The role of antisocial and borderline personality features in substance dependence among incarcerated females

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Abstract

This study examined the association of borderline personality disorder (BPD) and antisocial personality disorder (ASPD) with substance dependence among incarcerated females (N=105) as well as the influence of the co-occurrence of BPD and ASPD on psychosocial functioning in substance-dependent participants. The severity of BPD and ASPD both were associated with drug dependence, but BPD was not associated with alcohol dependence. After controlling for ASPD severity, BPD severity was no longer associated with drug dependence. The ASPD features of criminal activity and recklessness were most uniquely associated with drug and alcohol dependence (respectively). None of the BPD features was uniquely associated with alcohol or drug dependence after controlling for ASPD. A co-occurring BPD diagnosis was associated with mood disturbance and experiential avoidance among substance-dependent participants. An ASPD diagnosis was associated with an earlier age at first arrest, along with greater childhood abuse and severity of alcohol dependence. These findings have important implications for further understanding and developing ways to help substance-dependent incarcerated females.

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1. Introduction

Personality disorders (PDs) generally are associated with poorer psychosocial functioning and interfere with the treatment of substance use disorders (SUDs) (Reich & Green, 1991; Thomas, Melchert, & Banken, 1999), defined in the present report as alcohol and/or drug dependence. For instance, substance-abusing patients with a co-occurring PD report significantly greater depression and behavioral dyscontrol, are at

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greater risk for HIV infection, and are more extensively involved in substance abuse, compared with substance-abusing patients without a PD (Nace, Saxon, & Shore, 1983; Rutherford, Cacciola, & Alterman, 1994). In particular, borderline personality disorder (BPD) and antisocial personality disorder (ASPD) commonly co-occur with SUDs. Thus, research is needed to determine the role of ASPD and BPD in SUDs.

Studies have found that BPD and SUD are among the most commonly co-occurring disorders (McGlashan, Grilo, & Skodol, 2000; Verheul et al., 2000). In their review, Trull and colleagues reported that, across studies, 27% of substance abuse patients met criteria for BPD. Moreover, approximately half (49%) of BPD patients met criteria for an alcohol use disorder and 38% met criteria for a drug use disorder (Trull, Sher, Minks-Brown, Durbin, & Burr, 2000). Antisocial personality disorder (ASPD) also commonly co-occurs with SUDs (Hartford & Parker, 1994; Lewis & Bucholz, 1991), with many of the defining features of ASPD involving behaviors frequently seen among SUD populations (e.g., stealing and other antisocial acts).

A handful of studies have examined the relationship of specific personality disorder features with substance dependence. Using latent cluster analysis of ASPD symptom data from the Collaborative Study on Genetics of Alcoholism (COGA), Bucholz, Hesselbrock, Heath, Kramer, and Schuckit (2000) examined the association of subtypes of ASPD with alcohol dependence. Forty-one percent of the women in the sample met criteria for alcohol dependence; approximately 4% met criteria for ASPD. The cluster identified as having the most severe ASPD features also had the highest level of dependence symptoms. Within this cluster, the most frequently endorsed ASPD features included stealing, illegal activities, fighting, and defaulting on debts. In one study (Dulit, Fyer, Haas, Sullivan, & Frances, 1990), SUD patients who continued to meet criteria for BPD after excluding the contribution of substance abuse to the diagnosis more frequently reported the following BPD-related features (compared with SUD patients who no longer met BPD criteria after excluding the contribution of substance abuse): impulsivity, identity disturbance, intolerance of being alone, and feelings of emptiness and boredom.

Given the substantial co-occurrence of SUD with ASPD and BPD, further research is needed to examine the association of specific PD features with substance dependence. Illuminating the association between PD features in SUD may clarify the potential role of PDs in substance use problems. Further clarifying this relationship is an important step in the conceptualization and development of treatments for persons with co-occurring PDs and SUDs.

The present study focused on an incarcerated female population. Previous research has indicated high rates of personality disorders among incarcerated females, with rates of BPD and ASPD being particularly high (Chapman, Specht, & Cellucci, 2005a). Incarcerated women increasingly are imprisoned for substance abuse offenses (Henderson, 1998), and there is some evidence that BPD and ASPD features may be more strongly related to substance use problems in women than in men (Lewis & Bucholz, 1991). Yet, women with substance use problems remain understudied. For assessment and treatment of incarcerated women to progress, studies must examine the interplay between SUD and PDs.

