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## Toward a Psychopathology of Self-Control Theory: The Importance of Narcissistic Traits

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**Research on self-control and related constructs is central to individual-level explanations of antisocial behavior. However, less research attention has been paid to the psychopathological underpinnings of self-control. The current study explores relationships between self-control and psychiatric symptoms, head injury, trauma history, substance use, guiltlessness and narcissistic traits in a state-wide population of juvenile offenders. Results support the importance of these variables, in particular narcissistic traits, in better explicating theories of self-control. Implications for research on the psychopathological underpinnings of self-control are highlighted. Copyright © 2007 John Wiley & Sons, Ltd.**

### INTRODUCTION

Since the publication of *A General Theory of Crime* by Michael Gottfredson and Travis Hirschi in 1990, the construct of self-control has become a dominant area of inquiry in criminology. According to the theory, an individual's level of self-control is the outcome of parental socialization occurring in approximately the first ten years of life. Parents who responsibly monitor their child's behavior, recognize their child's inappropriate or deviant behavior, and appropriately sanction, punish, or correct their child's behavior are likely to instill or inculcate self-control. Parents who are unable or unwilling to fully invest and participate in the responsibilities inherent to

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parenting fail to instill self-control. What sets self-control theory apart from other criminological theories is the insistence that an individual-level characteristic is mostly responsible for involvement in crime and other antisocial behaviors, and that this individual-level characteristic is stable across social contexts. To Gottfredson and Hirschi (1990), established correlates of crime, such as association with delinquent peers, are spurious because they are the outcome of self-control. Those with low self-control *self-select* environments, relationships, and people that are conducive to crime.

Persons with low self-control demonstrate a constellation of attitudinal and behavioral characteristics. They tend to (1) have a here-and-now orientation whereby they seek immediate as opposed to delayed gratification, (2) prefer easy and simple tasks and dislike activities that require diligence, tenacity and persistence, (3) engage in behaviors that are risky and exciting rather than cautious and cognitive, (4) fail to see the longer-term benefits of investing in social institutions, (5) are attracted to endeavors that entail little skill or planning, and (6) are unkind, insensitive, hot-tempered, self-centered, and unsympathetic to others. The generality of self-control theory pertains to the multitudinous ways that these characteristics manifest (Gottfredson & Hirschi, 1990, p. 85). Those with low self-control are hypothesized to be attracted to and engage in imprudent behaviors, such as smoking, gambling, drinking, sexual promiscuity, and unsafe driving, criminal behaviors that encompass the use of “force or fraud” against others, and failure in or indifference to family, school, work, and other social institutions. As Hirschi and Gottfredson (1994, p. 261) noted, “evidence has accumulated that people who tend to lie, cheat, and steal also tend to hit other people; that the same people tend to drink, smoke, use drugs, wreck cars, desert their spouses, quit their jobs, and come late to class.”

Within criminology the construct of self-control has garnered significant research attention and empirical validation. For example, Pratt and Cullen (2000) reviewed 21 studies that included 17 independent data sets and 49,727 individual cases. They examined the effect-size estimates of 126 self-control measures to crime-related dependent variables and found a consistent effect size that exceeded  $r = .20$ . Pratt and Cullen (2000, pp. 951–952) concluded

When compared with other studies that have examined predictors of criminal behavior, this effect size would rank self-control as one of the strongest known correlates of crime. This effect size remained even when studies included controls for other theories and for opportunity. Further, the effect size was not significantly affected by whether self-control was measured as an attitudinal or behavioral measure or whether it was measured by Grasmick *et al.*'s (1993) scale or by scales developed by other scholars. This latter finding is important because it suggests that self-control's effects are sufficiently robust that they are not sensitive to different ways in which self-control is operationalized. Taken together, then, these considerations suggest that future research that omits self-control from its empirical analyses risks being misspecified.

Despite the influence of the self-control construct in mainstream criminology, it has been poorly integrated to related psychopathological constructs (for exceptions, see Cauffman *et al.*, 2005; DeLisi, 2005; Unnever, Cullen, & Pratt, 2003; Wiebe, 2003). This is unfortunate because the constitutive elements of self-control as theorized by Gottfredson and Hirschi are fairly well established in other research communities. As pointed out by Strayhorn (2002), much of psychopathological research and theory generally implicates diminished self-control. For instance, in

their research on personality correlates of crime, Lynam and Miller (2004, p. 320) observed that “impulsivity-related traits are consistently related to antisocial outcome variables. Impulsivity appears, in one form or another, in every major system of personality, often subsumed by broader personality dimensions (e.g., conscientiousness, constraint, impulsive-sensation seeking, novelty seeking). Impulsivity also plays a prominent role in the understanding and diagnosis of various forms of psychopathology.”

In her work on the interrelationships between neuropsychological deficits, the frontal lobes of the brain, and psychopathology, Moffitt (1990, p. 115) indicated “The normal functions of the frontal lobes of the brain include sustaining attention and concentration, abstract reasoning and concept formation, goal formulation, anticipation and planning, programming and initiation of purposive sequences of motor behavior, effective self-monitoring of behavior and self-awareness, and inhibition of unsuccessful, inappropriate, or impulsive behaviors, with adaptive shifting to alternative behaviors. These functions are commonly referred to as ‘executive functions,’ and they hold consequent implications for social judgment, self-control, responsiveness to punishment, and ethical behavior.” In other words, there is clear convergence about the effects of self-control on crime, however it is variously defined (see, e.g., Brower & Price, 2001; Fishbein, 2000; Niehoff, 1999; Vazire & Funder, 2006).

