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HISTRIONIC PERSONALITY DISORDER AND ANTISOCIAL PERSONALITY DISORDER: SEX-DIFFERENTIATED MANIFESTATIONS OF PSYCHOPATHY?

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Little is known about the etiology of histrionic personality disorder (HPD) or its relation to other personality disorders. In this study, we examined whether HPD is etiologically related to psychopathy and more specifically whether HPD and antisocial personality disorder (ASPD) are sex-typed alternative manifestations of psychopathy. In addition, based on Newman's (1987) response modulation hypothesis of psychopathy, we examined the associations between psychopathic, HPD, and ASPD features and performance on laboratory measures of passive avoidance errors and interference effects. Seventy-five live theater actors completed self-report questionnaires and two laboratory measures of response modulation, and peers completed questionnaires concerning the participants' personality disorder features. The results provided weak and inconsistent support for the hypotheses that HPD is a female-typed variant of psychopathy and that ASPD is a male-typed variant of psychopathy. Contrary to previous findings, scores on response modulation tasks were not significantly related to psychopathy, or to either HPD or ASPD. The limitations of this study and possibilities for future research in this area are outlined.

Historically, there has been disagreement concerning the etiology of histrionic personality disorder (HPD) and its relations to other syndromes of personality (Funtowicz & Widiger, 1999; Pfohl, 1991, 1995). The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994) describes HPD as marked by a long-standing proclivity towards attention seeking and excessive emotionality, as manifested in seductive and dramatic behavioral patterns. HPD is regarded as a primarily female disorder (APA, 1994; Hartung & Widiger, 1999), although the evidence for this sex difference is mixed (e.g., Hamburger, Lilienfeld, & Hogben, 1996; Lilienfeld, VanValkenburg, Larntz, & Akiskal, 1986).

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HPD seems to bear important associations with both psychopathic personality (psychopathy) and antisocial personality disorder (ASPD). Cleckley (1941/1988) delineated 16 criteria for the diagnosis of psychopathy, including superficial charm, unreliability, deceitfulness, egocentricity, and remorselessness. These criteria comprise a constellation of personality features. In contrast, the current DSM diagnosis of ASPD emphasizes a pattern of a chronic disregard for others, as manifested in impulsive, irresponsible, and criminal behaviors (APA, 1994). Psychopathy and ASPD, although overlapping constructs, are not interchangeable, largely because psychopathy is marked primarily by personality features whereas ASPD is marked primarily by behavioral features (Lilienfeld, 1994, 1998). Research evidence further suggests that these two conditions are not interchangeable. In criminal populations, the base rate of psychopathy (15 - 25%) is much lower than the base rate of ASPD (40 - 80%; see Hare, 1996; and Widiger & Corbitt, 1995, for reviews). Moreover, these two conceptualizations differ markedly in their demographic and personality correlates (Harpur, Hare, & Hakstian, 1989).

The HPD criteria reflect several characteristics of psychopathy (e.g., manipulativeness, shallow affect). In addition, the criteria for both HPD and ASPD reflect propensities toward impulsivity, superficiality, excitement seeking, and seductiveness (APA, 1994), all of which are related to psychopathy (Hare, 1991). In a variety of samples, HPD has demonstrated significant, although not always substantial, correlations with both psychopathy and ASPD (e.g., Hamburger et al., 1996; Hart & Hare, 1989; Lilienfeld et al., 1986; Salekin, Rogers, & Sewell, 1997). These studies indicate that HPD, psychopathy, and ASPD tend to covary among individuals.

Most studies have revealed that females are more likely than males to meet criteria for HPD, whereas males are more likely than females to meet criteria for ASPD and psychopathy. Although HPD is often diagnosed more frequently in females than in males, this difference may be accounted for by the disproportionate ratio of females in mental health settings (APA, 1994; Hamburger et al., 1996; Lilienfeld et al., 1986). The prevalence of ASPD is consistently higher in males than in females (APA, 1994; Mulder, Wells, Joyce, & Bushnell, 1994). There is also some evidence suggesting that the rates of psychopathy are higher in male than female inmates (e.g., Salekin, Rogers, & Sewell, 1997). In undergraduate samples, males have been found to score significantly higher than females on interview (e.g., Forth, Brown, Hart, & Hare, 1996) and self-report (e.g., Lilienfeld & Andrews, 1996; Zagon & Jackson, 1994) measures of psychopathy. However, other studies have yielded inconsistent sex differences in mean symptom levels of psychopathy (e.g., Cooney, Kadden, & Litt, 1990; Hamburger et al., 1996; Rutherford, Alterman, Cacciola, & McKay, 1998).

Some authors have conjectured that HPD and ASPD may be sex-typed behavioral manifestations of underlying psychopathic propensities (e.g., see Nuckolls, 1992; Warner, 1978). Hamburger et al. (1996) tested a model explaining the relations among psychopathy, ASPD, and HPD. They applied structural equation modeling to data obtained from self-report measures and found that psychopathy scores correlated significantly with both ASPD and HPD features. The researchers further found that biological sex moder-

ated the presumed manifestations of psychopathy, such that there was a significantly stronger association between psychopathy and ASPD features for males than females and a significantly stronger association between psychopathy and HPD features for females than males. These findings warrant replication in clinical samples using sources of data in addition to self-report measures.

Although these findings are consistent with the hypothesis that psychopathic personality features are channeled into different sex-typed disorders (i.e., HPD and ASPD), several other explanations are possible. First, HPD, ASPD, and psychopathy may be three independent constructs with overlapping symptoms but without a common etiology. Second, these three conditions may represent various manifestations of a single underlying disorder. Third, sex differences in psychopathy's presumed manifestations (i.e., HPD and ASPD) may be due to sex bias in the diagnosis of these disorders (e.g., see Ford & Widiger, 1989; Hamilton, Rothbart, & Dawes, 1986; Warner, 1978).

