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I am submitting herewith a thesis written by Melissa Kathryn Hunt entitled "The Assessment of Psychopathic Traits and Risk-Taking Using the Balloon Analog Risk Task (BART)." I have examined the final paper copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

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THE ASSESSMENT OF PSYCHOPATHIC TRAITS AND RISK-TAKING USING THE BALLOON ANALOG RISK TASK (BART)

A Thesis

Presented for the

Master of Arts

Degree

The University of Tennessee, Knoxville

Melissa Kathryn Hunt

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DEDICATION

To my husband and my family, whose constant support and encouragement have inspired me to set my goals high and strive daily to attain them.

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ABSTRACT

Continuing a program of research assessing the utility of the Behavioral Analog Risk Task (BART, Lejuez et al, 2002) as a measure of risk taking, the BART was administered to a non-forensic sample of individuals high and low in self-reported psychopathy. Inter-relations of BART performance with measures of psychopathy and impulsivity were examined, with an emphasis on exploring the predictive validity of self-report measures on overt risk-taking behavior. Following completion of the *Self-Report Psychopathy Scale* (SRP-II; Hare, 1991), *Barratt Impulsiveness Scale* (BIS; Barratt, 1985), and the *Authority Problems* subscale (Pd2) of the *MMPI-2* (Harris & Lingoes, 1955), physiological data were collected while participants completed the BART. Results supported the primary hypothesis that higher self-reported psychopathy (SRP-II Factor II: Antisocial Behavior) is predictive of increased risk-taking behavior on the BART. Findings also supported the notion of behavioral symmetry across forensic and non-clinical samples of individuals high in psychopathic traits, revealed interesting gender differences in self-reported psychopathy, and provided psychometric support for both the BART and SRP-II assessment strategies. Future research directions are presented.

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CHAPTER 1

INTRODUCTION

Individuals with psychopathic traits are described as irresponsible, unempathic, and generally deviant in terms of emotional and interpersonal development (Hare, 1980, 1991; Gacono, 2000). Psychopathy also is positively associated with impulsivity, sensation-seeking, and risk-taking (Zuckerman, Eysenck, & Eysenck, 1978), the latter concept defined as actions that simultaneously involve a high potential for punishment and opportunity for reward (Leigh, 1999). Although risk-taking encompasses a broad range of behaviors (Byrnes, Miller, & Schafer, 1999; Leigh, 1999) those that place individuals at risk for deleterious health or safety consequences (e.g., sexually transmitted diseases, drug dependence) have received particular attention in the literature (e.g., DiClemente, Hansen, & Ponton, 1995; Zuckerman, Ball, & Black, 1990). Compared with non-psychopathic individuals, research generally has shown that psychopathic individuals more frequently engage in sensation-seeking and high-risk behaviors (Blackburn & Maybury, 1985; Thornquist & Zuckerman, 1995; Zuckerman, 2002; Zuckerman, Eysenck, & Eysenck, 1978).

Among individuals with psychopathic traits, risk assessment typically has focused on whether these individuals are more or less likely to engage in violent behaviors. For example, Hare (1999) indicated that psychopathy was the most reliable predictor of recidivism among sex offenders. Similarly, Brown and Forth (1997) reported that compared with nonpsychopathic rapists, psychopathic rapists were more likely to have a

history of nonsexual criminal offenses. Interestingly, beyond such research that explores the association of psychopathy and violent behavior, limited data address the context generalizability of risk-taking behaviors among individuals with psychopathic traits. This situation is problematic in that more comprehensively assessing the stability of risk-taking behaviors might allow greater understanding of the phenomenology of psychopathy, improved prediction of individuals at risk for committing a range of delinquent or antisocial behaviors, and simultaneously might serve as a catalyst for the development of novel and potentially more effective treatment interventions.