In sum, the construct of self-control clearly overlaps with constructs such as impulsivity, neurodisinhibition and other central concepts resulting from diminished executive governance capacity. Self-control also converges with the construct of psychopathy, particularly the behavioral component associated with impulse control problems and irresponsible behavior (Cleckley, 1976; Cooke & Michie, 2001; DeLisi, 2003; DeLisi & Vaughn, 2007; Farrington, 2005; Salekin, Brannen, Zalot, Leistico, & Neumann, 2006; Skeem & Cauffman, 2003). These constructs and their attendant neurocognitive impairments in relation to antisocial outcomes have been extensively studied in the behavioral sciences (Cauffman et al., 2005; Lahey, Moffitt, & Caspi, 2003; Lynam & Miller, 2004; Moffitt, 1993; Raine, 2002; Raine et al., 2005; Wills, Vaccaro, & McNamara, 1994; Wilson & Herrnstein, 1985). Overall, these studies indicate that the self-control construct is central to the study of criminal behavior.

## CURRENT FOCUS

Although much is known about self-control in relation to predicting antisocial and criminal behavior, very little research has been afforded to understanding the psychopathology of self-control theory. There is ample reason to believe that persons with low self-control suffer from an array of problematic personality characteristics and abnormalities with respect to the frontal lobes—often characterized as the seat of executive governance in the brain. In the current study, we use a statewide population of residentially incarcerated youth to explore the relationships between forms of psychopathology, including psychopathic personality features of narcissism, guiltlessness, and scores on a measure of self-control (Cale & Lilienfeld, 2006; Edens, Skeem, Cruise, & Cauffman, 2001; Hare, 1996, 1998). Despite the surge of interest in self-control theory in criminology, relatively little attention has been paid to the role of psychopathological personality factors. As such, we were particularly

interested in investigating the relationship between self-control and interpersonal facets of psychopathy involving pathological egocentricity (i.e. narcissistic) and affective factors such as guiltlessness as predictors of antisocial behavior.

## METHODS

### Sample and Study Procedures

The present study sample represents 97.7% ( $n = 723$ ) of the population of current residents ( $n = 740$ ) in the Missouri Division of Youth Services (DYS) at the time the study was undertaken and 99.3% of residents available for interviewing. The Missouri DYS is the legal guardian of all residents who are committed to its care by the state's 45 juvenile courts. The DYS population is representative of incarcerated youth nationally with regard to the average age and gender distribution of offenders, percentage delinquent versus status offenders, and number of state youth currently incarcerated per 100,000 adolescents (Sickmund, 2004). No seasonal, administrative, legislative, or clinical issues that might have operated to reduce the representativeness of the sample were found. All interviewers completed an intensive one-day training session and an interview editor was on site at each facility as youth were interviewed to minimize interviewer omissions and errors. DYS residents are under 24-hour-a-day supervision; thus, interviews were conducted in large rooms that provided private areas where confidential interviews could be conducted simultaneously with between three and six youth.

All current residents were recruited for study participation at the time that interviewing commenced. The sample recruitment protocol ensured that no youths who had completed the interview at one facility then attempted to complete or were successful in completing the interview at another facility. This study was approved by DYS, the Washington University Human Studies Committee Institutional Review Board, and the federal Office of Human Research Protection, and was granted a Certificate of Confidentiality by the National Institute on Drug Abuse (NIDA). Youth received \$10 for their participation. Participation in the study was voluntary.

All youth providing written informed consent completed the structured face-to-face approximately 45-minute interview assessing demographic characteristics, lifetime and annual use of inhalants, other drug use, substance-related problems, current and lifetime psychiatric symptoms, suicidal ideation and actual suicide attempts, trauma and victimization history, antisocial personality traits and violent and nonviolent criminal activity. Additional information on the study sample and procedures has been published elsewhere (Vaughn, Howard, Foster, Dayton, & Zelner, 2005; Vaughn, Howard, & Harper-Chang, 2006).

## Measures

### *Criterion Variable*

*Low self-control.* We employed a 15-item self-control scale (see Vaughn & DeLisi, 2007) rationally derived from scales encompassing impulsivity and impulse-control

problems. As such, this scale can be considered a hybrid in terms of its construction. During the formation of this scale items were standardized into  $z$ -scores and subjected to exploratory factor analysis using principal components analysis with an oblique rotation. Inspection of the scree plot, eigenvalues, and percentage of cumulative variance all pointed toward a single dominant factor. Additional rotations were also used (e.g. varimax) but results showed no substantial differences. To further evaluate the structure of the self-control scale, maximum likelihood factor analysis was used and considered one to four factors. Results from this procedure showed reduction in chi-square fit indices as analyses proceeded from one to four factors supporting a single factor solution. Internal consistency reliability for the self-control scale was acceptable ( $\alpha = 0.83$ ). Table 1 displays self-control scale items along with their factor loading coefficients.

