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ANTICIPATORY FEAR AND PSYCHOPATHIC TRAITS IN ADOLESCENTS

by

Catherine Chan

A master's thesis submitted to the Graduate Faculty in Cognitive Neuroscience in partial fulfillment of the requirements for the degree of Master of Science, The City University of

New York

2021

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This manuscript has been read and accepted for the Graduate Faculty in
Cognitive Neuroscience in satisfaction of the thesis requirement for the degree of
Master of Science.

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ABSTRACT

Anticipatory Fear and Psychopathic Traits in Adolescents

by

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Psychopathy is characterized by impulsive antisocial behavior, interpersonal and affective deficits such as lack of guilt, empathy, and remorse. An affective deficit observed in individuals with psychopathic traits is the lack of anticipatory fear. In a fearful situation, individuals generally develop fear and associate it with the situation, so they know to avoid it in the future. The ability to anticipate fear prevents individuals from committing wrongdoings due to the negative consequences that arise from it. However, individuals with psychopathic traits have been found to show reduced anticipatory fear, which in turn may contribute to more antisocial behavior. To date, only a few studies have examined such deficits in youth with psychopathic traits across sex, and findings linking such deficits with specific psychopathic traits are mixed. In our study, we examined if adolescents with psychopathic traits showed deficits in anticipatory fear in ninety-two male and female schoolchildren (Mean age = 14.2, 57% male) from the community. Heart rate responses were recorded during a countdown task, in which participants viewed a countdown of numbers from 12 to 0 on a computer screen, and a burst of loud noise was delivered when the countdown reached zero. Their psychopathic traits were assessed via self and parents' reports. Results showed that in boys high Callousness was associated with reduced heart rate deceleration, whereas in girls high callous-unemotional traits (the affective dimension of psychopathic traits) were associated with more heart rate acceleration. These findings provide further evidence for gender differences in the etiology of psychopathy.

Keywords: psychopathy, countdown, heart rate, psychophysiological, children

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INTRODUCTION

Psychopathic traits are characterized by impulsive antisocial behavior (Koenigs, 2012) and affective deficits such as lack of guilt, empathy, and remorse (Patrick & Bernat, 2009). Individuals with psychopathic traits do not realize how their indifference and impulsiveness can impact others, which may cause conflict with others in society. This behavior can result in adverse personal consequences such as loss of a job or relationships, or even imprisonment (Anderson & Kiehl, 2011).

One of the earliest and most influential texts on psychopathy is “The Mask of Sanity” by Hervey Cleckley, which was first published in 1941 with six editions produced. Cleckley (1988) addresses how the classifications of psychopathic traits are often inconsistent in medical dictionaries and are not used in congruence with its etymological meaning. In the first edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association [APA], 1952), the term ‘sociopathic personality’ became a diagnostic category. The term was then replaced with ‘personality disorder, antisocial type’ in the second edition of the DSM (APA, 1968). Cleckley (1988) suggested the term, ‘antisocial personality’, and its more familiar term, ‘psychopathy’.

Cleckley (1988) also discusses the behavioral and personality characteristics of psychopathic traits. He defines them in 16 characteristics: 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 or 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 rarely carried out; sex life impersonal, trivial, and poorly integrated; and failure to follow any life plan. These characteristics described by Cleckley are still applicable in describing individuals with psychopathic traits today. He believes that psychopathic traits can only be demonstrated when the actions of an individual with these traits interacts with those without psychopathic traits. Individuals with psychopathic traits may demonstrate various degrees of those traits; some may exhibit a milder form of them in which these individuals are able to function outside a psychiatric hospital. Others may not even be considered as having psychopathic traits although they exhibit the characteristics of one. While the actions of these individuals may appear to be emotionally appropriate, they can behave like a normally functioning person. However, they most often lack any genuine feeling behind their actions (Cleckley, 1988).

Individuals who display psychopathic traits may also exhibit personality traits that are different from psychopathic individuals (Hare, 1970). These individuals can experience remorse and guilt from their actions. They are also able to form interpersonal and meaningful relationships with others. It is possible that individuals can demonstrate deviant behaviors that are perceived as psychopathic traits, but not necessarily have psychopathy.

Robert D. Hare developed the Psychopathy Checklist, a diagnostic tool to assess psychopathy using methods associated with clinical conception of psychopathy (Hare, 1980). In 1985, the checklist was revised with two items removed and a change in labeling of items (Hare, 1985a). The original Psychopathy Checklist consisted of 22 items while the Psychopathy Checklist-Revised (PCL-R) consisted of 20 items. One item was removed due to difficulty in scoring and the other was removed due to irrelevance (Hare, 1985a). The PCL-R has been

demonstrated to have high internal consistency and inter-rater reliability (Hare, 1980; Hare & Frazelle, 1980). It has been used in studies with incarcerated males (Hare 1983, 1985b).

The PCL-R has still been widely used in studies involving noncriminal and criminal individuals with psychopathic traits, although there are concerns regarding its validity. Noncriminal and criminal individuals with psychopathic traits may exhibit different characteristics of psychopathic traits. However, comparing these characteristics have been found to be difficult since studies involving noncriminal individuals with psychopathic traits have used mostly self-reported measures (Mehmet & Homewood, 2008). On the other hand, studies involving criminals with psychopathic traits were mainly psychophysiological and neurophysiological. Another reason for why the comparison of noncriminal and criminal individuals with psychopathic traits has been criticized is because the PCL-R is often inappropriately used in nonclinical settings (Mehmet & Homewood, 2008). Moreover, the percentage of community dwelling individuals with psychopathic traits is only approximately 1% of the population (Hare, 2003; Mehmet & Homewood, 2008). Furthermore, the PCL-R is lengthy to administer. Because of these reasons, the PCL-R is inefficient for mass screenings, which is necessary for adequate sample sizes.

