Specifying the Impulsivity of Female Inmates
With Borderline Personality Disorder

Nicole M. Hochhausen, Amanda R. Lorenz, and Joseph P. Newman
University of Wisconsin—Madison

Impulsivity is regarded as a core feature of borderline personality disorder (BPD; M. C. Zanarini, J. G. Gunderson, & F. R. Frankenburg, 1989) despite lack of evidence from laboratory research (D. M. Dougherty, J. M Bjork, H. C. G. Huckabee, F. G. Moeller, & A. C. Swann, 1999). This study examined impulsivity in incarcerated women with BPD using a passive avoidance task (J. P. Newman & W. A. Schmitt, 1998) and the Impulsiveness–Monotony Avoidance–Detachment inventory (IMD; D. Schalling, 1978). As predicted, incarcerated women diagnosed with BPD committed more passive avoidance errors and reported more impulsivity on the IMD than controls. These findings identify disinhibition as a potentially important component of the impulsivity that characterizes BPD. Specifying the impulsive behavior identified with BPD may contribute to the effective assessment and management of the disorder.

Borderline personality disorder (BPD) is commonly described as a disorder of emotions and of interpersonal relations. Levine, Marziali, and Hood (1997) found that individuals with BPD demonstrated less emotional awareness, less capacity to coordinate mixed-valence feelings, less accurate recognition of facial expressions of emotion, and more intense reactions to negative emotions than those not having BPD. Stein (1996) reported that BPD individuals show more short-term fluctuations in negative affective states and higher levels of unpleasant affects than non-BPD individuals.

Though emotionality is an integral, and often emphasized, aspect of the BPD construct, impulsivity is also a core feature of BPD (Hurt, Clarkin, Munroe-Blum, & Marziali, 1992). For instance, the *Diagnostic and Statistical Manual of Mental Disorders* (4th edition, revised text; *DSM–IV–TR*; American Psychiatric Association, 2000) defines BPD as "a pervasive pattern of instability of interpersonal relationships, self-image, and affects, and *marked impulsivity* [italics added] that begins by early adulthood and is present in a variety of contexts" (p. 706). According to the *DSM–IV–TR*, BPD involves "impulsivity in at least two areas that are potentially self-damaging (e.g., spending, sex, substance abuse, reckless driving, binge eating)" (p. 710). The revised Diagnostic Interview for Borderlines (DIB–R; Zanarini, Gunderson, Frankenburg, & Chauncey, 1989) also includes impulsive behavior, such as substance abuse, sexual deviation, self-mutilation, suicidal efforts, verbal outbursts, and physical fights as a criterion for the diagnosis of BPD. Thus, researchers commonly recognize impulsivity as an important component of the BPD construct.

To date, a precise definition of the "impulsivity" found in BPD has yet to emerge. In general, impulsivity refers to quick, unplanned behaviors that appear to lack clear forethought. However, as noted by van Reekum, Links, and Fedorov (1994), impulsivity ranges from a "rapid, poorly planned response style revealed in test taking and noted by neuropsychologists, through disinhibited affects such as irritability and affective lability, to more overt behaviors such as reckless driving and other thrill-seeking behaviors, and, finally, culminating in behavior central to diagnosis—that is, at the level of syndrome or disorder, as found in substance use disorders, antisocial personality disorder, and orbital frontal syndrome" (p. 2). Clearly, the concept of impulsivity may include a heterogeneous combination of behaviors.

Researchers have measured impulsivity in BPD individuals using various methods, including pharmacological (Coccaro et al., 1989), behavioral (Dougherty, Bjork, Huckabee, Moeller, & Swann, 1999), and self-report measures such as the Barratt Impulsiveness Scale 11th revision; (BIS-11; Patton, Stanford, & Barratt, 1995). A study by van Reekum et al. (1994) found evidence suggesting that inattentiveness and a tendency toward action without anticipating consequences, as measured by the BIS-11, appear to underlie the impulsivity exhibited by BPD individuals. The authors subsequently replicated this finding using inpatients from psychiatric facilities (van Reekum, Links, Mitton, Fedorov, & Patrick, 1996). Using the Revised NEO Personality Inventory (NEO-PI–R; Costa & McCrae, 1992) to measure personality traits, Trull (2001) also found evidence that disinhibition may be a core feature of BPD.

Due to the heterogeneity of the impulsivity construct, studies such as those by van Reekum et al. (1996) and Trull (2001), which separate out the underlying features of impulsivity in BPD, appear essential for clarifying the poorly regulated behaviors associated with BPD. Similarly, there is a need for laboratory-based behavioral research to evaluate the components of impulsivity in individuals diagnosed with BPD. Such evidence would not only serve to support inclusion of impulsivity in the diagnostic criteria for the disorder but may also clarify the processes contributing to the

impulsive behavior of BPD individuals. Despite the potential significance of laboratory testing for discerning the nature of impulsivity as exhibited in BPD, few researchers have used such measures with BPD individuals.