### *Independent Variables*

*Psychiatric symptoms.* The Brief Symptom Inventory (BSI) was used to assess current psychiatric symptoms. This instrument, descended from the 90-item Symptom Checklist—Revised (SCL-90-R), consists of 53 items with a Likert-type format consisting of nine subscales and an overall Global Severity Index relating to major mental health disorders (i.e. anxiety, depression, paranoid ideation, phobic anxiety, obsessive–compulsive, somatization, psychoticism, etc.) in order to characterize current psychiatric status and psychological distress. Studies support the BSI as a reliable and valid measure of current psychiatric symptoms (Derogatis & Savitz, 2000; Kellett, Beail, Newman, & Frankish, 2003; Soar, Turner, & Parrott, 2006). Test–retest reliabilities, symptom endurance particularly if untreated, and sensitivities in relation to psychiatric diagnoses are high (Derogatis, 1993). Total BSI reliability in the present study was excellent ( $\alpha = 0.96$ ) with subscale reliabilities ranging from 0.70 (Phobic Anxiety) to 0.83 (Depression).

*Mental health diagnosis, ADHD, and head injury.* Participants were asked whether or not they had a current mental health disorder diagnosis, specifically Attention Deficit Hyperactivity Disorder (ADHD), for which they were currently taking medication.

Table 1. Self-control scale items and factor loadings

“You act without thinking of the consequences.”	(0.57)
“You get bored easily.”	(0.43)
“You do risky or dangerous things.”	(0.48)
“Having urges to beat, injure, or harm someone.”	(0.59)
“You do not plan ahead or you leave things until the last minute.”	(0.45)
“Feeling easily annoyed or irritated.”	(0.62)
“I generally prefer to act first and think later.”	(0.59)
“I tend to get crabby and irritable when I have too many things to do.”	(0.41)
“I occasionally do something dangerous because someone has dared me to do it.”	(0.49)
“I weigh the pros and cons (i.e., pluses and minuses) of major decisions carefully before making them.” (Reverse scored)	(0.45)
“I quickly become very annoyed at people who do not give me what I want.”	(0.53)
“Temper outbursts that you could not control.”	(0.59)
“Having urges to break or smash things.”	(0.68)
“Getting into frequent arguments.”	(0.60)
“Feeling so restless you couldn’t sit still.”	(0.59)

In addition, we asked whether or not participants had experienced a head injury that led to a loss of consciousness (blackout period) that lasted for at least twenty minutes. Both ADHD and head injury are strongly correlated with serious antisocial behavior in juveniles (Lahey *et al.*, 2003; Raine, 2002; Raine *et al.*, 2005).

*Traumatic experiences.* The MAYSI-2 Traumatic Experiences Scale (Cauffman, 2004; Grisso, Barnum, Fletcher, Cauffman, & Peuschold, 2001) was used to assess the severity of past trauma. Reliability analyses from the present study indicate adequate reliability for the Traumatic Experiences subscale ( $\alpha = 0.77$  for females;  $\alpha = 0.68$  for males).

*Narcissism, fearlessness, and guiltlessness.* These psychopathic personality features were drawn from a 33-item modified Psychopathic Personality Inventory (Lilienfeld & Andrews, 1996) Short-Form (mPPI-SF) and the 20-item Antisocial Process Screening Device (Frick & Hare, 2002). The PPI-SF is based directly upon the 187-item PPI and correlates strongly ( $r = .90$ ) with the full PPI (Cale & Lilienfeld, 2006; Lilienfeld & Andrews, 1996). Both measures have shown good reliability and usefulness as a self-report measure assessing psychopathic personality (Vaughn & Howard, 2005). The PPI-SF is considered a “pure” personality inventory of psychopathy because it contains no items directly assessing antisocial behaviors. This avoids the tautological processes inherent in measures of psychopathy that include components of antisocial behavior. These measures were subjected to factor analyses (principal axis, principal components, and maximum likelihood) with results indicating support for a three factor solution (narcissistic, behavioral, and deficient affect). Both Narcissistic factors (APSD narcissism  $\alpha = 0.75$ , PPI-SF narcissism  $\alpha = 0.77$ ) from each of the measures were used and are characterized by aggressive ego-centered interpersonal relations or what can be usefully described as an arrogant deceitful interpersonal style (see Farrington, 2005). Exemplar items from these measure include “You think that you are better or more important than other people” (APSD) and “I sometimes try to get others to ‘bend the rules’ for me if I can’t change them any other way.” Fearlessness ( $\alpha = 0.70$ ) was derived from the PPI-SF and can be described by low fear, risk-taking, and lack of concern for potential harmful consequences—“Making a parachute jump would really frighten me” (reverse scored). Guiltlessness ( $\alpha = 0.66$ ) was indexed from four items that assess a deficient affective experience with regard to others and one’s actions—“You feel bad or guilty when you do something wrong” (reverse scored).

*Lifetime substance use and substance-related problems.* A multi-item poly-substance use matrix was used to assess lifetime substance use occasions (scale range, 0–51,  $\alpha = 0.75$ ). This comprehensive scale was created by summing 13 types of substance used including alcohol, heroin, ecstasy, marijuana, hallucinogens, cocaine, amphetamines, inhalants, and several others. In addition, the Massachusetts Youth Screening Inventory (MAYSI-2) (Grisso *et al.*, 2001) Alcohol and Drug Problems Index (eight yes/no items,  $\alpha = 0.83$ ) was used. This measure assesses problems related to the use of substances such as getting into fights while high or drunk.

*Demographics.* These variables consisted of age ( $M = 15.5$  years,  $SD = 1.2$  years), gender (0 = male, 1 = female), ethnicity (0 = White, 1 = African American, 2 = Hispanic, 3 = Multiethnic or other), and family receipt of public assistance (0 = no, 1 = yes), which served as a socioeconomic status proxy.