The primary purposes of the present study were to (a) examine the association of BPD and ASPD and specific features of these PDs with alcohol and drug dependence in incarcerated females, and (b) examine the effects of ASPD and BPD diagnoses on theoretically relevant aspects of psychosocial functioning among substance-dependent incarcerated females. In conducting our analyses, we controlled for the effects of BPD and ASPD features that are partially dependent on the presence of substance use behavior. We also controlled for the respective PDs in all relevant analyses in order to isolate the effects of BPD and ASPD. We hypothesized that the severity of BPD and ASPD would be positively associated with the severity of alcohol and drug dependence. In addition, we speculated that the effects of BPD and BPD features may not be uniquely associated with alcohol and drug dependence after controlling for the severity of ASPD.
We also examined the effects of co-occurring BPD or ASPD on psychosocial functioning among substance-dependent incarcerated females in the following domains: chronicity of legal difficulties, experiential avoidance, childhood abuse, depression and hopelessness, and drug and alcohol dependence severity. An early study based on the Epidemiological Catchment Area (ECA) data (Lewis & Bucholz, 1991) found that ASPD was uniquely associated with current alcohol problems after controlling for family history of alcohol problems. Another study found that antisocial behavior was associated with alcohol dependence symptoms in both women and men, even after controlling for SES and family history of substance dependence (Hartford & Parker, 1994). Therefore, we hypothesized that both ASPD and BPD diagnoses would be related to greater severity of alcohol and drug dependence among substance-dependent participants.

We also hypothesized differences in the effects of ASPD and BPD on other domains of functioning in substance-dependent participants. For instance, ASPD largely includes features that involve irresponsible, impulsive, reckless, or criminal behaviors, and as such, would be expected to be associated with legal difficulties among individuals with SUD. BPD has been associated with depression (Abela, Pain, & Moussaly, 2003; Bellino et al., 2005; Joyce et al., 2003) and a history of childhood abuse (Sabo, 1997) in several studies, and one study found that the presence of BPD was associated with greater psychiatric distress among substance abusers (Morgenstern, Langenbucher, Labouvie, & Miller, 1997). In addition, recent conceptualizations of BPD have emphasized a tendency toward experiential avoidance, or the avoidance of or escape from unwanted emotions and thoughts (Chapman, Specht, & Cellucci, 2005b; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Linehan, 1993). Therefore, we examined whether BPD was associated with greater levels of depression and hopelessness, past childhood abuse, and experiential avoidance among substance-dependent participants.

2. Methods

2.1. Participants

This study received IRB approval prior to data collection. One hundred and seventeen incarcerated females ($M_{\text{age}}=33.90, \text{S.D.}=8.52$) from a multilevel women’s prison volunteered to participate in the study in response to pamphlets posted on the cellblocks. Exclusionary criteria included a current psychotic episode or serious reading difficulties that precluded filling out questionnaires. Two participants were excluded, one because of reading difficulties and the other due to frank mental confusion. Ten participants completed questionnaires but had transferred to another facility before completing the diagnostic interviews. Please see Table 1 for information on the demographic features of the sample. Almost fifty percent (48.6%) of participants were incarcerated most recently for drug-related offenses, with the most common drug-related offense consisting of drug possession (27.6%). Participants reported a mean duration of current incarceration of 303.79 days (S.D.=553.58, range=6–2843), suggesting that it was unlikely that participants were undergoing acute detoxification from alcohol or drugs during the study.

2.2. Procedure

Participants were recruited from their cell-blocks using flyers describing the study as one that examines psychological difficulties characteristic of incarcerated females. Participants were not offered incentives for their research participation, as this was not allowed under prison regulations. Written informed consent
was obtained from each participant, and participants were told explicitly that their participation (or refusal to participate) would not influence their treatment or status in prison. The study was conducted over two separate sessions. During the first session, participants completed a demographics form and a packet of questionnaires in small groups (4–9 individuals) in a quiet room under supervision. During a second session ($M$=4.74 days after the first session, S.D.=3.99), participants were administered interview measures of personality disorders and substance dependence. These interviews lasted approximately 60–75 min and were conducted individually by doctoral students in clinical psychology or by a licensed clinical psychologist. All interviewers were trained in the administration of personality disorder interviews by the first author, who had conducted or rated over 100 such interviews. Subsequently, interview ratings for substance dependence and personality disorders were discussed during weekly meetings to ensure that the basis for ratings was consistent across interviewers. Questionable responses were scored based on team consensus.

2.3. Assessment measures

2.3.1. Demographics form

The demographics form included: age, ethnicity, marital status, education, gross yearly income in the year prior to incarceration (we did not specifically discriminate legal versus illegal income), as well as questions pertaining to criminality, including reasons for current incarceration and age at first arrest. Age at first arrest was used as an indicator of the chronicity of participants’ legal difficulties in subsequent MANCOVAs.

