

THE ROLE OF IMPULSIVITY IN ANTISOCIAL AND VIOLENT BEHAVIOR AND PERSONALITY DISORDERS AMONG INCARCERATED WOMEN

IRINA KOMAROVSKAYA
ANN BOOKER LOPER
JANET WARREN
University of Virginia

This study investigated the relationships among impulsivity, antisocial and violent behavior, and personality disorders in 590 female inmates of a maximum-security female prison. Measures included the Barratt Impulsivity Scale, Prison Violence Inventory, Structured Clinical Interview for *DSM-IV* Personality Disorders Screening Questionnaire, numbers of institutional infractions recorded in inmate files, and violent versus nonviolent offending. Results showed that impulsivity was associated with personality psychopathology and aggressive and antisocial behavior. In contrast to findings of studies with male inmates, female violent offenders did not demonstrate higher levels of impulsivity than nonviolent offenders.

Keywords: female inmates; impulsivity; antisocial behavior; violence; aggression; personality disorders

Impulsivity is related to various forms of psychopathology and maladaptive behavior. Previous research has shown higher levels of impulsivity among patients with conduct disorder, personality disorders, and substance-abuse disorders (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Among incarcerated men, there is a well-documented relationship between impulsivity and antisocial behavior (Barratt, Stanford, Kent, & Felthous, 1997; Moeller et al., 2001; Wang & Diamond, 1999) as well as institutional aggression and adjustment problems (Fornells, Capdevila, & Andres-Pueyo, 2002; Wang & Diamond, 1999). Despite the considerable increase in the number of female inmates in the past several years, few studies have focused on the relationship between impulsivity and antisocial behavior among incarcerated women.

DEFINITION OF IMPULSIVITY

In the *Oxford English Dictionary* (n.d.), *impulsivity* is defined as “the character of being impulsive or acting on impulse, without reflection or forethought.” In psychological science, early definitions of impulsivity have varied (Plutchik & van Praag, 1994). For example, Murray (1938) described impulsivity as the tendency to respond quickly and without reflection. Douglas (1972) understood impulsivity as the inability to sustain attention. Eysenck and Eysenck (1977) related impulsivity to risk-taking behavior and lack of planning.

AUTHORS' NOTE: *This research was funded in part by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice, to the University of Virginia (Grant No. 98-CE-VX-0027). Points of view expressed in this article are those of the authors and do not necessarily represent the official position or policy of the U.S. Department of Justice. Correspondence may be addressed to Irina Komarovskaya, University of Virginia, Curry School of Education, P.O. Box 400270, Charlottesville, VA 22904-4270; e-mail: iak3y@virginia.edu.*

CRIMINAL JUSTICE AND BEHAVIOR, Vol. 34 No. 11, November 2007 1499-1515

DOI: 10.1177/0093854807306354

© 2007 American Association for Correctional and Forensic Psychology

More recently, Whiteside, Lynam, and colleagues (Lynam & Miller, 2004; Miller, Flory, Lynam, & Leukefeld, 2003; Miller & Lynam, 2001; Whiteside & Lynam, 2001) offered a new understanding of the concept of impulsivity based on the five-factor model (FFM) of personality. Whiteside and Lynam (2001) identified four personality facets conceived of as pathways to impulsive behavior. The first facet, urgency, refers to the tendency to experience strong impulses, frequently under conditions of negative affect. The second facet, lack of premeditation, refers to the tendency to think and reflect on the consequences of an act before engaging in that act. The third facet, lack of perseverance, is understood as an individual's ability to remain focused on a task that may be boring or difficult. Finally, the fourth facet, sensation seeking, is conceptualized as a tendency to enjoy and pursue activities that are exciting and to have an openness to try new experiences that may or may not be dangerous. Given these multiple forms of impulsive behavior, Whiteside and Lynam argued, "Impulsivity is an artificial umbrella term that actually encompasses four distinct facets of personality associated with impulsive behavior" (p. 687). They further suggested that various forms of impulsive behavior are associated with distinct forms of psychopathology. For example, the lack of ability to stay on task despite boredom might be related to the inattention problems that are at the core of attention deficit hyperactivity disorder (ADHD); sensation seeking might be related to involvement in exciting but dangerous activities, such as substance abuse; and a lack of premeditation might lead to psychiatric problems, such as antisocial personality disorder and psychopathy.

Barratt (1959, 1965) developed a personality-based model of impulsivity to distinguish between impulsivity-related traits and anxiety-related traits. Barratt and Patton (1983) drew from research in medical, psychological, and behavioral models and defined impulsivity as a predisposition toward rapid, unplanned reactions to internal or external stimuli without regard to the negative consequences of these reactions to the impulsive individual or to others. Barratt (1965) viewed impulsivity as a personality construct that is orthogonal to the personality dimension of anxiety and that can be separated into three components: acting on the spur of the moment (motor impulsivity), not focusing on the task at hand (attentional impulsivity), and not planning and thinking carefully (nonplanning impulsivity; Patton, Stanford, & Barratt, 1995). Thus, the trait has theoretical linkage to personality structure as well as aggressive or violent behavior.

IMPULSIVITY AND PERSONALITY DISORDERS

The construct of impulsivity is included in multiple diagnostic criteria of psychiatric disorders in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) (*DSM-IV*; American Psychiatric Association, 1994) and is understood as the failure to resist an impulse, drive, or temptation to perform an act that is harmful to the person or to others (Swann & Hollander, 2002). In particular, impulsivity is an important characteristic of Cluster B personality disorders, comprised of antisocial, borderline, histrionic, and narcissistic personality disorders (Casillas & Clark, 2002; Coles, 1997).

Antisocial personality disorder (Code 301.7, *DSM-IV-Text Revision*; American Psychiatric Association, 2000) is defined as "a consistent disregard for, and violation of, the rights of others that begins in childhood or early adolescence and continues into adulthood" (p. 701). One of the possible criteria of this disorder is "impulsivity or failure to plan ahead" (p. 706). Impulsivity is likewise a core symptom of borderline personality disorder, or "a pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked

impulsivity that begins by early adulthood and is present in a variety of contexts” (American Psychiatric Association, 2000, p. 706). Individuals with borderline personality disorder may demonstrate impulsivity by gambling, spending money irresponsibly, abusing substances, engaging in unsafe sex, driving recklessly, and demonstrating recurrent suicidal gestures. Borderline personality disorder is associated with significant morbidity and mortality as a consequence of impulsivity (Swann & Hollander, 2002).

PERSONALITY DISORDERS AND IMPULSIVITY AMONG INCARCERATED WOMEN

Although research on the relationship between impulsivity and personality disorders among incarcerated women is limited, available evidence suggests a plausible connection. For example, in investigating the characteristics of personality disorders among incarcerated women using the Schedule for Nonadaptive and Adaptive Personality (SNAP), Hurt and Oltmanns (2002) found that antisocial personality disorder and borderline personality disorder were positively correlated with aggression and impulsivity. Along similar lines, Hochhausen, Lorenz, and Newman (2002) examined impulsivity in incarcerated women with borderline personality disorder using the Impulsiveness–Monotony Avoidance–Detachment Inventory (IMD) and a passive–avoidance task that measures the ability to inhibit punished responses. Results showed that incarcerated women with borderline personality disorder scored higher on the IMD and behavioral task, demonstrating higher degrees of impulsivity.

