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USING THR FFM TO UNDERSTAND AND INTEGRATE THE DEFICITS OF PSYCHOPATHY

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Abstract of Dissertation

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The Graduate School
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ABSTRACT OF DISSERTATION

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the College of Arts and Sciences at the University of Kentucky

By

Karen J. Derefinko

Lexington, Kentucky

Director: Dr. David T. R. Berry, Professor of Psychology

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Psychopathy is associated with several behavioral and psychophysiological deficits. Lynam (2002) has argued that the use of an overarching conceptualization of psychopathy can provide a parsimonious explanation of psychopathic pathology. The current study examined relations between tasks used to explore psychopathic pathology and dimensions from the Five Factor Model of personality. Undergraduate participants completed the NEO PI-R, the BART, a go/no-go task, an emotional morph task, and provided physiological responses to stimuli. While hypothesized relations to FFM psychopathy composites were generally unsupported, other interesting relations to traits were identified. Results indicated that hypoarousal to negative stimuli was negatively related to pan-impulsivity. Maladaptive risk taking was positively related to pan-impulsivity and high self-directed negative affect. Response modulation deficits were negatively related to pan-impulsivity, low self-directed negative affect, and facets of openness. Deficits in empathic responding were positively related to other-directed negative affect and self-directed negative affect, and negatively related to pan-impulsivity and interpersonal assertiveness. Although it remains unclear whether the failure to support hypotheses was related to the study variables or population, results indicate that the FFM can provide additional information with regard to what deficit tasks assess.

Keywords: Five Factor Model, psychopathy, psychopathic deficits, laboratory tasks

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To my family and friends, thank you for your support.

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Section One: Introduction

Psychopathy is a personality disorder that has received much attention in the fields of psychology, psychiatry, law, and criminology. Cleckley's (1941/1988) original study in psychopathy outlined several personality characteristics associated with the disorder, including traits such as manipulativeness, irresponsibility, arrogance, and remorselessness. Given this description, it is not surprising that psychopaths live deviant and antisocial lifestyles. Psychopathic individuals engage in many forms of high-risk behaviors, such as risky sexual relations (e.g., early onset of sexual behavior, sexual promiscuity, infrequent use of condoms, prostitution; Gill, Nolimal, & Crowley, 1992; Tourian et al., 1997; Miller & Lynam, 2003), and substance use (e.g., high rates of substance use and dependence, early onset of substance use, many types of substances used, and high rates of needle sharing; Hart & Hare, 1989; Smith & Newman, 1990; Tourian et al., 1997). With regard to antisociality, psychopathic offenders commit more crimes, more types of crimes, more violent crimes, and recidivate at higher rates than nonpsychopathic offenders (e.g., Hare, 1991, 2003; Kosson, Smith, & Newman, 1990). Additionally, psychopaths appear to be less receptive to treatment for substance disorders (Smith & Newman, 1990), and criminal conduct (Hobson, Shine, & Roberts, 2000), creating significant challenges for rehabilitation programs.

Due to the significant problems psychopathic individuals create for themselves and the broader society, considerable effort has focused on understanding the pathology of this disorder. Over the last 50 years, many researchers have attempted to identify the proximal mechanism that causes the psychopath to engage in risky and criminal conduct. Often, the search for the psychopathic deficit has been guided by Cleckley's seminal case studies (1941/1988), as well as contemporary theories of neuropsychological and neuroanatomical correlates of antisocial behavior (Blair, 2006a; Gray, 1991; Rogers, 2006). However, rather than identifying one underlying deficit, research has pointed to a multitude of viable candidates. Thus, several deficit-based conceptualizations of psychopathy have been developed. These include, but are not limited to, poor fear conditioning/hypoarousal to negative stimuli, maladaptive risk taking, deficits in response modulation, and deficits in empathic responding.

Poor Fear Conditioning/Hypoarousal to Negative Stimuli

Cleckley (1941/1988) made explicit reference to poor fear conditioning in his original 16 psychopathy criteria, indicating that the psychopath exhibits "poor judgment and failure to learn from experience," (p. 337). This deficit was first experimentally explored by Lykken (1957) through a classical conditioning paradigm. In Lykken's study, psychopathic inmates demonstrated poor physiological response (reduced skin conductance) to a conditioned stimulus paired with electric shock, indicating that psychopaths do not develop the expected anticipatory arousal from threat of physical punishment. In a description of this deficit, Lykken stated that for the psychopath, "the fear of punishment and the coercive voice of conscience both are, for some reason, weak or ineffectual" (p. 134). Electrodermal hypoarousal has also been evidenced in psychopathic individuals during the presentation of aversive tones (Hare, 1982), in aggression paradigms (Dengerink & Bertilson, 1975), following infusions of adrenaline (Hare 1972), and while viewing threatening visual images such as snarling dogs, mutilated bodies, or pointed guns (Blair, Jones, Clark, & Smith, 1997; Levenston, Patrick, Bradley, & Lang, 2000; Patrick, Bradley, & Lang 1993), further supporting the idea that psychopaths have a deficit in autonomic responding to aversive stimuli.

Other methodologies have also documented the psychopath's hypoarousal. Perhaps the most compelling and consistent findings have been in the area of fear-potentiated electromyogram (EMG) startle response (Patrick et al., 1993). Fear-potentiated startle tasks measure the magnitude of an eyeblink after a loud burst of noise is presented in conjunction with emotional stimuli representing three affective categories: unpleasant, neutral, and pleasant. While normal subjects reliably demonstrate a linear trend of startle magnitude, with the greatest startle responses associated with unpleasant slides (e.g., mutilations, aimed guns, and snakes) and the least startle associated with pleasant slides (e.g., opposite-sex nudes, food, and children; Bradley, Cuthbert, & Lang, 1991), Patrick and colleagues (1993) found that individuals with high psychopathy scores did not demonstrate this trend, and in fact had the greatest startle responses when viewing neutral slides (e.g., household objects and neutral faces). Interestingly, later studies demonstrated that psychopathic individuals' electrodermal responses are not significantly different from controls when viewing similar slides (Levenston et al., 2000), suggesting that startle hypoarousal is not an indicator of a system-wide deficit in autonomic response (Fowles, 2000).

Maladaptive Risk Taking

In conjunction with his assertions about the psychopath's deficits in fear conditioning, Lykken made explicit reference in his work to the psychopath's fearless approach to dangerous activities (Lykken, 1995). Lykken's fearlessness hypothesis predicts that the core psychopathic deficit should manifest not simply by poor conditioning to punishment, but more broadly with extreme levels of sensation seeking and risk taking, or "fearless" behaviors. Lykken operationalized this hypothesis with the development of the Activity Preference Questionnaire (APQ; Lykken, 1995), a self-report measure designed to assess willingness to engage in "frightening or embarrassing" behaviors versus those that are merely "uncomfortable or frustrating" (p. 146; Lykken, 1995). According to Lykken, the fearless psychopath chooses to be engaged in behaviors that many others would find aversively risky.

Recently, this aspect of fearlessness has been explored with laboratory tasks designed to assess risk taking and sensation seeking. One such task, the Balloon Analog Risk Task (BART; Lejuez et al., 2002) uses a computer-simulated balloon to assess participants' willingness to engage in high risk behaviors. Specifically, computer simulated balloons are presented and participants are allowed to "pump" each balloon for as many times as they wish to earn money. However, balloons pushed past their explosive point will pop, causing participants to lose the money earned on that balloon. High scores on the BART (measured by balloon pumps and pops) have been found to relate to constructs theoretically important to sensation seeking, such as alcohol and tobacco use, gambling, theft, aggression, and unprotected sex (Lejuez, Simmons, Aklin, Daughters, & Dvir, 2004), and have recently been associated with self-reported psychopathy scores (Hunt, Hopko, Bare, Lejuez, & Robinson, 2005), suggesting that this measure has potential to document maladaptive risk taking in the psychopathic individual.

Response Modulation Deficits

Newman and Wallace (1993) argued that a subtle information processing deficit may underlie the psychopathic pathology. Specifically, these authors posited that the psychopath's failure to learn from aversive experiences was not generalized, but dependent upon the circumstances of the event. According to these authors, response modulation involves the automatic or involuntary shift of attention from the goal-seeking behavior to more deliberative and evaluative processes. A deficit in response modulation results in continuance of goal-seeking behaviors despite a change in circumstances that might otherwise cause the individual to stop and evaluate the consequences of this behavior. Therefore, individuals with this type of deficit continue approach behaviors even when they are maladaptive, and are unlikely to consider contextual information that may be helpful in choosing alternative responses (Newman & Lorenz, 2003). Findings of this nature are consistent with Cleckley's (1941) description of the psychopath's ability to explicitly describe the consequences of stealing, yet inability to refrain from this behavior when the opportunity presents itself.

Newman, Patterson and Kosson (1987) explored the inability of the psychopath to inhibit a dominant response during a card playing task of worsening odds. Specifically, the task entailed 100 card trials set to reduce reward rate 10% after every 10 cards played. Newman and colleagues found that psychopaths continued for more trials of decreasing success with a dominant response set in comparison to nonpsychopaths. This effect has been replicated several times in various adult populations (Newman et al, 1987; Newman, Patterson, Howland, & Nichols, 1990). Interestingly, when this task was modified to incorporate a forced five-second delay (thereby creating a period for cognitive reflection on the loss of money or tokens) psychopaths' inhibition of response was similar to controls (Newman et al., 1990).

In addition to card-playing tasks, Newman and colleagues have developed a competing contingencies task where reward contingencies do not change over time (Newman & Kosson, 1986). In the Go/no-go (GNG) task, specific cues are associated with reward, whereas others are associated with punishment. When low anxious, or "primary" psychopaths (i.e., psychopaths with low scores on the Welsh Anxiety Scale; WAS; Welsh, 1956) completed the punishment-only condition, they performed like comparison psychopaths with high scores on the WAS (Newman et al., 1997; Newman & Schmitt, 1998). However, when both reward and punishment cues were present, low anxious psychopathic individuals evidenced more errors of commission (i.e., inappropriately responded to punishment cues) than high anxious psychopathic subjects, indicating that the mixed contingencies elicited a specific response inhibition deficit.

Despite these findings, other research suggests that Newman's task does not always perform as predicted. Howard, Payamal, and Neo (1996) found that psychopathic individuals do not exhibit more errors of commission on the mixed-incentive go/no-go. With regard to response modulation performance, Howard et al. (1996) stated "This overall pattern of responding shown by psychopathic subjects is most readily interpretable as reflecting a relative lack of motivation to perform the task. Nor was there any evidence of hypersensitivity to reward in psychopaths, as indexed by reward focused errors" (p. 715). This suggests that the GNG, although widely discussed in the psychopathy literature, may assess other processes beyond the response modulation deficit described by Newman and colleagues.

Deficits in Empathic Responding

Others have argued that psychopathic impulsivity and antisociality are a result of the psychopath's blunted capacity to experience and understand emotion (Cleckley, 1941/1988; Hare, 1991). Many believe that while cognitively intact, the psychopath fails to appreciate the emotional significance of behavior, leading to problems anticipating consequences of behavior, difficulties in classical conditioning, and remorseless and callous treatment of others (Aniskiewicz, 1979; Blair, 1999; Kosson, Suchy, Mayer, & Libby, 2002). Of this deficit, Cleckley (1941/1988) wrote:

> Let us assume, as a hypothesis, that the psychopath's disorder, or defect, or his difference from the whole or normal or integrated personality consists of an unawareness and a persistent lack of ability to become aware of what the most important experiences of life mean to others… Despite his otherwise perfect functioning, the major emotional accompaniments are absent or so attenuated as to count for little. (p. 371)

Cleckley felt that this emotional deficit was fundamental to the disorder, an idea shared by others over the past 50 years (Blair, 1995; Patrick, 1994). The hypothesis that the psychopath fails to experience or process emotional meaning has been empirically investigated in a number of ways.

Williamson, Harpur and Hare (1991) and Lorenz and Newman (2002) explored the psychopath's ability to recognize emotional words and their autonomic responses to emotional stimuli. Compared to controls, psychopaths did not demonstrate a facilitation effect for emotional words (as evidenced by similar recognition reaction times across emotional and non-emotional words), and did not demonstrate the normal autonomic response to emotional words, suggesting that the affect-laden words held little, if any, additional meaning over other words to the psychopathic individual.

Blair (1995, 2001) has argued that these emotional processing deficits are best explained by the Violence Inhibition Mechanism model (VIM). Specifically, the psychopath's abnormal affective processing is due to compromised functional integrity of the emotional system that responds to sad and fearful displays. While normal individuals find it aversive to engage in behaviors that frighten or harm others, the psychopath does not experience this negative response. The VIM model has garnered some support; psychopaths demonstrate autonomic hypoarousal to sad facial expressions (Blair, 1999; Blair et al., 1997), impairment in the naming of sad, fearful, and disgusted facial expressions (Blair, Colledge, Murray, & Mitchell, 2001; Blair et al., 2004; Kosson et al., 2002), and poor recognition of fearful vocal affect in both adults and children (Blair, Budhani, College, & Scott, 2005; Blair et al., 2002).

More recently, Blair and colleagues (2004) have used an emotional expression multimorph (EEM) task to test the psychopath's ability to recognize the emotions of others. In this task, empirically validated pictures of facial affect (Eckman & Friesen, 1976) were digitally blended with pictures of the same individuals evidencing no discernable emotional expression to create varying levels of recognizable emotional content (ranging from 0% expression of a prototypic emotion to 100% expression; Blair et al., 2004). Thus, these pictures with varying expression could be presented in succession to create a "morph" effect. Participants were told that they would view a face that would start with neutral affect, but would slowly change to reveal one of six emotions. Blair and colleagues (2004) found that psychopathic individuals required more morph stages before correct recognition of affect than nonpsychopaths, suggesting a generalized insensitivity to emotional expressions. Further, psychopaths were more likely to make identification errors when fearful emotions were displayed (Blair et al., 2004), suggesting that they are less able to correctly recognize when others are experiencing negative affect.

Toward Integration

The number and divergence of the proposed psychopathic deficits make synthesis of these alternative models quite difficult. Occasionally, those investigating one particular deficit resort to Procrustean techniques to incorporate deficits found by others into their particular model. Some have argued that attempting to make unrelated data fit into rival models has the unfortunate result of creating re-interpretations that do more to confuse, rather than integrate, relevant evidence (Lynam, 2002). Recently, Widiger and Lynam (1998) have argued for the use of an overarching conceptualization whereby an integrative and parsimonious explanation of psychopathic deficits can be made.

Specifically, Lynam (2002) and colleagues (Lynam & Derefinko. 2006; Miller, Lynam, Widiger, & Leukefeld, 2001; Widiger & Lynam, 1998) have argued that psychopathy can be understood as a constellation of traits found in a model of general personality functioning, specifically, the five-factor model of personality (FFM). The FFM consists of five broad domains, including neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A), and conscientiousness (C). In their particular version of the FFM, the NEO Personality Inventory-Revised (NEO PI-R; Costa & McCrae, 1992), Costa and McCrae have proposed that each of these overarching dimensions can be differentiated into six specific facets. The FFM enjoys considerable empirical support in the form of convergent and discriminant validation across self, peer, and spouse ratings (Costa & McCrae, 1988), temporal stability across 7-10 years (Costa & McCrae, 1994), and relations to important outcomes, including antisocial behavior (Miller, Lynam, & Leukefeld, 2003), and risky sex (Miller et al., 2004).

Several studies have used the FFM to conceptualize psychopathy (Derefinko & Lynam, 2006; Derefinko & Lynam, 2007; Miller & Lynam, 2003). In an initial study, Miller et al. (2001) asked 15 psychopathy experts to rate the "prototypic" psychopath in terms of the 30 facets of the NEO PI-R (Costa & McCrae, 1992). According to the expert descriptions, the psychopath is low in agreeableness (A; low on facets of trust, straightforwardness, modesty, compliance, altruism, and tendermindedness) and conscientiousness (C; low on dutifulness, self-discipline and deliberation), and has a blend of high and low traits from the domains of neuroticism (N; high impulsiveness and angry hostility, low self-consciousness, anxiety, depression and vulnerability) and extraversion (E; high excitement seeking and assertiveness, low warmth). Interestingly, this expert profile is similar to those obtained using empirical methods (Derefinko & Lynam, 2006) and translations of extant instruments of assessment (Widiger & Lynam, 1998).

Subsequent studies have demonstrated that psychopathy assessed using the FFM looks and behaves like psychopathy assessed using more traditional measures (Derefinko & Lynam, 2006; Derefinko & Lynam, 2007; Miller & Lynam, 2003). To assess psychopathy using the FFM, Lynam and colleagues employ a prototype matching approach in which the NEO PI-R profiles of individuals' are matched to an expert-generated prototype (Miller et al., 2001). A resulting, statistically determined similarity index is then used as an index of psychopathy. FFM psychopathy demonstrates strong total score convergence with other self-reports of psychopathy, including the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996; $r = .63$), and Hare's Self-Report Psychopathy scale (SRP; Hare, Harpur & Hemphill, 1989; $r = .69$), suggesting that the traits assessed via the FFM psychopathy are similar to those included in other self-report psychopathy measures (Derefinko & Lynam, 2006). In addition, psychopathy assessed via the FFM shows predicted relations with psychopathy-related constructs, such as self-reported violent and nonviolent antisocial behavior, arrest history, risky sex, substance use and abuse, aggression, symptoms of antisocial personality disorder, low internalizing symptoms, and early age of onset for criminality/delinquency (Miller et al., 2001; Miller & Lynam, 2003, Derefinko & Lynam, 2007). Finally, FFM psychopathy has shown important points of divergence in relations to associated constructs from other personality disorders, including those from clusters A and C and those in the closely associated cluster B, as well as incremental predictive utility over these disorders regarding antisocial behavior and substance use, suggesting that FFM psychopathy is assessing a construct distinct from generalized internalizing and externalizing pathology (Derefinko & Lynam, 2007).

Having supported the validity of the FFM conceptualization of psychopathy, effort is now focused on exploring the potential benefits this model offers with regard to assimilating information in the field. More specifically, it is proposed that the alternative perspectives of the pathology of psychopathy may also be understood from the perspective of the FFM. If psychopathy is understood as multifaceted in nature, it is reasonable that many different deficits would be found. Widiger and Lynam (1998) in fact have proposed specific deficit—FFM trait mappings, and have further established consensus sets of traits used to describe psychopathy that seem to relate well to the major areas of deficit research (Lynam & Widiger, 2007; see Table 1.1). These FFM psychopathy composites include low self-directed negative affect (LSNA;, comprised of low N1: anxiety, N3: depression, N4: self-consciousness, and N6: vulnerability, from the FFM domain of neuroticism), pan-impulsivity (PImp; comprised of low C3: dutifulness, C5: self-discipline, and C6: deliberation, from FFM conscientiousness, high E5: excitement seeking from FFM extraversion, and high N5: impulsiveness from FFM neuroticism), interpersonal antagonism (IAnt; comprised of low A1: trust, A2: straightforwardness, A3: altruism, A4: compliance, A5: modesty, and A6: tendermindedness from FFM agreeableness, and low E1: warmth from FFM extraversion), other-directed negative affect (ONA; comprised of high N2: angry hostility from FFM neuroticism), and interpersonal assertiveness (IAss; comprised of high E3: assertiveness from FFM extraversion).