Hall and Bennings (2006) believe that non-criminal individuals with psychopathic traits exhibit a less severe expression of psychopathy. Therefore, they have been called “successful” in previous literature because they can behave like a socially acceptable individual and can avoid being involved with the criminal justice system (DeMatteo, Heilbrun, & Marczyk, 2005; Hall & Bennings, 2006). Noncriminal and criminal individuals with psychopathic traits can both share the etiology and severity in psychopathy. However, there are factors which can intervene in this manifestation. A compensatory process is assumed in which the antisocial behavior of criminal

individuals with psychopathic traits is a consequence of their psychopathic behavior and personality. Some examples of compensatory variables are socioeconomic status, educational opportunity, intelligence, and highly effective socialization (Hall & Bennings, 2006). These variables can prevent individuals who are vulnerable to engaging with antisocial behavior from being involved with the criminal justice system (DeMatteo, Heilbrun, & Marczyk, 2005).

Anticipatory Fear Deficits in Psychopathy

An affective deficit observed in individuals with psychopathic traits is the lack of anticipatory fear. Fear reflects an individual's response to psychological and/or physical threat (Lang, Davis, & Ohman, 2000). The anticipation of fear is essential for development (Abend et al., 2020) and fear conditioning (Lykken, 1995; Mechias, Etkin, & Kalisch, 2009). Furthermore, anticipatory fear can be considered as classical fear conditioning in which a neutral stimulus is determined as a threat due to its association with a noxious stimulus (Mechias et al., 2009). Classical conditioning paradigms can be useful in examining fear given that an unconditioned stimulus can be used to provoke fear (Woody & Teachman, 2000). Because individuals have associated the stimulus as a threat, they become aware of this association before they experience the stimulus again. This initial elicitation of fear results from the negative association of the neutral stimulus.

In a fearful situation, individuals generally learn to associate fear with the situation so they would know to avoid it in the future. The ability to anticipate fear causes individuals to avoid committing wrongdoings due to the negative consequences that arise from the consequences of doing the wrongdoing. However, individuals with psychopathic traits lack this fear for anticipation of punishment and threat (Fung et al., 2005; Lykken, 1995). Because they cannot anticipate these consequences, they may not be able predict the outcome of their actions.

Understanding anticipatory fear is important because it allows us to understand why some individuals would commit wrongdoings and exhibit antisocial behavior. Previous studies theorized that certain individuals engage in criminal activity because they have not learned to associate their actions or cues to negative consequences (Lykken, 1995). Because they did not learn and develop the negative emotions that arise from committing the wrongdoing, the negative cues did not prevent them from doing the crime.

Due to the lack of anxiety, individuals with psychopathic traits may not be as affected by social approval and laws compared to those without psychopathic traits. Disobeying the law and committing wrongdoings may cause anxiety in individuals without psychopathic traits since they dislike causing harm or facing negative consequences. However, individuals with psychopathic traits are not as affected, so they are more likely to perform negative and harmful behaviors. Previous research has theorized that psychopathic traits may be a result of insufficient anticipatory fear arousal for the reinforcement of avoidance behavior (Hare, 1978). Because individuals with psychopathic traits tend to not display anticipatory arousal to an impending noxious stimulus, they are not affected by the social sanctions that serve to regulate socially unacceptable and impulsive behavior. Generally, high levels of anxiety make individuals without psychopathic traits uncomfortable. Therefore, they would regulate their behavior and avoid performing anxiety arousing behavior or situations. However, individuals with psychopathic traits are not influenced by those things due to their lack of anxiety and fear.

Psychophysiological measures are often obtained to assess deficits in emotional reactivity in individuals with psychopathic traits since they are found to have autonomic impairments in responding to fearful and neutral stimuli across various measures (Casey et al., 2012; Levenston, Patrick, Bradley, & Lang, 2000; Patrick, Cuthbert, & Lang, 1994). In typical fearful situations,

individuals with psychopathic traits do not exhibit the typical physiological response (Hosker-Field, Gauthier, Book, 2016). Consequently, psychophysiological measures are often used in studies regarding psychopathic traits because these individuals have a deficit in emotional reactivity (Benning, Patrick, & Iacono, 2005). For instance, the skin conductance response of individuals with psychopathic traits were slower and lower compared to individuals who are low in those traits (Hare, 1965c). These results indicate that physiological changes such as skin conductance and cardiovascular activity, can be indicators of fear arousal and psychopathic traits. Furthermore, it demonstrates how individuals with and without psychopathic traits react differently to imminent threat and/or punishment.

Countdown Paradigm

Fear conditioning paradigms have been used to examine the importance and effect of anticipatory fear in individuals with psychopathic traits. One of the paradigms used for this role is the countdown paradigm. The countdown paradigm assesses anticipatory psychophysiological responses to noxious stimuli (Ogloff & Wong, 1990) and has been used to investigate fear arousal and emotional reactivity. In the countdown task, the participant would view or hear a set of numbers counting down to zero. A noxious stimulus, such as a burst of loud noise or an electric shock, would be delivered once the countdown reaches zero. By using the countdown paradigm, researchers can assess the physiological responses of individuals with psychopathic traits as they anticipate an aversive stimulus.