IMPULSIVITY AND AGGRESSION

The link between impulsivity and aggression has been well documented. Barratt (1991, 1994) distinguished aggression that is impulsive from aggression that is planned and unemotional. Impulsive aggression is a reactive and emotionally charged aggressive response characterized by loss of behavioral control (Barratt, 1991). Barratt et al. (1997) have contended that although insufficient by itself, impulsivity—along with anger, poor verbal information processing, social-problem skills, and parietal lobe dysfunctions—plays an important role in impulsive aggression. Similarly, Stanford et al. (2003) proposed a dimensional approach to classifying aggressive behavior. They proposed that aggressive behavior is characterized as either predominantly impulsive or predominantly premeditated. In their study, a majority of aggressive individuals fell into a “mixed” group, demonstrating both impulsive and premeditated aggressive traits.

Comparisons between aggressive and nonaggressive inmates reveal an important connection between impulsivity and aggression. Barratt and colleagues (1997) demonstrated that aggressive inmates evidenced higher levels of anger and impulsivity; poorer performance on most neuropsychological tests, including verbal tests; and less neural involvement in frontal cortical areas compared to noninmate control subjects. Impulsivity and verbal skills were inversely correlated.

Barratt et al. (1997) examined personality, neuropsychological, and cognitive characteristics of impulsive aggression among male inmates who committed impulsive versus nonimpulsive aggression and who met the criteria for antisocial personality disorder. These researchers found that impulsivity was inversely correlated with verbal skills and P300 latencies, a measure of brain functioning related to information processing, whereas verbal skills were positively correlated with P300 latencies. They concluded that aggression is not a homogeneous construct even among antisocial individuals and that impulsive aggression has distinct neurological and cognitive characteristics.

IMPULSIVITY, CRIME, AND VIOLENCE

Impulsivity is frequently referenced in the etiologic theories of crime (Hirschi & Gottfredson, 1994; Moffitt, 1993). Impulsivity and low self-control have been shown to be consistent predictors of delinquency, especially serious delinquency (Moffitt, Caspi, Harrington, & Milne, 2002; White et al., 1994). Moffitt (1993) argued that an impulsive personality style serves to maintain antisocial behavior across the life span through a variety of person–environment interactions. Hirschi and Gottfredson (1994) suggested that low self-control is the property of individuals that explains variation in the likelihood of engaging in antisocial acts.

Impulsivity is a key component of psychopathy, a form of personality disorder with a specific pattern of interpersonal, affective, and behavioral symptoms characterized by a grandiose, arrogant, callous, superficial, and manipulative interpersonal style (Hare, 1996, 2006). Behaviorally, psychopaths are irresponsible, impulsive, and prone to delinquency and criminality. Hart and Dempster (1997) emphasized impulsivity as a cardinal feature of the construct of psychopathy.

Cornell and his colleagues (1996) investigated the relationship between psychopathy and violence in a group of adult male offenders. They found that instrumentally violent offenders had significantly higher scores on the Psychopathy Checklist–Revised (PCL-R; Hart & Hare, 1996) than did reactively violent and nonviolent offenders, with the biggest group differences on items relating to poor behavioral control and impulsivity. Along similar lines, Hart and Dempster (1997) asserted that psychopaths could be characterized as impulsively instrumental.

THE ROLE OF IMPULSIVITY, AGGRESSION, AND VIOLENCE IN ADJUSTMENT IN PRISON

Along with anger, hostility, and antisocial personality style, impulsivity has been shown to be a strong predictor of institutional aggression, violence, and adjustment problems among incarcerated male offenders (Fornells et al., 2002; Wang & Diamond, 1999). Wang and Diamond (1999) used structural modeling to predict institutional aggression among 385 male mentally ill offenders using the predictors of anger, antisocial personality style, current violent offense, ethnicity, and impulsivity. Impulsivity was measured using the Barratt Impulsivity Scale (BIS; Patton et al., 1995). Results indicated that anger, antisocial personality style, and impulsivity were stronger predictors of institutional aggression than were ethnicity and current violent offense. Likewise, Fornells et al. (2002) found that impulsivity, along with an inmate's level of aggression, hostility, and venturesomeness, predicted difficulty in institutional adjustment.

To summarize, the results of the previous studies indicate that impulsivity plays an important role in inmate behavior, is related to aggressive and impulsive actions exhibited by an inmate in prison, and can serve as a predictor of violent and aggressive behavior and poor institutional adjustment.

GENDER DIFFERENCES IN IMPULSIVITY, ANTISOCIAL, AND AGGRESSIVE BEHAVIOR AMONG INMATES

Although a substantial body of research has addressed the relationship between impulsivity, antisocial behavior, and aggression among incarcerated males, markedly fewer studies have focused on this relationship in incarcerated females. Women are less likely than men to

engage in serious and violent antisocial behavior (Moffitt, Caspi, Rutter, & Silva, 2001); however, some authors (Sommers & Baskin, 1993; Warren et al., 2005) have suggested that when women engage in violent behavior, their violence is more reactive and impulsive in nature compared to violence among men. Other researchers provided support for the similarity in the relationship between impulsivity and violent and aggressive behavior among men and women. For example, in a longitudinal study of a large sample of male and female adolescents, Vazsonyi, Cleveland, and Wiebe (2006) found significant relationships among impulsivity and delinquent and aggressive behavior in both genders. Cherek and Lane (1998) found that violent female parolees demonstrated higher levels of impulsivity on a delay-of-reward measure than the nonviolent female parolees and that their impulsive responses were at a rate that would be considered high compared to college students participating in similar studies. Similarly, violent female parolees scored higher on the BIS than the nonviolent female parolees.

Available evidence suggests that males are more likely than females to commit violent crimes. For example, men were almost 10 times more likely than women to commit murder in 2004 (Bureau of Justice Statistics, 2006). Given the link between impulsivity, crime, and violence, it is possible that the difference in the levels of impulsivity in men and women can help explain some of the differences in the level of violent offending between the two genders.

In the present study, a positive relationship between impulsivity, violence, and both self-reported and behaviorally observed antisocial behavior in incarcerated women was predicted. We also expected to find a positive relationship between impulsivity and those personality disorders in which impulsivity is an important component (i.e., antisocial personality disorder and borderline personality disorder), and no relationship between impulsivity and those personality disorders in which impulsivity is a less relevant construct (i.e., dependent personality disorder and avoidance personality disorder).

METHOD

PARTICIPANTS

Participants were 590 women incarcerated at a maximum-security prison in central Virginia who were participating in a larger prisonwide longitudinal study on adjustment in prison. Potential participants ($N = 1,006$) were informed about the study, and those women who indicated their interest in participation ($n = 802$) were contacted during a 6-month data collection period and were invited to fill out the research protocol in groups of 15 to 20 inmates. Among those, participants with complete data on the impulsivity measure were used for this study ($n = 590$). Participants' institutional files were reviewed to collect information about institutional infractions and criminal offenses.