The causes of psychopathy, like HPD, are unknown, although several hypotheses have been advanced regarding its etiology (see Lykken, 1995; Newman & Brinkley, 1997). One such influential model is the response modulation hypothesis (Newman, 1987). According to this hypothesis, psychopathic individuals tend to form dominant response sets in reward-seeking behavior that interfere with their ability to attend to extraneous stimuli, including punishment (see also Newman & Wallace, 1993; Wallace, Vitale, & Newman, 1999). Newman and colleagues argue that passive avoidance errors, which occur when one fails to withhold responses that previously led to punishment, are manifestations of response modulation defects. They also maintain that these deficits in response modulation hinder psychopaths' self-regulation of various behaviors, predisposing them to impulsivity. Newman and colleagues have found fairly consistent support for their response modulation hypothesis in Caucasian male criminals (e.g., Newman, Patterson, Howland, & Nichols, 1990; Newman & Schmitt, 1998) but not in African American male criminals (Newman & Kosson, 1986). Further replication of these findings in noncriminal, female, and non-Caucasian samples would provide more substantial evidence for the response modulation hypothesis. In addition, other disorders that covary with psychopathy (such as HPD and ASPD) may be overt manifestations of poor response modulation.

THE PRESENT STUDY

In a nonclinical sample, we tested the hypothesis that biological sex moderates the behavioral manifestations of psychopathy and that HPD and ASPD are sex-typed alternative manifestations of psychopathic features. Personality disorder features were assessed by self-report measures and peer ratings. Peer ratings were considered important for this study because individuals with some personality disorders, particularly those in Cluster B [i.e., ASPD, HPD, borderline personality disorder (BPD), and narcissistic personality disorder (NPD)], tend to lack insight into the nature and extent of their symptoms (Grove & Tellegen, 1991; Shapiro, 1965). In addition,

Cleckley (1941/1988) and others (e.g., Hare, 1991) have noted that psychopaths similarly tend to lack insight into the impact of their behavior on others. Peer ratings may therefore serve as an essential complement to self-report data, especially for persons with ego-syntonic personality disorders who often have "blindspots" for perceiving their maladaptive behaviors (Funder, 1997; Grove & Tellegen, 1991). We also examined the associations between psychopathic, HPD, and ASPD features and performance on two laboratory tasks designed to assess passive avoidance learning (e.g., Newman et al., 1990) and stimulus interference (e.g., Newman, Schmitt, & Voss, 1997), which are based on the response modulation hypothesis of psychopathy. Because HPD and ASPD were predicted to be sex-differentiated manifestations of psychopathy, it was important to ascertain whether previous laboratory findings on psychopathy would extend to these constructs.

Specifically, we tested the following hypotheses:

1. We predicted that the associations among psychopathic, HPD, and ASPD features would be positive and significant in both males and females, as found in prior studies (e.g., Hart & Hare, 1989; Lilienfeld et al., 1986; Salekin et al., 1997). In addition, we predicted that these associations would hold for both self-report and peer ratings of personality disorder features.
2. We predicted that psychopathic features would be associated primarily with HPD features in females and primarily with ASPD features in males. This prediction was based on the model proposed by Hamburger et al. (1996) in which biological sex moderates the relations between psychopathy and both HPD and ASPD features.
3. Because HPD and ASPD were hypothesized to be manifestations of underlying psychopathic features, we predicted that psychopathic, HPD, and ASPD features would be associated with poor passive-avoidance learning and little stimulus interference in both males and females.

These hypotheses were examined in a sample of live theater actors. The acting population was selected because it was speculated that actors exhibit high levels and perhaps a wide range of HPD symptoms (e.g., emotionality, theatricality, attention-seeking). There is evidence that actors, like individuals with HPD (see APA, 1980, p. 314), tend to exhibit high levels of suggestibility (e.g., Coe, 1964; Coe, Buckner, & Howard, 1972). Moreover, researchers have found actors to exhibit higher levels of self-monitoring (i.e., the ability to observe oneself and to alter behavior for the purpose of maximizing expression to others) and extraversion than non-actors (e.g., Hammond & Edelmann, 1991; Keller & Tetlow, 1980; Snyder, 1974). Moreover, Snyder (1974) found a significant positive correlation between his self-monitoring scale and the MMPI Psychopathic Deviate (Pd) scale, the latter of which correlates moderately with measures of ASPD (Hare, 1985). Self-monitoring may reflect tendencies toward superficiality or manipulativeness, both of which are characteristic of psychopathy, and extraversion appears to be related to HPD, ASPD, and psychopathy (Costa & Widiger, 1994). Presuming that HPD, ASPD, and psychopathy features tend

to covary, we also expected actors to exhibit relatively high levels and variances of these features.[1]

METHOD

PARTICIPANTS

Professional and nonprofessional actors in the Atlanta metropolitan area voluntarily participated in this study. Actors were recruited by telephone, by electronic mail, and through advertising at community and professional theaters. A total of 39 males and 36 females participated. Sixty-eight (90.7%) were Caucasian, five (6.7%) were African American, one (1.3%) was Asian American, and one (1.3%) was Hispanic. Participants' ages ranged from 16 to 69 (M = 35.2; SD = 12.8). Males and females did not differ significantly in age.

The participants nominated peers to provide ratings of their personality disorder features. A total of 108 peers (47 male, 58 female, three peers did not report biological sex) completed questionnaires regarding the participants' personality disorder features. Peers' ages ranged from 15 to 75 (M = 37.9; SD = 14.7; 4 peers did not indicate their ages). Seventy-seven (71.3%) were not professional actors and 46 (42.6%) had never acted before (5 peers did not indicate their occupations and/or acting experience).