Moreover, to the extent that behavioral testing has been used with BPD individuals, the findings fail to corroborate the significant association between impulsivity and BPD observed in self-report studies. For instance, an experiment by Dougherty et al. (1999) that used a delay of gratification task found no relation between BPD and this laboratory measure of impulsivity. These authors presented participants with 50 trials, offering a choice between an immediate, smaller monetary reward and a delayed, larger monetary reward on each trial. Thus, whereas self-report measures have shown repeatedly that people with BPD are more impulsive than controls, laboratory tasks have been unable to demonstrate this difference.

A potential explanation for this discrepancy was proposed by Dougherty et al. (1999). These authors noted that a single laboratory task may be inadequate for assessing such a broad construct, with the implication that a more differentiated assessment of the construct might capture the impulsivity associated with BPD. In this study, we assessed the impulsivity of incarcerated women with and without BPD using a different behavioral task and a multi-component self-report measure to evaluate three dimensions commonly associated with disinhibited behavior.

The behavioral assessment involved a passive avoidance task. Passive avoidance tasks measure the ability to inhibit punished responses and are commonly used to measure impulsivity in community and incarcerated samples. Passive avoidance tasks have been used successfully to differentiate the performance of incarcerated psychopaths and controls (e.g., Lykken, 1957; Newman & Kosson, 1986; Newman & Schmitt, 1998; Thornquist & Zuckerman, 1995) as well as other disinhibited and nondisinhibited groups (e.g., Finn, Justus, Mazas, & Steinmetz, 1999; Milich, Hartung, Martin, & Haigler, 1994; Patterson, Kosson, & Newman, 1987). Although passive avoidance deficits are common in various syndromes of disinhibition (Gorenstein & Newman, 1980), the factors contributing to the passive avoidance deficits of diverse groups are likely to differ (Newman & Wallace, 1993; Patterson & Newman, 1993). Nevertheless, in light of van Reekum et al.'s (1996) hypothesis that impulsivity in people with BPD includes a tendency toward action without anticipation of the consequences, we predicted that incarcerated women with BPD would exhibit more impulsive behavior and, thus, commit more passive avoidance errors than incarcerated women without BPD.

Because passive avoidance deficits have been observed in a variety of samples, it is important to determine whether any performance deficits observed in this study are a function of comorbid psychopathology as opposed to BPD per se. In light of the fact that BPD appears to be associated with psychopathy (Paris, 1997) and antisocial personality disorder (ASPD; Nurnberg, Raskin, Levine, Siegel, & Prince, 1991), and antisocial syndromes have been linked to poor passive avoidance (e.g., Newman, Widom & Nathan, 1985), it is especially important to evaluate the effects of comorbid psychopathy and ASPD on performance. In addition, because BPD diagnoses are associated with excessive anxiety (Snyder & Pitts, 1988) and depression (Manos, Vasilopoulou, & Sotiriou, 1987) and these characteristics have been associated with poor passive avoidance in female samples (MacCoon, Lorenz, & Newman, 2001; Segarra, Molto, & Torrubia, 2000), it

seems important to control for the effects of comorbid anxiety and depression. Finally, because laboratory performance on the go/no-go passive avoidance task used in this study is sometimes related to intelligence, we also examined the extent to which level of intelligence affects group differences in passive avoidance learning.

In addition to measuring women's impulsivity on the passive avoidance task, we also used the Impulsiveness–Monotony Avoidance–Detachment inventory (IMD), a self-report measure used by Schalling (1978) to specify the dimensions responsible for the dysregulated behavior of psychopathic individuals. The impulsiveness portion of this inventory measures the tendency to act on the spur of the moment, make quick decisions, fail to reflect, act hastily, and behave in a carefree, thoughtless manner. Borderline individuals' demonstration of higher levels of impulsivity on this scale would lend support to the hypothesis of van Reekum et al. (1994) that impulsivity in BPD includes a tendency toward action without anticipation of the consequences. In addition, impulsivity on this scale would be consistent with poor performance on the passive avoidance task, which also measures disinhibition and failure to consider consequences. Thus, we predicted that women with BPD would demonstrate higher levels of impulsivity than controls on the impulsiveness scale of the IMD.

The Monotony Avoidance scale of the IMD measures a component of impulsivity involving thrill seeking and the need for an adventurous life. Higher levels of impulsivity on this scale may correspond with a lowered willingness to delay gratification, as measured by Dougherty et al. (1999). Given that they reported no difference between BPD individuals and controls on the delay of gratification task, we predicted no differences on the Monotony Avoidance scale. The Detachment scale is associated with a lack of emotional involvement with others that may contribute to the expression of inappropriate, high-risk behavior. Because detachment does not appear to relate to the dysregulation found in BPD, we predicted no group difference on this scale.