MEASURES

The Structured Clinical Interview for DSM-IV Personality Disorders Screening Questionnaire (SCID-II Screen). The SCID-II Screen was used to assess the presence of personality psychopathology. The information regarding 10 personality disorders listed in the *DSM-IV* (American Psychiatric Association, 1994) was collected by means of 124

questions. The disorders included paranoid, schizoid, schizotypal, antisocial, borderline, histrionic, narcissistic, avoidant, dependent, and obsessive-compulsive. The SCID-II Screen is a brief self-report version of a more comprehensive personality disorder measure (First, Gibbon, Spitzer, Williams, & Benjamin, 1995a, 1995b). The SCID-II Screen includes questions for each of the 10 personality disorders stated in lay terms. Ekselius, Lindstrom, von Knorring, Bodlund, and Kullgren (1994) have found that the overall kappa for agreement between the SCID-II Screen and SCID interviews was 0.78.

The Prison Violence Inventory (PVI). The PVI (Warren et al., 2002) was used to measure self-reported violent behavior. The inventory included 12 questions about violent acts, which included making threats; throwing objects at another inmate; pushing, grabbing, or shoving; slapping; kicking, biting, or choking; hitting with a fist or beating someone up; forcing someone to have sex; threatening with a weapon; spreading rumors, telling lies about another inmate; stealing some object; and any action that the inmate considered to be violent. Women were asked whether they had inflicted each violent act since arriving at the correctional institution. Each woman received a total score for perpetrated violence. Warren and colleagues (2002) demonstrated that the relationship between self-reported violence and violent institutional infractions was robust, providing confirmation of the self-report data.

The BIS. The BIS is a measure of impulsivity with demonstrated good reliability and validity (Patton et al., 1995). Originally developed by Barratt (1959) as a 44-item self-report measure, it was based on a unidimensional model of impulsivity. After several revisions, however, Barratt proposed a three-dimensional model of impulsivity. The latest version (Patton et al., 1995) includes 34 items that comprise three subscales: Cognitive Impulsivity, Motor Impulsivity, and Nonplanning Impulsivity as well as a Total Impulsivity score. All items are answered on a 4-point scale (1 = *rarely or never*; 2 = *occasionally*, 3 = *often*, 4 = *almost always or always*). A high total score for all items indicates a high level of impulsivity.

Measures of institutional misconduct. Participants' institutional records were reviewed to obtain information about misconduct during incarceration. Evidence for institutional misconduct was documented in inmates' files by tickets, which were issued by prison staff to inmates for major and minor infractions. The records provided information regarding the number of tickets received and the nature of infractions. Institutional infractions were grouped into three categories: violent infractions, nonviolent societal rule violations, and institutional-only misconduct. Violent infractions included serious violations that could be considered a criminal offense. Nonviolent societal rule violation infractions included serious nonviolent violations that could also be considered a criminal offense, such as stealing. Institutional-only misconduct included rule-breaking behavior that would not be considered criminal outside of prison, such as smoking in an unauthorized area.

RESULTS

DISTRIBUTION OF MAJOR VARIABLES

Impulsivity. The mean of the Total Impulsivity score was 69.31 (range: 33-105), with a standard deviation of 12.23. In comparison to normative information (Patton et al., 1995),

TABLE 1: Descriptive Information of Major Variables

Variable	N	M	SD
Age (in years)	548	33.21	8.74
Impulsivity scores			
Total Impulsivity score	590	69.31	12.23
Motor Impulsivity	590	2.23	0.50
Attentional Impulsivity	590	2.22	0.54
Nonplanning Impulsivity	590	2.45	0.51
Self-reported aggression	589	1.00	1.84
Personality disorders (PD): No. of criteria met			
Borderline PD	590	5.21	2.66
Antisocial PD	586	3.38	3.59
Avoidant PD	586	2.94	1.97
Dependent PD	587	2.17	1.87
Infractions (avg. per month)			
Violent infractions	575	0.008	0.02
Nonviolent rule infractions	575	0.02	0.05
Institutional-only infractions	575	0.10	0.17

the mean Total Impulsivity score in our study was significantly higher than the mean Total Impulsivity score among female undergraduate students ($t = 7.10$, $df = 867$, $p < .001$), significantly lower than the scores among male inmates ($t = 4.62$, $df = 661$, $p < .001$), and not significantly different from the scores among female psychiatric patients ($t = 1.82$, $df = 633$, $p > .05$). Thirty-six percent of women in the current sample were classified as having serious problems with impulsivity, using a cutoff score of 74 to designate highly impulsive individuals on the total BIS scale (M. S. Stanford, personal communication, November 26, 2006). The mean of the Nonplanning Impulsivity subscale was 2.45 ($SD = 0.51$, range: 1-4); the mean of the Motor Impulsivity subscale was 2.23 ($SD = 0.50$, range: 1.00-3.82); and the mean of the Attentional Impulsivity subscale was 2.22 ($SD = 0.54$, range = 1.00-3.75). Further descriptive statistics for the Impulsivity scale, as well as for other major variables, are presented in Table 1.

Personality disorders. Based on the subjects' responses on the SCID-II Screen, 61.5% ($n = 363$) of women met criteria for borderline personality disorder, 47.6% ($n = 281$) for antisocial personality disorder, 36.1% ($n = 213$) for avoidant personality disorder, and 13.6% ($n = 80$) for dependent personality disorder. Personality disorders were significantly intercorrelated with each other.

Self-reported violence. Results obtained on the PVI showed that 32.7% ($n = 192$) of participants self-reported at least one incident of violent behavior.

Violent crime. Thirty-four percent of women ($n = 190$) in this sample were incarcerated for a violent crime. There was no statistically significant difference in impulsivity between violent and nonviolent offenders ($F = .04$, $p = .85$).

Infractions. According to the institutional records, 11.5% ($n = 68$) of participants committed at least one violent infraction, 20.3% ($n = 120$) committed at least one nonviolent societal rule violation infraction, and 53.6% ($n = 316$) committed at least one institutional-only infraction.

REGRESSION ANALYSES

We conducted a series of separate hierarchical logistic and multiple regression analyses to examine the relationships between impulsivity and personality disorders, self-reported violence, and institutional infractions. Initial analyses revealed a significant correlation between age and impulsivity ($r = -.17, p < .001$), with older women scoring lower on the BIS. Preliminary analyses also showed that minority status was significantly related to the dependent variables, although it was not significantly correlated with impulsivity ($r = -.08, p > .05$). Consequently age and minority were entered as an initial block in all regression analyses, which allowed evaluation of effects beyond age and minority status.