MEASURES

Psychopathic Personality Inventory (PPI). The PPI (Lilienfeld & Andrews, 1996) consists of 187 self-report items in a 1 to 4 Likert-type format. It assesses the core personality features of psychopathy as described by Cleckley (1941/1988). The PPI focuses primarily on psychopathic personality features and does not explicitly assess antisocial behaviors. Evidence of the PPI's reliability is strong. Internal consistencies (Cronbach's αs) have ranged from .90 to .93 for PPI total scores, and test-retest reliabilities over a mean 26-day interval were .95 for PPI total scores (Lilienfeld & Andrews, 1996). The PPI has also shown good convergent validity. In two nonclinical samples, Lilienfeld and Andrews reported that PPI total scores correlated highly with the Hare Self-Report Psychopathy Scale-Revised (SRP-R; Hare, 1985; rs = .91 and .62). Moreover, PPI total scores have correlated highly with well validated interview measures of psychopathy (e.g., Psychopathy Checklist - Revised, Hare, 1991; Psychopathy Checklist: Screening Version, Hart, Cox, & Hare, 1995) in prison (e.g., Poythress, Edens, & Lilienfeld, 1998) and undergraduate (e.g., Lilienfeld et al., 1998) samples. The PPI has demonstrated strong convergent-discriminant relations with interview, peer-rating, and family history measures of personality traits and disorders

1. Prior to conducting the present study, a pilot sample of 29 actors was administered various self-report questionnaires to assess levels of HPD, ASPD, and psychopathy. Overall, the findings suggested that actors manifest sufficient levels and considerable variances of these disorders (Cale, 1999). These data, and all data referred to in subsequent footnotes, are available upon request from the first author.

(Lilienfeld, 1996). In the present study, Cronbach's α was .93 for PPI total scores.

Personality Diagnostic Questionnaire (PDQ-4+). The PDQ-4+ (Hyler & Rieder, 1994) is a self-report measure that assesses the DSM-IV criteria for personality disorders. It consists of 118 True-False items (one item per personality disorder criterion). Trull, Goodwin, Schopp, Hillenbrand, and Schuster (1993) found that the 1-month (approximately) test-retest reliabilities of the subscales of the PDQ-R (the DSM-III-R version of this measure) ranged from $r = .62$ to $r = .75$. In a sample of psychiatric patients, Fossati et al. (1998) reported that the PDQ-4+ scales exhibited modest internal consistencies (mean K-R 20 was .61). Although the PDQ-4+ is not a proxy for structured interview measures of personality disorders (e.g., the Structured Clinical Interview for DSM-IV Personality Disorders; First, Spitzer, Gibbon, Williams, & Benjamin, 1994), it has generally been found to correlate moderately with such measures (e.g., Fossati et al., 1998).

When structured interviews of personality disorders are used as "criteria," the PDQ-R and PDQ-4+ typically exhibit a high rate of false positives (Fossati et al., 1998; Johnson & Bornstein, 1992). The PDQ-R and PDQ-4+ may, however, provide reasonably valid dimensional assessments of personality disorders (Skodol, Hyler, & Oldham, 1993; Trull & Larson, 1994). In the present study, the full PDQ-4+ (including all personality disorder scales as well as depressive personality disorder and passive-aggressive personality disorder) was administered, although we focus primarily on the HPD and ASPD scales here. Cronbach's αs were .44 and .53 for the HPD and ASPD scales, respectively, and ranged from .44 to .70 for the other personality disorder scales.

Coolidge Axis II Inventory (CATI) ASPD, BPD, HPD, and NPD Scales. The CATI (Coolidge, 1993) is a self-report measure of DSM-IV personality disorders that consists of items in a 1 to 4 Likert-type format. Due to time constraints, only the DSM-IV Cluster B personality disorder scales (totaling 98 items) were used in this study. By assessing symptoms of levels of Cluster B personality disorders, we were able to investigate whether the associations among personality disorder features were specific to psychopathy, HPD, and ASPD or instead generalized to other personality disorders characterized by dramatic and impulsive behaviors.

In a sample of undergraduates, Coolidge (1993) found that the mean 1-week test-retest reliability coefficient for the CATI personality disorder scales was $r = .90$. Coolidge and Merwin (1992) reported that Cronbach's αs ranged from .74 to .86 for the Cluster B scales in a sample of 609 participants. When comparing CATI scale scores with scores from another self-report measure of personality disorders (the Millon Clinical Multiaxial Inventory-II; Millon, 1987), convergent validity correlations for Cluster B scales were $r = .57$ (ASPD), $r = .87$ (BPD), $r = .72$ (HPD), and $r = .38$ (NPD) (Coolidge, 1993). These data were based on an earlier version of the CATI, which assessed DSM-III-R personality disorder criteria. In the present study, Cronbach's αs for the CATI Cluster B scales ranged from .65 to .83 (.76 for HPD and .78 for ASPD).

Go/no-go Computer Task (Newman & Schmitt, 1998). In this procedure, participants learn by trial and error when to respond and when to withhold

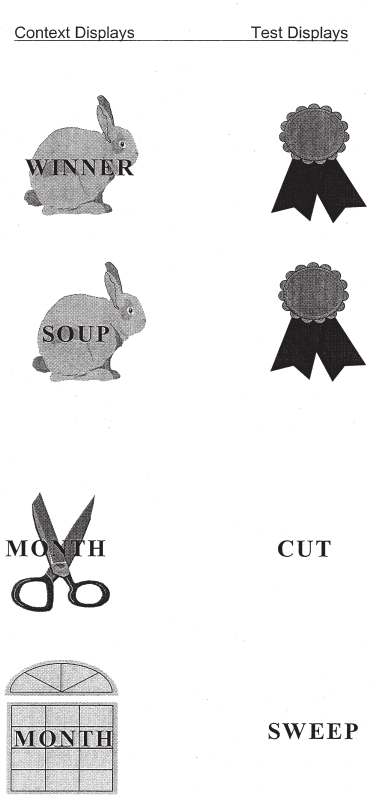

FIGURE 1. Sample picture and word trials including test trials (i.e., related words/pictures) and control trials (i.e., unrelated words/pictures). The top two trials are Picture trials and the bottom two trials are Word trials. *Note.* Adapted from Newman, Schmitt, and Voss (1997).

responding. Newman and Schmitt's (1998) findings with this task were consistent with prior research indicating that psychopaths commit more passive-avoidance errors than nonpsychopaths (e.g., Newman et al., 1990). Stimuli consist of two-digit numbers, five of which serve as "go" stimuli and five of which serve as "no-go" stimuli. Two-digit numbers appear repeatedly on the computer screen, and participants decide whether to respond by pressing a button on a box connected to a laptop computer. Prior to the onset of test trials, reward pre-treatment trials establish a dominant response set by first presenting all of the "go" stimuli. Each response results in visual and auditory feedback, and no feedback is provided in the absence of responding. In this study, participants were initially given 50 cents and were rewarded by gaining 10 cents for each correct response and punished by losing 10 cents for each passive avoidance error.