Method

Participants

Participants were offenders from a female prison in Wisconsin. Files were prescreened to select only women under the age of 40 who were not taking antipsychotic medications and who performed at a 4th-grade level or higher in math and reading on standardized prison evaluations. Participants were told that their decision to participate would not affect their status within the Department of Corrections. Participants gave informed consent and received compensation for their participation.

To be included in the analyses, we required that inmates be classified as Caucasian or African American, have an estimated intelligence score of 70 or greater, have completed the assessment of BPD symptoms, and have completed either the passive avoidance task or the IMD. A total of 109 Caucasian and 95 African American inmates met these inclusion criteria. Of these inmates, 96 Caucasian and 83 African American inmates performed the passive avoidance task, whereas 92 Caucasian and 78 African American inmates completed the IMD. In most cases, missing data indicates that the inmate was transferred or released from custody before testing was completed. In addition, the passive avoidance data for 2 African American participants, and the IMD data for 3 Caucasian and 1 African American participants, were not included in the statistical analyses because they met the criteria for outliers (i.e., value more than two standard deviations from the mean, and discontinuous with the sample distribution).

Procedure

BPD diagnoses were made using the revised Diagnostic Interview for Borderlines (DIB–R; Zanarini, Gunderson, Frankenburg, & Chauncey, 1989). Numerous studies support the reliability and validity of this measure in inpatient and outpatient samples (Hatzitaskos, Soldatos, Sakkas, & Stefanis, 1997; Links, Steiner, Offord, & Eppel, 1988; Nurnberg, Hurt, Feldman, & Suh, 1988; Pinto, Grapentine, Frances, & Picariello, 1996; Zanarini, Gunderson, & Frankenburg, 1990). There is also evidence to support the validity of the DIB–R when applied to incarcerated female offenders (Lorenz, Hochhausen, & Newman, 2002).

The DIB–R defines BPD using criteria similar to the current *DSM–IV–TR* criteria (American Psychiatric Association, 2000; Blais, Hilsenroth, & Castlebury, 1997; Moriya, Miyake, Minakawa, Ikuta, & Nishizono-Maher, 1993; Zanarini, Gunderson, Frankenburg, & Chauncey, 1989). This semistructured interview consists of 186 questions. Raters use information obtained from the interview to assign scores on 22 different summary statements relating to the core characteristics of BPD. The ratings on the 22 items are then converted to scaled section scores, which can add up to a range of 0–10. Following instructions included in DIB–R interview protocol, individuals earning scores of 8 or more were diagnosed with BPD, and those earning scores of less than 8 were classified as non-BPD controls. For the entire sample, this procedure yielded 48 individuals with BPD (28 Caucasian and 20 African American) and 156 individuals without BPD (81 Caucasian and 75 African American).

The passive avoidance task was administered on a PC computer and was identical to the one used by Newman and Schmitt (1998). Participants were instructed to use trial-and-error to learn when responding to experimental stimuli would result in monetary reward or loss. The experimental stimuli consisted of 10 two-digit numbers (03, 15, 42, 69, 74, 21, 38, 57, 84, 96). Stimuli were presented one at a time on the computer monitor. The series of 10 numbers was repeated nine times in pseudorandomized sequences. One half of the stimuli served as winning numbers and the other half as losing numbers. In a five-trial reward pretreatment, each of the winning numbers was presented on the screen, as in the test trials. The test trials followed the pretreatment with no noticeable break in the task. The pretreatment served to establish a dominant response set, or inclination to respond, by providing a high probability of winning numbers.

Participants began the experiment with 10 chips, worth 10 cents each. After pressing the button in response to a winning number, participants received a plastic chip from the experimenter and the computer monitor read, "You WIN 10 cents!" After a losing response, the experimenter removed one chip and the computer read, "You LOSE 10 cents." A high-pitched (400 Hz) tone accompanied winning feedback, and a low-pitched (100 Hz) tone accompanied losing feedback. No feedback occurred in the absence of a response. An experimenter, unaware of participant diagnosis, sat next to participants to dispense and remove chips. Monetary earnings were eventually deposited in each inmate's institutional account.

The IMD (Schalling, 1978) contains separate scales to measure three dimensions of dysregulated behavior: impulsiveness, monotony avoidance, and detachment. An example of an item from the Impulsiveness scale reads, "I often throw myself too hastily into things," with possible responses on a scale of 1 to 4 (1 = *very true*, 2 = *somewhat true*, 3 = *somewhat false*, 4 = *very false*). An example of an item from the Monotony Avoidance scale reads, "I prefer people who come up with exciting and unexpected activities." A sample item from the Detachment scale reads, "I avoid people who are interested in my personal life." Lower scores on the IMD indicate higher levels of impulsivity, monotony avoidance, or detachment.

