated with domains of a related measure, the HEXACO-PI. The Extraversion, Conscientiousness, and Openness domains were strongly related between the HEXACO-PI and the NEO-PI-R. The HEXACO Honesty-

Humility and Agreeableness domains were strongly related to the NEO-PI-R Agreeableness domain. Finally, the NEO-PI-R Neuroticism domain was related to HEXACO-PI Emotionality and Agreeableness domains.

The content of the HEXACO-PI domains of Extraversion, Conscientiousness, and Openness are highly similar to those of the NEO-PI-R. However, the Agreeableness and Neuroticism domains are slightly altered. The content of Agreeableness on the HEXACO-PI is related to anger versus even-temper which is similar to content of the NEO-PI-R Neuroticism domain. The content of Neuroticism on the HEXACO-PI is related to sensitivity versus toughness. (Neuroticism is renamed "Emotionality" on the HEXACO-PI to reflect this shift of content.) On the NEO-PI-R, this content is located on the Agreeableness factor.

A previous study examined the relationship between the HEXACO-PI domains and five scales from the International Personality Item Pool (IPIP; Goldberg, 1999) that were used to represent the FFM (Lee, Ogunforwora, & Ashton, 2005). The results from this study yielded the following concurrent correlations between HEXACO-PI domains and IPIP Big Five Scales: 0.83, 0.36, 0.80, 0.60, and -0.51 for Extraversion, Agreeableness, Conscientiousness, Openness to Experience/Intellect, and Emotionality, respectively. The negative correlation resulted from correlating Emotionality, a construct related to Neuroticism, with Emotional Stability. In this study, the relations between the NEO-PI-R domains and related HEXACO-PI domains assessed 9 years later were generally of equal or larger magnitude. This finding has implications for the lack of specificity that was found between the BPD prototype and some variables of interest.

One possibility for the finding that BPD prototype did not predict disinhibitory behaviors and risk avoidance several years later is that the personality traits changed over time. It could be argued that if measured more proximal to the outcome variables, the personality scores would have yielded a profile that would not be related to alcohol and drug use, gambling, and risk avoidance. Since the NEO-PI-R was only given at one time point, it was necessary to use a related personality measure to examine personality stability. Finding that overlapping personality domains were related over time suggests that the personality profiles remain relatively stable. Therefore, the lack of specificity in the relationship between BPD FFM prototype score and alcohol and drug use, gambling, and risk avoidance was probably not due to a change in personality traits over time.

Clinical Implications

This study replicated and extended previous findings regarding the relationship of FFM pd prototype scores to related constructs. These findings are consistent with the ideas of many researchers that personality disorders can be conceptualized as extreme variants of normal personality traits (e.g., Trull & McCrae, 1992; Widiger, 1993). Finding support for the convergent and discriminant validity of the FFM ASPD and BPD prototypes has clinical implications in the areas of classification, assessment, and treatment of personality disorders.

Classification. Adopting a FFM perspective on personality disorder classification remedies many of the problems that exist with the current categorical nosology. These problems include: (1) extreme rates of comorbidity that question the validity of diagnostic constructs, (2) inadequate coverage of pathology that leads to a

high rate of "not otherwise specified" (NOS) diagnoses, (3) arbitrary distinctions between normal and disordered functioning yielding subthreshold cases, (4) heterogeneity of clinical presentations within the same diagnosis, and (5) lack of scientific basis for the disorder (Widiger & Trull, in press).

Widiger and Trull (in press) discuss how the dimensional classification model would directly ameliorate these problems by providing an individualized personality trait profile. Assessing a person's personality profile with the NEO-PI-R provides a comprehensive description of an individual's psychopathology. This profile would eliminate the problem of comorbidity by describing a unique pattern of personality traits for each person, rather than by multiple overlapping diagnoses. This method also addresses heterogeneity by allowing constellations of traits to speak for themselves rather than forcing individuals into categories even when they do not fit well. Additionally, assessing personality dysfunction with the NEO-PI-R has the distinct advantage over the more traditional categorical classification system in providing comprehensive coverage of the underlying domains of personality problems. Since the profiles are allowed to stand on their own, atypical presentations would be accepted which would cut down on the use of the "garbage can" and heterogeneous NOS diagnoses.

Using the FFM to guide personality disorder classification increases the scientific basis for these constructs. Researchers and clinicians can use normal personality theory to shed light on the relationship between personality disorder and behaviors that are related and frequently co-occur with these constructs. Findings from this study illustrate how we can translate what we know about normal personality traits into a better

understanding of ASPD and BPD. Specifically, when utilizing the FFM, ASPD is conceptualized as a unique configuration of personality facets, including high impulsiveness, high excitement-seeking, low deliberation, low self-discipline, and low anxiousness which can explain why alcohol and drug use, gambling, and risk avoidance were related to this construct. Similarly, BPD is composed of high impulsiveness and low deliberation. Trull and Widiger (1997) described pathological variants of these traits:

(1) *High impulsiveness*. Likely to engage in risky behaviors that have harmful consequences, including having difficulty resisting urges to excessively spend money and use alcohol and drugs.

(2) *High excitement-seeking*. Prone to engage in behavior that is reckless and dangerous without much forethought.

(3) *Low anxiousness*. Difficulty anticipating danger, resulting in engaging in behaviors that could be harmful. Additionally, tendency to have difficulty changing behavior based on past negative experiences.

(4) *Low deliberation*. Prone to making decisions without thinking about the consequences. Likely to be hedonistic and self-indulgent.

Given that these traits are associated with excessive alcohol and drug use, gambling behavior, and acting in ways that might endanger one's health (e.g., Flory, Lynam,

Milich, Leukefeld, & Clayton, 2002; Trull & Widiger, 1997; Sher & Trull, 1994), this elucidates the reason that these behaviors are related to the ASPD and BPD FFM prototypes. Since ASPD includes many more traits that are associated with engaging in disinhibitory behaviors, it is clear why this prototype had a much stronger and consistent relationship with these variables than did the BPD prototype.

The BPD prototype includes high scores on depressiveness, vulnerability, and openness to feelings which elucidates the relationship between depression and this construct. Trull and Widiger (1997) provided a description of maladaptive forms of these traits:

(1) *High depressiveness*. Associated with feeling down and hopeless most of the time and, at times, feeling suicidal.

(2) *High vulnerability*. Likely to feel overwhelmed even with minor stressors and prone to mood symptomatology.

(3) *High openness to feelings*. Likely to be very sensitive to mood states and feel controlled by mood.

Thus, these facets are associated with dysphoric symptoms (e.g., Chopra et al., 2005; Trull & Widiger, 1997). Defining personality pathology within the domain of normal personality functioning allows researchers the distinct advantage of tying what is already known about normal personality functioning into understanding personality disorder. Broadening the research base for personality disorders by integrating personality psychology with psychiatry will increase the validity of these constructs.

The heritability of normal personality would also strengthen the legitimacy of personality disorders by increasing their scientific basis. Identifying the genetic contributions of mental disorders is important to establish their validity. Behavioral genetic research has been largely limited to antisocial, borderline, and schizotypal personality disorders. Findings have indicated a strong heritable component of antisocial personality disorder, but findings regarding schizotypal and borderline personality disorders are less clear (Nigg & Goldsmith, 1994). The sparse information regarding the heritability of categorical personality disorders questions the meaningfulness of these constructs as biological disorders. Jang, Vernon, and Livesley (2001) conclude that the lack of information regarding the heritability of personality disorder as defined by the DSM reflects that these constructs are poorly defined phenotypes. In contradiction, more is known about the heritability of dimensional personality traits. Heritability components of the FFM domains and facets range from 40-60% (e.g., Jang et al., 1996). These findings have been replicated across cultures (e.g., Jang, McCrae, Angleitner, Reimann, & Livesley, 1998). Going beyond determining the relative genetic contribution of personality functioning, Yamagata et al. (2006) tested the heritability invariance of the NEO-PI-R scores across large twin samples from Canada, Germany, and Japan. The authors extracted five genetic and environmental components from each sample and reported high convergence within and between each group, suggesting a common biological basis for personality. The sound findings from genetic research regarding the heritability and universality of the FFM personality traits provide an avenue for uncovering the molecular basis and etiology of personality dysfunction (Livesley, 2005).

Assessment. Guidelines for implementing the model into the clinical practice of assessment have been developed (Widiger, Costa & McCrae, 2002). To diagnose a personality disorder using the FFM, a four-step process is recommended: (1) Administer the NEO-PI-R to assess an individual's ratings on all domains and facets. This will yield a comprehensive profile and description of the person's maladaptive and adaptive personality traits. After obtaining this self-report information, it is recommended to conduct at least relevant sections of a semi-structured interview that assesses personality functioning, time permitting (Widiger & Samuel, 2005). In addition to providing a more comprehensive picture of a patient it generally takes half the time to administer this assessment battery compared to more traditional clinical interviews (Widiger & Trull, in press). (2) Determine if the individual suffers from any social or occupational difficulties and experiences distress as a result of deviant facet scores, i.e., t-scores less than 45 or greater than 55. To facilitate this step, the Structured Interview for the Five Factor Model (SIFFM; Trull & Widiger, 1997) has questions readily available that query about social, occupational impairment, and distress. (3) Determine if the maladaptive traits and associated impairment and distress constitute a diagnosis of a personality disorder. Widiger & Trull (in press) recommend using the Global Assessment of Functioning (GAF) scale of the DSM-IV, with a score ≤ 60 indicative of clinical significance. (4) Match the individual's FFM personality profile to a prototypic profile of DSM-IV personality disorders. This step is optional because it is not intended that the FFM conceptualization of personality disorder be reduced and limited by the current diagnostic classification categories. However, it is useful for researchers and clinicians who are

interested in researching and working with individuals who fall into one of the current diagnostic categories. This last step is directly relevant to the present study. In order to bolster support for dimensional classification models, this study aimed to demonstrate that this alternative scheme can capture the dysfunction related to personality pathology as it is currently defined.

As the four-step procedure for incorporating the FFM conceptualization of personality disorders into clinical practice illustrates, it is not recommended that FFM prototype scores be used in isolation for diagnostic purposes. The NEO-PI-R personality profile can "flag" facets that are likely to be associated with dysfunction. However, it is important to determine that these patterns of behaving are indeed causing the person significant impairment and distress. As previously mentioned, assessing for impairment and distress can be done with a clinical interview and with aid from GAF scores. Providing a multi-method assessment, such as the one suggested above, will yield more accurate diagnoses (e.g., Widiger & Samuel, 2005).

Treatment. Scores of books have been written on how to treat personality disorders (e.g., Leahy, Beck, & Beck, 2005), yet few clinical trials have evaluated the effectiveness of these treatments. The lack of empirical support likely reflects the difficulty with identifying a homogeneous population to treat. For example, to evaluate the effectiveness of a cognitive treatment for obsessive-compulsive personality disorder, individuals would likely have several co-morbid mood, anxiety, and personality disorders. Therefore, it would be difficult to determine exactly what the cognitive therapy was treating. Although there is little empirical support for treating specific

personality disorders with a unique treatment, general psychotherapy research does indicate that individuals with personality disorders improve with treatment (Sanislow & McGlashan, 1998). One exception to the lack of treatment specificity is Dialectical Behavior Therapy (DBT) which was developed to treat individuals with BPD (Linehan, 1993). This treatment approach focuses on reducing symptoms of BPD, (e.g., self-injurious behavior and other impulsive behaviors), and not on treating the borderline syndrome per se. DBT has empirical support for reducing self-injury, substance use, and angry hostility in women with BPD.

Treating individuals who have personality dysfunction as defined by a dimensional framework might parallel DBT's focus on reducing symptoms rather than on treating a global personality disorder. When developing a treatment plan, a multi-dimensional profile would elucidate specific targets that warrant clinical attention. Additionally, clinical trials might focus on "reducing impulsiveness" rather than on treating more global constructs that are difficult to precisely and uniformly define. Using a dimensional system allows clinicians to gather information that is comprehensive yet fine-grained about clients that could guide individualized treatment planning. Knowing that a patient has scored extremely high on the facet anxiousness might suggest that treatment should include interventions that focus on relaxation training and reducing worry. Importantly, more information about the individual is provided without having to create more diagnostic categories. The clinician would also have data about potential characteristics that are possible strengths for a patient. For example, a patient who

presents with normative scores on most facets of Extraversion and Agreeableness might have healthy interpersonal skills and supportive relationships.

Although a dimensional model of personality pathology defined by personality traits from well-established models seems compelling, several obstacles exist for implementing a dimensional classification scheme for personality disorders. These include: (1) deciding which dimensional model to choose (e.g., Widiger & Simonsen, 2005b; Widiger & Trull, in press), (2) implementing the new diagnostic system (e.g., Trull, 2005; Widiger & Trull, in press), and (3) determining the clinical value of the dimensional model (e.g., First, 2005; Widiger & Trull, in press). Widiger and Simonsen (2005b) suggest that integrating competing dimensional models into a hierarchical structure will likely provide the best classification system. Specifically, the authors propose that internalization and externalization might be the two broad factors at the top of the hierarchy. Directly beneath these two dimensions might be four or five broad domains of personality, namely Extraversion, Agreeableness, Contstraint, Neuroticism, and Openness. Lower-order traits and symptoms would compose the higher-order domains, and normal and abnormal variants would be described. For example, "abnormal" variants of lower-order facets for the domain Constraint might include perfectionism (low scores) and impulsivity (high scores). "Normal" variants of lower-order facets might include responsibility and dutifulness. Although there are strengths and weaknesses to every personality model, most of the well-established dimensional classification schemes would converge on this approach (Widiger & Simonsen, 2005b).

Future Directions

Before a FFM of personality disorder can be embraced, research must continue to address the obstacles for implementation that have been identified. First, the comprehensive dimensional classification scheme needs to be devised that would capture the strengths of the existing models. Although Widiger and Simonsen (2005b) have preliminarily described one such model, more work needs to be done. Trull (2005) outlines a research agenda for switching to a dimensional classification model for personality disorders in DSM-V: (1) determine which lower-order traits are important for inclusion in the new system, (2) correspond these lower-level traits to the DSM-IV pd symptoms, (3) determine cut off scores that will be clinically meaningful, and (4) incorporate an assessment of impairment and dysfunction that is valid for individuals suffering from personality pathology specifically.