Picture-Word Computer Task (Newman et al., 1997). Adapted from a task designed by Gernsbacher and Faust (1991), this task assesses the effects of interference on decision-making. Figure 1 displays examples of stimuli for the Picture-Word task. Half of the trials involve comparing two words on their relatedness and the other half involve comparing two pictures on their relatedness. Trials consist of sequences of context displays followed by test

displays. Half of the trials have a 1,000-millisecond delay between the context and test displays, and the other half have a 50-millisecond delay between the context and test displays. The context display features a line drawing with a superimposed word on it, and these figures are unrelated. The test display is either another picture for half the trials or another word for the other half. Participants must decide whether the word (or picture) in the test display is related to the word (or picture) in the context display. They respond by pressing one of two buttons on a button box connected to a laptop computer. Interference is assessed by subtracting mean response latencies for "unrelated trials" that depict unrelated words/pictures from response latencies for "unrelated trials" that depict related words/pictures. Interference is more apparent in response latencies for trials with 50-millisecond delays between the context and test displays than for trials with 1,000-millisecond delays (Gernsbacher & Faust, 1991; Newman et al., 1997). As a consequence, only mean response latencies for the 50-millisecond delay trials were examined in this study.

Participants received no monetary compensation for performance on this task. To motivate participants and to aid in their establishing a dominant response set, participants were initially told that: "Individuals with some traits that have been found to be prevalent in actors seem to perform better on this task." The computer indicated whether responses were correct and how many points were received based on reaction times for correct responses.

Peer Ratings. Participants were asked to provide the names and addresses of three people who know them well, but who are neither family members nor current romantic partners. Nominated peers each received a questionnaire in the mail, were paid $2, and were asked to complete the questionnaire and return it in a self-addressed, stamped envelope. The peer-rating questionnaire consisted of 39 items on a 5-point scale (1 = not true; 5 = extremely true) to be completed regarding the nominating participant. Modeled after the work of Harkness (1992) and the DSM-IV criteria for personality disorders, the peer-rating questionnaire assessed Cleckley (1941/1988) psychopathy features, HPD criteria, and ASPD criteria. In a study of undergraduates, Cronbach's α was .76 for the Cleckley peer-rating scale, and this scale correlated $r = .45$ with the PPI total score (Lilienfeld & Andrews, 1996). In the present study, Cronbach's αs were .77, .82, and .64 for the psychopathy, HPD, and ASPD scales, respectively. Item responses were averaged across peers because aggregating peer ratings has been found to increase their reliability and convergent validity (Cheek, 1982).

It seemed possible that participants' and peers' personality features would be systematically related. For example, HPD or ASPD participants might tend to nominate HPD peers, or HPD peers might exhibit a response bias in reporting psychopathy, HPD, or ASPD levels in the nominating participants. To address such possibilities, a brief self-report questionnaire was mailed along with the peer questionnaire. Out of concern that a lengthy self-report questionnaire would dissuade nominated peers from completing ratings, peers were asked to self-report only on a few demographic variables (age, sex, acting experience) and on their levels of HPD. HPD was the only personality disorder assessed among peers because it was suspected that

certain HPD features, such as suggestibility and exaggerated expression of emotions, would be especially likely to influence the reporting of others' personality features.

PROCEDURE

Informed consent was obtained from each participant. The order of administration was counterbalanced so that half first completed the self-report questionnaires and half first completed the laboratory tasks. A total of 10 participants' laboratory measure scores were omitted from the analyses. Eight participants' scores for the Go/no-go task were omitted because they either committed virtually no passive-avoidance errors or they responded to nearly all of the stimuli, suggesting that they did not understand the task. Two additional participants' scores for the Picture-Word task were omitted because their percentages of correct responses were low (42% and 69% correct responses), also suggesting that they did not understand the task.[2] After completing the questionnaires and laboratory tasks, participants were asked to provide the names and addresses of individuals to complete peer ratings. A total of 141 peer questionnaires were mailed. For 66 of the participants, two nominated peers were mailed questionnaires, and for nine participants, only one peer questionnaire was mailed due to insufficient address information. Seventy-seven percent of all questionnaires were completed and returned. Altogether, both peer-rating and self-report data were obtained for 71 participants.[3]

RESULTS

PSYCHOPATHY, HPD, AND ASPD SCORES: DESCRIPTIVE STATISTICS AND SEX DIFFERENCES

Table 1 displays the descriptive statistics for psychopathy, HPD, and ASPD measures. To test for significant differences between males and females on these self-report and peer-rating measures, while grouping dependent variables by important constructs of interest (see Huberty & Morris, 1989), three multivariate analyses of variance (MANOVAs) were performed: one on the psychopathy measures, one on the HPD measures, and one on the ASPD measures. The omnibus MANOVA for the psychopathy measures was significant (Wilks's lambda = .84, $p < .05$). Follow-up analyses of variance (ANOVAs) revealed that males scored higher than females on PPI total scores [$F(1,69) = 12.77$, $p = .001$], but that males' and females' scores on the psychopathy peer ratings were not significantly different [$F(1,69) = 2.37$, $p =$

2. T-tests were conducted to examine whether the personality features of the 10 participants whose Go/no-go or Picture-Word data were omitted differed from the personality features of the remaining participants. There were no significant differences between these two groups in their levels of psychopathy, HPD, or ASPD.

3. Exploratory analyses revealed that the correlations between self-reports and peer ratings of psychopathy, HPD, and ASPD did not differ significantly between participants with data obtained from two peers, and participants with data obtained from one peer.