2.3.2. Personality disorder assessment

Diagnostic assessment of borderline (BPD) and antisocial personality disorder (ASPD) was conducted via the Structured Clinical Interview for DSM-IV Personality Disorders (SCID-II-INT; First, Gibbon, Spitzer, Williams, & Benjamin, 1997). The SCID-II has demonstrated good psychometric properties in several studies (Farmer & Chapman, 2002; First et al., 1995). First, the SCID-II-Personality Questionnaire (SCID-II-PQ) was administered as a screening questionnaire. Next, the interviewer conducted the SCID-II interview and queried only those items rated “true” on the SCID-II-PQ. Given the prevalence of substance use among female prisoners, ratings were made based on instances when the inmate was not actively using substances. Diagnoses were made based on DSM-IV-TR (APA, 2000) cutoffs.

Similar to Chapman et al. (2005), we calculated a dimensional score representing the severity of the PDs examined in this study. Participants’ scores on BPD and ASPD items were coded such that symptoms

Table 1

<table>
<thead>
<tr>
<th>Marital status</th>
<th>%</th>
<th>Education</th>
<th>%</th>
<th>Income</th>
<th>%</th>
<th>Ethnicity</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>32.4</td>
<td>8th grade or less</td>
<td>10.5</td>
<td>$&lt;5000</td>
<td>36.2</td>
<td>White/Caucasian</td>
<td>71.4</td>
</tr>
<tr>
<td>Married</td>
<td>20.0</td>
<td>Some high school</td>
<td>13.3</td>
<td>$5000–9999</td>
<td>16.2</td>
<td>Native American</td>
<td>13.3</td>
</tr>
<tr>
<td>Separated/divorced</td>
<td>45.7</td>
<td>GED</td>
<td>27.6</td>
<td>$10,000–14,999</td>
<td>18.1</td>
<td>African American</td>
<td>1.9</td>
</tr>
<tr>
<td>Widowed</td>
<td>1.9</td>
<td>High school graduate</td>
<td>17.1</td>
<td>$15,000–19,999</td>
<td>7.6</td>
<td>Asian/Asian American</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Business or technical school</td>
<td>6.7</td>
<td>$20,000–24,999</td>
<td>3.8</td>
<td>Latina</td>
<td>9.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Some college</td>
<td>21.0</td>
<td>$25,000–29,999</td>
<td>7.6</td>
<td>Other</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>College graduate</td>
<td>3.8</td>
<td>$30,000–49,999</td>
<td>7.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$50,000+</td>
<td>2.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$N=105$.
deemed clinically present = 1, subthreshold = 0.50, and absent = 0. In contrast with Chapman et al. (2005), in calculating the dimensional scores, we excluded those features of ASPD and BPD that may partly depend on the presence of substance-related behaviors, in order to avoid presenting spurious associations between these PDs and substance dependence. For ASPD, we excluded “criminal behavior” (criterion 1; APA, 2000). For example, if three ASPD symptoms were clinically present, two were partially present, and one was absent, the resulting dimensional score would be: \[\frac{3(1.0) + 2(0.50) + 1(0)}{6} = 0.67.\] For BPD, we excluded “impulsive, potentially self-damaging behavior”, referred to here as impulsivity (criterion 4; APA, 2000). For example, if four BPD symptoms were clinically present, three partially present, and one absent, the resulting dimensional score would be \[\frac{4(1.0) + 3(0.50) + 1(0)}{8} = 0.69.\] In addition, we calculated ASPD and BPD diagnostic variables that did not include criminal behavior and impulsivity, respectively.

2.3.3. Substance dependence assessment

The Triage Assessment for Addictive Disorders (TAAD; Hoffman, 2000) is a brief structured interview of DSM-IV criteria for alcohol and drug abuse and dependence. Participants were asked about their alcohol and drug use during the 12 months prior to incarceration. In addition to diagnoses, dimensional scores were calculated that represented the severity of alcohol or drug dependence. Each criterion positively endorsed was given a value of “1”; each criterion negatively endorsed was given a value of “0”. The criteria for alcohol dependence or drug dependence were summed and divided by the total number of criteria for alcohol or drug dependence (seven criteria each) to yield the dimensional scores.

2.3.4. Childhood abuse

The Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994) assesses several aspects of childhood abuse. We administered a brief version consisting of the five items with the highest loadings on each of three factors for the CTQ: (1) physical and emotional abuse, (2) sexual abuse, and (3) neglect. For the CTQ, respondents are asked to rate from 1 (“never true”) to 5 (“very often true”) the extent to which each item applied to their experiences while growing up. The correlations among these subscales for the CTQ ranged from .36 to .54. We calculated z-scores for physical and emotional abuse (one scale, consisting of both physical and emotional abuse) and for sexual abuse and then summed and divided them by two to create a childhood abuse composite score (used in subsequent MANCOVA analyses).  