Psychopathy was assessed using the Psychopathy Checklist—Revised (PCL–R; Hare, 1991). Raters score each of 20 PCL–R items with a 0, 1, or 2 to indicate increasing similarity between the item description and information gathered from a semistructured interview and review of prison files. Summed together, these ratings yield a PCL–R total score that ranges from 0 to 40. ASPD diagnoses were made using information from the semistructured interview and the criteria listed in the *DSM–IV–TR* (Amer-

ican Psychiatric Association, 2000). Anxiety was assessed using the Welsh Anxiety Scale (WAS; Welsh, 1956), a 39-item questionnaire in which participants indicate whether they have experienced various anxiety symptoms. Depression was assessed using the Beck Depression Inventory (BDI; Beck & Steer, 1993), a 21-item scale on which participants indicate the degree to which they have experienced depressive symptoms. Full Scale IQ scores were estimated using the Shipley Institute of Living Scale (Zachary, 1986).

Results

Passive avoidance errors refer to the number of times that a participant responded to a losing number (commission errors). Misses refer to the number of times that a participant failed to respond to a winning number (omission errors). We conducted a 2 (BPD, controls) × 2 (African American, Caucasian) × 2 (misses, passive avoidance errors) mixed-model analysis of variance (ANOVA), with group and race as the between-subjects factors and type of error as the within-subjects factor. This analysis yielded a significant main effect for error type, $F(1, 173) = 30.93$, $p < .001$, indicating that, across groups, participants committed more passive avoidance errors than misses. This main effect was qualified by a Group × Error Type interaction, $F(1, 173) = 5.11$, $p = .025$. Whereas participants with BPD missed fewer winning numbers ($M = 8.17$, $SE = 1.21$) than controls ($M = 11.20$, $SE = 0.67$), they committed more passive avoidance errors ($M = 17.72$, $SE = 1.29$) than controls ($M = 15.23$, $SE = 0.71$). Our planned comparison indicated that BPD individuals committed significantly more passive avoidance errors than controls, $t(175) = 1.76$, $p < .05$, one-tailed. In addition, an analogous comparison indicated that those with BPD missed significantly fewer winning numbers than controls, $t(175) = 2.17$, $p < .05$, two-tailed. No other main effects or interactions reached statistical significance.

A 2 (BPD, controls) × 2 (African American, Caucasian) multivariate analysis of variance (MANOVA), with group and race as the between-subjects factors and the IMD scales as the dependent measures, yielded a significant main effect for group using Hotelling's trace, $F(3, 160) = 2.72$, $p < .05$. Examination of the univariate analyses revealed a significant main effect for group on the Impulsiveness scale, $F(1, 162) = 7.38$, $p < .01$ (BPD: $M = 22.01$, $SE = 0.72$; controls: $M = 24.24$, $SE = 0.39$; see Table 1). Those with BPD and controls did not differ on the Monotony Avoidance or Detachment scales ($Fs < 1.0$). These results are consistent with our prediction that BPD individuals would report higher levels of impulsivity than control participants while showing comparable levels of monotony avoidance and detachment.

Supplemental Analyses

Supplemental analyses[1] indicated that BPD was correlated with PCL–R psychopathy ratings, $r(177) = .195$, $p < .01$; WAS scores, $r(175) = .357$, $p < .001$; BDI scores, $r(123) = .247$, $p < .01$; and *DSM–IV–TR* diagnoses for antisocial personality disorder, $r(166) = .247$, $p < .001$. In light of these significant associations

---

[1] Supplemental analyses were conducted in response to reviewer requests for additional information. In particular, reviewers raised concerns about the potentially confounding effects of psychopathy, antisocial personality disorder, anxiety, depression, and intelligence.

this investigation and that these differences are relatively independent of the antisocial characteristics of our sample.

In 1980, Gorenstein and Newman proposed that the poor passive avoidance of psychopathic and other disinhibited individuals might reflect common etiological processes, but subsequent research has suggested that such inhibitory deficits often reflect different psychobiological processes (see Avila & Parcet, 2001; Newman & Wallace, 1993; Patterson & Newman, 1993). Passive avoidance deficits on go/no-go discrimination tasks such as the one used in this study have been observed in psychopathic offenders (Newman & Kosson, 1986; Newman & Schmitt, 1998), impulsive and disinhibited university students (Avila, Molto, Segarra, & Torrubia 1995; McCarthy, Kroll, & Smith, 2001; Newman et al., 1985), children with attention-deficit/hyperactivity disorder (ADHD; Iaboni, Douglas, & Baker, 1995; Milich et al., 1994), adolescents with conduct disorder (Hartung, Milich, Lynam, & Martin, in press), and aggressive adolescents (LeMarquand et al., 1998). More recently, such deficits have also been found to characterize female, neurotic introverts (i.e., anxious groups) in both institutionalized (i.e., MacCoon et al., 2001) and noninstitutionalized (i.e., Segarra et al., 2000) settings.

Such research suggests that poor passive avoidance is a common feature of diverse groups displaying self-regulatory deficits. However, there is also evidence that diverse groups display different patterns of performance on passive avoidance tasks and manifest performance deficits under different experimental circumstances. For example, the BPD participants in this study committed fewer omission errors as well as more passive avoidance errors than controls. The combination of excessive commission (i.e., passive avoidance) errors and fewer errors of omission means that inmates with BPD responded more frequently than controls. In other words, inmates with BPD displayed an overall response bias involving a tendency to respond as opposed to inhibit behavior in the presence of uncertainty. This pattern of performance appears to be different from the one associated with psychopathic individuals who typically commit more passive avoidance errors but no more omission errors than controls. Although Scerbo et al. (1990) found that antisocial adolescents, like the BPD individuals in this study, committed fewer omissions than controls, the antisocial group did not commit more passive avoidance errors than controls.

There is also preliminary evidence that different groups display poor passive avoidance under divergent experimental conditions. For example, the poor passive avoidance of psychopathic offenders and adolescents with conduct disorder is relatively specific to conditions that involve competing reward and punishment contingencies as opposed to conditions involving reward-only or punishment-only incentives (Hartung et al., in press; Newman & Kosson, 1986; Newman et al., 1985). By contrast, children with ADHD have been found to commit excessive passive avoidance errors regardless of incentive condition (Iaboni et al., 1995). The specificity of the passive avoidance deficit exhibited by BPD individuals has yet to be investigated.

Given apparent differences in the expression of poor passive avoidance in diverse groups, one should not assume that the passive avoidance deficit displayed by BPD individuals in this study reflects the same psychobiological processes that underlie the poor passive avoidance of other groups (Newman & Lorenz, 2002). To the extent that poor passive avoidance reflects a variety of potential regulatory problems, additional research is needed to specify the processes responsible for the regulatory deficit in BPD.

Nevertheless, as demonstrated by previous research that has linked the inhibitory deficits of diverse disinhibited groups to distinct psychobiological processes, such research appears to be a useful means of understanding the specific dysfunction mediating the impulsive behavior of these diverse groups (Avila, 2001; Newman, 1997; Nigg, 2000).

Researchers have commonly assumed that deficient passive avoidance reflects a traitlike insensitivity to punishment stimuli (e.g., Fowles, 1980; Lykken, 1995). Paralleling this proposal, Scerbo et al. (1990) interpreted the significantly smaller number of omission errors displayed by their experimental participants as indicating reward dominance (see also Arnett, 1997; Quay, 1993). According to this perspective, the performance of individuals with BPD may reflect a motivational imbalance or a combination of high reward sensitivity and low threat sensitivity.

Wallace and Newman (1998) and MacCoon et al. (2001) recently proposed alternative explanations for the impulsive behavior of emotionally reactive individuals. According to these authors, the impulsive responding of such individuals reflects their difficulty in mobilizing sufficient attentional resources to inhibit dominant responses or resolve response conflict. The fact that participants in this study committed significantly more passive avoidance than omission errors overall provides evidence that responding for reward, as opposed to inhibiting responses to avoid potential punishment, was the dominant response set. To the extent that emotionally reactive participants experience a situation-specific problem in using attentional resources to monitor and correct potentially inappropriate responses, this problem would be expected to interfere with regulating their dominant response set and result in overresponding. Unfortunately, it is not possible to choose among these alternative explanations on the basis of the current results alone.

A potentially important implication of this investigation relates to the heterogeneity of the impulsivity construct. The diagnostic criteria for BPD emphasize impulsive behaviors of clinical significance rather than the psychological processes that may underlie these high-risk behaviors. It is possible that specifying the type of impulsivity associated with BPD and identifying psychological processes associated with their disinhibited behavior would facilitate progress in understanding and treating aspects of this costly syndrome. Brodsky, Malone, Ellis, Dulit, and Mann (1997) reported that impulsivity was the only criterion of the *Diagnostic and Statistical Manual of Mental Disorders* (3rd edition, revised; American Psychiatric Association, 1987) predictive of suicidal behavior in people with BPD. In times of hopelessness, not pausing to place one's behavior in a broader context may increase a person's risk for acting on suicidal urges. For example, positive aspects of suicide, such as ending the feeling of hopelessness or making others feel guilty, may overwhelm conflicting, inhibitory considerations. To the extent that the results of this study documenting BPD individuals' failure to heed negative consequences are replicable, they may serve to clarify the dysregulatory processes contributing to their clinically significant high-risk behavior. It is also possible that performance on laboratory tasks such as the one used in this study, alone or in conjunction with biological predictors of parasuicidal behaviors (e.g., Coccaro & Astill, 1990), could be used to predict such high-risk behaviors. In other words, a tendency to respond in the face of uncertainty might be associated with a tendency to attempt suicide in a situation in which perhaps others would not attempt it because of their uncertainty.