### Statistical Analyses

The overall goal was to assess the ability of mental health, psychopathic, and substance use variables described above to predict self-control. Following presentation of descriptive statistics we developed a series of hierarchical linear regression models that parsed the amount of variance by each psychopathological domain (i.e. demographics, mental health, trauma and victimization, psychopathic personality traits, substance use). Regression diagnostics were conducted to test for multicollinearity and help ensure unbiased estimates. Examination of Variance Inflation Factors (VIFs) shows that no values exceeded a value of 4.0, which is a conservative cut-off point indicating multicollinearity (Fox, 1991). Further inspection of tolerance values showed that all were above standard problem levels. In addition, normality of residuals was checked to ensure regression assumptions. Histograms and plots of the residuals for the model were distributed normally. There was no clustering at the top, bottom, left or right in the plot, indicating that multivariate normality and homoscedasticity can be assumed.

Next, we sought to extend the regression analyses by examining the relative power of significant coefficients in classifying self-control using the Chi-Square Automatic Interaction Detector (CHAID). We used two separate CHAID analyses to best illustrate findings; one employing the dependent variable as interval and the second as categorical using cut points at one standard deviation above and below the mean value. CHAID is a data mining technique useful for exploring relationships between a dependent variable and a large number of independent variables (Kass, 1980). As a robust statistical analytic technique CHAID can be used with either dependent or independent variables that are continuous or categorical, although most applications have been used to classify. Further, this procedure minimizes outlier effects. The CHAID technique produces a tree analysis diagram that begins with a “tree trunk” that splits into “branches” based upon the effects of a given independent variable. Although typically employed in business and market research settings, decision tree analysis has become increasingly popular in health and mental health services research (Chan et al., 2006; Smith & Grawe, 2003). Successive splits indicate the strength of the independent variable relative to the others in formation of branches. Thus, the first initial split (root) from the trunk is the strongest predictor. Because of these procedures, CHAID can be thought of as a hierarchical method for partitioning variance. Although typically employed in business and market research settings, decision tree analysis has become increasingly popular in health services (Chan et al., 2005, 2006; Smith & Grawe, 2003), social services, and alcohol research. Decision tree analysis 4.0 from SPSS was used for the CHAID analyses. Because of the exploratory nature of the analyses we examined self-control in CHAID analyses both dimensionally and categorically.

Finally, we examined the overlap between narcissistic traits and low self-control (defined as one SD above the mean,  $N = 118$ ). We choose to use

this cut point because scores were normally distributed across the sample. This test provides an additional “window” into the ability of measures of narcissistic traits to correctly classify low self-control with better than chance accuracy. We found no significant differences between self-control groups with respect to two items used to assess deviant responding.

## RESULTS

### Descriptive Characteristics

Table 2 reveals characteristics of study variables. Not unexpectedly, most youths were male (87%). In terms of ethnicity, the population was predominately White (55.3%) and African-American (32.9%), followed by Latino/Latina (3.9%) and Multiethnic/other (7.7%). The mean age was 15.5 (SD = 1.2) with a range from 11 to 20. 40% of youth reported coming from a home that received public assistance

Table 2. Descriptive characteristics of study variables ( $N = 723$ )

	<i>N</i> (%)	<i>M</i> (SD)	Range	$\alpha$
Gender				
Male	629 (87.0)			
Female	94 (13.0)			
Ethnicity				
African-American	238 (32.9)			
White	400 (55.3)			
Latina/Latino	28 (3.9)			
Multiethnic/other*	56 (7.7)			
Age		15.5 (1.2)	(11–20)	
Family receipt of public assistance				
Yes	288 (40.4)			
No	425 (59.6)			
Current mental health diagnosis				
Yes	370 (51.4)			
No	350 (48.6)			
Head injury				
Yes	132 (18.3)			
No	588 (81.7)			
Self-control		0.01 (8.0)	(–19.9–22.3)	0.83
Anxiety		4.4 (4.7)	(0–24)	0.80
Phobic anxiety		2.0 (3.2)	(0–20)	0.70
Depression		4.7 (5.0)	(0–23)	0.83
Obsessive–compulsive		6.6 (5.4)	(0–24)	0.80
Paranoid ideation		6.3 (4.7)	(0–20)	0.78
Psychoticism		3.6 (3.9)	(0–20)	0.80
Somatization		3.6 (4.4)	(0–25)	0.77
Traumatic experiences**		2.9 (1.6)	(0–5)	0.68, 0.77
Victimization		6.3 (5.9)	(0–32)	0.76
Lifetime polysubstance use		15.6 (10.4)	(0–51)	0.75
Guiltlessness***		–0.1 (2.8)	(–4.1–7.9)	0.66
Fearlessness		23.5 (6.4)	(10–40)	0.70
mPPI-SF Narcissism		32.6 (7.5)	(14–52)	0.77
APSD Narcissism		23.5 (6.4)	(0–17)	0.75

\*Includes Native American and Asian.

\*\*Alpha coefficients displayed for males and females.

\*\*\*Negative mean due to reverse scoring of items and use of standardized scores.

(i.e. food stamps, AFDC). Approximately one-half of youth had reported a mental health diagnosis excluding any substance use disorder (51.4%). By far the most common mental health disorder reported was Attention Deficit Hyperactivity Disorder (ADHD). A substantial proportion (18.3) of youth reported a head injury that caused a loss of consciousness for at least 20 minutes. Although we have no empirical data regarding the events surrounding head injury, accounts from our interviews with each youth indicate that head injury was often caused by episodes of interpersonal violence such as during a gang fight. Descriptive values for previously described measures are also listed in Table 2.