2.3.5. Depressed mood and hopelessness

We measured depressed mood using the Beck Depression Inventory-Second Edition (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item self-report measure of the severity of depression. BDI-II items correspond closely with DSM-IV criteria for major depression, and the BDI-II has consistently demonstrated solid psychometric properties (Beck et al., 1996). The Beck Hopelessness Scale (BHS; Beck & Steer, 1993) is a 20-item self-report inventory of pessimistic or hopeless attitudes toward the future. As with the BDI-II, the BHS has demonstrated strong reliability and validity in several studies (Beck & Steer, 1993). The correlation between the BDI-II and the BHS in the present sample was high, \(r = .69.\) We created a depressed mood composite score (used in subsequent MANCOVA analyses) by calculating z-scores for depression and hopelessness, summing them, and dividing them by two.

\[1\] We did not include the CTQ neglect scale in this composite score, as it demonstrated low internal consistency within the present sample, \(\alpha = .43.\)
2.3.6. Experiential avoidance measures

Experiential avoidance tendencies were measured through two different measures: the Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004), and the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994). The AAQ (Hayes et al., 2004) measures the general tendency to avoid unwanted internal experiences, including emotions and thoughts. The AAQ has demonstrated good psychometric properties (i.e., test–retest reliability and internal consistency), and good convergent validity through positive associations with the Dissociative Experiences Scale and the Escape-Avoidance Scale of the Ways of Coping Questionnaire (WOC; Folkman & Lazarus, 1988) (Hayes et al., 2004).

The WBSI measures the tendency to avoid or suppress unwanted thoughts. The WBSI has demonstrated good internal consistency, adequate to very good test–retest reliability (range: .69–.92), and good concurrent validity (Wegner and Zanakos, 1994). The correlation between the AAQ and the WBSI was quite high, $r = .67$. We computed $z$-scores for both the AAQ and the WBSI and then calculated an experiential avoidance composite score (used in subsequent MANCOVA analyses) by summing these $z$-scores and dividing them by two.

3. Results

3.1. Preliminary analyses

3.1.1. Data screening and descriptive statistics

Table 2 displays the descriptive statistics (mean, standard deviation, and range) for each of the primary study variables. Among these variables, only the hopelessness scores were significantly skewed. We did not, however, perform data transformations, because the analyses reported below are relatively robust to violations of the normal distribution, the skewness value for hopelessness was not excessively high (1.68, S.E. = 0.24) (see Ormel & Rijsdijk, 2000 for a discussion of circumstances under which data transformations may be unnecessary), and because we wanted to maintain the interpretability of the coefficients in the analyses reported below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>S.D.</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug dependence severity</td>
<td>0.64</td>
<td>0.42</td>
<td>0–1.00</td>
</tr>
<tr>
<td>Alcohol dependence severity</td>
<td>0.47</td>
<td>0.39</td>
<td>0–1.00</td>
</tr>
<tr>
<td>BPD severity</td>
<td>0.49</td>
<td>0.27</td>
<td>0–1.00</td>
</tr>
<tr>
<td>BPD severity without criterion 4</td>
<td>0.46</td>
<td>0.29</td>
<td>0–1.00</td>
</tr>
<tr>
<td>ASPD severity</td>
<td>0.35</td>
<td>0.22</td>
<td>0–0.91</td>
</tr>
<tr>
<td>ASPD severity without criterion 1</td>
<td>0.46</td>
<td>0.24</td>
<td>0–1.00</td>
</tr>
<tr>
<td>Acceptance and Action Questionnaire (AAQ)</td>
<td>68.76</td>
<td>11.96</td>
<td>39–108</td>
</tr>
<tr>
<td>White Bear Suppression Inventory (WBSI)</td>
<td>53.45</td>
<td>13.67</td>
<td>15–75</td>
</tr>
<tr>
<td>Beck Depression Inventory (BDI-II)</td>
<td>22.23</td>
<td>11.06</td>
<td>4–57</td>
</tr>
<tr>
<td>Beck Hopelessness Scale (BHS)</td>
<td>4.18</td>
<td>4.73</td>
<td>0–20</td>
</tr>
<tr>
<td>Childhood Physical and Emotional Abuse (CTQ)</td>
<td>15.37</td>
<td>6.10</td>
<td>5–25</td>
</tr>
<tr>
<td>Childhood Sexual Abuse (CTQ)</td>
<td>14.15</td>
<td>8.08</td>
<td>5–25</td>
</tr>
<tr>
<td>Age at first arrest</td>
<td>20.79</td>
<td>8.20</td>
<td>7–44</td>
</tr>
</tbody>
</table>
3.1.2. Prevalence of substance dependence and personality disorders

Fifty-eight (55.2%) of the 105 participants met criteria for alcohol dependence, 73 (69.5%) met criteria for drug dependence, and 39% met criteria for both alcohol and drug dependence. In terms of diagnosis, alcohol and drug dependence were not significantly associated, \( \chi^2 = 0.08 \), ns.