Impulsivity and self-reported violence. Preliminary analysis showed that because of the positively skewed distribution of the PVI scores, the multiple regression model predicting the PVI scores from impulsivity scores, age, and minority status resulted in nonnormally distributed residuals. Consequently, a logistic regression model was used to predict the presence of self-reported violence from impulsivity scores, age, and minority status of the participants. First, age and minority status were entered as predictors. The results showed a significant relationship between the independent variables and self-reported violence ($\chi^2 = 49.86$, Nagelkerke pseudo $R^2 = .12, df = 2, p < .001$). The individual effect of minority status was not statistically significant (see Table 2). Next, we added Total Impulsivity score into the regression equation and obtained significant results ($\chi^2 = 88.04$, Nagelkerke pseudo $R^2 = .21, df = 3, p < .001$), with a significant improvement in model fit ($\Delta\chi^2 = 38.18, \Delta df = 1, p < .01$). To explore the relationship between each type of impulsivity (i.e., motor, attentional, and nonplanning) and self-reported violence, the scores obtained on the three impulsivity subscales were entered into a logistic regression as predictors, along with age and minority status. The results indicated that nonplanning impulsivity (log odds = 1.61, Wald = 4.33, $p < .05$) and attentional impulsivity (log odds = 2.09, Wald = 9.81, $p < .01$) were significantly related to self-reported violence, whereas motor impulsivity was not (log odds = 1.36, Wald = 1.70, $p = .19$).

Impulsivity and personality disorders. For each personality disorder under investigation, an initial logistic regression analysis was conducted to evaluate whether the combination of age and impulsivity could successfully predict a positive diagnosis of the disorder. Multiple regression analysis was then used to determine the relationship between the combination of age and impulsivity with the continuous personality disorder scores. Results indicated a pattern of significant relationships between impulsivity and age with each of the personality disorder measures. Results are summarized in Table 2.

The initial combination of age and minority status was positively associated with the diagnosis of borderline personality disorder ($\chi^2 = 19.82$, Nagelkerke pseudo $R^2 = .05, df = 2, p < .001$). A subsequent addition of impulsivity to the logistic regression model resulted in a significant improvement of the model ($\Delta\chi^2 = 112.64, \Delta df = 1, p < .01$). Individual effects of minority status, however, were not statistically significant in either of the two models, whereas the effects of impulsivity and age were significant (see Table 3). To further investigate the relationship between borderline personality disorder and impulsivity, multiple regression analysis was used to predict the number of met criteria for borderline disorder from impulsivity scores, age, and minority status. Results showed that the three independent variables accounted for 30% of the variance in the met criteria for borderline personality disorder (adjusted $R^2 = .30, F = 77.72, p < .001$). Impulsivity had a significant relationship to borderline

TABLE 2: Hierarchical Logistic Regression Analyses With Age, Minority Status, and Impulsivity as Predictors

<i>Dependent/Independent Variable</i>	<i>Log Odds</i>	<i>Wald</i>
Self-reported violence		
Age	0.93	32.25***
Minority status	1.63	5.56*
Impulsivity	1.05	34.60***
Borderline personality disorder (PD)		
Age	0.97**	6.30**
Minority status	0.75	1.93
Impulsivity	1.10	84.47***
Antisocial PD		
Age	0.94	24.71***
Minority status	0.97	0.02
Impulsivity	1.06	43.56***
Avoidant PD		
Age	0.99	0.25
Minority status	0.69	3.76*
Impulsivity	1.05	35.78***
Dependent PD		
Age	0.98	1.73
Minority status	0.67	2.33
Impulsivity	1.06	29.11***
Violent infractions		
Age	0.97	3.36
Minority status	2.90	11.44***
Impulsivity	1.03	6.66**
Nonviolent rule violations		
Age	0.96	8.15**
Minority status	1.74	5.92*
Impulsivity	1.02	3.35
Institutional-only infractions		
Age	0.95	21.27***
Minority status	1.26	1.57
Impulsivity	1.03	12.69***

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

personality disorder, beyond that afforded by age and minority status, $\Delta F(1, 541) = 195.40$, $\Delta R^2 = .25$, $p < .001$.

The logistic regression model for prediction of antisocial personality disorder revealed results similar to that for borderline personality disorder. Initially, the combination of age and minority status was statistically significant ($\chi^2 = 39.18$, Nagelkerke pseudo $R^2 = .09$, $df = 2$, $p < .001$), but the addition of impulsivity to the regression equation improved model prediction ($\Delta\chi^2 = 49.39$, $\Delta df = 1$, $p < .01$). Likewise, impulsivity was significantly related to the number of met diagnostic antisocial personality criteria beyond that afforded by age and minority status, $\Delta F(1, 538) = 82.15$, $\Delta R^2 = .12$, $p < .001$.

The logistic regression model predicting positive diagnosis of dependent personality disorder from age and minority status produced small but significant results ($\chi^2 = 9.36$, Nagelkerke pseudo $R^2 = .03$, $df = 2$, $p < .01$). The overall fit of the model was improved when impulsivity was added to the logistic regression equation, $\Delta\chi^2 = 32.52$ ($\Delta df = 1$, $p < .01$). When impulsivity was added to the model, the individual effects of age and minority status ceased to be statistically significant (see Table 3). Multiple regression analysis revealed that the Total Impulsivity score, age, and minority status predicted approximately

TABLE 3: Multiple Regression Analysis Predicting Personality Disorders From Impulsivity, Age, and Minority Status

Independent Variable	Step 1: Covariates			Step 2: Impulsivity Scores Beta Values (β)				
	Covariate	Adj. R^2	β	Adj. R^2	Total Impulsivity	Motor Impulsivity	Attentional Impulsivity	Nonplanning Impulsivity
Borderline	Age	.05	-.20***	.30	.51***	.17***	.29***	.20***
	Minority		-.11**					
Antisocial	Age	.09	-.13**	.21	.35***	.16***	.16***	.13**
	Minority		-.001					
Dependent	Age	.06	-.14***	.20	.39***	.11*	.25***	.13**
	Minority		-.20***					
Avoidant	Age	.03	-.12**	.14	.34***	-.03	.31***	.14**
	Minority		-.14***					

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

20% of the variance (adj. $R^2 = .20$, $F = 46.38$, $p < .001$) in the dependent personality disorder scores. Impulsivity had a significant relationship to dependent personality disorder, beyond that afforded by age and minority status, $\Delta F(1, 538) = 99.02$, $\Delta R^2 = .15$, $p < .001$.

Using the logistic regression model, the presence of avoidant personality disorder was first regressed on age and minority status ($\chi^2 = 8.15$, Nagelkerke pseudo $R^2 = .02$, $df = 2$, $p < .02$). Subsequent addition of impulsivity to the logistic regression equation resulted in a significant improvement of the model fit ($\Delta\chi^2 = 39.87$, $\Delta df = 1$, $p < .01$). The results indicated that when impulsivity was added to the model, the effects of age ceased to be statistically significant (see Table 2). The scores of Total Impulsivity, age, and minority status were then used to predict avoidant personality disorder scores using hierarchical multiple regression analysis. These multiple regression models yielded statistically significant results, $\Delta F(1, 537) = 68.53$, $\Delta R^2 = .11$, $p < .001$.

Analysis of individual beta weights for each regression analysis indicated that a higher level of motor, attentional, and nonplanning impulsivity was associated with a higher number of criteria met for borderline, antisocial, and dependent personality disorders. With regard to avoidant personality disorder, only the relationship between attentional and nonplanning impulsivity—but not motor impulsivity—and the disorder was statistically significant (see Table 3).