Past studies have used the countdown task to evaluate the physiological responses of individuals as they anticipate and receive an aversive stimulus such as a burst of white noise (Hare & Craigen, 1974; Wang, Baker, Gao, Raine, & Lozano, 2012). Researchers often use the countdown task with individuals with psychopathic traits (and sometimes those without

psychopathic traits) because of the inability of individuals with psychopathic traits to produce a fear response (Casey, Rogers, Burns, & Yiend, 2012; Hare et al., 1978).

In previous studies, the countdown paradigm usually consists of an electric shock as the aversive stimulus for the countdown task (Hare, 1965a). One of the researchers that are most well-known for the countdown paradigm was Hare, who mainly used the countdown task with prisoners. These early studies have shown that the threat of an aversive stimulus, such as an electric shock, elicited low electrodermal arousal in psychopathic prisoners (Hare, 1965a, 1965b; Hare & Craigen, 1974; Hare & Quinn, 1978). The threat of shock led to an increase in the heart rate of individuals with psychopathic traits that was equal to or greater than that found in prisoners without psychopathic traits (Hare & Craigen, 1974; Hare & Quinn, 1978).

Hare (1978) aimed to determine if the result of low electrodermal and high heart rate in individuals with psychopathic traits were the same if a different noxious stimulus, such as a loud noise, was delivered instead. Therefore, he used the countdown task using a burst of white noise instead of an electric shock. The results were consistent with previous studies which reflects the association with psychopathic traits and demonstrates the effective coping mechanisms in anticipation of a threat. Individuals with psychopathic traits may exhibit physiological activity that may indicate a defense response, which suggests the modulation of anxiety arousing nature of an imminent unpleasant situation (Hare, 1978; Hare, Frazelle & Cox, 1978). Because of this, they do not fear the threat of facing negative consequences (Hare, 1978; Schalling, 1978). Although this coping strategy may be useful in certain situations, it is not socially adaptive since individuals with psychopathic traits may tend to repeatedly commit wrongdoings or perform actions deemed unacceptable by society, which leads to them facing punishment such as imprisonment.

Since individuals with psychopathic traits have been shown to have this effective coping mechanism, they exhibit a decrease in anxiety which causes them to be less controlled by negative consequences (Ogloff & Wong, 1990). As a result, individuals with psychopathic traits cannot control or regulate their activities unlike those without psychopathic traits. For instance, individuals without psychopathic traits may be more nervous and scared to commit a crime compared to individuals with psychopathic traits. Because of this, a nervous individual without psychopathic traits may be less likely to commit the crime compared to the individual with psychopathic traits who is less nervous. Alternatively, the lack of fear may also predispose individuals to more risk-taking behaviors which may be a part of the characteristics within psychopathic traits.

Heart Rate Change in Individuals with Psychopathic Traits

Generally, heart rate demonstrates a stable tri-phasic pattern in the countdown paradigm (Hugdahl, 1995). In the beginning of the countdown period, an initial deceleration period, known as the D1 component, occurs. It is then followed by an acceleration of heart rate, called the A component. A deceleration at the end of the countdown period, called the D2 component, occurs afterwards (Wang et al., 2012). According to Hugdahl (1995), the D1 component is related to the cognitive mechanisms of stimulus orientation and the focus of attention. The A component is associated with the emotional aspect of the stimulus and the D2 component indicates the anticipation of the stimulus.

In previous literature, an acceleration in heart rate has been shown to be a normal response to processing visually pleasant stimuli (Casey et al., 2012; Lang, Bradley, & Cuthbert, 1999). However, this implies the response from individuals with psychopathic traits find the noxious stimulus highly rewarding, whereas individuals without those traits would react to it

negatively (Casey et al., 2012; Kirsch & Becker, 2007). Therefore, individuals with psychopathic traits may process the emotions that individuals normally would express as rewarding differently, which may explain why individuals with psychopathic traits are more likely to engage in activities that have a higher risk of negative consequences (Casey et al., 2012).

Individuals with psychopathic traits are shown to demonstrate an abnormal change in heart rate when anticipating an unpleasant event (Raine, 1997; Wang et al., 2012). During the countdown task, individuals with psychopathic traits displayed an acceleration in heart rate in anticipation of a noxious stimulus (Hare et al., 1978; Ogloff & Wong, 1990). Their heart rate was found to have a greater acceleration compared to individuals without psychopathic traits (Hare & Craigen, 1974; Hare et al., 1978). In other words, individuals with psychopathic traits were demonstrated to have a large increase in heart rate during the A component (Wang et al., 2012). On the other hand, the deceleration periods, the D1 and D2 components, of individuals with psychopathic traits are the same as those without psychopathic traits (Hare, 1982; Hare et al., 1978; Ogloff & Wong, 1990; Wang et al., 2012).

Heart rate has been suggested to be indicative of a defense mechanism or an attempt to cope (Hare, 1978). Heart rate acceleration in individuals with psychopathic traits is found to lead to increased blood pressure and is associated with decreased cortical arousal (Lacey & Lacey, 2017). This suggests that the pattern of heart rate acceleration of individuals with psychopathic traits can reflect an effective coping mechanism (Hare, 1975c, 1978).