Table 3 shows the proportions of alcohol/drug-dependent vs. non-alcohol/drug-dependent individuals who met criteria for BPD or ASPD. For these values, we used calculated BPD and ASPD diagnostic variables that substance use may have influenced (impulsivity for BPD and criminal behavior for ASPD). The BPD diagnosis demonstrated a trend toward an association with the diagnosis of drug dependence, \( \chi^2 = 3.25, p = .07 \), but was not significantly associated with alcohol dependence, \( \chi^2 < 0.01, p = .93 \). As seen in Table 3, the ASPD diagnosis was significantly associated with both drug dependence, \( \chi^2 = 18.98, p < .01 \) and alcohol dependence, \( \chi^2 = 6.22, p = .01 \).

3.1.3. Identification of covariates

We examined the association of demographic characteristics with alcohol and drug dependence severity in order to identify any possible influences other than PD symptomatology on these variables. Age, number of years of education, income, ethnicity (Caucasian vs. non-Caucasian), and marital status (married vs. single, separated, or divorced) were not significantly associated with alcohol dependence severity, and hence were not employed as covariates in analyses involving alcohol dependence severity. Number of years of education, ethnicity, and marital status were not significantly associated with drug dependence severity; however, age, \( r = -.25, p = .01 \), and income, \( r = -.27, p = .01 \), were significantly negatively associated with drug dependence severity. Age and income were included as covariates in regression analyses that involved drug dependence.

3.2. Association of BPD and ASPD severity with alcohol and drug dependence severity

A significant association of alcohol and drug dependence would suggest the need to control for alcohol dependence in drug dependence analyses and vice versa in order to isolate the factors specifically associated with each type of SUD. Thus, we examined the correlation between alcohol and drug dependence severity, which was non-significant, \( r = .04 \), ns. Given the orthogonality of these forms of SUD in the present study, as planned, we conducted the following analyses separately for alcohol and drug dependence severity. In terms of zero-order correlations, BPD severity was significantly correlated with ASPD severity, \( r = .40, p < .01 \), and drug dependence severity, \( r = .25, p = .01 \), but not with alcohol dependence severity, \( r = .12, p = .22 \).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Alcohol dependence</th>
<th>( \chi^2 )</th>
<th>Drug dependence</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absent (n=47)</td>
<td>Present (n=58)</td>
<td>Absent (n=32)</td>
<td>Present (n=73)</td>
</tr>
<tr>
<td>BPD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>76.6%</td>
<td>75.9%</td>
<td>87.5%</td>
<td>71.2%</td>
</tr>
<tr>
<td>Present</td>
<td>23.4%</td>
<td>24.1%</td>
<td>12.5%</td>
<td>28.8%</td>
</tr>
<tr>
<td>ASPD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>72.3.1%</td>
<td>48.3%</td>
<td>90.6%</td>
<td>45.2%</td>
</tr>
<tr>
<td>Present</td>
<td>27.7%</td>
<td>51.7%</td>
<td>9.4%</td>
<td>54.8%</td>
</tr>
</tbody>
</table>

\( ^a p < .10, ^* p < .05, ^{**} p < .01. \)
severity was significantly correlated with both drug dependence severity, $r = .35$, $p < .01$, and alcohol dependence severity, $r = .43$, $p < .01$.

We conducted a hierarchical regression analysis to examine whether the association of ASPD and BPD severity with drug dependence remained significant after controlling for identified covariates and the other respective PD. Age and education were entered in the first step, followed by ASPD severity and BPD severity in the second step. In the second step, ASPD severity was significant, $\beta = .25$, $p = .02$, but BPD severity was non-significant, $\beta = .11$, $p = .27$. We did not repeat these analyses for alcohol dependence, as neither BPD severity nor any of the covariates mentioned above was significantly associated with alcohol dependence.

### 3.3. Association of BPD and ASPD features with alcohol and drug dependence

We conducted a series of correlational and regression analyses to examine the association of specific BPD and ASPD features with alcohol dependence and drug dependence severity. As BPD severity was not significantly correlated with alcohol dependence severity, we did not examine the association of individual BPD features with alcohol dependence.

#### 3.3.1. BPD features

The following BPD criteria were significantly correlated with drug dependence severity: cognitive dysregulation, $r = .31$, $p < .01$, anger dysregulation, $r = .25$, $p < .01$, impulsivity, $r = .24$, $p < .01$, affect instability, $r = .21$, $p = .01$, and abandonment, $r = .18$, $p = .04$. We conducted a hierarchical regression analysis, with drug dependence severity as the DV. ASPD severity was entered in the first step, followed by the BPD feature of impulsivity in the second step (as mentioned, substance abuse/dependence may contribute to the rating of this criterion), and the remaining BPD features that had significant zero-order correlations with drug dependence in the third step. As seen in Table 4, after controlling for ASPD in the first step, impulsivity no longer was significantly associated with drug dependence severity. In the third step, none of the other BPD criteria were significant, although cognitive dysregulation demonstrated a trend ($p = .07$).

#### 3.3.2. ASPD features

In terms of zero-order correlations, the following ASPD criteria were significantly associated with drug dependence severity: criminal activity, impulsivity, irresponsibility, and aggressiveness, $r$’s = .47, .35, .34, and .30, respectively (all $p$’s $< .01$). A hierarchical regression analysis was conducted, with BPD severity entered in the first step, followed by criminal activity in the second step (substance use may directly contribute to the rating of this criterion), and the three remaining ASPD criteria that were significantly associated with drug dependence severity in the third step. As seen in Table 4, after controlling for BPD severity in the first step, criminal activity remained significant, $\beta = .44$. In the third step, only criminal activity was significant, although impulsivity demonstrated a trend, $\beta = .18$, $p = .08$.

The ASPD features of recklessness, aggressiveness, remorselessness, impulsivity, and conning were significantly correlated with alcohol dependence severity, $r$’s = .38, .27, .26, .24, and .22, respectively (all $p$’s $< .02$). As neither BPD severity (reported previously) nor criminal activity was significantly correlated with alcohol dependence severity, we did not control for these variables in the subsequent regression

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2 “Cognitive dysregulation” refers to BPD criterion 9 (APA, 2000), which involves paranoid thinking and/or dissociative behavior in response to stress.
analyses. Instead, we conducted a simultaneous regression analysis, with all five of the ASPD criteria that were significantly correlated with alcohol dependence severity entered into the model. As seen in Table 4, only recklessness was significantly and uniquely associated with alcohol dependence severity, $\beta = .33$, although remorselessness demonstrated a trend, $\beta = .16$, $p = .08$.3

3.4. The effects of BPD and ASPD on substance-dependent participants

Two one-way MANCOVAs were performed to examine separately the effects of BPD and ASPD on substance dependence. In contrast with the regression analyses reported above, for which we conducted separate analyses for alcohol and drug dependence, we collapsed across alcohol and drug dependence for the MANCOVAs and focused on whether an individual met criteria for either alcohol or drug dependence (“substance dependence”). This was because we had no reason to hypothesize that BPD and ASPD would differentially influence the psychosocial functioning of persons with alcohol versus drug dependence.4 In

[3] For these regression analyses, we decided against correcting for cumulative type-I error. As aspects of these analyses were largely exploratory, we did not believe that applying conservative corrections for type-I error would have been appropriate. In addition, Keppel (1991) has not recommended any special $\alpha$-level corrections for a “…reasonable number of comparisons….” (Keppel, 1991, p. 167). We believe that, within each regression analysis, the number of correlations and/or $\beta$-coefficients reported constitute a reasonable number of analyses (maximum = 9, for BPD), given the purposes of this study.

[4] Nevertheless, we separately examined alcohol and drug dependence severity as DVs in the MANCOVAs, rather than creating an overall composite for alcohol and drug dependence severity, given that these variables appeared to be relatively independent.
addition, the diagnostic variables representing BPD and ASPD included impulsivity and criminal behavior, respectively, in their calculations, in contrast with the diagnostic variables used to compute the chi-square values reported above (see Section 3.1.2).

### 3.4.1. Co-occurrence of BPD

The first MANCOVA examined the effects of BPD. The IV consisted of group (substance dependence without BPD: \( n = 57 \) vs. BPD + substance dependence: \( n = 31 \)), ASPD severity was the covariate, and the DVs consisted of: age at first arrest, child abuse composite, experiential avoidance composite, depression/hopelessness, and drug dependence severity. We did not include alcohol dependence severity as a DV, as BPD was not significantly associated with alcohol dependence severity. The MANCOVA was significant, \( F(5,81)=3.55, p<.01, \eta^2=.18 \). As seen in Table 5, univariate ANOVAs indicated that the BPD + substance-
dependent group scored significantly higher than the substance-dependent group on experiential avoidance and on depressed mood.