With regard to specific deficit mappings, these sets of traits work well to describe areas of pathology. For instance, hypoarousal to negative stimuli, as described by Lykken (1957) and Patrick and colleagues (1993), seems to be characterized by deficits in the anxiety, depression, self-consciousness, and vulnerability traits of LSNA. In contrast, maladaptive risk taking (Hunt et al., 2005), and deficits in response modulation (Newman & Wallace, 1993) appear to be related to the low dutifulness, low self-discipline, low deliberation, high excitement seeking, and high impulsiveness of PImp. Finally, interpersonal and emotional deficit models of psychopathy such as semantic dementia (Cleckley, 1941/1988) and the Violence Inhibition Mechanism model (Blair, 1995) may be related to the low trust, low straightforwardness, low altruism, low compliance, low modesty, low tendermindedness, and low warmth of IAnt, as well as the high angry hostility associated with ONA. Thus, because researchers are studying different aspects of the whole profile, the individual deficits they find are likely to be important but not complete explanations of the many deficits that the psychopath exhibits. Rather than viewing any specific deficit as the exclusive pathology of psychopathy, all may be subsumed under a common, interpretive model offered by the FFM.

Predicted Relations

To test the validity of the arguments proposed by Widiger and Lynam (1998) and Lynam (2002), it is necessary to establish these relations between psychopathic deficits and the domains of personality empirically. While present results are far from conclusive, several of these hypothesized associations between deficits and traits have begun to be explored.

Hypoarousal to negative stimuli. With regard to hypoarousal to negative stimuli, Patrick and colleagues have suggested that this deficit is associated with low negative affect. Patrick et al. (1994) stated that the first factor of the Psychopathy Checklist-revised (PCL-R; Hare, 1991) involves an "emotional detachment" (p. 532), and "may be associated with an aversive system dysfunction in which unpleasant stimuli and events fail to elicit a normal defensive response disposition" (p. 532). "This would be consistent with the idea that true ('primary') psychopathy is characterized by a specific anxiety deficit (Gray 1971; Lykken, 1957)" (Patrick et al., 1994, p. 532). Further, Patrick et al. (1994) stated "the observed absence of startle potentiation in psychopaths (Patrick et al., 1993) may reflect a temperamental deficit in the capacity for negative affect" (p. 325).

Patrick and colleagues support their hypothesized association between hypoarousal and low negative emotionality by citing positive relations between electromyogram (EMG) startle and electrodermal deficits and psychopathy factor 1 as estimated from the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982; Benning, Patrick, Hicks, Blonigen, & Krueger, 2003). Specifically, Benning and colleagues (2003) have used the MPQ to estimate scores from the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), creating a proxy measure of psychopathy from the MPQ. According to Benning et al. (2003) MPQ psychopathy factor 1 is characterized by high social potency, (a facet of MPQ positive emotionality), and low stress reaction and harm avoidance (facets of MPQ negative emotionality and constraint, respectively), thereby suggesting some relation between inhibited startle response and LSNA (Fowles, 2000).

Other research has also supported the relation between startle response and LSNA (Cook, Hawk, Davis, & Stevenson, 1991). Cook and colleagues (1991) found that scores of the Fear Survey Schedule (FSS; Arrindell, Emmelkamp, & van Ende, 1984), the Minnesota Multiphasic Personality Inventory-Depression scale (MMPI-D; Dahlstrom, Welsh, & Dahlstrom, 1972), and the State-Trait Anger Expression Inventory-Trait scale (STAXI-T: Speilberger, 1988), were all significantly related to increased affective modulation of startle magnitude, although trait scores on the State-Trait Anxiety Inventory (STAI; Speilberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) were not, suggesting that some, but not all facets of LSNA are relevant to this mechanism.

Other autonomic arousal deficits show predicted relations to LSNA as well (Schwerdtfeger, 2006). In a sample of undergraduates, Schwerdtfeger (2006) found that groups selected for extreme scores on the German version of the STAI (Laux, Glanzmann, Schaffner, & Spielberger, 1981) showed significantly different autonomic responses (e.g., deeper heart rate decelerations and lower electrodermal responses) to threatening stimuli, suggesting that deficits in this area may be associated with low trait anxiety. In addition, Smith, Bradley, and Lang (2004) found that low state scores on the STAI were associated with lower electrodermal responses to threatening photos in a sample of undergraduates.

Maladaptive risk taking. Tasks relating to risk taking have been studied rather extensively with regard to personality. The BART has evidenced reliable relations to the personality constructs it was designed to assess, including positive relations to Zuckerman's SSS, the Barratt Impulsiveness Scale (BIS; Barratt, 1985), and the Eysenck Impulsiveness Scale (Eysenck, Pearson, Easting, & Allsopp 1985; Hopko et al., 2006; Lejuez et al., 2002). Based on the findings regarding tasks associated with risk taking, the FFM correlate of these tasks is likely to be PImp, the set of traits encompassing low deliberation, high excitement seeking, and high impulsivity. Consistent with this, Zuckerman's SSS has been found to relate to FFM excitement seeking (Aluja, Garcia, & Garcia, 2003), although the BIS and the Eysenck Impulsiveness Scale have yet to be empirically related to a measure of the FFM.

Deficits in response modulation. Newman and colleagues have suggested that "low-anxious psychopaths' uninhibited responding for reward despite punishment is linked to low reflectivity, which, in turn, probably underlies their poor passive avoidance learning" (Patterson & Newman, 1993, p. 727). Low reflectivity is quite close conceptually to low deliberation, a core trait of FFM PImp. Relations of the GNG to measures of impulsivity have been partially supported in previous research; Reynolds, Ortengen, Richards and de Wit (2006) found that GNG commission errors were related to cognitive complexity, a subscale of the BIS which appears to assess deliberation (e.g., "I make up my mind quickly"), although a subsequent study failed to find a similar relation to the BIS (Dom, De Wilde, Hulstijn, & Sabbe, 2007). In further support of relations to impulsivity though, Thronquist and Zuckerman (1995) found that GNG errors of commission were related to the impulsive sensation seeking scale (ImpSS) of the Zuckerman-Kuhlman Personality questionnaire (ZKPQ; Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993), which has been negatively related to the FFM domain of conscientiousness in factor analytic studies (Aluja, Garcia, & Garcia, 2002)

Deficits in Empathic Responding. Use of emotion recognition tasks has only recently been established as a viable means to explore the pathology of psychopathy. While Widiger and Lynam (1998) hypothesized that the emotional deficit models of psychopathy may be theoretically related to the FFM personality traits of IAnt, at this point, there is very little evidence to support this hypothesis. Because many of the researchers using emotion recognition tasks come from a biological rather than a trait perspective (Blair et al., 2004; Blair, 2006b; Kosson et al., 2002), few studies have explicitly examined the relations of these tasks to personality.

Using a sample of Parkinson's disease patients and healthy age-matched controls, Lawrence, Goerendt, and Brooks (2007) found that a forced-choice emotion recognition task was significantly related to several subscales of the Tridimensional Personality

Questionnaire (TPQ; Cloninger, 1987), but not in uniform ways. Specifically, no single trait from the TPQ was related to emotion recognition across the different emotions being studied; rather, various traits related differentially to recognition of different emotional expressions. Recognition of anger was positively related to the exploratory excitability subscale of novelty seeking (NS1), rather than any TPQ scale that would in theory be associated with FFM IAnt or ONA. In contrast, recognition of sadness was positively related to the attachment (RD3) and dependence (RD4), subscales of TPQ social reward dependence.

Hypotheses

Based on this review of measures and their relations to traits, several predictions can be made. Indicators of hypoarousal to negative stimuli, including inhibited startle and electrodermal responses, are predicted to relate positively to the FFM psychopathy composite of LSNA. In contrast, indicators of maladaptive risk taking and response modulation deficits, including high error rates on the BART and errors of commission on the GNG task, are predicted to relate positively to the FFM psychopathy composite of PImp. Finally, deficits in empathic responding, as assessed by errors on the EEM task, are predicted to relate positively to both the FFM psychopathy composites of IAnt and ONA.

Table 1.1

FFM facet direction and weight for FFM consensus sets from Lynam & Widiger (2007)

Block	NEO PI-R facets	Weight
Low self-directed negative affect (LSNA)	N1: anxiety (-)	1/4
	N3: depression (-)	1/4
	N4: self-consciousness (-)	1/4
	N6: vulnerability (-)	1/4
Pan-impulsivity (PImp)	C3: dutifulness (-)	1/5
	C5: self-discipline (-)	1/5
	C6: deliberation (-)	1/5
	E5: excitement seeking (+)	1/5
	N5: impulsiveness (+)	1/5
Interpersonal antagonism (IAnt)	A1: trust (-)	1/7
	A2: straightforwardness (-)	1/7
	A3: altruism (-)	1/7
	A4: compliance (-)	1/7
	A5: modesty (-)	1/7
	A6: tendermindedness (-)	1/7
	E1: warmth (-)	1/7
Other-directed negative affect (ONA)	N2: angry hostility (+)	1
Interpersonal assertiveness (IAss)	E3: assertiveness (+)	1

Section Two: Method

Participants

Participants were male undergraduates at the University of Kentucky. One hundred and thirty participants were allowed to sign up from the general pool of participants from undergraduate psychology classes. In addition, seventy participants were selected from introductory psychology classes based on scores from a subset of items of a psychopathy screening measure, the Hare Self-Report Psychopathy Scale (HSRP; Paulhus, Hemphill, & Hare, in press), which was administered in a mass screen of all introductory psychology classes. Screening forms and contact information was completed by 362 individuals. Ninety-one individuals scoring in the top 25% (with a total score > 54) of the HSRP item subset were selected and contacted to participate in the study. As psychopathy scores are likely to be lower in undergraduate populations, this HSRP item selection process served to ensure that the top of the general distribution was well-represented.

Self-Report Measures

HSRP. The subset of items from the Hare Self-Report Psychopathy scale (HSRP; Paulhus, Hemphill, & Hare, in press) is a 20-item scale designed to assess the traits of psychopathy. Items are endorsed on a 5-point scale, ranging from 1 (*disagree strongly*) to 5 (*agree strongly*). The measure consists of 4 subscales, including Interpersonal Manipulation (IPM), Callous Affect (CA), Erratic Life Style (ELS), and Anti-Social Behavior (ASB). Rational selection of items was conducted so that 5 items from each HSRP subscale were included in the assessment. Items are presented in Appendix A.

Due to low endorsement rate, one item from the CA scale "It tortures me to see an injured animal" was dropped from analyses. For this sample, reliabilities (i.e., coefficient alpha) for the HSRP subscales were .60 for IPM, .44 for CA, .58 for ELS, and .57 for ASB, and .80 for the total score.

NEO PI-R. The NEO PI-R is a self-report questionnaire developed by Costa and McCrae (1992) to assess general personality dimensions based on the Five Factor Model of personality. It consists of 240 items, which are rated on a 5-point scale, anchored by 1 (*strongly disagree*) and 5 (*strongly agree*). This personality inventory provides a score for all five domains (neuroticism, extraversion, openness to experience, conscientiousness, and agreeableness) based on 48 questions per domain, and assesses six facets within each domain using 8 items per facet.

FFM psychopathy composite scores were computed using Lynam and Widiger's (2007) NEO PI-R interpretation. First, the relevant facet scores were reversed. Next, each FFM psychopathy composite's corresponding NEO PI-R facets were averaged to create the FFM psychopathy factor. For instance, the FFM psychopathy factor of LSNA is an average of four facets (i.e., N1: anxiety (reverse scored), N3: depression (reverse scored), N4: self-consciousness (reverse scored), and N6: vulnerability (reverse scored). The NEO PI-R facets associated with each FFM psychopathy factor are presented in Table 1.1. For this sample, reliabilities (i.e., coefficient alphas) for psychopathy composite scores were .82 for the LSNA composite, .68 for the PImp composite, and .79 for the IAnt composite.

Further, a total FFM psychopathy score (FFP) was created using the NEO PI-R prototype (Miller et al., 2001). The FFP was calculated using the procedure described by Miller and colleagues (2001) where individuals' NEO PI-R profiles were matched, in shape and magnitude, to the expert-generated prototype via a double-entry correlation.

Laboratory Measures

Autonomic response. The autonomic response tasks were conducted following the design used by Patrick et al. (1993). Specifically, participants viewed twenty-seven images from the International Affective Picture System previously chosen and categorized by Patrick et al. (1994): Nine pleasant images included opposite sex nudes, food, sports scenes, and children; nine neutral images included household objects and neutral faces; nine unpleasant images included mutilations, aimed guns, and snakes. Images were randomly presented for 6 seconds each in blocks of nine, with three pleasant, three neutral, and three unpleasant images in each block.

On six of the trials for each image type, an acoustic startle probe consisting of a 50-ms burst of 95dB (A) white noise with instantaneous rise time was presented through stereo headphones at either 3.5, 4.5, or 5.5 seconds after the presentation of the image. Orbicularis oculi electromyogram (EMG) was measured using two miniature domed Ag/AgCl electrodes (4 mm) filled with a standard electrode gel (Surgicon Systems) and attached with double-sided adhesive collars. The first electrode was placed approximately 1 cm below the lower lid of the left eye (directly under the pupil), and the second electrode was placed to the right 1 cm laterally. The raw EMG signal was amplified with a Biopac EMG100C amplifier (Biopac Systems, Inc., Santa Barbara, CA; Gain = 5000; Low Pass = 500 Hz, 100 Hz High Pass = Off, High Pass = 10 Hz; Bandstop = 60 Hz), and was sampled at a rate of 200 Hz (AcqKnowledge Version 3.7.3.0). The startle blink magnitude dependent variable is scored from the smoothed EMG signal as a baseline to peak difference following each noise probe trial. Higher EMG scores indicate a greater startle response.

Concurrent with startle blink recording during image presentation, participants' electrodermal responses to these same images were recorded with two disposable 8-mm Ag-AgCl electrodes placed on the distal flanges of the index and middle fingers of the participant's nondominant hand. The raw skin conductance was amplified with a Biopac GSR100C amplifier (Biopac Systems, Inc., Santa Barbara, CA; Gain = 200, Low Pass = 10Hz, High Pass = .05 Hz, DC); and was sampled at a rate of 200 Hz. The dependent variable is defined as the largest increase in microsiemens above baseline occurring during the period between the .5 and 3.5 seconds following the onset of image presentation. Higher SCR scores indicate a greater autonomic response.

BART. The Balloon Analog Risk Task is a computer-simulated measure of risk-taking behavior (Hunt, Hopko, Bare, Lejuez, & Robinson, 2005; Lejuez et al., 2002). During the task, a small image of a balloon and balloon pump was presented on the computer screen along with a reset button labeled "Collect $$$" and a display of total money earned. Participants used the computer's mouse to click the balloon pump and inflate the balloon, but were not given any information about the probability of a balloon exploding (it could explode after the first pump or only after the balloon fills the entire screen). In the present study, balloons had a 1 out of 134 chance of exploding on the first pump, a 1 out of 133 chance of exploding on the second pump, and so on. Each click inflated the balloon about .125 inches in all directions and $0.02 was added to a temporary reserve that was added to the "Total Earned" display if the participant clicked "Collect $$$" before the balloon exploded. If the balloon exploded before the participant clicked "Collect $$$," the money accumulated in the temporary reserve was lost. Not including practice trials, participants completed a total of 20 trials. The dependent variables are total number of balloon pumps on completed trials (i.e., trials without pops) and total balloon explosions across the 20 balloon trials.

GNG. The Go/no-go task (GNG; Newman & Kosson, 1986) is a successive go/no-go discrimination task with four positive stimuli (S+s) and four negative stimuli (S-s). The participant's task is to press a button whenever an S+ appears on the computer screen and to inhibit responding (i.e., not press the button) when an S- appears. A correct key press to an S+ stimulus is followed immediately by music and the message "you won $.10" on the computer screen, whereas a key press to an S- stimulus is followed by a buzzer and the message "you lose $.10" on the computer screen. Participants learned through trial and error which stimuli were S+s and S-s through key presses. Each correct response was rewarded with the presentation of $.10 and each incorrect response was punished by the loss of $.10. There were no monetary consequences (or feedback) when the participant did not respond to a stimulus. All stimuli were two digit numbers, and no characteristic of numbers was differentially associated with either the S+s or S-s. Stimuli were presented for 2 seconds or until a response was made. All participants received 68 trials, with the first 4 trials serving as the pretreatment phase to establish a dominant response set for reward. Blocks consisted of 4 S+s and 4 S-s presented in random order. Testing required approximately 5 minutes to complete. The dependent variable is the total number of commission errors (i.e., responding to an S- stimulus) across all 8 blocks, excluding the pretreatment phase. To account for learning task parameters through trial and error, an additional variable assessing commission errors after the first 3 complete blocks (after participants had learned which stimuli are associated with the S+s and the S-s) was created.

EEM. The emotional expression multimorph task uses validated pictures of facial affect (Eckman & Friesen, 1976) in a series of stimuli containing six different emotional facial expressions (happiness, surprise, fear, anger, sadness, and disgust). Using a continua of 21 morphed images for each continuum, images were presented to participants in a series starting with neutral expression (0% expression) and ending in full expression (100%) in 5% increments. Participants were asked to correctly identify the emotional expression as quickly as possible at the start of each trial for 18 trials total. Each stage of the morphing process was presented for 1 second. Testing required approximately 14 minutes to complete. The dependent variables are the number of stages required before successful emotion recognition takes place, and the number of errors (trials with an incorrect response). Failure to accurately identify the emotion resulted in a score of 22 (indicating the number of possible morphs + 1).