For example, in order to assess which lower-order facets are important for inclusion, future studies should flesh out the nomological network of personality traits that define pds that to date have received less research attention. Specifically, researchers could examine relations between these Cluster A FFM indexes and measures of cognitive aberrations and dissociative experiences. Studies that have examined the external validity of FFM pd constructs have so far focused on BPD and psychopathy. This probably reflects the fact that in the more general personality disorder literature, more research has been conducted with these constructs than with Cluster A and Cluster C personality disorders. For example, fewer studies have examined the axis I correlations of schizoid personality disorder compared to borderline personality disorder

(McGlahan, et al., 2000). Future research should expand this work to include defining traits that best define the full range of personality pathology.

A second obstacle to address is that of feasibility. Clinicians want to be assured that the new model will be relevant to their practice. To this end, it is important to present case studies of how individuals might go about actually applying this model in their clinical work. Also, pilot studies should be conducted with real-world clinicians using this model. These professionals could receive training in the new assessment procedure followed by actually performing dimensional assessments with patients. Clinicians could rate their satisfaction with administering the assessment battery, conceptualization, and treatment planning with the dimensional classification system.

Another obstacle to address is demonstrating the clinical utility of the dimensional classification scheme above the current categorical system (Verheul, 2005). Although the NEO-PI-R provides a comprehensive picture of a patient's functioning, it is important to determine whether this information is clinically relevant. Researchers could randomly assign patients to groups: one that requires the NEO-PI-R assessment, a second group that has a more traditional interview measure of personality pathology, and a third group that has no formal assessment of personality. The effect of assessment battery on patient outcome, improvement in quality of life, and satisfaction of treatment could then be assessed. Results from such a study could yield information about whether or not having access to the richer information about personality functioning really pays off.

Limitations

One limitation of this study is that participants are community volunteers and were not initially selected from a patient population. Given this selection procedure, generalizability to clinical populations is limited. This limitation is mitigated by the fact that the ranges of BPD FFM prototype scores are similar to those that have been reported in clinical populations (Trull et al., 2003).

A second limitation is that this study relied solely on self-report data. Therefore, the relationships between variables could be inflated because of common method variance. However, it should be noted that the pattern of relationships reported in this study are similar to previous findings that have utilized different types of measures, such as semi-structured assessments of personality pathology and informant-reports (e.g., Miller et al., 2004; Trull et al., 2003; Miller, Pilkonis, & Morse, 2004). Collecting self-report data, which is quick to administer, assured that large numbers of participants could be selected.

Although many of the predicted relations were found, effect sizes were small when testing the incremental variance that ASPD and BPD FFM prototype scores accounted for in the prediction of health practices, disinhibitory behaviors, and measures of psychopathology when controlling for other personality disorder prototypes. However, it is important to note that the effect sizes were generally of medium to large in magnitude when assessing the bivariate relationship between the personality disorder prototype scores and constructs of interest. The magnitude of the bivariate associations between ASPD FFM prototype and alcohol and drug use is similar to what has been

previously reported between the psychopathy FFM index and substance use variables (Miller et al., 2001; Miller & Lynam, 2003). These findings suggest that the small incremental associations are due to the fact that many personality disorder profiles have unique relationships with the outcome variables of interest.

Conclusion

In sum, this study demonstrated good convergent and discriminant validity for the FFM ASPD and BPD prototype scores over a period of up to 6 years in a large community sample. ASPD and BPD prototype scores were related to risk avoidance, disinhibitory behaviors, and measures of psychopathology as expected. Generally, these prototypes were not related to items related to leisure activities and interests. However, contrary to hypotheses, they were negatively related to measures of health behaviors that seem to be tapping conscientiousness. When controlling for other personality disorder prototype scores, several unique associations were found between the two FFM prototype scores and outcome variables of interest. However, these effect sizes were small in magnitude. Only one moderating effect with age group was detected suggesting that the relationship between ASPD and BPD prototype scores is generally stable across the adult lifespan. Lastly, overlapping personality domains were at least moderately associated over time suggesting that personality profiles remained relatively stable across a nine-year period.

These findings have implications regarding classification, assessment, and treatment of personality disorders. Adopting a dimensional nosology for classifying personality dysfunction would ameliorate many of the problems with the current

categorical system and strengthen the validity of these constructs. Secondly, a protocol for assessing personality dysfunction within a dimensional framework has been developed and still needs to be evaluated for clinical utility. Finally, a dimensional conceptualization of personality dysfunction would focus on treating specific dysfunctional traits rather than a global syndrome. This shift would enable more specific, and perhaps more effective, interventions for treating personality pathology to be developed.

APPENDIX 1

Table 1. Five-Factor Model Ratings for Personality Disorders

Domain & Facets	Paranoid	Schizoid	Schizotypal	Histrionic	Narcisstic	Avoidant	Dependent	Obsessive-Compulsive
Neuroticism	3.45	2.77	3.64	3.30	2.74	3.72	3.53	3.02
Anxiousness	3.60	2.23	**4.25**	3.42	2.33	**4.76**	**4.32**	**4.00**
Angry hostility	**4.00**	2.54	3.08	3.42	**4.08**	2.81	2.42	3.00
Depressiveness	3.30	3.15	3.58	2.68	2.42	3.95	3.63	3.18
Self-Consciousness	3.30	3.31	**4.00**	2.00	1.50	**4.67**	**4.16**	3.29
Impulsivity	2.90	2.08	3.17	**4.32**	3.17	1.62	2.32	1.53
Vulnerability	3.60	3.31	3.75	3.95	2.92	**4.52**	**4.32**	3.12
Extraversion	2.20	1.34	1.94	**4.21**	3.51	1.63	2.58	2.43
Warmth	1.30	1.08	1.58	3.89	1.42	2.33	3.84	2.06
Gregariousness	1.70	1.00	1.58	**4.74**	3.83	1.29	3.26	2.18
Assertiveness	2.90	1.54	2.17	3.84	**4.67**	1.19	1.32	3.00
Activity	2.90	1.92	2.25	**4.16**	3.67	2.05	2.26	3.35
Excitement seeking	2.20	1.38	2.17	**4.47**	**4.17**	1.24	2.26	1.59
Positive emotions	2.20	1.23	1.92	**4.16**	3.33	1.67	2.53	2.41
Openness	2.48	2.44	3.06	3.85	3.18	2.90	2.94	1.92
Fantasy	2.90	3.23	3.83	**4.37**	3.75	3.14	3.05	2.06
Aesthetics	2.20	2.77	3.17	3.53	3.25	3.05	2.89	2.59
Feelings	2.40	1.31	2.17	**4.16**	1.92	3.43	3.74	1.82
Actions	2.00	1.62	2.42	**4.21**	**4.08**	2.00	2.21	1.53
Ideas	3.50	3.38	**4.33**	3.11	2.92	3.19	2.84	1.76
Values	1.90	2.31	2.42	3.63	2.67	2.57	2.89	1.76
Agreeableness	1.75	2.71	2.74	2.74	1.40	3.22	**4.03**	2.99
Trust	1.00	2.38	2.08	**4.00**	1.42	2.24	**4.26**	2.65
Straightforwardness	2.00	2.77	3.00	2.32	1.83	2.90	3.11	3.47
Altruism	1.90	2.38	2.75	2.21	1.00	2.90	3.95	2.76
Compliance	1.40	3.00	2.50	2.53	1.58	3.52	**4.68**	3.18
Modesty	2.40	3.31	3.08	2.32	1.08	**4.33**	**4.26**	3.06
Tendermindedness	1.80	2.38	3.00	3.05	1.50	3.43	3.89	2.82

APPENDIX 1

Table 1. Five-Factor Model Ratings for Personality Disorders (continued)

Conscientiousness	3.45	2.95	2.40	2.13	2.81	3.15	2.93	**4.56**
Competence	3.30	2.85	2.33	2.37	3.25	3.05	2.58	**4.53**
Order	3.70	3.08	2.00	2.10	2.92	3.43	2.89	**4.76**
Dutifulness	3.40	3.00	2.50	2.10	2.42	3.29	3.79	**4.76**
Achievement striving	3.00	2.38	2.25	2.68	3.92	2.67	2.47	**4.29**
Self-discipline	3.50	3.15	2.67	1.79	2.08	3.05	2.84	**4.53**
Deliberation	3.80	3.23	2.67	1.74	2.25	3.43	3.00	**4.59**

Note: Characteristic items defined as less than or equal to 2 (low; underlined), or greater than or equal to 4 (high; in bold). From Lynam & Widiger (2001).

APPENDIX 2

Table 1. Formulas for calculating FFM pd counts

PPD	=	n2+e1r+e2r+o4r+06r+a1r+a2r+a3r+a4r+a6r.
SPD	=	e1r+e2r+e3r+e4r+e5r+e6r+o3r+o4r.
SLPD	=	n1+n4+e1r+e6r+o3r+o4r.
ASPD	=	n1r+n2+n4r+n5+e3+e4+e5+o4+a1r+a2r+a3r+a4r+a5r+a6r+c3r+c5r+c6r.
BPD	=	n1+n2+n3+n5+n6+o3+o4+a4r+c6r.
HPD	=	n4r+n5+e2+e2+e4+e5+e6+o1+o3+o4+a1+a5r+c6r.
NPD	=	n2+n4r+e1r+e3+e5+o3r+o4+a1r+a2r+a3r+a4r+a5r+a6r.
AVPD	=	n1+n4+n5r+n6+e2r+e3r+e5r+e6r+o4r+a5.
DPD	=	n1+n4+n6+e3r+a1+a4+a5.
OCPD	=	n1+n5r+e5r+o3r+o4r+o5r+o6r+c1+c2+c3+c4+c5+c6.

Note: r = reverse-score this facet before summing the facets. From Miller et al. (2005).

APPENDIX 2

Table 2. Descriptive statistics for FFM PD simple sum prototype scores (*n* = 857)

Personality Disorder	**Mean (*SD*)**	**Range**	**Skewness**	**Kurtosis**
Simple Sum of Facets Technique				
Paranoid (PPD)	119.80 (25.43)	41 - 211	0.30	0.49
Schizoid (SDPD)	111.77 (23.76)	39 - 190	0.10	0.07
Schizotypal (SLPD)	100.19 (17.97)	34 - 162	0.28	0.43
Antisocial (ASPD)	228.79 (31.98)	128 - 341	0.08	0.13
Borderline (BPD)	129.50 (25.00)	55 - 231	0.36	0.35
Histrionic (HPD)	203.60 (26.63)	106 - 287	-0.05	0.32
Narcisstic (NPD)	164.37 (26.31)	91 - 256	0.33	0.27
Avoidant (AVPD)	150.44 (25.09)	68 - 255	0.32	0.91
Dependent (DPD)	113.85 (18.37)	42 - 182	0.15	0.56
Obsessive-Compulsive (OCPD)	221.17 (27.73)	127 - 308	0.07	0.28

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Table 3. Descriptive statistics for FFM PD simple sum prototype scores

Variable	**Men (*n*=378) Mean (*SD*)**	**Women (*n*=478) Mean (*SD*)**	**Total Sample (*n*=857) Mean (*SD*)**
Simple Sum of Facets Technique			
Paranoid (PPD)	127.38 (25.00)	113.82 (24.19)	119.80 (25.43)
Schizoid (SDPD)	113.84 (22.87)	110.17 (24.37)	111.77 (23.76)
Schizotypal (SLPD)	101.62 (17.30)	99.04 (18.43)	100.19 (17.97)
Antisocial (ASPD)	237.58 (31.69)	221.78 (30.49)	228.79 (31.98)
Borderline (BPD)	126.60 (24.56)	131.72 (25.11)	129.50 (25.00)
Histrionic (HPD)	202.05 (23.82)	204.75 (28.61)	203.60 (26.63)
Narcissistic (NPD)	174.26 (26.61)	156.52 (23.30)	164.37 (26.31)
Avoidant (AVPD)	147.36 (23.79)	152.87 (25.87)	150.44 (25.09)
Dependent (DPD)	108.08 (17.95)	118.37 (17.42)	113.85 (18.37)
Obsessive-Compulsive (OCPD)	220.44 (25.52)	221.85 (29.33)	221.17 (27.73)

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Table 4. Descriptive statistics for FFM PD sum of facets prototype scores by cohort

Variable	**Cohort1 (*n*=194) Mean (*SD*)**	**Cohort2 (*n*=430) Mean (*SD*)**	**Cohort3 (*n*=232) Mean (*SD*)**
Paranoid (PPD)	124.98 (27.06)	120.62 (24.62)	114.00 (24.49)
Schizoid (SDPD)	107.62 (23.07)	111.66 (24.19)	115.52 (23.06)
Schizotypal (SLPD)	101.37 (18.52)	101.07 (17.97)	97.52 (17.31)
Antisocial (ASPD)	235.30 (30.56)	230.94 (32.95)	219.23 (29.24)
Borderline (BPD)	136.17 (26.68)	130.63 (24.69)	121.68 (21.97)
Histrionic (HPD)	206.01 (26.81)	204.72 (27.37)	199.37 (24.64)
Narcissistic (NPD)	169.26 (26.67)	165.51 (26.61)	158.11 (24.35)
Avoidant (AVPD)	150.69 (25.02)	150.02 (25.78)	151.02 (23.97)
Dependent (DPD)	114.62 (18.89)	113.04 (18.65)	114.61 (17.40)
Obsessive-Compulsive (OCPD)	219.13 (27.34)	220.01 (27.92)	225.22 (27.32)

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Table 5. Bivariate correlations between FFM personality disorder scores (n = 857)

	PPDc	**SDPDc**	**SLPDc**	**ASPDc**	**BPDc**	**HPDc**	**NPDc**	**AVPDc**	**DPDc**	**OCPDc**
PPDc	1.00									
SDPDc	0.49**	1.00								
SLPDc	0.56**	0.63**	1.00							
ASPDc	0.45**	-0.38**	0.02	1.00						
BPDc	0.35**	-0.09*	0.48**	0.42**	1.00					
HPDc	-0.44**	-0.85**	-0.42**	0.50**	0.30**	1.00				
NPDc	0.68**	-0.08*	0.17**	0.87**	0.26**	0.10**	1.00			
AVPDc	0.36**	0.81**	0.68**	-0.53**	0.22**	-0.74**	-0.33**	1.00		
DPDc	-0.16**	0.37**	0.40**	-0.60**	0.33**	-0.23**	-0.64**	0.74**	1.00	
OCPDc	0.11**	0.32**	-0.17**	-0.57**	-0.49**	-0.68**	-0.22**	0.34**	0.03	1.00

Note: variables ending in "c" denote the composite score.
**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