Psychopathic Traits in Adolescents

Over the years, research on psychopathy has been extended to the younger population. According to Macdougall et al. (2019), psychopathic traits in adolescence is characterized by grandiose-manipulative, daring-impulsive, and callous-unemotional traits. Respectively, these

interpersonal, behavioral, and affective traits may engender adult psychopathy (Cleckley, 1941, 1976; Hare, 1991, 2003; Macdougall et al., 2019). Callous-unemotional traits are an important aspect in psychopathy and is a specifier for conduct disorder that is included in the DSM-5 (APA, 2013). The DSM-5 added the specifier, “limited prosocial emotions” to the diagnosis for conduct disorder to classify adolescents exhibiting antisocial behavior with or without psychopathic traits.

Callous-unemotional traits can be defined as characteristics such as lack of guilt, absence of empathy, and limited emotions (Barry et al., 2000; Frick, 1995; Frick, Ray, Thornton, & Kahn, 2014). Adolescents with conduct problems who also display high levels of callous-unemotional traits are more likely to exhibit antisocial behavior at a greater severity and have more encounters with the law enforcement compared to adolescents with conduct problems but who do not display callous-unemotional traits (Christian, Frick, Hill, Tyler, & Frazer, 1997).

Callous-unemotional traits can be used to identify children who have conduct disorder or oppositional defiant disorder (Barry et al., 2000). Early identification is essential because adolescents with psychopathy are more likely to be diagnosed with these disorders (Frick, O’Brien, Wootton, & McBurnett, 1994). Furthermore, studies have shown that callous-unemotional traits can predict antisocial personality disorder, aggression, violence, and delinquency later in life (Frick & White, 2008; Wang et al., 2012).

Externalizing behavior is associated with callous-unemotional traits (Charles, Acheson, Mathias, Furr, & Dougherty, 2012; Huang et al., 2019; Pihet, Etter, Schmid, & Kimonis, 2015). Because individuals with callous-unemotional traits exhibit shallow and limited affect, adolescents with externalizing behavior problems may exhibit lower levels of fear anticipation.

Furthermore, children with externalizing behavior problems, such as aggression, are more likely to be involved in delinquency and criminal activity.

Psychopathic traits exhibited by adolescents may remain with them into adulthood (Cleckley, 1941, 1976; Macdougall et al., 2019). It is important to identify the causes of psychopathy early in childhood and develop effective treatment and intervention strategies to aid individuals with psychopathic traits. Early identification can help prevent further harm or wrongdoing that may negatively influence individuals with psychopathic traits and others. Doing so can reduce the adverse consequences of antisocial behavior towards others and society (Wang et al., 2012).

Although not many, there are findings in existing research that suggest sex differences in adolescents with psychopathic traits or conduct problems. According to Wang et al. (2012), manipulative-deceitfulness in boys was found to be negatively correlated to nonspecific skin conductance, but not in girls. Furthermore, aggressive girls with conduct problems exhibited different psychophysiological response patterns than aggressive boys with conduct problems (Beauchaine, Hong, & Marsh, 2008). Boys with conduct problems showed less pre-ejection period (PEP; a cardiovascular measure influenced by activity in the sympathetic nervous system) reactivity to reward such as monetary incentives. On the other hand, girls with conduct problems showed no difference in PEP. However, according to Wang et al. (2012), girls with psychopathic traits demonstrated an abnormal heart rate acceleration such that they exhibit a larger heart rate acceleration. Although this finding is inconsistent with Beauchaine et al. (2008), these findings suggest there are differences in psychopathic traits across sex.

Assessments of Childhood Psychopathy

Diagnostic tools for assessing psychopathy are an essential step for research purposes. These include self-report questionnaires, clinical diagnoses, and behavioral rating scales. Self-report questionnaires have been commonly used in studies on psychopathy. However, the use of self-report measures has been criticized since some characteristics of psychopathic traits are lying and deceitfulness (Ray et al., 2013). It is possible for individuals to not answer the items of the questionnaire truthfully, which can render the score to be invalid. Despite the limitations of self-report measures, it is still used as a diagnostic tool for psychopathy in many studies.

The Childhood Psychopathy Scale (CPS) by Lynam (1997) is one of the diagnostic instruments used to assess psychopathy. It has been used in previous studies to assess psychopathic traits in adolescents. This scale is based on Hare's PCL-R which is the standard assessment used to measure psychopathy in adults (Hare, 1991). It is also drawn from the Childhood Behavior Checklist (Achenbach, 1991) as well as the Common Language Q-set, which is a simplified version of the California Child Q Set (Block & Block, 1980; Lynam, 1997). The CPS measures 13 items from the PCL-R: glibness, pathological lying, lack of remorse, shallow affect, lack of empathy, failure to accept responsibility, parasitic lifestyle, conning, lack of plans, impulsivity, responsibility, and criminal versatility. According to Lynam (1997), the CPS can be a good predictor for delinquency. For instance, adolescents who scored high on the CPS were more likely to commit wrongdoings such as theft and violent acts. Furthermore, they may participate in more serious forms of delinquency such as selling drugs and stealing cars. Some researchers believe the CPS has some limitations because it does not follow Hare's original conceptualization of psychopathy well and that the CPS is biased towards the aspect of antisocial behavior (Bezdjian, Raine, Baker, & Lynam, 2010).