Investigating the relation between risk-taking and psychopathic traits requires an understanding of methods used to assess dimensions of psychopathy. The most common measure of psychopathic behaviors is the clinician-administered Psychopathy Checklist (Revised) (PCL-R; Hare, 1980, 1991a). Factor analyses of the PCL-R generally reveal a two-dimensional factor structure of psychopathy (Hare, Hart, & Harpur, 1991; Harpur, Hakstian, & Hare 1988; Harpur, Hare, & Hakstian, 1989; but see Cooke & Michie, 2001), a model also demonstrated with the Self-Report Psychopathy Scale-II (SRP-II; Williams, Nathanson, & Paulhus, 2002). An emotional detachment factor (Factor I) reflects interpersonal and affective characteristics such as egocentricity, lack of remorse, callousness, lack of emotionality or empathy, superficial charm, and a grandiose sense of self-worth (Hare et al, 1991). This factor has been positively associated with decreased anxiety (Harpur et al, 1989). In contrast, Factor II reflects chronically unstable and antisocial behaviors that include impulsivity, irresponsibility, and thrill-seeking. Factor II correlates higher with a diagnosis of Antisocial Personality Disorder (Harpur et al, 1989), criminal behavior, and higher self-reports of antisocial behavior (Hare, 1991). Higher

Factor II scores also are associated with substance abuse (Smith & Newman, 1990), suicidal behaviors (Verona, Patrick, & Joiner, 2001), emotionally laden acts of violent aggression, and prison recidivism (Bonta, Law, & Hanson, 1998; Hare, 1999; Hare, Clark, Grann, & Thornton, 2000; Hemphill, Hare, & Wong, 1998; Salekin, Rogers, & Sewell, 1996). Comparatively, individuals high in Factor I engage in more instrumental or premeditated aggressive behaviors (Patrick & Zempolich, 1998; Woodworth & Porter, 2002) and may be less likely to benefit from psychotherapy (Hobson, Shine, & Roberts, 2000; Seto & Barbaree, 1999).

In addition to the PCL-R and SRP-II, other measures of psychopathic traits include the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), the Cleckley Psychopathy Scale (Levenson, 1990), the MMPI-2 Pd subscales (Butcher, Graham, Williams, & Ben-Porath, 1990) and the Personality Diagnostic Questionnaire-Revised (PDQ-R; Hyler & Rieder, 1987). Although the psychometric properties of these measures generally are adequate, and in the case of the PCL-R quite strong (Brandt et al., 1997; Hare et al., 1990; Salekin et al. 1996), a number of limitations are inherent in such indices. First, the PCL-R requires significant training and expertise to administer, is time-consuming, and requires a large amount of collateral information to complete. Second, the veracity of self-report may be limited by any perceived negative consequences of reporting risky behavior, a significant consideration among individuals with psychopathic traits who may be prone to "faking good" or malingering (Rogers & Cruise, 2000). Third, some respondents may lack the insight or ability to provide accurate accounts of their behavior (Ladouceur et al, 2000). Finally, because these instruments generally include retrospective questions assessing the frequency of asocial behaviors or inquire about

current attitudes and beliefs, such tools may be considerably less useful (than a direct behavioral measure) in predicting the emergence of high-risk behaviors (Andrew & Cronin, 1997; Greene et al, 2000; Lejuez et al, 2002).

As risk taking is a fundamental aspect of psychopathy and antisocial personality disorder, and in an effort to better prevent or ameliorate potential negative outcomes associated with risk taking, researchers have attempted to better understand this behavioral phenomenon. Consequently, there has been much focus on developing reliable and valid assessment approaches for measuring risk-taking behaviors, largely through use of self-report instruments that assess sensation-seeking (Zuckerman, Eysenck, & Eysenck, 1978), venturesomeness (Eysenck, Pearson, Easting, & Allsopp, 1985), impulsivity (Barratt, 1985; Eysenck et al, 1985), and deficits in behavioral constraint (Tellegen, 1982). Although these constructs clearly overlap with risk-taking, none fully capture its broad, multidimensional nature, and currently there exists no universally accepted measure for the assessment of risk-taking (Lejuez et al, 2002).