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Table 6. Bivariate correlations between FFM pd prototype scores and FFM pd composite scores (n = 857)

	PPDc	**SDPDc**	**SLPDc**	**ASPDc**	**BPDc**	**HPDc**	**NPDc**	**AVPDc**	**DPDc**	**OCPDc**
PPDp	**0.87****	0.57**	0.55**	0.16**	0.19**	-0.64**	0.49**	0.47**	-0.10**	0.40**
SDPDp	0.43**	**0.93****	0.58**	-0.44**	-0.22**	-0.86**	-0.12**	0.75**	0.29**	0.42**
SLPDp	0.53**	0.69**	**0.89****	-0.05	0.47**	-0.43**	0.06	0.73**	0.47**	-0.17**
ASPDp	0.39**	-0.37**	-0.02	**0.96****	0.32**	0.50**	0.83**	-0.57**	-0.63**	-0.56**
BPDp	0.53**	0.03	0.53**	0.60**	**0.86****	0.22**	0.47**	0.15**	0.12**	-0.56**
HPDp	-0.15**	-0.65**	-0.20**	0.71**	0.42**	**0.88****	0.36**	-0.62**	-0.29**	-0.80**
NPDp	0.42**	-0.37**	-0.10**	0.89**	0.13**	0.37**	**0.89****	-0.61**	-0.79**	-0.27**
AVPDp	0.38**	0.82**	0.70**	-0.51**	0.22**	-0.73**	-0.30**	**0.96****	0.69**	0.29**
DPDp	-0.16**	0.55**	0.30**	-0.72**	0.06	-0.42**	-0.70**	0.76**	**0.87****	0.15**
OCPDp	0.30**	0.54**	0.02	-0.50**	-0.46**	-0.83	-0.11**	0.46**	0.04	**0.94****

Note: variables ending in "c" denote the composite score and variables ending in "p" denote the prototype matching score.
**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

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Table 7. Bivariate correlations between personality disorder prototypes and HPQ scores (n = 637)

Personality Disorder	**Health Practices Questionnaire**		
Simple Sum of Facets Technique	**Risk Avoidance**	**Good Health Practices**	**Health Concerns**
Paranoid (PPD)	-0.15**	-0.11**	-0.31**
Schizoid (SDPD)	0.15**	-0.13**	-0.17**
Schizotypal (SLPD)	-0.08*	-0.18**	-0.30**
Antisocial (ASPD)	**-0.48****	**-0.14****	**-0.21****
Borderline (BPD)	**-0.14****	**-0.02**	**-0.24****
Histrionic (HPD)	-0.28**	0.02	0.05
Narcisstic (NPD)	-0.40**	-0.14**	-0.21**
Avoidant (AVPD)	0.25**	-0.02	-0.12**
Dependent (DPD)	0.26**	0.05	-0.03
Obsessive-Compulsive (OCPD)	0.40**	0.19**	0.19**

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX 2

Figure 1. Bivariate correlations between ASPD FFM prototype summed score and health practices across cohorts

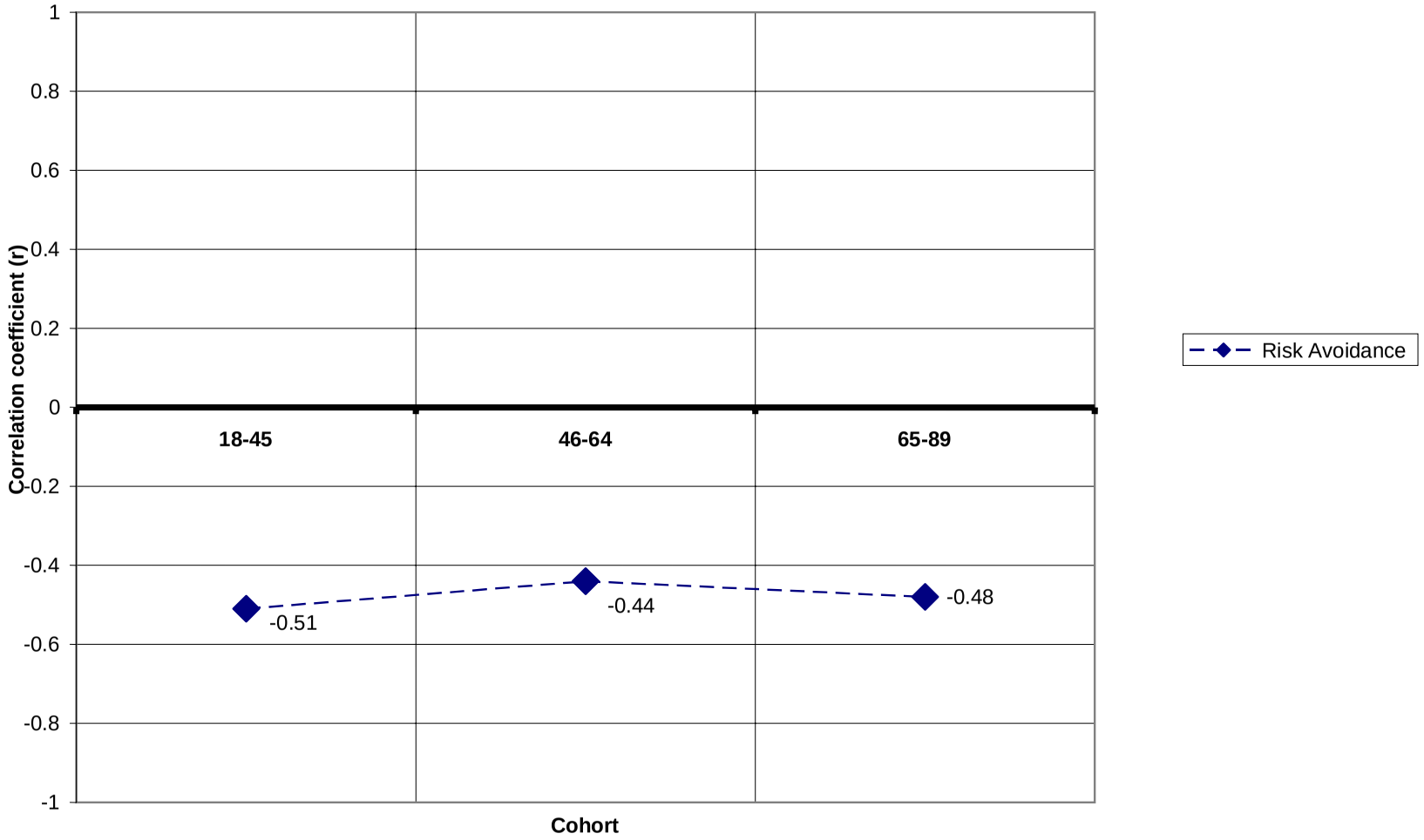

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Figure 2. Bivariate correlations between BPD FFM prototype summed scores and health practices across cohorts

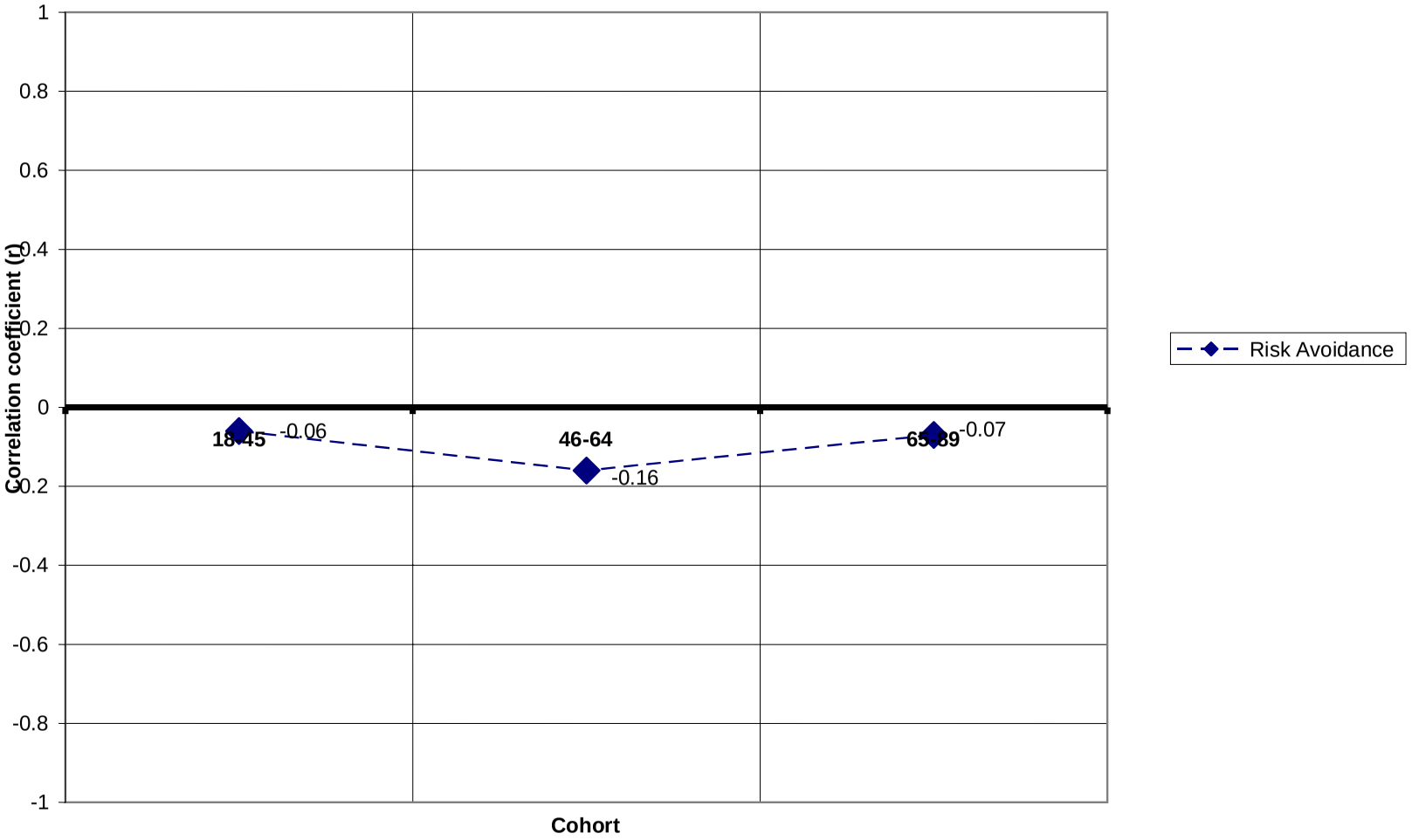

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Table 8. Bivariate correlations between FFM pd sum prototypes and disinhibitory behaviors (*n*=635)

	Behavioral Report Inventory (*n*=653)	
Simple Sum of Facets Technique	**Alcohol & Drug Use**	**Gambling**
Paranoid (PPD)	0.12**	0.12**
Schizoid (SDPD)	-0.15**	-0.09*
Schizotypal (SLPD)	0.05	-0.04
Antisocial (ASPD)	**0.39****	**0.26****
Borderline (BPD)	**0.17****	**0.04**
Histrionic (HPD)	0.25**	0.14**
Narcisstic (NPD)	0.34**	0.27**
Avoidant (AVPD)	-0.21**	-0.17**
Dependent (DPD)	-0.21**	-0.17**
Obsessive-Compulsive (OCPD)	-0.31**	-0.14**

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

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Figure 3. Bivariate correlations between ASPD FFM prototype summed score and disinhibitory behaviors across cohorts

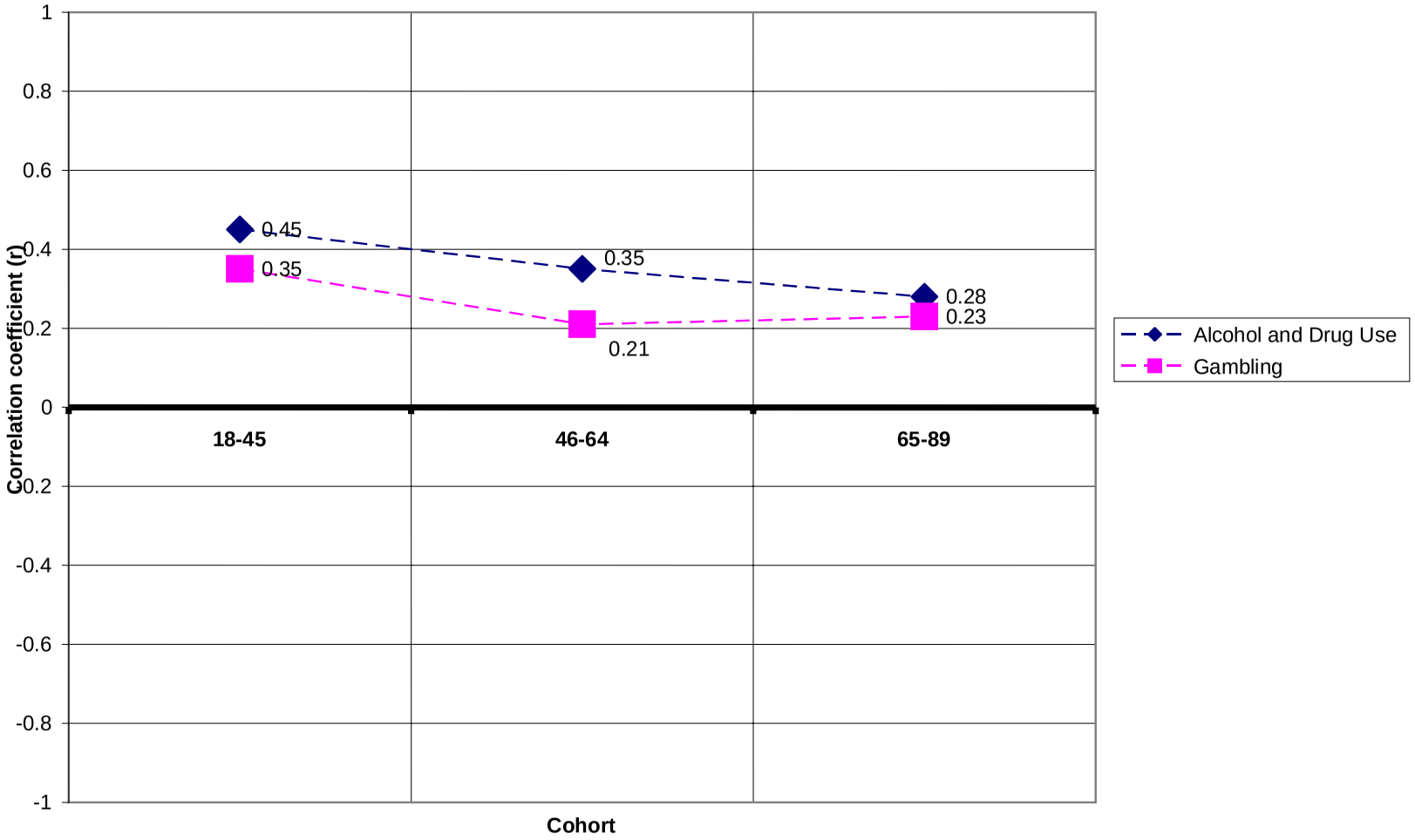

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Figure 4. Bivariate correlations between BPD FFM prototype summed score and disinhibitory behaviors across cohorts