The Antisocial Process Screening Device (APSD; Frick & Hare, 2001) and the Inventory of Callous-Unemotional Traits (ICU; Frick, 2003), which we used to assess psychopathic traits for our study, are also scales used to measure child psychopathy. The APSD, that is also based on the PCL-R, assesses antisocial behaviors and psychopathic traits in adolescents. The ICU is most commonly used to measure callous-unemotional traits and is comprised of three subscales of psychopathic traits: Uncaring, Unemotional, and Callousness. The ICU was derived from the APSD; it was developed to evaluate callous-unemotional traits more extensively. This overcomes some of the limitations of the APSD such as moderate internal consistency due to the small number of items on callous-unemotional traits in the APSD (Essau, Sasagawa, & Frick, 2006; Munoz & Frick, 2007). There are five available versions of the ICU: Youth Self-Report, Parent Report (Preschool Version), Parent Report, Teacher Report (Preschool Version), and Teacher Report.

Other forms of assessments on childhood psychopathy are the Youth Psychopathic Traits Inventory (YPI; Andershed, Kerr, Stattin, & Levander, 2002) and the Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003). One advantage of the YPI is that it minimizes the possibility of deceitful answers by framing the items such that it would make individuals with psychopathic traits to see themselves in a positive light (Andershed et al., 2002; Pechorro, da Silva, Andershed, Rijo, & Gonçalves, 2016). The YPI consists of three factors: Grandiose-Manipulative, Impulsive-Irresponsible, and Callous-Unemotional. The internal consistency of the YPI has been controversial in previous research. While some studies reported good reliability for the total score, Grandiose-Manipulative and Impulsive-Irresponsible factors, other studies reported poor reliability for the factor of Callous-Unemotional (Pechorro et al., 2016; Pihet, Suter, Meylan, & Schmid, 2014).

Similar to the assessments mentioned earlier, the PCL:YV describes the characteristics and behaviors of psychopathic traits. It was adapted from Hare's PCL-R and measures the affective, behavioral, and interpersonal aspects of this condition. Some of the items of this questionnaire address psychological characteristics such as callous-unemotional traits as well as personality styles such as manipulative and deceitfulness (Brazil & Forth, 2016). The questionnaire also includes behavioral traits such as violent criminal activities. It has been shown to demonstrate high internal consistency and high inter-rater reliability (Forth et al., 2003; Macdougall et al., 2019). While the relationship between the scores of the PCL-R and the PCL:YV has not yet been examined, studies have demonstrated that the PCL:YV showed similar results as the PCL-R (Brazil & Forth, 2016). Research using improved measurements of psychopathy such as the PCL:YV may be more relevant in the current work on childhood psychopathy.

Fear Deficits in Adolescents with Psychopathic Traits

Studies using the countdown paradigm have demonstrated a relationship between psychopathic traits in adolescents (Fung et al., 2005; MacDougall et al., 2019; Wang et al., 2012). One of the first studies that used the countdown paradigm with adolescents is a study by Fung et al. (2005). Researchers used the countdown task to determine electrodermal hyperresponsivity in adolescents, specifically in anticipation of an unpleasant event. The countdown task consisted of unsignaled and signaled conditions. For both conditions, electrodermal activity was recorded during the anticipatory phase, which was 12 seconds before the white noise, and during the responsivity phase, which was 20 seconds after the white noise.

Findings revealed that adolescents with psychopathic traits demonstrated a decrease in electrodermal activity when anticipating and responding to a noxious stimulus. This suggests that

adolescents with psychopathic traits do not experience anticipatory fear. Their reduced responsivity after the unpleasant stimuli indicates that they have a decreased responsivity to punishment (Arnett 1997; Fung et al., 2005; Hare, 1978a). This deficit can impede socialization and fear conditioning.

Wang et al. (2012) used the countdown task with adolescents from the community to determine the electrodermal and cardiovascular response patterns in individuals with high or low psychopathic traits. Similar to Fung et al. (2005), their countdown task was slightly modified so that it contains both signaled and unsignaled trials. The heart rate responses were first found in terms of change scores. To do this, researchers calculated the mean heart rate during the five second period before each trial and subtracted that number from the heart rate at each second during the 12-second period before the burst of white noise was delivered. The heart rate change scores were then averaged across trials through a second-by-second basis. These scores were determined separately for the signaled and unsignaled conditions.

Findings showed that high psychopathic traits were associated with increased acceleration in heart rate specifically for the callous-disinhibition factor. Meanwhile, there was a decrease in nonspecific skin conductance response that appeared to be only correlated with the manipulation and deceitfulness factor of psychopathic traits. Furthermore, the factor of manipulative-deceitfulness was found to be negatively correlated with nonspecific skin conductance only in boys. The results are similar to those in studies involving psychopathic adults, which demonstrates that children who have a deficiency in autonomic functioning may be at risk in being predisposed to later psychopathy (Wang et al., 2012). In girls with psychopathic traits, their heart rate acceleration was abnormal, but they demonstrated normal non-specific skin conductance responses. Although this finding was not in line with previous research, it suggests

psychopathic traits may be associated differently with sympathetic and parasympathetic dominance between males and females. These sex differences in physiology and psychopathic traits may be due to the influence of the assessment of psychopathic traits (Wang et al., 2012). Sex differences may also be driven by genetic and environmental influences (Rutherford, Alterman, Cacciola, & Snider, 1995; Wang et al., 2012).