Additional Measures

PPI. The Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) is a self-report measure specifically designed to assess psychopathy in non-forensic populations. Consisting of 187 items, which are responded to on a 5-point scale, anchored by (1 = *false)* and (5 = *true*), the PPI offers items that are subtle in content, and designed to measure personality traits characteristic of psychopathy. The PPI also includes validity scales to identify malingering or inconsistent responding. The measure consists of 8 subscales, including machiavellian egocentricity, social potency, fearlessness, coldheartedness, impulsive nonconformity, blame externalization, carefree nonplanfulness, and stress immunity. This measure has shown high test-retest reliability (Lilienfeld & Andrews, 1996), good internal validity from .90 to .93 for the total score, and has been validated as a measure of psychopathy when the PCL-R (Hare, 1991) was the criterion (Sandoval, Hancock, Poythress, Edens, & Lilienfeld, 2000). For this sample, reliabilities (i.e., coefficient alphas) for the subscales ranged from .80 for coldheartedness and impulsive nonconformity to .88 for machiavellian egocentricity and blame externalization.

STAI. The State-Trait Anxiety Inventory (STAI; Spielberger et al., 1983) is a widely used self-report questionnaire designed to assess both immediate and enduring propensity to general anxiety and negative affect. The STAI consists of 40 items rated on a 4-point Likert scale that assess two subscales (state vs. trait anxiety), although only the 20 items used to determine trait anxiety were used in the present study. For this sample, reliability (i.e., coefficient alpha) for the total score was .90.

WAS. The Welsh Anxiety Scale (WAS; Welsh, 1956) is a 39-item true/false self-report measure derived from MMPI items, and represents the first and largest factor of the MMPI and MMPI-2. The WAS has been used to assess five clusters of anxiety-related symptoms (e.g., decreased mental efficiency, negative emotional tone, pessimism and loss of energy, interpersonal over-sensitivity, and schizoid mentation), and is also considered a measure of emotional upset or general maladjustment (Lykken, 1957; Newman & Kosson, 1986). For this sample, reliability (i.e., coefficient alpha) for the total score was .87.

UPPS Impulsivity Scale. The UPPS Impulsivity Scale (Whiteside & Lynam, 2001) is a 59-item self-report inventory designed to measure five personality pathways to impulsive behavior. The UPPS consists of 5 subscales, including negative urgency (12 items), premeditation (11 items), perseverance (10 items), sensation seeking (12 items), and positive urgency (14 items). Whiteside and Lynam (2001) have found that the UPPS demonstrates excellent internal consistency and convergent validity, and later studies have indicated that the subscales of the UPPS make unique contributions to different disorders, suggesting that these subscales represent important aspects of impulsivity not assessed in other impulsivity measures (Whiteside, Lynam, Miller, & Reynolds, 2005).

The UPPS was scored using a 5-point likert scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*). For this sample, reliabilities (i.e., coefficient alphas) for the subscales ranged from .76 for negative urgency to .87 for positive urgency.

CAB. The Crime and Analogous Behavior Scale (Lynam, Whiteside, & Jones, 1999) is a 69-item self-report inventory that asks the respondent about criminal behavior (i.e., stealing, driving while intoxicated, fighting, aggressive acts toward others), substance use (i.e., cigarette, alcohol, marijuana, and other drug use), and sexual experience (i.e., ever had intercourse, age of first intercourse, risky sexual practices, and lifetime number of partners).

Procedure

Two-hundred participants were asked to participate in two 1.5 hour sessions for which they received course credit and the chance to earn modest monetary incentives. Participants were tested individually. In the first session, participants were asked to provide informed consent. Following this, participants were asked to sit in front of a computer where all measures and tasks were administered. Participants were administered four laboratory measures, including assessment of autonomic (i.e., startle and electrodermal) responses to negative stimuli, the BART, the GNG, and the EEM, as well as one self-report measure, the NEO PI-R. Prior to the start of this session, the student number of each volunteer participant (i.e., those who were not contacted by the researcher) was matched to existing HSRP data. For those individuals that did not complete the HSRP at the mass screening, the HSRP was administered during the first session as the first measure.

Tasks were presented in the same order for all participants, and self-report questions and laboratory tasks were alternated to prevent participant fatigue or boredom. All participants completed the first session assessments in the following order: 1) baseline and assessment of autonomic responses to negative stimuli, 2) the NEO PI-R, 3) the EEM, 4) the GNG, and 5) BART. Two of these tasks, the BART and the GNG, allowed participants the opportunity to earn up to $20.00. Financial compensation is believed to be imperative for adequate motivational factors on test performance on these tasks. For this reason, these tasks were presented last in the order of measures so that payment could be administered post testing and would not interfere with the participants' motivation to complete other aspects of the session.

During the second session, participants were administered five self-report questionnaires, including the WAS, the CAB, the PPI, the UPPS, and the STAI. Measures were presented in counterbalanced order. For completion of all self-report measures, participants received $10.00. For both sessions, a researcher was always present during testing, and participants were encouraged to ask questions if clarification was necessary. Procedures for recruitment, data collection and storage were approved by the University of Kentucky Institutional Review Board.

Section Three: Analyses

Analysis of Psychophysiological Data

Due to problems with psychophysiological recording, only 162 participants provided EMG and SCR data. EMG was filtered (FIR/Band Pass Low Frequency = 28 Hz, high frequency 100Hz) and rectified using AcqKnowledge version 3.7.3.0. Due to low sampling rate, smoothing of the EMG waveform was not conducted. Response magnitude was derived from the rectified channel and was defined as the maximum value of the response curve reached within 20 to 450 ms after stimulus onset. A response was scored as zero if no responses occurred within 20 to 450 ms after stimulus onset. A trial was scored missing if the EMG baseline was too unstable (i.e., larger than 20 mV) to judge the presence of a response or if a response began within less than 20 ms after stimulus onset. Based on these criteria 5.8% of the trials were excluded from the analysis. A participant's entire startle data were discarded if more than half of the responses across the experiment were zero responses and/or missing (n = 3).

SCR was filtered (FIR/Low Pass Window = Blackman -61dB, Cutoff Frequency = 1, Number of Coefficients = 200) and smoothed (Median Value, 200 samples) using AcqKnowledge version 3.7.3.0. Baseline was recorded from the average SCR value during a 2-minute baseline recorded after the end of stimuli. SCR was defined as the largest increase in microsiemens above baseline occurring during the period between the .5 and 3.5 seconds following the onset of image presentation.

Descriptions of Hierarchical Regression Analyses

Correlational analyses and hierarchical and step-wise multiple regression analyses were used to test 1) the hypothesized relations between each laboratory task variable and the relevant psychopathy composite, 2) incremental variance provided by other psychopathy composite scores, and 3) incremental variance provided by other facets of the NEO PI-R. In the hierarchical regression analyses, each laboratory task variable served as the dependent variable (DV), with psychopathy composite scores and other NEO PI-R facet scores serving as predictors.

Poor Fear Conditioning/Hypoarousal to Negative Stimuli. For autonomic arousal, startle response magnitude during neutral images at 3.5 second noise probe onset served as the DV, and LSNA (defined as the average of the inverse of N1: anxiety, N3: depression, N4: self-consciousness, and N6: vulnerability facets) was entered first to test the hypothesized relation. Following this, the other psychopathy composite scores (PImp, IAnt, ONA, IAss) were entered in step two to assess whether incremental variance is captured by these additional psychopathy composites. Finally, all other facets of the NEO PI-R not included in psychopathy composite scores were entered in a step-wise regression to identify other traits that contributed to the prediction of variance in startle response during neutral images at 3.5 second noise probe onset. This same procedure was followed for all other autonomic variables serving as the other independent DVs.

Maladaptive risk taking and response modulation deficits. For the BART, balloon explosions served as the DV, and PImp (defined as the average of the inverse of C3: dutifulness, C5: self-discipline, C6: deliberation, and non-inverse of N5: impulsiveness and E5: excitement seeking) was entered first to test the hypothesized relation. Following this, the other psychopathy composite scores (LSNA, IAnt, ONA, IAss) were entered in step two to assess incremental variance. Finally, all remaining facets of the NEO PI-R were entered in a step-wise regression to identify other traits that contributed to the prediction of variance. This same procedure was followed for BART Pumps, GNG errors of commission across all trials, and GNG errors of commission during the last 5 trial blocks as the other independent DV.

Deficits in empathic responding. For the EEM variables, number of stages required for each emotion (i.e., sad, happy, angry, disgust, fear, surprise) and the number of trials with an error present served as the DVs, and IAnt (defined as the average of the inverse of A1: trust, A2: straightforwardness, A3: modesty, A4: compliance, A5: altruism, A6: tendermindedness, E1: warmth) and ONA (defined as N2: angry hostility) were entered first to test the hypothesized relations. Following this, the remaining psychopathy composite scores were entered in step two to assess incremental variance. Finally, all other facets of the NEO PI-R were entered in a step-wise regression to identify other traits that contributed to the prediction of variance.

Description of Suppressor Relations

In addition, relations were further explored based upon evidence of suppression effects. Suppression is defined as a variable which increases the predictive utility of another variable (or set of variables) by its inclusion in a regression equation (MacKinnon, Krull, & Lockwood, 2000). Several relations were found to have evidence of suppression (i.e., significant increases in predictive utility) when other variables were added to the regression equation in subsequent steps. In these instances, suppression was explored by entering individual facets from FFM psychopathy composite scores into regression equations where appropriate. For example, if the relation between a DV and PImp was not significant at the first step, but became significant upon entry of additional traits in subsequent steps, a separate regression using the individual facets that comprise PImp (rather than the aggregated variable) was conducted to explore the nature of the suppression. Further, the semi-partial correlation squared was compared with the correlation squared for facets implicated in the suppression to identify those facets that predicted more variance in the regression equation than when alone.

Section Four: Power Analysis

Power calculations were conducted using a two-tailed, t-test, correlational a priori analysis in G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007). Previous research (Hunt et al., 2005; Reynolds et al., 2006) suggests that relations between personality measures and laboratory tasks result in small to medium effect sizes (Cohen, 1992). Using a medium effect size of $r = 0.30$, alpha = .05, and power = .95, the recommended sample size was calculated to be $N = 134$. Using these same criteria but setting the effect size at $r = .10$, indicating a small effect, the recommended sample size was calculated to be $N = 1,289$. Due to the necessary constraints of running individual subjects in the present design, a two-tailed, t-test, correlational post-hoc analysis was conducted with in G*Power 3 with $N = 150$, alpha = .05, and an effect size of $r = .10$. The result of this analysis suggests that this size sample would have a power of .23 to detect a small effect, and a power of .97 to detect a medium effect. Taken together, these values suggest that the proposed study has modest power to detect a small effect, but sufficient power to detect a medium to large effect among the proposed analyses.

Section Five: Results

Descriptives and Correlations

Descriptive statistics for variables are presented in Table 5.1. Correlational analyses were used to test the hypothesized relations between psychopathy composite scores and other facets of the NEO PI-R. Correlations between the NEO PI-R psychopathy composite scores and dependent variables are presented in Table 5.2.

Poor Fear Conditioning/Hypoarousal to Negative Stimuli

It was hypothesized that indicators of hypoarousal to negative stimuli, including inhibited startle and electrodermal responses would relate positively to the FFM psychopathy composite of LSNA. Correlational analyses indicated that skin conductance response to neutral images related modestly and positively to FFP total score ($r = .13$, $p < .10$), and skin conductance response to pleasant images was significantly and positively related to FFP total score ($r = .16$, $p < .05$), indicating that individuals with high psychopathy scores had greater skin conductance response to neutral and pleasant images. Skin conductance response to aversive images was not significantly related to any psychopathy composite scores or the FFP.

EMG response to neutral images at 3.5 second noise probe onset, and EMG response to all images at 3.5 second noise probe onset were significantly and negatively related to PImp ($r = -.16$, $p < .05$ and $r = -.19$, $p < .05$, respectively). Further, EMG response to pleasant images at 3.5 second noise probe onset, EMG response to aversive images at 3.5 second noise probe onset, EMG response to aversive images at 5.5 second noise probe onset, and EMG response to all images at 5.5 second noise probe onset were modestly and negatively related to PIMP ($r = -.14$, $p < .10$; $r = -.15$, $p < .10$; $r = -.15$, $p < .10$; and $r = -.14$, $p < .10$, respectively). None of the other EMG response variables was significantly related to any psychopathy composite scores or the FFP.

Taken together, these results indicate that individuals with high pan-impulsivity scores generally have lower EMG responses to noise probes across all types of visual stimuli. However, none of the relations between FFM psychopathy composite scores and indicators of autonomic hypoarousal (i.e., skin conductance, EMG startle response) was consistent with hypotheses.

Maladaptive risk taking

It was hypothesized that indicators of maladaptive risk taking would relate positively to the FFM psychopathy composite of PImp. Correlational analyses indicated that the BART explosions variable was modestly and positively related to PImp ($r = .14$, $p < .10$), suggesting that individuals high in pan-impulsivity were more likely to pump balloons to the point of explosion. The BART pumps variable (total number of pumps per un-popped balloon) was not significantly related to any psychopathy composite score or the FFP total score. Although the relation between BART explosions and PImp was consistent with hypotheses, the non-significant relation between BART pumps and PImp failed to support hypotheses.

Response modulation deficits

It was hypothesized that indicators of response modulation deficits would relate positively to the FFM psychopathy composite of PImp. Correlational analyses indicated that the GNG total commission errors across all 8 trials variable was significantly and negatively related to IAnt ($r = -.16$, $p < .05$), and FFP total score ($r = -.19$, $p < .01$), suggesting that individuals with high interpersonal antagonism and high FFM psychopathy scores had fewer errors of commission on the GNG task. The GNG commission errors during the last 5 trials variable was significantly and negatively related to LSNA (r = -.16, $p < .05$), PImp (r = -.15, $p < .05$), and FFP total score (r = -.20, $p < .01$), indicating that individuals with low self-directed negative affect, high pan impulsivity, and high psychopathy scores committed fewer errors of commission on the GNG task. These findings failed to support hypotheses.

Deficits in empathic responding

It was hypothesized that deficits in empathic responding, as assessed by errors on the EEM task, would relate positively to both the FFM psychopathy composites of IAnt and ONA. Average number of morphs required to identify EEM happy was significantly and negatively related to LSNA (r = -.15, $p < .05$), modestly and negatively related to IAss (r = -.13, $p < .10$), and modestly and positively related to ONA (r =.14, $p < .05$), indicating that individuals high in self-directed negative affect, low in interpersonal assertiveness, and high in other-directed negative affect required more morphs to correctly identify EEM happy. Average number of morphs required to identify EEM anger was modestly and negatively related to IAss (r = -.13, $p < .10$), indicating that individuals with low interpersonal assertiveness scores required more morphs to correctly identify the emotion of anger. Average number of morphs required to identify EEM fear was modestly and negatively related to FFM psychopathy total score (r = -.14, $p < .10$), indicating that individuals with low psychopathy scores required more morphs to correctly identify the emotion of fear. Finally, the number of EEM trials with an error present was significantly and positively related to LSNA (r =.17, $p < .05$), indicating that individuals with low self-directed negative affect were more likely to make errors on the EEM task. Although the positive relations between EEM happy and other directed negative affect was consistent with predictions, other relations did not support hypotheses.

Regression Analyses

Hierarchical regression analyses were conducted to investigate the relative contributions of the FFM psychopathy composite scores to the dependent variables (see Table 5.3). For each DV, those psychopathy composite scores hypothesized to relate to the task were entered first, followed by the other composite scores relevant to psychopathy to identify other potential relations. Finally, those NEO PI-R facets not included in composite scores were entered in the last step in a stepwise entry method to identify other potential contributors.

In several instances, suppression effects were noted. In order to understand the nature of these effects, individual facets from FFM psychopathy factor scores were entered into subsequent regression equations where appropriate. Specific suppressor effects were explored by examining the difference between squared zero-order correlation and the squared semi-partial correlation with the dependent variable. According to Velicer (see Smith et al, 1992), suppression exists when a predictor's "usefulness" (squared semipartial correlation) in the regression equation is greater than its squared zero-order correlation with the criterion variable. A greater squared semi-partial correlation indicates that the independent variable accounts for more variance in the dependent variable while in the presence of the suppressor variable(s) than when by itself.

Poor Fear Conditioning/Hypoarousal to Negative Stimuli

Skin Conductance Response. Increase in skin conductance during neutral images was not found to be related to LSNA in the first step, or to FFM psychopathy composite scores in the second step. However, a significant and positive relation with C4 (achievement striving) was observed in the stepwise regression in the third step ($B = .227$, $p < .05$), and a suppression effect was observed with PImp (from $B = .155$, *ns,* in the second step to $B = .331$, $p < .05$ in the third step). This increase in B from the second to the third step suggested that the facets of PImp were accounting for more variance when entered with C4: achievement striving from the conscientiousness domain of the NEO PI-R.

An alternate regression analysis was performed using the individual facets of PImp, rather than the aggregated composite score, so that specific relations could be investigated (see Table 5.4). In addition to regression coefficients, Table 5.4 also provides zero-order, squared zero-order, and squared semi-partial coefficients for all variables entered to further explore relations. In this suppression analysis, increase in skin conductance during neutral images was not found to be related to LSNA in the first step, or to other FFM psychopathy composite scores in the second step. However, a significant and positive relation with C4 (achievement striving) was observed in the stepwise regression in the third step ($B = .297$, $p < .01$), and the PImp facet of C6R (deliberation) increased from not significant to modestly and positively significant (from $B = .133$, *ns,* in the second step to $B = .145$, $p < .10$ in the third step).

Additional exploration of the squared zero-order and squared semi-partial correlations indicated that the squared semi-partial correlation of C5 (self-discipline; $sr^2 = .012$) exceeded its squared zero-order correlation ($r^2 = .000$) by greater than .005, and that the squared semi-partial correlation of C4 (achievement striving; $sr^2 = .042$) exceeded its squared zero-order correlation ($r^2 = .015$) by greater than .005 (see Table 5.4). Correlations revealed that the regression coefficients were greater than the zero-order correlation coefficients in absolute value (C5 $B = .160$, *ns*, vs. $r = .017$, *ns*; C4 $B = .297$, $p < .01$, vs. $r = .123$, *ns*). This suggests that when entered together, the variance common to both facets of PImp and C4 is suppressed and therefore allows relations with increase in skin conductance during neutral images to show more strongly.

Increase in skin conductance response during pleasant images was not found to be related to LSNA in the first step, or to other FFM psychopathy composites in the second step. However, a significant and positive relation with C4 (achievement striving) was observed in the stepwise regression in the third step ($B = .200$, $p < .05$), and a suppression effect was observed with PImp (from $B = .187$, *ns,* in the second step to $B = .341$, $p < .05$ in the third step). This increase in B from the second to the third step suggested that the facets of PImp were accounting for more variance when entered with C4 (achievement striving).