### Regression Models

In the next set of analyses, four regression models were examined (see Table 3). The first contains a demographic and mental health set of variables (Model 1) followed by a set of psychiatric symptom variables (Model 2), trauma, victimization and substance use (Model 3), and finally the complete model with variables representing psychopathic personality features (Model 4).

Table 3. Self-control regressed on demographic, mental health, trauma and substance use, and personality measures: unstandardized (standardized) ( $N = 722$ )

	Model 1	Model 2	Model 3	Model 4
<i>Demographic/mental health</i>				
Age	-.283 (-.043)	-.565 (-.086)**	-.819 (-.125)***	-.387 (-.059)*
Female <sup>1</sup>	1.97 (.082)**	.348 (.014)	.351 (.015)	.301 (.013)
African-American <sup>2</sup>	-1.33 (-.078)	-.396 (-.081)*	-1.25 (-.073)*	-1.10 (-.064)*
Latino/Latina	2.33 (.056)	-.086 (-.002)	-.737 (-.018)	-.718 (-.017)
Multiethnic	1.23 (.041)	.867 (.029)	.730 (.024)	-.052 (-.002)
Receipt of welfare	.929 (.056)	.055 (.003)	.234 (.014)	.006 (.000)
Head injury	3.05 (.146)***	.017 (.001)	-.707 (-.034)	.096 (.005)
ADHD	.446 (.027)	.855 (.051)	1.12 (.067)	.237 (.014)
Mental illness	3.19 (.197)***	.935 (.058)	.611 (.038)	.688 (.042)
<i>Psychiatric symptoms</i>				
Anxiety		.299 (.174)***	.291 (.170)***	.354 (.207)***
Depression		.045 (.028)	.061 (.038)	.084 (.052)
Obsessive-compulsive		.377 (.251)***	.327 (.218)***	.195 (.130)***
Paranoid ideation		.404 (.235)***	.340 (.198)***	.058 (.034)
Phobic anxiety		-.097 (-.038)	-.085 (-.034)	-.208 (-.082)*
Psychoticism		.109 (.052)	.072 (.035)	.149 (.071)
Somatization		.056 (.030)	.052 (.028)	.036 (.019)
<i>Trauma and substance use</i>				
Victimization Index			.108 (.079)**	.056 (.041)
Traumatic experiences			.319 (.063)	.152 (.030)
Lifetime substance use			.083 (.107)***	.031 (.039)
<i>Personality</i>				
Guiltlessness				.267 (.093)***
Fearlessness				.026 (.021)
mPPI-SF Narcissism				.248 (.230)***
APSD Narcissism				.693 (.300)***
Model $F$	10.23***	40.05***	36.73***	59.75***
Model $R^2$	.11	.48	.50	.66
$\Delta R^2$		.36	.02	.16

<sup>1</sup>Dummy coded with the males as the excluded category.

<sup>2</sup>Dummy coded with Whites as the excluded category.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

The objective was to partial out the amount of variance that the range of independent variables would account for in the self-control scale as an interval level variable while controlling for each successive block described above. As shown in Table 3, Model 1 accounted for 11% of the variance in self-control with female gender ( $b = 1.97$ ,  $\beta = .082$ ,  $p < .01$ ), head injury ( $b = 3.05$ ,  $\beta = .146$ ,  $p < .001$ ), and previous diagnosis of mental health disorder ( $b = 3.19$ ,  $\beta = .197$ ,  $p < .001$ ) being significant predictors. Adding psychiatric symptoms in Model 2 dramatically increased the amount of variance over and above the previous set of independent variables ( $\Delta R^2 = .36$ ) with anxiety ( $b = .299$ ,  $\beta = .174$ ,  $p < .001$ ), obsessive-compulsive ( $b = .377$ ,  $\beta = .251$ ,  $p < .001$ ), and paranoid ideation symptoms ( $b = .404$ ,  $\beta = .235$ ,  $p < .01$ ) driving the increased variance. Although prior victimization experiences and lifetime substance use were significantly positively related to self-control in Model 3, the incremental variance added in this step was small ( $\Delta R^2 = .02$ ). Finally, the addition of personality variables related to psychopathy features added a significant amount of variance in the final model ( $\Delta R^2 = .16$ ). At this point the final model is accounting for a robust 66% of variance in self-control. Anxiety and obsessive-compulsive psychiatric symptoms remained significant drivers with the addition of guiltlessness ( $b = .377$ ,  $\beta = .251$ ,  $p < .001$ ) and Narcissism as measured by both the mPPI-SF ( $b = .377$ ,  $\beta = .251$ ,  $p < .001$ ) and the APSD ( $b = .377$ ,  $\beta = .251$ ,  $p < .001$ ) adding incremental variance over and above previous variables. Notably, African-Americans had significantly (inversely) lower mean scores compared with Whites. This is consistent with previous research on ethnic differences in juvenile offenders (Vaughn, Wallace, Davis, Fernandes, & Howard, 2007).