More studies on childhood psychopathy are needed since most studies on the psychopathy focus on the adult population (MacDougall, Salekin, & Gillen, 2019). Researchers aim to better understand the psychobiological processes that underlie psychopathy and find effective treatment options for this disorder at younger ages (Koenigs, 2012).

Our study builds upon existing studies involving the psychophysiological correlates of childhood psychopathic traits using the countdown paradigm. In Wang et al. (2012), researchers used the Childhood Psychopathic Scale (CPS) to measure psychopathic traits which is not in line with the current work on childhood psychopathy. For instance, the factors they used were Callous/Unemotional and Manipulative/Deceitful, which were different than those of the APSD. To address this, our study used the Inventory of Callous-Unemotional Traits (ICU; Frick, 2003) and the Antisocial Process Screening Device (APSD; Frick & Hare, 2001) to assess psychopathic traits and sub-factors. Therefore, we aimed to examine the associations between heart rate abnormality in the countdown paradigm and affective, interpersonal, and behavioral dimensions of psychopathic traits. Furthermore, we would examine the anticipatory fear deficits in females and males separately. From this, we can determine if the lack of anticipatory fear is specific to any one dimension of psychopathic traits or one gender group.

METHODS

Participants

Participants are a part of an ongoing longitudinal study that assesses the development of conduct problems in community children known as the Healthy Childhood Study (HCS). The children were recruited in Brooklyn, New York when they were 8 to 10 years old (Gao & Zhang, 2015). The original cohort consisted of 340 participants along with their caregivers. This study is part of the third wave of the HCS and consisted of participants from the original cohort as well as new participants. Ninety-two adolescents participated in the task. Participants comprised of 40 female and 52 male aged 13 to 16 years old (Mean age = 14.2, $SD = 0.73$). Ethnicity breakdown is as follows: Caucasian (21.1%), Hispanic/Latino (11.1%), African American (42.2%), Asian/Pacific Islander (3.3%), Native American (1.1%), and Other/Mixed (16.8%). Participants were compensated with \$100 for their participation. The procedure was approved by the university Institutional Review Board. The families were invited to the lab for a 2-hour testing that includes several tasks and questionnaires to be completed by the child and parent. After obtaining parental consent and youth assent, the child performed computer tasks while their physiological responses were recorded. They also completed the Wechsler Intelligence Scale for Children (WISC-V; Wechsler, 2016) and had their hair and nails collected to assess environmental stressors found in such samples. The parent was administered the Clinical Data Interchange Standards Consortium (CDISC). After the tasks are complete, the child and parent completed a set of questionnaires that assesses different psychological measures. Participants also completed a demographic questionnaire regarding age, race, and gender.

Measures

Antisocial Process Screening Device (APSD)

Our version of the APSD is a 14-item questionnaire that is rated on a 3-point Likert Scale ranging from 0 (not at all true) to 2 (definitely true). The APSD assesses the different factors of psychopathic behavior specifically measuring narcissism and impulsivity. Two variables are assessed: narcissism (e.g., “Your emotions are shallow and fake”) and impulsivity (“You act without thinking of the consequences”) in which there are 7 and 5 items per subscale respectively. Our study uses the self-report and parent report versions of this questionnaire. See Appendix A and B for the child and parent versions of the APSD.

Inventory of Callous-Unemotional Traits (ICU)

The ICU is a 24-item questionnaire that is rated on a 4-point Likert scale which ranges from 0 (not at all true) to 3 (definitely true). There are three subscales that are defined as Callousness, Uncaring, and Unemotional. The callousness subscale consists of 11 items (e.g., “I do not care if I get into trouble”), the uncaring subscales consists of 8 items (e.g., “I work hard on everything I do”), and the unemotional subscale consists of 5 items (e.g., “I hide my feelings from others”). We used the Youth Self-Report and the Parent Report for our study which the child and parent filled out respectively. Positively worded items (items 1, 3, 5, 8, 13, 14, 15, 16, 17, 19, 23, 24) were reverse coded before calculating total scores; the higher the score, the more callous-unemotional. See Appendix A and B for the child and parent versions of the ICU.

Physiological Data Collection and Processing

Data was collected and preprocessed using BIOPAC AcqKnowledge (Version 4.2). ECG responses were recorded using EL503 electrodes that are filled with Gel 100. Before application, ELPREP skin preparation gel was applied and rubbed into the skin where the electrodes would be placed. Two electrodes are applied on each child: one just below the right collarbone and the other on the left just above the waistline. ECG data was recorded using a MP150 system.

Baseline heart rate was collected in the beginning and at the end of the experiment. Participants were instructed to sit still while looking at the plus sign on the computer screen for 120 seconds.

They would then hear the following instructions:

"For the next few minutes nothing will happen. All you need to do is sit still without moving your hand and look at the + on the screen."

Countdown Task

During the task, the participants were instructed to sit in front of a computer screen while wearing a set of headphones that they would wear throughout the task. They would hear the following instructions:

"In this situation you will see numbers counting down on the computer screen from 12 to 0. One number will appear every second. When you see the number 0, you will hear a loud noise for one second. Sometimes this loud noise will come on without any warning, however. There is nothing you need to do in this task apart from keeping your head and body as still as you can. Do you have any questions?"

Once the task began, the participants saw a set of numbers counting down to zero on the computer screen. When the countdown reached zero, a one second burst of 105 dB white noise was presented through the headphones. As the task was being administered, the participant's physiological measures were recorded.

Our countdown task consisted of three signaled and two unsignaled trials. In signaled trials, the participants are presented with a visual countdown of numbers which indicates when the noxious stimulus will occur. In unsignaled trials, the participants are not provided with a visual countdown so they will not know when they will be presented with the noxious stimulus.

Our study focused on the signaled trials only because we were examining the response of the participants in anticipation of an event.

Analysis

Analyses on the associations between psychopathic traits, sex, age, and heart rate were examined using IBM SPSS Statistics software Version 25. To determine the A (acceleration) and D2 (deceleration) components, we examined the second-by-second change during the 12 second trial following the previous literature (Wang et al., 2012). For the A the D2 component, the highest heart rate was subtracted by the lowest. We determined which was the A and D2 component by averaging the heart rate change for each second and then converting the data into a graph to establish which parts are accelerating and decelerating. In Wang et al. (2012), their A component is corresponded to seconds 2 to 6, and their D2 component is corresponded to seconds 8 to 12. We aimed to determine if our data also followed this trend. Partial correlations were performed while controlling for age to determine the relationship between heart rate and psychopathic traits. The correlations were found for both self-reported and parent reported psychopathic traits, and for boys and girls separately.

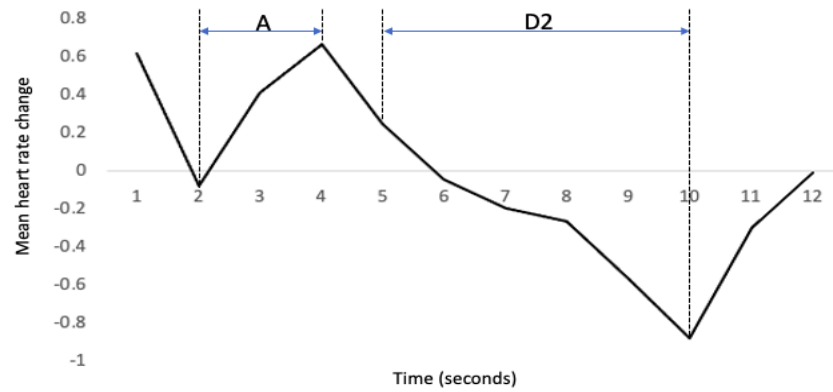
RESULTS

Heart Rate Change Scores

Following Wang et al. (2012), the heart rate responses were determined as change scores by subtracting the mean heart rate during the five-second period before each trial from the heart rate at each second during the 12-second period. Heart rate acceleration (A component) was arranged by seconds 2 to 4, and heart rate deceleration (D2 component) was arranged by seconds 5 to 10 (Figure 1).

Figure 1

Mean heart rate change at A and D2 phases



Descriptive Statistics

Means, standard deviations, skewness, and kurtosis were examined for each variable. See Table 1 for full descriptive statistics for the child report variables, and Table 2 for the parent report variables. Similarly, descriptive statistics for the heart rate measures are included in Table 3.

Table 1

Descriptive Statistics for Self-Reported Psychopathic Traits

Variables	N	Mean	Std. Deviation	Min.	Max.	Skewness		Kurtosis	
						Mean	Std. Error	Mean	Std. Error
Total CU Traits	91	22.6	8.84	7	46	0.54	0.25	0.00	0.50
Uncaring	91	8.39	4.53	1	24	0.61	0.25	0.41	0.50
Unemotional	91	8.14	3.12	2	15	-0.12	0.25	-0.47	0.50
Callousness	91	6.12	3.99	1	18	1.24	0.25	1.01	0.50
Impulsivity	91	3.55	1.96	0	9	0.17	0.25	-6.19	0.50
Narcissism	91	2.54	2.33	0	9	0.91	0.25	0.34	0.50

Table 2*Descriptive Statistics for Parent Reported Psychopathic Traits*

Variables	N	Mean	Std. Deviation	Min.	Max.	Skewness		Kurtosis	
						Mean	Std. Error	Mean	Std. Error
Total CU Traits	90	19.88	9.08	0	43	0.53	0.25	-0.30	0.50
Uncaring	90	9.92	5.23	0	23	0.37	0.25	-0.36	0.50
Unemotional	90	5.31	2.76	0	13	0.29	0.25	-0.34	0.50
Callousness	90	4.64	3.69	0	20	1.27	0.25	2.24	0.50
Impulsivity	89	2.40	1.89	0	8	0.87	0.26	0.26	0.51
Narcissism	89	1.38	1.52	0	5	1.51	0.26	0.42	0.51

Table 3*Descriptive Statistics for HR Acceleration and Deceleration*

Variables	N	Mean	Std. Deviation	Min.	Max.	Skewness		Kurtosis	
						Mean	Std. Error	Mean	Std. Error
Acceleration	92	0.80	4.56	-10.99	12.25	0.01	0.25	0.22	0.50
Deceleration	92	1.12	5.80	-14.19	21.27	0.35	0.25	1.21	0.50

Correlations

A partial correlation was run to determine the relationship between psychopathic traits and heart rate acceleration and deceleration while controlling for age (Table 4). Analyses were run for each gender separately. In boys, high parent-reported Callousness was associated with lower heart rate deceleration, $r(35) = -0.35, p < 0.035$. In girls, heart rate acceleration was positively associated with self-reported total ICU score: $r(44) = 0.30, p < 0.048$, and self-

reported callousness ($r(44) = 0.31, p < 0.039$). As a reminder, a higher ICU score indicates more callous-unemotional traits.