An important shortcoming of this study concerns the fact that our sample was specific to incarcerated women with BPD and controls. As already noted, female prison inmates with BPD may be more likely to express impulsivity in a laboratory context than other individuals with BPD. In addition, the use of this specific sample limits the generalizability of our findings. Thus, additional research with nonincarcerated women and men with BPD is needed to evaluate whether or not such individuals also perform more impulsively than controls on the passive avoidance task and IMD inventory.

In summary, across both Caucasians and African Americans, incarcerated women with BPD behaved impulsively on a passive avoidance task, thus identifying disinhibition as a feature of the impulsivity present in BPD. In addition, their significantly greater impulsiveness on the IMD inventory suggests that BPD individuals' impulsivity includes a failure to consider consequences before acting. Future studies investigating the specific components of impulsivity in BPD are needed to further differentiate the behavioral deficits underlying this disorder and explore the association between behavioral and biological correlates of the disorder. These studies may help therapists obtain an understanding of the impulsivity demonstrated in BPD and, in turn, assist them in the development of more effective treatment strategies.

References

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., rev.). Washington, DC: Author.

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

Arnett, P. A. (1997). Autonomic responsivity in psychopaths: A critical review and theoretical proposal. *Clinical Psychology Review, 17,* 903–936.

Avila, C. (2001). Distinguishing BIS-mediated and BAS-mediated disinhibition mechanisms: A comparison of disinhibition models of Gray (1981, 1987) and of Patterson and Newman (1993). *Journal of Personality and Social Psychology, 80,* 311–324.

Avila, C., Molto, J., Segarra, P., & Torrubia, R. (1995). Sensitivity to conditioned or unconditioned stimuli: What is the mechanism underlying passive avoidance deficits in extraverts? *Journal of Research in Personality, 29,* 373–394.

Avila, C., & Parcet, M. (2001). Personality and inhibitory deficits in the stop-signal task: The mediating role of Gray's anxiety and impulsivity. *Personality & Individual Differences, 31,* 975–986.

Beck, A. T., & Steer, R. A. (1993). *Beck Depression Inventory manual.* San Antonio, TX: Psychological Corporation.

Blais, M. A., Hilsenroth, M. J., & Castlebury, F. D. (1997). Content validity of the *DSM–IV* borderline and narcissistic personality disorder criteria sets. *Comprehensive Psychiatry, 38,* 31–37.

Brodsky, B. S., Malone, K. M., Ellis, S. P., Dulit, R. A., & Mann, J. J. (1997). Characteristics of borderline personality disorder associated with suicidal behavior. *American Journal of Psychiatry, 152,* 1715–1719.

Coccaro, E. F. (1998). Clinical outcome of psychopharmacologic treatment of borderline and schizotypal personality disordered subjects. *Journal of Clinical Psychiatry, 59*(Suppl. 1), 30–35.

Coccaro, E. F., & Astill, J. L. (1990). Central serotonergic function in parasuicide. *Progress in Neuro-Psychopharmacology & Biological Psychiatry, 14,* 663–674.

Coccaro, E. F., & Kavoussi, R. J. (1991). Biological and pharmacological aspects of borderline personality disorder. *Hospital & Community Psychiatry, 42,* 1029–1033.

Coccaro, E. F., Siever, L. J., Klar, H. M., Maurer, G., Cochrane, K., Cooper, T. B., et al. (1989). Serotonergic studies in patients with affective and personality disorders: Correlates with suicidal and impulsive aggressive behavior. *Archives of General Psychiatry, 46,* 587–599.

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

Dougherty, D. M., Bjork, J. M., Huckabee, H. C. G., Moeller, F. G., & Swann, A. C. (1999). Laboratory measures of aggression and impulsivity in women with borderline personality disorder. *Psychiatry Research, 85,* 315–326.

Finn, P. R., Justus, A., Mazas, C., & Steinmetz, J. E. (1999). Working memory, executive processes and the effects of alcohol on go/no-go learning: Testing a model of behavioral regulation and impulsivity. *Psychopharmacology, 146,* 465–472.

Fowles, D. C. (1980). The three arousal model: Implications of Gray's two-factor learning theory for heart rate, electrodermal activity, and psychopathy. *Psychophysiology, 17,* 87–104.

Gorenstein, E. E., & Newman, J. P. (1980). Disinhibitory psychopathology: A new perspective and a model for research. *Psychological Review, 87,* 301–315.

Gurvits, I. G., Koenigsberg, H. W., & Siever, L. J. (2000). Neurotransmitter dysfunction in patients with borderline personality disorder. *Psychiatric Clinics of North America, 23,* 27–40.

Hare, R. D. (1991). *The Hare Psychopathy Checklist—Revised.* Toronto, Ontario, Canada: Multi-Health Systems.

Hartung, C. M., Milich, R., Lynam, D. R., & Martin, C. A. (in press). Understanding the relations among gender, disinhibition, and disruptive behavior in adolescents. *Journal of Abnormal Psychology.*

Hatzitaskos, P. K., Soldatos, C. R., Sakkas, P. N., & Stefanis, C. N. (1997). Discriminating borderline from antisocial personality disorder in male patients based on psychopathology patterns and type of hostility. *Journal of Nervous and Mental Disease, 185,* 442–446.

Hurt, S. W., Clarkin, J. F., Munroe-Blum, H., & Marziali, E. (1992). Borderline behavioral clusters and different treatment approaches. In J. F. Clarkin, E. Marziali, & H. Munroe-Blum (Eds.), *Quantitative analysis of behavior* (Vol. 5, pp. 55–73). Hillsdale, NJ: Erlbaum.

Iaboni, F., Douglas, V. I., & Baker, A. G. (1995). Effects of reward and response costs on inhibition in ADHD children. *Journal of Abnormal Psychology, 104,* 232–240.

LeMarquand, D. G., Pihl, R. O., Young, S. N., Tremblay, R. E., Seguin, J. R., Palmour, R. M., & Benkelfat, C. (1998). Tryptophan depletion, executive functions, and disinhibition in aggressive, adolescent males. *Neuropsychopharmacology, 19,* 333–341.

Levine, D., Marziali, E., & Hood, J. (1997). Emotion processing in borderline personality disorders. *Journal of Nervous and Mental Disease, 185,* 240–246.

Links, P. S., Steiner, M., Offord, D. R., & Eppel, A. (1988). Characteristics of borderline personality disorder: A Canadian study. *Canadian Journal of Psychiatry, 33,* 336–340.

Lorenz, A. R., Hochhausen, N. M., & Newman, J. P. (2002). *The validity of borderline personality diagnoses in incarcerated females.* Unpublished manuscript.

Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology, 55,* 6–10.

Lykken, D. T. (1995). *The antisocial personalities.* Hillsdale, NJ: Erlbaum.

MacCoon, D. G., Lorenz, A. R., & Newman, J. P. (2001). *Dysregulation in female prisoners: Anxiety, impulsivity, and psychopathy.* Manuscript submitted for publication.

Manos, N., Vasilopoulou, E., & Sotiriou, M. (1987). *DSM–III* diagnosed borderline personality disorder and depression. *Journal of Personality Disorders, 1,* 263–268.

McCarthy, D. M., Kroll, L. S., & Smith, G. T. (2001). Integrating disinhibition and learning risk for alcohol use. *Experimental & Clinical Psychopharmacology, 9,* 389–398.

Milich, R., Hartung, C. M., Martin, C. A., & Haigler, E. D. (1994). Behavioral disinhibition and underlying processes in adolescents with

disruptive behavior disorders. In D. K. Routh (Ed.), *Disruptive behavior disorders in childhood* (pp. 109–138). New York: Plenum.

Moriya, N., Miyake, Y., Minakawa, K., Ikuta, N., & Nishizono-Maher, A. (1993). Diagnosis and clinical features of borderline personality disorder in the East and West: A preliminary report. *Comprehensive Psychiatry, 34,* 418–423.

Newman, J. P. (1997). Conceptual models of the nervous system: Implications for antisocial behavior. In D. M. Stoff, J. Breiling, & J. D. Maser (Eds.), *Handbook of antisocial behavior* (pp. 324–335). New York: Wiley.

Newman, J. P., & Kosson, D. S. (1986). Passive avoidance learning in psychopathic and nonpsychopathic offenders. *Journal of Abnormal Psychology, 95,* 257–263.

Newman, J. P., & Lorenz, A. R. (2002). Response modulation and emotion processing: Implications for psychopathy and other dysregulatory psychopathology. In R. J. Davidson, K. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 1043–1067). New York: Oxford University Press.

Newman, J. P., & Schmitt, W. A. (1998). Passive avoidance in psychopathic offenders: A replication and extension. *Journal of Abnormal Psychology, 107,* 527–532.

Newman, J. P., & Wallace, J. F. (1993). Diverse pathways to deficient self-regulation: Implications for disinhibitory psychopathology in children. *Clinical Psychology Review, 13,* 690–720.

Newman, J. P., Widom, C. S., & Nathan, S. (1985). Passive avoidance in syndromes of disinhibition: Psychopathy and extraversion. *Journal of Personality and Social Psychology, 48,* 1316–1327.

Nigg, J. T. (2000). On inhibition/disinhibition in developmental psychopathology: Views from cognitive and personality psychology and a working inhibition taxonomy. *Psychological Bulletin, 126,* 220–246.

