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## Developmental Pathways to Psychopathic Traits in Caucasian and African American Juvenile Offenders

Eva Kimonis  
*University of New Orleans*

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DEVELOPMENTAL PATHWAYS TO PSYCHOPATHIC TRAITS IN CAUCASIAN AND  
AFRICAN AMERICAN JUVENILE OFFENDERS

A Dissertation

Submitted to the Graduate Faculty of the  
University of New Orleans  
in partial fulfillment of the  
requirements for the degree of

Doctor of Philosophy  
in  
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by

Eva R. Kimonis

B.A., Brandeis University, 2000  
M.S., University of New Orleans, 2003

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## Abstract

There is a growing body of research suggesting that the presence of psychopathic traits, and more specifically, callous-unemotional traits in youth, may constitute a distinct developmental pathway to aggressive behavior. However, ethnic groups are understudied in this literature such that it is unclear whether the correlates of psychopathic traits (i.e., violence, aggression, emotional processing deficits) are equally associated with these traits across different ethnic groups. Also, most theories on the development of psychopathy have provided biologically-based explanations for the cognitive-affective deficits that are considered to be core features of psychopathy. However, research suggests that exposure to adverse contextual environments is also associated with emotional processing deficits and could be important in the etiology of psychopathic traits. The current study examined callous-unemotional traits, emotional processing using the emotional pictures dot-probe task, and exposure to adverse contextual environments (i.e., community violence, abuse) in sixty African American and twenty Caucasian detained boys ( $n = 80$ ). The results of the current study revealed that aggression, delinquency, and violence were associated with psychopathic traits and this did not differ across ethnic groups. Also, there was an interaction between psychopathic traits and aggression that supported past research and indicated that aggressive youth high on psychopathic traits showed a reduced responsiveness to distressing stimuli but aggressive youth low on psychopathic traits showed an enhanced responsiveness to distressing stimuli. The association with contextual factors revealed that exposure to community violence was correlated with both psychopathic traits and emotional response to distress stimuli. There was also an interaction between psychopathic traits and exposure to community violence that was similar to the interaction found between psychopathic traits and aggression. That is, psychopathy was inversely related to emotional responses to distressing

stimuli, but only for youth high on exposure to violence. Both of these interactions suggested that there was a group of youth high on callous-unemotional traits that also showed strong emotional responses to distressing stimuli. Analyses indicated that this group of youth experienced greater levels of abuse, consistent with research showing that abused children tend to be hypervigilant to emotional stimuli but may also show deficits in empathy. These findings suggest that there may be multiple developmental pathways to psychopathy and have important implications for how treatment approaches should be uniquely tailored to the needs of youth in each pathway.



## Introduction

### *The Construct of Psychopathy*

More than half of known crime is committed by 5-6% of the criminal population and it is more than likely that the majority of these individuals have psychopathy (Hart & Hare, 1997). Individuals with psychopathy become involved in criminal behavior early in life and continue to engage in criminal behavior throughout most of their life (Forth & Burke, 1998). While not all psychopathic individuals become involved in the criminal justice system, the inherent nature of their personality places them at increased risk for violent and aggressive behavior (Hare, 1998; Hart & Hare, 1997). Prevalence estimates indicate that roughly 15-30% of criminal populations and 1% of the general population show psychopathic traits (Hare, 1991; Hart & Hare, 1997).

The devastating effects of psychopathic individuals can be seen in their particularly severe and chronic pattern of antisocial behavior, often characterized by violence (Hare, Hart, & Harpur, 1991; Kosson et al., 1990), their resistance to rehabilitative treatment efforts while incarcerated compared with nonpsychopathic inmates (see Hare, 2003 for review; Ogloff, Wong, & Greenwood, 1990), higher rates of escape attempts while in prison (McPherson, 1984), and higher rates of criminal and violent recidivism following release (Harris, Rice, & Cormier, 1991; Hart, Kropp, & Hare, 1988; Hemphill, Hare, & Wong, 1998). Compared with nonpsychopathic criminals, psychopathic criminals are less likely to show contextual risk factors and more likely to show biological risk factors (Hare, et al., 1991), leading researchers to focus on biologically-based causal explanations for the development of psychopathic traits (Blair, 2001; Hare, et al., 1991; Patrick, 1994).

The strong association between psychopathy and antisocial behavior has led to a great deal of confusion in the definition of the construct (Hare, 1991). Some psychopathy researchers

include antisocial behavior as diagnostic criteria, which has led to the overdiagnosis of psychopathy in criminal populations (Hart & Hare, 1997). Inclusion of antisocial behavior blurs the boundaries between antisocial personality disorder (APD) and psychopathy, such that many researchers use these terms interchangeably and incorrectly. The Diagnostic and Statistical Manual of Mental Disorders (DSM IV-TR) criteria for APD highlight behavioral characteristics, including a failure to conform to social norms of lawful behavior; impulsive, irresponsible, and antisocial behavior; aggressiveness; reckless disregard for others; and early conduct problems (American Psychological Association, 2000), whereas definitions of psychopathy focus on the constellation of interpersonal and affective features that constitute the psychopathic personality (Cleckley, 1982). Statistically, 50-80% of offenders meet diagnostic criteria for APD, whereas only 25% of those with APD meet criteria for psychopathy (Hare, 1985).

Many psychopathy researchers view psychopathy as purely a personality disturbance, characterized by a constellation of interpersonal and affective characteristics outlined by Cleckley (1982). Interpersonally, individuals with psychopathy are callous, superficial, and arrogant. Affectively, they lack empathy and guilt and are unable to form strong emotional bonds with others (Cleckley, 1982; Hare, 1999). In developing a system of classification and assessment for psychopathy, the Psychopathy Checklist (PCL-R), Hare (1985) consistently revealed two separate factors (Harpur, Hare, & Hakstian, 1989): callous-unemotional personality style (Factor 1) and impulsive/antisocial lifestyle (Factor 2). The items from Factor 2 are positively correlated with diagnoses of APD and encompass the DSM-IV behavioral definition (Hare, et al., 1991), while the items from Factor 1 are similar to the original affective and interpersonal criteria identified by Cleckley (1982). Factor analyses have confirmed that these are separate but highly correlated dimensions, explaining the high incidence of antisocial

behavior and criminality in individuals with psychopathic traits. Hare and colleagues (1991) explain that individuals who meet criteria for APD may have many different motivations behind their antisocial behavior, while the motivation behind a psychopath's antisocial behavior may be an "[impaired] capacity for empathy, remorse, anxiety, or loyalty" (Hare, et al., 1991, pp. 393).

The psychopathy dimensions identified by Hare have been extended to child and adolescent samples. Frick and colleagues adapted the PCL-R to be developmentally appropriate for assessing psychopathy in youth, using a scale they called the Antisocial Process Screening Device (APSD; Frick & Hare, 2001; Frick, O'Brien, Wootton, & McBurnett, 1994). Factor analyses of the APSD revealed a callous-unemotional (CU) factor and an impulsivity-conduct problems (I/CP) factor mapping onto Factor 1 and Factor 2 of the adult PCL-R, respectively. Analogous to adult APD and psychopathy, most children with conduct disorder score high on the I/CP dimension, while few score high on the CU dimension. Further, children with CU traits show fewer contextual risk factors, including less dysfunctional parenting compared with children without CU traits (Loney, Frick, Ellis, & McCoy, 1998; Oxford, Cavell, & Hughes, 2003; Wootton, Frick, Shelton, & Silverthorn, 1997), and more temperamental risk factors, including a preference for thrill and adventure seeking activities (Frick, Cornell, Bodin et al., 2003; Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999), a reward dominant response style (Barry, Frick, Grooms, McCoy, Ellis, & Loney, 2000; Fisher & Blair, 1998), and deficits in the processing of emotional stimuli (Blair, 1999; Frick, Cornell, Bodin, et al., 2003; Loney, Frick, Clements, Ellis, & Kerlin, 2003). Altogether these findings, in addition to multiple recent studies (Barry, et al., 2000; O'Brien & Frick, 1996), provide support for the extension of the construct of psychopathy to youth, based on the presence of CU traits.

### *Psychopathy and Violence*

In both children and adults, psychopathy is strongly associated with general violence and sexual violence (Frick, Cornell, Barry, et al., 2003; Hare, 1999; Hare & McPherson, 1984; Kruh, Frick, & Clements, 2005). Compared with nonpsychopathic offenders, psychopathic offenders show significantly more community and institutional violence (Hart & Hare, 1997; Heilbrun, Hart, Hare, Gustafson, Nunez, & White, 1998; Hill, Rogers, & Bickford, 1996), with victims who are often strangers (Hare, 1999). Adolescents with psychopathy also show higher rates of violence than nonpsychopathic adolescent offenders (Brandt, Kennedy, Patrick, & Curtin, 1997; Forth & Burke, 1998). Also, the nature of their aggression is qualitatively different such that youth and adults with psychopathic traits show higher rates of predatory, premeditated, and instrumental aggression (Cornell, Warren, Hawk, Stafford, Oram, & Pine, 1996; Frick, Cornell, Barry, et al., 2003; Kruh et al., 2005; Woodworth & Porter, 2002). Further, Hemphill and colleagues (1998) found that individuals with psychopathy were four times more likely to violently reoffend in the first year following release from prison than nonpsychopathic offenders.

### *Violence and Ethnicity*

Different groups of psychopathic individuals may show differential levels of antisocial behavior and violence. For example, there is evidence to suggest that males show a higher rate of antisocial behavior than females with psychopathy (i.e., Forth, Brown, Hart, & Hare, 1996; Robins et al., 1984); however, psychopathy in females is generally understudied. Also, racial and ethnic minority groups have been understudied in the psychopathy literature. The few studies that have examined ethnic group differences in violent behavior have found that specific racial groups show differing rates of violent behavior (Hawkins, Laub, Lauritsen, & Cothorn, 2000;

U.S. Department of Justice, 1997). For example, although African American youth only constitute fifteen percent of the juvenile population, compared with the seventy-nine percent of Caucasian youth, they are overrepresented in arrests for violent crimes, constituting forty-two percent of arrests for violent crime compared with fifty-five percent for Caucasian youth (Snyder, 1999; Federal Bureau of Investigation, 1999). Further, in 1992 African American youth were seven times more likely to be arrested for homicide compared with Caucasian youth (Hawkins, et al., 2000).

While many of these differences may be attributable to law enforcement bias in arrest policy with different racial or ethnic groups (Hagan & Peterson, 1995), comparisons of arrest statistics and victim reports suggest that African American males do show a higher rate of serious and violent offending than Caucasians (Elliott & Ageton, 1980; Elliott, Huizinga, & Morse, 1986; Hawkins, et al., 2000). One explanation is that certain community conditions, including high rates of African American male joblessness, female-headed households, and family disruption, may account for these ethnic differences (Hawkins, et al., 2000). When controlling for these community conditions, ethnic differences in violence disappear, suggesting that violence by African American and Caucasian juveniles are affected by the same contextual factors but that African American youth are exposed to greater rates of these adverse factors (Peeples & Loeber, 1994).

As noted previously, psychopathy has been strongly related to violence. However, it has also been more strongly associated with dispositional correlates and less strongly with contextual correlates. As a result, it is unclear whether psychopathy would have the same association with violence in African American and Caucasian samples. The majority of studies examining psychopathy and violence have used predominantly Caucasian samples (i.e., Douglas, Ogloff,

Nicholls, & Grant, 1999; Skeem & Mulvey, 2001). The only study comparing the prevalence and severity of criminal behavior across ethnicity found equal rates of nonviolent offenses in African Americans and Caucasians with psychopathy (Kosson et al., 1990). However, a recent study mistakenly interchanging APD and psychopathy claimed that psychopathy and criminal and violent behavior are disproportionately distributed across ethnic groups (Lynn, 2002). In their critique of Lynn's (2002) manuscript, Skeem and colleagues (2004) proposed that any racial or ethnic differences in the rate of crime and imprisonment would likely disappear after statistically controlling for confounding variables, such as socioeconomic status. Therefore, it is expected that any differences in the rate of violent offending across ethnic groups of psychopathic offenders would disappear after accounting for adverse community conditions.

### *Developmental Models of Psychopathy*

To understand potential ethnic differences it is important to understand how psychopathy may develop. The violent behavior of individuals with psychopathy likely results from their callousness and lack of empathy, which function to emotionally disconnect them from society (Hare, 1999). Further, this personality style, characterized by the core features of low empathy and guilt, likely disrupts socialization mechanisms resulting in impaired conscience development in these individuals. Specifically, deficient moral development may result from deficient conditioning abilities in the child (Eysenck, 1964). Cleckley (1982) proposed that because individuals with psychopathy do not have normal internal affective experiences they do not learn to associate these negative internal states with related markers to a given emotional experience within the context of early socializing experiences. In her investigation of moral development within a normative sample, Kochanska (1993) developed a similar model of early moral

development that focuses on the importance of emotional arousal. According to Kochanska, the child develops his or her internal model of morality as a toddler through a conditioning process involving repeated pairings of his or her transgressions and the parent's affective response. Through this process, future transgressions become conditioned to elicit strong emotions of fear and guilt in the child (Kochanska, 1993).

Kochanska's (1993) model of early conscience development requires both comprehension of emotion in others and intact emotional arousal for the development of moral emotions, such as empathy and guilt. Accordingly, individuals who lack either of these characteristics would be most likely to have impairments in conscience development, according to Kochanska. To explain impaired conscience in cases of psychopathy, Blair (1995) developed a Violence Inhibition Mechanism (VIM) model, which he proposed is an innate mechanism responsible for inhibiting a person's ongoing aggressive behaviors when confronted with distress cues of others. Non-verbal communications of distress activate the VIM and produce a physiological arousal in the individual that is interpreted as a moral emotion, such as empathy. Similar to Cleckley and Kochanska's proposals, moral development results through a classical conditioning process of repeated pairings of experiences of transgressions and distress cues that activate the VIM (Blair, 1995). Individuals that do not show normal affective experiences are expected to have deficient VIMs. Consistent with these developmental models, there is evidence to suggest that youth and adults with psychopathic traits are deficient in their affective experiences.

### *Psychopathy and Emotional Processing*

The affective deficits that could potentially impair conscience development in these individuals have been measured using several laboratory paradigms. These studies constitute a substantial body of evidence suggesting that psychopathic individuals show emotional deficits (i.e., Blair, Jones, Clark, & Smith, 1997, Levenston, Patrick, Bradley, & Lang, 2000). Generally, individuals who show psychopathic traits show an emotional deficit for negative stimuli, with a specific emotional deficit for distressing stimuli. At the physiological level, deficits in response to distress cues have been identified by reduced skin conductance responses (SCR) (Aniskiewz, 1979; Blair, et al., 1997; Blair, 1999; House & Milligan, 1976), and reduced startle reflex to noise probes (Levenston, et al., 2000) while viewing distressing images. Blair and colleagues (1997) used slides of various affective valence to examine physiological arousal in psychopathic adults and found that they showed reduced SCR to distress slides compared with incarcerated individuals low on psychopathy. Also, with a youth sample, Blair (1999) found that children with psychopathic tendencies showed reduced SCR to distress and threat slides compared to children without psychopathic tendencies.

Levenston and colleagues (2000) measured acoustic startle while presenting individuals low and high on psychopathic traits with pleasant (erotic and thrill scenes), neutral, and unpleasant (mutilation scenes, assaults on others, and threatening) images. The magnitude of the startle response typically reflects the valence of the picture, such that unpleasant images prime a defensive state and potentiate (enhance) the startle response, and pleasant images evoke an appetitive state and inhibit (reduce) the startle response (i.e., Bradley, Cuthbert, & Lang. 1990; Lang, Bradley, & Cuthbert, 1990). Levenston and colleagues found that individuals with



psychopathic traits showed a blink inhibition to images of victim scenes, including mutilated figures and attacks on others, compared with individuals low on psychopathy. They attributed this finding to a number of possible explanations. Blink inhibition to victim scenes could reflect a deficit in empathy in individuals with psychopathy (Blair, et al., 1997), a pleasurable response to others' distress, and/ or attentive engagement towards others' distress (Levenston, et al., 2000).

In addition to physiological deficits in response to affective stimuli, individuals with psychopathy also show electrocortical and behavioral deficits. Williamson, Harpur and Hare (1991) adapted the lexical decision paradigm to measure these deficits. The lexical decision task requires participants to quickly identify whether letter strings are words or non-words. Words may be positive (e.g., play), negative (e.g., blood), or neutral (e.g., cup) in valence. The task compares the response time for recognition of emotional versus neutral words (i.e., facilitation) to assess the participant's automatic allocation of attention to emotional material. Typically, nonpsychopathic individuals respond more quickly to affective words over neutral words, which is also reflected in larger amplitude event-related potentials (ERP) (Strauss, 1983). However, Williamson et al. (1991) found that adult inmates high on a measure of psychopathy, compared with those low on psychopathy, not only failed to show a reaction time facilitation or larger amplitude ERPs to affective words over neutral words, but actually responded slowest to negative words. This pattern of response suggests that individuals with psychopathy do not automatically allocate attentional resources to emotional stimuli over neutral stimuli and extract less information from affective stimuli than individuals low on psychopathy.

In youth, Loney and colleagues (2003) also found that adolescents with psychopathic traits showed slower reaction times to negative emotional words using the lexical decision task.