An alternate regression analysis was performed using the individual facets of PImp, rather than the aggregated composite score (see Table 5.4). Increase in skin conductance response during pleasant images was not found to be related to LSNA in the first step, or to other FFM psychopathy composites in the second step. However, a significant and positive relation with C4 (achievement striving) was observed in the stepwise regression in the third step ($B = .275$, $p < .05$.

Additional exploration of the squared zero-order and squared semi-partial correlations indicated that the squared semi-partial correlation of C5 (self-discipline; $sr^2 = .012$) exceeded its squared zero-order correlation ($r^2 = .001$) by greater than .005, and that the squared semi-partial correlation of C4 (achievement striving; $sr^2 = .036$) exceeded its squared zero-order correlation ($r^2 = .009$) by greater than .005 (see Table 5.4). Correlations revealed that the regression coefficients were greater than the zero-order correlation coefficients in absolute value (C5 $B = .160$, *ns*, vs. $r = .034$, *ns*; C4 $B = .297$, $p < .05$ vs. $r = .123$, *ns*). This suggests that when entered together, the variance common to both facets of PImp and C4 is suppressed and therefore allows relations with increase in skin conductance response during pleasant images to show more strongly.

Increase in skin conductance response during aversive images was not found to be related to LSNA in the first step, or to psychopathy consensus scales in the second step. However, a significant and positive relation with C4 (achievement striving) was observed in the stepwise regression in the third step ($B = .214$, $p < .05$), and a suppression effect was observed with PImp (from $B = .169$, *ns,* in the second step to $B = .334$, $p < .05$ in the third step). This increase in B from the second to the third step suggested that the facets of PImp were accounting for more variance when entered with C4 (achievement striving).

An alternate regression analysis was performed using the individual facets of PImp, rather than the aggregated composite score, so that specific relations could be investigated (see Table 5.4). Increase in skin conductance response during aversive images was not found to be related to LSNA in the first step, or to other FFM psychopathy composites in the second step. A significant and positive relation with C4 (achievement striving) was observed in the stepwise regression in the third step ($B = .214$, $p < .05$).

Additional exploration of the squared zero-order and squared semi-partial correlations indicated that the squared semi-partial correlation of C5 (self-discipline; $sr^2 = .010$) exceeded its squared zero-order correlation ($r^2 = .001$) by greater than .005, and that the squared semi-partial correlation of C4 (achievement striving; $sr^2 = .034$) exceeded its squared zero-order correlation ($r^2 = .010$) by greater than .005 (see Table 5.4). Correlations revealed that the regression coefficients were greater than the zero-order correlation coefficients in absolute value (C5 $B = .146$, *ns*, vs. $r = .028$, *ns*; C4 $B = .270$, $p < .05$, vs. $r = .099$, *ns*). This indicates that when entered together, the variance common to both facets of PImp and C4 is suppressed and therefore allows relations with increase in skin conductance response during aversive images to show more strongly.

Taken together, skin conductance analyses across all image types suggest that after removing variance common to the facets of conscientiousness, C4 (achievement striving) and C6 (deliberation) significantly accounted for variance in skin conductance response. However, it should be noted that these relations represent partial relations, and should be interpreted with caution.

Startle Response. EMG startle response magnitude during neutral images at 3.5 second probe onset was not found to relate to LSNA in the first step, although startle was marginally and negatively related to PImp in the second step ($B = -.039$, $p < .10$). EMG startle response magnitude during neutral images at 4.5 second probe onset was not found to relate to any FFM psychopathy composite scores. EMG startle response magnitude during neutral images at 5.5 second probe onset was not found to relate to LSNA in the first step, or to other FFM psychopathy composites in the second step. However, a significant and positive relation with C4 (achievement striving) was observed in the stepwise regression in the third step (B = .029, p < .05), and a suppression effect was observed with IAss (from B = -.015, *ns,* in the second step to B = -.026, p < .10 in the third step).

Due to the fact that IAss and C4 (achievement striving) scores are based upon only one NEO PI-R facet each, no additional regression analysis was conducted. Correlations between EMG startle response magnitude during neutral images at 5.5 second probe onset and the facets of IAss and C4 revealed that neither of the regression coefficients were greater than the zero-order correlation coefficients in absolute value (IAss B = -.026, p < .10, vs. r = -.060, *ns*; C4 B = .029, p < .05, vs. r = .148, p < .10).

EMG startle response magnitude during pleasant images at 3.5 second probe onset was not found to relate to LSNA in the first step, although startle was significantly and negatively related to PImp in the second step (B = -.042, p < .05). EMG startle response magnitude during pleasant images at 4.5 second probe onset was not found to relate to any FFM psychopathy composite scores. EMG startle response magnitude during pleasant images at 5.5 second probe onset was not found to relate to LSNA in the first step, or to other FFM psychopathy composite scores in the second step. However, a significant and positive relation with C4 (achievement striving) was observed in the stepwise regression in the third step (B = .033, p < .05), and a suppression effect was observed with IAss (from B = -.015, *ns,* in the second step to B = -.026, p < .10 in the third step).

Due to the fact that IAss and C4 scores are based upon only one NEO PI-R facet each, no additional regression analysis was conducted. Correlations between EMG startle response magnitude during pleasant images at 5.5 second probe onset and the facets of IAss and C4 (achievement striving) revealed that neither of the regression coefficients were greater than the zero-order correlation coefficients in absolute value (IAss B = -.026, p < .10, vs. r = -.076, *ns*; C4 B = .033, p < .05, vs. r = .177, p < .05).

EMG startle response magnitude during aversive images at 3.5 second probe onset was not found to relate to LSNA in the first step, although startle was modestly and negatively related to PImp in the second step (B = -.030, p < .10). EMG startle response magnitude during aversive images at 4.5 second probe onset was not found to relate to any FFM psychopathy composite scores. EMG startle response magnitude during aversive images at 5.5 second probe onset was not found to relate to LSNA in the first step, although startle was modestly and negatively related to PImp in the second step (B = -.043, p < .10).

EMG startle response magnitude at 0.0 second probe onset was not found to relate to any FFM psychopathy composite scores. EMG startle response magnitude during all image types at 3.5 second probe onset was not found to relate to LSNA in the first step, although startle was significantly and negatively related to PImp in the second step (B = -.042, p < .05). EMG startle response magnitude during all image types at 4.5 second probe onset was not found to relate to any FFM psychopathy composite scores. EMG startle response magnitude during aversive images at 5.5 second probe onset was not found to relate to LSNA in the first step, although startle was modestly and negatively related to PImp in the second step (B = -.033, p < .10).

Taken together, these results suggest a possible relation between EMG startle response and PImp, where those high in pan-impulsivity exhibit smaller EMG responses to noise probes that occur with various types of visual stimuli.

Maladaptive risk taking

As hypothesized, the BART explosion score was found to be modestly and positively related to PImp in the first step (B = .177, p < .10). In the second step, the BART explosion score was modestly and negatively related to LSNA (B = -.163, p < .10), while the relation with PImp remained significant (B = .201, p < .05). In addition, a significant and negative relation with C2 (order) was observed in the stepwise regression in the third step (B = -.158, p < .05), while the negative relation with LSNA remained modestly significant (B = -.181, p < .10). This indicates that individuals with high pan-impulsivity, high self-directed negative affect, and low order were more likely to pump balloons to the point of explosion.

The BART pumps score was not found to be significantly related to PImp in the first step, or to FFM psychopathy composite scores in the second step. However, a significant and positive relation with E2 (gregariousness) was observed in the stepwise regression in the third step (B = .070, p < .05), and a significant and positive relation with O5 (openness to ideas) was observed in the stepwise regression in the fourth step (B = .063, p < .05), while E2 remained significant (B = -.087, p < .05). This indicates that those with high gregariousness and high openness to ideas pump the balloon more in the BART task.

Response modulation deficits

GNG commission error score across all 8 trials was not found to be related to PImp in the first step. However, GNG commission error score across all 8 trials was modestly and negatively related to LSNA in the second step (B = -1.956, p < .10). A significant and negative relation with O1 (openness to fantasy) was observed in the stepwise regression in the third step (B = -1.609, p < .05), while the negative relation with LSNA remained significant (B = -2.208, p < .05). This indicates that those high in self-directed negative affect and low in openness to fantasy commit more errors of commission across all trials on the GNG task.

GNG commission error score during the last 5 trials was found to be related to PImp in the first step (B = -1.469, p < .05). However, this relation was in the opposite direction to hypotheses. GNG commission error score during the last 5 trials was significantly and negatively related to LSNA in the second step (B = -2.063, p < .01), while the relation with PImp remained significant (B = -1.937, p < .05). A significant and negative relation with O1 (openness to fantasy) was observed in the stepwise regression in the third step (B = -1.219, p < .01), while the negative relation with LSNA remained significant (B = -2.254, p < .01). This indicates that those low in pan-impulsivity, high in self-directed negative affect, and low in openness to fantasy commit more errors of commission on the GNG task after learning of the stimuli has occurred.

Deficits in empathic responding

EEM average number of morphs across all emotions was not found to be significantly related to IAnt or ONA in the first step, or to FFM psychopathy composite scores in the second step. In addition to average number of morphs, the average number of morphs required to correctly identify the emotion was calculated for each type of emotion.

The average number of morphs required to correctly identify EEM sad was not significantly related to IAnt or ONA in the first step. However, EEM sad was modestly and negatively related to PImp (*B* = -1.238, $p < .10$) and a suppression effect was observed with ONA (from *B* = .689, *ns,* in the first step to *B* = 1.022, $p < .10$ in the second step). This increase in *B* from the second to the third step suggested that ONA was accounting for more variance when entered with PImp.

An alternate regression analysis was performed using the individual facets of PImp, rather than the aggregated composite score, so that specific relations could be investigated (see Table 5.4). Results indicated that the average number of morphs required to correctly identify EEM sad was not significantly related to IAnt or ONA in the first step. However, in the second step, EEM sad was significantly and negatively related the PImp facet of N5 (impulsiveness; *B* = -1.345, $p < .01$) and ONA increased from not significant to modestly and positively significant (from *B* = .689, *ns,* in the first step to *B* = .946, $p < .10$ in the second step).

Additional exploration of the squared zero-order and squared semi-partial correlations that at the first step indicated that the squared semi-partial correlation of ONA ($sr^2 = .016$) exceeded its squared zero-order correlation ($r^2 = .007$) by greater than .005, the squared semi-partial correlation of N5 (impulsiveness; $sr^2 = .037$) exceeded its squared zero-order correlation ($r^2 = .030$) by greater than .005 (see Table 5.4). Correlations revealed that the regression coefficients were greater than the zero-order correlation coefficients in absolute value (N5 *B* = -1.345, $p < .01$, vs. $r = -.174$, $p < .05$; ONA *B* = .946, $p < .10$ vs. $r = .086$, *ns*). This indicates that when entered together, the variance common to both ONA and N5 (impulsiveness) is suppressed and therefore allows relations with EEM sad to show more strongly.

The average number of morphs required to correctly identify EEM happy was significantly and positively related to ONA in the first step (*B* = .894, $p < .05$), although the relation to IAnt was not significant. No other relations were observed in subsequent steps.

The average number of morphs required to correctly identify EEM anger was not significantly related to IAnt or ONA in the first step. However, a modest and negative relation with IAss (*B* = -.944, $p < .10$) was observed in the second step.

The average number of morphs required to correctly identify EEM disgust was not found to be significantly related to IAnt or ONA in the first step, or to FFM psychopathy composite scores in the second step.

The average number of morphs required to correctly identify EEM fear was not significantly related to IAnt or ONA in the first step. However, a modest and negative relation with LSNA was observed in the second step (*B* = -.847, $p < .10$).

The average number of morphs required to correctly identify EEM surprise was not significantly related to IAnt or ONA in the first step, or to psychopathy composite scores in the second step. However, a significant and negative relation with C2 (order) was observed in the stepwise regression in the third step (*B* = -1.092, $p < .05$), and a suppression effect was observed with PImp (from *B* = -.552, *ns,* in the first step to *B* = -1.460, $p < .10$ in the second step).

An alternate regression analysis was performed using the individual facets of PImp, rather than the aggregated composite score (see Table 5.4). The average number of morphs required to correctly identify EEM surprise was not significantly related to IAnt or ONA in the first step. However, EEM sad was significantly and negatively related the PImp facet of C3R (dutifulness; $B = -1.761$, $p < .01$) and N5 (impulsiveness; $B = -1.172$, $p < .05$), and significantly and positively related to the PImp facet of C5R (self-discipline; $B = 1.110$, $p < .05$) in the second step.

Additional exploration of the squared zero-order and squared semi-partial correlations that at the first step indicated that the squared semi-partial correlation of IAnt ($sr^2 = .006$) exceeded its squared zero-order correlation ($r^2 = .000$) by greater than .005 (see Table 5.4). Correlations revealed that the regression coefficient was greater than the zero-order correlation coefficient in absolute value (IAnt $B = .086$, *ns,* vs. $r = -.022$, *ns*). This indicates that when entered together, the variance common to both facets of IAnt and ONA is suppressed and therefore allows relations with EEM surprise to show more strongly. Further, at step two of the regression equation, the squared semi-partial correlation of C3R (dutifulness; $sr^2 = .038$) exceeded its squared zero-order correlation ($r^2 = .013$) by greater than .005, the squared semi-partial correlation of C5 (self-discipline; $sr^2 = .022$) exceeded its squared zero-order correlation ($r^2 = .006$) by greater than .005, and the squared semi-partial correlation of N5 (impulsiveness; $sr^2 = .025$) exceeded its squared zero-order correlation ($r^2 = .011$) by greater than .005. Correlations revealed that the regression coefficients were greater than the zero-order correlation coefficients in absolute value (C3R $B = -1.761$, $p < .01$, vs. $r = -.113$, *ns*; C5R $B = 1.110$, $p < .05$, vs. $r = .070$, *ns*; N5 $B = -1.172$, $p < .05$, vs. $r = -.105$, *ns*), indicating that when entered together, the variance common to facets of PImp is suppressed and therefore allows relations with EEM surprise to show more strongly.

The number of trials with an error present was calculated for each participant. EEM error score was not significantly related to IAnt or ONA in the first step. However, a significant and positive relation with LSNA ($B = 1.386$, $p < .05$) was observed in the second step. Further, a significant and negative relation with C2 (order) was observed in the stepwise regression in the third step ($B = -.998$, $p < .05$), while the relation with LSNA remained significant ($B = 1.270$, $p < .05$). Finally, a significant and positive relation with C1 (competence) was observed in the stepwise regression in the fourth step ($B = 1.453$, $p < .05$), while the relation with C2 (order) remained significant ($B = -1.201$, $p < .01$).

Taken together, these results for the EEM suggest that those high in other-directed negative affect, high in self-directed negative affect, and low in assertiveness required more morph stages to accurately identify various emotions. In addition, after removing shared variance, ONA and N5 (impulsiveness) significantly accounted for variance in EEM sad, and after removing shared variance, C3 (dutifulness), C5 (self-discipline) and N5 (impulsiveness) significantly accounted for variance in EEM surprise. However, it should be noted that these relations represent partial relations, and should be interpreted with caution. Finally, those high in self-directed negative affect, high in (self-perceived) competence, and low in order committed errors on more trials in the EEM task.

Relations with Additional Measures

Descriptive statistics for additional variables and relations between additional measures and task variables are presented in Appendices B- F. As hypotheses did not exist for these measures, they are not explored beyond presentation in Appendices.

Table 5.1
Descriptive statistics

Variable	N	Mean	SD	Min	Max
Age	181	19.69	2.76	17.00	45.00
LSNA	199	3.30	.48	1.72	4.44
PImp	199	3.04	.37	1.82	4.22
IAnt	199	2.54	.38	1.70	3.84
ONA	199	2.64	.62	1.38	4.62
IAss	199	3.23	.58	1.88	4.88
FFM Psychopathy	199	-.08	.19	-.59	.52
SCR Neutral Images - Baseline	162	.17	.51	-1.36	3.12
SCR Pleasant Images - Baseline	162	.19	.51	-1.25	3.09
SCR Aversive Images - Baseline	162	.16	.52	-1.39	2.88
EMG Neutral 3.5	161	.09	.08	.01	.42
EMG Neutral 4.5	160	.10	.09	.01	.52
EMG Neutral 5.5	161	.10	.08	.01	.43
EMG Pleasant 3.5	161	.09	.08	.01	.47
EMG Pleasant 4.5	159	.09	.08	.01	.55
EMG Pleasant 5.5	160	.09	.07	.01	.52
EMG Aversive 3.5	161	.09	.07	.01	.33
EMG Aversive 4.5	161	.10	.08	.01	.55
EMG Aversive 5.5	161	.11	.10	.01	.61
EMG All Images 0.0	164	.07	.07	.01	.52
EMG All Images 3.5	164	.09	.07	.01	.34
EMG All Images 4.5	164	.10	.07	.01	.41
EMG All Images 5.5	164	.10	.07	.01	.50
BART Explosions	198	6.05	2.63	1.00	14.00
BART Pumps	198	472.96	105.35	138.00	725.00
GNG Total Commission Errors	199	14.17	5.05	3	34
GNG Com Errors Last 5 Trials	199	5.50	3.69	0	19
EEM Average	200	12.11	2.45	6.67	22.00
EEM Sad	200	14.15	3.20	5.00	22.00
EEM Happy	200	7.34	3.02	3.00	22.00
EEM Anger	200	13.27	3.43	5.00	22.00
EEM Disgust	200	13.49	3.44	5.33	22.00
EEM Fear	200	14.63	2.55	9.33	22.00
EEM Surprise	200	9.78	3.53	2.67	22.00
EEM Errors	200	3.75	.14	.00	18.00

Table 5.2

Relations between NEO PI-R psychopathy composite scores and all dependent variables

Variable	LSNA	PImp	IAnt	ONA	IAss	FFM Psy
SCR Neutral Images –BL	.01	.10	.07	.03	.03	.13†
SCR Pleasant Images – BL	.03	.12	.08	.03	.02	.16*
SCR Aversive Images – BL	.00	.11	.05	.02	.01	.12
EMG Neutral 3.5	.01	-.16*	-.08	-.03	-.02	-.08
EMG Neutral 4.5	-.05	-.03	-.03	-.06	-.13	-.06
EMG Neutral 5.5	.02	-.10	.03	-.04	-.06	.00
EMG Pleasant 3.5	-.01	-.14†	-.01	-.03	-.07	-.07
EMG Pleasant 4.5	-.01	-.06	-.02	-.07	-.07	-.05
EMG Pleasant 5.5	.02	-.08	.01	-.02	-.08	.01
EMG Aversive 3.5	.05	-.15†	-.03	-.09	-.03	-.03
EMG Aversive 4.5	.09	-.11	-.06	-.05	-.01	-.01
EMG Aversive 5.5	.02	-.15†	-.04	-.04	-.01	-.06
EMG All Images 0.0	.01	-.04	.02	.00	-.02	.01
EMG All Images 3.5	.01	-.19*	-.03	-.05	-.04	-.07
EMG All Images 4.5	.01	-.10	-.03	-.06	-.08	-.05
EMG All Images 5.5	.01	-.14†	.01	-.03	-.05	-.02
BART Explosions[a]	-.11	.14†	-.06	-.05	-.05	-.04
BART Pumps[a]	.00	.10	-.01	-.05	-.01	.06
GNG Total Com Errors	-.09	-.11	-.16*	-.09	-.03	-.19**
GNG Com Error Last 5 Trials	-.16*	-.15*	-.11	-.02	-.04	-.20**
EEM Average	-.05	-.03	-.05	.03	-.12	-.09
EEM Sad	-.03	-.09	-.01	.09	-.09	-.05
EEM Happy	-.15*	.07	.00	.14†	-.13†	-.07
EEM Anger	.01	.01	-.07	-.05	-.13†	-.06
EEM Disgust	.07	-.07	-.07	-.05	.00	-.04
EEM Fear	-.12	-.00	-.07	-.04	-.08	-.14†
EEM Surprise	-.05	-.02	-.02	.07	-.09	-.06
EEM Errors	.17*	.03	.00	-.07	.05	.12

Note. a. Log function presented.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5.3

Independent contributions of FFM psychopathy composites and facets to dependent variables

Step and variable	B	SEB	β	ΔR	ΔF	p	N
Skin Conductance Response: Neutral Images							
1 LNSA	.006	.086	.006	.000	.005	.942	162
2 LSNA	.012	.122	.011	.016	.622	.647	
PImp	.155	.124	.108				
IAnt	.094	.146	.070				
ONA	-.033	.104	-.040				
IAss	.031	.085	.034				
3 LSNA	.014	.120	.013	.040	6.484*	.012	
PImp	.331*	.140	.230				
IAnt	.076	.143	.056				
ONA	-.048	.103	-.058				
IAss	-.050	.089	-.056				
C4: Achievement Striving	.227*	.089	.256				
Skin Conductance Response: Pleasant Images							
1 LNSA	.034	.086	.031	.001	.156	.694	162
2 LSNA	.076	.123	.069	.021	.824	.512	
PImp	.187	.124	.129				
IAnt	.090	.146	.067				
ONA	-.015	.104	-.018				
IAss	.003	.085	.003				
3 LSNA	. 077	.121	.070	.030	4.933*	.028	
PImp	.341*	.141	.236				
IAnt	.074	.144	.055				
ONA	-.029	.103	-.035				
IAss	-.068	.090	-.075				
C4: Achievement Striving	.200*	.090	.223				
Skin Conductance Response: Aversive Images							
1 LNSA	.004	.087	.003	.000	.002	.968	162
2 LSNA	.026	.125	.023	.014	.557	.694	
PImp	.169	.126	.115				
IAnt	.067	.149	.049				
ONA	-.029	.106	-.035				
IAss	.010	.087	.010				
3 LSNA	.027	.123	.024	.034	5.456*	.021	
PImp	.334*	.143	.228				
IAnt	.049	.147	.036				
ONA	-.043	.105	-.051				
IAss	-.067	.091	-.072				
C4: Achievement Striving	.214*	.091	.236				

Table 5.3 (continued).
Independent contributions of FFM psychopathy composites and facets to dependent variables

Step and variable	B	SEB	β	ΔR	ΔF	p	N
Startle Response: Neutral Images 3.5 Second Onset							
1 LNSA	.002	.013	.014	.000	.033	.857	159
2 LSNA	.001	.019	.007	.031	1.227	.302	
PImp	-.039†	.020	-.169				
IAnt	-.015	.023	-.074				
ONA	.008	.016	.065				
IAss	-.006	.013	-.045				
Startle Response: Neutral Images 4.5 Second Onset							
1 LNSA	-.009	.015	-.048	.002	.366	.546	158
2 LSNA	-.012	.021	-.066	.023	.906	.462	
PImp	-.013	.022	-.052				
IAnt	.016	.025	.072				
ONA	-.018	.018	-.131				
IAss	-.019	.014	-.122				
Startle Response: Neutral Images 5.5 Second Onset							
1 LNSA	.003	.014	.018	.000	.051	.821	159
2 LSNA	.001	.020	.006	.023	.914	.458	
PImp	-.026	.020	-.113				
IAnt	.025	.024	.118				
ONA	-.010	.017	-.078				
IAss	-.015	.014	-.106				
3 LSNA	.001	.020	.008	.026	4.108*	.044	
PImp	-.004	.023	-.017				
IAnt	.023	.023	.105				
ONA	-.012	.017	-.091				
IAss	-.026†	.014	-.178				
C4: Achievement Striving	.029*	.014	.205				
Startle Response: Pleasant Images 3.5 Second Onset							
1 LNSA	-.003	.014	-.015	.000	.037	.847	159
2 LSNA	-.006	.020	-.037	.033	1.287	.278	
PImp	-.042*	.021	-.173				
IAnt	.012	.023	.056				
ONA	-.005	.017	-.038				
IAss	-.014	.014	-.098				
Startle Response: Pleasant Images 4.5 Second Onset							
1 LNSA	-.002	.013	-.015	.000	.019	.891	157
2 LSNA	-.007	.019	-.044	.016	.626	.645	
PImp	-.015	.019	-.067				
IAnt	.014	.023	.064				
ONA	-.015	.016	-.114				
IAss	-.011	.013	-.080				

Table 5.3 (continued).

Independent contributions of FFM psychopathy composites and facets to dependent variables

Step and variable	B	SEB	β	ΔR	ΔF	p	N
Startle Response: Pleasant Images 5.5 Second Onset							
1 LNSA	.002	.012	.015	.000	.033	.856	158
2 LSNA	.007	.017	.048	.018	.707	.588	
PImp	-.020	.017	-.097				
IAnt	.010	.020	.053				
ONA	.000	.014	-.006				
IAss	-.015	.011	-.126				
3 LSNA	.006	.016	.044	.046	7.384**	.007	
PImp	.006	.020	.031				
IAnt	.008	.020	.045				
ONA	-.003	.014	-.024				
IAss	-.026*	.012	-.220				
C4: Achievement Striving	.033**	.012	.274				
Startle Response: Aversive Images 3.5 Second Onset							
1 LNSA	.007	.014	-.015	.002	.345	.558	159
2 LSNA	.000	.017	-.005	.028	1.120	.349	
PImp	-.030†	.017	-.153				
IAnt	.012	.020	.062				
ONA	-.010	.014	-.086				
IAss	-.008	.011	-.067				
Startle Response: Aversive Images 4.5 Second Onset							
1 LNSA	.015	.014	-.015	.008	1.225	.270	159
2 LSNA	.021	.020	.122	.014	.557	.694	
PImp	-.024	.021	-.097				
IAnt	-.013	.024	.060				
ONA	.010	.017	.074				
IAss	-.010	.014	-.071				
Startle Response: Aversive Images 5.5 Second Onset							
1 LNSA	.003	.016	.015	.000	.033	.855	159
2 LSNA	-.006	.023	-.031	.023	.912	.459	
PImp	-.043†	.023	-.157				
IAnt	.000	.028	-.004				
ONA	-.002	.020	-.010				
IAss	-.004	.016	-.022				
Startle Response: All Images 00 Second Onset							
1 LNSA	.001	.011	.011	.000	.004	.950	162
2 LSNA	.002	.016	.014	.003	.137	.968	
PImp	-.010	.016	-.052				
IAnt	.006	.019	.032				
ONA	.000	.014	.004				
IAss	-.005	.011	-.040				

Table 5.3 (continued).
Independent contributions of FFM psychopathy composites and facets to dependent variables

Step and variable	B	SEB	β	ΔR	ΔF	p	N
Startle Response: All Images 3.5 Second Onset							
1 LNSA	.001	.011	.010	.000	.015	.901	162
2 LSNA	-.005	.016	-.033	.045	1.842	.124	
PImp	-.042*	.016	-.219				
IAnt	.008	.019	.044				
ONA	-.003	.014	-.028				
IAss	-.009	.011	-.075				
Startle Response: All Images 4.5 Second Onset							
1 LNSA	.001	.012	.011	.000	.012	.912	162
2 LSNA	.000	.017	-.005	.021	.840	.502	
PImp	-.022	.017	-.109				
IAnt	.009	.020	.048				
ONA	-.008	.015	-.069				
IAss	-.013	.012	-.105				
Startle Response: All Images 5.5 Second Onset							
1 LNSA	.002	.012	.011	.000	.025	.874	161
2 LSNA	-.002	.018	-.012	.027	1.074	.372	
PImp	-.033†	.018	-.157				
IAnt	.016	.021	.080				
ONA	-.006	.015	-.047				
IAss	-.011	.012	-.084				
Balloon Analog Risk Task Explosions[a]							
1 PImp	.177†	.091	.137	.019	3.761†	.054	198
2 PImp	.201*	.099	.156	.027	1.334	.259	
LSNA	-.163†	.097	-.161				
IAnt	-.012	.120	-.009				
ONA	-.130	.082	-.168				
IAss	.038	.069	.046				
3 PImp	.070	.112	.054	.029	6.015*	.015	
LSNA	-.181†	.096	-.178				
IAnt	-.017	.118	-.013				
ONA	-.112	.082	-.145				
IAss	.069	.069	.082				
C2: Order	-.158*	.064	-.200				

Table 5.3 (continued).
Independent contributions of FFM psychopathy composites and facets to dependent variables

Step and variable	B	SEB	β	ΔR	ΔF	p	N
Balloon Analog Risk Task Pumps[a]							
1 PImp	.068	.050	.095	.009	1.802	.181	198
2 PImp	.090	.055	.127	.008	.410	.801	
LSNA	-.008	.054	-.014				
IAnt	.023	.067	.032				
ONA	-.050	.046	-.119				
IAss	.001	.038	.002				
3 PImp	.035	.061	.049	.021	4.175*	.042	
LSNA	-.030	.055	-.054				
IAnt	.059	.068	.084				
ONA	-.048	.045	-.113				
IAss	-.024	.040	-.052				
E2: Gregariousness	.070*	.034	.175				
4 PImp	.028	.061	.040	.023	4.713*	.031	
LSNA	-.033	.054	-.060				
IAnt	.071	.068	.101				
ONA	-.045	.045	-.107				
IAss	-.032	.040	-.070				
E2: Gregariousness	.087*	.035	.219				
O5: Ideas	.063*	.029	.158				
Go/No-go Commission Errors							
1 PImp	-1.518	.957	-.112	.013	2.517	.114	199
2 PImp	-1.607	1.035	-.119	.039	1.986†	.098	
LSNA	-1.956†	1.003	-.185				
IAnt	-1.499	1.236	-.112				
ONA	-.489	.851	-.060				
IAss	.377	.719	.043				
3 PImp	-.390	.162	-.029	.031	6.463*	.012	
LSNA	-2.208*	1.127	-.209				
IAnt	-1.641	.994	-.123				
ONA	-.654	1.220	-.081				
IAss	.555	.842	.063				
O1: Fantasy	-1.609*	.633	-.197				

Table 5.3 (continued).

Independent contributions of FFM psychopathy composites and facets to dependent variables

Step and variable	B	SEB	β	ΔR	ΔF	p	N
Go/No-go Commission Errors: Last 5 Trials							
1 PImp	-1.469*	.695	-.149	.022	4.471*	.036	199
2 PImp	-1.937*	.745	-.196	.055	2.881*	.024	
LSNA	-2.063**	.722	-.267				
IAnt	-.686	.890	-.070				
ONA	-.179	.613	-.030				
IAss	.391	.517	.061				
3 PImp	-1.016	.810	-.103	.033	7.184**	.008	
LSNA	-2.254**	.714	-.292				
IAnt	-.794	.877	-.081				
ONA	-.304	.605	-.052				
IAss	.526	.512	.082				
O1: Fantasy	-1.219**	.455	-.204				
Emotional Expression Multimorph Total: All Emotions							
1 IAnt	-.665	.525	-.112	.009	.911	.404	199
ONA	.356	.317	.099				
2 IAnt	-.518	.560	-.087	.013	.829	.479	
ONA	.394	.385	.109				
LSNA	.161	.454	.034				
PImp	-.366	.468	-.061				
IAss	-.466	.326	-.119				
Emotional Expression Multimorph: Sad							
1 IAnt	-.725	.726	-.088	.012	1.235	.293	199
ONA	.689	.439	.138				
2 IAnt	-.637	.769	-.077	.027	1.834	.142	
ONA	1.022†	.529	.204				
LSNA	.461	.623	.070				
PImp	-1.238†	.643	-.148				
IAss	-.647	.447	-.120				
Emotional Expression Multimorph: Happy							
1 IAnt	-.864	.611	-.123	.029	2.930†	.056	199
ONA	.894*	.369	.211				
2 IAnt	-.598	.653	-.085	.009	.621	.602	
ONA	.688	.449	.162				
LSNA	-.193	.529	-.035				
PImp	.033	.456	.005				
IAss	-.375	.380	-.082				

Table 5.3 (continued).

Independent contributions of FFM psychopathy composites and facets to dependent variables

Step and variable	B	SEB	β	ΔR	ΔF	p	N
Emotional Expression Multimorph: Anger							
1 IAnt	-.538	.777	-.061	.005	.455	.635	199
ONA	-.058	.470	-.011				
2 IAnt	-.347	.826	-.039	.020	1.341	.262	
ONA	-.028	.569	-.005				
LSNA	.597	.670	.086				
PImp	.136	.691	.015				
IAss	-.944†	.480	-.164				
Emotional Expression Multimorph: Disgust							
1 IAnt	-.582	.781	-.066	.005	.512	.600	199
ONA	-.054	.472	-.010				
2 IAnt	-.779	.835	-.088	.008	.495	.686	
ONA	.320	.575	.060				
LSNA	.636	.677	.091				
PImp	-.448	.699	-.050				
IAss	-.190	.485	-.033				
Emotional Expression Multimorph: Fear							
1 IAnt	-.433	.573	-.067	.005	.456	.635	199
ONA	-.009	.347	-.002				
2 IAnt	-.023	.609	-.003	.021	1.370	.253	
ONA	-.441	.419	-.112				
LSNA	-.847†	.494	-.165				
PImp	-.125	.509	-.019				
IAss	-.078	.354	-.018				
Emotional Expression Multimorph: Surprise							
1 IAnt	-.850	.775	-.096	.011	1.080	.342	199
ONA	.673	.469	.126				
2 IAnt	-.727	.828	-.082	.009	.609	.610	
ONA	.804	.570	.151				
LSNA	.310	.671	.044				
PImp	-.552	.693	-.062				
IAss	-.560	.481	-.097				
3 IAnt	-.747	.817	-.085	.029*	5.929	.016	
ONA	.918	.565	.172				
LSNA	.183	.665	.026				
PImp	-1.460†	.779	-.164				
IAss	-.349	.483	-.061				
C2: Order	-1.092*	.448	-.201				

Table 5.3 (continued).

Independent contributions of FFM psychopathy composites and facets to dependent variables

Step and variable	B	SEB	β	ΔR	ΔF	p	N
Emotional Expression Multimorph: Errors							
1 IAnt	.547	.756	.064	.008	.757	.470	199
ONA	-.562	.457	-.108				
2 IAnt	.027	.799	.003	.028	1.889	.133	
ONA	-.062	.550	-.012				
LSNA	1.386*	.648	.204				
PImp	.797	.669	.092				
IAss	-.171	.465	-.030				
3 IAnt	.008	.791	.001	.026	5.301*	.022	
ONA	.042	.546	.008				
LSNA	1.270†	.643	.187				
PImp	-.033	.753	-.004				
IAss	.022	.467	.004				
C2: Order	-.998*	.434	-.188				
4 IAnt	.100	.784	.012	.024	4.979*	.027	
ONA	.001	.541	.000				
LSNA	.998	.648	.147				
PImp	.451	.777	.052				
IAss	-.141	.468	-.025				
C2: Order	-1.201**	.439	-.227				
C1: Competence	1.453*	.651	.191				

† $p < .10$. * $p < .05$. ** $p < .01$.

Table 5.4

Suppression effects

Step and variable	B	SE_B	β	r	r^2	sr^2	ΔR	ΔF	*p*	N
Skin Conductance Response: Neutral Images										
1 LNSA	.006	.086	.006	.006	.000	.000	.000	.005	.942	162
2 LSNA	-.060	.130	-.055	.006	.000	.001	.036	.709	.683	
C3R	-.062	.111	-.058	.019	.000	.002				
C5R	-.021	.091	-.025	.017	.000	.000				
C6R	.133	.084	.165	.155	.024	.016				
E5	.076	.092	.071	.111	.012	.004				
N5	-.033	.090	-.034	.012	.000	.001				
IAnt	.104	.153	.077	.071	.005	.003				
ONA	-.026	.105	-.031	.029	.001	.000				
IAss	.003	.089	.004	.030	.001	.000				
3 LSNA	-.040	.128	-.037	.006	.000	.001	.043	6.980*	.009	
C3R	-.015	.110	-.014	.019	.000	.000				
C5R	**.160**	**.112**	**.197**	**.017**	**.000**	**.012**				
C6R	.145†	.082	.180	.155	.024	.019				
E5	.055	.091	.052	.111	.012	.002				
N5	-.072	.089	-.074	.012	.000	.001				
IAnt	.095	.150	.070	.071	.005	.002				
ONA	-.044	.103	-.054	.029	.001	.001				
IAss	-.048	.090	-.054	.030	.001	.002				
C4: Achievement Striving	**.297****	**.112**	**.334**	**.009**	**.015**	**.042**				

Table 5.4 (continued).

Suppression effects

Step and variable	B	SE_B	β	r	r^2	sr^2	ΔR	ΔF	*p*	N
Skin Conductance Response: Pleasant Images										
1 LNSA	.034	.086	.031	.031	.001	.001	.001	.156	.694	162
2 LSNA	.039	.131	.036	.031	.001	.001	.026	.515	.844	
C3R	.031	.131	.036	.071	.005	.000				
C5R	.031	.112	.029	.034	.001	.000				
C6R	-.007	.092	-.008	.138	.019	.006				
E5	.081	.084	.101	.097	.009	.003				
N5	-.004	.091	-.004	.027	.001	.000				
IAnt	-.010	.106	-.013	.075	.002	.002				
ONA	-.015	.104	-.018	.028	.001	.000				
IAss	-.013	.090	-.014	.021	.000	.000				
3 LSNA	.058	.129	.053	.031	.001	.001	.036	5.852*	.017	
C3R	.075	.112	.069	.071	.005	.003				
C5R	**.160**	**.114**	**.197**	**.034**	**.001**	**.012**				
C6R	.092	.083	.115	.138	.019	.008				
E5	.052	.092	.048	.097	.009	.002				
N5	-.040	.091	-.041	.027	.001	.001				
IAnt	.076	.152	.056	.075	.002	.001				
ONA	-.028	.104	-.034	.028	.001	.000				
IAss	-.061	.091	-.067	.021	.000	.002				
C4: Achievement Striving	**.275***	**.114**	**.308**	**.191**	**.009**	**.036**				

Table 5.4 (continued).