Several behavioral risk tasks have been developed that include the delay discounting procedure (Petry, 2001), the gambling task (Grant, Contoreggi, & London, 2000), a computerized risk-taking task (Rogers et al, 1999), behavioral choice tasks (Mitchell, 1999), and a card task simulating real-life decision-making (Bechara, Damasio, Damasio, & Anderson, 1994). However, convergent validity of these tasks with self-report measures of risk-taking, sensation seeking, and impulsivity has not consistently been demonstrated (Bentler & McCain, 1976; Mitchell, 1999; Petry, 2001; Stuart, 1998; White et al, 1994). Additionally, there is limited evidence for the external validity of these tasks as they relate to a range of risk-taking behaviors observable outside the

laboratory (Gullone & Moore, 2000; Jessor & Jessor, 1977; Pack, Crosby, & St. Lawrence, 2001).

The Balloon Analog Risk Task (BART; Lejuez et al, 2002) is a novel behavioral measure of risk taking that was designed to address limitations of self-report measures and to maximize the breadth of risk-taking assessment. To date, construct validity of the BART has been demonstrated via strong associations with a variety of real-world risk-taking behaviors including drug use (i.e., nicotine and ecstasy), gambling, unprotected sexual intercourse, seat belt violations, and theft (Aklin, Lejuez, Zvolensky, Kahler, & Gwadz, in press; Lejuez et al., 2002; Lejuez, Aklin, Jones et al., 2003; Lejuez, Aklin, Zvolensky, & Pedulla, 2003; Lejuez, Simmons, Aklin, Daughters, & Dvir, in press). The current study extended upon this literature and examined the utility of the BART as a measure of risk taking among (non-forensic) individuals high and low in self-reported psychopathy. Inter-relations of BART performance with measures of psychopathy and impulsivity were examined, with an emphasis on exploring the predictive validity of self-report measures on risk-taking behavior. Psychopathic traits were assessed using the SRP-II and the Authority Problems subscale (Pd2) of the MMPI-2 (Harris & Lingoes, 1955). Whereas the Authority Problems subscale assessed a specific aspect of psychopathy related to risk-taking (Heaven, 1989), the SRP-II was used to capture the two broader dimensions of psychopathy. A measure of impulsivity (i.e. the *Barratt Impulsiveness Scale*) was employed because of the demonstrated relationship between impulsivity and risk-taking (Lejuez et al., 2002; Whiteside & Lynam, 2003). Because individuals with psychopathic traits engage in high-risk (antisocial) behaviors more frequently than nonpsychopathic individuals, our primary hypothesis was that these

individuals also might exhibit a propensity toward risk-taking on a task unrelated to criminal behaviors (the BART), thus exhibiting a more stable behavioral phenomenon that generalizes across contexts. Additionally, given equivocal data on the utility of the PCL-R and the understudied nature of the SRP-II among female samples (Salekin, Rogers, & Sewell, 1997; Strachan, Williamson, & Hare, 1990), both self-reported psychopathy and behavioral risk-taking were examined as a function of gender.

CHAPTER 2

METHODS

Participants

Participants included 80 university undergraduate students at the University of Tennessee. The mean age of participants was 18.9 years (*SD* = 3.0). Sixty-two percent (*n* = 58) were female. Ethnic distribution was as follows: 79 percent Caucasian (*n* = 63), 13 percent African-American (*n* = 11), 5 percent Asian (*n* = 4), and 3 percent Latino (*n* = 2).

Assessment Instruments

The Self-Report Psychopathy Scale – Revised

The *Self-Report Psychopathy Scale - Revised* (SRP - II; Hare, 1985; 1991a, 1991b) is a 60-item self-report measure of psychopathic traits. The instrument was developed as an analogue to the clinician administered Psychopathy Checklist – Revised (PCL-R; Hare, 1991a). Factor analyses of the SRP-II have revealed a two-factor structure, described previously (Williams, Nathanson, & Paulhus, 2002). The SRP-II has strong predictive validity for delinquency (Williams, Nathanson, & Paulhus, 2002) and correlates moderately (and as well as MCMI-II APD scale scores) with DSM-IV Antisocial Personality Disorder criteria (Widiger et al., 1996; r = .41) and the PCL-R (Hare, 1991b; r = .54). Convergent validity of the SRP-II is supported by significant correlations with MMPI-2 Psychopathic Deviate subscales (Lilienfeld, 1999), the Psychopathic Personality Inventory (Lilienfeld & Andrews, 1996), peer ratings on

Cleckley's psychopathy criteria, and Levenson's primary and secondary psychopathy scales (Levenson, Kiehl, & Fitzpatrick, 1995). Higher scores on the SRP-II have been found to be associated with increased lying and narcissistic behavior, as well as decreased empathy (Zagon & Jackson, 1994). Coefficient alpha for the SRP-II was .83 in the present study.

The Barratt Impulsiveness Scale

The *Barratt Impulsiveness Scale* (BIS; Barratt, 1985) is a 34-item self-report measure of impulsivity. The scale includes questions that address cognitive impulsivity (making quick cognitive decisions), motor impulsivity (acting without thinking), and nonplanning impulsivity (lack of concern about the future). Barratt (1985) demonstrated excellent internal consistency for the measure with alpha coefficients ranging from .89 to .92. In the present study, impulsivity was calculated by summing the three subscales.

Authority Problems

Authority Problems (Pd2) is the second of five subscales developed by Harris and Lingoes (1955) for the Psychopathic Deviate Scale (Scale 4) of the Minnesota Multiphasic Personality Inventory (MMPI). The items used for the present study are from the latest version of the instrument, the MMPI-2. The pd2 subscale correlates higher than other Pd subscales with most measures of antisocial personality styles and may be a better indicator of primary psychopathy (Friedman et al, 2001).

The Balloon Analog Risk Task (BART)

The *Balloon Analog Risk Task* (BART) is a computer-administered assessment of risk-taking behavior. In this task, a small, simulated balloon and balloon pump are presented on a computer screen, along with a reset button labeled "Collect $$$" and a

permanent money earned display labeled "Total Earned." Participants were asked to use the computer mouse to click the balloon pump to inflate the balloon to a desired level. Participants were given no detailed information about the probability of a balloon exploding, but were told that "at some point each balloon will explode and this explosion could occur as early as the first pump or as late as the point at which the balloon would expand to fill the entire computer screen." Accordingly, the balloon was set to explode on a VR schedule and risk-taking (i.e. continued pressing of the pump) was rewarded to a variable level whereby further risk-taking resulted in an adverse outcome (i.e. explosion of the balloon and loss of accrued money). After each balloon explosion or money collection, the participant's exposure to that balloon ended and a new balloon appeared. Following instructions and practice trials, the experimental block was administered until 30 trials were completed.

The number of balloon pumps on the BART was the primary dependent measure. Adjusted values were used for all analyses. These adjusted values, defined as the average number of pumps excluding balloons that exploded, were preferable because the number of pumps was necessarily constrained on balloons that exploded, thereby limiting between-participant variability in the absolute averages.

Psychophysiological Measurement

Heart rate (HR) and skin conductance level (SCL) were collected using a Biopac MP 100 data collection device at a sample rate of 10 samples/s across all channels using Biopac's Acqknowledge Software. SCL (in microsiemens) was obtained using the Biopac GSR100B electrodermal activity amplifier with the TSD103A Ag-AgCl

electrodes placed on the middle phalanges of the middle and ring fingers. Raw electrocardiogram data were collected using the Biopac ECG100B Electrocardiogram amplifier, with disposable Ag/AgCl electrodes aligned in a standard configuration (right and left sides of the lower rib cage and just below the left clavicle). These raw data were converted to obtain HR in beats per minute.

Procedure

Participants were part of a larger study examining relationships among anxiety, psychopathic traits, and physiological responsiveness to guided imagery (Bare, Hopko, & Armento, in press). Following informed consent procedures, participants completed questionnaires in randomized order: *Self-Report Psychopathy Scale* (SRP-II; Hare, 1991), *Barratt Impulsiveness Scale* (BIS; Barratt, 1985), and the *Authority Problems* subscale (Pd2) of the *MMPI-2* (Harris & Lingoes, 1955). After completion, participants were asked to relax for a 5-min baseline period during which heart rate and skin conductance data were recorded. Following collection of baseline physiological data, the BART was administered while heart rate and skin conductance were recorded.