Similarly, Kimonis, Frick, Fazekas, and Loney (in press) used the emotional pictures dot-probe paradigm and revealed a significant association between proactive aggression and reduced responsiveness to distressing stimuli in non-referred children. In addition, psychopathic traits were associated with a selective reduced responsiveness to distressing stimuli, but only for children high on aggression, which may have simply operated as a marker for the severity of psychopathic traits in this non-referred sample (Kimonis et al., in press). In another group of studies in which boys with psychopathic traits were presented with affective facial expressions and neutral words spoken with emotional intonations, those with psychopathic traits showed selective impairment in recognizing both sad and fearful facial expressions and vocal tones (Blair, Budhani, Colledge, & Scott, in press; Blair, Colledge, Murray, & Mitchell, 2001; Stevens, Charman, & Blair, 2001). Altogether, these studies and others (Blair & Coles, 2000; Blair, Mitchell, Richell, Kelly, Leonard, Newman, & Scott, 2002; Loney et al., 2003; Patrick, 1994; Patrick, Bradley, Lang, 1993) suggest that an affective deficit in responding to distress cues is associated with psychopathic traits in both adult and child samples.

### *Emotional Processing, Psychopathy, and Ethnicity*

Like the majority of studies examining psychopathic traits in general, studies examining emotional deficits in psychopathic individuals have used predominantly Caucasian samples (i.e., Blair et al., in press; Hiatt, Lorenz, & Newman, 2002; Patrick et al., 1993). The few studies that have compared the performance of ethnic groups suggest that the emotional deficits identified in psychopathic individuals may not extend to ethnic minority adults (Kosson et al., 1990; Lorenz & Newman, 2002b; Lorenz & Newman, 2002c) and children (Kimonis et al., in press) with psychopathic tendencies. In an adult sample, Lorenz and Newman (2002b) examined how

African Americans high on psychopathy performed on a lexical decision task that had differentiated the performance of Caucasian individuals with and without psychopathic traits (Lorenz & Newman, 2002a). They found that African Americans high on psychopathy compared with African Americans low on psychopathy did not show the same affective processing deficits as Caucasian adults high on psychopathy. Also, in their child sample, Kimonis and colleagues (in press) did not find the same relationship between psychopathic traits and reduced sensitivity to distressing stimuli in African American children as was found in Caucasian children. Although preliminary, this handful of studies suggests that psychopathic traits may differ in their association with information-processing tasks according to ethnicity (Kimonis et al., in press; Lorenz & Newman, 2002b).

These preliminary results of ethnic differences in emotional processing suggest that either a) the behavioral and psychobiological processes underlying psychopathy may be different for Caucasian and African American offenders, such that there are different causal pathways to psychopathic traits across ethnic groups or b) the measure(s) used to assess psychopathy are ethnically biased (Lorenz & Newman, 2002b; Lorenz, Smith, Bolt, Schmitt, & Newman, 2004; see Skeem, Edens, Sanford, & Hauser, 2004). Lorenz and colleagues (2004) examined the latter explanation of differences in construct validity across ethnicity with the PCL-R. They found that compared with African American offenders, Caucasian offenders tended to show significantly higher mean Factor 2 (impulsive/antisocial lifestyle) scores on the PCL-R. Also, Kosson and colleagues found that compared with Caucasian offenders, African American offenders tended to show significantly higher mean Total PCL (earlier version) scores (Kosson et al., 1990).

These conflicting findings suggest that the gold standard for assessing psychopathic traits (PCL-R) may be responsible for ethnicity-related differences in the identification of

psychopathic traits (Lorenz et al., 2004). However, Cooke, Kosson, and Michie (2001) compared PCL-R ratings of a large sample of Caucasian and African American participants using confirmatory factor analysis and item response theory analyses and determined that the structure in both ethnic groups was equivalent. As a result of these analyses, Cooke and colleagues proposed that the PCL-R could be used in an unbiased way with African American individuals (Cooke et al., 2001). Further, several studies of adolescents have found no differences between Caucasian and African American samples in the correlates of psychopathy, such as conduct disorder, delinquency, criminal history variables (i.e., age at first arrest, number of prior incarcerations), and violent recidivism following release (Brandt et al., 1997; Myers, Burket, & Harris, 1995).

A second explanation for ethnic differences in performance on emotional tasks is that there are multiple developmental pathways to psychopathy. The predominating view in the literature is that emotional deficits identified in individuals with psychopathy are present very early in life and may be congenital (Viding, Blair, Moffitt, & Plomin, 2005). Frick & Morris (2004) propose that a temperamental style predisposes some people to the development of psychopathic tendencies, constituting the primary developmental pathway to psychopathy. Studies finding that African Americans don't show the same cognitive and affective deficits associated with this temperamental style as Caucasians with psychopathic traits (Kosson et al., 1990; Lorenz & Newman, 2002b; Lorenz & Newman, 2002c) could suggest the existence of a secondary pathway to psychopathic traits involving contextual influences, such as exposure to extremely threatening living environments. Virtually no studies to date have examined social risk factors for psychopathy or ethnic differences in social risk for psychopathy. However, it is

possible that there exists a primary temperamental as well as a secondary contextual pathway to psychopathic traits, which is differentially prevalent across ethnic groups.

Given a lack of ethnic studies on psychopathy specifically, Skeem and colleagues (2004) examined social factors accounting for ethnic differences in the prevalence of antisocial personality. They cited a study by Neopolitan (1998) that found that although African Americans had higher crime rates than Caucasians and Asian Americans, the effect of ethnicity was no longer significant after controlling for a number of social demographic variables including SES, household size, and youth population. This is important given that such factors related to neighborhood disadvantage (i.e., poverty, high rates of public assistance, unemployment, etc.) are strongly correlated with ethnicity (Silver, 2000). Also, Silver (2000) found that irrespective of ethnicity, individuals from highly disadvantaged neighborhoods were more likely to be violent. Further, Skeem and colleagues (2004) found that ethnicity explained minimal variance in psychopathy after neighborhood disadvantage was taken into account. They hypothesized that social factors related to threatening living environments, such as greater exposure to violence, which is more likely experienced by African Americans, would explain potential ethnic differences in the rate of antisocial behavior and psychopathic traits.

### *Contextual Influences on Psychopathy*

From a social-contextual perspective, one explanation for differences between minority and Caucasian individuals with psychopathic traits is that contextual factors exert more influence on the development of these traits for minority individuals. This is likely given that minorities are exposed to a greater number of social risk factors (Fisher, Jackson, & Villarruel, 1998), including exposure to violence in the home and community (Deater-Deckard, Dodge, Bates, &

Pettit, 1998), which may result in extremely harsh living conditions for many minority children. Further, the additive and interactive effects of multiple psychosocial risk factors may contribute to a learned type of callousness in minorities such that despite potentially intact capabilities for appropriate response to emotional stimuli, harsh living conditions may desensitize the child over time to the effects of their own antisocial and violent behavior. It is possible that this learned callousness would magnify over time as new risk factors emerge during development (i.e., affiliation with deviant peers). However, this model is purely speculative given the absence of research on contextual risk factors contributing to psychopathy and emotional processing deficits in ethnic minority individuals.

Although no studies have tested multiple developmental pathways to psychopathy across ethnic groups, theoretical models propose the existence of multiple types of psychopathy with different causal factors (Lykken, 1995; Porter, 1996). Porter (1996) suggests that a “secondary psychopathy” may develop through exposure to adverse environmental conditions. He proposes that some individuals who are severely traumatized may adapt to their adverse environment by detaching their emotion from their cognition and behavior. In essence, these individuals cope with their traumatic environments by learning to “turn off” their emotions through a desensitization process. Compared with individuals with primary psychopathy, who are born with a predisposition to psychopathy, individuals with secondary psychopathy may have an intact conscience that deactivates as a result of poor socialization experiences (Lykken, 1995). Further, Porter (1996) proposes that, with secondary psychopathy, Factor 1 traits develop during childhood and Factor 2 traits develop later in childhood or adolescence as a result of “progressive deterioration of emotional experience” (pp.182). If there were multiple etiological pathways to psychopathy, adverse childhood experiences may be undetected in existing studies

that aggregate all individuals with psychopathy into a single category, especially if this group of individuals was proportionately smaller (Porter, 1996). Importantly, given equivalent exposure to adverse contextual factors, Caucasian and African American individuals would be equally likely to develop psychopathic traits via either developmental pathway. However, as noted previously, in many samples, ethnic minority individuals are more likely to be exposed to many adverse contextual factors.

### *Child Maltreatment and Psychopathy*

One potentially important adverse contextual factor is childhood abuse. In 2001, five million children were referred to child protective services (CPS) in the United States, and out of this number close to a million were found to be victims of child maltreatment (National Clearinghouse on Child Abuse and Neglect Information, 2001). The most common type of maltreatment was found to be neglect, accounting for 57 percent of all cases. Physical abuse was found in 19 percent of cases, sexual abuse in 10 percent of cases, and psychological abuse in 7 percent of cases. Sadly, 28 percent of victims were age 3 or younger and 84 percent of perpetrators were parents. Fifty percent of child victims were Caucasian and 25 percent were African American. Further, approximately 1,300 children died from abuse or neglect in 2001, with 85 percent of these fatalities under the age of six (National Clearinghouse on Child Abuse and Neglect Information, 2001). There is considerable heterogeneity in the outcome of child maltreatment (Kaufman, 1996), including anxiety, depression (Boudewyn & Liem, 1995), attention deficit/hyperactivity disorder (ADHD), posttraumatic stress disorder (PTSD), conduct problems (Famularo, Kinscherff, & Felton, 1992), borderline personality disorder, and substance abuse (Putnam & Trickett, 1997).

Psychopathic traits may be another outcome of child maltreatment (Hare, 1970; Hodge, 1992; Weiler & Widom, 1996). In some early studies, Haller (1942) found that the majority of his sample of paroled individuals with psychopathy had been rejected or neglected as children. Robins (1966) found that children who had experienced abuse, inconsistent or absent discipline, were more likely to show psychopathy thirty years later. McCord and McCord (1959; 1964) found that psychopathy was strongly associated with early emotional deprivation, including lack of affection, cruelty, neglect, and extreme parental rejection. Many of these early studies used measures of psychopathy that emphasized the antisocial behavior dimension. However, several recent studies have also documented a link between abuse and psychopathic traits using more current conceptualizations of psychopathy.

In a Finnish sample using retrospective data, Koivisto and Haapasalo (1996) found that individuals who had experienced maltreatment (physical abuse or neglect) or parental absence or death were significantly more likely to score high on the PCL. Weiler and Widom (1996) conducted a prospective longitudinal study with a sample of 1144 abused and/or neglected and control children that they followed from before age 12 into adulthood. Using the PCL-R they found that abused and/or neglected individuals had significantly higher mean PCL-R scores, regardless of sex and ethnicity. Furthermore, PCL-R scores in these individuals significantly predicted whether they had engaged in violence, according to self-report and arrest data. Their interpretation of this finding is that childhood maltreatment may place a person at risk for psychopathy, which then places them at risk for violent behavior (Weiler & Widom, 1996). This is confirmed by other studies finding an association between maltreatment and aggression in childhood (Goodwin, 1988) and adulthood (Kellert & Felthous, 1985; Kroll, Stock, & James, 1985).



Consistent with this link between abuse and psychopathy, maltreated children show abnormal recognition, expression, and understanding of emotions (see Pollak, Cicchetti, Hornung, & Reed, 2000). In one study, children were asked to rate the similarity between emotional expressions modeled in two photographs. Compared with controls, maltreated children detected fewer differences between facial expressions (Pollak et al., 2000). Camras and colleagues (1990) also found less accuracy in the recognition of emotions in 3 to 7-year old maltreated children (Camras, Ribordy, Hill, Martino, Sachs, Spaccarelli, & Stefani, 1990). Abnormal affective functioning in neglected children, specifically, may be the result of barren emotional learning environments. Compared with other maltreatment groups, neglectful parents are less engaged and interact with their children less frequently, are less emotionally expressive and sympathetic, and exchange less affective information with the child (Bousha & Twentyman, 1984; Crittendon, 1981). Such rearing environments are inadequate for fostering empathic or altruistic responses to others' distress (Zahn-Waxler, Radke-Yarrow, & King, 1979).

Children who are maltreated show abnormal responses to the distress of others (Klimes-Dougan and Kistner, 1990; Main & George, 1985; Troy & Sroufe, 1987). For example, Main and George (1985) found that, compared with controls, no maltreated toddlers showed sadness or concern towards distressed peers (0% vs. 56%), and many threatened or assaulted these distressed peers (33% vs. 0%). Further, maltreated children were less likely to offer help and more likely to withdraw from the distressed peer. In another study, abused preschoolers exposed to distressed peers showed more inappropriate responses, including aggression and withdrawal, compared with nonmaltreated children. The maltreated children in this study were also more likely to be the cause of a peer's distress (Klimes-Dougan & Kistner, 1990). In yet another study, maltreated children were presented with an emotional recognition task in which they were

required to match emotional vignettes to photographs depicting various facial expressions, and an emotion differentiation task in which they had to indicate the similarity or difference between two facial expressions (Pollak et al., 2000). Maltreated children (physically abused and neglected) were significantly less likely to recognize sad facial expressions compared with controls, and neglected children were less able to differentiate between angry, sad, and fearful expressions compared with controls and physically abused children (Pollak et al., 2000).

Abnormal affective responses to distress in others are only inconsistently evident at the neuropsychological level in maltreated children. In one study examining event related potentials (ERPs) in children presented with a series of slides depicting various emotional expressions, Pollak and colleagues (2001) found that maltreated children showed comparable P522 waves to controls when viewing fearful facial expressions. However, other studies have found psychobiological abnormalities corresponding to conscience functioning in early maltreated children (Galvin, Stillwell, Shekhar, Kopta, & Goldfarb, 1997). These studies suggest that serum dopamine beta hydroxylase (D $\beta$ H), which is an enzyme responsible for converting dopamine to norepinephrine, is lower in both early maltreated and callous-unemotional children (Galvin, Ten Eyck, Shekhar, Stilwell, Fineberg, Laite, & Karwisch, 1995; Rogeness, 1994). Using a conscience interview, Galvin and colleagues (1997) compared children who had been abused before and after age 3 and found that early childhood trauma resulting from maltreatment (before age 3) was associated with delayed conscience development, as well as lower D $\beta$ H activity.

Pollak and colleagues (2000) suggest that there may be a U-shaped function to emotional expression, such that exposure to heightened levels of anger and hostility as in the case of physical abuse, and minimal exposure to appropriate emotional expression, as in the case of neglect, both lead to suboptimal emotional learning (Pollak et al., 2000). Physical abuse is more

strongly associated with intense and reactive emotions and hypervigilance to anger or threat-related cues in children (Dodge & Pettit, 2003), whereas neglected children are more likely to show a blunted affective response (Gaensbauer & Harmon, 1982). Inconsistent findings in maltreated children at the psychobiological level (Kaufman, 1996) may be explained by this U-shaped function. Specifically, studies have found both increases and decreases in urinary catecholamine secretion (DeBellis, Baum, Birmaher, et al., 1999; Rogeness, 1991), basal cortisol secretion (DeBellis, et al., 1999; Goenjian, Yehuda, Pynoos, et al., 1996), and other psychobiological factors, which may be explained by heterogeneous affective outcomes resulting from maltreatment. For example, children with PTSD, who are likely to be hypervigilant (“sensitized”) to stress, showed significantly increased urinary catecholamines (DeBellis, et al., 1999), while boys with conduct disorder showed reduced urinary catecholamines (Rogeness, 1991), which suggests that the stress response in the latter group was blunted (“desensitized”) and is associated with deficits in conscience development (Kaufman & Henrich, 2000).

### *Exposure to Community Violence and Psychopathy*

Maltreatment is strongly associated with another type of threatening living condition: exposure to community violence (Lynch & Cicchetti, 1998). This is extremely serious because exposure to multiple ecological levels of violence, as in the case of children who are maltreated (microsystem level) and exposed to chronic community violence (exosystem variable), significantly heightens the risk for adverse outcomes (Lynch & Cicchetti, 1998). In their study of a predominantly African American (62.1%) economically disadvantaged sample, Lynch and Cicchetti (1998) found that the rate of physical abuse and the severity of neglect were higher among children who reported higher levels of exposure to community violence. This study also

found an additive effect of child maltreatment and exposure to community violence (Lynch & Cicchetti, 1998). Further, Cicchetti and Lynch (1993) suggest that there may be a reciprocal process by which chronic community violence constitutes a persistent vulnerability factor increasing a child's risk for maltreatment within the home.

Prevalence studies in major U.S. cities reveal that exposure to community violence is a serious concern. According to these studies, the typical African American child in poverty-stricken areas of Chicago has witnessed a shooting by age 5, and one third have witnessed a homicide by adolescence (Bell & Jenkins, 1991; Bell & Jenkins, 1993; Dubrow & Garbarino, 1989). In a New Orleans sample of 9 to 12 year old African American children, 91% had witnessed some type of violence and 25% had witnessed someone being shot (Osofsky, Werers, Hann, & Fick, 1993). There is substantial evidence that exposure to community violence leads to adverse outcomes in children (Lynch & Cicchetti, 1998). Similar to maltreatment, exposure to community violence can have heterogeneous outcomes, including anxiety, depression, PTSD, and aggression (Cooley-Quille, Turner, & Beidel, 1995; Fitzpatrick & Boldizar, 1993; Freeman, Mokros, & Poznanski, 1993; Osofsky, 1995). The nature of violence exposure may also have heterogeneous outcomes, such that exposure to acute violent incidents may be more related to internalizing outcomes such as PTSD, and exposure to chronic community violence may be more related to externalizing outcomes (Cooley-Quille et al., 1995; Pynoos, 1993). Similar to child maltreatment, violence exposure may also have detrimental effects on moral development (Garbarino, Kostelny, & Dubrow, 1991; Ney, Fung, & Wickett, 1994; Pynoos, 1993). Researchers suggest that children and adolescents who are exposed to chronic high levels of violence can become uncaring and lack empathy towards others (Farrell & Bruce, 1997; Jonson-Reid, 1998).

*Mechanisms for the Link between Maltreatment/ Exposure to Community Violence and Psychopathy*

A number of developmental mechanisms may explain how the experience of threatening living environments, including maltreatment and community violence exposure, may lead to the development of callous-unemotional traits. First, in the case of child maltreatment, inadequate socialization experiences may disrupt moral development (Buchsbbaum, Toth, Clyman, Cicchetti, & Emde, 1992). Developmental models of conscience development (Blair, 1995; Kochanska, 1993) highlight the need for appropriate parental socialization for the child's internalization of moral norms. This socialization process, which typically occurs in the child's first years of life, requires the parents' socialization of emotions through encouraging some emotional expressions and discouraging others. Children exposed to violence and children who are maltreated may have limited extrafamilial socializing experiences. While children in high violence communities often remain isolated within the home to protect them from their violent surroundings, studies have also found that parents who maltreat their children tend to isolate themselves from friends and family and expose their children to fewer adults modeling appropriate affective communication (Salzinger, Feldman, Hammer, & Rosario, 1993).

Second, a desensitization mechanism may also be responsible for affective deficits identified in maltreated children and children exposed to community violence. Desensitization is defined as a mechanism by which repeated exposure to a stimulus leads to decreases in emotional responsivity to that stimulus (Wilson, 1995, p.12). The repeated adverse emotional experiences that come with child maltreatment and community violence may lead to emotional numbing and suppression (Kingsbury, 1988), such that the child turns off his or her capacity for

empathic responding (Porter, 1996). Children who have experienced threatening living environments may become emotionally desensitized to violence and threatening conditions and act uncaring and unempathic (Fitzpatrick & Boldizar, 1993; Osofsky et al., 1993). Similar mechanisms have been identified in viewing violent television programs, whereby children show a gradual blunting of emotional response to subsequent displays of real-life or television violence (Donnerstein, Slaby, & Eron, 1994; Goranson, 1970). Also, 76% of adults participating in a poll on television violence responded that it numbs people to violence and leads to callousness and insensitivity (Lacayo, 1995). The desensitization that these children show in response to maltreatment and violence exposure is similar to children living in combat zones (Dubrow & Garbarino, 1989; Garbarino et al., 1991). For both, desensitization may be an adaptive coping mechanism that protects them from the stressful effects of violence, but also leads to certain behavioral changes including reduced emotional response towards others, a lack of empathy and guilt, and callousness (Fitzpatrick, 1993; Weiler & Widom, 1996), all central features of psychopathy, that become maladaptive when the child is outside of these violent contexts.

Third, the reduced responsiveness to others' distress that is seen in children who are exposed to violence (maltreatment and community violence) may be explained at the psychobiological level. Early adverse experiences can have dramatic effects on brain development (Weiss & Wagner, 1998). Exposure to chronic adversity may have multiple psychobiological outcomes, including overstimulation of certain brain structures, alteration of the child's arousal response during stressful situations, and dysregulation of the major stress-regulating system, the hypothalamic-pituitary-adrenal (HPA) axis (see Margolin & Gordis, 2000 for review). Initially, when a child is exposed to stress, he or she produces increased cortisol. However, in some cases when stress becomes chronic, a reduced inhibitory feedback mechanism

results in decreased cortisol production and long-term changes in resting levels of cortisol, indicated by a decreased responsiveness to stress (Golier & Yehuda, 1998; Gunnar, 1998; Nelson & Carver, 1998). Such HPA axis dysregulation may explain blunted affective response to others' distress, especially if this is typically a stressful situation for the child.

Fourth, a social learning mechanism may explain the relationship between maltreatment and exposure to violence, and unempathic, violent behavior by the child. Studies have found that abusive mothers are less nurturing and respond to distressed children with less sympathy, more negative emotions, and show fewer positive interactions (Bousha & Twentyman, 1984; Burgess & Conger, 1978; Frodi & Lamb, 1980). These maternal rearing conditions characteristic of maltreated youth do not provide an adequate learning environment for the development of appropriate moral emotions or foster empathic and altruistic responses to others' distress (Zahn-Waxler et al., 1979). Further, children who are exposed to violence at home or in the community may come to view violent behavior as socially sanctioned and, especially in the absence of punishment contingencies, are more likely to imitate and model this behavior (Bandura, 1977). Studies have confirmed that the experience of physical abuse is more strongly associated with aggression than other types of maltreatment (Hoffman-Plotkin & Twentyman, 1984; Kaufman & Cicchetti, 1989). Adding exposure to community violence into the equation, a study comparing various combinations of children exposed to violence and abuse found that these children ranked in the following order from most to least aggressive: abused children exposed to violence, nonabused children exposed to violence, and nonabused, nonexposed children (Hughes, Parkinson, & Vargo, 1989).

### *Maltreatment, Exposure to Violence, and Poverty*

Most research on exposure to community violence has used economically disadvantaged minority urban samples of youth. The likely reason for this is that ethnic minority youth, especially African Americans, are disproportionately affected by community violence (Attar, Guerra, & Tolan, 1994; Bureau of Justice Statistics, 1991; Cooley-Quille, Boyd, Frantz, & Walsh, 2001). The greater prevalence of community violence exposure in ethnic minorities can be explained by their overrepresentation in low socioeconomic status (SES) urban areas that have higher levels of violence and crime (Attar et al., 1994; Bell & Jenkins, 1993; Cooley-Quille et al., 2001; Cooley-Quille et al., 1995; Federal Interagency Forum on Child and Family Statistics, 1998). In 2002, the general official poverty rate was 12.1%, with a rate of 8% in Caucasians, and around 24% in African Americans (U.S. Census Bureau, 2003). Crouch and colleagues found that as household income decreased, the prevalence of witnessing violence, and the experience of physical abuse, physical assault, or sexual assault, increased (Crouch, Hanson, Saunders, Kilpatrick, & Resnick, 2000). This is confirmed by finding that, in households at or below the poverty line, parents reported significantly higher rates of violence towards children (Gelles, 1992). Also, a special report on perceptions of neighborhood crime found that crime was most likely to be identified as a major problem in African American, urban renter-households (U.S. Department of Justice, 1998). However, community impoverishment also predicted rates of child maltreatment in Caucasian samples (Korbin, Coulton, Chard, Platt-Houston, & Su, 1998). All of these findings make it plausible that any differences in the prevalence of child maltreatment, exposure to community violence, and psychopathic traits across ethnicity, may be attributable to neighborhood poverty.



### *Developmental Pathways to Psychopathy*

Taken together, there is evidence to suggest that two pathways to psychopathy may exist, a temperamental-genetic (“primary”) pathway and a threatening living environment (“secondary”) pathway. Also, behavioral genetic research suggests that the heritability of psychopathic traits may be greater in more advantaged environments, but in more disadvantaged environments the influence of extremely negative environments may be greater (Mednick, Kiregaard-Sorenson, Hutchings, Knop, Rosenberg, & Schulsinger, 1977; Rowe, Almeida, & Jacobsen, 1999). One explanation is that in higher social classes, where there is less of a push towards antisocial behavior, a much larger genetic effect is needed for the expression of behavioral traits, whereas in lower social classes, more prevalent adverse environmental conditions can influence the development of behavioral traits even in individuals without a genetic predisposition (Raine & Venables, 1981; Rowe et al., 1999). This proposal is confirmed by Raine and Venables (1981) who found that youth in high social classes who were undersocialized showed poor conditioning (measured by skin conductance response (SCR)), a pre-disposing trait for poor conscience development. In contrast, youth in low social classes who were undersocialized showed superior conditioning. Based on this model, any ethnic differences in the prevalence of emotional deficits may be accounted for by differences in neighborhood disadvantage, maltreatment or community violence.

### *Measuring Emotional Processing*

A method for assessing emotional processing must be established in order to identify emotional processing deficits in individuals with psychopathic traits. One method for evaluating

affective processing deficits comes from research on anxiety. Anxious individuals show a pattern of emotional processing that appears to be the reverse of the pattern of fearlessness demonstrated by individuals with psychopathy, whereby they selectively attend to emotional stimuli, showing a cognitive bias for its processing (Eysenck, 1992; MacLeod, Mathews, & Tata, 1986; Martin, Williams, & Clark, 1991; Mogg, Bradley, De Bono, & Painter, 1997). One reason why anxious individuals may show this attentional bias is because they are hypervigilant to emotional stimuli and have a lower threshold for detecting it. For example, on the emotional Stroop color-naming task, where participants must identify the color of words that are either neutral or threatening/distressing (i.e., mutilated, pathetic), anxious individuals are slower to process the color of threat/distress words because they require a greater allocation of processing resources (MacLeod, et al., 1986; Martin, et al., 1991; Mogg, Bradley, Dixon, et al., 2000).

The dot-probe task is a well-established computer paradigm that theoretically indexes attentional bias for emotional stimuli (MacLeod, Mathews, & Tata, 1986). It has primarily been used to assess the relation between trait anxiety and attentional orienting responses across adult (Brosschot, de Ruiter, & Kindt, 1999; Mogg & Bradley, 1999) and child samples (Vasey, Daleidon, Williams, & Brown, 1995; Vasey, El-Hag, & Daleidon, 1996) with consistent findings that anxious individuals show an attentional bias for emotionally threatening words. However, there is a growing interest in using the paradigm to assess the relation between emotional processing and child aggressive behavior (e.g., Kimonis et al., in press; Schippell, Vasey, Cravens-Brown, & Bretveld, 2003). In their study, Schippell et al (2003) found that aggressive youth showed a reduced responsiveness to social-threat words over neutral words.

The dot probe task is typically modified in terms of specific emotional content based on the focus of a given investigation. The original dot-probe task used verbal stimuli; however,

pictorial stimuli, which have been normed for both adult and child populations (McManis, Bradley, Berg, et al., 2001; Sabatinelli, Bradley, & Lang, 2001) have also been used (Kimonis et al., in press) and require less advanced verbal ability. The emotional pictures dot-probe task (Loney, 2003) presents a series of picture pairs of varied emotional content including distress (e.g., crying child), positive emotion (e.g., kittens) and neutral emotion (e.g., book), most of which were taken from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 1997). The validity of these pictures for eliciting emotional responses has been established by studies in non-referred samples finding distinct psychophysiological responses to pleasant, unpleasant, and neutral IAPS slides in both children and adults (McManis et al., 2001).

Using the emotional pictures dot-probe task, Kimonis et al. (in press) investigated the relationship between psychopathic traits and emotional responsivity to distressing (e.g., crying child), threatening (e.g., attacking dog), and positive (i.e., kittens) images in fifty non-referred children (mean age of 9.30;  $SD = 2.00$ ) and found that psychopathic traits and aggression were related to reduced attentional orienting to distress stimuli but not threatening or positive stimuli. Specifically, they found that the relationship between the processing of distressing stimuli and psychopathic traits was moderated by aggression, such that youth with psychopathic traits that were high on aggression showed a reduced responsiveness to distressing stimuli, whereas youth high on aggression and low on psychopathic traits showed an enhanced responsiveness to distressing stimuli. Taken together with the study by Schippell et al. (2003), these studies suggest that the emotional pictures dot-probe task is a promising paradigm for studying emotional deficits related to psychopathic traits and aggression in samples of youth.

## *Statement of the Problem and Specific Study Hypotheses*

### *Hypothesis One*

In summary, psychopathy, which is characterized by a lack of empathy and lack of guilt and callousness, is strongly associated with aggression and violence. However, it is unclear whether psychopathic traits are equally predictive of violent and aggressive behavior across ethnicities. No existing studies have examined the relationship between violence and aggression and psychopathy across ethnic groups of youth. However, given that research on antisocial behavior in general has found that differences in the rate of offending across ethnic groups are attributable to differences in social disadvantage, the first hypothesis tested in the current study was that the level of psychopathic traits would be equally predictive of violent offenses and aggression in Caucasians and African Americans.

### *Hypothesis Two*

In determining what leads to these traits, existing research on psychopathy suggests that an emotional deficit that onsets early in development may be core to the disorder. However, a few studies comparing ethnic groups with psychopathic traits on emotional deficits have found that African Americans with psychopathy fail to show the same emotional deficits as Caucasians with psychopathy (Kimonis et al., in press; Kosson et al., 1990; Lorenz & Newman, 2002b; Lorenz & Newman, 2002c). This finding may be explained by behavioral genetic studies that demonstrate that the heritability of psychopathic traits is greater in more advantaged environments. According to this model, a reduced responsivity to distressing stimuli, which reflects a temperamental abnormality, should be more prevalent in Caucasian individuals with psychopathic traits as they are less likely to be exposed to adverse contexts. Given that past research suggests that a core feature of psychopathy is a deficit in response to distressing stimuli

and that psychopathic traits may differ in their association with emotional processing deficits according to ethnicity, a second hypothesis tested in the current study is that an emotional deficit in response to distressing stimuli would be predictive of psychopathic traits but that this would be stronger in Caucasian youth. Given that many studies attribute ethnic differences related to psychopathy and aggression to economic disadvantage, it is also predicted that that the association between psychopathy and an emotional deficit in response to distressing stimuli would be stronger in boys from more advantaged neighborhoods and socioeconomic disadvantage would account for the predicted ethnic differences. The limited body of research examining ethnic differences in emotional processing has compared Caucasians and African Americans, such that these two ethnic groups are the primary focus of this investigation. However, it is certainly important to examine these research questions for people of other ethnicities, given the multicultural nature of the United States.

### *Hypothesis Three*

The only study to use the emotional pictures dot-probe paradigm to examine the relationship between psychopathic traits and responsivity to emotional stimuli, found that a selective deficit in response to distress stimuli was only associated with psychopathic traits in children who were also high on aggression (Kimonis et al., in press). Given that youth with psychopathic traits only showed an emotional deficit in response to distressing stimuli using the dot-probe task if they were also high on aggression, a third hypothesis was tested that psychopathic traits would be associated with an emotional deficit in response to distressing stimuli but that this would be stronger in boys high on aggression.

#### *Hypothesis Four*

One possibility for discrepant findings for the association between psychopathic traits and an emotional processing deficit in response to distress stimuli across ethnicity, is that there may be multiple pathways to the development of psychopathic traits. One developmental pathway to psychopathic traits may be through contextual experiences, such as exposure to threatening living environments. Exposure to threatening living environments may take multiple forms ranging from exposure to community violence to direct experience of maltreatment, including abuse and neglect. Each of these violent contexts is highly correlated with one another, such that exposure to one increases the probability of exposure to other violent contexts. Multiple developmental mechanisms may explain how exposure to chronic violence leads to the development of psychopathic traits. Potential mechanisms include inadequate socialization experiences, desensitization, psychobiological changes as a result of chronic violence exposure, and social learning mechanisms. Each of these mechanisms may lead to callousness and reduced empathy towards others, core symptoms of psychopathy. Given that adverse contextual factors may contribute to the development of a psychopathic personality style, a fourth hypothesis was tested that chronic exposure to community violence and direct experience of maltreatment would be associated with psychopathic traits.

## Methods

### *Participants*

The initial sample consisted of 102 detained boys housed at a juvenile detention center in a moderate-sized urban area in the Southeastern United States. Fourteen boys were excluded from the study because they showed impaired verbal abilities (scores below 65 on the Peabody Picture Vocabulary Test (PPVT; Dunn & Dunn, 1997)) and this may have influenced their ability to complete study measures. Eight boys who were not classified as either Caucasian or African American, based on self-report of ethnicity, were also excluded from analyses. The final sample consisted of 20 Caucasian and 60 African American ( $n = 80$ ) boys between the ages of 13 and 18 ( $M = 15.55$ ;  $SD = 1.27$ ). This study sample closely matched the demographic composition of the detention center, which consisted of 63% African American, 33% Caucasian, and 4% classified as “Other”, according to 1998 statistics on the 1,697 juveniles admitted in the participating detention center (Thomas, 1998). The mean PPVT score of the final sample fell approximately one standard deviation below average at 83.88 ( $SD = 12.02$ ).

Similar to methods used in past research (i.e., Tolan, Gorman-Smith, & Henry, 2003), the median family income for each youth’s neighborhood was obtained from the United States Census 2000 Summary File 3 (SF 3) – Sample Data, DP-3 Profile of Selected Economic Characteristics at [www.census.gov](http://www.census.gov) using their home addresses. The neighborhood median family income ranged from \$19,768 to \$80,895 with a mean of \$38,940.39 ( $SD = \$13,267.22$ ). Of the eighty boys, 20 percent ( $n = 16$ ) were currently on psychotropic medications, 55 percent ( $n = 44$ ) were placed in special education classes, and 67.5 percent ( $n = 54$ ) had received some type of mental health care with a mental health care professional, including counselors, social workers, psychiatrists, and psychologists, based on self-report. The current sample was relatively severe

given that 51.3 percent ( $n = 41$ ) had a history of being arrested for a violent crime, based on detention center records.

### *Procedures*

All procedures for the study were approved by the Institutional Review Board of the University of New Orleans. A staff member from the detention center contacted the parents of youth at the facility to obtain permission for the researchers to contact them about the study and 137 parents or legal guardians agreed to be contacted. Researchers contacted 126 parents via telephone and read them the consent form. The remaining 11 parents could not be contacted before the youth was released from the facility. Of the 126 parents contacted, 117 provided taped verbal consent, the remaining 9 declined consent. Parents consenting to their son's participation were sent a copy of the consent form. Five additional youth were released from the facility before youth assent could be obtained. Within a week of obtaining verbal consent from the parent, each youth was individually escorted to a private visitor's room by a security guard from the detention center. In this room, a researcher read the assent form to the youth and he was given the opportunity to ask questions about the research before assenting. Participants were informed that they were free to discontinue testing for any reason and at any time during the session. Each participant was also informed that his participation would not affect his treatment or the length of his detention in any way. Ten youth refused to participate after the assent procedure.

After a youth assented to participate, he was individually administered a demographic interview followed by a questionnaire requiring him to report on his ethnicity. Next the youth completed a mood checklist that evaluated his experience of twelve emotions on a scale of 1 ("Not at all") to 5 ("Extremely"). After completing this checklist, the youth was given



instructions for the emotional pictures dot-probe task and then completed the task. Next, the youth was given a second mood checklist to compare to the mood baseline. Comparisons of pre- and post-task mood checklists indicated that the task did not lead to a deterioration in mood for any youth. The child then completed the Parent-Child Conflict Tactics Scale and the Multidimensional Neglect Scale. Due to the sensitive nature of these questionnaires, they were administered individually to each participant. In most cases these questionnaires were read to the youth unless he demonstrated sufficient competence in his reading ability. The youth was then administered the Peabody Picture Vocabulary Test (Dunn & Dunn, 1997) by a trained graduate researcher. These procedures typically took around one and a half hours to complete.

Later in the day, and at least half an hour following the initial session, boys were escorted in groups to a larger visitor's room (groups ranged from two to three youth). In this group setting, the youth were given a soda of their choice to drink while one of the researchers read all remaining questionnaires to the youth and another researcher helped check over questionnaires to make sure that all items were completed. These questionnaires included the Inventory of Callous Unemotional Traits (ICU), the Self Report of Delinquency (SRD) questionnaire, the Peer Conflict Scale, and the Children's Report of Exposure to Violence (CREV) scale. The questionnaires took approximately one hour to complete and were given in a standardized order, such that the last question completed by the child was positively worded. After completing these questionnaires, youth were given a candy bar of their choice for their participation.

## *Measures*

### *Chart Review*

*Legal and Abuse History.* Following completion of the study, information about each youth was obtained from the youth's detention center files. Chart information included the youth's current charge, the number of prior arrests and the number of prior detentions at the time of protocol completion, and whether the youth had a history of violent arrests.

At intake and booking, every youth in Jefferson Parish is administered the Multi-faceted Assessment of Juvenile Offender Risk (MAJOR) through the Jefferson Parish Juvenile Assessment Center (JAC). The MAJOR is a structured interview, which predominately asks youth to respond to a series of questions in a yes/no format. A staff member from the detention center provided t-scores for the abuse scale from each youth's MAJOR. This abuse scale is based on a conceptual grouping of the following eight items from the MAJOR: 1. Has a parent or guardian ever hit you? 2. Have you ever had bruises, burns, or broken bones as a result of being hit by a parent or guardian? 3. Have your parents ever been investigated by the child protection agency? 4. Have you ever been hit or beaten by any adult other than your parents? 5. Have you ever run away from home for longer than a few hours (without your parents permission)? 6. Have your parents ever touched you in ways that made you feel uncomfortable? 7. Has anyone other than your parents ever touched you in ways that made you feel uncomfortable? 8. Have you ever been placed (by the Court) outside of your parent's home? Preliminary t-scores for the MAJOR were created via linear transformation based on a sample of 570 youth and were then updated on a sample of 2077 youth administered the MAJOR between March 5, 1999 and January 17, 2001. T-scores were transformed to raw scores using a conversion table provided by the MAJOR. In the current sample, abuse t-scores ranged from 38 to 81 with a mean of 50.78

( $SD = 9.23$ ). Raw scores for the MAJOR ranged from 0 to 6 with a mean of 1.81 ( $SD = 1.23$ ) and the distribution of scores indicated that 82.1% of youth endorsed three items or less. This base rate of abuse in the current sample is consistent with past research on the level of maltreatment in detained samples (Straus & Hamby, 1997).

### *Self-Report Questionnaires*

*Demographic Interview.* This interview obtained information from the youth about his age, address, current grade or last grade completed, receipt of mental health services, placement in special education classes, living situation, the number of siblings living at home, the biological parents' marital status, and the employment status of both parents.

*The Inventory of Callous-Unemotional Traits (ICU; Frick, 2004).* One of the most widely used measures to assess psychopathic traits in youth is the Antisocial Process Screening Device (APSD; Frick & Hare, 2001). This measure is a 20-item behavior rating scale that can be completed by the child. Items describing the child, such as "You feel bad or guilty when you do something wrong", are rated on a three-point scale from 0 (Not at all true) to 2 (Definitely true). This measure identifies three dimensions that are analogous to those dimensions found in adult samples, and includes a callous/unemotional factor (CU), an impulsivity/conduct problems factor, and a narcissism factor (Frick, Bodin, & Barry, 2000). The CU dimension, which includes items such as "feels bad or guilty," "concerned about the feelings of others," and "does not show emotions" has proven to be the most stable dimension of the APSD across multiple samples (Frick et al., 2000) and has been used in multiple research studies with children as young as age five (Frick et al., 1999) and as old as 21 (Kruh et al., 2005). Further, the CU dimension has been shown to designate a group of children with conduct problems who show characteristics

consistent with theories of psychopathy (Frick, in press). The validity of CU traits assessed by the APSD has been established by studies finding that youth who score high on callous-unemotional traits tend to be more thrill and adventure seeking (Frick et al., 2003; Frick et al., 1999), are less sensitive to cues of punishment when a reward-oriented response set is primed (Fisher & Blair, 1998; Frick et al., 2003; O'Brien & Frick, 1996), and are less reactive to threatening and emotionally distressing stimuli (Blair, 1999; Frick et al., 2003; Loney et al., 2003). Further, their conduct problems appear to be less strongly associated with deficits in verbal intelligence (Loney et al., 1998) and dysfunctional parenting practices (Wootton et al., 1997).

While the validity of the CU scale of the APSD has been supported in a number of studies, there are multiple psychometric problems with the 6-item CU subscale of the APSD. First, although some studies have estimated an internal consistency of .76 and .65 for the CU scale in a community sample and a clinic-referred sample, respectively (Frick et al., 2000), the small number of items has led to low internal consistency in other samples (Kimonis et al., in press), especially when self-report is used (Loney et al., 2003). Second, the measure is on a three-point Likert scale with item responses ranging from 0 (Not at all true) to 2 (Definitely true), restricting its range. Third, five out of the six items are worded in the same direction, making response sets more likely.

To overcome these problems, the four items from the APSD CU scale that loaded consistently on this factor in clinic and community samples (Frick et al., 2000) were included on a separate scale. For each, three similar positively worded items and three similar negatively worded items were included for a total of 6 analogous items for each of the four original APSD items. These 24 items, such as "I do not show my emotions to others", were then put on a 4-point

Likert scale from 0 (Not at all true) to 3 (Definitely true), with mid points of 1 (Somewhat true) and 2 (Very true), to form the items on the ICU. The ICU is a longer scale, with an equal number of positive and negative items, and a wider range, that measures CU traits in a self-report format. All items from the ICU scale were summed for a total score with the exception of two items with low corrected item-total correlations, Item 2 ( $r = .02$ ; “What I think is “right” and “wrong” is different from what other people think”) and Item 10 ( $r = -.24$ ; “I do not let my feelings control me”). This resulted in an internal consistency of  $\alpha = .72$ . In the current sample the ICU scores ranged from 1 to 41 with a mean of 23.41 ( $SD = 7.58$ ).

*The Self-Reported Delinquency Scale (SRD; Elliot & Ageton, 1980)*. The SRD scale assesses the number and types of crimes committed by the youth. The SRD lists 36 questions about illegal juvenile acts and was developed from a list of all offenses reported in the Uniform Crime Report with a juvenile base rate of greater than 1% (Elliott & Huizinga, 1984). For each question the youth is asked to respond with yes or no for whether or not he has ever done the behavior, to identify the age at which he first did the behavior, and how many times he has ever done the behavior. Consistent with past uses of the scale (Krueger, Schmutte, Caspi, Moffitt, Campbell, & Silva, 1994) a total delinquency composite was created by summing the number of delinquent acts committed (with a possible range of 0-36). The SRD also has four subscales assessing specific types of delinquent acts, including only more serious offenses. In addition to the total delinquency score, the current study used the 8-item violent offenses subscale (e.g., “have you ever been involved in gang fights”) and summed the 7-item property offenses subscale (e.g. “have you ever purposely damaged or destroyed property belonging to school”), the 4-item status offenses subscale (e.g. “have you ever taken a vehicle for a ride without the owners’ permission”) and the 9-item drug offenses subscale (e.g. “have you ever sold hard drugs such as

heroin, cocaine, and LSD”) to create a 20-item nonviolent delinquency subscale. Importantly, the violent offenses scale includes items that could include threats of physical violence, as well as actual violence (e.g., “have you ever hit (or threatened to hit) a teacher or other adult at school”). One study using this scale with a sample of 98 community children found that callous-unemotional traits predicted all types of delinquent acts (i.e., property, status, violent, and drug offenses), with violent delinquency and status offenses showing the strongest associations (Frick, Cornell, Barry, et al., 2003). In the current study the total delinquency score ranged from 3 to 27 with a mean of 12.93 ( $SD = 6.74$ ), the violent delinquency score ranged from 0 to 7 with a mean of 2.53 ( $SD = 1.62$ ), and the nonviolent delinquency score ranged from 1 to 19 with a mean of 8.99 ( $SD = 5.29$ ). Internal consistency for these scales ranged from  $\alpha = .61$  for violent delinquency to  $\alpha = .88$  for total delinquency.

*The Peer Conflict Scale (PCS; Kimonis, Marsee, & Frick, 2004).* A number of measures have been developed to assess reactive, proactive, overt, and relational aggression; however, none of these measures include all four dimensions of aggression and those that include multiple dimensions only include a few items assessing each dimension. Also, many of the existing aggression scales do not limit the items to acts harming another person and include many items that assess conduct problems in general (i.e., Brown, Atkins, Osborne, & Milnamow, 1996). The purpose of developing the Peer Conflict Scale was to create a scale that measures all four dimensions of aggression and includes a sufficient number of items ( $n=10$ ) for each, while also limiting these items to acts harming another person.

To develop the PCS, several steps were taken. First, all items assessing reactive, proactive, overt, and relational aggression from existing scales, including the Aggressive Behavior Rating Scale (Brown et al., 1996), the Aggressive Subtypes Scale (Dodge & Coie,

1987), the Direct and Indirect Aggression Scales (Bjorkqvist, Lagerspetz, & Osterman, 1992), and aggression scales created by Little and colleagues' (Little, Jones, Henrich, & Hawley, 2003), Crick and Grotpeter (1995), and Galen and Underwood (1997), were pooled and items that weren't clearly related to harming others were deleted. Second, items were reworded to ensure that there was direct correspondence between overt and relational items, such that for each overt reactive item there was an analogous relational reactive item, and for each overt proactive item, there was an analogous relational proactive item. These items were then reviewed to ensure that the wording was simple and developmentally appropriate.

This process led to the creation of the self-report of the Peer Conflict Scale that includes ten items in each of the four categories; overt proactive ("I carefully plan out how to hurt others"), relational proactive ("I ignore or stop talking to others in order to get them to do what I want"), overt reactive ("Sometimes I have hurt others when I am angry and I feel bad about it"), and relational reactive ("Sometimes I gossip about others when I am angry and I feel bad about it"). The youth is asked to describe how well each statement describes him on a 4-point scale from 0 ("Not at all true") to 3 ("Definitely true"). The current study used only the total overt aggression, overt proactive aggression, and overt reactive aggression subscales. The total overt score ranged from 0 to 40 with a mean of 13.24 ( $SD = 9.02$ ); the overt proactive subscale ranged from 0 to 13 with a mean of 2.59 ( $SD = 3.20$ ); and the overt reactive subscale ranged from 0 to 29 with a mean of 10.65 ( $SD = 6.55$ ). Internal consistency ranged from  $\alpha = .73$  for proactive overt aggression to  $\alpha = .88$  for total overt aggression.

*Abbreviated Parent-Child Conflict Tactics Scale (CTSPC; Straus, Hamby, Kinkelhor, Moore, & Runyan, 1998).* The abbreviated parent-child conflict tactics scale included fourteen items on which the child reports separately on both parents' behavior. On the CTSPC, the child

reports how frequently the parent engaged in each behavior in the past year when the child disobeyed or did something wrong, on a seven-point Likert scale from 0 (This has never happened) to 6 (More than 20 times in the past year). The abbreviated CTSPC consists of three scales, including a 4-item Non-Violent Discipline scale (e.g., Took away privileges or grounded him/her), a 5-item Psychological Aggression scale (e.g., Called him/her dumb or lazy or some other name like that), and a 5-item corporal punishment scale (e.g., Spanked him/her on the bottom with your bare hand). The corporal punishment scale was used in the current study and ranged from 0 to 17 with a mean of 2.29 ( $SD = 4.22$ ). The internal consistency of this scale was  $\alpha = .70$ . In an earlier version of the Conflict Tactics Scale, which included additional more severe “physical assault” scales (e.g., Burned or scalded him or her on purpose) the test-retest reliability was found to range from .49 (McGuire & Earls, 1993) to .80 (Amato, 1991). There is evidence for the validity of the physical assault scales, one of which is the corporal punishment scale used in the current study, such that higher scores are associated with greater levels of parental stress, nonviolent delinquency, and drug use in youth (see Straus & Hamby, 1997).

*The Multidimensional Neglect Scale (MNS: Straus, Kinard, & Williams, 1995).* The MNS (Form A) is a 40-item child report scale that measures the neglect of the child’s four basic developmental needs, including physical needs (i.e., shelter, food, clothing), emotional needs (i.e., affection, companionship), supervisory needs (i.e., attending to child’s misbehavior), and cognitive needs (i.e., explaining things, reading to the child). Items are positively and negatively worded and neglect is measured by asking the child to rate how strongly he agrees that behaviors occurred in the home on a 4-point Likert scale from 1 (Strongly agree) to 4 (Strongly disagree). Preliminary construct validity of the MNS has been demonstrated through significant correlations with variables known to correlate with neglect. For example, total neglect was found



to be significantly correlated with being raised by a non-biological father ( $r = .13, p < .05$ ) or mother ( $r = .27, p < .01$ ), unmarried parents ( $r = .17, p < .01$ ), low maternal education ( $r = -.14, p < .05$ ), low social integration ( $r = .43, p < .01$ ), and partner-to-partner violence ( $r = .14, p < .05$ ) (Straus et al., 1995). Consistent with past uses of the scale (Straus et al., 1995), the total score was used to establish the child's experience of neglect in the current study. The total neglect score ranged from 82 to 160 with a mean of 134.68 ( $SD = 16.32$ ) and had good internal consistency ( $\alpha = .92$ ) in the current sample.

*Children's Report of Exposure to Violence- Revised (CREV-R: Cooley, Turner, & Beidel, 1995).* The CREV-R is a 33-item self-report rating scale that assesses exposure to community violence through multiple mechanisms, including the media, reports from others of hearing about violence, witnessing violence, and direct victimization. Community violence is defined as "deliberate acts intended to cause physical harm against a person or persons in the community" (Cooley-Quille et al., 2001) and includes situations such as being robbed or mugged, stabbed, or killed. For the first 29 items, youth are asked to rate whether they have "ever" been exposed to specific acts of violence, assessing the lifetime frequency of exposure to violence, and how many times they were exposed to the specific act of violence in the last year, on a 5-point Likert scale from 0 (never) to 4 (every day). The CREV also includes three open-ended questions for youth to indicate whether they have ever been exposed to other types of violent acts not listed. Only the total exposure to community violence score was used in the current study by summing all of the 29 rated items. The CREV has demonstrated good internal consistency ( $\alpha = .78$ ) and 2-week test-retest reliability ( $r = .75$ ), and has been used extensively with African American youth between the ages of 9 and 15 (i.e., Cooley et al., 1995; Cooley-Quille et al., 2001). In the current

study the total exposure to violence score ranged from 13 to 92 with a mean of 46.46 ( $SD = 17.15$ ). The scale demonstrated good internal consistency ( $\alpha = .93$ ).

### *Computer Task*

*Emotional Pictures Dot-probe Task (Loney, 2003)*. The emotional pictures dot probe task used in the current study was developed using primarily slides taken from the International Affective Picture System (IAPS; Center for the Study of Emotion and Attention, 1999). These slides were carefully selected to tap distress content domains relevant to study hypotheses and were selected based on their use in previous studies with children (Blair, 1999; McManis, Bradley, Berg, Cuthbert, & Lang, 2001). Because the number of affective images was not sufficient for dividing the slides into neutral, distress and positive categories, a small amount of additional slides were added that directly matched the IAPS slide content previously used in studies with children. For example, additional slides of a crying child were added to the existing IAPS slides of crying children.

The task consisted of 1 block of practice stimuli (16 picture pairs) followed by 4 blocks of picture pairs used in the calculation of attentional bias scores. The 4 test blocks each contained 24 picture pairs and were separated by a short break. Studies using picture variants of the dot-probe task in college students most commonly use a stimulus duration of 500ms for picture presentations, however, the duration can range anywhere from 17ms to 1250ms, with more robust findings at shorter stimulus durations (17ms; Fox, 2002 and 500ms; Bradley, Mogg, Falla, & Hamilton, 1998). A previous study with a similar version of the dot-probe task in children used a 500ms stimulus duration (Kimonis et al., in press). However, there is a general lack of research guiding appropriate stimulus durations in older antisocial and aggressive youth samples. Therefore, the current version of the task included two stimulus durations, 250ms and 500ms,

which were evenly and randomly distributed throughout the test trials. The 500ms duration was used based on its validity from a previous study of children (Kimonis et al., in press). The second stimulus duration of 250ms was selected to include a shorter stimulus duration that avoids confounding automatic and effortful processes and taps the preconscious mechanisms responsible for discriminating and directing attentional resources toward biologically relevant stimuli (Ohman, 1993).

Each picture presentation consisted of three sequential components: (1) a 500 millisecond fixation cross appearing in the center of the screen, (2) a 250 or 500 millisecond simultaneous presentation of two picture stimuli that are centered and located immediately above and below the location of the fixation cross, and (3) an asterisk (i.e., dot probe) appearing in either the top or bottom picture location. The primary objective of the task is to select a key on the keyboard that corresponds to the location on the screen (up or down) where the dot-probe appears. If no key is pressed within 5000 milliseconds, the response is recorded as incorrect. Because incorrect responses reflected that the participant was not paying attention to a specific stimulus pair, these responses were not included in the calculation of facilitation indices. Also, response times less than 100 milliseconds were not included in calculations because they were considered to be outliers resulting from program error.

The picture pairs represented one of three potential picture pairings: neutral-neutral, distress-neutral, and positive-neutral. The number and location of picture stimuli were counterbalanced across test trials in order to assure an equal number of emotional and neutral stimuli appearing in both top and bottom locations across the 4 blocks of test stimuli. Additionally, there were an equal number of emotional and neutral stimuli that were replaced versus not replaced by a dot probe stimulus. The primary dependent measure for the current

study is an attentional facilitation index calculated by subtracting the average latency to responding to dot probes replacing distress picture stimuli from the average latency to responding to dot probes replacing neutral stimuli in the various neutral-neutral picture pairings. To control for potential location effects the following formula was used to calculate the facilitation indices:  $\text{Facilitation} = 1/2 \times [(\text{Neutral Only/Probe Up} - \text{Distress Up/Probe Up}) + (\text{Neutral Only/Probe Down} - \text{Distress Down/Probe Down})]$ . The facilitation index for positive emotion slides was calculated in the same way. Facilitation indices were calculated for distress and positive stimuli at the 250ms, 500ms, and the combined millisecond stimulus duration. Given that emotionality of picture and word stimuli is generally thought to facilitate allocation of attention, participants were generally expected to respond more quickly to probes replacing distressing images because their attention selectively orients to the distressing image (Vasey et al., 1995; Vasey et al., 1996). Since this normal response would result in an overall shorter mean response time to distressing pictures, this would be indicated by higher scores on the facilitation index. Facilitation scores that fell more than three standard deviations above or below the mean ( $n = 2$ ) were eliminated from analyses.

## Results

### *Preliminary Analyses*

The distributions of all study variables are described in Table 1. The mean psychopathy (Inventory of Callous-Unemotional traits; ICU) score was 23.41 ( $SD = 7.58$ ). The means for proactive, reactive, and total aggression were 2.59 ( $SD = 3.20$ ), 10.65 ( $SD = 6.55$ ), and 13.24 ( $SD = 9.02$ ), respectively. The mean facilitation indices to distress images were -4.31 ( $SD = 61.60$ ), -4.36 ( $SD = 51.13$ ), and -7.83 ( $SD = 49.78$ ) for 500ms, 250ms, and combined stimulus durations, respectively. These distributions from the dot probe task suggest that, on average, participants showed an abnormal response pattern by responding more quickly to probes replacing neutral pictures versus emotional pictures, which is not consistent with findings from a non-referred sample of children (Kimonis et al., in press). This response pattern is likely a function of the antisocial sample, which consisted of primarily repeat offenders of which 51.3 % had a history of violent arrests.

The shape of the distributions of the main study variables were examined using the Kolmogorov-Smirnov Test of Normality. The distribution of ICU scores did not differ significantly from normality. However, total and proactive aggression scores showed skewed distributions with most boys scoring at the lower end of the distribution. This skewed distribution was most evident for the measure of proactive aggression. The distribution of the response facilitation indices did not differ significantly from normality, with the exception of the facilitation to distressing pictures at the 250ms stimulus duration, which showed a skewed distribution with most boys scoring at the lower end of the distribution (negative facilitation). Also, the distribution of the number of prior arrests showed a strongly skewed distribution with

Table 1  
*Distributions of main study variables*

	Mean	(SD)	Range	Skewness	Kurtosis
<u>Psychopathic Traits</u>					
ICU	23.41	(7.58)	1 – 41	-.16	.14
<u>Aggression</u>					
Total	13.24	(9.02)	0 – 40	.94	.85
Proactive	2.59	(3.20)	0 – 13	1.63	2.29
Reactive	10.65	(6.55)	0 – 29	.57	-.16
<u>Delinquency</u>					
Total	12.93	(6.74)	3 – 27	.43	-.92
Violent	2.53	(1.62)	0 – 7	.78	-.15
Nonviolent	8.99	(5.29)	1 – 19	.36	-1.12
Number of Prior Arrests	5.95	(5.20)	0 – 28	1.85	4.41
<u>Emotional Facilitation</u>					
Distress (Combined ms)	-7.83	(49.78)	-155.31 – 141.75	-.06	1.17
Distress (500 ms)	-4.31	(61.60)	-163.76 – 174.13	.04	.84
Distress (250 ms)	-4.36	(51.13)	-110.07 – 152.39	.70	1.31
Positive (Combined ms)	-2.33	(41.74)	-154.22 – 125.06	-.28	2.67
Positive (500 ms)	-3.32	(60.01)	-148.23 – 185.81	.25	1.13
Positive (250 ms)	3.24	(58.60)	-176.53 – 190.38	.46	2.18
<u>Threatening Living Environment</u>					
Exposure to Community Violence	46.46	(17.15)	13 – 92	.16	-.54
Corporal Punishment	2.29	(4.22)	0 – 17	2.00	3.13
Abuse	1.81	(1.23)	0 – 6	1.17	1.35
Neglect	134.68	(16.32)	82-160	-.70	.19

Note: ICU = Inventory of Callous-Unemotional Traits.

most boys scoring at the lower end of the distribution. Examination of the distribution of contextual variables revealed that the distribution of exposure to community violence scores did not differ significantly from normality. However, there was a significantly skewed distribution of scores for corporal punishment and abuse, with most youth scoring at the lower end of the distribution, and for neglect, with most youth scoring at the higher end of the distribution. Given the strongly skewed distributions of proactive aggression, number of prior arrests, corporal punishment, and abuse scores, two new variables were created for each that normalized and dichotomized these variables. Normalization of variables was accomplished by performing a square root transformation. Comparisons of continuous, dichotomized, and transformed variables did not reveal significant differences in study results. Thus, only analyses for the non-transformed variables are reported.

The correlations between the main study variables and demographic variables are reported in Table 2. Age, taking psychotropic medications, receipt of mental health services, PPVT score, income, and ethnicity were generally not associated with the main study variables. However, PPVT score and income were positively associated and ethnicity was negatively associated with total ( $r = .36, p < .01$ ;  $r = .23, p < .05$ ;  $r = -.36, p < .01$ , respectively) and nonviolent delinquency ( $r = .42, p < .001$ ;  $r = .31, p < .01$ ;  $r = -.43, p < .001$ , respectively), which was also significantly associated with age ( $r = .23, p < .05$ ). This pattern of relationships indicates that in this sample being Caucasian and having a higher verbal ability (PPVT) and income was related to higher levels of total and nonviolent delinquency. As would be expected, older boys tended to show more nonviolent delinquency than younger boys. Demographic variables were generally not significantly associated with facilitation indices to distress or

Table 2

*Correlations between main study variables and major demographic variables*

Variables	Age	Meds	Mental Health	PPVT	Income	Ethnicity
<u>Psychopathic Traits</u>						
ICU	.13	-.03	-.04	.08	.10	-.07
<u>Aggression</u>						
Total	.03	-.15	.08	.14	.07	-.16
Proactive	.10	-.11	-.07	.15	-.10	-.12
Reactive	.00	-.12	.06	.13	.14	-.16
<u>Delinquency</u>						
Total	.20	-.03	.04	.36**	.23*	-.36**
Violent	.04	.05	.06	.00	-.07	.04
Nonviolent	.23*	-.03	.04	.42***	.31**	-.43***
<u>Emotional Facilitation</u>						
Distress (Combined ms)	.05	-.08	.05	.18	.15	-.06
Distress (500ms)	.14	-.17	.01	.31**	.19	-.11
Distress (250ms)	-.02	-.06	-.06	.00	.09	.01
Positive (Combined ms)	-.01	-.06	.12	.06	.04	-.01
Positive (500ms)	.11	.02	-.03	.27*	.03	-.16
Positive (250ms)	-.15	-.05	.13	-.15	-.02	.07
<u>Threatening Living Environment</u>						
Exposure to Comm. Violence	.29*	-.31**	-.06	-.05	-.05	.03
Corporal Punishment	.05	-.04	.10	-.18	-.11	.20
Abuse	-.04	.00	.31**	.19	-.11	-.03
Neglect	-.21	.07	.14	-.01	.03	.07

Note: ICU = Inventory of Callous-Unemotional Traits; Meds = Taking psychotropic medication; Mental Health = Receipt of mental health services; PPVT = Peabody Picture Vocabulary Test (Dunn & Dunn, 1997); Ethnicity was coded as 0 for Caucasian and 1 for African American; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .



positive pictures at any stimulus duration, with the exception of a significant positive association between PPVT scores and facilitation to distress and positive pictures at the 500ms stimulus duration ( $r = .31; p < .01$  and  $r = .27; p < .05$ , respectively), suggesting that boys with a higher verbal ability tended to show a greater facilitation to emotional pictures at the 500ms stimulus duration.

### *Primary Analyses*

In Table 3, the correlations among psychopathy, aggression, delinquency, and chart review variables are provided. As expected from past research, there were significant correlations between psychopathy and proactive ( $r = .28; p < .05$ ), reactive ( $r = .33; p < .01$ ), and total aggression ( $r = .39; p < .01$ ). There were also significant associations between psychopathy and total ( $r = .36; p < .01$ ) and nonviolent ( $r = .38; p < .001$ ), but not violent delinquency ( $r = .17; p = n.s.$ ). Also confirming past research, total, proactive, and reactive aggression were strongly positively correlated with total, violent, and nonviolent delinquency, ranging from .41 ( $p < .001$ ) to .58 ( $p < .001$ ). Unexpectedly, self-report of psychopathy and aggression were unrelated to chart variables, including number of prior arrests and history of violent arrests. This lack of association may be explained by the significantly skewed distribution of prior arrests that indicated that most boys scored at the lower end of the distribution (Table 1). However, normalization by a square root transformation and dichotomization of the number of prior arrests (coding two or fewer prior arrests as one and three or greater prior arrests as two) did not significantly affect these associations.

Table 3  
*Correlations among measures of aggression and delinquency variables*

Variable	Psychopathic Traits		Aggression	
	ICU	Total Aggression	Proactive Aggression	Reactive Aggression
<u>Self-Reported Aggression</u>				
Total	.39**		.84***	.97***
Proactive	.28*			.67***
Reactive	.33**			
<u>Self-Reported Delinquency</u>				
Total	.36**	.57***	.49***	.54***
Violent	.17	.50***	.58***	.41***
Nonviolent	.38***	.50***	.41***	.50***
<u>Chart Review Variables</u>				
Number of prior arrests	-.13	.01	-.04	.03
History of violent arrests	.06	-.02	.02	-.04

Note: ICU = Inventory of Callous-Unemotional Traits.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

To determine whether psychopathy was equally associated with aggression, delinquency, and chart variables across race, two-step hierarchical multiple regression analyses were conducted. For these analyses, psychopathy, aggression, delinquency, and number of prior arrest scores were centered by subtracting the sample mean from each participant's score to reduce multicollinearity when forming the multiplicative interaction term. In Step 1, total aggression was regressed onto the moderator variable (race; coded as 0 for Caucasian and 1 for African American) and psychopathy. In Step 2, a multiplicative interaction term was entered into the equation to test for the interaction in predicting total aggression. This procedure was conducted separately for predicting proactive and reactive aggression, total, violent, and nonviolent delinquency, and number of prior arrests. For these regressions none of the interactions were close to significance, such that the change in  $R^2$  ranged from .000 to .028 when the interaction term was added, indicating that it accounted for less than 3% of the variance in the dependent variable. A logistic regression was performed to examine whether there was an interaction between psychopathy and race in predicting a history of violent arrests. For this analysis as well, there was no race by psychopathy interaction ( $B = -.11$ ;  $p = n.s.$ ) for predicting a history of violent arrests. Altogether, this series of regressions indicated that, as predicted by hypothesis one, there were no significant interaction effects between psychopathy and race for predicting any of these variables.

Associations between psychopathy, aggression and facilitation indices to distressing and positive pictures at 250ms, 500ms, and combined stimulus durations, are presented in Table 4. Psychopathic traits were not associated with facilitation to distressing pictures or facilitation to positive pictures at any stimulus duration, with correlations ranging from  $-.10$  to  $.10$  (all  $p = n.s.$ ).

Table 4  
*Correlations with emotional facilitation indices*

Variable	Psychopathic Traits	Aggression		
	ICU	Total Aggression	Proactive Aggression	Reactive Aggression
<u>Facilitation to Distress Pictures</u>				
Distress Combined	.07	.07	.05 (.01)	.07 (.05)
Distress 500ms	.07	.13	.10 (.01)	.14 (.09)
Distress 250ms	.06	.11	.09 (.02)	.11 (.07)
<u>Facilitation to Positive Pictures</u>				
Positive Combined	-.07	.07	.02 (-.05)	.08 (.09)
Positive 500ms	.10	.07	.04 (-.01)	.08 (.07)
Positive 250ms	-.10	.12	.05 (-.05)	.13 (.14)

Note: ICU = Inventory of Callous-Unemotional Traits; Correlations in the body of the table are zero-order correlations, except for correlations in parentheses which are partial correlations controlling for the overlap between reactive and proactive aggression.

Total and reactive aggression were also not significantly associated with facilitation to distressing pictures or facilitation to positive pictures at any stimulus duration, with correlations ranging from .07 to .14 (all  $p = \text{n.s.}$ ). As expected from past research, proactive aggression was also unrelated to facilitation to positive pictures. However, contrary to predictions, proactive aggression was unrelated to facilitation to distressing pictures at 500ms ( $r = .10; p = \text{n.s.}$ ), 250ms ( $r = .09; p = \text{n.s.}$ ), and combined stimulus durations ( $r = .05; p = \text{n.s.}$ ). Partial correlations with each type of aggression, controlling for the other type were examined to determine if the strong correlation between proactive and reactive aggression ( $r = .67; p < .001$ ) might have obscured differential associations; however, there was no significant change in the associations between proactive and reactive aggression and the facilitation indices using these partial correlations.

To determine whether psychopathy or aggression were differentially associated with facilitation indices across ethnicity or income, two-step hierarchical multiple regression analyses were conducted, again using centered variables. In Step 1, facilitation to distress was regressed onto the moderator variable (ethnicity) and psychopathy. In Step 2, a multiplicative interaction term was entered into the equation to test for the interaction in predicting facilitation to distress. Similar regression analyses separately investigated possible interactions between psychopathy and income, and between aggression and ethnicity or income in predicting emotional facilitation to distressing and positive pictures. For all of these regressions the change in  $R^2$  resulting from the inclusion of the multiplicative interaction term did not reach significance (ranging from .001 to .023), accounting for less than 3% of the variance. Contrary to the relationship that was predicted by hypothesis two, this series of regressions indicated that psychopathy and aggression were not differentially related to facilitation indices across ethnicity or income.

To determine whether psychopathy was equally associated with facilitation to distress pictures at each stimulus duration across proactive, reactive, and total aggression, two-step hierarchical multiple regression analyses were conducted with centered variables. In Step 1, facilitation to distressing pictures was regressed onto aggression and psychopathy variables. In Step 2, a multiplicative interaction term was entered into the equation to test for the interaction in predicting facilitation to distress. Similar regression analyses separately investigated possible interactions between psychopathy and the three aggression measures in predicting facilitation to distress at the 500ms, 250ms, and the combined stimulus durations. The results of these analyses are provided in Table 5. Altogether, there were no significant interactions between psychopathic traits and each of the aggression measures in predicting facilitation to distress at the 500ms and the combined stimulus durations. The change in  $R^2$  resulting from the inclusion of the multiplicative interaction terms, accounted for less than 3% of the variance in predicting facilitation to distress at the combined stimulus duration and less than 1% of the variance in predicting facilitation to distress at the 500ms stimulus duration. However, there was a strong and significant interaction between psychopathy and proactive aggression ( $R^2$  change = .12,  $p < .01$ ), reactive aggression ( $R^2$  change = .08,  $p < .05$ ), and total aggression ( $R^2$  change = .10,  $p < .01$ ) in predicting facilitation to distress at the 250ms stimulus duration.

The significant interaction between psychopathy and aggression was further explored using the procedure recommended by Holmbeck (2002). In this procedure, the regression equation from the full sample is used to calculate predicted values of the dependent variable (i.e., the facilitation index to distressing pictures at the 250ms stimulus duration), at high (1 SD above the mean) and low levels (1 SD below the mean) of the two predictors (i.e., psychopathy and

Table 5:

*Hierarchical regression analyses testing for the potential moderating role of aggression in the association between facilitation to distress and psychopathy*

	Emotional Facilitation to Distress Pictures								
	Distress Combined			Distress 500ms			Distress 250ms		
	Std. Beta	R <sup>2</sup>	R <sup>2</sup> -change	Std. Beta	R <sup>2</sup>	R <sup>2</sup> -change	Std. Beta	R <sup>2</sup>	R <sup>2</sup> -change
<u>Total Aggression</u>									
Aggression	.05			.12			.10		
ICU	.06			.03			.02		
		.007			.018			.013	
Aggression	.06			.13			.14		
ICU	.08			.03			.06		
Aggression x ICU	-.16			-.02			-.32**		
		.033	.03		.019	.00		.113	.10**
<u>Proactive Aggression</u>									
Proactive	.03			.09			.08		
ICU	.07			.05			.04		
		.006			.012			.009	
Proactive	.06			.09			.14		
ICU	.07			.05			.06		
Pro x ICU	-.16			-.01			-.36**		
		.031	.03		.012	.00		.130	.12**
<u>Reactive Aggression</u>									
Reactive	.06			.13			.10		
ICU	.05			.03			.02		
		.007			.019			.012	
Reactive	.06			.13			.12		
ICU	.08			.03			.07		
Rea x ICU	-.16			-.02			-.29*		
		.031	.02		.019	.00		.092	.08*

Note: ICU = Inventory of Callous-Unemotional Traits; All predictors were centered using the sample mean prior to entering them into the regression analyses.

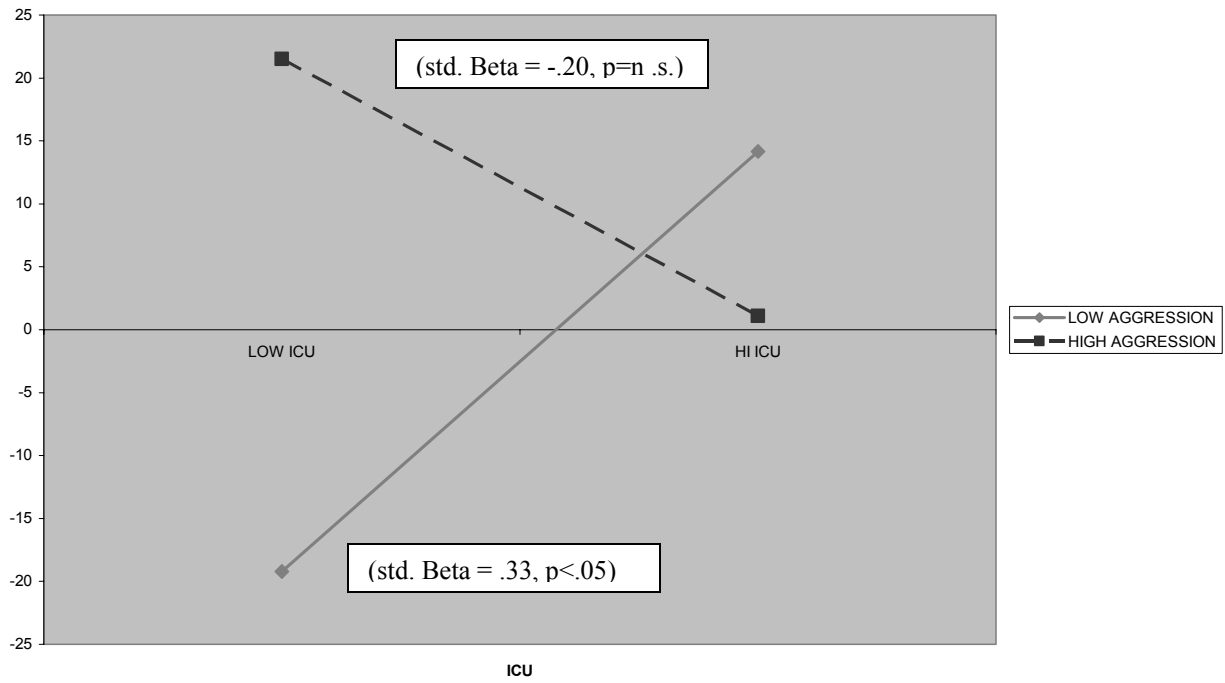
\* p<.05; \*\* p<.01.

aggression scores). Post-hoc probing was used to determine if the association between psychopathy and the facilitation index to distressing pictures at the 250ms stimulus duration was significant at either of the two levels of aggression by computing the simple slopes (i.e., standardized beta) and testing these for significance (Holmbeck, 2002). The results of these analyses are summarized in Figure 1. These analyses revealed very different associations between psychopathy and facilitation to distress at low and high levels of total aggression. Specifically, as predicted there was a negative association between psychopathic traits and facilitation to distress pictures at high levels of aggression (Std. Beta =  $-.20$ ,  $p = \text{n.s.}$ ). However, there was an unexpected significant positive association between psychopathic traits and the facilitation index to distress pictures at low levels of aggression (Std. Beta =  $.33$ ,  $p < .05$ ). This pattern of results was similar for proactive and reactive aggression, such that there was a negative association between psychopathic traits and the facilitation index to distress pictures at high levels of proactive and reactive aggression (Std. Beta =  $-.23$ ,  $p = \text{n.s.}$  and Std. Beta =  $-.18$ ,  $p = \text{n.s.}$ , respectively), and a significant positive association between psychopathic traits and the facilitation index to distress pictures at low levels of proactive and reactive aggression (Std. Beta =  $.36$ ,  $p < .05$  and Std. Beta =  $.32$ ,  $p < .05$ , respectively).

The next set of analyses focused on the contextual variables. Associations between demographic variables and contextual variables are presented in Table 2. Exposure to community violence was significantly positively associated with age ( $r = .29$ ,  $p < .05$ ) and negatively associated with taking medication ( $r = -.31$ ,  $p < .01$ ), such that older boys and boys not taking medication tended to experience more exposure to community violence. Also, abuse was significantly associated with receipt of mental health services ( $r = .31$ ,  $p < .01$ ), such that



Figure 1:  
*The interaction between aggression and psychopathy in predicting facilitation to distress (ms) at the 250ms stimulus duration*



children who were abused were more likely to have received mental health services. To examine the associations among contextual variables, zero-order correlations are presented in Table 6. Contrary to past research, exposure to community violence was not significantly correlated with abuse ( $r = -.04$ ;  $p = \text{n.s.}$ ) and was significantly negatively correlated with neglect ( $r = -.28$ ;  $p < .05$ ). Also, corporal punishment was not significantly associated with abuse ( $r = -.06$ ;  $p = \text{n.s.}$ ) or neglect ( $r = .03$ ;  $p = \text{n.s.}$ ) and abuse was weakly negatively correlated with neglect ( $r = -.19$ ), although this association did not reach significance.

To determine whether contextual variables were associated with the main study variables in this sample, zero-order correlations were examined and are also presented in Table 6. Importantly, exposure to community violence was significantly associated with both psychopathic traits ( $r = .35$ ;  $p < .01$ ) and facilitation to distress pictures at the 250ms stimulus duration ( $r = -.22$ ;  $p < .05$ ). Exposure to community violence was also associated with total aggression ( $r = .40$ ;  $p < .001$ ), proactive aggression ( $r = .34$ ;  $p < .01$ ), reactive aggression ( $r = .36$ ;  $p < .01$ ), total delinquency ( $r = .45$ ;  $p < .001$ ), violent delinquency ( $r = .46$ ;  $p < .001$ ), and nonviolent delinquency ( $r = .38$ ;  $p < .01$ ). Corporal punishment was positively correlated with facilitation to distress at the 250ms ( $r = .25$ ;  $p < .05$ ) and the combined stimulus duration ( $r = .17$ ;  $p = \text{n.s.}$ ), and facilitation to positive at the 250ms ( $r = .32$ ;  $p < .01$ ) and the combined stimulus duration ( $r = .27$ ;  $p < .05$ ). In contrast, abuse and neglect variables were uncorrelated with all emotional facilitation indices. However, abuse was significantly associated with total ( $r = .26$ ;  $p < .05$ ), proactive ( $r = .28$ ;  $p < .05$ ), and reactive aggression ( $r = .22$ ;  $p < .05$ ), and total ( $r = .26$ ;  $p < .05$ ) and nonviolent delinquency ( $r = .25$ ;  $p < .05$ ). Interestingly, there was a strong negative correlation between neglect and psychopathic traits ( $r = -.40$ ;  $p < .001$ ). In Table 6, the partial correlations with each type of aggression, controlling for the other type, are also provided

Table 6  
*Correlations with contextual variables*

Variables	Exposure to Community Violence	Corporal Punishment	Abuse	Neglect
<u>Threatening Living Environment</u>				
Exposure to Community Violence	*	-.13	-.04	-.28*
Corporal Punishment		*	-.06	.03
Abuse			*	-.19
<u>Psychopathic Traits</u>				
ICU	.35**	-.09	.05	-.40***
<u>Aggression</u>				
Total	.40***	.05	.26*	-.20
Proactive	.34** (.20)	-.03 (-.12)	.28* (.19)	-.14 (-.01)
Reactive	.36** (.12)	.09 (.15)	.22* (.08)	-.21 (-.17)
<u>Delinquency</u>				
Total	.45***	-.04	.26*	-.19
Violent	.46***	.04	.20	-.02
Nonviolent	.38**	-.07	.25*	-.21
<u>Emotional Facilitation</u>				
Distress Combined	-.19	.17	.16	-.05
Distress (500ms)	-.04	.09	.09	-.08
Distress (250ms)	-.22*	.25*	.06	.06
Positive Combined	.00	.27*	.09	-.05
Positive (500ms)	.01	-.03	.13	-.10
Positive (250ms)	-.04	.32**	-.02	.03

Note: ICU = Inventory of Callous-Unemotional Traits; Correlations in the body of the table are zero-order correlations, except for correlations in parentheses which are partial correlations controlling for the overlap between reactive and proactive aggression; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

to determine if the correlation between aggression measures may have obscured differential associations. After controlling for reactive aggression, correlations were no longer significant between proactive aggression and exposure to community violence ( $r = .34, p < .01$  to  $r = .20, p = n.s.$ ) and abuse ( $r = .28, p < .05$  to  $r = .19, p = n.s.$ ). Also, after controlling for proactive aggression, correlations were no longer significant between reactive aggression and exposure to community violence ( $r = .36, p < .01$  to  $r = .12, p = n.s.$ ) and abuse ( $r = .22, p < .05$  to  $r = .08, p = n.s.$ ).

To further explore the relationship among contextual variables, particularly exposure to community violence, psychopathy, and facilitation to distress pictures at the 250ms stimulus duration, a series of two-step hierarchical multiple regression analyses were conducted using centered variables. In Step 1, facilitation to distress at the 250ms stimulus duration was regressed onto exposure to community violence and psychopathy variables. In Step 2, a multiplicative interaction term was entered into the equation to test for the interaction in predicting facilitation to distress. This procedure was repeated to investigate the interaction between each contextual variable and psychopathic traits in predicting facilitation to distress. These analyses are presented in Table 7 and revealed that the addition of interaction terms between psychopathic traits and corporal punishment, abuse, and neglect added between two and five percent of the variance to the prediction of facilitation to distress, although none of these were significant. Importantly, there was a significant interaction between psychopathy and exposure to community violence ( $R^2$  change = .12,  $p < .01$ ) in predicting facilitation to distress pictures.

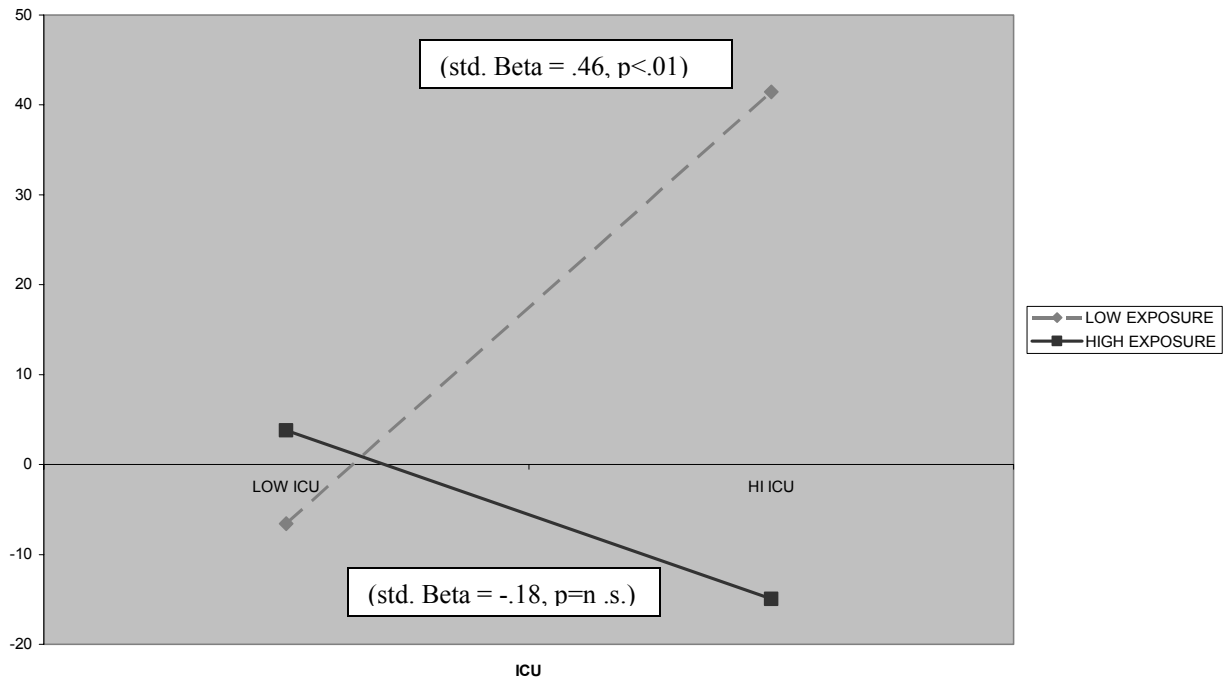
This significant interaction between exposure to community violence and psychopathy was further explored, again using the procedure recommended by Holmbeck (2002). The results of this analysis are summarized in Figure 2 and revealed very different associations between

Table 7:  
*Hierarchical regression analyses testing for the potential moderating role of contextual variables*

				<b>Facilitation to Distress Pictures (250ms)</b>			
				Std. Beta	R <sup>2</sup>	R <sup>2</sup> -change	
<u>Exposure to Community Violence</u>							
	ECV			-.28*			
	ICU			.15			
						.07	
	ECV			-.22			
	ICU			.14			
	ECV x ICU			-.35**			
						.19	<b>.12**</b>
<u>Mother Corporal Punishment</u>							
	CP			.26*			
	ICU			.09			
						.07	
	CP			.29*			
	ICU			.11			
	CP x ICU					.09	.02
<u>Abuse</u>							
	Abuse			.06			
	ICU			.05			
						.01	
	Abuse			.07			
	ICU			.35			
	Abuse x ICU			-.37			
						.05	.05
<u>Neglect</u>							
	Neglect			.10			
	ICU			.10			
						.01	
	Neglect			.09			
	ICU			.06			
	Neglect x ICU			.13		.03	.02

Note: ICU = Inventory of Callous-Unemotional Traits; All predictors were centered using the sample mean prior to entering them into the regression analyses; \* p<.05; \*\* p<.01.

Figure 2:  
*Interaction between exposure to community violence and psychopathy in predicting facilitation to distress stimuli (ms)*



facilitation to distress and psychopathy at low and high levels of exposure to community violence. Specifically, there was a negative association between the facilitation index to distress pictures and psychopathy at high levels of exposure (Std. Beta =  $-.18$ ,  $p = n.s.$ ), but a significant positive association between facilitation to distress and psychopathy at low levels of exposure (Std. Beta =  $.46$ ,  $p < .01$ ). This is a similar interaction to what was found between aggression and psychopathy in predicting facilitation to distress.

### *Post-hoc Analyses*

Importantly, these findings indicated that there were two groups of boys high on psychopathic traits. The first group was exposed to high levels of community violence and showed a negative facilitation to distressing pictures, which is the pattern expected from past research. However, there was a second group of youth high on psychopathic traits but who were not exposed to high levels of community violence and who showed the unexpected positive facilitation to distressing pictures. To explore differences between these groups using a more person-centered analysis, four groups were created based on a median split of both exposure to community violence and psychopathy, resulting in a low exposure-low psychopathy ( $n = 19$ ), high exposure-low psychopathy ( $n = 18$ ), low exposure-high psychopathy ( $n = 18$ ), and a high exposure-high psychopathy group ( $n = 22$ ). Next,  $2 \times 2$  factorial ANOVAs were performed on the main study variables. The results of these analyses are presented in Table 8. These analyses revealed a significant main effect of exposure to community violence for facilitation to distress pictures ( $F(1, 77) = 4.84$ ,  $p < .05$ ), such that both groups of boys high on exposure to violence were low on emotional facilitation. Importantly, when comparing groups on mean levels of facilitation to distressing stimuli, the high exposure-high psychopathy group showed the lowest

mean facilitation to distress stimuli (-20.48;  $SD = 11.48$ ), followed by the high exposure-low psychopathy (-10.03;  $SD = 10.92$ ) group. As suggested by the regression analyses, the other high psychopathy group that was low on exposure to community violence showed a high positive facilitation to distress stimuli (25.54;  $SD = 13.37$ ).

These analyses also revealed significant main effects of exposure to community violence in predicting all six aggression and delinquency variables, total aggression ( $F(1, 77) = 5.40, p < .05$ ), proactive aggression ( $F(1, 77) = 4.20, p < .05$ ), reactive aggression ( $F(1, 77) = 4.68, p < .05$ ), total delinquency ( $F(1, 77) = 12.00, p < .01$ ), violent delinquency ( $F(1, 77) = 9.14, p < .01$ ), and nonviolent delinquency ( $F(1, 77) = 8.12, p < .01$ ). These analyses also indicated an additive effect of exposure to community violence and ICU, such that there was an additional main effect for ICU for total ( $F(1, 77) = 4.96, p < .05$ ) and proactive aggression ( $F(1, 77) = 6.18, p < .05$ ) and total ( $F(1, 77) = 6.72, p < .05$ ) and nonviolent delinquency ( $F(1, 77) = 7.88, p < .01$ ). The additive effects of these variables is evidenced by the fact that the high exposure-high psychopathy group showed the highest mean levels of aggression and delinquency. Importantly, there was also a significant interaction effect between exposure to community violence and psychopathy for abuse ( $F(1, 76) = 6.12, p < .05$ ). The high psychopathy-low exposure group, which showed a strong positive facilitation to distress stimuli, and the high exposure-low psychopathy group, showed the highest mean levels of abuse (2.29;  $SE = .33$  and 2.19,  $SE = .27$ , respectively) compared with the other two groups.



Table 8

*Characteristics of the sample split by levels of psychopathy and exposure to community violence*

Variable	Lo EV Lo ICU (n = 19)	Hi EV Lo ICU (n = 18)	Lo EV Hi ICU (n = 18)	Hi EV Hi ICU (n = 22)	Effects	Total (n = 80)
<u>Emotional Facilitation</u>						
Distress (250ms)	-5.01 (10.43)	-10.03 (10.92)	25.54 (13.37)	-20.48 (11.48)	EV <sup>a</sup>	-4.36 (51.13)
<u>Psychopathic Traits</u>						
ICU	17.17 (.97)	19.48 (1.01)	28.86 (1.24)	30.84 (1.06)	ICU <sup>b</sup> , EV <sup>c</sup>	23.41 (7.58)
<u>Aggression</u>						
Total	8.83 (1.79)	13.91 (1.88)	13.71 (2.30)	17.90 (1.97)	ICU <sup>d</sup> , EV <sup>c</sup>	13.24 (9.02)
Proactive	1.09 (.64)	2.62 (.67)	2.93 (.82)	4.32 (.70)	ICU <sup>f</sup> , EV <sup>g</sup>	2.59 (3.20)
Reactive	7.74 (1.32)	11.29 (1.38)	10.79 (1.69)	13.58 (1.45)	EV <sup>h</sup>	10.65 (6.55)
<u>Delinquency</u>						
Total	8.35 (1.25)	14.71 (1.31)	13.50 (1.61)	16.79 (1.38)	ICU <sup>i</sup> , EV <sup>j</sup>	12.93 (6.74)
Violent	1.83 (.32)	3.00 (.34)	2.29 (.41)	3.26 (.35)	EV <sup>k</sup>	2.53 (1.62)
Nonviolent	5.57 (1.01)	9.91 (1.05)	9.86 (1.29)	11.90 (1.11)	ICU <sup>l</sup> , EV <sup>m</sup>	8.99 (5.29)
<u>Threatening Living Environment</u>						
EV	31.17 (1.88)	56.29 (1.96)	33.57 (2.40)	64.95 (2.06)	ICU <sup>n</sup> , EV <sup>o</sup>	46.46 (17.15)
Corporal Punishment	3.45 (.89)	1.91 (.93)	2.00 (1.14)	1.56 (1.00)		2.29 (4.22)
Abuse	1.48 (.26)	2.19 (.27)	2.29 (.33)	1.56 (.29)	ICU x EV <sup>p</sup>	1.81 (1.23)
Neglect	139.78 (3.25)	133.14 (3.40)	138.50 (4.16)	128.16 (3.57)	EV <sup>q</sup>	134.68 (16.32)

Note: ICU = Inventory of Callous-Unemotional Traits; EV = Exposure to Community Violence. Effects are from a 2x2 ANOVA with median split of ICU and median split of exposure to community violence as the between groups factors; <sup>a</sup>  $F(1, 77) = 4.84, p < .05$ ; <sup>b</sup>  $F(1, 77) = 114.90, p < .001$ ; <sup>c</sup>  $F(1, 77) = 3.98, p < .05$ ; <sup>d</sup>  $F(1, 77) = 4.96, p < .05$ ; <sup>e</sup>  $F(1, 77) = 5.40, p < .05$ ; <sup>f</sup>  $F(1, 77) = 6.18, p < .05$ ; <sup>g</sup>  $F(1, 77) = 4.20, p < .05$ ; <sup>h</sup>  $F(1, 77) = 4.68, p < .05$ ; <sup>i</sup>  $F(1, 77) = 6.72, p < .05$ ; <sup>j</sup>  $F(1, 77) = 12.00, p < .01$ ; <sup>k</sup>  $F(1, 77) = 9.14, p < .01$ ; <sup>l</sup>  $F(1, 77) = 7.88, p < .01$ ; <sup>m</sup>  $F(1, 77) = 8.12, p < .01$ ; <sup>n</sup>  $F(1, 77) = 7.03, p < .05$ ; <sup>o</sup>  $F(1, 77) = 183.37, p < .001$ ; <sup>p</sup>  $F(1, 76) = 6.12, p < .05$ ; <sup>q</sup>  $F(1, 77) = 5.53, p < .05$ .

## Discussion

The current study adds to a growing body of research suggesting that the presence of psychopathic traits, and specifically callous-unemotional traits, designates an important subgroup of children with antisocial behavior. In the current study psychopathic traits were related to greater levels of aggression and total, violent, and nonviolent delinquency. Youth with psychopathic traits also showed the highest levels of both proactive and reactive aggression, which were strongly intercorrelated and associated themselves with greater levels of delinquency. These results add to a substantial body of research finding that antisocial youth who show psychopathic traits present with a more severe, aggressive, and stable pattern of antisocial behavior and delinquency, with greater levels of proactive or instrumental aggression (i.e., Cornell et al., 1996; Frick, Cornell, Barry, et al., 2003; Frick, Cornell, Bodin et al., 2003; Woodworth & Porter, 2002). Also consistent with predictions, psychopathy was not differentially related to violence, aggression, or delinquency across ethnicity. This confirms a previous study in adults finding a comparable prevalence and severity of criminal behavior in adult African Americans and Caucasians with psychopathy (Kosson et al., 1990). However, the relationship between psychopathic traits and aggression/ delinquency was only found for self-report measures and was not found for measures of violence and delinquency based on institutional records. Thus, these associations may have been inflated due to shared method variance. However, the failure to find associations with official records may also be partially due to inadequacies in the available records, the severely skewed distribution of the number of prior arrests, and the high prevalence of a history of violent arrests in the current sample.

Psychopathic traits and aggression were not individually associated with emotional processing in the current study. Further, the current study did not find a direct relationship between proactive aggression and responsiveness to distress stimuli as was found in a past study using the emotional pictures dot-probe task with non-referred children (Kimonis et al., in press). Past studies finding an association between emotional processing, psychopathy, and aggression have used primarily Caucasian samples (Blair et al., in press; Hiatt et al., 2002; Kimonis et al., in press; Patrick et al., 1993). Also, the few studies examining cognitive-affective deficits associated with psychopathic traits in predominantly African American samples have failed to show the same significant findings (Kosson et al., 1990; Lorenz & Newman, 2002b; Lorenz & Newman, 2002c). Taken together, the failure to find a significant relationship between psychopathic traits and emotional processing deficits may be attributable to the predominantly African American sample used in the current study. Although there was no interaction between ethnicity and psychopathic traits for predicting emotional responses to distressing stimuli, the relatively small ( $n=20$ ) and highly antisocial sample of Caucasians may not have provided enough power to detect such an interaction.

As predicted, there was an interaction between psychopathic traits and aggression in predicting response to distress. Specifically, at high levels of total, proactive, or reactive aggression, psychopathy was associated with a reduced responsivity to distressing stimuli, supporting past research (Kimonis et al., in press). This finding could suggest that the association between psychopathy and deficits in emotional processing reported in past research may be a function of the use of antisocial samples with high rates of aggression (e.g., Blair et al., 2001; Loney et al., 2003; Patrick et al., 1993). If deficits in emotional processing are considered a core feature of the construct of psychopathy (e.g., Cleckley, 1982; Hare, 1993; Lykken, 1995), then

these results suggest that it may only be individuals that show the interpersonal and affective features of the construct along with high levels of aggression who should be considered as showing psychopathy. However, such findings need to be replicated in other samples that can separate aggressive behavior from the other features of the construct before firm conclusions can be made. Importantly, the reduced sensitivity to emotional stimuli found for children high on both aggression and psychopathic traits was not consistent across all types of emotional stimuli and was specific to distressing stimuli, supporting previous findings in adult (Levenston et al., 2000) and child samples (Kimonis et al., in press).

This finding is also consistent with models of moral development that emphasize the sensitivity to others' distress (Blair 1999). Specifically, several models of moral development describe how a pattern of low arousal in the child could lead distress signals from others to be insufficiently negatively reinforcing, making them ineffective punishers for the child's aggressive behaviors. As a result, normal moral development is impaired and transgressions do not become associated with strong internal reactions of anxiety and guilt in the child that function to inhibit future aggressive behaviors (Kochanska, 1993; Blair 1995). Further, low arousal to distress cues in others can lead to the development of maladaptive social cognitions that not only fail to inhibit aggressive behaviors but also support the use of aggression for positive outcomes (Guerra & Huesmann, 2004). Support for this theory comes from research finding that youth with callous-unemotional traits show a cognitive style characterized by an increased focus on the positive aspects of aggression and a decreased focus on the negative aspects (i.e., punishment), which likely contributes to the development and maintenance of antisocial behavior and aggression in these youth (Pardini, Lochman, & Frick, 2003).

The emotional deficit in response to distressing stimuli was only evident at the 250ms stimulus duration. This finding coincides with research on attentional biases in anxious individuals, which reports more robust associations at shorter stimulus durations (i.e., Fox, 2002; Bradley et al., 1998). The failure to find the same emotional deficits in response to distress at the 500ms stimulus duration, as was found in a previous study of children (Kimonis et al., in press), suggests that at the longer stimulus duration, adolescents' attention may shift in focus and effortful processes may come into play. This finding confirms past research using a similar version of the emotional pictures dot-probe task in an adolescent sample, which failed to find emotional deficits at the 500ms stimulus duration (Loney, 2004, personal communication). Therefore, it is possible that the 250ms stimulus duration more specifically assessed the automatic allocation of attention to emotional stimuli in this sample.

Contrary to predictions, there was a strong positive association between psychopathic traits and emotional responsivity to distressing stimuli at low levels of aggression. Specifically, children who were high on psychopathic traits but low on aggression showed an enhanced response to distressing pictorial stimuli. These findings are in line with an innovative study by Ishikawa, Raine, Lencz, Bihrlle and Lacasse (2001), which compared "successful" and "unsuccessful" criminals with psychopathy from the community. In this study, adult males were recruited from temporary employment agencies and grouped into "successful psychopaths" (never convicted of a crime), "unsuccessful psychopaths" (history of criminal conviction), and controls, based on Psychopathy Checklist- Revised (PCL-R; Hare, 2003) scores. Participants performed an emotional manipulation task in which they prepared to give a speech detailing their faults and weaknesses for two minutes and then gave the speech in front of a video camera and a research assistant for two minutes while physiological reactivity was measured. Consistent with

past studies, “unsuccessful psychopaths” showed reduced cardiovascular responsivity compared with the other two groups. In contrast, “successful psychopaths” showed a significantly greater increase in heart rate from baseline to the end of the emotional stress paradigm compared with both “unsuccessful psychopaths” and controls. The authors interpreted this intact emotional functioning as an asset that allows these individuals to process cues in risky situations and make decisions that help avoid criminal apprehension and conviction. While the group in the current study who was high on psychopathy and high on reactivity to distressing stimuli could not be considered “successful”, given that individuals in this group were all detained for a criminal offense, this group was less aggressive and this could indicate some enhanced ability to regulate their behavior in social situations.

The presence of this group is also consistent with research suggesting multiple etiological pathways to psychopathic traits. Specifically, a distinction between primary and secondary psychopathy has frequently been made in the psychopathy literature (Lykken, 1995; Porter, 1996). The constellation of interpersonal, affective, and behavioral features that characterize individuals with psychopathy are believed to be biologically based and unrelated to social disadvantage, psychopathology, neurotic anxiety or low intelligence in the primary subtype (Cleckley, 1982). In contrast, the development of secondary psychopathy is viewed as being more heavily dependent on social forces (Porter, 1996). Furthermore, primary psychopathy is characterized by distinct cognitive-affective and physiological deficits, including fearlessness, reduced physiological responsivity when anticipating punishment, and poor passive avoidance, which have been attributed to an overall weak behavioral inhibition system (Lykken, 1995; Newman, MacCoon, Vaughn, & Sadeh, 2005). Individuals with secondary psychopathy fail to

show these same deficits in behavioral inhibition and are often high in anxiety and other indices of emotional distress (Fowles, 1980; Lykken, 1995; Newman et al., 2005).

In the current study, the group of youth high on both aggression and psychopathic traits most closely resembled the primary psychopathy subtype because of their reduced responsivity to distressing stimuli. The second group of youth high on psychopathic traits that was low on aggression more closely resembled the secondary psychopathy subtype given their heightened responsivity to distressing stimuli. The most common method for distinguishing between individuals with primary and secondary psychopathy is to assess the individual's experience of anxiety (Brinkley, Newman, Widiger, & Lynam, 2004; Levenson, Kiehl, & Fitzpatrick, 1995; Newman & Brinkley, 1997; Schmitt & Newman, 1999), given performance differences on a variety of tasks between high-anxious and low-anxious individuals with psychopathy (Blackburn, 1979; Newman et al., 2005; Newman, Widom, & Nathan, 1985; Newman & Brinkley, 1997). Given the association found in past research between attentional orienting to negative stimuli and anxiety (Vasey et al., 1995; Vasey et al., 1996), it is quite possible that this group of youth would have been high on measures of anxiety. Future studies need to address this issue directly by including a measure of anxiety and comparing the performance of high- and low-anxious individuals with psychopathy on affective processing tasks.

The influence of contextual variables might also explain differences in emotional reactivity between the two groups of youth high on psychopathic traits, given the importance of social stressors placed on the development of secondary psychopathy in most theories (e.g. Lykken, 1995). Importantly, community violence showed more consistent associations with a reduced responsivity to distress stimuli than psychopathic traits. Specifically, youth exposed to community violence in the current study showed an underreactivity to distressing images using

the dot-probe paradigm, indicated by a slower response time to probes replacing distressing images over neutral images. These results support previous investigations finding that exposure to community violence is related to reduced physiological reactivity to distressing stimuli (i.e., Cooley-Quille et al., 2001). Fitzpatrick and Boldizar (1993) propose that a desensitization process takes place, whereby youth exposed to chronic high levels of community violence adapt to their contexts to avoid experiencing frequent emotional distress. This process impacts normal moral development (Pynoos, 1993) and could account for the prevalence of a lack of empathy and callousness in youth exposed to high levels of community violence (Jonson-Reid, 1998; Wilson, 1995).

There was also an interaction between psychopathy and exposure to violence, but it was similar to the interaction found for aggression. This interaction was described in Figure 2 and in Table 8. In Table 8, it is evident that there were two groups of youth that showed high exposure to community violence, both of which showed decreased reactivity to distressing stimuli, but only one of which showed high levels of callous-unemotional traits. This interaction suggests that some children who become desensitized to distress because of violence exposure develop callous-unemotional traits, leading them to act more aggressively, but other children do not. It is important for future studies to address what types of risk and protective factors are present in youth exposed to community violence who fail to develop psychopathic traits, despite showing some reduced responsiveness to distress cues. It is possible that certain parenting styles, such as warm and responsive parenting, can promote conscience development in children who may not show high levels of emotional reactivity (Kochanska, 1993).

The interaction between psychopathic traits and exposure to community violence does not help to explain why there was a group of youth high on psychopathic traits that were also



highly reactive to distressing stimuli. That is, this group did not show higher rates of exposure to community violence. Person-centered analyses were performed to examine how the youth high on psychopathic traits but low on exposure to community violence differed from the other youth high on psychopathic traits. As previously mentioned, this group of youth was much more responsive to distress stimuli compared with other youth. These analyses revealed that there was another important difference between these two groups that could account for differences in their patterns of emotional reactivity. Importantly, youth with psychopathic traits that were exposed to low levels of community violence had experienced greater levels of abuse than other youth. This finding supports the study by Ishikawa and colleagues (2001) that found that “successful psychopaths” (no history of criminal conviction) that showed a heightened physiological reactivity during a socially stressful paradigm also showed the highest levels of corporal punishment, physical abuse, and sexual abuse. This finding is also in line with research on secondary psychopathy that indicates a contextual etiology for this subtype, which may be related to certain types of early traumatic experiences (Newman et al., 1985)

Consistent with this possibility, children exposed to acute and proximal violence, as in the case of abuse, tend to be hypervigilant to emotional stimuli (Pollak, Klorman, Thatcher, & Cicchetti, 2001; Posner & Raichle, 1994; Shields & Cicchetti, 1998). To help them avoid harm, this pattern of heightened arousal to distressing social cues develops as an adaptation to unpredictable exposure to extreme environmental stress (Rieder & Cicchetti, 1989). However, despite this heightened arousal, physically abused youth often show blunted or inappropriate affect (Gaensbauer, Mrazek, & Harmon, 1981 Klimes-Dougan & Kistner, 1990; Main & George, 1985) and lower levels of empathy for others (Howes & Eldredge, 1985). Porter (1996) proposed that youth with secondary psychopathy may have an intact capacity for empathic responding that

is “turned off” as a result of repeated experiences of maltreatment that interfere with early socializing processes and normal moral development. While these youth show similar outward manifestations of callousness as their underaroused counterparts, they maintain a pattern of heightened emotional reactivity to potentially distressing or threatening social situations.

The two divergent patterns of emotional reactivity found in youth high on psychopathic traits could explain the failure to find a relationship between emotional processing and psychopathic traits in the current study and in other samples (e.g., Hare, 1968; see Mawson & Mawson, 1977 for review; Pham, Philippot, & Rime, 2000), especially African-American samples in which there may have been a high rate of abuse (Lorenz & Newman, 2002b). In line with these findings, an early study concluded that individuals with psychopathy actually show a bimodal distribution of emotional reactivity (Tong, 1959). These findings are also consistent with developmental theories of conscience development in which both too high and too low levels of emotional reactivity can negatively affect conscience development (Kochanska, 1993).

One curious and unexpected finding concerned the relationship between neglect and exposure to community violence and psychopathy. This finding falls in direct contrast with one of the first studies to examine the relationship between maltreatment and exposure to community violence, which found that exposure to community violence was related to more severe neglect experiences (Lynch & Cicchetti, 1998). The results of the current study indicate that there was a negative relationship between neglect and exposure to community violence, as well as between neglect and callous-unemotional traits. One possible interpretation of this finding is that because neglected children are deprived of opportunities for interacting with adults they are more likely to seek out affection from others and are less likely to show the prototypical characteristics of psychopathy, including callousness and an inability to form strong emotional bonds with others.

However, this finding could also be related to the use of a detained sample, most of whom came from socioeconomically disadvantaged neighborhoods and, as a result, this finding needs to be replicated before strong conclusions can be reached.

### *Study Limitations*

The findings of the current study should be interpreted cautiously because of several limitations. First, many of the main study variables were assessed solely through adolescent self-report, which is susceptible to reporter biases. Also, shared method variance could have inflated correlations among several of the study variables. However, there were a number of reasons for using self-report scales with the current sample of adolescent offenders. One reason is that the reliability and validity of reports on child psychopathology, and especially covert behaviors, decrease for parent and teacher report as they increase for self-report into adolescence (Kamphaus & Frick, 1996). Another reason is that self-report measures have been used in a number of past studies to assess psychopathic traits (Lilienfeld & Andrews, 1996; Lynam, Whiteside, & Jones, 1999) and have successfully differentiated groups of adolescent offenders in other adolescent and young adult samples (Caputo, Frick, & Brodsky, 1999; Silverthorn, Frick, & Reynolds, 2001). However, it is important to replicate these findings using multiple informants for assessing psychopathic traits and aggression.

Second, although the dot-probe paradigm has been shown in several studies to assess attentional biases in anxious individuals who are highly reactive to emotional stimuli (Mogg & Bradley, 1999; Vasey et al., 1995; Vasey et al., 1996), it has only been used in one study to investigate the relation between deficits in emotional processing and psychopathic traits in non-referred youth (Kimonis et al., in press) and another study investigating deficits in emotional

processing and aggression in youth (Schippell et al., 2003). Further, the dot-probe task is not a direct index of emotional responsiveness, since a number of cognitive, affective, and motoric processes are operating between the child's perception of the pictorial stimuli and his or her motoric response concerning the location of the dot (Vasey et al., 1996). Therefore, differences in performance may have been due to processes other than the child's responsiveness to the emotional stimuli. Also, the visual images used in this study have not been used extensively with children (Blair, 1999; McManis et al., 2001). Therefore, some of the stimuli may not be as effective as others in evoking the target emotion in children.

Third, given the correlational, cross-sectional design of this study, causal interpretations cannot be made directly from these findings. This is an important issue given that research supports the possibility of bi-directional effects for psychopathic traits and exposure to community violence. While exposure to community violence can lead youth to become desensitized to others' distress (i.e., Cooley-Quille et al., 2001), youth with psychopathic traits, who show a pattern of low arousal, may also seek out sensational and thrilling activities (Frick, Cornell, Bodin, et al., 2003; Frick et al., 1999), making them more likely to experience community violence. Also, the study was conducted solely with a sample of detained adolescent offenders without the inclusion of a normal comparison group. As a result, the findings cannot be generalized to community youth with psychopathic traits. In addition, the sample was relatively homogeneous in levels of antisocial behavior and delinquency, as well as risk factors associated with delinquency. Specifically, youth in the sample showed a mean verbal ability (PPVT) one standard deviation below average, had a low mean neighborhood family income, and over half had been placed in special education classes or had received some type of mental health care. Future research might address these issues by employing longitudinal study designs

to determine the temporal ordering of contextual factors, emotional processing and psychopathic traits, and comparing the performance of community and incarcerated youth with psychopathic traits to controls on a variety of emotional processing tasks.

### *Summary and Implications*

Perhaps the most important implication of the current study is the possibility that there may be multiple pathways to the development of psychopathic traits characterized by distinct patterns of emotional reactivity and exposure to contextual risk factors. The current study confirms the existence of a group of youth high on psychopathy that also showed a reduced responsiveness to distressing stimuli. Further, this group showed a very high rate of aggression and delinquency and was characterized by exposure to high levels of community violence. This suggests that some children who develop psychopathic traits may do so as a result of community violence exposure and who, over time, become desensitized to others' distress. However, this study also provides evidence for the existence of a second pathway to psychopathic traits, whereby youth show both high levels of psychopathic traits and high rates of emotional reactivity. Importantly, the one contextual factor to differentiate this group was in reports of high levels of abuse. It is possible that these youths' hypervigilance to emotional cues functions as a survival mechanism in the face of unexpected threats of direct harm. Further, Ishikawa et al. (2001) suggest that high reactivity may serve as a physiological marker of a less severe outcome in these individuals, such that they are able to appropriately process cues in risky situations and reduce their tendency to act in an aggressive manner. This contention is supported in the current sample in that this group showed lower mean levels of aggression and delinquency compared with the low reactive psychopathic group, albeit still at higher levels than the two low

psychopathy groups. Overall, these findings strongly support the need for future studies focusing on the role of contextual factors for understanding the link between psychopathic traits and emotional processing.

The results of the current study also could have important implications for the development of effective prevention and intervention programs for antisocial youth with psychopathic traits. There is a growing consensus that effective interventions for antisocial youth should be individualized to address the youth's unique needs based on multiple interacting processes that interplay in the development of antisocial behavior (Frick, 1998). The results of the current study suggest that interventions targeting antisocial behavior in youth with callous-unemotional traits and high emotional reactivity might need to be very different from those provided to youth with callous-unemotional traits and low emotional reactivity. While interventions for highly emotionally reactive youth may focus primarily on coping with abuse and addressing cognitions related to encoding ambiguous stimuli as hostile, interventions for low reactive youth might focus on dealing with the effects of chronic exposure to community violence and targeting maladaptive cognitions related to the overestimation of positive outcomes of aggression over the negative outcomes. Prevention efforts can also target youth who show abnormal patterns of emotional reactivity early in development, and before the onset of severe antisocial behavior, to prevent their development in later childhood and adolescence. The development of effective programs is crucial given the millions of dollars that are spent by society each year on chronically antisocial youth.

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Appendix A

*Correlations among all study variables*

Variables	Age	Meds	Mental Health	PPVT	Income	Ethnicity	ICU	Total Agg.
<u>Demographics</u>								
Meds	-.32**							
Mental Health	-.02	.35**						
PPVT	.02	-.07	.10					
Income	-.02	.01	.07	.43***				
Ethnicity	-.05	-.14	-.09	-.58***	-.46***			
<u>Psychopathic Traits</u>								
ICU	.13	-.03	-.04	.08	.10	-.07		
<u>Aggression</u>								
Total	.03	-.15	.08	.14	.07	-.16	.39**	
Proactive	.10	-.11	-.07	.15	-.10	-.12	.28*	.84***
Reactive	.00	-.12	.06	.13	.14	-.16	.33**	.97***
<u>Delinquency</u>								
Total	.20	-.03	.04	.36**	.23*	-.36**	.36**	.57***

Note: Meds = Taking psychotropic medication; PPVT = Peabody Picture Vocabulary Test; ICU = Inventory of Callous-Unemotional Traits; Total Agg. = Total Aggression; Ethnicity was coded as 0 for Caucasian and 1 for African American; \*p < .05; \*\* p < .01; \*\*\*p < .001.

Variables	Age	Meds	Mental Health	PPVT	Income	Ethnicity	ICU	Total Agg.
<u>Delinquency</u>								
Violent	.04	.05	.06	.00	-.07	.04	.17	.50***
Nonviolent	.23*	-.03	.04	.42***	.31**	-.43***	.38***	.50***
Prior Arrests	-.16	.10	.39***	-.15	.00	-.03	-.13	.01
History of Violent Arrests	.21	.11	.23*	-.08	-.05	-.10	.06	-.02
<u>Emotional Facilitation</u>								
Distress Combined	.05	-.08	.05	.18	.15	-.06	.07	.07
Distress 500ms	.14	-.17	.01	.31**	.19	-.11	.07	.13
Distress 250ms	-.02	-.06	-.06	.00	.09	.01	.06	.11
Positive Combined	-.01	-.06	.12	.06	.04	-.01	-.07	.07
Positive 500ms	.11	.02	-.03	.27*	.03	-.16	.10	.07

Note: Meds = Taking psychotropic medication; PPVT = Peabody Picture Vocabulary Test; ICU = Inventory of Callous-Unemotional Traits; Total Agg. = Total Aggression; Ethnicity was coded as 0 for Caucasian and 1 for African American; \*p < .05; \*\* p < .01; \*\*\*p < .001.

Variables	Age	Meds	Mental Health	PPVT	Income	Ethnicity	ICU	Total Agg.
<u>Emotional Facilitation</u>								
Positive 250ms	-.15	-.05	.13	-.15	-.02	.07	-.10	.12
<u>Threatening Living Environment</u>								
ECV	.29*	-.31**	-.06	-.05	-.05	.03	.35**	.40***
CP	.05	-.04	.10	-.18	-.11	.20	-.09	.05
Abuse	-.04	.00	.31**	.19	-.11	-.03	.05	.26*
Neglect	-.21	.07	.14	-.01	.03	.07	-.40***	-.20

Note: Meds = Taking psychotropic medication; PPVT = Peabody Picture Vocabulary Test; ICU = Inventory of Callous-Unemotional Traits; Total Agg. = Total Aggression; ECV = Exposure to Community Violence; CP = Corporal Punishment; Ethnicity was coded as 0 for Caucasian and 1 for African American; \*p < .05; \*\* p < .01; \*\*\*p < .001.

Variables	Proactive Aggression	Reactive Aggression	Total Delinquency	Violent Delinquency	Nonviolent Delinquency	Prior Arrests	Violent Arrests	Fac. D Comb.
<u>Aggression</u>								
Reactive	.67***							
<u>Delinquency</u>								
Total	.49***	.54***						
Violent	.58***	.41***	.69***					
Nonviolent	.41***	.50***	.97***	.53***				
Prior Arrests	-.04	.03	-.04	.04	-.04			
History Violent Arrests	.02	-.04	.03	.01	.06	.48***		
<u>Emotional Facilitation</u>								
Distress Combined	.05	.07	-.03	-.12	-.01	.06	.05	
Distress 500ms	.10	.14	.07	-.07	.10	-.04	-.05	.78***
Distress 250ms	.09	.11	-.07	-.09	-.05	.17	.07	.59***

Note: Fac. D Comb. = Facilitation to Distress at the combined stimulus duration; \*\*\*p < .001.

Variables	Proactive Aggression	Reactive Aggression	Total Delinquency	Violent Delinquency	Nonviolent Delinquency	Prior Arrests	Violent Arrests	Fac. D Comb.
<u>Emotional Facilitation</u>								
Positive Combined	.02	.08	-.09	.00	-.15	.10	-.11	.34**
Positive 500ms	.04	.08	.02	-.07	.01	-.21	-.23*	.29**
Positive 250ms	.05	.13	-.17	.00	-.22*	-.32**	.07	.14
<u>Threatening Living Environment</u>								
ECV	.34**	.36**	.45***	.46***	.38**	-.03	-.05	-.19
CP	-.03	.09	-.04	.04	-.07	.09	.10	.17
Abuse	.28*	.22*	.26*	.20	.25*	.16	-.08	.16
Neglect	-.14	-.21	-.19	-.02	-.21	.28*	.15	-.05

Note: Fac. D Comb. = Facilitation to Distress at the combined stimulus duration; ECV = Exposure to Community Violence; CP = Corporal Punishment; \*p < .05; \*\* p < .01; \*\*\*p < .001.

Variables	Fac. D 500ms	Fac. D 250ms	Fac. P Comb.	Fac. P 500ms	Fac. P 250ms	ECV	CP	Abuse
<u>Emotional Facilitation</u>								
Distress 250ms	.59***							
Positive Combined	.38**	.05						
Positive 500ms	.46***	.02	.41***					
Positive 250ms	-.01	.21	.70***	-.23*				
<u>Threatening Living Environment</u>								
ECV	-.04	-.22*	.00	.01	-.04			
CP	.09	.25*	.27*	-.03	.32**	-.13		
Abuse	.09	.06	.09	.13	-.02	-.04	-.06	
Neglect	-.08	.06	-.05	-.10	.03	-.28*	.03	-.19
Note: Fac. D = Facilitation to Distress; Fac. P = Facilitation to Positive; Comb. = Combined stimulus duration; ECV = Exposure to Community Violence; CP = Corporal Punishment; *p < .05; ** p < .01; ***p < .001.								

Appendix B

*IRB Approval Form*

University Committee for the Protection  
of Human Subjects in Research  
University of New Orleans

Form Number: 04oct04-r

(please refer to this number in all future correspondence concerning this protocol)

Principal Investigator Kimonis, Munoz, Aucoin Title: Graduate Student

Faculty Supervisor: Paul Frick (if PI is a student)

Department: Psychology College: Science

Project Title: Emotional adjustment in adjudicated boys

Date Reviewed:

Dates of Proposed Project Period From 10/01/04 to 08/31/05

*\*approval is for one year from approval date only and may be renewed yearly.*

Note: Consent forms and related materials are to be kept by the PI for a period of three years following the completion of the study.

Approval Status

Date

Full Committee Approval

Expedited Approval

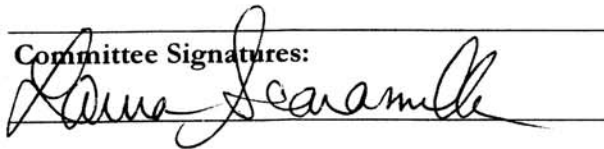
Continuation

Rejected

The protocol will be approved following receipt of satisfactory response(s) to the following question(s) within 15 days:

11-17-04

Committee Signatures:



Laura Scaramella, Ph.D. (Chair)

Pamela Jenkins, Ph.D.



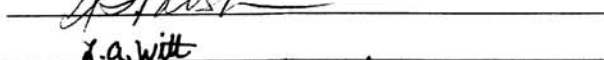
Anthony Kontos, Ph.D.



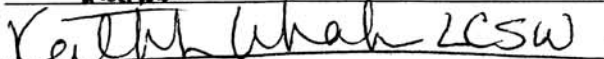
Richard B. Speaker, Ph.D.



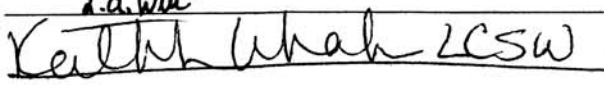
Gary Talarchek, Ph.D.



Kari Walsh



L. Allen Witt, Ph.D.



Kathleen Whalen, LCSW



## Vita

Eva Kimonis was born in Portsmouth, England and received her B.A. in May, 2000 from Brandeis University in Waltham, Massachusetts, with a double major in psychology and anthropology and with high honors in psychology. Following her undergraduate education she worked in Dr. Carolyn Zahn-Waxler's Section on Developmental Psychopathology at the National Institute of Mental Health in Bethesda, Maryland as a pre-doctoral researcher. She began the Applied Developmental Psychology program at the University of New Orleans in August, 2001 and earned her Masters Degree in August, 2003. She plans to complete a postdoctoral traineeship at the University of California, Irvine, in the Department of Psychology and Social Behavior. She also plans to continue investigating psychopathic traits across development, with special interest in emotional processing and contextual risk factors.