3.4.2. Co-occurring ASPD

The second MANCOVA examined the effects of ASPD diagnosis. The IV consisted of group (substance dependence without ASPD: \( n=45 \) vs. ASPD+substance dependence: \( n=43 \)), and BPD severity was the covariate. The DVs consisted of: age at first arrest, child abuse composite, experiential avoidance composite, depression/hopelessness, drug dependence severity, and alcohol dependence severity. The MANCOVA was significant, \( F(6,80)=6.61, p<.01, \eta^2 = .33 \). As seen in Table 5, univariate ANOVAs indicated that, compared with the substance-dependent group, the ASPD+substance-dependent group had a significantly lower age at first arrest\(^6\) and scored significantly higher on the abuse composite and on alcohol dependence severity.

4. Discussion

The present study examined the association of borderline personality disorder (BPD) and antisocial personality disorder (ASPD) with substance dependence in an incarcerated female sample. The findings underscored the high prevalence of substance problems among incarcerated females, and shed some light on the association of specific PD features with alcohol and drug dependence, as well as on the effect of co-occurring PDs on psychosocial functioning in persons with substance dependence. In particular, findings supported previous research indicating a very high prevalence of substance dependence among incarcerated females. For instance, approximately 70% of the present sample met criteria for drug dependence. A large proportion of participants were most recently incarcerated for offenses related to illicit substances, suggesting that drug and alcohol issues are critical targets in any treatment program for female offenders. In addition, the frequent co-occurrence of BPD and ASPD with substance dependence in this study was consistent with previous research (Hartford & Parker, 1994; Lewis & Bucholz, 1991; McGlashan et al., 2000; Verheul et al., 2000), indicating that features associated with these PDs may play a role in substance dependence (and vice versa).

It is unclear as to why neither BPD diagnosis (chi-square analyses) nor BPD severity was associated with alcohol dependence, given that research has not suggested a differential association or differential rates of co-occurrence of BPD with alcohol versus drug use disorders (see Trull et al., 2000, for a review). Our sample had a high prevalence of drug problems and a high rate of incarceration for drug-related offenses, and alcohol and drug dependence severity were not significantly associated. If BPD features are related to difficulty regulating emotions (Linehan, 1993), and drug and alcohol use are emotion regulation strategies among individuals with significant BPD features (Trull et al., 2000), then the association of BPD with drug (but not alcohol) dependence may reflect the possibility that

\(^{6}\) A diagnosis of ASPD requires the presence of a diagnosis of childhood conduct disorder (APA, 2000). As such, it was possible that the diagnosis of ASPD was related to an earlier age at first arrest primarily because of its overlap with childhood conduct problems. We investigated this possibility by conducting an ANCOVA with group (substance dependence vs. ASPD+substance dependence) as the IV, a dimensional score representing the severity of conduct disorder features (calculated in the same manner as were the ASPD and BPD severity scores, but not excluding any conduct disorder criteria in the calculation) as the covariate, and age at first arrest as the DV. With conduct disorder severity included as a covariate, the effect of group on age at first arrest was no longer significant, \( F(1,87)=1.97, p = .16 \).
incarcerated females in the current sample preferentially use drug dependence as an emotion regulation strategy. Further research with samples of incarcerated females is needed to replicate and clarify this finding.

Our findings broadly indicated that BPD may be only indirectly linked with drug dependence among incarcerated females. BPD was no longer associated with drug dependence severity after we controlled for ASPD severity, suggesting that BPD is indirectly linked with severity of drug dependence through its association with ASPD and related features, perhaps most notably including the feature of impulsivity (a criterion for both BPD and ASPD). Although the association of affective instability and impulsivity with drug dependence supported the notion that impulsivity and emotion dysregulation are critical in the link between BPD and SUDs (Trull, Wadby, & Sher, 2003), these features (affective instability, impulsivity, as well as efforts to avoid abandonment) were no longer related to drug dependence after controlling for ASPD. This finding suggested that not only is BPD severity indirectly related to drug dependence, but that specific BPD features are associated with drug dependence only through their association with ASPD.

In terms of BPD features, cognitive dysregulation demonstrated a trend toward a significant unique association with drug dependence after controlling for ASPD. This association was consistent with suggestions that women with BPD who experience cognitive dysregulation may be particularly prone to “self-medication” through drug use (Blume, Marlatt, & Schmaling, 2000). On the other hand, being a drug-user may predispose people toward greater cognitive dysregulation. The DSM-TR BPD criterion that captures cognitive dysregulation involves dissociation and/or suspicious or paranoid thinking in response to stress. A certain degree of suspiciousness may actually be adaptive in social circles that involve drug use, particularly given the likelihood of lying and personal property crimes.