### Exploratory Tree Analyses

Results from the first CHAID tree analysis (shown in Figure 1) indicate that Narcissism, a self-centered exploitive interpersonal style, as measured by the mPPI-SF, formed the first split into seven parent nodes or branches based on the distribution of scores on this factor. Scores at both low (Nodes 1 and 2) and high (Nodes 6 and 7) ends terminated or ended classification of participants. Combined, Nodes 1 and 2 were comprised of 152 youths (21.1%) with low scores on both the self-control and narcissism measures. Conversely, 136 youths (18.9%) possessed high scores on both, demonstrating the convergence of low self-control and high levels of self-centered interpersonal relations. The middle range of self-control and mPPI-SF narcissism scoring youth ( $N = 431$ , 60.0%) were split into six more nodes based upon moderate scores on anxiety and narcissism as measured by the APSD. To illustrate the difference between Nodes 1 and 7, a Cohen's  $d$  effect size was calculated using mean and standard deviation scores on self-control. The resulting difference was a substantial 2.88 standard deviation units ( $d = 2.88$ ).

Next, we attempted to refine the initial classification (Figure 1) by employing cut scores based on one standard deviation above and below the mean on the normally distributed self-control scale. This resulted in four groupings: high self-control, mid-high self-control, mid-low self-control and low self-control. As in Figure 1, the initial split was based on the strongest predictor, which was mPPI-SF narcissism ( $\chi^2 = 334.19$ ,  $p < .001$ ). As revealed in Figure 2, the preponderance of participant

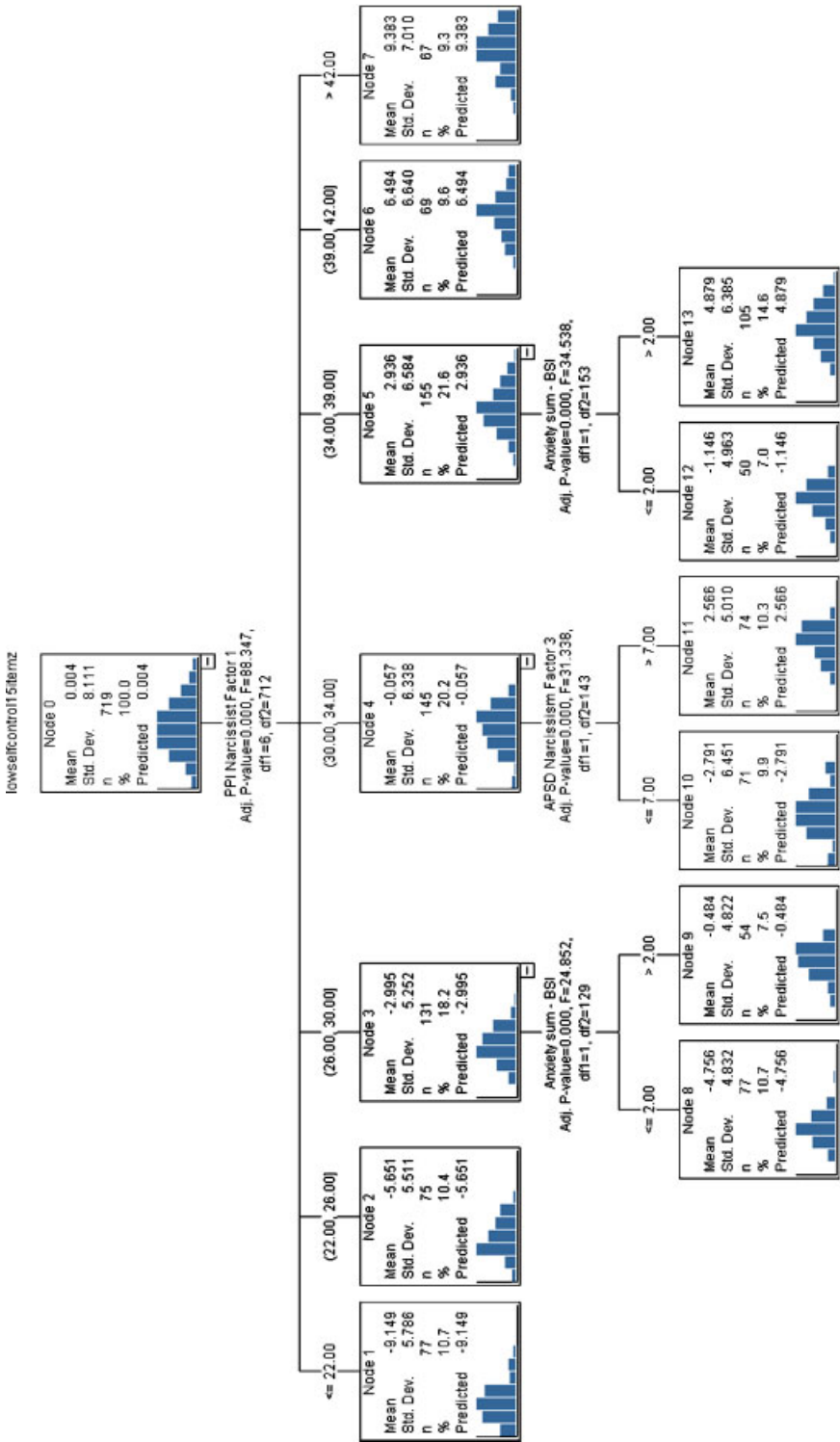


Figure 1. Results of tree analysis with self-control scale.lowselfcontrol15itemz = self-control scale (dependent variable). This figure is available in colour online at [www.interscience.wiley.com/journal/bsl](http://www.interscience.wiley.com/journal/bsl)