Impulsivity and institutional infractions. The logistic regression model was used to examine the significance of impulsivity and age for the likelihood of violent infractions. First, age and minority status were used as predictors ($\chi^2 = 16.53$, Nagelkerke pseudo $R^2 = .06$, $df = 2$, $p < .001$), and then impulsivity was added to the model ($\chi^2 = 23.35$, Nagelkerke pseudo $R^2 = .08$, $df = 3$, $p < .001$). The results indicated that the association between violent infractions and impulsivity was small but significant ($\Delta\chi^2 = 6.82$, $\Delta df = 1$, $p < .01$). When impulsivity was added to the regression equation, the individual effects of age were not significant (see Table 2). To test the relationship between each type of impulsivity (i.e., motor, attentional, and nonplanning) and violent infractions, the scores obtained on the three impulsivity subscales were used as predictors of violent infractions in a logistic regression model. The results indicated that by themselves, the three types of impulsivity were not significantly predictive of violent institutional infractions.

The presence of nonviolent societal rule violation infractions was regressed on age and minority status ($\chi^2 = 16.22$, Nagelkerke pseudo $R^2 = .05$, $df = 2$, $p < .001$), and then

impulsivity was added to the model ($\chi^2 = 19.59$, Nagelkerke pseudo $R^2 = .06$, $df = 3$, $p < .001$) using the logistic regression model. The addition of impulsivity to the model was not statistically significant ($\Delta\chi^2 = 3.37$, $\Delta df = 1$, $p > .05$). The individual effects of the three impulsivity scores (i.e., motor, nonplanning, and attentional) were not statistically significant.

Finally, the presence of institutional-only infractions was first regressed on age and minority status ($\chi^2 = 30.61$, Nagelkerke pseudo $R^2 = .08$, $df = 2$, $p < .001$). Next, the Total Impulsivity score was added to the model ($\chi^2 = 43.73$, Nagelkerke pseudo $R^2 = .10$, $df = 3$, $p < .001$), which improved the model significantly ($\Delta\chi^2 = 13.12$, $\Delta df = 1$, $p < .01$). The individual contribution of minority status, however, was not statistically significant. Among the three individual impulsivity scores, only cognitive impulsivity had a significant effect on the presence of institutional-only infractions (log odds = 1.71, Wald = 6.19, $p < .05$).

DISCUSSION

IMPULSIVITY AMONG INCARCERATED WOMEN

Inmates in our sample reported significantly higher BIS scores than the normative sample of female undergraduate students, significantly lower scores than male inmates, and scores similar to psychiatric inpatients from the study by Patton et al. (1995). Available evidence from the previous studies indicates that females generally show lower levels of impulsivity and risky behavior than males (Coccaro et al., 1997; Helfritz & Stanford, 2006; Patton et al., 1995). Our study supports this conclusion and suggests that gender differences in impulsivity extend to the population of incarcerated individuals. Assuming a gender difference in impulsivity levels among inmates, the substantially lower levels of violent offending among women may in part be associated with their lower levels of impulsive behavior.

The levels of impulsivity found in our sample were not significantly different from those obtained among female psychiatric inpatients (Patton et al., 1995). High rates of psychopathology found among incarcerated individuals may explain the comparable levels of impulsivity in female inmates and female inpatients. Several studies attest to the high levels of substance abuse and mental illness—including mood disorders and posttraumatic stress disorder—among female inmates (e.g., Jordan, Schlenger, Fairbank, & Caddell, 1996; Teplin, Abram, & McClelland, 1996).

Younger women in our sample were more likely to have higher levels of impulsivity than older women. This is consistent with previous studies in which younger individuals showed higher rates of impulsive and sensation-seeking behavior than older individuals (Hurt & Oltmanns, 2002; Todesco, 2004).

IMPULSIVITY AND VIOLENCE

Self-reported violence and violent infractions. The results of this study reflect the complexity of the relationship between impulsivity and different aspects of violent and aggressive behavior among incarcerated women. Although self-reported aggression and violent institutional infractions were significantly related to impulsivity, violent offenses were not. Consistent with findings obtained in previous studies (Barratt et al., 1997; Moeller et al., 2001), women who self-reported higher levels of violent behavior were more likely to be impulsive

than women who reported less violent behavior. Among the three types of impulsivity measured by the BIS, attentional impulsivity (ability to focus on the task at hand and cognitive instability) and nonplanning impulsivity (self-control and cognitive complexity) were shown to have small but significant relationships with self-reported violent behavior, whereas motor impulsivity (acting on the spur of the moment) was not. These findings support the importance of multidimensional understanding of impulsivity proposed by several authors (e.g., Barratt & Patton, 1983; Lynam & Miller, 2004). For example, Whiteside and Lynam (2001) argued that lack of premeditation should be related to antisocial behavior and psychopathy, whereas sensation seeking should be related to exciting but dangerous behavior, such as substance abuse. Similarly, Miller et al. (2003) found that lack of premeditation, or the inability to think through possible consequences of one's behavior, was consistently the strongest correlate of externalizing problems. Like the previous research, this study suggests that the cognitive aspect of impulsivity (i.e., attentional and nonplanning impulsivity) may be more predictive of self-reported aggression than its behavioral aspect (i.e., motor impulsivity).

Furthermore, impulsive women committed more violent institutional infractions than women who were not impulsive. Once impulsivity was taken into account in predicting violent infractions, the individual contribution of age was not significant, which suggests that impulsivity is better able to account for variability in violent infractions than age. Interestingly, none of the three individual impulsivity scores was more predictive of violent institutional infractions than the others. A possible reason for the lack of individual effects could be related to the low base rate of violent infractions in the current sample. Only one tenth of the women had at least one violent infraction, which might not be enough to distinguish among the individual effects of the three impulsivity scores.

The concept of executive cognitive functioning might be useful for explaining the association among self-reported violence, violent behavior in prison, and impulsivity. The term "executive cognitive functioning" describes a multidimensional construct that refers to several higher-order cognitive processes, such as initiation, planning, hypothesis generation, cognitive flexibility, cognitive inhibition, regulation, and self-monitoring, among others. Some authors have hypothesized that aggressive individuals with low executive cognitive functioning have difficulty inhibiting impulsive behavior (e.g., Hoaken, Shaughnessy, & Pihl, 2003). For example, Stanford, Greve, and Gerstle (1997) noted that errors in executive functioning deficits were typically observed among impulsive, aggressive subjects.

Incarcerated populations, particularly those with violent offenses, tend to show higher levels of neuropsychological impairment compared to the general population (e.g., Foster, Hillbrand, & Silverstein, 1993; Raine, 1993). In one of the few studies of neurological dysfunction among female inmates, Daoust, Loper, Magaletta, and Diamond (2006) observed that poor executive functioning was significantly related to aggression, mirroring previous studies of neuropsychological dysfunction and aggression among men (e.g., Dolan, Anderson, & Deakin, 2001; Rosenbaum & Hoge, 1989). This poor cognitive regulation may underlie the observed connections between impulsive behavior and aggression in both male and female inmates.