Nurnberg, H. G., Hurt, S. W., Feldman, A., & Suh, R. (1988). Evaluation of diagnostic criteria for borderline personality disorder. *American Journal of Psychiatry, 145,* 1280–1284.

Nurnberg, H. G., Raskin, M., Levine, P. E., Siegel, O., & Prince, R. (1991). The comorbidity of borderline personality disorder with other *DSM–III–R* Axis II personality disorders. *American Journal of Psychiatry, 148,* 1311–1317.

Paris, J. (1997). Antisocial and borderline personality disorders: Two separate diagnoses or two aspects of the same psychopathology? *Comprehensive Psychiatry, 38,* 237–242.

Patterson, C. M., Kosson, D. S., & Newman, J. P. (1987). Reaction to punishment, reflectivity, and passive avoidance learning in extraverts. *Journal of Personality and Social Psychology, 52,* 565–576.

Patterson, C. M., & Newman, J. T. (1993). Reflectivity and learning from aversive events: Toward a psychological mechanism for the syndromes of disinhibition. *Psychological Review, 100,* 716–736.

Patton, J. M., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt Impulsiveness Scale. *Journal of Clinical Psychology, 51,* 768–774.

Pinto, A., Grapentine, W. L., Frances, G., & Picariello, C. M. (1996). Borderline personality disorder in adolescents: Affective and cognitive features. *Journal of the American Academy of Child and Adolescent Psychiatry, 34,* 1338–1343.

Quay, H. C. (1993). The psychobiology of undersocialized aggressive conduct disorder: A theoretical perspective. *Development & Psychopathology, 5,* 165–180.

Scerbo, A., Raine, A., O'Brien, M., Chan, C., Rhee, C., & Smiley, N. (1990). Reward dominance and passive avoidance learning in adolescent psychopaths. *Journal of Abnormal Child Psychology, 18,* 451–463.

Schalling, D. (1978). Psychopathy-related personality variables and the psychophysiology of socialization. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behaviour: Approaches to research* (pp. 85–105). New York: Wiley.

Segarra, P., Molto, J., & Torrubia, R. (2000). Passive avoidance learning in extraverted females. *Personality & Individual Differences, 29,* 239–254.

Snyder, S., & Pitts, W. M. (1988). Characterizing anxiety in the *DSM–III* borderline personality disorder. *Journal of Personality Disorders, 2,* 93–101.

Soubrie, P. (1986). Reconciling the role of central serotonin neurons in human and animal behavior. *Behavioral & Brain Sciences, 9,* 319–335.

Stein, K. F. (1996). Affect instability in adults with a borderline personality disorder. *Archives of Psychiatric Nursing, 10,* 32–40.

Thornquist, M. H., & Zuckerman, M. (1995). Psychopathy, passive-avoidance learning and basic dimensions of personality. *Personality and Individual Differences, 19,* 525–534.

Trull, T. J. (2001). Structural relations between borderline personality disorder features and putative etiological correlates. *Journal of Abnormal Psychology, 110,* 471–481.

van Reekum, R., Links, P. S., & Fedorov, C. (1994). Impulsivity in borderline personality disorder. In K. R. Silk (Ed.), *Biological and neurobehavioral studies of borderline personality disorder* (pp. 1–22). Washington, DC: American Psychiatric Press.

van Reekum, R., Links, P. S., Mitton, M. J., Fedorov, C., & Patrick, J. (1996). Impulsivity, defensive functioning, and borderline personality disorder. *Canadian Journal of Psychiatry, 41,* 81–84.

Wallace, J. F., & Newman, J. P. (1998). Neuroticism and the facilitation of the automatic orienting of attention. *Personality & Individual Differences, 24,* 253–266.

Welsh, G. S. (1956). Factor dimensions A and R. In G. S. Welsh & W. G. Dahlstrom (Eds.), *Basic readings on the MMPI in psychology and medicine* (pp. 264–281). Minneapolis: University of Minnesota Press.

Zachary, R. A. (1986). *Shipley Institute of Living Scale: Revised manual.* Los Angeles: Western Psychological Services.

Zanarini, M. C., Gunderson, J. G., & Frankenburg, F. R. (1989). Axis I phenomenology of borderline personality disorder. *Comprehensive Psychiatry, 30,* 149–156.

Zanarini, M. C., Gunderson, J. G., & Frankenburg, F. R. (1990). Cognitive features of borderline personality disorder. *American Journal of Psychiatry, 147,* 57–63.

Zanarini, M. C., Gunderson, J. G., Frankenburg, F. R., & Chauncey, D. L. (1989). The revised Diagnostic Interview for Borderlines: Discriminating BPD from other Axis II disorders. *Journal of Personality Disorders, 3,* 10–18.