Figure 2. Results of tree analysis with cut score on self-control scale. lowselfcontrol15itemz (banded) = self-control scale (dependent variable) with cut scores at 1 standard deviation above and below the mean. This figure is available in colour online at [www.interscience.wiley.com/journal/bsl](http://www.interscience.wiley.com/journal/bsl)

scores in Nodes 1 and 2 were relatively high in self-control, with only four (3.15) of Node 3 being split into Nodes 8 and 9 by anxiety scores ( $\chi^2 = 30.86, p < .001$ ). Youths scoring one standard deviation above the mean (low self-control) were split into Nodes 5–7 based on high scores on mPPI-SF narcissism. A total of 66 youths with low self-control were classified by mPPI-SF narcissism scores. There were, however, 12 youths with low self-control and moderate scores on the mPPI-SF who were further classified into Nodes 10 and 11 based on APSD narcissism scores ( $\chi^2 = 24.74, p < .001$ ). Remaining low self-control youths ( $N = 36$ ) were further classified by scores on anxiety into Node 13 and then by lifetime substance use ( $\chi^2 = 9.89, p < .001$ ) into termination at Nodes 14 and 15.

### Overlap between Narcissistic Traits and Self-control

Given the importance of classifying self-control scores based on narcissism factor, we generated an AUC-ROC graph to assess the overlap between both narcissism factors and low self-control, again utilizing the one standard deviation above the mean cut score. As displayed in Figure 3, both the mPPI-SF and APSD narcissism factors overlapped significantly with classifying low self-control. Narcissism derived from the mPPI-SF was somewhat more sensitive compared with APSD narcissism, thus supporting CHAID analyses. The two measures showed no overlap in the asymptotic 95% confidence interval, suggesting dissimilarity in performance (see Table 4). Area under the curve results for the mPPI-SF narcissism were 84.2% (AUC = .842, SE = .018,  $p < .001$ ) and 73.8% (AUC = .738, SE = .025,  $p < .001$ ) for the APSD narcissism factor.

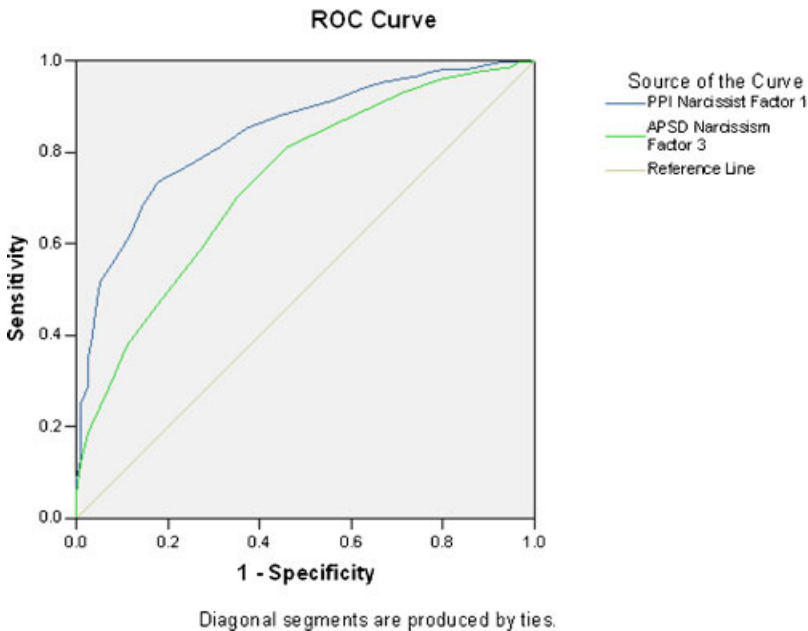


Figure 3. AUC-ROC results assessing overlap between narcissism factors and low self-control. This figure is available in colour online at [www.interscience.wiley.com/journal/bsl](http://www.interscience.wiley.com/journal/bsl)

Table 4. Area under the curve (AUC) results assessing overlap between narcissism factors and low self-control

Test variables	Area	S.E.	Significance	95% C.I.
mPPI-SF Narcissism	.842	.018	<.001	.806–.878
APSD Narcissism	.738	.025	<.001	.690–.786

Null hypothesis: true area = 0.5.

## DISCUSSION

Previous research on the construct of self-control is limited with respect to its relationships with other forms of psychopathology, such as psychiatric symptomatology and personality variables reflective of psychopathy. In the current regression analyses, a significant proportion of variance in self-control was found in successive models, including an *R*-square of 66% in the full model. Symptoms of anxiety including obsessive-compulsion and psychopathy factors of narcissism (both APSD and mPPI-SF) and guiltlessness were important drivers of the results. CHAID analyses also supported regression findings by visually revealing the importance of narcissism and anxiety in classifying self-control. The AUC-ROC analyses of narcissism factors showed significant overlap with low self-control. Overall, these findings support the conceptualizations of psychopathy that involve a strong interpersonal domain comprised of aggressive social relations, manipulation, rebelliousness, self-centeredness, and a tendency to externalize blame. More importantly, the current findings point to the importance of these variables in better understanding the construct of self-control as it is currently used in criminology (Gottfredson & Hirschi, 1990). To be sure, self-control is closely connected with psychopathology, specifically narcissism, and is a much broader construct than has been reported in the criminological literature. Indeed, self-control is likely subsumed by narcissism. Present study findings also add depth to the construct of self-control by showing that there are linkages between it and other individual-level constructs, such as narcissism and psychopathy, which are important ingredients in understanding antisocial conduct.