CHAPTER 3

RESULTS

Descriptive Statistics

Self-report measures. Males (M = 79.7, SD = 10.0) reported significantly more psychopathic traits than females (M = 67.2, SD = 13.1) on the SRP-II [F (1,73) = 13.1, p < .01, η^2 = .15]. Males also scored significantly higher than females on both the emotional detachment [males: M = 34.7, SD = 5.6; females: M = 29.52, SD = 5.98; F (1,73) = 10.2, p < .01, η^2 = .12] and antisocial behavior factors of this instrument [males: M = 45.0, SD = 9.3; females: M = 37.5, SD = 11.2; F (1,74) = 6.4, p < .01, η^2 = .08]. Consistent with this finding, a significant gender difference on the MMPI Pd2 scale was observed, with males (M = 3.5, SD = 1.5) reporting more authority problems than females [M = 2.5, SD = 1.1; F (1,73) = 10.5, p < .01, η^2 = .13]. The total sample mean for the BIS was 66.9 (SD = 10.0), with males (M = 70.3, SD = 8.5) and females (M = 65.8, SD = 10.3) not differing significantly in self-reported impulsivity.

Bart performance. Mean number of adjusted balloon pumps on the BART for the entire sample was 35.0 (SD = 14.3). In general, there was a trend for males (M = 40.8, SD = 15.1) to accrue a greater number of balloon pumps than females [M = 33.4, SD = 13.6; F (1,74) = 3.8, p = .06, η^2 = .05]. Mean number of balloon explosions for the total sample was 9.4 (SD = 4.1). Males (M = 10.8, SD = 4.3) and females (M = 9.1, SD = 4.0) did not differ significantly in number of balloon explosions (F (1,74) = 2.5, p = .12, η^2 = .04).

Bivariate Correlations

Correlations among self-report measures are presented in Table A-1. As predicted, there was a significant positive correlation between self-reported psychopathy (SRP-II Total Score) and number of balloon explosions ($r = 0.28, p = .01$). Antisocial behavior (SRP-II Factor II) correlated significantly with both number of balloon pumps (BART adjusted, $r = 0.23, p < .05$) and number of balloon explosions ($r = 0.31, p < .01$). In contrast, emotional detachment (SRP-II Factor I) did not correlate significantly with performance on the BART. Neither antisocial behavior nor emotional detachment correlated significantly with physiological indices (hr and sc). Interestingly, self-reported impulsivity also was not significantly correlated with risk-taking as measured by the BART, a finding supporting the divergent validity of these measures and also consistent with recent research (Lejuez et al., in press; Lejuez, Aklin, & Jones, 2003).

Regression Analyses

Simultaneous regression analyses were conducted to determine the relative value of gender, impulsivity, authority problems, emotional detachment, and antisocial behavior scores in predicting BART performance. Gender was included in analyses given the strong (bivariate) relationship with self-reported psychopathy and marginal relationships with BART performance. For both regression analyses, collinearity statistics were within the acceptable range [tolerance values $R = .64$ - $.83$, variable inflation factor (VIF) $R = 1.20$ - 1.57; Hair, Anderson, Tatham, & Black, 1995].

The first regression equation was a full model including gender and all self-report measures as predictors of adjusted number of balloon pumps on the BART. Results of

this analysis indicated that the full model did not predict adjusted number of balloon pumps significantly better than a model containing no predictors [$R^2 = .11$, $F(5, 68) = 1.86$, $p = .13$]. Standardized beta coefficients are presented in Table A-2. Because this model indicated that the SRP-II antisocial behavior factor was the only predictor variable accounting for significant variance, a follow up simple regression (restricted model) was conducted to specifically assess the predictive power of the antisocial behavior factor. Since gender was highly related to self-reported psychopathy (i.e., SRP-II and pd2) and moderately associated with BART performance, gender was included as a predictor variable to partial out the effects of gender and antisocial behavior on adjusted balloon pumps. Results indicated that the restricted model (antisocial behavior and gender) significantly predicted balloon pumps [$R^2 = .09$, $F(2,73) = 3.65$, $p < .05$]. In this restricted model, neither the antisocial behavior factor [$t(73) = 1.85$, $p = .07$, $\beta = .22$] nor gender [$t(73) = -1.37$, $p = .18$, $\beta = -.16$] accounted for significant unique variance, although the former was marginally significant. A model comparison indicated that the full model did not account for significant variance in number of balloon pumps beyond that explained by SRP-II (antisocial behavior) and gender in the restricted model [$F(3, 69) = .54$].

When the full model was used to predict number of balloon explosions on the BART, results indicated that it did not predict balloon explosions significantly better than a model containing no predictors [$R^2 = .13$, $F(5, 68) = 2.10$, $p = .08$]. Standardized beta coefficients are presented in Table A-3. As in the previous analysis, the antisocial behavior factor accounted for significant unique variance. Thus, a simple regression was conducted to specifically assess the predictive power of antisocial behavior on number of

balloon explosions. Results of the restricted analysis containing antisocial behavior and gender indicated that the model significantly predicted BART explosions [$R^2 = .11$, F (2, 73) = 4.96, $p = .01$]. Although gender did not account for unique variance in predicting number of explosions on the BART [t (73) = -.82, $p = .41$, $\beta = -.09$], increased antisocial behavior was significantly associated with increased balloon explosions [t (73) = 2.68, $p < .01$, $\beta = .31$]. A model comparison revealed that the full model did not account for significant variance in number of balloon explosions beyond that accounted for in the restricted model [F (3, 69) = .54]. Accordingly, a regression model containing only antisocial behavior and gender is as effective in predicting *both* adjusted number of balloon pumps and number of balloon explosions as a full model containing additional predictors. Thus, in conceptualizing BART performance, the most parsimonious explanation involves a restricted model whereby gender, and more importantly antisocial behaviors are critical toward understanding behavioral risk-taking.

Physiological Responsivity

Physiological response magnitudes were calculated for the BART by subtracting baseline skin conductance and heart rate from the mean skin conductance and heart rate recorded during the task (i.e. mean – baseline = response magnitude). Accordingly, each individual had an index of response magnitude for both skin conductance and heart rate, with larger values indicating increased physiological responding. Because the antisocial behavior factor was designated as the primary predictor of BART performance, two simple regression analyses were conducted using the antisocial behavior factor as the predictor variable and response magnitude (skin conductance and heart rate) as the

criterion variable. Antisocial behaviors did not account for significant variance in predicting either heart rate [F (1, 74) = 2.40, p = .12, β = .18] or skin conductance [F (1, 74) = 0.04, p = .84, β = .02] response magnitudes during the BART.

CHAPTER 4

DISCUSSION

Results of this study are consistent with the widely accepted notion that psychopaths exhibit behavioral patterns divergent from those of non-psychopathic individuals (Blair, Jones, Clark, & Smith, 1997; Fowles, 2000; Levenston, Patrick, Bradley, & Lang, 2000; Patrick, Cuthbert, & Lang, 1994). Importantly, present findings support the developing research that theoretical models of psychopathy may generalize to non-forensic samples. For example, in the few studies examining the phenomenology of psychopathy within non-forensic cohorts, college students who were less physiologically reactive during aversive tasks exhibited decreased anxiety and were more likely to be impulsive, aggressive, and nonconforming (Block, 1957; Jones, 1950, 1960). Researchers also have reported depressed startle responses and electrodermal hyporeactivity (Bare, Hopko, & Armento, in press; Lynam, Whiteside, & Jones, 1999) as well as increased substance use, criminal activity, and inappropriate interpersonal behaviors among students with psychopathic characteristics (Forth, Brown, Hart, & Hare, 1996; Zagon and Jackson, 1994). Continuing to support symptomatic stability across psychopaths and non-clinical samples of individuals high in psychopathic traits, it is provocative that the present non-forensic sample exhibited substantial high-risk behavior on the BART. As alluded to earlier, this finding generally is consistent with observations of increased (real-world) risk behaviors exhibited by psychopaths, and thus justifies further exploration of whether theoretical models of the etiology and phenomenology of psychopathy

generalize toward non-criminal samples. In addition, given that most studies assessing psychopathy have used male criminal samples, findings in this study are noteworthy in that the majority of participants were younger, educated, Caucasian women with no history of criminal behavior.

Of equal importance, the results provide continuing support for the construct validity of the SRP-II (Bare et al., in press; Williams et al., 2002). Specifically, only the SRP-II antisocial behavior factor (which assesses *behavioral* correlates of psychopathy) was a significant predictor of risk-taking as measured by total number of balloon pumps and balloon explosions on the BART. Given that the full and restricted regression models essentially were equivalent in predicting BART performance, the most parsimonious explanation of behavioral risk-taking involves an increased propensity toward antisocial behaviors. Although somewhat less essential toward understanding risk-taking, considering marginal significance levels and moderate effect sizes, larger sample sizes likely would indicate increased risk-taking by male cohorts. Authority problems, self-reported impulsivity, and emotional detachment largely were unrelated to risk-taking behavior. In addition to supporting the construct validity of the SRP-II antisocial behavior factor, convergent validity of this factor with authority problems (Pd2) and impulsivity (BIS) was supported via moderate correlations with these measures. Discriminant validity of the SRP-II factors also was supported via significantly higher relations of the antisocial behavior factor with both self-reported impulsivity and BART performance (balloon pumps and explosions).

Another significant observation was that males and females significantly differed on self-reported emotional detachment and antisocial behaviors. Although it has been

shown that the SRP-II correlates moderately with its predecessor, the PCL-R, minimal and equivocal research has addressed the utility of either instrument with female samples. For instance, some researchers have noted comparable PCL-R scores across male and female forensic samples (Salekin, Rogers, & Sewell, 1997; Strachan, Williamson, & Hare, 1990) while others have identified gender differences in the factor structure (Salekin, Rogers, & Sewell, 1997) and gender bias in the appropriateness of individual items toward describing experienced behaviors and symptoms (Strachan et al., 1990). Louth, Hare, and Linden (1998) reported that psychometric properties and correlates of the PCL-R among female offenders generally were similar to those of male offenders. In their study of female prison inmates, however, 30% were diagnosed as psychopaths using the PCL-R, a much higher prevalence rate than reported among incarcerated male offenders (15 to 21%; Hare, 1991a). To our knowledge, the present investigation was the first to identify gender differences on the SRP-II. Indeed, because of the preliminary nature of this finding and the equivocal research associated with gender differences on the PCL-R, replication using both non-forensic and non-clinical female samples is necessary.

In assessing the relation of physiological reactivity and self-reported psychopathy, no significant association was identified, a finding somewhat discrepant from literature that links physiological hyporeactivity and psychopathic symptoms. For example, using a forensic cohort, Patrick et al. (1994) found decreased heart rate, skin conductance, and EMG related to the antisocial behavior component of psychopathy. Conversely, more recent findings with a non-clinical sample suggested that electrodermal hyporeactivity might be more related to the emotional detachment factor (Bare, et al., in press). As

highlighted in this latter article, it is probable that physiological responsivity largely is dependent on both sample characteristics (i.e., forensic vs. non-forensic) as well as stimulus context and outcome measurement. As such, one may speculate that a non-significant association between electrodermal hyporeactivity and BART performance suggests that within a non-forensic sample, a risk-taking task may be functionally different from other tasks that elicit hyporeactivity such as fear-induced imagery (Bare et al., in press). Indeed, the former task was strongly linked with the emotional detachment factor while BART performance was linked to the behavioral correlates of psychopathy. So although a behaviorally oriented experimental task may be inadequate toward eliciting differential physiological responsivity among individuals high in psychopathy, a more cognitively-based paradigm might be more effective. A more probable interpretation would be that the guided imagery task involved imagining vignettes describing psychopathic behaviors, which may be a more salient method of eliciting physiological change than a more "benign" task that is perhaps less related to actual psychopathic (or criminal) behaviors. Whether findings are a product of the (covert or overt) experimental manipulation, more specifically a function of stimulus properties regardless of administration method, and whether identified relationships generalize to forensic samples are questions that also merit further attention.