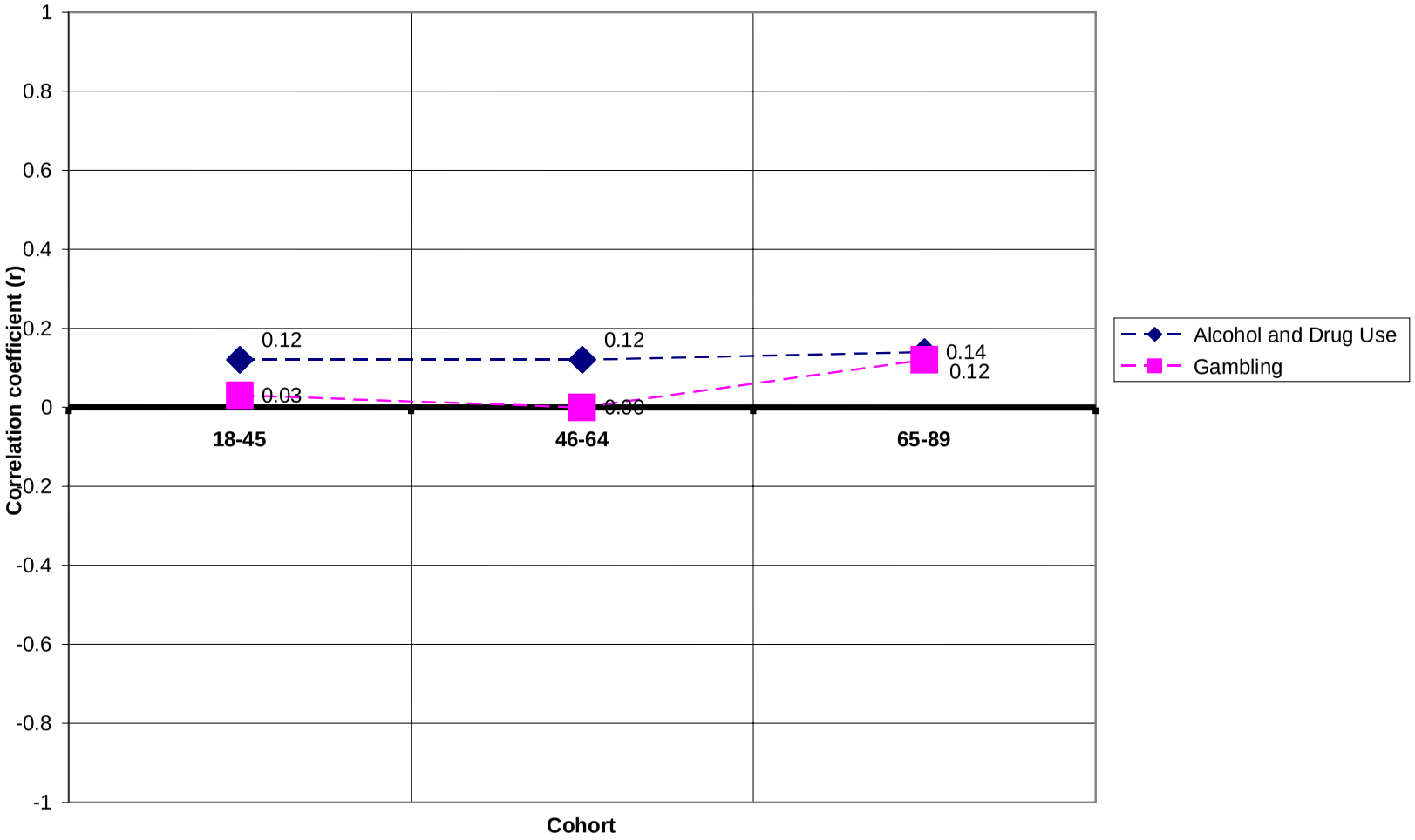

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Table 9. Bivariate correlations between personality disorder prototypes and psychopathology measures

	Behavioral Report Inventory (*n*=677)	**Personality, Emotions, & Attitudes Survey (*n*=613)**	
Simple Sum of Facets Technique	**Depression Score**	**Psychopathy (LSRP)**	**Borderline Personality (BPI)**
Paranoid (PPD)	0.22**	0.39**	0.34**
Schizoid (SDPD)	0.16**	0.14**	0.11*
Schizotypal (SLPD)	0.39**	0.33**	0.43**
Antisocial (ASPD)	**0.03**	**0.30****	**0.23****
Borderline (BPD)	**0.43****	**0.34****	**0.52****
Histrionic (HPD)	-0.07	-0.04	0.02
Narcisstic (NPD)	0.03	0.32**	0.20**
Avoidant (AVPD)	0.33**	0.12*	0.24**
Dependent (DPD)	0.32**	0.04	0.24**
Obsessive-Compulsive (OCPD)	-0.11**	-0.15**	-0.24**

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

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Figure 5. Bivariate correlations between ASPD FFM prototype summed score and psychopathology measures across cohorts

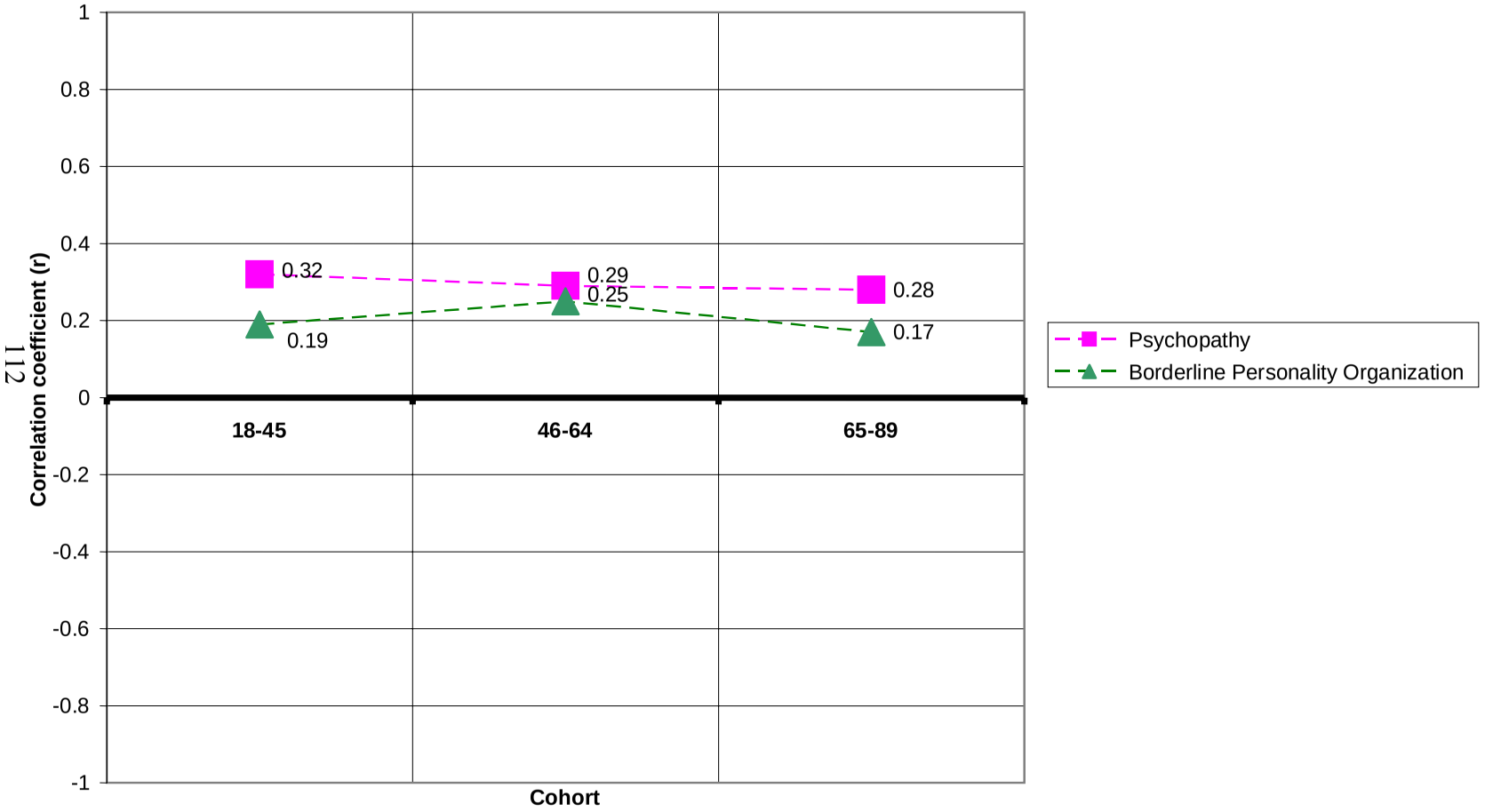

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Figure 6. Bivariate correlations between BPD FFM prototype summed score and psychopathology measures across cohorts

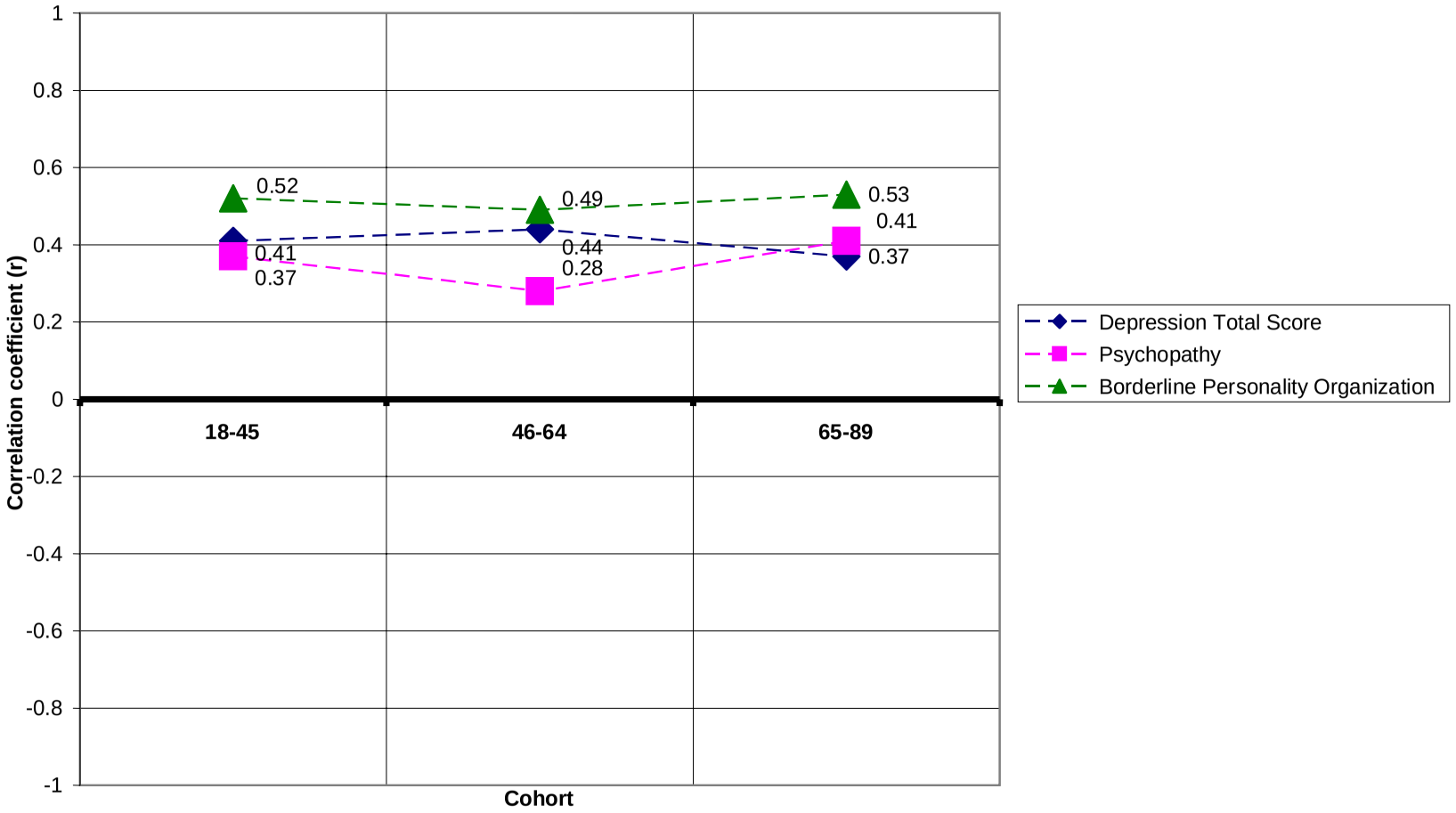

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Table 10. Bivariate correlations between personality disorder prototypes and leisure activities and interests

	Behavioral Report Inventory (*n*=693)			**PEA (*n*=651)**	**Personal Reactions Survey (*n*=621)**		
Simple Sum of Facets Technique	**Chewing gum**	**Outdoor market**	**Public library**	**Reading Freq**	**Country Music**	**Pop Music**	**Non-fiction**
Paranoid (PPD)	0.02	-0.20**	-0.08	-0.11**	0.08*	-0.07	-0.06
Schizoid (SDPD)	-0.13**	-0.23**	-0.03	-0.19**	0.05	-0.16**	-0.12**
Schizotypal (SLPD)	-0.01	-0.09*	0.07	-0.04	0.02	-0.15**	0.01
Antisocial (ASPD)	**0.07**	**0.07**	**0.03**	**0.13****	**-0.03**	**0.03**	**0.06**
Borderline (BPD)	**0.18****	**0.07**	**0.03**	**0.03**	**0.05**	**-0.06**	**0.00**
Histrionic (HPD)	0.11**	0.23**	0.09*	0.17**	-0.06	0.11**	0.11**
Narcisstic (NPD)	0.03	-0.01	-0.02	0.08*	-0.01	0.02	0.03
Avoidant (AVPD)	-0.01	-0.14**	-0.01	-0.17**	0.08	-0.14**	-0.10*
Dependent (DPD)	0.10*	-0.01	0.00	-0.13**	0.06	-0.06	-0.07
Obsessive-Compulsive (OCPD)	-0.06	-0.15**	-0.13**	-0.11**	0.07	0.02	-0.08

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

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Table 11. Bivariate correlations between FFM pd prototype summed scores and dependent variables by sex

A. Bivariate correlations with convergent validity items

	Health Practices	Disinhibitory Behaviors		Psychopathology Measures		
Personality Disorder Prototype Score	Risk avoidance	Alcohol and Drug Use	Gambling	Depression	Psychopathy	Borderline Personality Organization
Females (*n*)	***366***	***380***	***380***	***393***	***358***	***358***
ASPD	-0.49**	0.36**	0.22**	0.07	0.24**	0.22**
BPD	-0.20**	0.22**	0.09	0.45**	0.36**	0.53**
Males (*n*)	***271***	***279***	***279***	***284***	***255***	***255***
ASPD	-0.39**	0.33**	0.20**	0.02	0.35**	0.24**
BPD	-0.21**	0.20**	0.05	0.37**	0.33**	0.50**

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

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Table 12. ASPD summed score predicting risk avoidance

Predictors	Model 1				Model 2				Model 3			
	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	.56*				.45				.44			
cohort 1	.18				.20				.26			
cohort 3	.18	.15	37.63***	3, 633	.13	.15	37.63***	3, 633	.17	.15	37.63***	3, 633
Cluster A												
PPD					.27*				.23*			
SDPD					-.06				.08			
SLPD					-.06				-.04			
Cluster C												
AVPD					-.15				-.54***			
DPD					.07				.04			
OCPD					.14	.18	28.96***	6, 627	.22*			
Cluster B												
HPD									-.27*			
NPD									-.31*			
BPD									.29***	.22	23.74***	9, 624
ASPD	-.34***	.15	139.53***	1, 632	-.44***	.02	16.11***	1, 626	-.27	.00	3.05	1, 623
ASPD*sex	-.02				-.15				-.17			
ASPD*cohort 1	-.19				-.25				-.29			
ASPD*cohort 3	-.06	.00	.66	3, 629	-.01	.00	.46	3, 623	-.05	.00	.60	3, 620

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

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Table 13. ASPD summed score predicting alcohol and drug use

Predictors	Model 1				Model 2				Model 3			
	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.44				-.28				-.24			
cohort 1	-.48				-.46				-.50			
cohort 3	.11	.15	38.15***	3, 655	.17	.15	38.15***	3, 655	.14	.15	38.15***	3, 655
Cluster A												
PPD					-.26*				-.27*			
SDPD					.05				.08			
SLPD					.04				-.10			
Cluster C												
AVPD					.15				.55**			
DPD					-.08				-.26*			
OCPD					-.10	.11	15.58***	6, 649	-.23*			
Cluster B												
HPD									.44***			
NPD									.62***			
BPD									-.01	.14	14.30***	9, 646
ASPD	.26***	.09	72.99***	1, 654	.39**	.01	9.05**	1, 648	.32	.00	2.15	1, 645
ASPD*sex	.21				.02				.00			
ASPD*cohort 1	.55*				.56*				.58*			
ASPD*cohort 3	-.30*	.01	2.73*	3, 651	-.36	.01	2.84*	3, 645	-.34	.01	3.00*	3, 642

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

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Table 14. ASPD summed score predicting gambling

Predictors	Model 1				Model 2				Model 3			
	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.37				-.31				-.27			
cohort 1	-.49				-.50				-.55*			
cohort 3	-.17	.09	21.36***	3, 693	-.24	.09	21.36***	3, 693	-.29	.09	21.36***	3, 693
Cluster A												
PPD					.23				.23			
SDPD					.11				.01			
SLPD					-.05				-.17*			
Cluster C												
AVPD					-.46				-.12			
DPD					.26				.21			
OCPD					-.04	.05	6.94***	6, 687	-.20			
Cluster B												
HPD									.22			
NPD									.51***			
BPD									-.11	.06	5.58***	9, 684
ASPD	.12	.03	25.63***	1, 692	-.04	.00	.04	1, 686	-.53*	.01	4.31*	1, 683
ASPD*sex	.13				.08				.06*			
ASPD*cohort 1	.54				.55*				.59			
ASPD*cohort 3	.13	.00	1.35	3, 689	.19	.00	1.35	3, 683	.24	.00	1.57	3, 680

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

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Table 15. ASPD summed score predicting psychopathy

Predictors	Model 1				Model 2				Model 3			
	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	.57*				.40				.37			
cohort 1	-.25				-.18				-.14			
cohort 3	-.27	.05	11.19***	3, 648	-.08	.05	11.19***	3, 648	-.08	.05	11.19***	3, 648
Cluster A												
PPD					.10				.07			
SDPD					.25***				.15			
SLPD					.11				.00			
Cluster C												
AVPD					-.28*				-.40*			
DPD					.48***				.50***			
OCPD					.20*	.29	47.02***	6, 642	.01			
Cluster B												
HPD									-.30*			
NPD									.22			
BPD									.15*	.33	38.08***	9, 639
ASPD	.49***	.16	132.98***	1, 647	.79***	.03	34.04***	1, 641	.50*	.01	5.39*	1, 638
ASPD*sex	-.68**				-.49*				-.47*			
ASPD*cohort 1	.28				.19				.14			
ASPD*cohort 3	.28	.01	2.83*	3, 644	.12	.01	1.72	3, 638	.11	.00	1.50	3, 635

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

APPENDIX 2

Table 16. ASPD summed score predicting borderline personality inventory

	Model 1				Model 2				Model 3			
Predictors	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	.07				-.05				-.11			
cohort 1	.11				.09				.13			
cohort 3	.15	.01	2.05	3, 620	.45	.01	2.05	3, 620	.47	.01	2.05	3, 620
Cluster A												
PPD					.23*				.20			
SDPD					-.24**				-.22*			
SLPD					.24***				.23**			
Cluster C												
AVPD					.07				-.17			
DPD					.40***				.42***			
OCPD					-.02	.33	51.77***	6, 614	-.04			
Cluster B												
HPD									-.25			
NPD									-.10			
BPD									.16*	.34	35.76***	9, 611
ASPD	.26***	.05	33.46***	1, 619	.35*	.01	5.61*	1, 613	.39	.00	2.98	1, 610
ASPD*sex	-.04				.03				.07			
ASPD*cohort 1	-.07				-.11				-.16			
ASPD*cohort 3	-.18	.00	.12	3, 616	-.41	.00	.82	3, 610	-.43	.00	.94	3, 607

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

APPENDIX 2

Table 17. BPD summed score predicting risk avoidance

	Model 1				Model 2			
Predictors	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	.28				.24			
cohort 1	-.20				-.14			
cohort 3	-.04	.15	37.63***	3, 633	-.05	.15	37.63***	3, 633
Cluster A								
PPD					-.18*			
SDPD					.17			
SLPD					-.05			
Cluster C								
AVPD					-.06			
DPD					.11			
OCPD					.42***	.18	28.96***	6, 627
Cluster B								
HPD								
NPD								
ASPD								
BPD	-.23***	.03	19.82***	1, 632	.07	.00	2.48	1, 626
BPD*sex	.09				.04			
BPD*cohort 1	.18				.12			
BPD*cohort 3	.19	.00	.48	3, 629	.18	.00	.35	3, 623

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

APPENDIX 2

Table 18. BPD summed score predicting alcohol and drug use

Predictors	Model 1 β	Model 1 ΔR^2 (adj.)	Model 1 ΔF	Model 1 df_1, df_2	Model 2 β	Model 2 ΔR^2 (adj.)	Model 2 ΔF	Model 2 df_1, df_2
Sex	-.30				-.22			
cohort 1	.02				.00			
cohort 3	-.19	.15	38.15***	3, 655	-.07	.15	38.15***	3, 655
Cluster A								
PPD					-.04			
SDPD					.04			
SLPD					.01			
Cluster C								
AVPD					-.04			
DPD					-.18			
OCPD					-.23***	.11	15.58***	6, 649
Cluster B								
HPD								
NPD								
ASPD								
BPD	.15*	.02	17.76***	1, 654	.13	.00	2.68	1, 648
BPD*sex	-.01				-.04			
BPD*cohort 1	.05				.09			
BPD*cohort 3	-.02	.00	.03	3, 651	-.12	.00	.30	3, 645

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

APPENDIX 2

Table 19. BPD summed score predicting gambling

Predictors	Model 1			
	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.42*			
cohort 1	-.04			
cohort 3	-.33	.09	21.36***	3, 693
Cluster A				
PPD				
SDPD				
SLPD				
Cluster C				
AVPD				
DPD				
OCPD				
Cluster B				
HPD				
NPD				
ASPD				
BPD	-.02	.00	1.57	1, 692
BPD*sex	.14			
BPD*cohort 1	.10			
BPD*cohort 3	.28	.00	.75	3, 689

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

APPENDIX 2

Table 20. BPD summed score predicting depression

Predictors	Model 1				Model 2				Model 3			
	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.36*				-.34				-.34			
cohort 1	.09				.12				.12			
cohort 3	.16	.03	7.41***	3, 673	.18	.03	7.41***	3, 673	.17	.03	7.41***	3, 673
Cluster A												
PPD					.02				.01			
SDPD					.01				-.02			
SLPD					.19**				.19*			
Cluster C												
AVPD					.03				-.03			
DPD					.10				.13			
OCPD					.04	.21	31.14***	6, 667	.02			
Cluster B												
HPD									-.10			
NPD									-.03			
ASPD									.04	.21	20.94***	9, 664
BPD	.32***	.16	133.51***	1, 672	.21*	.02	16.41***	1, 666	.23*	.02	15.08***	1, 663
BPD*sex	.45*				.43*				.43*			
BPD*cohort 1	.01				.00				-.01			
BPD*cohort 3	-.11	.01	2.02	3, 669	-.13	.00	2.08	3, 663	-.12	.00	2.02	3, 660

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

APPENDIX 2

Table 22. BPD summed score predicting psychopathy

Predictors	Model 1				Model 2				Model 3			
	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.03				.02				.02			
cohort 1	-.08				-.12				-.09			
cohort 3	-.11	.05	11.19***	3, 648	-.07	.05	11.19***	3, 648	-.06	.05	11.19***	3, 648
Cluster A												
PPD					.50***				.08			
SDPD					.22*				.14			
SLPD					.06				.00			
Cluster C												
AVPD					-.58***				-.41*			
DPD					.29***				.50***			
OCPD					-.04	.29	47.02***	6, 642	.00			
Cluster B												
HPD									-.31*			
NPD									.23			
ASPD									.42*	.33	38.25***	9, 639
BPD	.44***	.16	131.69***	1, 647	.24**	.01	10.99***	1, 641	.17	.00	4.41*	1, 638
BPD*sex	-.24				-.13				-.14			
BPD*cohort 1	.09				.12				.09			
BPD*cohort 3	.14	.00	.74	3, 644	.10	.00	.37	3, 638	.10	.00	.35	3, 635

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

APPENDIX 2

Table 22. BPD summed score predicting borderline personality inventory

	Model 1				Model 2			
Predictors	β	ΔR^2 (adj.)	ΔF	df_1, df_2	β	ΔR^2 (adj.)	ΔF	df_1, df_2
Sex	-.16				-.10			
cohort 1	-.11				-.11			
cohort 3	.03	.01	2.05	3, 620	.09	.01	2.05	3,620
Cluster A								
PPD					.36***			
SDPD					-.20*			
SLPD					.21**			
Cluster C								
AVPD					-.09			
DPD					.29***			
OCPD					-.10	.33	51.77***	6, 614
Cluster B								
HPD								
NPD								
ASPD								
BPD	.51***	.27	226.47	1, 619	.14	.01	5.05*	1, 613
BPD*sex	.07				.07			
BPD*cohort 1	.10				.09			
BPD*cohort 3	.00	.00	.15	3, 616	-.06	.00	.21	3, 610

Note: β = standardized beta coefficient in the final model; ΔR^2 (adj) = change in R^2, adjusted; ΔF = change in F; df_1, df_2 = numerator degrees of freedom, denominator degrees of freedom. *p<.05, **p<.01, ***p<.001.

APPENDIX 3

Table 1. Bivariate correlations between FFM personality disorder prototype scores and dependent variables for females and males

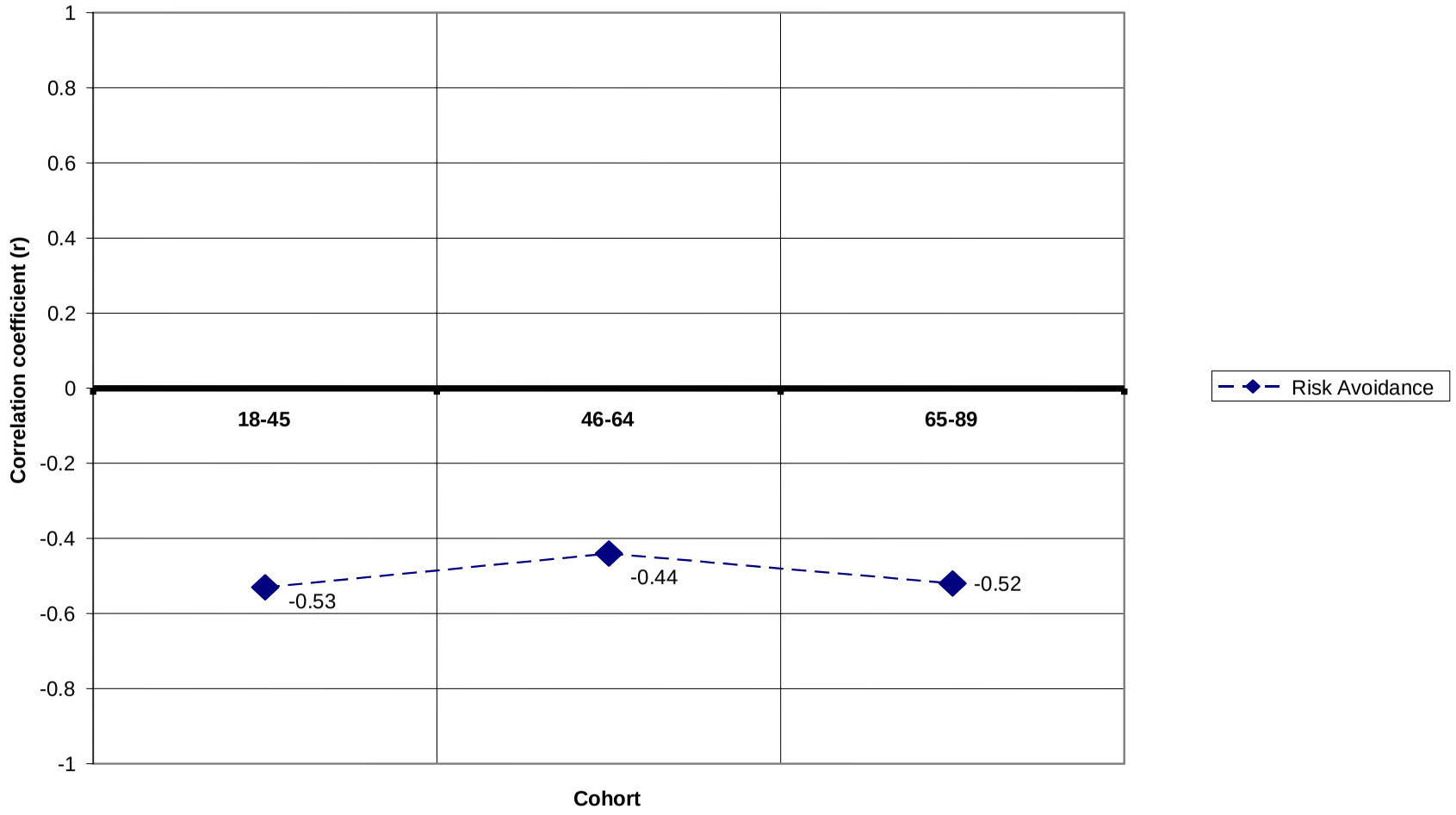
A. Bivariate correlations with convergent validity items

	Health Practices	Disinhibitory Behaviors		Psychopathology Measures		
Personality Disorder Prototype Score	Risk avoidance	Alcohol and Drug Use	Gambling	Depression	Psychopathy	Borderline Personality Inventory
Females (*n*)	***366***	***380***	***380***	***393***	***358***	***358***
ASPD	-0.49**	0.37**	0.25**	-0.01	0.30**	0.18**
BPD	-0.27**	0.23**	0.12	0.39**	0.46**	0.57**
Males (*n*)	***271***	***279***	***279***	***284***	***255***	***255***
ASPD	-0.41**	0.33**	0.23**	-0.03	0.46**	0.20**
BPD	-0.32**	0.23**	0.09	0.32**	0.59**	0.50**

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

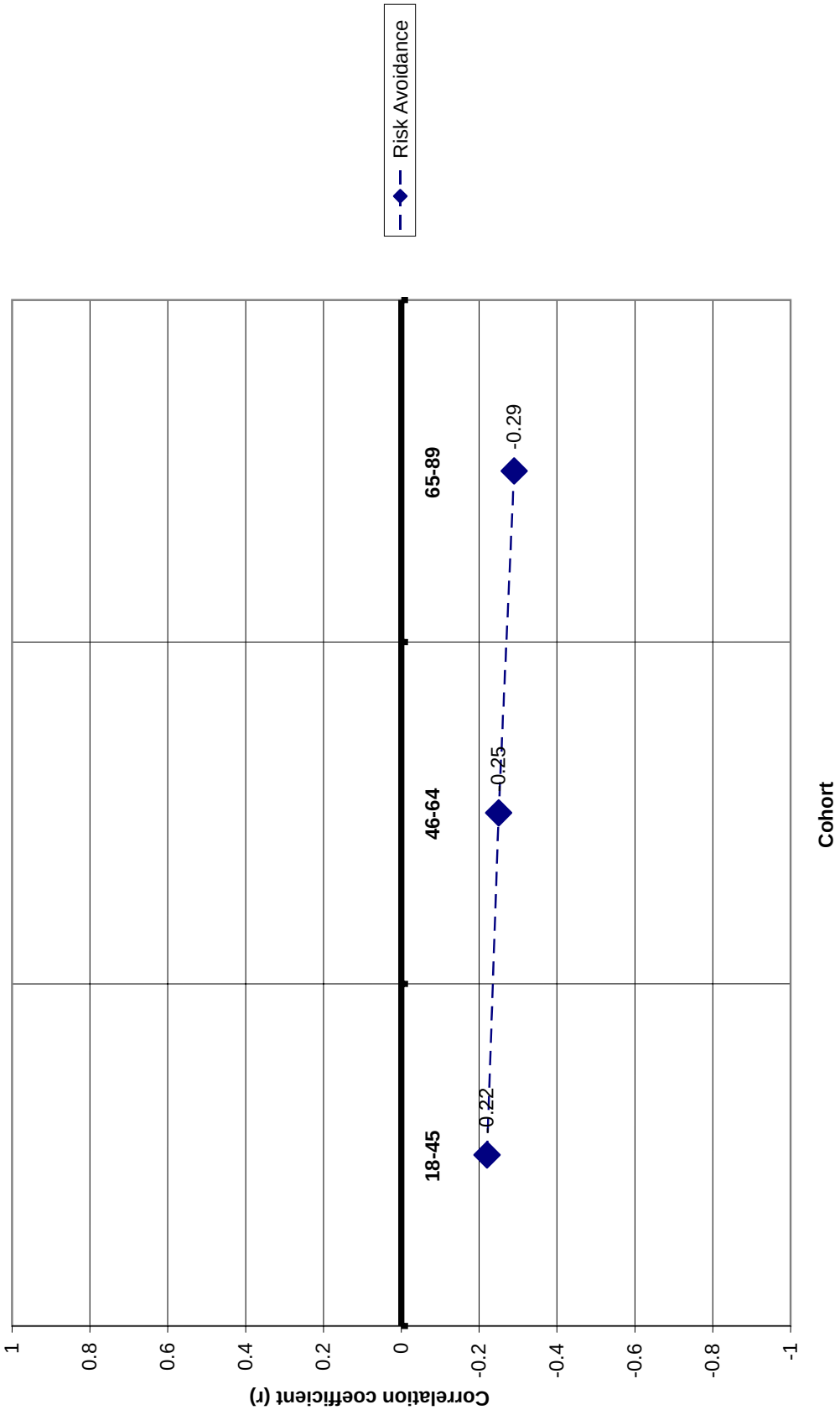
APPENDIX 3

Figure 1. Bivariate correlations between ASPD FFM prototype score and health practices across cohorts



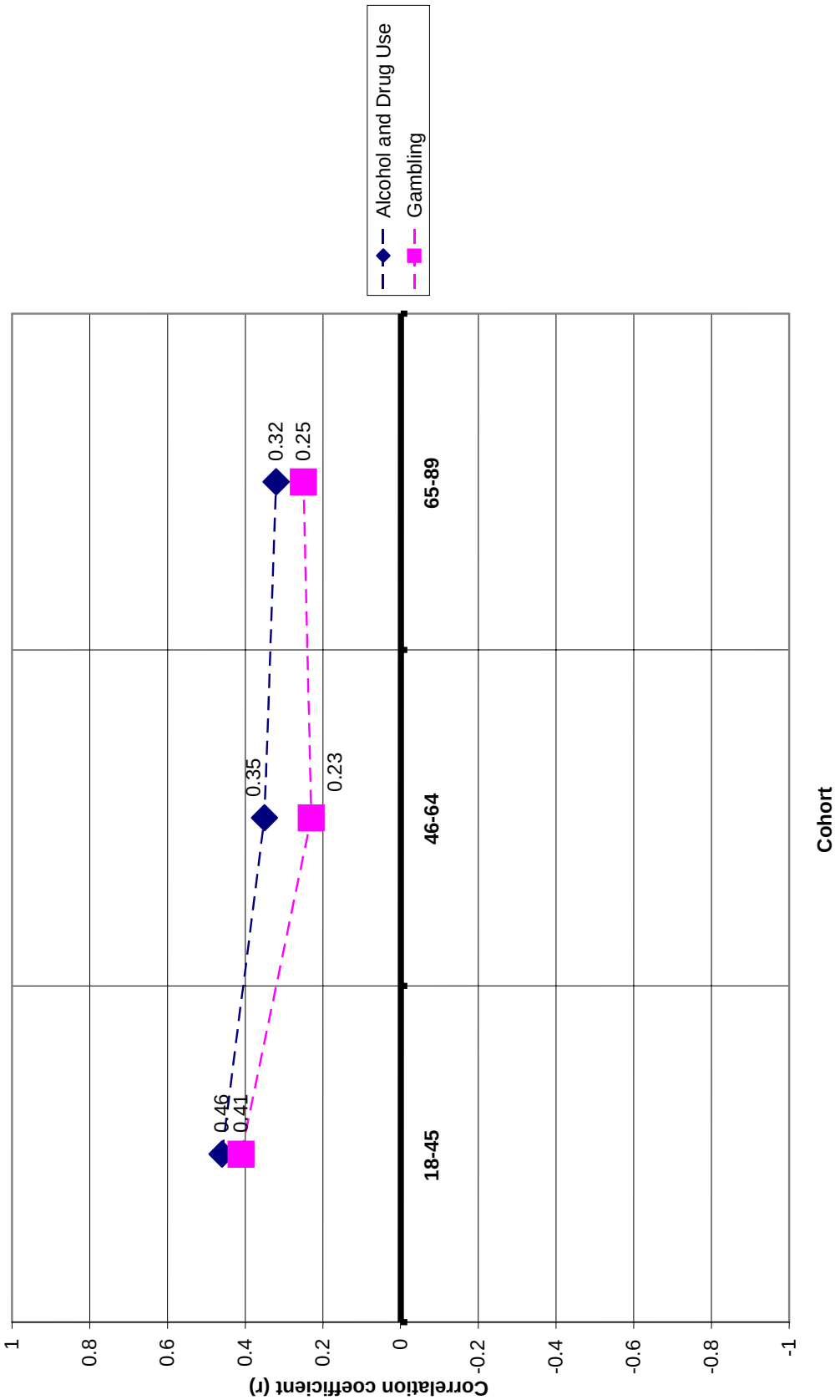
APPENDIX 3

Figure 2. Bivariate correlations between BPD FFM prototype score and health practices across cohorts



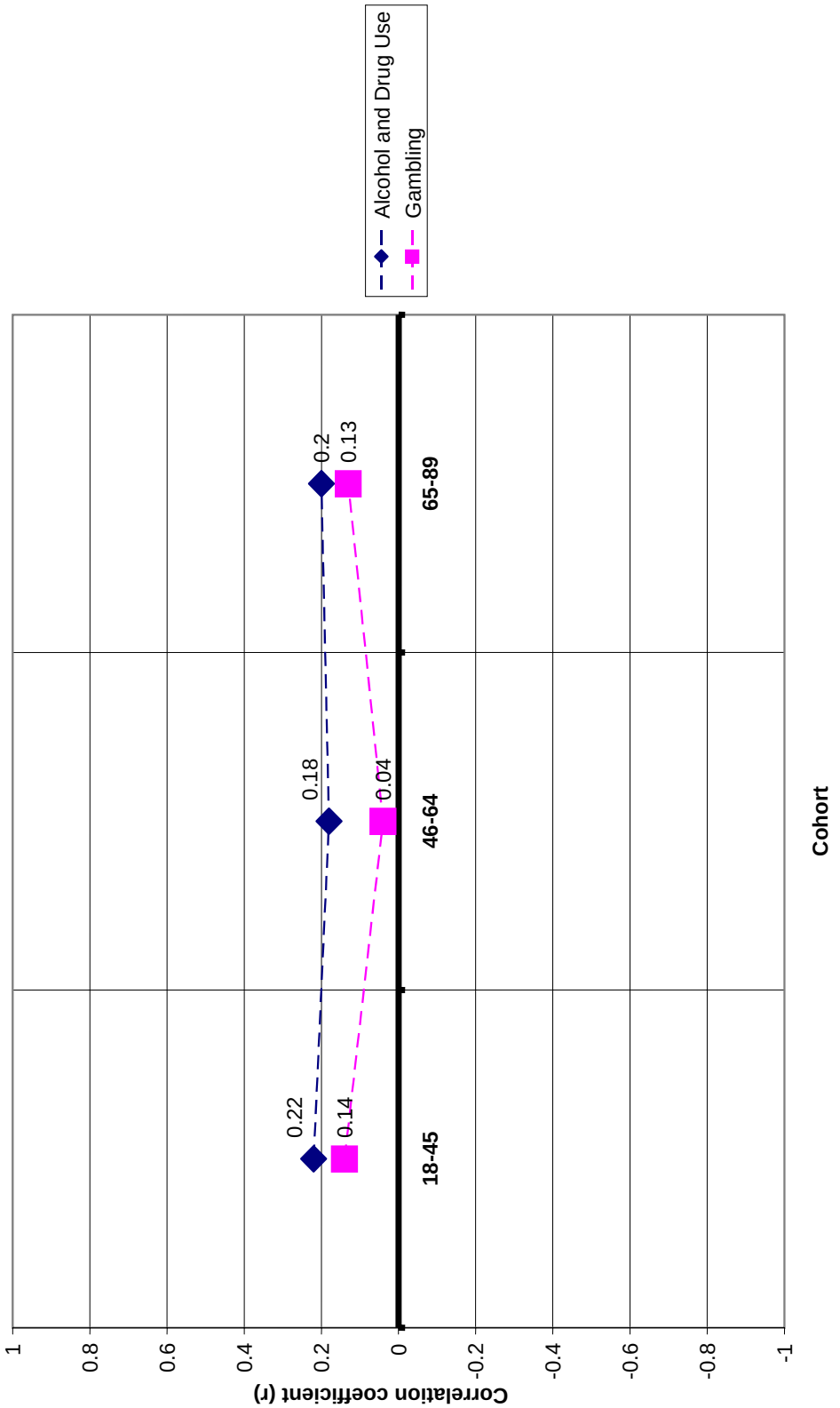
APPENDIX 3

Figure 3. Bivariate correlations between ASPD FFM prototype score and disinhibitory behaviors across cohorts.



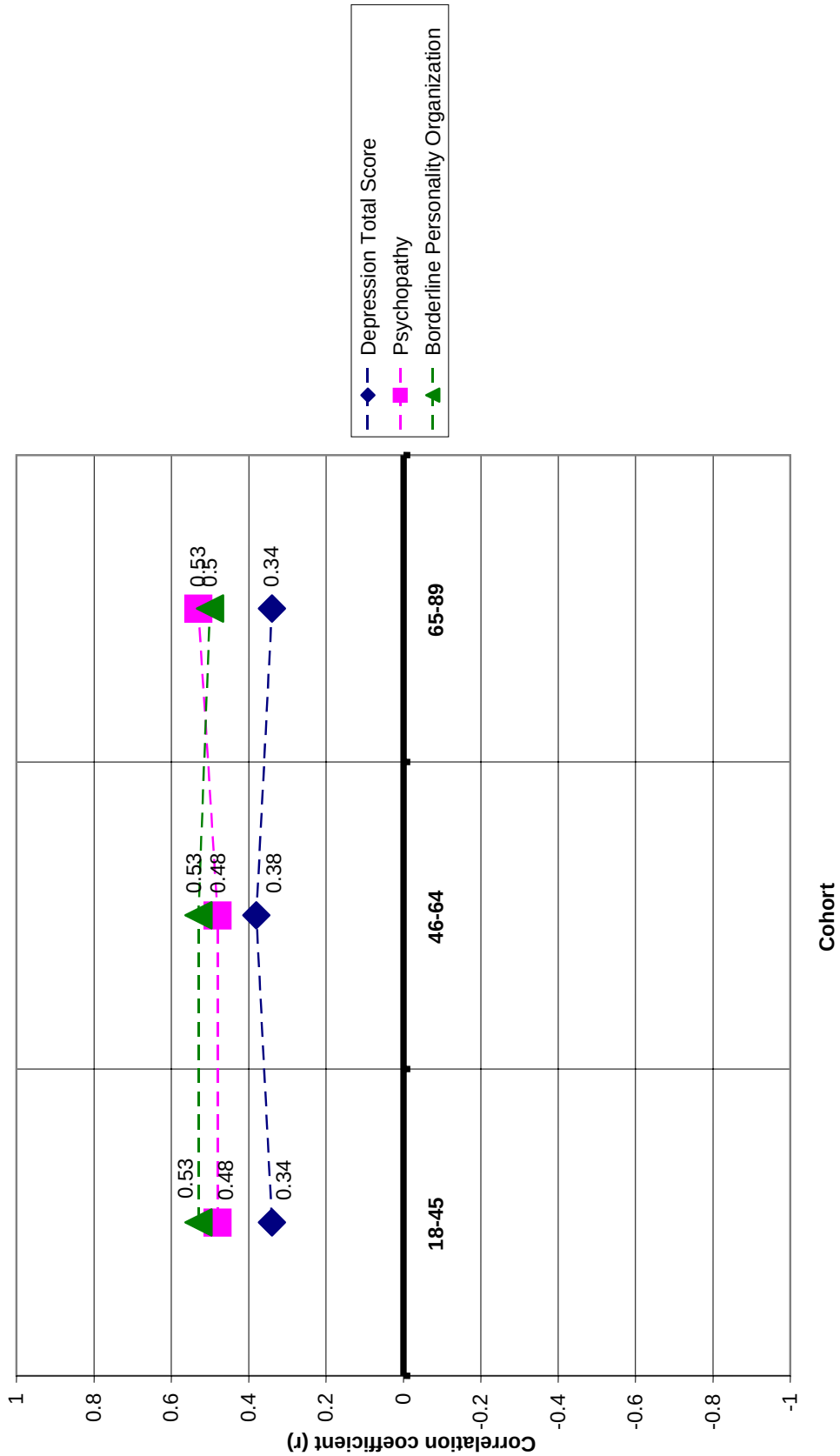
APPENDIX 3

Figure 4. Bivariate correlations between BPD FFM prototype score and disinhibitory behaviors across cohorts



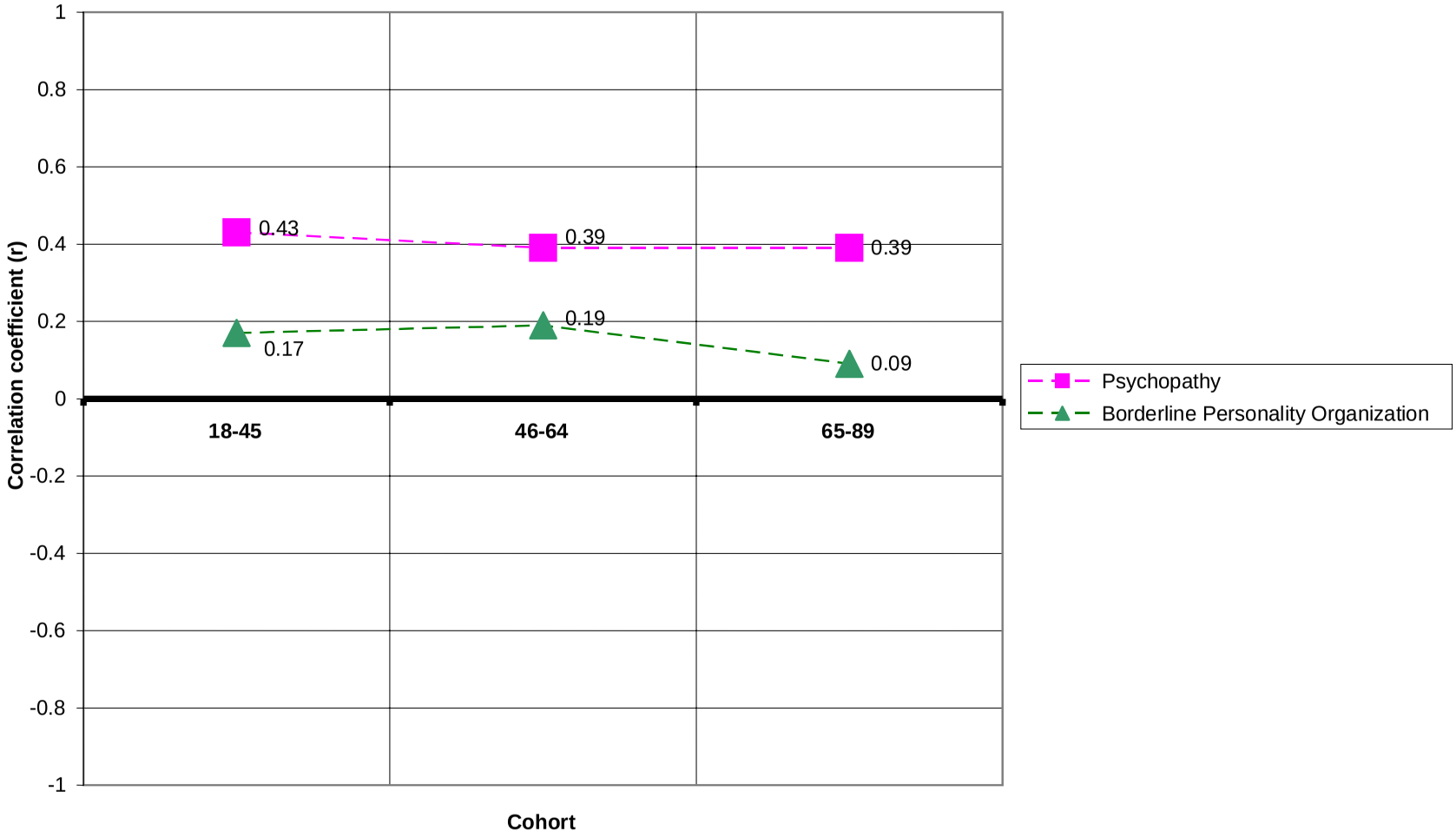
APPENDIX 3

Figure 5. Bivariate correlations between BPD FFM prototype score and psychopathology measures across cohorts



APPENDIX 3

Figure 6. Bivariate correlations between ASPD FFM prototype score and psychopathology measures across cohorts



REFERENCES

Allport, G. W., & Odbert, H. S. (1936). Traitnames: A psycho-lexical study. *Psychological Monographs, 47,* (1, Whole No. 211).

Alpert, J. E., Uebelacker, L. A., McLean, N. E., Nierenberg, A. A., Pava, J. A., Worthington, J. J. III, Tedlow, J. R., Rosenbaum, J. F., & Fava, M. (1997). Social phobia, avoidant personality disorder and atypical depression: Co-occurrence and clinical implications. *Psychological Medicine, 27,* 627-633.

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., Text Revision). Washington, DC: Author.

Ashton, M. C. & Lee, K. (2005). Honesty-humility, the Big Five, and the Five-Factor Model. *Journal of Personality, 73,* 1321-1353.

Axelrod, S. T., Widiger, T., Trull, T., & Corbitt, E. (1997). Relations of the Five-Factor Model antagonism facets with personality disorder symptomatology. *Journal of Personality Assessment, 69,* 297-313.

Bazanis, E., Rogers, R. D., Howson, J. H., Taylor, P., Meux, C., Staley, C., Nevinson-Andrews, D., Taylor, C., Robbins, T. W., & Sahakian, B. J. (2002). Neurocognitive deficits in decision-making and planning of patients with DSM-III-R borderline personality disorder. *Psychological Medicine, 32,* 1395-1405.

Blashfield, R. K., & Intoccia, V. (2000). Growth of the literature on the topic of personality disorders. *American Journal of Psychiatry, 157,* 472-473.

Bornovalova, M. A., Lejuez, C. W., Daughters, S. B., Rosenthal, M. Z., & Lynch, T. R. (2005). Impulsivity as a common process across borderline personality and substance

use disorders. *Clinical Psychology Review, 25,* 790-812.

Chopra, K. K., Bagby, R. M., Dickens, S., Kennedy, S. H., Ravindran, A., & Levitan, R. D. (2005). A dimensional approach to personality in atypical depression. *Psychiatry Research, 134, 1*61-167.

Clark, L. A., Watson, D., & Reynolds, S. (1995). Diagnosis and classification of psychopathology: Challenges to the current system and future directions. *Annual Review of Psychology, 46,* 121-153.

Clarkin, J. F., Hull, J. W., Cantor, J., & Sanderson, C. (1993). Borderline personality disorder and personality traits: A comparison of SCID-II BPD and NEO-PI. *Psychological Assessment, 5,* 472-476.

Cleckley, H. (1988). *The mask of sanity*. St. Louis, MO: Mosby.

Costa, P. T. & McCrae, R. R. (1985). *The NEO Personality Inventory manual.* Odessa, FL: Psychological Assessment Resources.

Costa, P. T. & McCrae, R. R. (1994). Personality disorders and the five-factor model of personality. *Journal of Personality Disorders, 4,* 362-371.

Costa, P. T. & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI), professional manual*. Odessa, FL: Psychological Assessment Resources.

Devins, G. M., Orme, C. M., Costello, C. G., Binik, Y. M., Frizzell B., Stam, H. J., et al. (1988). Measuring depressive symptoms in illness populations: Psychometric properties of the Center for Epidemiologic Studies Depression (CES-D) Scale. *Psychology and Health, 2,* 139-156.

Duijsens, I. J. & Diekstra, R. F. W. (1996). DSM-III-R and ICD-10 personality disorders and

their relationship with the big five dimensions of personality. *Personality and Individual Differences, 21,* 119-133.

Dyce, J. A. & O'Connor, B. P. (1998). Personality disorders and the Five Factor Model: A test of facet-level predictions. *Journal of Personality Disorders, 12,* 31-45.

Ekselius, L., Tillfors, M., Furmark, T., & Fredrikson, M. (2001). Personality disorders in the general population: DSM-IV and ICD-10 defined prevalence as related to the sociodemographic profile. *Personality and Individual Differences, 30,* 311-320.

Erikson, E. H. (1975). *Life history and the historical moment.* New York: W. W. Norton.

First, M. B. (2005). Clinical utility: A prerequisite for the adoption of a dimensional approach in DSM. *Journal of Abnormal Psychology, 114,* 560-564.

Goldberg, L. R. (1999). A broad-bandwidth, public-domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality psychology in Europe, Vol. 7* (pp. 7–28). Tilburg, The Netherlands: Tilburg University Press.

Goldberg, L. R. (2005). *The Eugene-Springfield community sample: Information available from the research participants* (Vol. 45, 1). Oregon Research Institute.

Goldberg, L. R. & Strycker, L. A. (2002). Personality traits and eating habits: The assessment of food preferences in a large community sample. *Personality and Individual Differences, 32,* 49-65.

Grant, B. F., Bridget F. G., Stinson, F. S., Dawson, D. A., Chou, S. P., & Ruan, W. J. (2005a). Co-occurrence of DSM-IV personality disorders in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions.

Comprehensive Psychiatry, 46, 1-5.

Grant, B. F., Hasin, D. S., Stinson, F. S., Dawson, D. A., Chou, S. P., Ruan, W. J., & Huang, B. (2005b). Co-occurrence of 12-month mood and anxiety disorders and personality disorders in the US: Results from the national epidemiologic survey on alcohol and related conditions. *Journal of Psychiatric Research, 39,* 1-9.

Grucza, R. A. & Goldberg, L. R. (unpublished manuscript). The comparative validity of 10 modern personality inventories: Predictions of behavioral acts, informant reports, and clinical indicators.

Gunderson, J.G. & Phillips, K.A. (1991). A current view of the interface between borderline personality disorder and depression. *American Journal of Psychiatry,148*, 967-975.

Harpur, Hart, & Hare (2002). Personality of the psychopath. In P. T. Costa & T. A. Widiger (Eds.), *Personality disorders and the Five Factor Model of personality, 2nd edition,* (pp. 299-324). Washington DC: American Psychological Association.

Hollander, E. (1998). Treatment of obsessive-compulsive spectrum disorders with SSRIs. *British Journal of Psychiatry, 173*, 7-12.

Jang, K. L., Livesley, W., J., & Vernon, P., A. (1996). Heritability of the big five personality dimensions and their facets: a twin study. *Journal of Personality, 64,* 577-91.

Jang, K. L., McCrae, R. R., Angleitner, A., Riemann, R., & Livesley, W. J. (1998). Heritability of facet-level traits in a cross-cultural twin sample: Support for a hierarchical model of personality. *Journal of Personality and Social Psychology, 74,* 1556-1565.

Jang, K. L., Vernon, P. A., & Livesley, W. J. (2001). Behavioural-genetic perspectives on personality function. *Canadian Journal of Psychiatry, 46,* 234-244.