Violent crime. In contrast to self-reported violence and institutional infractions, violent offenses were not significantly related to higher levels of impulsivity in women in our sample. These findings are surprising given the previously suggested notion that violent crimes by women are more reactive and impulsive in nature compared to violent crimes committed by men (Sommers & Baskin, 1993; Warren et al., 2005), leading us to expect elevated levels

of impulsivity among violent female offenders compared to nonviolent offenders. The results of this study suggested that violent offending might not capture daily patterns of impulsivity exhibited by incarcerated women.

More than 70% of all women in state prisons are serving sentences for nonviolent offenses, including drug and property offenses (Greenfield & Snell, 2000). The role of impulsivity in a particular nonviolent offense may vary considerably, and certain nonviolent offenses, such as drug offending, may often involve impulsive behavior. It is also possible that the nature of violent offenses committed by women does not reflect a lifelong pattern of impulsivity but rather is a reflection of other characteristics. For example, some researchers have suggested that a substantial aspect of homicide in women is not a reflection of violent character but is often committed in retaliation for perceived injustice. When women commit severe acts of violence, they are likely to be acting alone at home, to have been provoked, or to be responding to a victim-initiated attack (Fagan & Browne, 1994; Loper & Cornell, 1996). Kruttschnitt, Gartner, and Ferraro (2002) observed that women engage in relatively few acts of lethal violence, and when they do, the violence is usually directed toward a family member or intimate partner. Loper and Cornell (1996) obtained similar results in their study, which found that homicides by women and girls were more likely to involve interpersonal conflict than those committed by men and boys. Women, who commit proportionately more familial than nonfamilial violence, may be less likely than men to be characterized by long-standing impulsivity. Further research on gender differences in impulsivity among offenders is needed to clarify whether isolated but serious acts of violence committed by women are less likely to have a pattern of impulsive behavior than similar acts committed by males.

Research on psychopathy among female inmates provides further insight into the relationship between impulsivity and violent crimes in this population. Impulsivity is an important characteristic of psychopathy, which is included as part of the criteria on the Psychopathy Checklist–Revised (PCL-R; Hart, Hare, & Harpur, 1992). Warren et al. (2005) investigated the relationship between psychopathy and criminality in a sample of incarcerated women. They found that scores on the PCL-R were not related to convictions for violent crime. These findings are in contrast to research with male inmates, in which psychopathy scores are consistently related to various forms of violent behavior. In the study by Warren et al., psychopathy was correlated with several types of nonviolent criminal behavior, providing additional evidence that impulsivity (as an important characteristic of psychopathy) might not be sensitive to differences between violent and nonviolent female offenders.

IMPULSIVITY AND INSTITUTIONAL MISCONDUCT

Women with higher levels of impulsivity were more likely to commit violent infractions and institutional-only infractions during incarceration than were women with lower levels of impulsivity. However, the effect sizes measuring the importance of impulsivity in predicting infractions were not large. These findings are somewhat different from the findings obtained in the previous studies on incarcerated men (Barratt et al., 1997; Fornells et al., 2002; Moeller et al., 2001). One of the possible reasons for this weak relationship may be related to the gender differences in violent behavior among men and women. Although impulsivity is a strong correlate of violent behavior among men, violence in women might not be a reflection of a daily pattern of impulsive behavior. It is possible that, in addition to impulsivity, other characteristics account for violent infractions within the prison. For

example, our study did not include affective factors, such as anger, in predicting violent acts in prison. It is reasonable to suggest that negative emotional experiences serve as additional predictors of violence. The importance of examining other affective components has been highlighted in studies with male inmates (Barratt et al., 1997; Wang & Diamond, 1999).

Overall, impulsivity seems to have a significant—although not strong—relationship to institutional infractions. Given the high intercorrelations among the three types of infractions and their low base rates, impulsivity might be treated as a marker, rather than a predictor, of behavior problems in prison. Future research should investigate the interplay of impulsivity and other personality characteristics and affective factors, such as anger, among incarcerated females.

IMPULSIVITY AND PERSONALITY DISORDERS

Impulsivity is an important component of borderline and antisocial personality disorders (Casillas & Clark, 2002; Coles, 1997; Hochhausen et al., 2002; Hurt & Oltmanns, 2002). Therefore, we expected to find a significant relationship between these disorders and impulsivity. Conversely, we did not expect to find a relationship between impulsivity and avoidant and dependent personality disorders. The results of this study partially supported our hypotheses: Women with higher levels of impulsivity were more likely to meet the diagnoses of borderline and antisocial personality disorders. These findings are not surprising, given that the *DSM-IV* (American Psychiatric Association, 1994) specifies impulsivity as one of the important criteria for these disorders. Our findings support the results of the previous studies that found impulsivity to be predictive of these disorders among incarcerated individuals (Hochhausen et al., 2002).

Contrary to the hypothesis, however, higher levels of impulsivity were also associated with dependent and avoidant personality disorders. A possible explanation for the unexpected relationship between impulsivity and dependent and avoidant personality disorders could be related to the high comorbidity among personality disorders in general (Hurt & Oltmanns, 2002; Widiger, Frances, Pincus, Davis, & First, 1991), which made it difficult to distinguish among personality disorders based on impulsivity. In our study, personality disorders were highly intercorrelated with each other. It is also important to note that the measure (SCID-II Screen) used in this study to assess personality disorder was originally designed as a screening measure and has limited specificity. Therefore, endorsement of personality disorder items on the SCID-II Screen might reflect global elevation of psychopathology and serve as an indicator of general interpersonal distress rather than a specific personality disorder. Present results confirm that women with higher levels of impulsivity are likely to also endorse high levels of interpersonal dysregulation symptomatic of a variety of personality disorders.

LIMITATIONS AND CONCLUSIONS

In the current study, the assessments of impulsivity, personality disorder, and violent behavior rely on self-report measures. Although the measures show good psychometric properties, self-report introduces a potential bias in women's responses, especially with regard to self-reported violence and antisocial behavior. The participants' responses to the self-report measures may be influenced by their emotional status and any situation that arose prior to the inmate's participation in this study. Some women in the sample may have

tried to portray themselves in a more positive light, whereas others may have intentionally exaggerated their responses.

The SCID-II Screen was used as a marker for personality disorders. The measure is designed, however, as a screen and is not sensitive to the full range of diagnostic criteria for specific personality disorders. Therefore, it was difficult to distinguish between impulsivity as a marker of specific personality disorders and impulsivity as an indicator of general interpersonal distress. Future research should address the specific role of impulsivity in personality disorders using multiple measures of personality psychopathology, including a structured diagnostic interview and self-report scales.

The results of this study do not allow for the determination of causality but help to illustrate the relationship between impulsivity and self-reported violence, institutional infractions, and personality disorders. Although it is possible, for example, that an inmate's predisposition to impulsivity results in personality psychopathology, it is also possible that personality psychopathology could lead to poor behavioral and cognitive inhibition. In addition, this study was not longitudinal by design.

The present study demonstrated the association between incarcerated women's levels of impulsivity and self-reported violent behavior, personality psychopathology, and institutional infractions. The study contributes to the research on the unique characteristics of incarcerated women by demonstrating similarities and differences related to the construct of impulsivity among female inmates compared to male inmates. As has been shown in studies of male offenders (e.g., Cornell et al., 1996; Hart & Dempster, 1997), higher levels of impulsivity were related to antisocial and aggressive behavior and institutional maladjustment. However, the predicted relationship between violent offending and impulsivity was not observed. The relationship between impulsivity and violence among incarcerated women seems to be complicated by the characteristics of female violent offending, which disproportionately involves domestic matters and interpersonal conflict. Further gender-specific research regarding patterns of violent behavior among female inmates is indicated.

In conclusion, this research provides evidence for the importance of impulsivity in the behavior of female offenders. Current results underscore the need for gender-specific models of understanding of impulsivity. In particular, although impulsivity is associated with violent offending among men (Cornell et al., 1996; Hart & Dempster, 1997), the present study indicates that women incarcerated for violent crimes do not demonstrate higher levels of impulsivity than nonviolent female offenders. Further research is needed to explore the relationships among different types of criminal behavior and impulsivity in women. Moreover, this study primarily focused on one particular model of impulsivity (Barratt et al., 1997; Barratt & Patton, 1983). It might be useful to explore the application of other models of impulsivity to female offenders. For example, Whiteside and Lynam (2001) suggested that among the four personality facets associated with impulsivity, lack of premeditation might lead to psychiatric problems such as antisocial personality disorder and psychopathy. Further research would do well to examine these and similar hypotheses on male and female inmates.

REFERENCES

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders, 4th edition*. Arlington, VA: Author.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders, 4th edition—text revision*. Arlington, VA: Author.

- Barratt, E. S. (1959). Anxiety and impulsivity related to psychomotor efficiency. *Perceptual and Motor Skills*, *9*, 191-198.
- Barratt, E. S. (1965). Factor analysis of some psychometric measures of impulsiveness and anxiety. *Psychological Reports*, *16*, 547-554.
- Barratt, E. S. (1991). Measuring and predicting aggression within the context of a personality theory. *Journal of Neuropsychiatry*, *3*, 535-539.
- Barratt, E. S. (1994). Impulsiveness and aggression. In J. Monahan & H. J. Steadman (Eds.), *Violence and mental disorders: Developments in risk assessment* (pp. 61-79). Chicago: University of Chicago Press.
- Barratt, E. S., & Patton, J. H. (1983). Impulsivity: Cognitive, behavioral and psychophysiological correlates. In M. Zuckerman (Ed.), *Biological bases of sensation seeking, impulsivity, and anxiety* (pp. 77-122). Hillsdale, NJ: Lawrence Erlbaum.
- Barratt, E. S., Stanford, M. S., Kent, T. A., & Felthous, A. (1997). Neuropsychological and cognitive psychophysiological substrates of impulsive aggression. *Biological Psychiatry*, *41*, 1045-1061.
- Bureau of Justice Statistics. (n.d.). *Homicide trends in the U.S. Trends by gender*. Retrieved November 2006 from <http://www.ojp.usdoj.gov/bjs/homicide/gender>
- Casillas, A., & Clark, L. A. (2002). Dependency, impulsivity, and self-harm: Traits hypothesized to underlie the association between Cluster B personality and substance abuse disorders. *Journal of Personality Disorders*, *16*, 424-436.
- Cherek, D. R., & Lane, S. D. (1998). Laboratory and psychometric measurements of impulsivity among violent and nonviolent female parolees. *Society of Biological Psychiatry*, *46*, 273-280.
- Coccaro, E. F., Kavoussi, R. J., Trestman, R. L., Gabriel, S. M., Cooper, T. B., & Siever, L. J. (1997). Serotonin function in human subjects: Intercorrelations among central 5-HT indices and aggressiveness. *Psychiatry Resources*, *73*, 1-14.
- Coles, E. M. (1997). Impulsivity in major mental and personality disorders. In C. Webster & M. Jackson (Eds.), *Impulsivity: Theory, assessment, and treatment* (pp. 180-194). New York: Guilford.
- Cornell, D., Warren, J., Hawk, G., Stafford, E., Oram, G., & Pine, D. (1996). Psychopathy in instrumental and reactive violent offenders. *Journal of Consulting and Clinical Psychology*, *64*, 783-790.
- Daoust, S., Loper, A., Magaletta, P., & Diamond, P. (2006). Neuropsychological dysfunction and aggression among female federal inmates. *Psychological Services*, *3*, 88-96.
- Dolan, M., Anderson, I. M., & Deakin, J.F.W. (2001). Relationship between 5-HT function and impulsivity and aggression in male offenders with personality disorders. *British Journal of Psychiatry*, *178*, 352-359.
- Douglas, V. (1972). Stop, look, and listen: The problem of sustained attention and impulse control in hyperactive and normal children. *Canadian Journal of Behavioral Science*, *4*, 259-282.
- Ekselius, L., Lindstrom, E., von Knorring, L., Bodlund, O., & Kullgren, G. (1994). SCID II interviews and the SCID Screen questionnaire as diagnostic tools for personality disorders in DSM-III-R. *Acta Psychiatrica Scandinavica*, *90*, 120-123.
- Eysenck, S.B.G., & Eysenck, H. J. (1977). The place of impulsiveness in a dimensional system of personality description. *British Journal of Social and Clinical Psychology*, *16*, 57-68.
- Fagan, J., & Browne, A. (1994). Violence between spouses and intimates: Physical aggression between women and men in intimate relationships. *Understanding and Preventing Violence*, *3*, 151-292.
- First, M. B., Gibbon, M., Spitzer, R. L., Williams, J. B., & Benjamin, L. S. (1995a). The Structured Clinical Interview for DSM-III-R personality disorder (SCID-II): I. Description. *Journal of Personality Disorders*, *9*, 83-91.
- First, M. B., Gibbon, M., Spitzer, R. L., Williams, J. B., & Benjamin, L. S. (1995b). The Structured Clinical Interview for DSM-III-R personality disorder (SCID-II): II. Description. Multi-site test-retest reliability study. *Journal of Personality Disorders*, *9*, 92-104.
- Fornells, A. R., Capdevila, J.M.L., & Andres-Pueyo, A. (2002). Personality dimensions and prison adjustment. *Psicothema*, *14*(Suppl.), 90-100.
- Foster, H. G., Hillbrand, M., & Silverstein, M. (1993). Neuropsychological deficit and aggressive behavior: A prospective study. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, *17*, 939-946.
- Greenfield, L., & Snell, T. (2000). *Women offenders*. Washington, DC: Bureau of Justice Statistics.
- Hare, R. D. (1996). Psychopathy and antisocial personality disorder: A case of diagnostic confusion. *Psychiatric Times*, *13*, 39-40.
- Hare, R. D. (2006). Psychopathy: A clinical and forensic overview. *Psychiatric Clinics of North America*, *29*, 709-724.
- Hart, S. D., & Dempster, R. J. (1997). Impulsivity and psychopathy. In C. Webster & M. Jackson (Eds.), *Impulsivity: Theory, assessment, and treatment* (pp. 212-232). New York: Guilford.
- Hart, S. D., & Hare, R. D. (1996). Psychopathy and risk assessment. *Current Opinion in Psychiatry*, *9*, 380-383.
- Hart, S. D., Hare, R. D., & Harpur, T. J. (1992). The Psychopathy Checklist: Overview for researchers and clinicians. In J. Rosen & P. McReynolds (Eds.), *Advances in psychological assessment* (Vol. 7, pp. 103-130). New York: Plenum.
- Helfritz, L., & Stanford, M. (2006). Personality and psychopathology in an impulsive aggressive college sample. *Aggressive Behavior*, *32*, 28-37.
- Hirschi, T., & Gottfredson, M. R. (1994). The generality of deviance. In T. Hirschi & M. R. Gottfredson (Eds.), *The generality of deviance* (pp. 1-22). New Brunswick, NJ: Transaction Publishers.
- Hoaken, P., Shaughnessy, V., & Pihl, R. (2003). Executive cognitive functioning and aggression: Is it an issue of impulsivity? *Aggressive Behavior*, *29*, 15-30.
- Hochhausen, N. M., Lorenz, A. R., & Newman, J. P. (2002). Specifying the impulsivity of female inmates with borderline personality disorder. *Journal of Abnormal Psychology*, *111*, 495-501.

- Hurt, S., & Oltmanns, T. F. (2002). Personality traits and pathology in older and younger incarcerated women. *Journal of Clinical Psychology, 58*, 457-464.
- Jordan, B., Schlenger, W., Fairbank, J., & Caddell, J. (1996). Prevalence of psychiatric disorders among incarcerated women: Convicted felons entering prison. *Archives of General Psychiatry, 53*, 513-519.
- Krutttschnitt, C., Gartner, R., & Ferraro, K. (2002). Women's involvement in serious interpersonal violence. *Aggression and Violent Behavior, 7*, 529-565.
- Loper, A., & Cornell, D. (1996). Homicide by juvenile girls. *Journal of Child and Family Studies, 5*, 323-336.
- Lynam, D. R., & Miller, J. D. (2004). Personality pathways to impulsive behavior and their relations to deviance: Results from three samples. *Journal of Quantitative Criminology, 20*, 319-341.
- Miller, J. D., Flory, K., Lynam, D. R., & Leukefeld, C. (2003). A test of the four-factor model of impulsivity-related traits. *Personality and Individual Differences, 34*, 1403-1418.
- Miller, J. D., & Lynam, D. (2001). Structural models of personality and their relations to antisocial behavior: A meta-analytic review. *Criminology, 39*, 765-792.
- Moeller, F. G., Barratt, E. S., Dougherty, D. M., Schmitz, J. M., & Swann, A. C. (2001). Psychiatric aspects of impulsivity. *American Journal of Psychiatry, 158*, 1783-1793.
- Moffitt, T. E. (1993). Life-course-persistent and adolescence-limited antisocial behavior: A developmental taxonomy. *Psychological Review, 700*, 674-701.
- Moffitt, T., Caspi, A., Harrington, H., & Milne, B. J. (2002). Males on the life-course persistent and adolescence-limited antisocial pathways: Follow-up at age 26. *Development and Psychopathology, 14*, 179-207.
- Moffitt, T., Caspi, A., Rutter, M., & Silva, P. (2001). *Sex differences in antisocial behavior*. Cambridge, UK: Cambridge University Press.
- Murray, H. (1938). *Explorations in personality*. New York: Oxford University Press.
- Oxford English Dictionary*. (n.d.). Retrieved February 23, 2007, from www.oed.com
- Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt Impulsiveness Scale. *Journal of Clinical Psychology, 51*, 768-774.
- Plutchik, R., & van Praag, H. M. (1994). The nature of impulsivity: Definitions, ontology, genetics, and relations to aggression. In E. Hollander & D. J. Stein (Eds.), *Impulsivity and aggression* (pp. 7-24). New York: John Wiley.
- Raine, A. (1993). *The psychopathology of crime*. New York: Academic Press.
- Rosenbaum, A., & Hoge, S. K. (1989). Head injury and marital aggression. *American Journal of Psychiatry, 146*, 1048-1051.
- Sommers, I., & Baskin, D. (1993). The situational context of violent female offending. *Journal of Research in Crime and Delinquency, 30*, 136-162.
- Stanford, M., Greve, K., & Gerstle, J. (1997). Neuropsychological correlates of self-reported impulsive aggression in a college sample. *Personality and Individual Differences, 23*, 961-965.
- Stanford, M. S., Houston, R. J., Mathias, C. W., Villemarette-Pittman, N. R., Helbritz, L. E., & Conkin, S. M. (2003). Characterizing aggressive behavior. *Assessment, 10*, 183-190.
- Swann, A., & Hollander, E. (2002). *Impulsivity and aggression: Diagnostic challenges for the clinician* [Monograph]. Department of Continuing Medical Education, Arlington Heights, Illinois. Retrieved February 26, 2005, from http://cene.com/PDFs/D11-1_Impulsivity.pdf
- Teplin, L., Abram, K., & McClelland, G. (1996). Prevalence of psychiatric disorders among incarcerated women: Pretrial jail detainees. *Archives of General Psychiatry, 53*, 505-512.
- Todesco, P. (2004). *Developmental differences in sensation seeking*. Doctoral dissertation, Wayne State University, Detroit, MI. Retrieved March 15, 2006, from <http://digitalcommons.wayne.edu/dissertations/AAI3152344>
- Vazsonyi, A., Cleveland, H., & Wiebe, R. (2006). Does the effect of impulsivity on delinquency vary by level of neighborhood disadvantage? *Criminal Justice and Behavior, 33*, 511-541.
- Wang, E., & Diamond, P. (1999). Empirically identifying factors related to violence risk in corrections. *Behavioral Sciences and the Law, 17*, 377-389.
- Warren, J. I., Hurt, S., Loper, A., Bale, R., Friend, R., Chauhan, P. (2002). Psychiatric symptoms, history of victimization, and violent behavior among incarcerated female felons: An American perspective. *International Journal of Law and Psychiatry, 25*, 129-149.
- Warren, J., South, S., Burnette, M., Rogers, A., Bale, R., & Friend, R., et al. (2005). Understanding the risk factors for violence and criminality in women: The concurrent validity of the PCL-R and HCR-20. *International Journal of Law and Psychiatry, 28*, 269-289.
- White, J. L., Moffitt, T. E., Caspi, A., Bartusch, D. J., Needles, D. J., & Stouthamer-Loeber, M. (1994). Measuring impulsivity and examining its relationship to delinquency. *Journal of Abnormal Psychology, 103*, 192-205.
- Whiteside, S. P., & Lynam, D. R. (2001). The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences, 30*, 669-689.
- Widiger, T. A., Frances, A. J., Pincus, H. A., Davis, W. W., & First, M. (1991). Toward an empirical classification for DSM-IV. *Journal of Abnormal Psychology, 100*, 280-288.