In terms of ASPD features, the findings were consistent with prior research (Bucholz et al., 2000) and broadly suggested that features related to reckless and criminal behavior are most strongly associated with substance dependence. Similarly, a recent study of university students (N=335, 61% women) found that impulsivity and delinquent behavior predicted alcohol problems, even after controlling for alcohol consumption (Magid & MacLean, 2002). Although we took steps to eliminate the influence of substance use on ratings for ASPD (and BPD) criteria, it was also possible that substance-related activities led to higher levels of the ASPD features of criminal behavior and recklessness. Nevertheless, after controlling for criminal behavior (the only ASPD criterion directly influenced by substance-related behaviors), recklessness remained significantly associated with alcohol dependence. These findings may further support the idea that a shared temperament feature related to disinhibited behavior underlies both substance dependence and ASPD (Battaglia, Przybeck, & Bellodi, 1996; Trull et al., 2003). In addition, our findings suggest that treatments focused on increasing behavioral inhibition and reducing impulsivity may be particularly useful for incarcerated women with substance dependence.

Supporting previous research (Morgenstern et al., 1997), the co-occurrence of BPD and ASPD was related to greater severity of psychosocial problems in particular domains among persons with SUD. Whereas BPD was consistently associated with greater experiential avoidance and depression/hopelessness, ASPD was associated with a younger age at first arrest and childhood abuse. Similarly, in a substance abuse sample, Morgenstern et al. (1997) found that BPD, but not ASPD, was related to psychiatric distress. Dulit et al. (1990) also reported that, compared with BPD substance abuse patients, non-BPD substance abuse patients demonstrated lower severity and chronicity in their psychiatric difficulties. Similar to our results regarding experiential avoidance, in
the Morgenstern et al. (1997) study, BPD was related to less adaptive coping. In addition, the findings support research indicating that persons with BPD tend to report heightened levels of experiential avoidance (Chapman et al., 2005; Vollrath, Alnaes, & Torgersen, 1998) and may be vulnerable to negative emotions (Linehan, 1993; Siever & Davis, 1991; Stiglmayr et al., 2001; Stiglmayr et al., 2005).

Unexpectedly, our findings indicated a link between childhood abuse and ASPD (among substance-dependent participants), but not BPD. Although other studies have found a link between antisocial personality traits and physical abuse and neglect among SUD samples (Bernstein, Stein, & Handelsman, 1998), it is unclear as to why BPD was not associated with greater childhood abuse in the present study, given the research suggesting a strong link between BPD and childhood maltreatment (Sabo, 1997). Among incarcerated females, ASPD features (possibly those related to childhood conduct problems) may largely account for this link between BPD and childhood maltreatment.

Our findings indicate that it may be important to conduct routine assessments of PD features among substance-dependent incarcerated females, particularly given that greater psychosocial severity in particular domains may have indications for rehabilitative and psychosocial treatment interventions. For instance, BPD was consistently associated with greater experiential avoidance and depression/hopelessness among individuals with SUD, suggesting that treatment interventions might involve strategies to enhance effective coping or emotion regulation skills and/or cognitive-behavioral therapy for problems with depression and hopelessness. Indeed, recent studies have shown promising results for treatments that focus on enhancing emotion regulation in BPD patients with SUD (e.g., Dialectical Behavior Therapy, or DBT; Linehan, 1993; Linehan et al., 1999; for a review, see Robins & Chapman, 2004).

Findings for ASPD suggest that interventions may focus on issues related to criminal or deviant behavior, possibly including treatment of cognitive and behavioral factors related to criminality as well as behavioral inhibition and control among persons with both substance dependence and ASPD features. Nevertheless, it is noteworthy that, after controlling for conduct disorder severity, the ASPD diagnosis was no longer significantly associated with age at first arrest. This finding suggested that the heightened chronicity of legal difficulties among persons with SUD and ASPD (relative to non-ASPD persons with SUD) may be related primarily to the greater prevalence of childhood conduct problems among this population. In addition, our findings indicated that childhood abuse and trauma may be a focus of treatment with persons who have co-occurring SUD and ASPD.

Some study limitations warrant consideration. For instance, this study used cross-sectional data, and as such, it is unclear as to whether personality disorders (presumed to be longstanding) preceded and influenced the development of SUD. It is possible that substance use problems influenced the development of ASPD or BPD in the present sample, and it is even more likely that both sets of problems exist in a mutual interplay. It also is unclear as to whether participants would have met BPD or ASPD criteria in the absence of substance dependence. It was possible that substance dependence influenced many of the behavioral problems related to these PDs. Notwithstanding, in the assessments, the rating clinicians were conservative about rating the criteria without some evidence that the behaviors occurred during periods during which participants were not actively abusing substances. In addition, BPD and ASPD presumably represent longstanding, maladaptive patterns that likely would pre-date the period for which we targeted our assessment of substance dependence (the year prior to incarceration). Nevertheless, longitudinal studies are needed to further disentangle the association of PDs with SUDs.
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References