Suppression effects

Step and variable	B	SE_B	β	r	r^2	sr^2	ΔR	ΔF	*p*	N
Skin Conductance Response: Aversive Images										
1 LNSA	.004	.087	.003	.003	.000	.000	.000	.002	.968	162
2 LSNA	-.004	.134	-.004	.003	.000	.000	.020	.385	.927	
C3R	-.005	.114	-.004	.045	.002	.000				
C5R	-.017	.093	-.021	.028	.001	.000				
C6R	.078	.086	.095	.119	.014	.005				
E5	.069	.095	.063	.088	.008	.003				
N5	.036	.093	.036	.057	.003	.001				
IAnt	.069	.157	.050	.050	.003	.001				
ONA	-.027	.108	-.032	.019	.000	.000				
IAss	-.015	.092	-.016	.008	.000	.000				
3 LSNA	.014	.132	.012	.003	.000	.000	.034	5.456*	.022	
C3R	.038	.114	.035	.045	.002	.001				
C5R	**.146**	**.116**	**.177**	**.028**	**.001**	**.010**				
C6R	.088	.085	.108	.119	.014	.007				
E5	.050	.094	.046	.088	.008	.002				
N5	.001	.092	.001	.057	.003	.000				
IAnt	.060	.155	.044	.050	.003	.001				
ONA	-.044	.106	-.052	.019	.000	.001				
IAss	-.062	.093	-.067	.008	.000	.003				
C4: Achievement Striving	**.270***	**.116**	**.298**	**.099**	**.010**	**.034**				

Table 5.4 (continued).
Suppression effects

Step and variable	B	SE_B	β	r	r^2	sr^2	ΔR	ΔF	*p*	N
Emotional Expression Multimorph: Sad										
1 IAnt	-.725	.726	-.088	-.007	.000	.005	.012	1.235	.293	199
ONA	.689	.439	.138	.086	.007	.012				
2 IAnt	-.194	.789	-.023	-.007	.000	.000	.076	2.241	.033	
ONA	**.946†**	**.523**	**.189**	**.086**	**.007**	**.016**				
LSNA	-.232	.671	-.036	-.033	.001	.001				
C3R	-.901	.592	-.138	-.094	.009	.011				
C5R	.030	.488	.006	-.044	.002	.000				
C6R	.037	.455	.008	-.058	.003	.000				
E5	.640	.465	.104	.067	.004	.009				
N5	**-1.345****	**.481**	**-.231**	**-.174**	**.030**	**.037**				
IAss	-.672	.461	-.124	-.089	.008	.010				
Emotional Expression Multimorph: Surprise										
1 **IAnt**	**-.850**	**.775**	**-.096**	**-.022**	**.000**	**.006**	.011	1.080	.342	199
ONA	.673	.469	.126	.069	.005	.010				
2 IAnt	.086	.841	.010	-.022	.000	.000	.079	2.337	.026	
ONA	.709	.557	.133	.069	.005	.008				
LSNA	-.238	.715	-.034	-.050	.002	.001				
C3R	**-1.761****	**.630**	**-.253**	**-.113**	**.013**	**.038**				
C5R	**1.110***	**.520**	**.215**	**.079**	**.006**	**.022**				
C6R	-.037	.485	-.007	-.016	.000	.000				
E5	.663	.495	.102	.063	.004	.009				
N5	**-1.172***	**.512**	**-.189**	**-.105**	**.011**	**.025**				
IAss	-.437	.491	-.076	-.091	.008	.004				

Note. Suppression ($sr^2 > r^2$ by greater than .005) in bold type. † $p < .10$. * $p < .05$. ** $p < .01$.

Section Six: Discussion

The purpose of the current study was to investigate relations between FFM psychopathy composite scores and psychopathic deficits. FFM psychopathy composites were created from NEO PI-R facets based upon hypothesized sets of traits that seem to relate well to the major areas of deficit research (Lynam & Widiger, 2007). FFM psychopathy composites included low self-directed negative affect (LSNA), pan-impulsivity (PImp), interpersonal antagonism (IAnt), other-directed negative affect (ONA), and interpersonal assertiveness (IAss). The four main areas of psychopathic deficit research were operationalized using tasks previously investigated in the literature. Poor fear conditioning/Hypoarousal to negative stimuli was assessed by collecting physiological data while subjects viewed neutral, peasant, and aversive images from the International Affective Picture System (IAPS) previously chosen and categorized by Patrick et al. (1994). Skin conductance response was assessed after the onset of each image, whereas EMG responses were recorded after 95dB noise probes were presented at varying onset intervals after image presentation. Maladaptive risk taking was assessed using the Balloon Analog Risk Task (BART, Lejuez et al., 2002), a task that allows individuals to earn money by pumping computer-simulated balloons and bank money before the balloon explodes. Response modulation deficits were assessed using a reward/punishment go/no-go task originally developed by Newman and Kosson (1986). Finally, deficits in empathic responding were assessed using the Emotional Expression Multimorph (EEM) task (Blair, 2004), an emotional expression morph task which required individuals to correctly identify emotions during a series of progressive morphs.

It was predicted that indicators of physiological hypoarousal would relate positively to the FFM psychopathy composite of LSNA, maladaptive risk taking and response modulation deficits would relate positively to the FFM psychopathy composite of PImp, and deficits in empathic responding would relate positively to both the FFM psychopathy composites of IAnt and ONA. Results indicated that hypoarousal to negative stimuli was unrelated to low self-directed negative affect, although EMG startle response was negatively related to pan-impulsivity. Maladaptive risk taking was negatively related to pan-impulsivity, low self-directed negative affect, and C2 (order), and positively related to E2 (gregariousness) and O5 (openness to ideas). Response modulation errors of commission were negatively related to pan-impulsivity, low self-directed negative affect, and O1 (openness to fantasy). Finally, deficits in empathic responding were positively related to other-directed negative affect, self-directed negative affect, and C1 (self-perceived competence), and negatively related to assertiveness, and C2 (order).

The current results suggest that the FFM psychopathy composites created for use in this study generally did not relate in predicated ways to the major deficit areas of psychopathy. Tasks related to predicted FFM psychopathy composites in only two instances, including a positive relation between pan-impulsivity and BART explosions, and a positive relation between other-directed negative affect and the number of morphs required to identify EEM happy. However, despite this failure to support hypotheses, other important relations were found that appear consistent with other research conducted with these specific deficit tasks.

For instance, regression analyses indicated relations with FFM psychopathy composites not predicted for the EMG variables. EMG startle response variables were negatively related to pan-impulsivity in 6 of the 13 cases, indicating that in general, individuals with high pan-impulsivity exhibited smaller EMG responses to noise probes across various onset times and image types. Relations between low pan-impulsivity and high (EMG) response may be reasonable, given other findings in the psychophysiological literature (Bechara, Tranel, Damasio, & Damasio, 1996; Fishbein et al., 2005; Iacono, Lykken, & McGue, 1996; Raine et al., 1997). Because increased autonomic arousal reflects heightened emotional states which commonly lead to behavioral inhibition (Volavka, 1995), it is possible that individuals with weak or absent physiological response have little of the emotional arousal necessary to control their behavior. In support of this, autonomic deficits have been associated with behaviors commonly associated with impulsivity. For instance, low skin conductance responsivity has been related to risky behaviors and anticipation of electric shock in drug abusers and those at risk for substance abuse (Finn, Kessler, & Hussong, 1994; Fishbein et al., 2005; Iacono, Lykken, & McGue, 1996). Further, low resting heart rate has been associated with childhood antisocial and aggressive behaviors (Pitts, 1997; Raine et al., 1997). These findings suggest that individuals with impulsive behavior may also exhibit psychophysiological deficits. Thus, the negative relation between EMG and pan-impulsivity is reasonable, given that individuals who do not exhibit appropriate emotional or anticipatory reactions to aversive stimuli may lack the emotional arousal necessary to inhibit behaviors. However, it remains unclear why relations between low self-directed negative affect and psychophysiological variables failed to reach significance. One possibility is the way in which psychophysiological responses were recorded in the current study. Specifically, the design of the current study did not allow for sufficient recording of skin conductance, given that no recovery period was available between image stimuli, and skin conductance response was likely affected by repeated presentation of noise probes. While each image trial allowed for an uninterrupted 3-second interval, the inclusion of other aversive stimuli after this 3 second period likely did not allow sufficient return to homeostasis before recording of the next trial began. With regard to startle response, EMG was recorded at lower frequency than recommended, which may increase type II error. However, although the lower frequency is more likely to limit statistically significant relations, negative relations with pan-impulsivity suggest that this low frequency may not have been an issue. Another possibility is that autonomic reactivity is simply not related to trait measures of self-reported affect in predictable ways. In other words, stable differences in emotionality may not relate particularly well to state-arousal measures of autonomic functioning.

An additional area where relations were found that did not support hypotheses, but appear consistent with other research was response modulation. In the present study, those high in self-directed negative affect and low in openness to fantasy committed more errors of commission across all trial blocks on the GNG task, and those low in pan-impulsivity, high in self-directed negative affect, and low in openness to fantasy committed more errors of commission on the GNG task after learning of the stimuli had occurred.

Although not predicted, it is not unreasonable that high emotional affect would adversely impact performance on the GNG (resulting in more errors of commission). Previous research by Newman and colleagues has utilized anxiety measures, such as the Welsh Anxiety Scale, to specify groups or exclude high-anxiety individuals from analyses. According to Newman, Schmitt, & Voss (1997), "The rationale for excluding high-[Negative Affect] participants when testing our hypothesis stems from our conceptualization of psychopathy, is based on empirical evidence, and reflects our concern with ruling out trait anxiety/[Negative Affect] as an alternative explanation for our findings" (p. 564). Newman and colleagues' concern about negative affect suggests that performance on this particular task may have notable relations to anxiety, a possibility that has received some support in recent research. In fact, Segarra, Molto, and Torrubia (2000), found that undergraduate women high in neuroticism and low in extroversion committed more errors of commission on Newman's GNG task than other groups.

While there are many possible reasons for these relations, one possibility lies in the particular requirements of this task; Newman's GNG task places high demands on participants, including limited response time and strong memory demands. Negative relations between cognitive performance and negative affect are widely cited (Eysenck & Calvo, 1992), and may be an appropriate alternative explanation for how the GNG task relates to personality.

Finally, in the case of deficits in empathic responding, relations to personality appeared to vary across emotions, rather than relate consistently to interpersonal antagonism or other-directed negative affect. Those high in other-directed negative affect required more morph stages to accurately identify the emotion of happy, those low in interpersonal assertiveness required more morph stages to identify the emotion of anger, and those high in self-directed negative affect required more morph stages to identify the emotion of fear. Further, those high in self-directed negative affect, high in (self-perceived) competence, and low in order committed errors on more trials of the EEM task. The finding that each emotion appears to relate differently to personality dimensions is similar to the results of Lawrence, Goerendt, and Brooks (2007), who found that various traits related differentially to recognition of different emotional expressions, although the relations found in the current study do not appear to converge with any of the findings from Lawrence et al. It is possible that recognition of various emotions requires varying processes not consistently applicable to the FFM psychopathy composites.

Suppression Analyses

In addition to significant relations, regression analyses indicated that suppression was occurring when specific independent variables were entered together. The occurrence of suppression in the current analyses is perhaps not surprising, given the high multicollinearity that exists between facets of the NEO PI-R, particularly those from the same FFM domain. By including several independent variables with a high degree of shared variance, this essentially "frees up" the independent variable to account for more variance in the dependent variable. One composite, pan-impulsivity, appeared to be the most prominent composite implicated in instances of suppression. Importantly, pan-impulsivity is comprised of facets from 3 different NEO PI-R domains (C, E, and N). Exploration of this effect indicated that generally, suppression occurred in the presence of those variables that one would expect to have large multicollinearity:

Inclusion of a facet from the domain of N (i.e., ONA) made the N facet involved in pan-impulsivity able to account for more variance in the dependent variable, and inclusion of independent facets from the domain of C made the C facets involved in pan-impulsivity able to account for more variance.

Although suppression is common in analyses of this nature where independent variables share a significant amount of variance, its presence suggests that results should be interpreted with caution (Lynam, Hoyle, & Newman, 2006). Specifically, due to the fact that these facets are significant only when variance common to more than one independent variable has been removed, the remaining variable does not necessarily represent the same construct as it would in a zero-order relation. Thus, it is incomplete to say that C4 (achievement striving) relates to increase in skin conductance during pleasant images, as this relation exists only in the presence of other variables from the C domain of the NEO PI-R. Although primary relations were examined in the current study, additional exploration of the residuals present in later stages of the regression equation would be necessary before conclusions could be drawn about the constructs.

Implications

Results from the current study suggest that although the FFM psychopathy conceptualization has shown empirical validation through convergence with other measures of psychopathy and by predicting relations with psychopathy-related constructs (Miller et al., 2001; Miller & Lynam, 2003, Derefinko & Lynam, 2007), it was generally unable to capture deficit areas of psychopathy in predictable ways. While some identified relations appear to converge with other laboratory task research, other instances suggest that the FFM psychopathy composites are unable to capture variance in deficit tasks.

Several explanations for this deserve mention. First, it is possible that deficits previously related to psychopathy are indicative of group differences in functioning, but not group differences in personality. In other words, it may be that psychopaths perform differently on tasks than nonpyschopaths due to stable characteristics that cannot be captured via stable trait differences, such as behavior or neuroanatomical functioning. Cognitive ability, sensory perception, and motor response are commonly involved in task performance, yet are unlikely to be readily applicable to any specific personality domain.

Alternatively, it may be that behavioral and psychophysiological deficits are related to personality, but are unable to be captured due to assessment requirements. With regard to personality assessment, some individuals may lack the insight or ability to provide an accurate report of their own personality and/or behavior (e.g., Ladouceur et al., 2000), suggesting that it may be quite difficult to relate self-perceived and self-reported characteristics to observed emotional responses or reactions. With regard to deficit assessment, performance on laboratory tasks is known to involve many other factors, such as state levels of hunger, stress, and fatigue, and demand characteristics. This could explain why stable differences in personality are unable to capture highly variable "snapshots" of behavior in the laboratory, but seem perform well when predicting long-term outcomes which involve the culmination of behaviors over time.

Another explanation for the current findings is that deficits related to psychopathy are related to aspects of the psychopathic personality profile, but the NEO PI-R and the FFM psychopathy composites are not capable of capturing variance associated with deficit tasks. The NEO PI-R is a model of general personality, and therefore less likely than other measures to capture the extremes of the psychopathic personality. Due to this, the FFM psychopathy composites used in the current study may not be sensitive enough to extreme traits to capture sufficient variance in task variables. Similarly, it is possible that deficits related to psychopathy are, in fact, related to aspects of the psychopathic personality profile, but the FFM psychopathy composite scores created for this study were not well-suited to capture variance associated with deficit tasks. FFM psychopathy composite scores have yet to be investigated in other research, and although they appear to function appropriately with regard to relations with other self-report variables (see Appendix C), it is possible that the aggregated variables are not operating as predicted.

Finally, it is also possible that the tasks associated with psychopathic deficits are not performing well in this specific sample. While descriptive analyses suggested no evidence of a floor or ceiling effect, use of an undergraduate sample may limit the range of responses on tasks, thereby reducing the likelihood of finding a significant task/personality relation.

Limitations

There are three primary limitations to the current work. First, the participants in the current study were university undergraduates, a population not commonly studied in the psychopathy deficit research. As such, individuals in this study were less likely to exhibit extreme deficits on tasks. Although oversampling based on Hare's Self-Report Psychopathy scores was utilized in effort to increase the higher end of the distribution, this was not sufficient to replicate the scores traditionally found in incarcerated or clinical populations.

In addition, despite the large number of participants, power analyses suggested that only medium to large effects could be detected with a sample of 200. Relations between tasks and personality traits are notably difficult to find (Lejuez et al., 2003), suggesting that studies relating personality and task performance must have the ability to detect small effect sizes. With limited power, only medium to large effects could be identified in the current study.

Finally, there were limitations with regard to the recording of psychophysiological variables. The design of the current study did not allow for appropriate recording of skin conductance response, given that no recovery period was available between image stimuli, and repeated presentation of noise probes likely introduced a confound to the skin conductance response to image presentation. Further, EMG was recorded at lower frequency than recommended (200 Hz vs. 2000 Hz). Using a sampling rate of 200 Hz prevented recording of responses in the higher frequency range (above 100 Hz), resulting in a loss of power likely present in responses. While this flaw in recording was significant, visual inspection of the EMG waveforms suggested that analyses could be carried out to completion with the exception of smoothing the wave, as the wave was essentially smoothed via the low sampling rate (T. Blumenthal, personal communication, July 29, 2008).

Future Directions

Despite limitations, the current study suggests that future work consider the benefits of utilizing a common framework to understand the diverse deficits implicated in the psychopathy research. Although hypothesized relations were generally unsupported, unpredicted relations to FFM psychopathy composites and facets suggests that many deficit areas can be understood more thoroughly through relations to personality. Tasks where the primary pathology associated with poor performance is less-widely understood, such as Newman's GNG task, would benefit from further evaluation to better conceptualize what this task assesses. Furthermore, the EEM task has been rarely explored with regard to the aspects of functioning it addresses. Although deficits within specific populations have been found, it is unclear why recognition of various emotions appears to relate differentially to aspects of personality.

Further, future work would benefit from investigating relations between deficit tasks and personality in populations that have higher incidence of psychopathy. If the failure to find significant relations was related to less extreme performance on tasks in this undergraduate population, investigating these relations in more extreme populations may serve to identify important relations. Also, utilizing psychopathic personality measures, in addition to generalized personality measures, may help to identify whether relations between aspects of psychopathic personality and deficits exist across the various forms of psychopathy assessment and conceptualization.

This study examined relations between tasks used to explore psychopathic pathology and FFM psychopathy composites. While hypothesized relations to FFM psychopathy composites were generally unsupported, other interesting relations to traits were identified. Although it remains unclear whether the failure to support hypotheses was related to the study variables or population, results indicate that the FFM can provide additional information with regard to what deficit tasks assess. Future work may indicate that the FFM conceptualization is an appropriate framework through which deficits can be integrated, although it is perhaps the case that these deficits are not as straightforwardly related to traits as originally hypothesized.

Appendix A

HSRP items used in the mass screening

Interpersonal Manipulation (IPM)

1. I think I could "beat" a lie detector.
2. I trust other people to be honest. (R)
3. It's fun to see how far you can push people before they get upset.
4. Sometimes you have to pretend you like people to get something out of them.
5. I can talk people into anything.

Callous Affect (CA)

1. Most people are wimps.
2. It tortures me to see an injured animal. (R)
3. I like to see fist-fights.
4. I never feel guilty over hurting others.
5. I sometimes dump friends that I don't need any more.

Erratic Life Style (ELS)

1. I've often done something dangerous just for the thrill of it.
2. I always plan out my weekly activities. (R)
3. I'd be good at a dangerous job because I make fast decisions.
4. I like to have sex with people I barely know.
5. I keep getting in trouble for the same things over and over.

Anti-Social Behavior (ASB)

1. I have tricked someone into giving me money.
2. I have never attacked someone with the idea of injuring them. (R)
3. I have broken into a building or vehicle in order to steal something or vandalize.
4. Every now and then I carry a weapon (knife or gun) for protection.
5. I have close friends who served time in prison.

Note. R = Item reverse scored.

Appendix B

Descriptive statistics

Variable	N	Mean	SD	Min	Max
HSRP Total	197	2.43	.52	1.20	4.22
HSRP IPM	197	2.69	.69	1.00	4.60
HSRPCA	197	2.26	.62	1.00	4.00
HSRPELS	197	2.77	.65	1.20	4.20
HSRPASB	197	2.01	.72	1.00	5.00
PPI Total	193	2.87	.23	2.06	3.40
PPI Machiavellian Egocentricity	193	2.55	.40	1.47	3.87
PPI Social Potency	193	3.22	.37	2.29	4.21
PPI Fearlessness	193	3.04	.50	1.58	4.21
PPI Coldheartedness	193	3.13	.37	2.29	4.19
PPI Impulsive Nonconformity	193	2.36	.45	1.35	3.41
PPI Blame Externalization	193	2.25	.48	1.17	3.61
PPI Carefree Nonplanfulness	193	2.82	.35	1.85	3.60
PPI Stress Immunity	193	3.58	.50	1.73	4.64
WAS	193	1.31	.20	1.00	1.90
STAIT	193	2.23	.53	1.10	3.95
UPPS Negative Urgency	193	2.67	.71	1.17	4.67
UPPS Premeditation	193	2.44	.63	1.00	4.55
UPPS Perseverance	193	2.26	.56	1.00	3.80
UPPS Sensation Seeking	193	3.89	.70	1.58	5.00
UPPS Positive Urgency	193	2.27	.83	1.00	4.64
CAB Ever Used Alcohol	193	1.79	.41	1	2
CAB Age Alcohol Onset	151	15.44	2.29	6	21
CAB Alcohol Use Dose	151	3.79	1.47	1	7
CAB Extreme Alcohol Use	147	1.93	.41	1	2
CAB Freq Extreme Alcohol Use	146	4.41	5.24	0	45
CAB Ever Used MJ or Hash	192	1.58	.91	1	12
CAB MJ Use Past Year	101	46.47	96.86	0	500
CAB Ever Used Cocaine	192	1.10	.30	1	2
CAB Age Cocaine Onset	19	18.53	1.68	16	21
CAB Cocaine Use Past Year	19	1.79	2.46	0	10
CAB Ever Used Psychedelics	193	1.16	.37	1	2
CAB Age Psychedelic Onset	32	17.75	1.61	14	21
CAB Psychedelic Use Past Year	32	1.94	2.63	0	12
CAB Ever Used Hard Drugs	192	1.04	.19	1	2
CAB Age Hard Drug Onset	7	18.29	1.60	16	20
CAB Hard Drug Use Past Year	7	2.29	5.62	0	15
CAB Ever Driven Drunk or High	193	1.40	.49	1	2
CAB Drunk Driving Past Year	75	10.63	28.40	0	200
CAB Ever Arrested for DUI	190	1.04	.20	1	2
CAB DUI Arrests Lifetime	8	1.25	.46	1	2
CAB Ever Stolen Car	193	1.04	.20	1	2
CAB Age Car Stealing Onset	8	16.75	1.75	14	19

Appendix B (continued).

Descriptive statistics

Variable	N	Mean	SD	Min	Max
CAB Car Stealing Past Year	8	1.00	2.45	0	7
CAB Ever Stolen Item < $50	193	1.58	.50	1	2
CAB Age Stealing Onset	106	12.05	4.49	3	20
CAB Stealing Past Year	109	1.03	2.80	0	25
CAB Ever Stolen Item > $50	191	1.10	.31	1	2
CAB Age Stealing Onset	19	16.16	2.57	12	20
CAB Stealing Past Year	20	1.75	2.61	0	10
CAB Ever Physical Fight	189	1.64	.48	1	2
CAB Age Fighting Onset	118	12.06	3.79	3	20
CAB Fighting Past Year	119	.56	1.47	0	10
CAB Ever Used with Weapon	192	1.03	.16	1	2
CAB Age Weapon Use Onset	5	14.60	4.39	11	22
CAB Weapon Use Past Year	5	.00	.00	0	0
CAB Ever Hurt Other Person	192	1.18	.38	1	2
CAB Age Hurt Other Onset	31	13.03	4.28	6	23
CAB Hurt Other Past Year	34	.50	1.73	0	10
CAB Ever Commit Armed Robbery	192	1.01	.10	1	2
CAB Armed Robbery Onset	1	16.00		16	16
CAB Armed Robbery Past Year	2	.00	.00	0	0
CAB Ever Break and Enter	192	1.10	.31	1	2
CAB Break and Enter Onset	19	15.16	2.14	12	19
CAB Break and Enter Past Year	19	2.11	6.90	0	30
CAB Ever Arrested	192	1.14	.35	1	2
CAB Age first Arrested	27	17.70	2.33	12	23
CAB Arrested Past Year	27	.59	.69	0	2
CAB Partner Violence 1	193	1.07	.25	1	2
CAB Partner Violence 2	193	1.04	.20	1	2
CAB Partner Violence 3	193	1.07	.25	1	2
CAB Partner Violence 4	193	1.19	.39	1	2
CAB Partner Violence 5	193	1.03	.16	1	2
CAB Partner Violence 6	193	1.01	.10	1	2
CAB Ever Sexual Intercourse	192	1.72	.45	1	2
CAB Age Intercourse Onset	138	17.56	8.57	14	116
CAB Number Sexual Partners	140	4.51	5.49	0	35
CAB Sex with Stranger	175	1.23	.42	1	2
CAB Sex with Stranger Lifetime	40	2.98	2.93	1	12
CAB Condom Use Relationship	145	4.01	1.29	1	5
CAB Condom Use Nonrelationship	119	4.48	1.16	1	5
CAB Ever Abortion (self/partner)	192	1.03	.17	1	2
CAB Ever Diagnosed with STD	192	1.02	.12	1	2
CAB Ever Played Lottery	192	1.59	.49	1	2
CAB Ever Played Game for Money	192	1.88	.33	1	2
CAB Ever Bet at Casino	192	1.26	.44	1	2

Appendix B (continued).
Descriptive statistics

Variable	N	Mean	SD	Min	Max
CAB Ever Bet on Racetrack	192	1.60	.49	1	2
CAB Ever Bet More Than $10	192	1.44	.50	1	2
CAB Ever Lost Sig Money on Bet	192	1.06	.25	1	3

Note. HSRP = Hare Self-Report Psychopathy Scale Total score. HSRP IPM = Interpersonal Manipulation. HSRP CA = Callous Affect. HSRP ELS = Erratic Life Style. HSRP ASB = Anti-Social Behavior. WAS = Welsh Anxiety Scale. STAIT = State-Trait Anxiety Trait scale. UPPS NU = Negative Urgency. UPPS PRE = (Lack of) Premeditation. UPPS PRS = (Lack of) Perseverance. UPPS SS = Sensation Seeking. UPPS PU = Positive Urgency. CAB 1 = Ever thrown something at romantic partner. CAB 2 = Ever twisted romantic partner's arm or pulled hair. CAB 3 = Ever pushed or shoved romantic partner. CAB 4 = Ever grabbed romantic partner. CAB 5 = Ever slapped romantic partner. CAB 6 = Ever punched or hit romantic partner with something that could hurt.

Appendix C

Relations between NEO PI-R psychopathy consensus scales and additional scales

Variable	LSNA	PImp	IAnt	ONA	IAss	FFM Psy
LSNA	1.00	**-.31*** **	-.05	**-.47*** **	**.48*** **	**.45*** **
PImp	**-.31*** **	1.00	**.20** **	**.35*** **	**-.19** **	**.35*** **
IAnt	-.05	**.20** **	1.00	**.59*** **	**.15** **	**.74*** **
ONA	**-.47*** **	**.35*** **	**.59*** **	1.00	-.10	**.30*** **
IAss	**.48*** **	**-.19** **	**.15** **	-.10	1.00	**.47*** **
HSRP Total	.03	**.39*** **	**.57*** **	**.38*** **	**.17* **	**.60*** **
HSRP IPM	.01	**.25** **	**.62*** **	**.38*** **	**.23** **	**.58*** **
HSRP CA	-.04	**.27*** **	**.44*** **	**.39*** **	.06	**.40*** **
HSRP ELS	**.14* **	**.42*** **	**.34*** **	**.19** **	**.13†**	**.53*** **
HSRP ASB	-.03	**.29*** **	**.38*** **	**.26*** **	.11	**.38*** **
PPI Total	**.28*** **	**.46*** **	**.44*** **	**.14†**	**.29*** **	**.70*** **
PPI ME	-.15*	**.42*** **	**.70*** **	**.48*** **	.08	**.59*** **
PPI SP	**.48*** **	.05	**.12†**	**-.15* **	**.62*** **	**.52*** **
PPI FLS	**.16* **	**.45*** **	.06	.04	.11	**.38*** **
PPI CLD	**.43*** **	-.15*	**.45*** **	.00	**.26*** **	**.51*** **
PPI IMN	-.04	**.45*** **	**.19** **	**.20** **	-.03	**.29*** **
PPI BE	**-.28*** **	**.28*** **	**.37*** **	**.47*** **	-.02	**.21** **
PPI CFN	**-.12†**	**.62*** **	**.23** **	**.20** **	**-.16* **	**.28*** **
PPI SI	**.71*** **	**-.17* **	**-.13†**	**-.58*** **	**.40*** **	**.27*** **
STAIT	**-.76*** **	**.28*** **	**.16* **	**.50*** **	**-.31*** **	**-.24** **
WAS	**-.72*** **	**.34*** **	.11	**.42*** **	**-.34*** **	**-.23** **
UPPS NU	**-.54*** **	**.63*** **	**.23** **	**.50*** **	**-.28*** **	.11
UPPS PRE	.09	**.62*** **	**.19** **	**.14†**	.01	**.44*** **
UPPS PER	**-.41*** **	**.55*** **	.07	**.23** **	**-.39*** **	-.05
UPPS PU	**.23** **	**.55*** **	**.22** **	**.32*** **	**-.19** **	**.25** **
CAB Ever Used Alcohol	.03	**.25*** **	**.21** **	**.14†**	.04	**.28*** **
CAB Age Alcohol Onset	.00	**-.18* **	**-.32*** **	**-.26** **	.05	**-.31*** **
CAB Alcohol Use Dose	-.10	**.37*** **	.09	.10	-.00	**.21* **

Appendix C (continued).

Relations between NEO PI-R psychopathy consensus scales and additional scales

Variable	LSNA	PImp	IAnt	ONA	IAss	FFM Psy
CAB Extreme Alcohol Use	-.08	**.34*** **	.06	.08	-.07	.08
CAB Freq Extreme Alcohol Use	-.01	**.19***	-.02	.02	-.03	.13
CAB Ever Used MJ or Hash	**.13**†	**.17***	.09	.01	-.02	**.21****
CAB Age MJ Onset	-.07	.09	-.15	-.09	-.04	-.13
CAB MJ Use Past Year	-.06	.06	-.01	.00	**-.20**†	-.05
CAB Ever Used Cocaine	-.10	**.18***	.08	**.16***	-.01	.10
CAB Age Cocaine Onset	-.20	.21	**-.53***	-.31	-.12	-.35
CAB Cocaine Use Past Year	.10	-.11	.06	.16	-.10	.04
CAB Ever Used Psychedelics	-.06	**.21****	**.12**†	**.13**†	**-.13**†	**.14**†
CAB Age Psychedelic Onset	-.17	.26	-.10	-.02	.04	-.05
CAB Psychedelic Use Past Year	.11	.08	**-.33**†	-.18	-.27	-.21
CAB Ever Used Hard Drugs	.04	.06	.11	.08	-.03	.12
CAB Age Hard Drug Onset	-.03	-.21	.58	.38	.40	.49
CAB Hard Drug Use Past Year	-.10	.56	-.46	-.45	.24	-.34
CAB Ever Driven Drunk or High	.02	.28	.18	.17	.02	**.30*****
CAB Drunk Driving Past Year	-.11	-.01	.09	.08	-.17	-.05
CAB Ever Arrested for DUI	-.08	.07	.01	.06	.03	.02
CAB DUI Arrests Lifetime	-.61	-.16	.27	.54	-.32	-.28
CAB Ever Stolen Car	-.01	**.12**†	.07	.05	.01	.10
CAB Age Car Stealing Onset	-.19	-.36	-.31	.15	-.05	-.62
CAB Car Stealing Past Year	-.19	.45	-.40	-.09	.33	-.25
CAB Ever Stolen Item < $50	-.10	**.14**†	**.17***	**.16***	.07	.14
CAB Age Stealing Onset	.03	-.04	.01	-.12	-.03	-.01
CAB Stealing Past Year	**-.21***	**.20***	-.00	.15	-.10	-.05
CAB Ever Stolen Item > $50	.00	.12	**.15***	.11	**.15***	**.18***
CAB Age Stealing Onset	-.15	-.33	.12	.10	.13	-.08
CAB Stealing Past Year	-.38	-.04	.29	**.51***	-.09	-.05
CAB Ever Physical Fight	**.16***	**.14**†	**.20****	.10	**.15***	**.30*****

Appendix C (continued).

Relations between NEO PI-R psychopathy consensus scales and additional scales

Variable	LSNA	PImp	IAnt	ONA	IAss	FFM Psy
CAB Age Fighting Onset	.02	-.00	-.11	-.03	**.17†**	-.05
CAB Fighting Past Year	.07	.08	**.27****	**.23***	**.17†**	**.29****
CAB Ever Used with Weapon	.06	-.05	.11	.11	.11	.09
CAB Age Weapon Use Onset	-.56	**-.98****	.45	.62	-.55	-.24
CAB Weapon Use Past Year[a]						
CAB Ever Hurt Other Person	.06	.09	**.15***	**.15***	.02	**.15***
CAB Age Hurt Other Onset	-.06	-.00	.22	.22	.11	.09
CAB Hurt Other Past Year	.11	.00	.12	.02	.22	.18
CAB Ever Commit Armed Robbery	.06	-.05	**.18***	.01	**.13†**	**.16***
CAB Armed Robbery Onset[a]						
CAB Armed Robbery Past Year[a]						
CAB Ever Break and Enter	-.04	.10	**.18***	**.18***	**.16***	**.18***
CAB Break and Enter Onset	-.09	-.19	.15	.21	.11	.02
CAB Break and Enter Past Year	**-.58***	.12	-.04	.27	**-.48***	-.38
CAB Ever Arrested	.03	**.13†**	**.18***	.10	.06	**.23****
CAB Age first Arrested	-.08	.05	.21	.22	-.03	.09
CAB Arrested Past Year	.22	-.23	-.10	-.26	.13	-.06
CAB Partner Violence 1	-.04	.03	**.22****	.09	.02	**.14†**
CAB Partner Violence 2	.06	.09	**.20****	**.17***	.01	**.20****
CAB Partner Violence 3	-.09	**.12†**	.10	**.17***	-.05	.09
CAB Partner Violence 4	-.06	**.20****	**.21****	**.18***	.02	**.21****
CAB Partner Violence 5	-.10	.05	.11	.10	**-.13†**	.03
CAB Partner Violence 6	.03	.04	**.12†**	.04	-.05	.10
CAB Ever Sexual Intercourse	.08	.10	**.26*****	.11	.10	**.31*****
CAB Age Intercourse Onset	-.09	.07	.07	.08	-.02	.03
CAB Number Sexual Partners	.07	.08	.01	.01	.10	.13
CAB Sex with Stranger	-.01	**.20****	.11	.12	**.15***	**.21****
CAB Sex with Stranger Lifetime	.11	**-.37***	.05	-.04	-.04	-.05

Appendix C (continued).