Although this study bolsters the notion that narcissistic traits and anxiety are useful for understanding self-control, it does not mean that exclusive attention to these traits is the only ingredient necessary for advancing self-control theory. Instead, these traits may be important ingredients as part of a nomological network (see, e.g., Lynam, 1997; Salekin *et al.*, 2005; Salekin, Trobst, & Krioukova, 2001; Widiger & Lynam, 1998) of variables including genetic, neurobiological, psychological, and sociological ones that contribute to understanding impulse control problems. Indeed, the following limitations should be considered to not only understand the findings in their proper context but also bear in mind for future research.

First, the measure of self-control was a 15-item scale that was not subjected to confirmatory methods and is clearly not capturing the full breadth of self-control. The most commonly used measure of self-control in criminological research (Grasmick *et al.*, 1993) was not available in the survey instrument. Although the Grasmick scale has been called into question (DeLisi, Hochstetler, & Murphy, 2003; Higgins, 2007; Marcus, 2003, 2004), it has nevertheless been shown to be a valid and reliable measure of self-control. Further research is needed to assess the

psychometric properties of the current self-control scale. Similarly, some measures had less than excellent alpha reliabilities, which is another limitation.

Second, findings should be interpreted cautiously given the limitation of this cross-sectional study design and the lack of temporal ordering necessary to help reveal causal relationships. For instance, it could be argued that self-control trait score durability and changes in psychiatric symptoms could be induced based on the incarceration experience. In order to examine this notion, equal percentile groupings of youths based on months spent in custody were compared across self-control and psychiatric symptom scores. Results using multiple cut-point variations including one month intervals showed no statistically significant mean score differences between these various groupings. Although inconclusive, this does suggest that the incarceration experience is not confounding study results.

Third, given the importance of narcissism, how does it relate to broader topics in psychopathology, such as psychiatric symptoms and psychopathy? Much theorizing about psychopathy has involved a primary and secondary typology (e.g., Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003). Primary psychopathy has as its hallmark a deficient affective experience and cold-heartedness that is relatively free of psychiatric distress, particularly anxiety. Secondary psychopathy is characterized by similar patterns of antisocial behavior as primary psychopathy, yet the personality disorder is co-morbid with anxiety, depression, and other mental health conditions. Given this potential heterogeneity and implications for etiology and treatment, follow-up studies should test various configurations of psychopathy and antisocial behavior that involve measures of self-control, narcissism, cold-heartedness, and mental health disorder. Since there are mixed findings about the place of anxiety in relation to psychopathy (Hale, Goldstein, Abramowitz, Calamari, & Kosson, 2004), especially among juveniles (Salekin et al., 2005), future research should include multiple measures of anxiety to distinguish between trait anxiety and low fear (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999). One way to do this would be to include physiological indicators such as skin conductance tests and functional magnetic resonance imaging.

There may be different pathways that lead from narcissism to low self-control and ultimately to antisocial behavior. For example, Lynam and Miller (2004) in their attempt to disaggregate the construct of impulsivity confirmed a four factor model of impulsivity (urgency, lack of premeditation, lack of perseverance, sensation seeking) and examined relationships between these factors and measures of substance abuse and delinquency, psychiatric disorders, social information processing vignettes, and laboratory indices. It seems likely that narcissistic traits interact with these factors in the expression of antisocial behavior. For example, high narcissism may interact with high urgency in response to negative situational encounters, leading to retaliatory interpersonal violence.

Finally, Wright and Beaver (2005) recently called into question the notion that parental socialization processes account for self-control. Using data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999, Wright and Beaver found that the effects of parenting on self-control were rendered spurious once genetic factors were considered. Similarly, the current study found that the bulk of variation in low self-control was explained by psychiatric symptoms and psychopathic personality traits—factors with substantial genetic underpinnings. Hopefully, criminological investigations of self-control will incorporate comparable

constructs from related fields of study to arrive at a more complete understanding of the effects of this important individual-level construct and crime.

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**APPENDIX. CORRELATIONS AMONG STUDY VARIABLES**

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Anxiety	—													
2. Depression	.69***	—												
3. Obsessive-compulsive	.72***	.67***	—											
4. Paranoid ideation	.63***	.64***	.64***	—										
5. Phobic anxiety	.68***	.56***	.54***	.54***	—									
6. Psychoticism	.69***	.75***	.67***	.66***	.58***	—								
7. Somatization	.72***	.60***	.64***	.59***	.59***	.61***	—							
8. Victimization index	.22***	.20***	.27***	.30***	.22***	.26***	.26***	—						
9. Traumatic experiences	.36***	.33***	.37***	.44***	.33***	.40***	.36***	.40***	—					
10. Lifetime substance use	.26***	.25***	.33***	.22***	.15***	.26***	.17***	.24***	.28***	—				
11. Guiltlessness	-.09*	-.06	-.01	-.19	-.06	.07	-.07	.01	-.10**	.21***	—			
12. Fearlessness	.24***	.20***	.22***	.16***	.06	.24***	.16***	.82	.14***	.28***	-.06	—		
13. mPPI-SF Narcissism	.47***	.47***	.52***	.54***	.54***	.47***	.40***	.30***	.43***	.28***	.04	.33***	—	
14. APSD Narcissism	.23***	.81***	.26***	.34***	.24***	.18***	.24***	.15***	.15***	.92***	.16***	.13***	.50***	—

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .