

PSYCHOPATHY IN YOUTH AND FACIAL AFFECT RECOGNITION:
A MULTI-MORPH INVESTIGATION

by

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ABSTRACT

In attempting to develop explanatory models for the psychopathic individuals, concern has been expressed regarding psychopathic individuals' ability to accurately recognize emotions in others. When examining the ability of psychopathic individuals to correctly identify facial displays of emotions, researchers have found a myriad of results, and thus, this relation between psychopathy and emotion recognition remains relatively unclear. A popular theoretical model, the Violence Inhibition Model, by Blair (1995) addresses the ability of psychopathic individuals to identify emotional displays and was examined in light of previous and current findings. The current study tested the relation between psychopathy and emotion affect using the Psychopath Checklist: Youth Version and the Multi-morph task for displaying gradation of emotions across a specific time frame. History of abuse was examined as a potential variable moderating the relationship. The findings from the current study backed the notion that psychopathic individuals have a deficit in processing fear, but this finding was only true for boys. Girls were found to have higher scores in social deviance characteristics and better recognition of fearful emotions. Other hypotheses regarding the speed of processing and the relative impact on scores of psychopathy, as well as abuse history only evidenced partial support. Gender discrepancies are discussed in light of the current findings.

DEDICATION

This thesis is dedicated to my parents, who have always supported my dreams.

LIST OF ABBREVIATIONS AND SYMBOLS

β	Beta: standardized regression coefficient
F	Fisher's F ratio: a ration of two variances
M	Mean: the sum of a set of items divided by the number of items within the set
N	Sample size of group
p	Probability: chance of occurrence under the null hypothesis of a value more extreme than the observed value
R^2	Squared multiple correlation indicating proportion of variance accounted for
r	Pearson product moment correlation: value of a correlation
SD	Standard Deviation: value of variation from the mean
t	Value of the t -test
$<$	Less than
$>$	Greater than
$=$	Equal to

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INTRODUCTION

Psychopathy is a personality disorder characterized by callousness, impulsivity, and superficial charm (Hare, 1991, 2003). Cleckley's (1955) clinical profile of the psychopathic personality served as a template from which the conceptualization of psychopathy has evolved. Cleckley's early work hinted that the personality construct could be compartmentalized into factors. Cleckley proposed 16 characteristics of psychopathy, including: superficial charm and good intelligence, absence of delusions and other signs of irrational thinking, absence of nervousness or psychoneurotic manifestations, unreliability, untruthfulness and insincerity, lack of remorse and shame, inadequately motivated, antisocial behavior, poor judgment and failure to learn by experience, pathologic egocentricity and incapacity for love, general poverty in major affective reactions, specific loss of insight, unresponsiveness in general interpersonal relations, fantastic and uninviting behavior with drink and sometimes without, suicide threats rarely carried out, sex life impersonal, trivial, and poorly integrated, and failure to follow any life plan.

Differing with Cleckley's definition, which colored psychopathy with personality traits, Robins (1966) and Cloninger (1978) focused on the behavioral aspects that define psychopathic individuals. Their shift to primarily behavioral items was based on a belief that personality was difficult to reliably assess and that behavioral items could capture the traits of the psychopathic individual. In her book, *Deviant Children Grown Up*, Robins (1966) determined that children who had conduct problems early in life were likely to have difficulties also in adulthood with some youth continuing with their antisocial lifestyles in adulthood. These behaviors used to mark

antisociality in Robins' research studies now reflect those found to define Antisocial Personality Disorder as delineated in the DSM-IV (American Psychiatric Association, 2000).

Hare (1980, 1991) proposed a model of psychopathy that combined Cleckley's (1955) conceptualization of psychopathy with that of Robin's model for sociopathy (Robins, 1966). Originally, Hare's model for psychopathy was found to be underpinned by two broad factors including an interpersonal/affective factor (Factor 1 or F1) and a social deviance factor (Factor 2 or F2) (Harpur, Hare, & Hakstian, 1989). More recent research has suggested that three and four factor models may be even more applicable (Hare, 2003). These factors reflect interpersonal (e.g., superficial charm), affective (e.g., lack of remorse), lifestyle (e.g., irresponsible) and antisocial (e.g., criminal versatility) features of the disorder (see Hare, 2003; Hare & Neumann, 2010).

Hare's Psychopathy Checklist Revised (PCL-R; Hare, 1991) is one of the first systematic measurement tools designed to tap the construct of psychopathy. The PCL-R is a semi-structured interview that also uses case history information to score criteria to identify psychopathy. The specific scoring criteria for the PCL-R involve paragraph descriptions of each trait and a 3-point scale (0, 1, 2) to rate each of 20 items (traits). The trichotomous scale is used to denote the extent to which a prototypical psychopathy item applies to a given individual. Once data has been collected via the interview and the file information, and the scoring completed, a structure of psychopathy can be examined. As mentioned, two broad factors, or four factors, can be derived from the 20 PCL-R items. Thus, clinicians and researchers alike can get a finer grained analysis of the types of characteristics that led to an individual's high score (e.g., primarily interpersonal and affective versus lifestyle and antisocial characteristics).

In the last two decades, the concept of psychopathy has been downwardly extended to youth and much research has amassed on the topic (see Salekin & Lynam, 2010). This research has attempted to establish the same nomological net for child and adolescent psychopathy that exists for adult psychopathy. This research has shown that youth scoring high on psychopathy scales demonstrate similar relations as do adult psychopathic individuals to models of general personality (Lynam et al., 2005), their dominant response style (Vitale et al., 2005), disinhibition (Loney, Frick, Clements, Ellis, & Kerlin, 2003), antisocial conduct, and general and violent recidivism (Leistico et al., 2008). While considerable progress has been made on the defining features, factor structure, and the nomological network for psychopathy, less is known regarding the etiology of the syndrome. I address this topic in some detail below focusing primarily on affect recognition deficits. Before I cover this topic, however, I first briefly discuss the normal development of affect recognition. This will help put in developmental context any potential deficits that may occur in this area.

Development and Affect Recognition

From birth, infants are learning to recognize faces and facial affect from their caregivers. It is true that, in preschool, children learn how to interact with classmates, while developing emotional understanding and negotiation in social situations (Morris, Hirshfeld-Becker, Henin, & Storch, 2004). During this period of development, children can accurately identify happy faces, and by age 10 children can accurately identify all emotions, with fear being the last emotion fully and correctly identified (Philipott & Feldman, 1990). This developmental research would suggest that in children over the age of 10 the examination of callous unemotional traits and emotion recognition should be a viable avenue of research. Given that this development is crucial for social and emotional health, researchers have investigated differences among children

who behave prosocially or antisocially. Denham and colleagues (2003) found that children who performed well on facial affect recognition tasks were more likely to behave prosocially. Thus, even in early childhood, deficits in identifying facial affect are associated with poorer outcomes.

Generally speaking, children who engage in early antisocial or delinquent behavior lack interpretations of intent, moral reasoning, social reasoning, social perspective-taking, affective perspective-taking, and formulation of future expectations (Burack et al., 2006; Dodge, 1993; Rieffe, Terwogt, & Stockman, 2000). These factors contribute to a lack of empathy and social insensitivity that are characteristic of psychopathic adolescents (Blair, Morris, Frith, & Perrett, 1999; Borke, 1971; Feshbach, 1983, 1987). What is key in all the factors mentioned above is the ability to recognize facial emotion. It is this ability that ties together interpretations of others' intent, perspective-taking, and so forth. Thus, the ability to identify affective cues in others may be central as to whether a person chooses to behave prosocially or antisocially and potentially may explain the development of psychopathic personality in youth. Below, I cover in some detail the Violence Inhibition Model theory of psychopathy, which focuses primarily on the recognition of fear.

Facial Affect Recognition and the Violence Inhibition Model (VIM) Theory of Psychopathy

Poorer life outcomes are, in general, associated with a deficit in facial affect recognition at an early age (Trentacosta & Fine, 2009). Because of the impact this deficit has on functioning in general, researchers have tested the deficits' potential link to psychopathy. One of the most frequently discussed theories of facial affect recognition in psychopathy is the Violence Inhibition Model (VIM; Blair, 1995). Blair (1995) set forth the VIM, a model for the development of morality. Blair states that recognition of fear is critical for youth to act in prosocial ways. Blair outlines a chain of events that leads to empathy in normal functioning

individuals. Specifically, nonverbal communication of distress, such as emotional display, in this case, fear, activates cognitive processes (recognition of fear and consequential empathy), which then activates withdrawal from attacking another person.

To elaborate on this theory, the VIM indicates that withdrawal typically occurs in normal functioning individuals because they can empathize with the plight of others. This only occurs, however, when individuals can accurately read others' facial expression. Therefore, when an individual demonstrates fear and/or submission, the attacker retreats and resists further aggression. According to Blair, however, there are times when the VIM is taken over by other executive functions that are in pursuit of a dominant goal. In such a case, an attacker may continue to attack even in the presence of distress cues of another. This occurs because, according to Blair (1995), psychopathic individuals do not recognize the fearful expression in others and the VIM is never fully activated. Although the etiology of this deficit is not known, it may be that through proper classical conditioning, even seeing or picturing distress cues elicits empathy in typical development. However, in the case of psychopathy (improper development), this classical conditioning never occurs, or fearful expressions are paired with some other stimuli (perhaps reward) which reinforces the development of pursuit of one's goals in the inability to detect fear or distress in others to the same extent to which normal individuals recognize these cues.

Put another way, the VIM is a prerequisite to the development of morality distinction, given that moral transgressions have served as stimuli to activate VIM. For individuals with psychopathy, lacking the VIM would not result in negative reinforcement, indicating that the distress cue would not serve as an aversive event and ending the presentation of a distress cue would not be reinforcing for the individual. This would account for the callous/unemotional type

characteristics, showing aggression or even violence at an early age. Needed also are other cognitive or environmental factors in addition to inactivation of the VIM to become a psychopath. For example, if asked why an act is 'bad', psychopathic individuals are more likely to refer to what they have been told categorizes an act as 'bad'. Psychopathic individuals are more likely to treat conventional situations like moral ones, and less likely to worry about a victim's welfare.

Thus, psychopathic individuals are able to know that a given act is wrong. However, to know this, they are likely recruiting resources from different parts of the brain (prefrontal cortex) to make these decisions rather than some combination of emotional (amygdala) and executive (prefrontal cortex) functioning that typically generates emotion guided decision making in normal individuals. Because of the potential this theory has to offer in terms of better understanding the etiology of psychopathy, a series of research studies have been conducted on the topic. Due to the emergence of studies in response to Blair's findings, these studies are discussed below in chronological order.

Support for Deficits in Facial Affect Recognition

As mentioned above, if psychopathic individuals lack activation of VIM, fearful or disgusting facial displays would not serve as distress cues, and based on this social information, psychopathic individuals would, consequently, not expect any negative reinforcement from acting in the manner that elicited the facial affect display. To support his theory, Blair and his colleagues conducted a series of studies.

Specifically, Blair (1995), using a sample of 20 participants in their mid-thirties, examined psychopathic individuals responses to human transgression. Blair found that adult psychopathic individuals did not make a distinction between moral and conventional

transgressions. Blair (1995) found that psychopathic individuals tended to treat conventional transgressions like moral transgressions. This finding may be due to psychopathic individuals, who may have had contact with the law, learning to give the appropriate answer to moral questions to prove they are rehabilitated. Psychopathic individuals were also less likely to justify their responses based on the victim's welfare. Blair's theory regarding the VIM and addressing moral or conventional transgressions applies directly to facial affect recognition in psychopathy.

Subsequently, Blair and Coles (2000) tested the VIM hypothesis using the Psychopathy Screening Device (PSD; Frick & Hare, 2001) and unmorphed standardized pictures with 55 primarily Caucasian children having a mean age of 12.40 years. Ability to recognize sad and fearful expressions has been found to be inversely related to affective–interpersonal disturbance and impulsive/conduct problems. Specifically, in 37 children (mean age 11.70 years) with behavioral problems, the PSD has been used to examine performance on the Diagnostic Analysis of Nonverbal Accuracy (DANVA; Nowicki & Duke, 1994) between children with psychopathic tendencies and a comparison group (Stevens, Charman, & Blair, 2001). Selective impairments were found in recognizing sad and fearful facial expressions for psychopathic children.

To further replicate findings showing a deficit in fear recognition, Blair, Colledge, Murray, and Mitchell (2001) examined 51 children (mean age 12.89 years) with psychopathic tendencies and their sensitivity to facial affect recognition. Using a multi-morph task, a program which displays a neutral face then progressively morphs into an emotion, the researchers examined children from schools for boys with emotional and behavioral difficulties. Participants were divided into psychopathic and non-psychopathic groups, which was determined using the PSD. Children with psychopathic tendencies were more likely to mistakenly identify those facial affect displays of fear as a different emotion (something other than fear). The psychopathic

tendency group was also less sensitive to identifying sad affect when compared to children without psychopathic tendencies.

Using 67 adult inmates (45% African American, with a mean age of 27 years) as their participants, Kosson and colleagues (2002) compared psychopathic and nonpsychopathic groups based on PCL-R scores. Using Pictures of Facial Affect (POFA; Ekman & Friesen, 1976), psychopathic individuals demonstrated a facial affect recognition deficit for disgust, even when collapsing across utilization of left and right hands. However, Kosson and colleagues (2002) did not replicate findings of deficits in sadness and fear recognition. Psychopathic individuals performed equally compared to nonpsychopathic individuals. The researchers' propose that the lack of fear deficit was still accompanied by psychopaths' autonomic hyporeactivity, indicating that psychopaths may possess a failure to trigger appropriate autonomic activity in response to fear stimuli rather than a lack of recognition. When responding with their right hand, psychopathic individuals were found to be relatively better at identifying angry faces than nonpsychopathic individuals. Other studies using the PCL-R to compare groups (34 participants with a mean age of 33.50) have found deficits in all emotion recognition when using the PENN Facial Discrimination Test (PENN; Habel, Kuhn, Salloum, Devos, & Schneider, 2002).

Conducting another study, Blair, Mitchell, Peschardt, Colledge, Leonard, Shine, Murray, and Perrett (2004) examined psychopathic ability to recognize facial emotion in 38 primarily Caucasian adults with a mean age of 32.11 years. Blair created two groups based on their PCL-R scores. Specifically, participants were grouped as psychopathic individuals if their PCL-R scores were greater than 30 and as non-psychopathic if their PCL-R scores were below 20. Participants were shown a series of faces that were first displayed as neutral and then morphed into one of six different emotional expressions and asked to identify what emotion was displayed. Participants'

performance was scored based on how many stages it took before accurate expression recognition was made. Blair and colleagues (2004) found a general insensitivity to recognizing facial displays of emotion for psychopathic individuals. There was only one significant group difference, which was recognition for the fearful expressions. Psychopathic participants were more insensitive to recognizing fearful expressions than the comparison group participants, and psychopathic individuals also made more errors than comparison individuals when attempting to identify fearful expressions. Even when the display was shown at 100% intensity, participants in the psychopathic group made more errors than the non-psychopathic group.

Using a screening version of the PCL-R, Dolan and Fullman (2006) examined 98 psychopathic offenders with a mean age of 35.18 years who demonstrated deficits particularly in recognizing sad displays of affect. Deficits in recognizing happy and surprised faces also were found within the same sample (Dolan & Fullam, 2006). Additional studies using screening devices and morphing faces with adult inmates found overall facial affect recognition deficits, with greatest deficits occurring for sad and happy faces (Aniskiewicz, 1979; Blair, Jones, Clark, & Smith, 1997; Blair, Mitchell, Richell, Kelly, Leonard, Newman, & Scott, 2002; Hastings, Tangney, & Stuewig, 2008).

Munro, Dywan, Harris, McKee, Unsal, and Segalowitz (2007) used a face flanker task to examine the ability of psychopathic individuals to recognize five basic emotions. Specifically, with 30 adult offenders with a mean age of 42.25 years, the authors tested accuracy in discrimination between angry and fearful expressions using a flanker task. Participants were given the PCL-R and grouped based on low (below 25) or high (above 25) scores. The authors found that individuals high in psychopathy demonstrated more difficulty differentiating angry

from fearful facial expressions, with the greatest difficulty identifying fearful facial expressions (Munro, Dywan, Harris, McKee, Unsal, & Segalowitz, 2007).

In a private school setting, 100 primarily Caucasian adolescent males with a mean age of 12.40 years were grouped based on scores from the Antisocial Process Screening Device (APSD; Frick & Hare, 2001), formerly named the PSD, and then shown stagnant faces (Dadds, Masry, Wimalaweera, & Gustella, 2008). Adolescents high in psychopathy were associated with poorer fear recognition when compared to low psychopathy peers.

Another sample of 43 adult male inmates (mean age 31.58) designated as psychopathic by the PCL-R had deficits in recognizing sad and disgusted un-morphed faces (Hansen, Johnsen, Hart, Waage, & Thayer, 2008). Interestingly, F1 was associated with greater impairments in recognizing disgust. Other studies have shown that psychopathic individuals may experience deficits in recognition of emotional facial expressions beyond recognition of fear, sadness, and anger. Specifically, Eisenbarth, Alpers, Serge, Calogero, and Angrilli (2008) tested the differences in categorizing and evaluating emotional expressions for 44 women (mean age 41.73 years) who were classified as psychopathic forensic patients, nonpsychopathic forensic patients, and healthy control participants. Using Karolinska Directed Emotional Faces set (KDEF, Lundqvist, Flykt, & Ohman, 1998), psychopathic participants recognized all facial emotions less well than other participants with the exception of happy and fearful faces. All participants performed equally on identifying happy faces, and all participants performed poorly on recognizing fearful faces.

With shorter presentations of sad faces, the psychopathic group performed worse than the nonpsychopathic group only when categorizing sad faces. Psychopathic participants also demonstrated a response bias reporting briefly presented sad, angry, surprised, and neutral

expressions as happy expressions. The response bias supports the hypothesis that psychopathic individuals incorrectly identify most emotions in other individuals, which may contribute to antisocial behavior. Additionally, these results could contribute to Blair's VIM hypothesis. If these individuals were misclassifying emotions, especially sad and angry emotions as happy, there would be no inhibition of aggressive behavior. Furthermore, Eisenbarth and colleagues (2008) found a difference, although non-significant, between psychopathic participants and other participants on subjective ratings of how arousing the faces were when displayed. Psychopathic participants reported nearly all faces as less arousing than other participants, especially for angry, disgusted, neutral, or surprise faces.

These results also show that the differences in facial affect recognition do not just exist between forensic and community populations; there are differences between psychopathic and nonpsychopathic individuals within the same forensic setting. In addition to literature linking facial affect recognition and antisocial behavior of psychopathic individuals, Eisenbarth and colleagues (2008) support the theory that social interactions are altered by these deficits. This study also suggests that psychopathic women may be similar to psychopathic men in facial affect recognition deficits.

With these findings replicated in samples of psychopathic adults and children, Blair and colleagues (2004) suggest that facial affect recognition impairment for individuals with psychopathy exists from childhood to middle age. Deficits have been found for all emotions, with the majority of studies emphasizing deficits in fear and sadness. Thus, there are not clear indications of the exact deficits in individuals rating high in psychopathy, although the bulk of the results lean toward fear and sadness recognition deficits.

Regarding facial emotion recognition deficits, psychopathic individuals would not be able to perceive expressions as a sign of impending punishment. If these deficits exist in childhood, psychopathic individuals may have increased chances of engaging in antisocial behavior when interacting with other individuals. The lack of ability to recognize these signals appears to be a contributing factor to behaviors that may result in contact with the law. Identifying these deficits and exploring methods of reducing psychopathic individuals' impairment in facial affect recognition could reduce the amount of illegal behavior that these individuals may commit.

For many of the tasks used, particularly those not using morphing faces, the displays may have been too easy to classify, given that psychopathic groups and non-psychopathic groups performed similarly on many emotions (Kosson, Suchy, Mayer, & Libby, 2002). Kosson and colleagues (2002) also found when psychopathic participants were required to use their left hand (i.e., promoting right hemisphere utilization), they performed worse in recognizing all facial affect when compared to non-psychopathic participants. The argument that the task may modify the responses is key here, indicating that if the faces were morphed, the differences may reflect reality better and may result in differing responses. Table 1 provides information on each of the studies including number of participants, task utilized, and the outcome regarding accuracy so that the studies can be viewed alongside one another (see Table 1).

Table 1

Facial Affect Recognition and Psychopathy, Antisocial Behavior, & Conduct Disorder

Study	N	Age	Race	Measure	Groups	Task	Deficit	Statistics
Blair et al. (2004)	38	32.11	95% Caucasian; 5% African American	PCL-R	Yes	Emotional Expression Multi-morph Task	Fear	$F(1,36) = 11.96$
Blair et al. (2001)	51	12.89		PSD	Yes	Emotional Expression Multi-morph Task	Fear, Sad	Fear: $F(1, 47) = 5.23$ Sad: $F(1, 44) = 11.80$
Blair & Coles (2000)	55	12.40	59% Caucasian; 20% African American; 21% Asian	PSD	Yes	POFA	Fear, Sad	$R = .59, F(1,54) = 3.565$
Carr & Lutjemeier (2005)	29	15.30	28% Caucasian; 62% African American/Hispanic	IECA; SRDQ	Yes	DANVA	None	Multiple <i>ns</i> Correlations
Dadds et al. (2008)	100	12.40	Largely White European and Asian	APSD; SRDQ	Yes	UNSW Facial Emotion Task	Fear	$r = .50$
Del Gaizo & Falkenbach (2008)	175	19.74	37.8% Hispanic; 25.6% Caucasian; 23.3% African American; 13.3% Other	PPI	No	DANVA-2	None	$r = -.10$
Dolan & Fullam (2006)	98	35.18		ASPD	Yes	AFFECT	Sad	$F(1,47) = 5.64$
Eisenbarth et al. (2008)	44	41.73		PCL-R	Yes	KDEF	All	$F(6, 2546) = 51.22$
Glass & Newman (2006)	111	32.30	100% Caucasian	PCL-R	Yes	MBFSS	None	$n_p^2 = .007, ns$
Habel et al. (2002)	34	33.50		PCL-R	Yes	PFD	All	$t(17.3) = 2.60$
Hansen et al. (2008)	43	31.58	100% Caucasian	PCL-R	No	POFA	Disgust, Neutral	Correlations by Facet
Hastings et al. (2008)	145	30.94	48% African American; 32.4% Caucasian; 19.6% Other	PCL: SV	No	Hess & Blairy Pictures	All	$r = -.14$
Kosson et al. (2002)	67	27.00	45% African American	PCL-R	Yes	POFA	Disgust	$d = .61$
McCown et al. (1986)	40	14.89	50% African American	Incarceration	Yes	POFA	Sadness, Surprise, Disgust	$F(6, 73) = 2.88$
McCown et al. (1988)	84	14.52	100% Caucasian	Incarceration	Yes	POFA	None	$t(107.80) = -.87,$ $p < .40$
Munro et al. (2007)	30	45.25		PCL-R	Yes	Gur et al. Pictures	Fear	$n_p^2 = .20$
Pajer et al. (2010)	65	17.80	65% Caucasian; 35% African American	DISC:IV	Yes	POFA	None	$d = .04$
Pham & Philippot (2010)	68	34.70		PCL-R	Yes	Hess & Blairy Pictures	None	Not Reported
Stevens et al. (2001)	37	11.70		PSD	Yes	DANVA	Fear, Sad	$F(1,16) = 6.90$
Walker (1981)	60	11.78		Diagnosis	Yes	Single Photos	None	Not Reported
Wilson et al. (2008)	44	19.25	91% Caucasian; 5% African-Canadian; 4% Other	PPI	Yes	POFA	Better than controls	$n_p^2 = .16$

Note. *N*: sample size; PCL-R: Psychopathy Checklist Revised; PSD: Psychopathy Screening Device; APSD: Anitsocial Process Screening Device; PPI: Psychopathic Personality Inventory; IECA: Index of Empathy for Children and Adolescents; SRDQ: Self-Reported Delinquency Questionnaire; DISC-IV: Diagnostic Interview Schedule for Children Version IV; DANVA: Diagnostic Analysis of Nonverbal Accuracy; POFA: Picture of Facial Affect; PFD: PENN Facial Discrimination Test; AFFECT: Animated Full Facial comprehension Test; MBFSS: MacBrain Facial Stimulation Set; KDEF: Karolinska Directed Emotional Faces; *d*: Cohen's effect estimate; n^2 : eta squared; n_p^2 : partial eta squared.

Lack of Support for Deficits in Facial Affect Recognition

Although considerable support has been garnered for Blair's theory and other theories that would posit that psychopathic individuals have difficulty recognizing fear, other studies have not found this relation to be robust. For instance, some research supports this lack of facial affect deficit in children. Youth offenders have been found to be better at identifying anger and fear in some studies. For example, using a sample of 29 youth with a mean age of 15.30 years, Carr and Lutjemeier (2005) found no such deficits in fear recognition.

After reviewing the literature, Glass and Newman (2006) conducted an experiment to replicate studies showing specific deficits in sad and fearful affect recognition for 111 Caucasian adult psychopathic individuals with a mean age of 32.30 years. Additionally, the researchers wanted to examine the effect of attentional focus on discerning what facial affect was being displayed. To accomplish this, prisoners from a secure facility were assessed for psychopathy using the PCL-R, and they were divided into a psychopathic or non-psychopathic group. Using the MacBrain Face Stimulus set, Glass and Newman (2006) expected to find differences in performance between the psychopathic and non-psychopathic group, they found that both groups performed equally as well in identifying facial affect. In light of these findings, the researchers hypothesized that the nature of their task might have affected the outcome. One criticism is that, had they used a morphing task, they might have found different skills allowing for a more sensitive measure of facial affect recognition.

Other studies have suggested why there are unequivocal findings in this area. Using a college population (mean age 19.74 years) of 175 primarily Hispanic individuals and the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), Del Gaizo and Falkenbach (2008) investigated psychopathic-like traits and facial affect recognition deficits,

measured by the Diagnostic Analysis of Nonverbal Accuracy-Form 2 (DANVA2; Nowicki & Carton, 1993). Psychopathy can be divided into two factors or subtypes, primary and secondary. Primary psychopathy tends to be negatively related to negative emotionality, while secondary psychopathy tends to be positively associated with negative emotionality. However, other research found no relationship between negative emotionality and psychopathy. Del Gaizo and Falkenbach (2008) examined positive emotionality in addition to negative emotionality.

Psychopathic traits were uniquely related to emotional processing. Primary psychopathic traits were related to less negative emotionality, and secondary psychopathic traits were related to more negative emotionality. In line with predictions and research, primary psychopathic traits were related to fewer errors in recognizing fear. Primary psychopaths, given their manipulative nature, would need to recognize fear in order to protect themselves with their lifestyle. To perceive fear on another's face allows primary psychopathic individuals to decide whether they are charming to another individual or when they have been perceived as conning. Using manipulation and charm, they can then adjust their behavior to accomplish their goals more successfully.

The secondary psychopathic traits were not linked to deficits in identifying emotion. The secondary psychopathic individual may be associated with not being able to feel emotions, but they may be able to still identify what emotions are expressed. With decreased attention and interest in others, coupled with the inability to feel emotions, secondary psychopathic individuals should be able to identify how others are feeling but may lack any concern about their feelings. These differences, especially when looking at the type of affect the subtypes experience, may be helpful in determining the extent to which psychopathic individuals evidence this particular fear deficit.

One study found that, in a sample of 44 non-forensic, primarily Caucasian individuals (mean age 19.25 years), high in psychopathy were near completely accurate in identifying sad facial affect (Wilson, Demetriooff, & Porter, 2008). Additionally, psychopathic individuals may be better at identifying emotions in others, which contributes to a predatory nature. While explaining the aggressive nature of psychopathy, these findings contradict Blair's (1995) VIM hypothesis.

In another study, sixty-eight criminal psychopaths and non-criminal psychopaths (mean age 34.7 years), grouped by PCL-R scores, were compared for identifying varying intensities of face emotion (Pham & Philipott, 2010). In this sample, there were no differences in accuracy for all emotions. Thus, psychopathic adults may be as capable at identifying emotions others express as non-psychopathic adults, which opposes Blair's (1995) VIM theory. With 64 primarily Caucasian adolescent girls (mean age 17.80 years) diagnosed with conduct disorder, no facial affect recognition deficits were found when using the POFA (Pajer, Leininger, & Gardner, 2010). Relatively few studies have found the lack of deficit in youth.

As described for studies supporting deficits in psychopathic individuals, the type of task used may affect results. Some sets of faces may require participants, both psychopathic and non-psychopathic, to make quick judgments, which may have forced participants to make a guess without time to process facial affect (Glass & Newman, 2006). Thus, examining the type of task used to measure facial affect recognition needs to be considered when interpreting the results of other studies within the field. Additionally, some stimuli used in several studies (those finding deficits as well as those finding no deficits) are not the most frequently used stimuli in facial affect discrimination tasks. Regardless of how the faces are presented, most studies use POFA (Ekman & Friesen, 1976). Using POFA with a morphing program may provide consistency in

the literature (i.e., faces being displayed) and more sensitive measurement (i.e., morphing displays) of facial affect recognition. Additionally, findings indicate that there are differences in ability to process emotional displays depending on the subtype of psychopathy, which has not been examined in many of the studies of facial affect deficits in psychopathy (Del Gaizo & Falkenbach, 2008).

While discrepancies are not always easy to sort through in research studies, it can be helpful to systematically look at potential factors that may moderate the relation between two variables. One potential variable that may be linked to recognition of facial expression of emotion may be whether or not someone was previously abused. It is possible that past abuse could greatly harm one's ability to appropriately empathize with others. I discuss abuse history briefly below.

Abuse History

Although not frequently studied, the history of psychopathic individuals may also contribute to deficits in facial affect recognition. Graham, Kimonis, Wasserman, and Kline (2011) examined the effects of child maltreatment on psychopathy in an adult sex offender population. Abuse history was associated with higher PCL-R scores for the participants. Sexual abuse was associated with higher scores in facets tapping grandiose-manipulative interpersonal style, impulsive-irresponsible lifestyle, and antisocial behavior. Emotional detachment traits were associated with childhood neglect, indicating a lack of empathy after experiencing this childhood trauma. Having emotional detachment may prove adaptive for these individuals. With detached emotional traits, these individuals would likely lack functionality in their VIM. Thus, childhood maltreatment may increase deficits in facial affect recognition. Poythress, Skeem, and Lilienfeld (2006) did not find a difference regarding abuse when examining the effects of

dissociation. However, the researchers suggest that examining the differences between primary and secondary psychopaths with abuse histories on emotionality may provide a better understanding of how abuse affects emotions and emotional processing of psychopaths.

Despite the significant progress that has been made on the relation between psychopathy and facial affect recognition, much research is left to be done. Contradictory results are found throughout the literature, as mentioned above. This is because only a few studies have examined children, virtually no studies have examined adolescents, and the bulk of studies that have been conducted on this topic have used self-report inventories for psychopathy - a method for assessing psychopathy that Hare noted as problematic in the 1980s (Hare, 1980). Moreover, different theories of psychopathy have posited that psychopathic individuals might be even better at facial recognition than non-psychopathic individuals (Wilson, Demetriooff, & Porter, 2008), and some findings have backed this theoretical model as well suggesting the need for further research on this topic. Additionally, consideration of the time lapse between guessing and correctly guessing has been minimally discussed in the literature. The amount of time applied to decision making in facial affect recognition may extend the understanding of deficits for psychopathic individuals compared to non-psychopathic individuals.

Furthermore, a limited number of studies have examined the impact of type of psychopathy on facial affect recognition deficits. Childhood abuse, in general (emotional, physical, sexual) should also be investigated regarding facial affect recognition. Examining these factors may allow for a better understanding of group differences, providing some clarification of the contradictory results found in the literature.

The Current Investigation

The current study sought to examine the relation between psychopathy and facial affect recognition with greater precision. The study used secondary data in which a clinical structured interview for assessing psychopathy and a morphing facial affect program, namely Multi-morph, were administered to examine facial affect recognition. Multi-morph allows for the documentation of correct responses as well as the amount of time taken to identify an emotion. Based on past research, it was hypothesized that psychopathic adolescents would demonstrate less ability in correctly identifying fearful emotions than non-psychopathic adolescents. Additionally, psychopathic adolescents were expected to take more time to make a correct guess but less time to make their first guess on all emotions. Primary psychopathic adolescents (F1 psychopathic individuals) were expected to recognize fear better than secondary psychopathic individuals (F2 psychopathic individuals) but still with less accuracy than non-psychopathic adolescents. The impact of abuse was expected to moderate the increase in facial affect recognition deficits for secondary psychopaths.

METHODOLOGY

Participants

The data for the current study was collected as a part of a larger investigation of conduct disorder youth in a juvenile detention center. Participants were 146 youth (95 males, 49 females) between the ages of 11 and 19 years ($M = 15.22$, $SD = 1.59$) who were placed in a regional detention facility in Tuscaloosa, Alabama. The racial composition of the sample was 55% African American and 45% Caucasian. Representative crimes included violation of probation, theft, disorderly conduct, and assault. It should be noted that the detention center used in this study houses a large number of juvenile delinquents including severe and repeat offenders.

The subset of participants ($n = 49$; 67.3% male, 32.7% female) used in the current study had completed an additional task recognizing facial affect. Only data from participants completing the additional task were used in the present study. Participants ranged in age from 11 to 19 years, with a mean age of 15.16 years ($SD = 1.82$). Participants were 63.3% African American and 36.7% Caucasian. Their crimes ranged from theft to more serious crimes such as assault and burglary.

Table 2

Overall Sample Characteristics

Characteristics	N (%)	Range	<i>M</i>	<i>SD</i>	Skew	Kurtosis
Ethnicity						
African American	31 (63.30)					
Caucasian	18 (36.70)					
Gender						
Female	16 (32.70)					
Male	33 (67.30)					
Age		11-19	15.16	1.82	.07	-.37
PCL-R: YV		5-32	16.86	6.85	.37	-.64
F1		0-15	6.61	3.96	.40	-.30
F2		4-18	10.16	3.82	.35	-.81
Abuse	17 (34.70)					
Physical	2 (4.10)					
Sexual	2 (4.10)					
Emotional	4 (8.20)					
Combination	9 (18.40)					

Procedure

All procedures for the larger study were approved by the Internal Review Board at the University of Alabama, Tuscaloosa, prior to the initiation of the study. Both paternal consent and child assent were obtained before primary data collection began. Doctoral clinical psychology students and advanced undergraduate researchers were trained and were responsible for facilitating progress of this study with the principle investigator. Research assistants completed the Human Subjects Training. Assistants also underwent training prior to the initiation of data collection. Training entailed tutorials in professionalism (laboratory and at research sites), administering the protocol, and general mental health issues related to detained youth.

Researchers were provided with information and guidelines for monitoring participants throughout the short protocol and for identifying any signs of distress or discomfort in participants. No problems were noted during the course of the study.

Our trained research assistants approached youth to determine if they had interest in the study and to obtain consent. Participants were advised of the risks and benefits of participating in the study. The target for the current study was to obtain approximately 50 participants for the study. With a large effect and a two-tailed test of significance, the power was calculated to be .66 for detecting an effect. The detention facility was chosen for the current study because it housed only the most severe youthful offenders. This group was also thought to include those youth whom were most likely to exhibit more serious conduct problems as well as to possess psychopathic characteristics.

Youth were initially informed that the study was to examine their personality and emotional functioning. All sessions were conducted by a team of researchers, including at least two of four trained research assistants. Sessions were held in a small office in the detention center. This allowed for a quiet space to complete the study and at least one research assistant was able to help a participant if required. The test battery was administered to the youth, which included the Antisocial Process Screening Device, Psychopathy Checklist: Youth Version, BarOn Emotional Quotient Inventory-Youth Version, as well as several other self-report psychological measures, and Multi-morph.

Following the completion of the initial test battery, participants completed Multi-morph. Participants were asked to view a series of faces on a laptop computer. They were informed that six emotions (happiness, surprise, fear, sadness, disgust, anger) would serve as selections at the bottom of the screen. Participants were instructed to click the emotion they felt was displayed,

and they were informed that they could change their answer at any time. At the end of the morphing stages occurring at the 40th intensity, participants were asked to confirm the emotion by making a final selection. The task required roughly 15 to 20 minutes to complete. Participants were not instructed to use a particular hand, accounting for lateralization bias.

All youth received payment (\$2) for their participation. The rate of payment for the current study was chosen by the IRB as to not unduly affect participants' free choice to participate in the study. After the completion of the study, we debriefed all participants. In debriefing, we informed participants that we were studying personality and emotion and the accuracy at which they could detect facial emotion. We informed adolescents that we would eventually have research reports that were based on the group data and that those research reports would be available to them upon request.

One new aspect to the data collection for this study involved examining the youths PCL: YV interview files to determine if they had experienced any type of abuse (physical, emotional, sexual). Because the interview is comprehensive and includes a large number of questions on how youth were reared, it was relatively straightforward to examine the files for abuse history. One question in particular was examined before the entire interview was perused for reporting of abuse. The one question asked specifically if youth had experienced physical, sexual or emotional abuse. Two raters (the author and an undergraduate assistant) rated whether youth were physically, sexually, or emotionally abused. An aggregate score of abuse was created to represent a total abuse score.

Measures

Demographic information. Participants provided demographic data during an interview format. Participants provided information regarding gender, age, ethnicity, and years of

education. Youth for the proposed study had in common the following four factors: they had come into contact with the legal system, they were detained at a detention center in the southeastern United States, met criteria for CD and typically had at least 2 of 6 features of psychopathy from the interpersonal-callousness factor (Frick et al., 1994; Frick & Moffitt, 2010).

Psychopathy. The Hare Psychopathy Checklist: Youth Version (PCL: YV) is a 20-item rating scale used to assess psychopathic traits in adolescent male and female offenders. This measure was adapted from the Hare Psychopathy Checklist-Revised (PCL-R; Hare, 1991, 2003) in 1996 (draft version). The PCL: YV was later published in 2003 by Multihealth systems and uses an expert-rater format with a semi-structured interview. Factor analyses of the PCL: YV in previous research has shown that the broad two factor and four facet models of psychopathy are applicable and fit the data well (see Forth et al., 2003). As mentioned, F1 is an interpersonal and affective factor and F2 is a social deviance factor. The four factor model is represented by the interpersonal factor which includes impression management, grandiose self-worth, pathological lying, and manipulation for personal gain. The affective factor includes items tapping lack of remorse, shallow affect, callousness or lack of empathy, and failure to accept responsibility. The irresponsible factor includes items reflecting stimulation seeking, impulsivity, irresponsibility, and lack of goals. The final factor is the antisocial factor, which includes poor anger control, early behavioral problems, and serious criminal behavior.

Facial Affect Recognition. Participants completed the Multi-morph task to demonstrate ability to identify facial affect. The Multi-morph task uses the empirically validated Pictures of Facial Affect from Ekman and Friesen (1976). The stimuli utilize six different basic emotional facial expression, including happiness, surprise, fear, sadness, disgust, and anger. The photographic pictures are morphed with 40 morphed stages per continuum. Each stimulus begins

at 0% emotional display, or neutral facial affect, and morphs to 100% expression. Each facial emotion was presented six times.

First guess accuracy was calculated by averaging the number of facial displays that received a correct identification on the participant's first emotion selection. Similarly, last guess accuracy was averaged for the final selection of emotion across the six displays of each emotion. Time to first guess was averaged across faces and indicates how many morphed stages passed before a guess was made. Time to first correct guess was averaged across faces and indicates how many morphed stages passed before the first correct guess was made.

Abuse. The measure of abuse, as mentioned above, was indexed via the PCL: YV interview files. Researchers examined the interview questions to determine if youth had experienced any type of abuse (physical, emotional, sexual). The interview included a large number of questions but one that specifically dealt with abuse, and participants were asked if they had a history of abuse. If the participant indicated they had this history, or any other question, they were coded as having been abused. Further, because youth were asked if the abuse was physical, sexual, or emotional, researchers were able to further specify the type of abuse.

Analytic Strategy

A secondary data analysis was performed in order to compare the facial affect recognition performance relative to level of psychopathy score. Correlation analyses and partial correlation analyses were used to identify the relationship between accuracy of emotion recognition and total psychopathy score, accuracy of emotion recognition and type of psychopathy (primary and secondary), and average time taken to make a first guess and psychopathy. Multiple regression analyses were utilized to determine whether psychopathy

scores predicted the accuracy scores on the emotion fear. Moderation analyses were used to examine abuse history as a moderator of facial affect recognition deficits.

RESULTS

Descriptive Statistics

There was a good amount of dispersion in the study variables. Scores on the PCL: YV ranged from 5 to 32 with a mean of 16.86. Male participants scored between 5 and 32 with a mean of 17.79 ($SD = 7.30$), while female participants scored between 8 and 30 with a mean of 14.94 ($SD = 5.51$) (see Table 3). With regard to abuse, overall, 34.7% of participants experienced abuse as a child. For males, 30.3 % experienced abuse (physical, sexual, emotional). Females had a higher percentage of abuse history (43.80%).

For the overall sample, the fear mean first guess accuracy was .46 ($SD = .30$), the mean last guess accuracy was .58 ($SD = .31$), the mean time for first guess was 29.67 ($SD = 7.53$), and the time to first correct guess was 34.09 ($SD = 6.47$) (see Table 4 for all Multi-morph data).

For males, the fear mean accuracy for first guess was .50 ($SD = .31$), the last guess accuracy mean was .62 ($SD = .31$), the time to first guess mean was 30.68 ($SD = 7.90$), and the time to first correct guess was 34.11 ($SD = 7.03$) (see Table 5 for male Multi-morph data). For females, the fear mean accuracy for first guess was .38 ($SD = .30$), the last guess accuracy mean was .52 ($SD = .30$), the time to first guess mean was 27.59 ($SD = 6.42$), and the time to first correct guess was 34.04 ($SD = 5.27$) (see Table 5 for female Multi-morph data).

Table 3

Sample Characteristics: Male and Female

Characteristics	N	Male					Skew	Kurtosis	Female				
		Range	M	SD	Skew	Kurtosis			N	Range	M	SD	Skew
Ethnicity													
African													
American	20							5					
Caucasian	13							11					
Age		12-19	15.55	1.77	.10	-.58			11-17	14.83	1.71	-.03	-.06
PCL-R: YV		5-32	17.79	7.30	.06	-.91			8-30	14.94	5.51	1.26	2.85
F1		0-15	6.88	4.27	.16	-.71			1-15	6.06	3.82	1.34	-.72
F2		5-18	10.81	3.97	.24	-1.08			4-15	8.81	3.17	.23	2.46
Abuse	10							7					
Physical	1							1					
Sexual	2							0					
Emotional	3							1					
Combination	4							5					

Table 4

Multi-morph Response Data: Overall Sample

	Fear	Happy	Sad	Angry	Disgust
FGA	.46 (.30)	.80 (.22)	.48 (.28)	.54 (.28)	.32 (.27)
LGA	.58 (.31)	.88 (.17)	.59 (.28)	.66 (.26)	.42 (.29)
TFG	29.67 (7.53)	25.13 (6.88)	29.17 (7.87)	29.22 (7.92)	28.47 (7.40)
TFCG	34.09 (6.47)	25.87 (6.29)	32.34 (6.58)	31.27 (5.66)	33.07 (6.83)

Note. Standard deviations are in parentheses. FGA: First guess accuracy; LGA: Last guess accuracy; TFG: Time to first guess; TFCG: Time to first correct guess.

Table 5

Multi-morph Accuracy and Time to Guess Data

	Female						Male					
	Fear	Happy	Sad	Angry	Disgust	Surprise	Fear	Happy	Sad	Angry	Disgust	Surprise
FGA	.38 (.30)	.85 (.17)	.46 (.30)	.59 (.28)	.37 (.30)	.54 (.33)	.50 (.31)	.77 (.24)	.48 (.27)	.52 (.29)	.30 (.25)	.46 (.29)
LGA	.52 (.30)	.89 (.15)	.59 (.29)	.68 (.23)	.52 (.31)	.67 (.32)	.62 (.31)	.88 (.18)	.59 (.28)	.64 (.28)	.37 (.27)	.59 (.30)
TFG	27.59 (6.42)	22.97 (6.21)	28.40 (7.30)	27.06 (7.28)	25.78 (6.61)	28.28 (7.52)	30.68 (7.90)	26.17 (7.03)	29.55 (8.23)	30.27 (8.11)	29.77 (7.50)	30.16 (7.80)
TFCG	34.04 (5.27)	22.37 (5.51)	31.99 (6.71)	29.46 (5.27)	31.46 (6.97)	32.64 (4.07)	34.11 (7.03)	27.57 (6.00)	35.52 (6.62)	32.20 (5.71)	33.93 (6.73)	34.03 (4.48)

Note. Standard deviations are in parentheses. FGA: First Guess Accuracy; LGA: Last Guess Accuracy; TFG: Time to First Guess; TFCG: Time to First Correct Guess.

Relations between Variables

Pearson product moment correlations showed no significant relations between first guess accuracy and psychopathy (total, F1, and F2) for all emotional displays. Pearson product moment correlations also showed no significant relations between last guess accuracy and psychopathy (total, F1, F2) across all emotions. Time to first guess and time to first correct guess were not correlated with psychopathy (total, F1, F2) across all emotions. Non-significant correlations were found when accounting for age and gender.

Total PCL: YV score was significantly and positively correlated with history of abuse, $r = .27, p < .05$. There was a trend toward a negative correlation between PCL: YV total score and gender, $r = -.20, p = .09$, indicating a higher PCL: YV score in males than females. There was also a trend toward a positive correlation between F1 and abuse, $r = .20, p = .08$. For F2, there was a significant negative correlation with gender, $r = -.25, p < .05$, indicating a higher F2 score in males than females. F2 was also significantly correlated with history of abuse, $r = .29, p < .05$.

When the data was analyzed for males only, there was a trend toward a negative correlation for total PCL: YV score and fearful last guess accuracy, $r = -.31, p = .08$. There was a significant negative correlation between F2 and fearful last guess accuracy, $r = -.34, p = .05$. For females only, there was a trend toward a positive correlation between F2 and fearful first guess accuracy, $r = .46, p = .08$. A significant positive correlation was found for F2 and fearful last guess accuracy, $r = .55, p = .03$. See Table 6 for correlations.

Although some of the findings for the current study only approached significance, this way of interpreting the findings is somewhat misleading, given the small sample size for the current study, which reduces the power to detect a significant effect. Another way to examine the current findings is to look at the magnitude of the effect. Empirical guidelines for interpreting the

magnitude of correlations are readily found for psychological research and there are guidelines available. Historically, correlation magnitudes have been interpreted using guidelines set forth by Cohen (1988). Cohen suggested that correlations of .10 are small, .30 are medium, and .50 are large. Correlations in psychological research tend to fall in the lower range by Cohen's standards, which have influenced some researchers to extend Cohen's benchmarks (see Hemphill, 2003). Analyzing meta-analyses covering psychological assessment and treatment, Hemphill (2003) found that a third of studies possessed correlations falling below .20, a third between .20 and .30, and the last third more than .30. This range of correlations prompted Hemphill (2003) to provide new guidelines to demonstrate robust magnitude findings.

Large effect sizes, as defined by Cohen (1988), represent approximately the 89th to 97th percentile of correlations found in the literature (Meyer et al, 2001; Lipsey & Wilson, 1993) which may be too stringent to determine when variables are highly correlated in psychological research. Thus, using Hemphill's (2003) guidelines, one can better account for the degree of the effect compared to other psychological and social science research. Using the Hemphill guidelines, several of the findings in the current study are considered medium to large in magnitude. Additionally, after surveying psychopathy and facial affect literature, the correlation coefficients in the current study are similar to, or larger than, correlation coefficients of other studies (see Dadds, Masry, Wimalaweera, & Gustella, 2008; Del Gaizo & Falkenbach, 2008; Hastings, Tangney, & Stuewig, 2008). Clearly, this paints a different picture as to the relation between psychopathy and facial affect recognition. Because of the findings presented by Hemphill (2003), his guidelines are used to interpret the effects for the current study.

Table 6

Pearson Correlations of Psychopathy and Facial Affect Recognition

	1	2	3	4	5	6	7	8	9
1. PCL Tot	-	.87**	.86**	.23 (.43)†	.13 (-.18)	-.05 (.09)	-.05 (-.13)	.07 (-.09)	.14 (-.03)
2. F1	.91**	-	.49†	-.05 (.22)	.08 (-.29)	-.14 (-.04)	-.03 (-.15)	.08 (-.17)	.26 (.05)
3. F2	.88**	.61**	-	.46† (.55)*	.15 (-.00)	.09 (.23)	-.07 (-.09)	.07 (-.06)	-.06 (-.12)
4. Fear	-.27 (-.31)†	-.19 (-.22)	-.29 (-.34)*	-	.35 (.34)	.58** (.62)*	.07 (.47)†	.48† (.45)†	.16 (.22)
5. Anger	-.02 (.20)	-.03 (.24)	-.02 (.10)	.45** (.11)	-	.74** (.64)**	.68** (.56)*	.52* (.55)*	.46† (.43)†
6. Disgust	-.15 (-.26)	-.10 (-.17)	-.17 (-.29)	.42* (.36)*	.46** (.37)*	-	.35 (.39)	.55* (.71)**	.01 (.41)
7. Sadness	-.06 (.10)	-.01 (.10)	-.14 (.05)	.23† (.15)	.54** (.48)**	.15 (.08)	-	.03 (.47)†	.32 (.56)*
8. Surprise	-.24 (-.16)	-.17 (-.08)	-.28 (-.22)	.42* (.01)	.42* (.33)†	.46** (.43)*	.40* (.43)*	-	.50* (.42)
9. Happy	-.19 (-.18)	-.22 (-.22)	-.12 (-.09)	.26 (.12)	.50** (.27)	.27 (.25)	.33† (.18)	.15 (.12)	-

Note. In parentheses are correlations for last guess accuracy. Above the diagonal line are correlations for female participants. Below the diagonal line are the correlations for male participants. PCL represents the total score on the PCL:YV. Factor 1 includes interpersonal/affective items. Factor 2 includes social deviance items.

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

Hierarchical Multiple Regression Analysis

Multiple regression analyses were conducted with the current data. Three models were run to examine psychopathy and the prediction of performance on the Multi-morph fear display. Abuse was examined as a moderator of the relationship.

The first model entered gender, PCL: YV total score, and abuse, and the interaction term of PCL: YV total score and abuse were entered on the second step. The model was not significant. The second model tested entered gender, F1, and abuse, and the interaction term of F1 and abuse was entered on the second step. The second model was not significant. The third model was also not significant, but there was a trend for significant explained variance by the interaction of F2 and history of abuse, $p = .09$. See Table 5 for regression analyses. The change in R^2 here is pretty large given what is typically found in psychological research.

Separate regression analyses were conducted for males and females following the same models mentioned above with the exception of entering gender into the model. For females, the first (total PCL: YV score) and the second (F1) model showed a significant amount of explained variance by history of abuse, $p = .04$ and $p = .02$, respectively. See Table 6 for regression analyses.

Table 7

Hierarchical Multiple Regression Analyses Predicting Fearful First Guess Accuracy with Total Psychopathy Score, Factor 1 Score, and Factor 2 Score: Overall Sample

Predictor	Measure of Psychopathy					
	Total Psychopathy		Factor 1		Factor 2	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.05		.06		.04	
Gender		-.22		-.21		-.21
Measure		-.06		-.00		-.11
Abuse		-.60		.34		.70
Step 2	.06		.04		.06†	
Measure						
X						
Abuse		-.74		-.46		-.84
Total R ²	.11		.10		.10	

Note. Psychopathy scores were measured using the Hare Psychopathy Checklist: Youth Version (PCL: YV). Factor 1 and Factor 2 were derived from the PCL: YV.

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

Table 8

Hierarchical Multiple Regression Analyses Predicting Fearful First Guess Accuracy with Total Psychopathy Score, Factor 1 Score, and Factor 2 Score: Female and Male

Predictor	Measure of Psychopathy					
	Total Psychopathy		Factor 1		Factor 2	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.20 (.14)		.22 (.12)		.29 (.14)	
Measure		.58 (-.12)		.37 (-.10)		.49 (-.10)
Abuse		1.63* (-.01)		1.31* (-.21)		.90 (.20)
Step 2	.17 (.01)		.18 (.00)		.03 (.02)	
Measure						
X						
Abuse		-1.52 (-.31)		-1.15 (-.10)		-.68 (-.53)
Total R ²	.37 (.14)		.40 (.12)		.33 (.16)	

Note. Analyses for males are in parentheses. Psychopathy scores were measured using the Hare Psychopathy Checklist: Youth Version (PCL: YV). Factor 1 and Factor 2 were derived from the PCL: YV.

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

DISCUSSION

The field of psychopathy has been divided regarding facial affect deficits, especially in youth. Many studies have found deficits in recognizing fear in individuals with psychopathy (Blair et al., 2004; Blair et al., 2001; Blair & Coles, 2000; Dadds et al., 2008; Eisenbarth et al., 2008; Habel et al., 2002; Hastings et al., 2008; Munro et al., 2007; Stevens et al., 2001), and others have found a deficit in recognizing sadness (Blair et al., 2001; Blair & Coles, 2000; Dolan & Fullam, 2006; Eisenbarth et al., 2008; Habel et al., 2002; Hansen et al., 2006; Hastings et al., 2008; McCown et al., 1986; Stevens et al., 2001). Another group of studies have found no difference between psychopathic and non-psychopathic individuals in identifying facial affect (Carr & Lutjemeier 2005; Del Gaizo & Falkenbach, 2008; Glass & Newman, 2006; McCown et al., 1988; Pajer et al., 2010; Pham & Philipott, 2010; Walker, 1981). Arguments for the discrepant findings have suggested that findings in this area may be highly dependent upon how both psychopathy and emotion are indexed. In addition, few studies have examined chief variables, such as abuse, that could well affect the ability of psychopathic individuals to recognize emotion. With greater precision in the assessment of psychopathy and emotion as well as the consideration of important moderators, like abuse, the relation between psychopathy and emotion recognition might well be further illuminated.

The current study sought to test the relation between psychopathy and emotion affect using a state of the art psychopathy scale, namely the PCL: YV, and the Multi-morph task for displaying gradation of emotions across a specific time frame. The study had four specific aims. First, it was hypothesized that high psychopathy scores would be linked with less

accurate identification of fearful expressions. Second, the current study hypothesized that psychopathic adolescents would take more time to make a correct guess but less time to make their first guess on all emotions. Third, it was hypothesized that primary psychopathic adolescents (F1 psychopathic individuals) were expected to recognize fear better than secondary psychopathic individuals (F2 psychopathic individuals) but with less accuracy than non-psychopathic adolescents. Fourth, the impact of abuse was expected to moderate the increase in facial affect recognition deficits for secondary psychopaths.

The findings for the current study were examined in two ways. Specifically, I looked at traditional significance testing and then examined the magnitude of the effect to determine the extent to which psychopathic individuals showed a deficit in their recognition of facial affect and in particular, fear. In general, the findings from the current study backed the notion that psychopathic individuals have a deficit in processing fearful faces, but this finding was only true for boys. Other hypotheses regarding the speed of processing and the relative impact scores on the factor of psychopathy, as well as abuse history only evidenced partial support. The range for significant correlations in previous studies is $\pm .10$ to $\pm .50$. The current study produced significant correlations ranging from .27 to .55. Additionally, the current study produced trending correlations ranging from .20 to .46. The magnitude of the current correlations is similar to those found in the literature. Each of the main hypotheses is discussed in detail below.

Psychopathy and Recognition of Fear

When examining the Pearson product moment correlations it was clear that although not significant, there was a large negative correlation between psychopathy and fear processing. This finding is in line with past research on this topic showing that psychopathic individuals including youth have a deficit that may not allow for the inhibition or halting of aggressive behavior

toward others because they simply do not recognize fear or distress in others. Interestingly, this finding did not hold for females. In fact, counterintuitively, the correlation was high and positive suggesting that psychopathic females had a heightened ability to detect fear in others. This finding aligns with Cleckley's early writing on the psychopathic individual suggesting that they have a heightened ability to notice when others are vulnerable. While I have focused on the magnitude of effect, the hypothesis was not fully confirmed across gender for the overall sample when using traditional significance testing. There were no significant correlations with overall psychopathy score and accuracy on any of the displayed emotions when using traditional significance testing (happy, angry, sad, fearful, disgust, and surprise).

Time to First Accurate Guess

A second hypothesis of the current study was that all participants with higher psychopathy scores would have higher times before making a correct guess with less time taken to make their first guess. This is consistent with the notion that psychopathic individuals are more impulsive but not necessarily accurate in their decision making. Despite the theoretical rationale for this hypothesis, it was not supported by the current study. Specifically, there was no relationship between psychopathy scores and amount of time taken to respond or correctly respond.

Psychopathy Factors (Subtypes) and Fear Recognition

Another primary hypothesis of the current study was to consider whether the type of psychopathy was related to fear processing. Differences in type of psychopathy, interpersonal/affective (F1) and social deviance (F2), were expected to influence the ability to recognize fearful expressions. Specifically, individuals with high scores on F1, which is often considered primary psychopathy, were expected to recognize fear better than individuals high in

F2. When looking at the participants grouped by gender, deficits in fear accuracy were identified. For males, a significant negative correlation between F2 and fearful last guess accuracy was found. This association indicates that male participants with lower scores on the social deviance factor (F2) have better last guess accuracy for fearful facial displays. Male participants with lower F2 scores were better at identifying the fearful face at the end of the display. However, female participants showed an inverse significant correlation. Female participants with higher social deviance factors (F2) were associated with greater last guess accuracy for fearful facial displays. Female participants with a low F2 score were worse at identifying the fearful face at the end of the display. There was a trend toward a positive association between F2 and fearful first guess accuracy for female participants. Combined with the associations with F2 on last guess accuracy for fear, there is consistency in associations with accurate fear identification from the first guess to the final guess in female participants. There are critical gender differences of last guess accuracy for fear based on F2 scores where males fit the VIM model for psychopathy. That is, the higher the psychopathy score the less well they perform in recognizing fear. Females, on the other hand, perform better when psychopathy scores are high which may align with Cleckley's notion of psychopathy, which alludes to taking advantage of others when they show a weakness. This would require being able to detect the fear or distress in others.

History of Abuse and Emotion Functioning

An important hypothesis of the current study was to examine whether psychopathy was linked to a deficit in fear processing and whether abuse moderated that relation. When examining Pearson product moment correlations it was found that there were rather large correlations between psychopathy and fear processing, but the direction of the relation differed across gender. As has been found in past research, individuals with higher social deviance scores were

associated with a history of abuse. Specifically, males with higher psychopathy scores in social deviance may have experienced more sexual abuse in childhood than those scoring lower. Thus, the research supporting less accuracy in fearful emotions may be supported by the finding, but sexual abuse history and type of psychopathy may need to be examined when making this statement.

Regression Analyses Examining the Moderating Role of Abuse

Total psychopathy score, F1, and F2 were not found to be predictive of accuracy identifying displays of fearful affect. Expectations were that higher psychopathy scores would predict lower accuracy in fear. However, a trend was found for F2 explaining the variance found in accuracy of fearful emotions. While the overall model did not reach significance, there was a significant amount of explained variance by abuse history in accuracy of identifying fearful emotion based on PCL: YV total scores and F1 scores.

Implications

Findings from the current study have salient implications for theories indicating deficits in facial affect recognition for individuals high in psychopathy. Although not expected, the current study indicates no clear deficit in facial affect recognition for all individuals (male and female) high in overall psychopathy score, which contradicts Blair's (1995) VIM theory as a paradigm that can explain all psychopathic individuals. However, when only males were considered, deficits in accuracy of fear recognition were found when emotion was at full intensity. Thus, Blair's (1995) VIM theory is supported in males, not females. Females, who performed better at fearful facial recognition and had high F2 scores, were more skilled at recognizing fearful facial displays, indicating that Cleckley's proposition of psychopaths' skill at identifying vulnerable individuals. Without this deficit, another mechanism may account for

psychopathic individuals' behavior in the presence of distress cues. Lack of empathy may still account for the inability to correctly distinguish moral and conventional transgressions, but fearful facial affect recognition does not appear to be a key factor. The current study's results are not unprecedented. Book and colleagues (2007) purport that psychopathic individuals may have callous empathy, where they lack feeling for others but understand the mental state of others. Psychopathic adolescents may be able to process the distress cue of a negative facial emotion, but the lack of empathy may allow them to continue acting antisocially.

Breaking psychopathy down into primary and secondary psychopathy subtypes showed gender differences in facial affect deficits. Higher secondary psychopathy scores were predicted to be associated with worse identification of fearful facial displays, which was only found in male participants. Female participants were more accurate if their scores were higher on F2. Secondary psychopathy characteristics may be associated with lack of emotional feeling rather than lack of perceiving emotion (Book, 2005; Del Gaizo & Falkenbach, 2008; Richell et al., 2005). Thus, the specific affect recognition may not be the primary factor in commencing with antisocial behavior. Conversely, for many psychopathic individuals who have already encountered the law during their antisocial lifestyle, the ability to recognize these facial affects could prove advantageous, leading to better identification for these individuals. If individuals scoring high on psychopathy have learned to process these facial displays, they may appear normative in addressing facial distress cues, which may be particularly true for female participants rating high on F2 (Book, 2005; Del Gaizo & Falkenbach, 2008; Wilson, Demetriooff, & Porter, 2008).

Although previous studies have indicated finding a lack of deficit as a product of their task, the use of the Multi-morph task was hoped to eliminate many of these concerns (Glass &

Newman, 2006). Morphing allows the participant to identify the emotion from no expression to full expression, which does not force participants to make a quick judgment. Additionally, this provides sensitivity of expression, which should capture how obvious the expression needs to be in order to identify. The faces, Eckman and Friesen's (1976) Pictures of Facial Affect, are the most commonly used faces in facial affect studies and were also used in the current study. This accounts for a lack of consistency among facial displays, indicating that results of the current study are not due to a difference in stimuli used. However, the time allotted for multiple guesses and reconsiderations may allow participants to modify their responses more than would be natural in a real interaction.

Based on the current findings and the literature, there does not seem to be enough evidence to state a significant impairment in facial affect recognition for psychopathic adolescents without considering the two factors of psychopathy as well as gender. As noted by Kosson and colleagues (2002), Pajer and colleagues (2010), and Pham and Philipott (2010), the differences in facial affect may be very subtle for psychopathic individuals; the differences may not be detectable with current measurements but may still be a factor in real life recognition. This may explain the lack of stronger correlations found in the current study. Abused children may also be at risk for higher scores of psychopathy, which may lead to higher antisocial behavior and even possibly delinquent behavior or contact with the law.

The research conducted here may also question some of the studies that purport brain anomalies in psychopathic individuals. Specifically, deficits in amygdala functioning may be challenged given the results of the current and previous studies. Additionally, interactions in reality involve specific situations and other cues that may help or hinder an individual's

recognition of facial affect. More studies that include moderators and context specific recognition of affect are needed (Newman & Lorenz, 2003).

Potential Limitations and Future Directions

The findings of the current study are somewhat tempered by the study's limitations. First, the sample is small. Although the sample was small the effect sizes were rather large and with a slightly larger sample the findings would produce significant findings. Second, the sample included only a small portion of girls. There were some interesting gender effects in this study and again with a larger sample, researchers could further tease these gender differences apart. Third, in all studies there are concerns about motivation and there is the possibility that, especially the psychopathic individuals could have performed better than they did. Fourth, the findings may be confounded if age has not been accounted for, and some studies show that the deficit of fear recognition is not significant after accounting for age (Blair & Coles, 2000). Other studies using younger participants have not reported analyzing age as an influence on significant outcomes (Dadds, Masry, Wimalaweera, & Gustella, 2008; Stevens, Charman, & Blair, 2001). These influences may produce confounding results for youth facial affect deficits and may explain the variability in the literature.

Fifth, the sample used was completely drawn from a detention center, and using controls from the community may provide a better contrast than individuals who have come in contact with the law. Thus, the delinquent sample may have compromised a clear comparison group. The range of psychopathy scores for the current sample did not capture extremely high scores of psychopathy, which may have contributed to a lack of significant differences in accuracy.

The age range for the current study includes individuals aged 11 and older. Developmental research indicates that by age 10 most children can accurately identify fearful

expressions. Although age was not significant in affecting the results, individuals in this age group may still not be as skilled at facial affect recognition, particularly of fearful expressions, when compared to adults. This developmental difference may hinder finding the same deficits for adults in children. Thus, the sample used for the current study may have some individuals who have not quite grasped properly identifying fearful expressions, which, in combination with the low number of participants, may have impacted the ability for younger participants to correctly identify fear across all levels of psychopathy.

While the task used in the current study is considered the best task to date for examining facial affect recognition, the displays of facial affect do not completely reflect what an individual would experience in a real life interaction. Other factors, such as situation specific information, may affect the ability for high psychopathy individuals to recognize what emotion others are displaying. For example, factors that may distract the individual or provide more context clues to how another may feel could change recognition ability. Other factors, such as comorbidity of disorders could also alter affect recognition accuracy and were not accounted for in the current study (Pham & Philipott, 2010). Some disorders may impact the ability to recognize, such as substance use, mood disorders, or OCD.

Future research should consider the limitations of the current study and of previous studies. Providing more realistic context with a larger sample, wider range of psychopathy scores, and accounting for comorbidity could offer better understandings of affect recognition within the population of adolescents with psychopathic tendencies. Despite the limits of the current investigation, the current study elucidated further the relation between psychopathy and emotional processing of facial affect.

Conclusion

Considerable knowledge regarding the defining features, structure, and correlates of psychopathy has been garnered; however, one primary question for many researchers is—precisely, – what causes psychopathy? Researchers have been searching for mechanisms or models that can explain the disorder and move us beyond descriptive, structural, and correlational research. In an attempt to develop explanatory models for the psychopathic individuals, concern has been expressed regarding psychopathic individuals' ability to accurately recognize emotions in others. When investigating the ability of psychopathic individuals to correctly identify facial displays of emotion, researchers have developed a number of theories to outline the relation between psychopathy and emotion recognition and to also explain the causes of this deficit in psychopathic individuals. In the current study, I investigated one chief etiological model, which suggests psychopaths have a deficit in fear processing. This theory was partially supported. Specifically, the theory generally held for males but not for females. Males with high psychopathy scores showed a deficit in fear processing whereas females showed a heightened ability to detect fear. These findings suggest that different etiological models may be necessary for males and females.

REFERENCES

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.) Washington, DC: Author.
- Aniskiewicz, A.S. (1979). Autonomic components of vicarious conditioning and psychopathy. *Journal of Clinical Psychology* 35, 60–67.
- Blair, R. J. R. (1995). A cognitive developmental approach to morality: Investigating the psychopath. *Cognition*, 57, 1– 29.
- Blair, R. J. R., & Coles, M. (2000). Expression recognition and behavioral problems in early adolescence. *Cognitive Development*, 15, 421-434.
- Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. (2001). A selective impairment in the processing of sad and fearful expressions in children with psychopathic tendencies. *Journal of Abnormal Child Psychology*, 29, 491–498.
- Blair, R. J. R., Jones, L., Clark, F., & Smith, M. (1997). The psychopathic individual: a lack of responsiveness to distress cues? *Psychophysiology*, 34, 192–198.
- Blair, R.J.R., Mitchell, D.G.V., Peschardt, K.S., Colledge, E., Leonard, R.A., Shine, J.H., Murray, L.K., Perrett, D.I., (2004). Reduced sensitivity to others' fearful expressions in psychopathic individuals. *Personality and Individual Differences*, 37, 1111–1122.
- Blair, R. J., Mitchell, D. G., Richell, R. A., Kelly, S., Leonard, A., Newman, C. & Scott, S. K. (2002). Turning a deaf ear to fear: impaired recognition of vocal affect in psychopathic individuals. *Journal of Abnormal Psychology*, 111, 682–686.
- Blair, R. J. R., Morris, J. S., Frith, C. D., & Perrett, D. I. (1999). Dissociable neural responses to facial expressions of sadness and anger. *Brain*, 122, 883-893.
- Book, A. (2005). Psychopaths as social predators. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 66, 1216.
- Book, A. S., Quinsey, V. L., & Langford, D. (2007). Psychopathy and the perception of affect and vulnerability. *Criminal Justice and Behavior*, 34, 531-544.
- Borke, H. (1971). Interpersonal perception of young children: Egocentrism or empathy? *Developmental Psychology*, 5, 412-434.
- Burack, J. A., Flanagan, T., Peled, T., Sutton, H. M., Zygmuntowicz, C., & Manly, J. T. (2006). Social perspective taking skills in maltreated children and adolescents. *Developmental Psychology*, 42, 207-217.
- Carr, M. B., & Lutjemeier, J. A. (2005). The relation of facial affect recognition and empathy to