Kanzler, H. R. & Rosenthal, R. N. (2003). Dual diagnosis: Alcoholism and co-morbid psychiatric disorders. *American Journal on Addictions, 12 (Suppl1),* S26-S40.

Kernberg, O. F. (1984). *Severe personality disorders: Psychotherapeutic strategies*. New Haven, CT: Yale University Press.

Kessler, R. C., Nelson, C. B., McGonagle, K. A., Frank, R. G., & Leaf, P. J. (1996). The epidemiology of co-occurring addictive and mental disorders: Implications for prevention and service utilization. *American Journal of Orthopsychiatry, 66,* 17-31.

Krueger, R.F. (2002). Psychometric perspectives on comorbidity. In J.E. Helzer & J.J. Hudziak (Eds.), *Defining psychopathology in the 21st century: DSM–V and beyond* (pp. 41–54). Washington, DC: American Psychiatric Publishing.

Krueger, R. F. & Tackett, J. L. (2003). Personality and psychopathology: Working toward the bigger picture. *Journal of Personality Disorders, 17,* 109-128.

Lee, K. & Ashton, M. C. (2004). Psychometric properties of the HEXACO Personality Inventory. *Multivariate Behavioral Research, 39*, 329-358.

Lee, K., Ogunforwora, B., & Ashton, M. C. (2005). Personality traits beyond the Big Five: Are they within HEXACO space? *Journal of Personality, 73,* 1437-1463.

Leahy, R. L., Beck, J., Beck, A. T. (2005). Cognitive Therapy for the Personality Disorders. Strack, Stephen (Ed). *Handbook of personology and psychopathology*. (pp. 442-461). Hoboken, NJ, US: John Wiley & Sons, Inc.

Leichsenring, F. (1999). Development and first results of the Borderline Personality Inventory: A self-report instrument for assessing borderline personality organization. *Journal of Personality Assessment, 73,* 45-63.

Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic

attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology, 68,* 151-158.

Levinson, D. J. (1978). *Season of a man's life.* New York: Knopf.

Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York, NY, US: Guilford Press.

Livesley, W. J. (2003). Diagnostic dilemmas in classifying personality disorder. In K.A. Phillips, M.B. First, & H.A. Pincus (Eds.), *Advancing DSM: Dilemmas in psychiatric diagnosis* (pp. 153–190). Washington, DC: American Psychiatric Association.

Livesley, W. J. (2005). Behavioral and molecular genetic contributions to a dimensional classification of personality disorder. *Journal of Personality Disorders, 19,* 131-155.

Lynam, D. R. (2002). Psychopathy from the perspective of the Five-Factor Model of personality. In P. T. Costa & T. A. Widiger (Eds.) *Personality disorders and the Five Factor Model of personality, 2nd edition,* (pp. 325-348). Washington, DC: American Psychological Association.

Lynam, D. R., Leukefeld, C., & Clayton, R. R. (2003). The contribution of personality to the overlap between antisocial behavior and substance use/misuse. *Aggressive behavior, 29,* 316-331.

Lynam, D. R., Whiteside, S., & Jones, S. (1999). Self-reported psychopathy: A validation study. *Journal of Personality Assessment, 73,* 110-132.

Lynam, D. R. & Widiger, T. A. (2001). Using the Five-Factor Model to represent DSM-IV personality disorders: An expert consensus approach. *Journal of Abnormal Psychology, 110,* 401-412.

McCrae, R. R., Costa, P. T., Del Pilar, G. H., Rolland, J. P., & Wayne D. (1998). Cross-

cultural assessment of the five-factor model: The Revised NEO Personality Inventory. *Journal of Cross-Cultural Psychology, 29,* 171-188.

McCrae, R. R. & John, O. P. (1992). An introduction to the Five-Factor Model and its applications. *Journal of Personality, 60,* 175-215.

McGlashan, T. H., Grilo, C. M., Skodol, A. E., Gunderson, J. G., Shea, M. T., Morey, L. C., Zanarini, M. C., & Stout, R. L. (2000). The Collaborative Longitudinal Personality Disorders Study: Baseline Axis I/II and II/II diagnostic co-occurrence. *Acta Psychiatrica Scandinavica, 102,* 256-264.

Miller, J. D. & Lynam, D. R. (2003). Psychopathy and the Five-Factor Model of personality: A replication and extension. *Journal of Personality Assessment, 81,* 168-178.

Miller, J. D., Lynam, D., & Leukefeld, C. (2003). Examining antisocial behavior through the lens of the Five Factor Model of personality. *Aggressive Behavior, 29,* 497-514.

Miller, J. D., Lynam, D. R., Widiger, T. A., & Leukefeld, C. (2001). Personality disorders as extreme variants of common personality dimensions: Can the Five-Factor Model adequately represent psychopathy? *Journal of Personality, 69,* 253-276.

Miller, J. D., Pilkonis, P. A., & Morse, J. Q. (2004). Five-Factor Model prototypes for personality disorders: The utility of self-reports and observer ratings, *Assessment, 11,* 127-138.

Miller, J. D., Reynolds, S. K., & Pilkonis, A. (2004). The validity of the Five-Factor Model prototypes for personality disorders in two clinical samples. *Psychological Assessment, 16,* 310-322.

Morey, L. C. (1992). Personality disorder NOS: Specifying patterns of the otherwise unspecified. Presented at the annual convention of the American Psychological

Association, 100th, Washington, DC.

Morey, L. C. & Zanarini, M. C. (2000). Borderline personality: Traits and disorder. *Journal of Abnormal, 109,* 733-737.

Neter, J., Kutner, M. H., Wasserman, W., & Nachtsheim, C. J. (1996). *Applied linear statistical models, 4th edition*. New York, NY: McGraw-Hill.

Nigg, J. T. & Goldsmith, H. H. (1994). Genetics of personality disorders: Perspectives from personality and psychopathology research. *Psychological Bulletin, 115,* 346-380.

Norman, W. T. (1963). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *Journal of Abnormal and Social Psychology, 66,* 574-583.

Paunonen, S. V. & Ashton, M. C. (2001). Big Five factors and facets in the prediction of behavior. *Journal of Personality and Social Psychology, 81,* 524-539.

Petry, N. M., Stinson, F. S., & Grant, B. F. (2005). Comorbidity of DSM-IV pathological gambling and other psychiatric disorders: Results from the National Epidemiological Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry, 66,* 564-574.

Quirk, S. W., Christiansen, N. D., Wagner, S. H., & McNulty, J. L. (2003). On the usefulness of measures of normal personality for clinical assessment: Evidence of the incremental validity of the Revised NEO Personality Inventory. *Psychological Assessment, 15,* 311-325.

Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1,* 385-401.

Reynolds, S. K. & Clark, L. A. (2001). Predicting dimensions of personality disorder from

domains and facets of the Five-Factor Model. *Journal of Personality, 69,* 199-222.

Sanislow, C. A. & McGlashan, T. H. (1998). Treatment outcome of personality disorders. *Canadian Journal of Psychiatry, 43,* 237-250.

Samuels, J., Eaton, W. W., Bienvenu, O. J., Brown, C. H., Costa, P. T., & Nestadt, G. (2002). Prevalence and correlates of personality disorders in a community sample. *British Journal of Psychiatry, 180,* 536-542.

Shedler, J. & Westen, D. (2004). Refining personality disorder diagnosis: Integrating science and practice. *American Journal of Psychiatry, 161,* 1350-1365.

Sher, K. J. & Trull, T. (1994). Personality and disinhibitory psychopathology: Alcoholism and antisocial personality disorder. *Journal of Abnormal Psychology, 103,* 92-102.

Siever, L. J., & Davis, K. L. (1991). A psychobiological perspective on the personality disorders. *American Journal of Psychiatry, 148,* 1647-1658.

Skodol, A. E., Gunderson, John G., McGlashan, T. H., Dyck, I. R., Stout, R. L., Bender, D. S., Grilo, C. M., Shea, M. T., Zanarini, M. C., Morey, L. C., Sanislow, C. A., & Oldham, J. M. (2002). Functional impairment in patients with schizotypal, borderline, avoidant, or obsessive-compulsive personality disorder. *American Journal of Psychiatry, 159,* 276-283.

Slutske, W. S., Eisen, S., Xian, H., True, W. R., Lyons, M. J., Goldberg, J., & Tsuang, M. (2001). A twin study of the association between pathological gambling and antisocial personality disorder. *Journal of Abnormal Psychology, 110,* 297-308.

Trull, T. J. (1992). DSM-III-R personality disorders and the Five-Factor Model of personality: An empirical comparison. *Journal of Abnormal Psychology, 101*, 553-560.

Trull, T. J. (2005). Dimensional models of personality disorder: Coverage and cutoffs. *Journal of Personality Disorders, 19,* 262-282.

Trull, T. J. & McCrae, R. R. (2002). A five-factor perspective on personality disorder research. In P. T. Costa & T. A. Widiger (Eds.), *Personality disorders and the Five Factor Model of personality, 2nd edition* (pp. 45-57). Washington DC: American Psychological Association.

Trull, T. J., Sher, K. J., Minks-Brown, C., Durbin, J., & Burr, R. (2000). Borderline personality disorder and substance use disorders: A review and integration. *Clinical Psychology Review, 20,* 235-253.

Trull, T. J., Useda, D., Conforti, K., & Doan, B. (1997). Borderline personality disorder features in nonclinical young adults: 2. Two-year outcome. *Journal of Abnormal Psychology, 106,* 307-314.

Trull, T. J., & Widiger, T. A. (1997). *Structured Interview for the Five-Factor Model of Personality (SIFFM): Professional manual.* Odessa, FL: Psychological Assessment Resources.

Trull, T. J., Widiger, T. A., & Burr, R. (2001). A structured interview for the assessment of the Five-Factor Model of personality: Facet-level relations to the axis II personality disorders. *Journal of Personality, 69,* 175-198.

Trull, T. J., Widiger, T. A., Lynam, D. R., & Costa, P. T. (2003). Borderline personality disorder from the perspective of general personality functioning. *Journal of Abnormal Psychology, 112,* 193-202.

Verheul, R. (2005). Clinical utility of dimensional models for personality pathology. *Journal of Personality Disorders, 19,* 283-302.

Westen, D. & Arkowitz-Westen, L. (1998). Limitations of axis II in diagnosing personality pathology in clinical practice. *American Journal of Psychiatry,155,* 1767-1771.

Westen, D. & Shedler, J. (2000). A prototype matching approach to diagnosing personality disorders: Toward DSM-V. *Journal of Personality Disorders, 14,* 109-126.

Widiger, T. A. (1993). The DSM-III-R categorical personality disorder diagnoses: A critique and an alternative. *Psychological Inquiry, 4, 75*-90.

Widiger, T. A. & Costa, P. T., Jr. (2002). Personality disorder research. In P. T. Costa & T. A. Widiger (Eds.), *Personality disorders and the Five Factor Model of personality, 2nd edition* (pp. 59-87). Washington DC: American Psychological Association.

Widiger, T. A. & Frances, A. J. (2002). Toward a dimensional model for the personality disorders. In P. T. Costa & T. A. Widiger (Eds.), *Personality disorders and the Five Factor Model of personality, 2nd edition* (pp. 23-44). Washington DC: American Psychological Association.

Widiger, T. A. & Lynam, D. R. (1998). Psychopathy as a variant of common personality traits: Implications for diagnosis, etiology, and pathology. In T. Millon (Ed.), *Psychopathy: Antisocial, criminal, and violent behavior* (pp. 171-187). New York: Guildford.

Widiger, T. A. & Samuel, D. B. (2005). Evidence based assessment of personality disorders. *Psychological Assessment, 17,* 278-287.

Widiger, T. A. & Simonsen, E. (2005a). Introduction to the special section: The American Psychiatric Association's research agenda for the DSM-V. *Journal of Personality Disorders, 19,* 103-109.

Widiger, T. A. & Simonsen, E. (2005b). Alternative dimensional models of personality

disorders: Finding a common ground. *Journal of Personality Disorders, 19,* 110-130.

Widiger, T. A., Trull, T. J., Clarkin, J. F., Sanderson, C. J., & Costa, P. T. (1994). A description of the DSM-III-R and DSM-IV personality disorders with the Five-Factor Model of personality. In P. T. Costa, Jr., & T. A. Widiger (Eds.), *Personality disorders and the Five-Factor Model of personality* (pp. 41-56). Washington, DC: American Psychological Association.

Widiger, T. A., Trull, T. J., Clarkin, J. F., Sanderson, C. J., & Costa, P. T. (2002). A description of the DSM-IV personality disorders with the Five-Factor Model of personality. In P. T. Costa, Jr., & T. A. Widiger (Eds.), *Personality disorders and the Five-Factor Model of personality, 2nd edition* (pp. 89-102). Washington, DC: American Psychological Association.

Wiggins, J. S. & Pincus, H. A. (1989). Conceptions of personality disorder and dimensions of personality. *Psychological Assessment, 1,* 305-316.

Wilberg, T., Urnes, O., Friis, S., Pedersen, G., & Karterud, S. (1999). Borderline and avoidant personality disorders and the five-factor model of personality: A comparison between *DSM-IV* diagnoses and NEO-PI-R. *Journal of Personality Disorders, 13,* 226-240.

Yamagata, S., Suzuki, A., Ando, J., Ono, Y., Kijima, N., Yoshimura, K., Ostendorf, F., Angleitner, A., Riemann, R., Spinath, F. M., Livesley, W. J., & Jang**,** K. L. (2006). Is the genetic structure of human personality universal? A cross-cultural twin study from North America, Europe, and Asia. *Journal of Personality and Social Psychology, 90,* 987-998.

Yoon, K., Schmidt, F., & Ilies, R. (2002). Cross-cultural construct validity of the five-factor

model of personality among Korean employees. *Journal of Cross-Cultural Psychology, 33,* 217-235.

Zanarini, M. C., Frankenburg, F. R., Dubo, E. D., Sickel, A. E., Trikha, A., Levin, A., & Reynolds, V. (1998). Axis I comorbidity of borderline personality disorder. *American Journal of Psychiatry,155,* 1733-1739.

Zweig-Frank, H. & Paris, J. (1995). The five-factor model of personality in borderline and non-borderline personality disorders. *Canadian Journal of Psychiatry, 40,* 523-526.

Zweig-Frank, H. & Paris, J. (2002). Predictors of outcome in a 27-year follow-up of patients with borderline personality disorder. *Comprehensive Psychiatry, 43,* 103-107.

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