Relations between NEO PI-R psychopathy consensus scales and additional scales

Variable	LSNA	PImp	IAnt	ONA	IAss	FFM Psy
CAB Condom Use Relationship	**.23****	-.09	-.11	-.11	.04	.00
CAB Condom Use Nonrelationship	.11	-.03	.01	.05	-.10	.05
CAB Ever Abortion (self/partner)	-.04	.07	**.15***	**.16***	.06	**.16***
CAB Ever Diagnosed with STD	.01	.04	-.01	.03	.05	.06
CAB Ever Played Lottery	.03	**.15***	.12	.06	.01	**.16***
CAB Ever Played Game for Money	.10	.11	**.14***	.01	.05	**.21****
CAB Ever Bet at Casino	.02	**.16***	.11	.01	.06	**.19****
CAB Ever Bet on Racetrack	.01	**.19****	.07	.07	-.01	**.14†**
CAB Ever Bet More Than $10	.10	**.15***	**.15***	.08	.10	**.27*****
CAB Ever Lost Sig Money on Bet	**-.12†**	.09	.04	.05	**-.13†**	-.01

Note. a. Endorsement rate too low to calculate correlation. Significant correlations are in bold type. HSRP = Hare Self-Report Psychopathy Scale Total score. HSRP IPM = Interpersonal Manipulation. HSRP CA = Callous Affect. HSRP ELS = Erratic Life Style. HSRP ASB = Anti-Social Behavior. PPI Total = PPI Total score. PPI ME = PPI Machiavellian Egocentricity. PPI SP = PPI Social Potency. PPI FRL = PPI Fearlessness. PPI CLD = PPI Coldheartedness. PPI IMN = PPI Impulsive Nonconformity. PPI BE = PPI Blame Externalization. PPI CFN = PPI Carefree Nonplanfulness. PPI STI = PPI Stress Immunity. WAS = Welsh Anxiety Scale. STAIT = State-Trait Anxiety Trait scale. UPPS NU = Negative Urgency. UPPS PRE = (Lack of) Premeditation. UPPS PRS = (Lack of) Perseverance. UPPS SS = Sensation Seeking. UPPS PU = Positive Urgency. CAB 1 = Ever thrown something at romantic partner. CAB 2 = Ever twisted romantic partner's arm or pulled hair. CAB 3 = Ever pushed or shoved romantic partner. CAB 4 = Ever grabbed romantic partner. CAB 5 = Ever slapped romantic partner. CAB 6 = Ever punched or hit romantic partner with something that could hurt.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Appendix D

Correlations between HSRP subscales and dependent variables

Variable	HSRP Total	HSRP IPM	HSRP CA	HSRP ELS	HSRP ASB
SCR Neutral Images –BL	.07	.19*	-.01	.06	-.01
SCR Pleasant Images – BL	.12	.20*	.01	.07	.03
SCR Aversive Images – BL	.10	.18*	.01	.07	.03
EMG Neutral 3.5	-.08	-.04	.05	-.13	-.15†
EMG Neutral 4.5	-.02	-.02	.11	-.08	-.05
EMG Neutral 5.5	-.02	.03	.17*	-.17*	-.08
EMG Pleasant 3.5	-.00	-.02	.18*	-.11	-.04
EMG Pleasant 4.5	-.04	-.03	.14†	-.17*	-.06
EMG Pleasant 5.5	.01	.03	.19*	-.11	-.05
EMG Aversive 3.5	-.03	.02	.12	-.10	-.12
EMG Aversive 4.5	-.05	.03	.06	-.16*	-.10
EMG Aversive 5.5	-.02	.02	.12	-.14†	-.07
EMG All Images 0.0	-.05	.03	.07	-.14†	-.10
EMG All Images 3.5	-.05	-.01	.14†	-.14†	-.11
EMG All Images 4.5	-.04	-.01	.12	-.17*	-.07
EMG All Images 5.5	-.01	.03	.17*	-.16*	.08
BART Explosions[a]	.06	-.06	-.04	.22**	.07
BART Pumps[a]	.11	.04	.05	.16*	.11
GNG Total Com Errors	-.10	-.17*	-.07	-.01	-.06
GNG Com Error Last 5 Trials	-.08	-.10	-.03	-.07	-.05
EEM Average	-.03	-.02	.02	-.06	-.04
EEM Sad	-.01	.02	.01	-.03	-.04
EEM Happy	-.05	.04	.03	-.15*	-.09
EEM Anger	-.03	-.02	.04	-.04	-.06
EEM Disgust	.01	-.07	.06	.01	.02
EEM Fear	-.04	-.06	-.02	-.06	.02
EEM Surprise	-.04	.00	-.04	-.04	-.04
EEM Errors	.01	-.06	-.02	.11	-.01

Note. Significant correlations are in bold type. a. Log function presented. HSRP = Hare Self-Report Psychopathy Scale. HSRP IPM = Interpersonal Manipulation. HSRP CA = Callous Affect. HSRP ELS = Erratic Life Style. HSRP ASB = Anti-Social Behavior.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Appendix E

Correlations between PPI subscales and dependent variables

Variable	PPI Tot	ME	SP	FRL	CLD	IMN	BE	CFN	STI
SCR Neutral Images –BL	.08	.06	.11	.09	.01	.04	.05	.01	-.01
SCR Pleasant Images – BL	.13	.12	.14†	.14†	.04	.04	.05	.03	-.00
SCR Aversive Images – BL	.08	.07	.11	.09	.04	.02	.01	.01	-.00
EMG Neutral 3.5	-.07	-.04	.00	-.04	.10	-.13	-.08	-.02	-.07
EMG Neutral 4.5	-.08	.04	-.09	-.04	.10	-.11	-.14†	-.02	-.06
EMG Neutral 5.5	-.03	.05	-.05	-.06	.20*	-.12	-.07	-.01	-.02
EMG Pleasant 3.5	-.04	.08	-.04	-.03	.16*	-.10	-.06	-.04	-.08
EMG Pleasant 4.5	-.06	-.03	-.10	-.09	.14†	-.11	-.08	.07	-.02
EMG Pleasant 5.5	-.06	.05	-.06	-.03	.16†	-.16†	-.11	.01	-.05
EMG Aversive 3.5	-.03	.06	.02	-.04	.15†	-.07	-.09	-.10	-.03
EMG Aversive 4.5	-.10	.01	-.02	-.13	.12	-.19*	-.09	-.06	-.02
EMG Aversive 5.5	-.10	-.07	-.08	-.08	.13	-.16†	-.13	.01	-.03
EMG All Images 0.0	-.09	.01	-.09	-.06	.12	-.09	-.09	-.10	-.06
EMG All Images 3.5	-.06	.03	-.01	-.06	.17*	-.11	-.08	-.08	-.06
EMG All Images 4.5	-.10	.00	-.08	-.11	.15†	-.16*	-.12	-.03	-.03
EMG All Images 5.5	-.07	.00	-.07	-.07	.19*	-.16*	-.11	-.01	-.04
BART Explosions[a]	.07	-.09	.04	.17*	.00	.16*	-.10	.06	.03
BART Pumps[a]	.11	.07	.10	.17*	-.03	.14†	-.01	.06	-.02
GNG Total Com Errors	-.09	-.13†	-.06	.02	-.09	-.02	-.02	-.11	-.02
GNG Com Error Last 5	-.15*	-.10	-.10	-.03	-.09	-.10	-.02	-.14	-.09
EEM Average	-.05	-.10	-.17*	-.05	-.03	.06	.09	.05	-.08
EEM Sad	-.06	-.05	-.16*	-.05	-.04	.05	.10	-.07	-.08
EEM Happy	-.08	-.04	-.17*	-.07	-.02	-.02	.06	.10	-.17*
EEM Anger	.01	-.07	-.07	-.02	-.02	.04	.10	.09	-.00
EEM Disgust	.00	-.09	-.06	-.03	.06	.05	.02	.06	.01
EEM Fear	-.07	-.11	-.18*	-.03	-.11	.07	.06	-.03	-.02
EEM Surprise	-.04	-.07	-.14†	-.05	-.01	.08	.08	.04	-.11
EEM Errors	.12†	-.02	.09	.09	.03	.16*	-.01	.08	.09

Note. Significant correlations are in bold type. a. Log function presented. PPI Tot = PPI Total score. ME = PPI Machiavellian Egocentricity. SP = PPI Social Potency. FRL = PPI Fearlessness. CLD = PPI Coldheartedness. IMN = PPI Impulsive Nonconformity. BE = PPI Blame Externalization. CFN = PPI Carefree Nonplanfulness. STI = PPI Stress Immunity.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Appendix F

Correlations between anxiety and impulsivity scales and dependent variables

Variable	WAS	STAIT	UPPS NU	UPPS PRE	UPPS PRS	UPPS SS	UPPS PU
SCR Neutral Images –BL	.02	.05	.12	.09	.04	.14†	.11
SCR Pleasant Images – BL	.05	.04	.15†	.06	.05	.18*	.15†
SCR Aversive Images – BL	.06	.03	.14†	.06	.05	.13†	.13
EMG Neutral 3.5	-.09	-.02	-.10	-.01	-.09	-.01	-.14†
EMG Neutral 4.5	.01	.02	-.10	.04	-.00	-.01	-.11
EMG Neutral 5.5	-.03	-.02	-.08	-.02	.01	-.05	-.09
EMG Pleasant 3.5	-.05	.02	-.10	-.06	-.11	.03	-.15†
EMG Pleasant 4.5	-.07	.00	-.11	-.07	-.00	-.08	-.07
EMG Pleasant 5.5	-.10	.02	-.09	-.02	-.10	-.06	-.10
EMG Aversive 3.5	-.09	-.03	-.10	-.07	-.11	.03	-.10
EMG Aversive 4.5	-.11	-.07	-.10	-.01	-.02	-.05	-.13
EMG Aversive 5.5	-.13†	.04	-.07	-.02	-.01	-.10	-.14†
EMG All Images 0.0	-.06	-.00	-.07	-.06	-.05	-.05	-.15†
EMG All Images 3.5	-.09	-.01	-.12	-.07	-.13	.00	-.17*
EMG All Images 4.5	-.07	-.03	-.12	-.02	-.02	-.06	-.13
EMG All Images 5.5	-.10	.02	-.09	-.04	-.04	-.09	-.14†
BART Explosions[a]	.01	.02	-.01	.11	.04	.20**	-.01
BART Pumps[a]	-.07	-.05	.01	.05	-.08	.14†	.02
GNG Total Com Errors	-.04	.06	-.01	-.10	-.07	.05	.03
GNG Com Error Last 5	.02	.11	-.00	-.14†	-.07	.00	-.01
EEM Average	-.04	-.01	.03	.06	.06	-.11	.02
EEM Sad	-.02	.00	.02	-.01	.03	-.10	-.04
EEM Happy	.03	.02	.11	.12†	.11	-.09	.07
EEM Anger	-.09	-.03	-.04	.05	.02	-.06	-.04
EEM Disgust	-.10	-.06	-.07	.06	-.03	-.09	.02
EEM Fear	.02	.06	.04	-.01	.12†	-.04	-.02
EEM Surprise	.02	.01	.09	.06	.06	-.09	.08
EEM Errors	-.04	-.07	-.09	.07	-.02	.06	.07

Note. Significant correlations are in bold type. a. Log function presented. UPPS NU = Negative Urgency. UPPS PRE = (Lack of) Premeditation. UPPS PRS = (Lack of) Perseverance. UPPS SS = Sensation Seeking. UPPS PU = Positive Urgency.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Appendix G

Correlations between FFM psychopathy factors and the 30 facets of the NEO PI-R

NEO PI-R Facet	LSNA	PImp	IAnt	ONA	IAss	PSY
Neuroticism	-.95***	.45***	.22**	.67***	-.41***	-.23**
Anxiousness	-.79***	.17*	.10	.38***	-.30***	-.31***
Angry hostility	-.46***	.35***	.59***	1.00***	-.10	.30***
Trait depression	-.85***	.31***	.10	.44***	-.40***	-.33***
Self-consciousness	-.78***	.21**	-.09	.28***	-.46***	-.46***
Impulsiveness	-.38***	.63***	.18*	.33***	-.12	.16*
Vulnerability	-.83***	.33***	.03	.43***	-.41***	-.35***
Extraversion	.37***	.12†	-.21**	-.20**	.61***	.31***
Warmth	.18*	-.07	-.63***	-.40***	.21**	-.25***
Gregariousness	.26***	.24**	-.18*	-.19**	.29***	.25***
Assertiveness	.48***	-.19**	.15*	-.10	1.00***	.47***
Activity	.26***	-.07	.12	.07	.43***	.36***
Excitement seeking	.16*	.39***	-.01	.02	.17*	.36***
Positive emotions	.08	.11	-.29***	-.20**	.22**	-.05
Openness to Experience	-.08	.18	-.13t	-.01	.10	-.03
Fantasy	-.16*	.43***	-.01	.07	-.04	.10
Aesthetic	-.18*	.02	-.23**	-.04	-.07	-.28***
Feelings	-.16*	.17*	-.09	.17*	.10	-.05
Actions	.03	.16*	-.13†	-.09	-.01	.08
Ideas	.03	-.08	-.06	-.06	.03	-.02
Values	.19**	.04	.01	-.08	.07	.16*
Agreeableness	.02	-.20**	-.99***	-.58***	-.20**	-.77***
Trust	.14*	-.02	-.71***	-.51***	.04	-.38***
Straightforwardness	.04	-.26***	-.73***	-.40***	-.27***	-.65***
Altruism	.18*	-.27***	-.71***	-.48***	.14*	-.42***
Compliance	-.02	-.22**	-.73***	-.57***	-.19**	-.63***
Modesty	-.21**	-.10	-.66***	-.25***	-.35***	-.67***
Tender-mindedness	-.02	.02	-.60***	-.21**	-.18*	-.43***
Conscientiousness	.34***	-.83***	-.12	-.24**	.36***	-.13†
Competence	.38***	-.48***	-.08	-.22**	.34***	.09
Order	.11	-.48***	-.02	-.05	.23**	-.08
Dutifulness	.35***	-.68***	-.28***	-.35***	.24**	-.22***
Achievement striving	.31***	-.76***	-.02	-.26***	.41***	.13†
Self-discipline	.43***	-.76***	-.02	-.26***	.41***	.02
Deliberation	.02	-.80***	-.21**	-.21**	.02	-.46***
Relations between FFM psychopathy factors						
PImp	-.31***					
IAnt	-.05	.20**				
ONA	-.47***	.35***	.59***			
IAss	.48***	-.20**	.15*	-.10		
PSY	.45***	.35***	.74***	.30***	.47***	

Note. † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .00$.

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Vita

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University of Kentucky Lexington, Kentucky	M.S., Clinical Psychology December, 2004
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Professional Positions

Parenting Group Co-Leader Jesse G. Harris, Jr. Psychological Services Center University of Kentucky Supervisor: Dr. Richard Milich	September 2006 to May 2007
Student Therapist Chrysalis House Substance Use Rehabilitation Clinic Lexington, Kentucky Supervisor: Dr. Carmella Yates	July 2006 to December 2006
Child Anger Control Group Co-Leader Jesse G. Harris, Jr. Psychological Services Center University of Kentucky Supervisor: Dr. Richard Milich	June 2006 to August 2006
Student Therapist University of Kentucky Psychiatry University of Kentucky Supervisor: Dr. John Ranseen	July 2005 to July 2006
Healthy Relationships Group Co-Leader Hope Center Lexington Kentucky Supervisor: Dr. David Susman	July 2004 to April 2006
Marketing Coordinator Jesse G. Harris, Jr. Psychological Services Center University of Kentucky Supervisor: Dr. David Susman	August 2004 to July 2005

Child Social Skills Group Co-Leader June 2004 to August 2004
Jesse G. Harris, Jr. Psychological Services Center
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Student Therapist August 2004 to present
Jesse G. Harris, Jr. Psychological Services Center
University of Kentucky
Supervisors: Drs. David Berry, Tamara Brown, Mary Beth McGavran, David Susman

Student Counselor June 2003 to August 2003
Center for Children and Families
SUNY Buffalo
Supervisor: Dr. William Pelham

Ad Hoc Reviewer
Journal of Abnormal Psychology
Psychological Assessment
Aggressive Behavior

Teaching Assistant Fall Semester 2007
Introduction to Clinical Interviewing
Department of Psychology, University of Kentucky

Project Manager June 2008 to present
Center for Drug Abuse Research Translation
University of Kentucky
Supervisor: Drs. Richard Milich, Donald Lynam

Research Assistant June 2007 to June 2008
University of Kentucky
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<u>Scholastic and Professional Honors</u>

Outstanding Clinical Performance Award, University of Kentucky	2009
Research Challenge Trust Fund Award, University of Kentucky	2007, 2008
Cheryl Wynne Hare Award, SSSP	2007
Scientist-Practitioner Award, University of Kentucky	2007
Excellent Clinical Performance Award, University of Kentucky	2007
Paul Hager Graduate Research Award, KPA	2006, 2007
Women's Club Fellowship, University of Kentucky	2006
Student Merit Travel Award, University of Kentucky	2003-2006
Charles T. Wethington Fellowship	2003

Professional Publications

Gudonis, L. C. & Derefinko, K. J. (in press). The treatment of substance misuse in psychopathic individuals: Why heterogeneity matters. In Special Issue: Treatment and Prevention of Alcohol Related Violence. *Substance Use and Misuse.*

Huss, D., Derefinko, K. J., Milich, R., Farzam, F., & Baumann, R. (in press). Examining the Stress Response and Recovery among Children with Migraine. *Journal of Pediatric Psychology.*

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Derefinko, K. J., Samuel, D., & Lynam, D. R. (under review). The FFM assessment of psychopathy: An item response theory analysis.

Derefinko, K. J., Bailey, U., Milich, R., Lorch, E. P., & Fillmore, M. T. (under review). The effects of stimulant medication on story comprehension in children with Attention Deficit/Hyperactivity Disorder.

Miller, D. J., Derefinko, K. J., Lynam, D. R., Milich, R., & Fillmore, M. T. (under review). Impulsivity and the ADHD subtypes: Use of the UPPS Impulsive Behavior Scale.

Derefinko, K. J., & Lynam, D. R. (2009, April). *Using the FFM to understand and integrate the deficits of psychopathy.* Poster presented at the bi-annual meeting of the Society for the Scientific Study of Psychopathy, New Orleans, LA.

Derefinko, K. J., Samuel, D., & Lynam, D. R. (2007, October). *The FFM assessment of psychopathy: An item response theory analysis.* Poster presented at the annual meeting of the Society for Research in Psychopathology, Iowa City, IA.

Derefinko, K. J., Milich, R., Adams, Z. W., Fillmore, M. T., & Lynam, D. R. (2007, June). *Inhibitory deficits in children with Attention-Deficit/Hyperactivity Disorder: A test of two competing models.* Poster presented at the bi-annual meeting of the international Society for Research in Child and Adolescent Psychopathology, London, England.

Derefinko, K. J., & Lynam, D. R. (2007, April). *The misconception of psychopathic low anxiety: Meta-analytic evidence for the absence of inhibition, not affect.* Poster presented at the bi-annual meeting of the Society for the Scientific Study of Psychopathy, St. Petersburg, FL.

Derefinko, K. J., & Lynam, D. R. (2007, April). *Psychopathy and low anxiety: Meta-analytic evidence for the absence of inhibition, not affect.* Poster presented at the annual meeting Kentucky Psychological Association, Lexington, KY.

Derefinko, K. J., & Lynam, D. R. (2006, October). *Understanding the relation between psychopathy and anxiety: A meta-analytic approach.* Poster presented at the annual meeting of the Society for Research in Psychopathology, San Diego, CA.

Derefinko, K. J., & Lynam, D. R. (2006, April). *Convergence and divergence among self-report psychopathy measures: A personality-based approach.* Poster presented at the annual meeting of the Kentucky Psychological Association, Louisville, KY.

Derefinko, K. J., & Lynam, D. R. (2005, October). *Using the FFM to conceptualize psychopathy: A test using a drug abusing sample.* Poster presented at the annual meeting of the Society for Research in Psychopathology, Coral Gables, FL.

Derefinko, K. J., & Lynam, D. R. (2005, June). *The two factors of psychopathy: A personality-based approach.* Poster presented at the annual meeting of the Society for Prevention Research, Quebec City, Canada.