In summary, the paucity of research exploring the relations among psychopathic characteristics, behavioral risk-taking, and electrodermal hyporeactivity in non-forensic samples make the results of the study especially intriguing. Although (behavioral) psychopathic characteristics were associated with increased risk-taking, electrodermal hyporeactivity was not evident during the task—a finding potentially related to

experimental design issues. As indicated, theoretical and empirical consistencies with data obtained from forensic samples also were evident, although replication among both non-forensic and incarcerated samples clearly is warranted to better assess potential similarities and distinctions among these cohorts with respect to the phenomenology of psychopathy. Taken together, results indicate that the BART may be a valid and potentially more effective behavioral measure of risk-taking that resolves limitations associated with extant assessment strategies. For example, given the limited face validity of the BART relative to self-report measures of psychopathy and related constructs, individuals completing the BART may be substantially less likely to either "fake good" or malinger on this task, a problem inherent in the assessment of psychopaths (Rogers & Cruise, 2000). Second, this behavioral task may be a particularly appealing alternative for assessing adolescents, especially those who may be at high risk for developing conduct disorder problems. Extending toward forensic samples, it also would be intriguing to examine the discriminant validity of the BART in differentiating between individuals who meet diagnostic criteria for antisocial personality disorder and those who are considered psychopaths. Assessing the predictive validity of the BART as it relates to criminal activity and more specifically violent and economically detrimental crimes also would be worthwhile. Such programs of research will help to elucidate theoretical models and clinical correlates of psychopathy, which may result in increased understanding of the etiology, maintenance, and treatment of psychopathic behaviors.

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APPENDICES

Table A-1

Correlations Among Self-Report Measures, Physiological Reactivity, and the BART

	SRPF1	SRPF2	SRP Total	BIS	PD2	BART Adj.	BART Exp.	BART HR	BART SC
SRPF1	--								
SRPF2	.14	--							
SRP Total	.58**	.89**	--						
BIS	-.03	.52**	.40**	--					
PD2	.31**	.36**	.44**	.07	--				
BART Adj.	.02	.26*	.21	.08	.00	--			
BART Exp.	.04	.33**	.29*	.11	.02	.93**	--		
BART HR	.07	.18	--	-.13	.10	--	--	--	
BART SC	-.11	-.02	--	.00	.01	--	--	--	--

Note. SRP Factor I = *Self-Report Psychopathy Scale—II,* Factor I; SRP Factor II = *Self-Report Psychopathy Scale—II*, Factor II; SRP Total = *Self-Report Psychopathy Scale—II,* total score; BIS = *Barratt Impulsiveness Scale*; Pd2 = Authority Problems Subscale on the *MMPI—II*; BART Adj. = Adjusted number of balloon pumps on the BART; BART Exp. = Number of balloon explosions on the BART; BART HR = Mean heart rate during the BART – baseline heart rate; BART SC = Mean skin conductance during the BART – baseline skin conductance.

Table A-2

Predicting Adjusted Number of Balloon Pumps as a Function of Self-Report Measures

Independent Variable	Standardized Coefficient (β)	t	p
Gender	-.24	-1.85	= .07
Impulsivity	-.13	-.99	= .33
Authority Problems	-.16	-1.22	= .23
Emotional Detachment	-.06	.458	= .65
Antisocial Behaviors	.30	2.01	= .04

Note. Impulsivity = Barratt Impulsivity Scale, Authority Problems = Psychopathic Deviate Scale 2 of the MMPI, Emotional Detachment = Self-Report Psychopathy Scale-II Factor I, Antisocial Behaviors = Self-Report Psychopathy Scale-II Factor II.

Table A-3

Predicting Number of Balloon Explosions as a Function of Self-Report Measures

Independent Variable	Standardized Coefficient (β)	t	p
Gender	-.17	-1.30	= .20
Impulsivity	-.13	-1.01	= .32
Authority Problems	-.16	-1.25	= .21
Emotional Detachment	-.02	-.17	= .87
Antisocial Behaviors	.38	2.72	< .01

Note. Impulsivity = Barratt Impulsivity Scale, Authority Problems = Psychopathic Deviate Scale 2 of the MMPI, Emotional Detachment = Self-Report Psychopathy Scale-II Factor I, Antisocial Behaviors = Self-Report Psychopathy Scale-II Factor II.

VITA

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