TABLE 1. Descriptive Statistics for Personality Measures

	Total sample	Males	Females	*d*
Psychopathy measures				
*PPI total scores	362.93 (41.60)	378.41 (41.90)	346.17 (34.60)	.84
Peer ratings of psychopathy	41.16 (5.40)	42.13 (6.56)	40.17 (3.71)	.37
HPD measures				
PDQ–4+ HPD scores	3.39 (1.54)	3.41 (1.73)	3.36 (1.33)	.03
CATI HPD scores	71.87 (7.82)	71.85 (8.47)	71.89 (7.17)	.00
Peer ratings of HPD	23.04 (6.75)	23.07 (6.79)	23.01 (6.80)	.00
ASPD measures				
*PDQ–4+ ASPD scores	1.39 (1.44)	1.90 (1.59)	0.83 (1.03)	.86
*CATI ASPD scores	80.45 (13.56)	85.51 (14.86)	74.97 (9.45)	.84
Peer ratings of ASPD	10.64 (3.44)	11.07 (3.65)	10.20 (3.20)	.25

Note. Overall $N = 75$ (39 males and 36 females). PPI = Psychopathic Personality Inventory; PDQ–4 = Personality Diagnostic Questionnaire; CATI = Coolidge Axis II Inventory. d = Cohen's d (ds < .001 were rounded to .00). *Males scored significantly higher than females at the $p < .05$ level.

.13]. The omnibus MANOVA for the HPD measures indicated than males and females did not differ significantly on HPD scores (Wilks's lambda = .99, $p = .94$). In contrast, the omnibus MANOVA for the ASPD measures was significant (Wilks's lambda = .75, $p < .05$). Follow-up ANOVAs indicated that males scored higher than females on PDQ-4+ adult ASPD criteria [$F(1,69) = 12.39$, $p = .001$] and CATI ASPD items [$F(1,69) = 14.36$, $p < .001$], although males did not score higher than females on peer ratings of ASPD [$F(1,69) = 1.14$, $p = .29$].[4] Effect sizes (i.e., Cohen's d; Cohen, 1992) revealed that the differences between males' and females' scores were large for the self-report measures of psychopathy and ASPD, small for the peer ratings of psychopathy and ASPD, and negligible for measures of HPD.

CORRELATIONAL ANALYSES OF PERSONALITY DISORDER MEASURES

Table 2 displays the correlations among measures of psychopathy, HPD, ASPD, and other Cluster B disorders (i.e., BPD and NPD). Within disorders, correlational analyses revealed that self-reports significantly correlated with peer ratings for psychopathy, HPD, and ASPD (rs ranged from .25 to .69). Across disorders, measures of psychopathy, HPD, and ASPD scores

4. Because the use of omnibus MANOVAs to control for Type I error has been called into question in certain circumstances (Huberty & Morris, 1989), Bonferroni corrections were also used to hold the family-wise α level at $p < .05$ for the follow-up ANOVAS. The same pattern of significant differences emerged; with the Bonferroni-corrected α levels, males scored significantly higher than females on self-report measures of psychopathy (p was < .05) and ASPD (ps were < .01). Given that we were interested in overall sex differences in the different personality disorders and in identifying meaningful differences among the variables within a given MANOVA (e.g., self-report measures vs. peer ratings), we opted to conduct both MANOVAs and ANOVAs (see Huberty & Morris, 1989). Also following the recommendations of Huberty and Morris, we include a correlational matrix of the dependent variables included in these MANOVAs (see Table 2).

TABLE 2. Pearson Product–Moment Correlations Among Self–Report and Peer Ratings

	PPI	PR Psyc	PDQ HPD	CATI HPD	PR HPD	PDQ ASPD	CATI ASPD	PR ASPD	PDQ BPD	CATI BPD	PDQ NPD	CATI NPD
PPI	—	.33**	.28*	.41*	.26*	.69**	.66**	.32**	.40**	.36**	.53**	.49**
PR Psyc	71	—	.19	.21	.58**	.09	.17	.58**	.14	.09	.20	.25*
PDQ HPD	75	71	—	.61**	.33**	.16	.20	.25*	.35**	.36**	.42**	.49**
CATI HPD	75	71	75	—	.43**	.28*	.29*	.29*	.25*	.57**	.52**	.70**
PR HPD	71	71	71	71	—	.12	.22	.66**	.24*	.36**	.36**	.34**
PDQ ASPD	75	71	75	75	71	—	.69**	.25*	.54**	.40**	.51**	.46**
CATI ASPD	75	71	75	75	71	75	—	.37*	.52**	.51**	.50**	.58**
PR ASPD	71	71	71	71	71	71	71	—	.24*	.35**	.34**	.27*
PDQ BPD	75	71	75	75	71	75	75	71	—	.62**	.58**	.51**
CATI BPD	75	71	75	75	71	75	75	71	75	—	.52**	.58**
PDQ NPD	75	71	75	75	71	75	75	71	75	75	—	.63**
CATI NPD	75	71	75	75	71	75	75	71	75	75	75	—

Note. The correlations are displayed above the diagonal; *N*s are displayed below the diagonal. PPI = Psychopathy PersonalityInventory; PDQ = Personality Diagnostic Questionnaire 4+; CATI = Coolidge Axis II Inventory; PR = peer ratings; Psyc = psychopathy; HPD = histrionic personality disorder; ASPD = antisocial personality disorder; BPD = borderline personality disorder; NPD = narcissistic personality disorder. Cases were excluded pairwise in the analyses, and a 2 tailed test of significance was employed. *$p < .05$. **$p < .01$.

were, with few exceptions, significantly intercorrelated (*r*s ranged from .09 to .66). In addition, measures of psychopathy, HPD, and ASPD were significantly correlated mostly with measures of BPD and NPD (*r*s ranged from .09 to .70).[5] Because the correlations between PDQ-4+ and CATI HPD items, and between PDQ-4+ and CATI ASPD items for the total sample were large in magnitude (*r*s = .61 and .69, respectively), participants' scores on these measures were standardized into *z*-scores, which were summed to create composite self-report indexes of HPD and ASPD. These composite self-report indexes were used in subsequent analyses.

Correlations among the self-report and peer ratings of psychopathy, HPD, and ASPD were generated separately for males and females (see Table 3). Overall, psychopathy scores were more strongly associated with HPD scores among females than among males, whereas psychopathy scores were more strongly associated with ASPD scores among males than among females. Tests of the significance of differences between independent correlations (Cohen, 1982) revealed that the correlation between self-reported psychopathy and self-reported HPD was marginally significantly stronger for females than for males ($Z = 1.59$; $p = .06$) but that the correlation between self-reported psychopathy and self-reported ASPD was nonsignificantly stronger for males than for females ($Z = .82$; $p = .20$). In addition, the correlations between peer ratings of psychopathy and both HPD and ASPD were not significantly different between males and females.

Nominated peers' self-reports of HPD were also analyzed. Exploratory correlational analyses revealed that peers' self-reports of HPD features were significantly associated with participants' self-reports of psychopathy and ASPD features (*r*s = .38 and .30, respectively) but not HPD features (r = .16). These correlations raise the possibility that peers' levels of HPD systematically influenced the associations between peer ratings of psychopathy and other measures. Peers' self-reported HPD scores were therefore entered as a covariate in subsidiary correlational analyses. When controlling for peers' HPD scores, correlations between peer ratings of psychopathy and both HPD and ASPD scores remained significant (*r*s = .61 and .63, respectively, for females; both *r*s = .62 for males).

MODERATED MULTIPLE REGRESSION ANALYSES OF PERSONALITY DISORDER MEASURES

To examine the hypothesis that HPD and ASPD represent sex-typed alternative manifestations of psychopathic personality features, we conducted six moderated multiple regression analyses (MMRAs) using biological sex as a moderator variable (see Table 4). PPI total scores and psychopathy peer

5. Exploratory correlational analyses were also conducted on other PDQ-4+ scale scores. These subsidiary analyses revealed that all measures of HPD were positively and significantly associated with schizotypal, avoidant, depressive, and passive-aggressive scale scores. All measures of ASPD were positively and significantly associated with paranoid, schizotypal, depressive, and passive aggressive scale scores. Also, PPI scores correlated positively and significantly with paranoid, schizotypal, and passive-aggressive scale scores, and peer ratings of psychopathy did not significantly correlate with any other personality scale scores.

TABLE 3. Pearson Product–Moment Correlations Among Self–Report and Peer Ratings Of Psychopathy, ASPD, and HPD

	SR psych	PR psych	SR HPD	PR HPD	SR ASPD	PR ASPD
SR psych	—	*.42	**.60	.31	**.61	**.50
PR psych	.23	—	*.35	**.65	**.43	**.59
SR HPD	.30	.17	—	*.35	**.57	*.40
PR HPD	.25	**.59	**.49	—	**.45	**.76
SR ASPD	**.72	–.05	.18	.07	—	**.53
PR ASPD	.16	**.58	.23	**.64	.21	—

Note. The correlations for the males are displayed below the diagonal. For the males, $N = 39$ for the self–report measures and $N = 36$ for the peer ratings. For the females, $N = 36$ for the self–report measures and $N = 35$ for the peer ratings. Cases were excluded pairwise in the analyses, and a two–tailed test of significance was employed. SR = self–report scores; PR = peer rating scores; psych = psychopathy. Self–report HPD and ASPD scores were combined *z*–scores on the HPD self–report measures and ASPD report measures, respectively. *$p < .05$. **$p < .01$.

ratings were entered in separate analyses as continuous independent variables. Biological sex was dummy coded (males = 0; females = 1) and entered as a moderator variable. For all MMRAs, psychopathy scores were entered in the first step, sex was entered in the second step, and the product of psychopathy scores and sex (with the partialled product term representing the interaction) was entered in the third step.

For the first MMRA on HPD data, the combined HPD index served as the dependent variable and PPI total scores and biological sex served as independent variables. Results showed that the interaction between PPI total scores and sex, although in the predicted direction, fell short of significance for predicting HPD. For the second MMRA on HPD data, HPD peer ratings served as the dependent variable, and psychopathy peer ratings and biological sex served as independent variables. Here, the interaction between peer ratings of psychopathy and sex added significantly to the model for predicting HPD (R^2 change = .04). When first controlling for peers' self-reported levels of HPD, however, this interaction was no longer significant.

For the first MMRA on ASPD data, the combined ASPD index served as the dependent variable and PPI total scores and biological sex served as independent variables. The interaction between PPI total scores and sex added to the model for predicting self-reports of ASPD (R^2 change = .02), although this interaction was only marginally significant. For the second MMRA on ASPD data, ASPD peer ratings were entered as the dependent variable and psychopathy peer ratings and biological sex served as independent variables. In this regression equation, the interaction between psychopathy peer ratings and sex was not in the predicted direction and was nonsignificant. When controlling for peers' self-reported levels of ASPD, this interaction remained nonsignificant.

PERSONALITY DISORDER FEATURES AND LABORATORY TASK PERFORMANCE

We next examined the hypothesis that psychopathic, HPD, and ASPD individuals tend to exhibit deficits in passive-avoidance learning and minimal

TABLE 4. Moderated Multiple Regression Analyses Examining Biological Sex as a Moderator

Variables entered	R^2 change	df	β	*F* change	*p* value
SR psych	.15	1, 73	.017	12.46	.001
Sex	.02	1, 72	.596	2.05	.157
SR psych × sex	.02	1, 71	.013	1.54	.219
(Dependent variable: SR HPD)					
PR psych	.34	1, 69	.723	34.72	< .001
Sex	.01	1, 68	1.404	1.10	.298
PR psych × sex	.04	1, 67	.594	4.30	.042
(Dependent variable: PR HPD)					
Peers' SR HPD	.02	1, 65	.341	1.09	.300
PR psych	.32	1, 64	.685	31.13	< .001
Sex	.01	1, 63	1.129	.69	.411
PR psych × sex	.02	1, 62	.433	2.04	.158
(Dependent variable: PR HPD)					
SR psych	.53	1, 73	.032	83.30	< .001
Sex	.02	1, 72	–.560	3.20	.078
SR psych × sex	.02	1, 71	–.013	2.84	.096
(Dependent variable: SR ASPD)					
PR psych	.34	1, 69	.370	35.28	< .001
Sex	< .01	1, 68	–.152	.05	.825
PR psych × sex	.01	1, 67	.179	1.44	.234
(Dependent variable: PR ASPD)					
Peers' SR HPD	< .01	1, 65	.011	< .01	.949
PR psych	.36	1, 64	.380	36.01	< .001
Sex	< .01	1, 63	–.251	.13	.724
PR psych × sex	.02	1, 62	.209	1.76	.189
(Dependent variable: PR ASPD)					

Note: SR = self–report scores; PR = peer–rating scores; psych = psychopathy.

interference effects. The overall correlation between passive-avoidance errors and interference effects for the full sample was nonsignificant (r =- .11). These measures did not correlate significantly with any self-report or peer-rating personality disorder measure, and all correlations were low in magnitude (rs ranged from -.12 to .10 for passive-avoidance errors and from -.19 to .17 for interference effects).

Exploratory Analyses on Personality and Laboratory Measures. Other variables were examined for their potential effects on the relations between the personality disorder features and laboratory measures. First, to test for significant effects of counterbalancing, a MANOVA was conducted on the number of passive-avoidance errors and interference effects. The omnibus MANOVA was significant (Wilks's lambda = .90, $p < .05$). Follow-up ANOVAs revealed that the subsample that completed the laboratory measures first

committed more passive-avoidance errors than the subsample that completed the interview and self-report measures first [$F(1,63) = 4.71$, $p < .05$]. However, the two groups did not differ significantly in their interference effects [$F(1,63) = 1.45$, $p = .23$].[6] Second, because the age range of the sample was substantial (i.e., 16 - 69), correlations were generated to explore the associations between age and the laboratory indices. Age correlated positively and significantly with number of passive-avoidance errors ($r = .32$), indicating that older individuals tend to commit more passive-avoidance errors than younger individuals. In addition, age correlated positively with interference effects ($r = .21$), although this correlation was nonsignificant. Third, there were no significant correlations between reaction times on the Go/no-go task (i.e., subjects' average reaction times for all trials, subjects' average reaction times after being rewarded for a correct response, and subjects' average reaction times after being punished for an incorrect response) and any of the personality disorder measures. Interestingly, however, all of these reaction time associations were negative (*r*s ranged from -.19 to -.03), suggesting a slight trend for psychopathic, HPD, and ASPD individuals to exhibit shorter reaction times.

DISCUSSION

The overarching hypothesis that HPD and ASPD are sex-typed manifestations of psychopathy received only weak and inconsistent support. For the entire sample, associations among psychopathy, HPD, and ASPD features were typically significant and moderate in magnitude. Further examination of sex differences provided some, albeit inconsistent, evidence that psychopathic females tend to exhibit histrionic features, whereas psychopathic males tend to exhibit antisocial features. The most overwhelmingly negative finding was that psychopathy, HPD, and ASPD scores were not significantly related to either passive-avoidance learning or stimulus interference. Here, we outline several possible explanations for these largely negative findings.

In accord with our first hypothesis and prior studies (e.g., Hamburger et al., 1996; Lilienfeld et al., 1986), the results suggest that HPD and ASPD features tend to covary with psychopathic features. Correlational analyses revealed that psychopathy, HPD, and ASPD features were associated with features of other Cluster B personality disorders (i.e., BPD and NPD). This finding is not surprising given that all of these disorders are characterized by emotional, dramatic, and impulsive behaviors, and it further suggests that the associations among psychopathy, HPD, and ASPD are not specific to these three conditions. These personality disorders may instead be linked by a shared predisposition toward impulsivity or behavioral disinhibition (e.g., see Gorenstein & Newman, 1980).

Our results provided inconsistent support for our second hypothesis that biological sex moderates the relations between psychopathic features and

6. The laboratory measures' associations with personality disorder measures were further examined by controlling for order effects. These analyses were conducted for both males and females to examine potential sex differences. None of the correlations was significant.

HPD and ASPD features. One point of discrepancy was that the two statistical procedures we used to examine moderating effects (i.e., tests for significant differences between correlations and MMRAs) did not yield congruent results. Across statistical procedures, findings were inconsistent for the hypothesis that biological sex moderates the relations between self-reported psychopathic features and HPD features, and between peer ratings of psychopathic features and HPD features. In contrast, across both statistical procedures used, there was a significant or marginally significant moderator effect of biological sex on the association between self-reported psychopathic features and ASPD features, suggesting a trend for psychopathic males to self-report more ASPD features than psychopathic females. However, results were nonsignificant when examining the associations between peer ratings of psychopathic features and ASPD features.

It is difficult to interpret the mixed findings for self-reports and peer ratings in the MMRAs, which serve as particularly stringent tests of interaction effects (Jaccard, Turrisi, & Wan, 1990). The results suggest that females who were perceived by peers as psychopathic tended to be rated as more histrionic than males who were perceived by peers as psychopathic. One possible explanation is that participants' peers may be more accurate in observing and reporting HPD traits than the participants themselves. Moreover, HPD individuals may not be inclined to endorse items that describe them in a negative light, perhaps owing to their "pollyannaish" style and lack of insight into their problematic traits and behaviors (Shapiro, 1965; see also Grove & Tellegen, 1991). Nevertheless, because individuals with ASPD (for whom positive findings for peer ratings were not obtained) also often lack insight into the nature and extent of their symptoms, this explanation should be regarded as tentative.

Another explanation for the inconsistent findings may stem from the fact that some predicted sex differences in levels of personality disorders were not replicated in this study. Contrary to findings of higher HPD base rates in females than in males (APA, 1994; Reich, 1987), males and females did not differ significantly on either self-reports or peer ratings of HPD features. It is important to note, however, that studies have not consistently found sex differences in base rates or dimensional measures of HPD (e.g., Hamburger et al., 1996; Lilienfeld et al., 1986). Sex differences in HPD may be more apparent in clinical settings, perhaps reflecting the greater prevalence of females in such settings or selection or referral biases (APA, 1994). Consistent with this interpretation, some authors have suggested that sex differences in HPD and ASPD are due to diagnostic sex bias (Funtowicz & Widiger, 1999). Several researchers have found that mental health professionals are more likely to diagnose females as having HPD and males as having ASPD even when the individual case descriptions are identical or nearly identical (e.g., Hamilton, Rothbart, & Dawes, 1986; Warner, 1978). It is possible that a similar bias led peers to view their psychopathic female friends as histrionic and their psychopathic male friends as antisocial. Even so, when controlling for peers' levels of HPD, the interaction between psychopathic features and sex was nonsignificant.