- delinquency in youth offenders. *Adolescence*, 40, 601-619.
- Cleckley, H. (1955). *The mask of sanity*. (3rd ed.). St. Louis, MO: Mosby.
- Cloninger, C. R. (1978). The antisocial personality. *Hospital Practice*, 13, 97-106.
- Dadds, M. R., Masry, Y. E., Wimalaweera, S., & Guastella, A. J. (2008). Reduced eye gaze explains “fear blindness” in childhood psychopathic traits. *American Academy of Child and Adolescent Psychiatry*, 47, 455-463.
- Del Gaizo, A. L., & Falkenbach, D. M. (2008). Primary and secondary psychopathic-traits and their relationship to perception and experience of emotion. *Personality and Individual Differences*, 45, 206–212.
- Denham, S. A., Blair, K. A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Major, S., et al. (2003). Preschool emotional competence: Pathway to social competence? *Child Development*, 74, 238-256.
- Dodge, K. (1993). Social cognitive mechanisms in the development of conduct disorder and depression. *Annual Review of Psychology*, 44, 559-584.
- Dolan, M., & Fullam, R. (2006). Face affect recognition deficits in personality-disordered offenders: Association with psychopathy. *Psychological Medicine*, 26, 1563-1569.
- Ekman, P., & Friesen, W. V. (1976). *Pictures of facial affect*. Palo Alto: Consulting Psychologists Press.
- Eisenbarth, H., Alpers, G. W., Serge, D., Calogero, A., & Angrilli, A. (2008). Categoization and evaluation of emotional faces in psychopathic women. *Psychiatry Research*, 159, 189-195.
- Feshbach, N. D. (1983). Learning to care: A positive approach to child training and discipline. *Journal of Clinical Child Psychology*, 12, 266-271.
- Feshbach, N. D. (1987). Parental empathy and child adjustment/maladjustment. In: Eisenberg, N., & Strayer, J. (eds.). *Empathy and its Development*. New York: Cambridge University Press, pp 271-291.
- Forth, A. E., Kosson, D., & Hare, R. D. (2003). *Hare Psychopathy Checklist: Youth Version*. Toronto, ON: Multi-Health Systems.
- Frick, P. J., & Hare, R. D. (2001). *The Antisocial Process Screening Device*. Toronto, ON: Multi-Health Systems.
- Glass, S. J., & Newman, J. P. (2006). Recognition of facial affect in psychopathic offenders. *Journal of Abnormal Psychology*, 115, 815-820.

- Graham, N., Kimonis, E. R., Wasserman, A. L., & Kline, S. M. (2011, October 24). Associations Among Childhood Abuse and Psychopathy Facets in Male Sexual Offenders. *Personality Disorders: Theory, Research, and Treatment*. Advanced online publication.
- Habel, U., Kuhn, E., Salloum, J., Devos, H., & Schneider, F. (2002). Emotional processing in psychopathic personality. *Aggressive Behavior, 28*, 394–400.
- Hansen, A.L., Johnsen, B. H., Hart, S., Waage, L., & Thayer, J. F. (2008). Brief communication: Psychopathy and recognition of facial expressions of emotion. *Journal of Personality Disorders, 22*, 639-645.
- Hare, R. D., (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality and Individual Differences, 1*, 111-119.
- Hare, R. D. (1991). *The Hare psychopathy checklist-revised*. Toronto, ON: Multi-Health Systems.
- Hare, R. D., (2003). *Manual for the Hare Psychopathy Checklist- Revised*, 2nd edition. Multi-Health Systems, Toronto.
- Hare, R. D., & Neumann, C. S. (2010). The role of antisociality in the psychopathy construct: Comment on Skeem and Cooke (2010). *Psychological Assessment, 22*, 446-454.
- Harpur, T. J., Hare, R. D., & Hakstian, A. R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment: A Journal of Consulting and Clinical Psychology, 1*, 6-17.
- Hastings, M. E., Tangney, J. P., & Stuewig, J. (2008). Psychopathy and identification of facial expressions of emotion. *Personality and Individual Differences, 44*, 1474-1483.
- Hemphill, J. F. (2003). Comment: Interpreting the magnitudes of correlation coefficients. *American Psychologist, 58*, 78-80.
- Kosson, D. S., Suchy, Y., Mayer, A. R., & Libby, J. (2002). Facial affect recognition in criminal psychopaths. *Emotion, 2*, 398-411.
- Leistico, A. R., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the Hare measures of psychopathy to antisocial conduct. *Law and Human Behavior, 32*, 28–45.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment, 66*, 488–524.
- Lundqvist, D., Flykt, A., Ohman, A., 1998. *Karolinska directed emotional faces (KDEF)*. Dept.

of Neurosciences, Karolinska Institute, Stockholm, Sweden.

- Lipsey, M. W., & Wilson, D. B. (1993). The efficacy of psychological, educational, and behavioral treatment: Confirmation from meta-analysis. *American Psychologist, 48*, 1181–1209.
- Loney, B. R., Frick, P. J, Clements, C. B, Ellis, M. L., & Kerlin, K. (2003). Callous-unemotional traits, impulsivity, and emotional processing in adolescents with antisocial behavior problems. *Journal of Clinical Child and Adolescent Psychology, 32*, 66-80.
- Lynam, D. R., Caspi, A., Moffit, T. E., Raine, A., Loeber, R., & Stouthamer-Loeber, M. (2005). Adolescent Psychopathy and the Big Five: Results from Two Samples. *Journal of Abnormal Child Psychology, 33*, 431-443.
- McCown, W. G., Johnson, J. L., & Austin, S. H. (1986). Inability of delinquents to recognize facial affects. *Journal of Social Behavior and Personality, 1*, 489-496.
- McCown, W. G., Johnson, J. L., & Austin, S. H. (1988). Patterns of facial affect recognition errors in delinquent adolescent males. *Journal of Social Behavior and Personality, 3*, 215-224.
- Morris, T. L., Hirshfeld-Becker, D. R., Henin, A., & Storch, E. A. (2004). Developmentally-sensitive assessment of social anxiety. *Cognitive and Behavioral Practice, 11*, 109-126.
- Munro, G. E. S., Dywan, J., Harris, G. T., McKee, S., Unsal, A., & Segalowitz, S. J. (2007). ERN varies with degree of psychopathy in an emotion discrimination task. *Biological Psychology, 76*, 31-42.
- Meyer, G. J., Finn, S. E., Eyde, L. D., Kay, G. G., Moreland, K. L., Dies, R. R., et al. (2001). Psychological testing and psychological assessment: A review of evidence and issues. *American Psychologist, 56*, 128–165.
- Newman, J., & Lorenz, A. (2003). Response modulation and emotion processing: Implications for psychopathy and other dysregulatory psychopathology. In R. Davidson, K. Scherer, & H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 1043–1067). New York: Oxford University Press.
- Nowicki, S., & Carton, J. (1993). The measurement of emotional intensity from facial expressions. *Journal of Social Psychology, 133*, 749–750.
- Nowicki, Jr. S., & Duke, M. P. (1994). Individual differences in nonverbal communication of affect: The diagnostic analysis of nonverbal accuracy scale. *Journal of Nonverbal Behavior, 18*, 9-36.
- Pajer, K., Leininger, L., & Gardner, W. (2010). Recognition of facial affect in girls with conduct disorder. *Psychiatry Research, 175*, 244-251.

- Pham, T. H., & Philippot, P. (2010). Decoding of facial expression of emotion in criminal psychopaths. *Journal of Personality Disorders, 24*, 445-459.
- Philippot, P., & Feldman, R. S. (1990). Age and social competence in preschoolers' decoding of facial expression. *British Journal of Social Psychology, 29*, 43-54.
- Poythress, N. G., Skeem, J. L., & Lilienfeld, S. O. (2006). Associations among early abuse, dissociation, and psychopathy in an offender sample. *Journal of Abnormal Psychology, 115*, 288-297.
- Richell, R. A., Michell, D. G. V., Peschardt, K. S., Winston, J. S., Leonard, A., Dolan, R. J., et al. (2005). Trust and distrust: The perception of trustworthiness of faces in psychopathic and non-psychopathic offenders. *Personality and Individual Differences, 38*, 1735-1744.
- Rieffe, C., Terwogt, M., & Stockman, L. (2000). Understanding atypical emotions among children with autism. *Journal of Autism and Developmental Disorders, 30*, 195-203.
- Robins, L. N. (1966). *Deviant children grown up: A sociological and psychiatric study of sociopathic personality*. Baltimore: Williams and Wilkins.
- Salekin, R. T., & Lynam, D. R. (2010). *Handbook of child and adolescent psychopathy*. New York: Guilford Press.
- Stevens, D., Charman, T., Blair, R. J. R. (2001). Recognition of emotion in facial expressions and vocal tones in children with psychopathic tendencies. *Journal of Genetic Psychology, 162*, 201-211.
- Trentacosta, C. J., & Fine, S. E. (2009). Emotion knowledge, social competence, and behavior problems in childhood and adolescence: A meta-analytic review. *Social Development, 19*, 1-29.
- Vitale, J. E., Newman, J. P., Bates, J. E., Goodnight, J., Dodge, K. A., & Petit, G.S. (2005). Deficient behavioral inhibition and anomalous selective attention in a community sample of adolescents with psychopathic and low-anxiety traits. *Journal of Abnormal Child Psychology, 33*, 461-470.
- Walker, E. (1981). Emotion recognition in disturbed and normal children: A research note. *Journal of Child Psychology and Psychiatry, 22*, 263-268.
- Walker, D. W., & Leister, C. (1994). Recognition of facial affect cues by adolescents with emotional and behavioral disorders. *Behavior Disorders, 19*, 269-276.
- Wilson, K., Demetriooff, S., & Porter, S. (2008). A pawn by any other name? Social information processing as a function of psychopathic traits. *Journal of Research in Personality, 42*, 1651-1656.