Because HPD and ASPD were hypothesized to be manifestations of psychopathy, our third hypothesis predicted that psychopathic, HPD, and

ASPD features would be associated with poor passive-avoidance learning and minimal stimulus interference. Surprisingly, the correlation between passive-avoidance errors and interference effects was nonsignificant and low in magnitude. This finding calls into question the assumption that the Go/no-go and Picture-Word tasks assess the same construct (i.e., poor response modulation). Moreover, prior findings that psychopathic individuals tend to commit more passive-avoidance errors (e.g., Newman & Schmitt, 1998) and experience less interference than nonpsychopathic individuals (e.g., Newman et al., 1997) were not replicated in this sample, nor did these laboratory indexes correlate with HPD and ASPD.[7]

An interesting subsidiary finding was that peers' self-reported HPD scores correlated significantly with participants' self-reported psychopathy and ASPD scores. This finding may bear similarities to assortative mating tendencies that have been reported between HPD females and ASPD males (see Nichols, 1996). Some have conjectured that HPD and ASPD individuals are attracted romantically due to their common tendencies toward manipulativeness. In a similar vein, our study provides provisional evidence for "assortative friendship" tendencies between HPD individuals and psychopathic and ASPD friends, although it should be noted that participants were not asked explicitly to nominate people they liked.

A few subsidiary findings regarding the laboratory tasks warrant further investigation. One was that individuals who completed the computer tasks first committed more passive-avoidance errors than individuals who completed the self-report measures first. Perhaps those who completed the computer tasks first were initially less comfortable and focused than they were by the end of the study, and consequently, they may have been less able to withhold responses that were previously punished (J. Newman, personal communication, November, 1999). Nevertheless, this unanticipated order effect should be viewed with caution until replicated. Another unexpected finding was that participants' ages were positively associated with passive-avoidance errors and interference effects. It is possible that older individuals are less familiar with using computers and are therefore less able to monitor their responding than younger individuals. Almost a third of the sample was at least 40 years old. Perhaps the findings of Newman and

7. Newman and colleagues have typically studied samples with wide ranges of psychopathy features (i.e., inmate samples) and have found that *low anxious* psychopaths exhibit relatively high levels of passive-avoidance errors (Newman et al., 1990) and relatively low levels of interference effects (Newman et al., 1997). Although these researchers have rarely used regression analyses to examine dimensional associations between psychopathy and their laboratory measures, Newman et al. (1997) reported hierarchical multiple regression results, which indicated that psychopathy (assessed categorically) and anxiety (assessed dimensionally) interacted and accounted for 2.7% of the variance in interference effects beyond what was predicted independently by psychopathy and anxiety. For this study, exploratory multiple regression analyses indicated that PPI scores (minus the Stress Immunity scale, a reversed measure of anxiety) interacted with Stress Immunity scores to predict 2.6% of the variance in passive-avoidance errors beyond the effects of PPI and Stress Immunity scores, but this interaction accounted for only 0.8% of the variance in interference effects beyond the effects of PPI and Stress Immunity scores. Thus, the present findings point to a weak trend suggesting that psychopathic individuals commit more passive-avoidance errors than nonpsychopathic individuals if they are also low in anxiety, but this pattern was not found for interference effects.

colleagues are better generalized to relatively young adults who exhibit higher mean levels of antisocial behavior than older adults. A final subsidiary finding was that psychopathic, HPD, and ASPD individuals tended to exhibit slightly (but not significantly) shorter reaction times on the Go/no-go task, perhaps reflecting a propensity toward impulsivity shared by all three syndromes.

Several limitations of this study should be considered. First, the analyses examining sex differences were limited by relatively small sample sizes, which restrict the statistical power to detect significant differences in analyses of interaction effects (Jaccard et al., 1990). Our hypotheses should therefore be tested in larger samples of males and females. Second, questions can be raised concerning the personality disorder measures. Although peer ratings of psychopathy correlated significantly with peer ratings of HPD and ASPD, they did not correlate significantly with self-report measures of HPD and ASPD. Also, the intercorrelations among peer ratings of psychopathic, HPD, and ASPD features were all moderate to large in magnitude. These data suggest that the peer-rating items may have lacked sufficient discriminant validity for assessing personality disorders. Perhaps the peers of participants who manifest some degree of psychopathy or Cluster B personality disorder traits tended to rate participants similarly across items (i.e., a halo effect). Another finding unique to the peer ratings was their failure to yield significant sex differences in psychopathy and ASPD scores. Third, the overall pattern of results may be relatively specific to acting populations. Because actors tend to be higher in self-monitoring (Hammond & Edelmann, 1991; Snyder, 1974) and extraversion (Hammond & Edelmann, 1991; Keller & Tetlow, 1980) than nonactors, these or other personality variables may limit the generalizability of the results. Fourth, the lack of ethnic diversity further limits the generalizability of these findings. A few researchers have found ethnic differences in the correlates of psychopathy (e.g., Kosson, Smith, & Newman, 1990). Over 90% of our sample was Caucasian, precluding the examination of race differences in personality and laboratory variables.

Although findings from this study do not provide strong evidence that HPD and ASPD are sex-typed manifestations of psychopathy, they suggest that the features of these disorders tend to covary across individuals. In addition, there may be a shared vulnerability (e.g., impulsivity) underlying the manifestations of these conditions. With respect to sex differences in personality disorders, future research should explore potential female-typed manifestations of psychopathy other than HPD. Potential candidates may be somatization disorder (see Lilienfeld, 1992) or borderline personality disorder (see Hudziak, Boffeli, Battaglia, Stanger, & Guze, 1997). The examination of these conditions should help to advance our understanding of psychopathy as well as its potentially diverse behavioral manifestations.

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