Table 4

Correlations between HR and Psychopathic Traits Across Different Genders

		HR Acceleration		HR Deceleration	
		Boys	Girls	Boys	Girls
Child Report					
	Total ICU	-0.16	0.30*	-0.15	0.12
	Uncaring	0.06	0.21	-0.12	0.29
	Unemotional	-0.29	0.15	-0.02	0.12
	Callousness	-0.14	0.31*	-0.18	-0.17
	Narcissism	0.03	0.03	-0.21	-0.00
	Impulsivity	0.20	0.20	-0.13	-0.04
Parent Report					
	Total ICU	-0.15	0.01	-0.24	-0.15
	Uncaring	-0.27	0.13	-0.01	-0.22
	Unemotional	-0.08	0.04	-0.30	0.10
	Callousness	0.09	0.01	-0.35*	-0.13
	Narcissism	-0.03	-0.09	-0.28	-0.06
	Impulsivity	0.12	-0.22	-0.28	-0.29

*. Correlation is significant at the 0.05 level (2-tailed)

Heart Rate Change

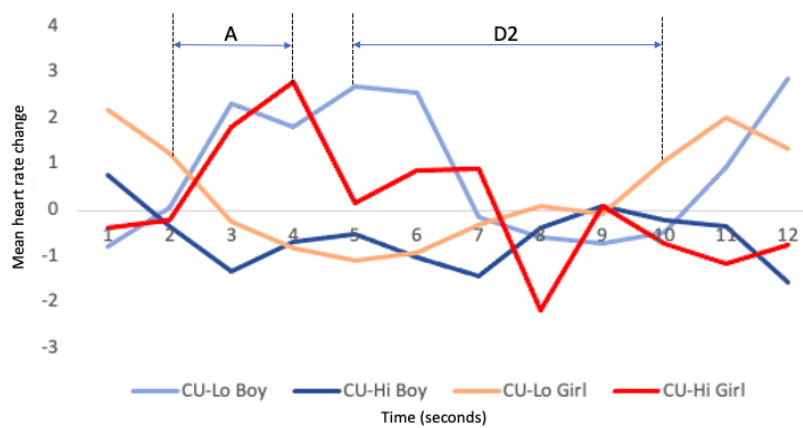
Repeated measures ANOVA was conducted for heart rate changes to examine the interaction between time, psychopathic traits, and sex. No significant result was found for either heart rate acceleration or deceleration. For illustration purposes, the figures of mean heart rate

changes in the high and low groups of psychopathic traits (based on median split) between boys and girls were created separately for parental and child report (Figures 2-4).

Figure 2

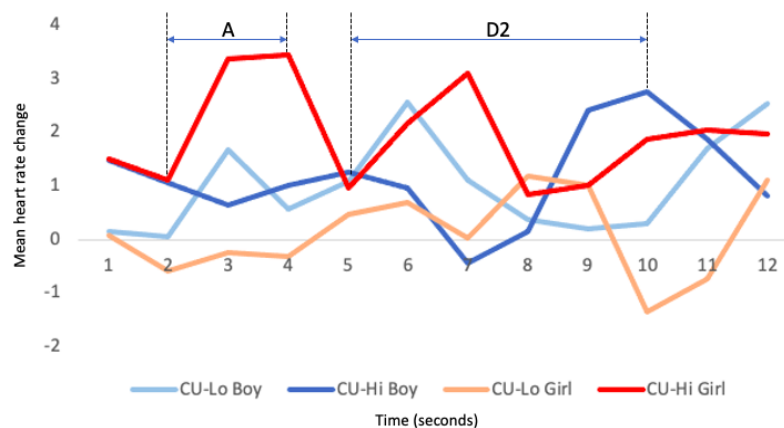
Mean heart rate (HR) change during the A and D2 components for groups with high and low callous-unemotional (CU) traits across sex

a)



Note: Mean HR change for high/low self-reported callous-unemotional (CU) traits

b)

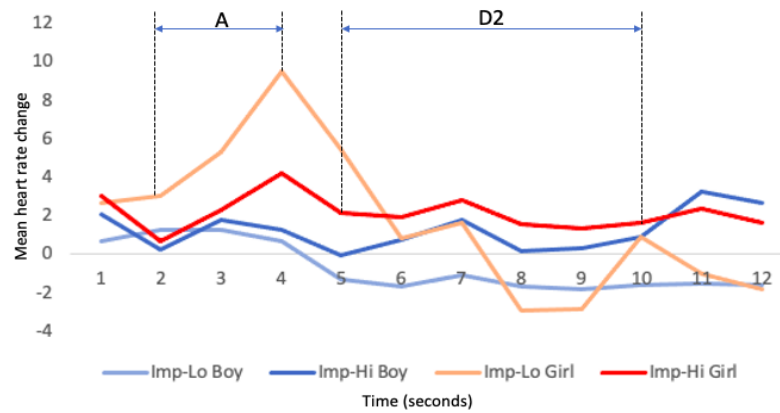


Note: Mean HR change for high/low parent reported CU traits

Figure 3

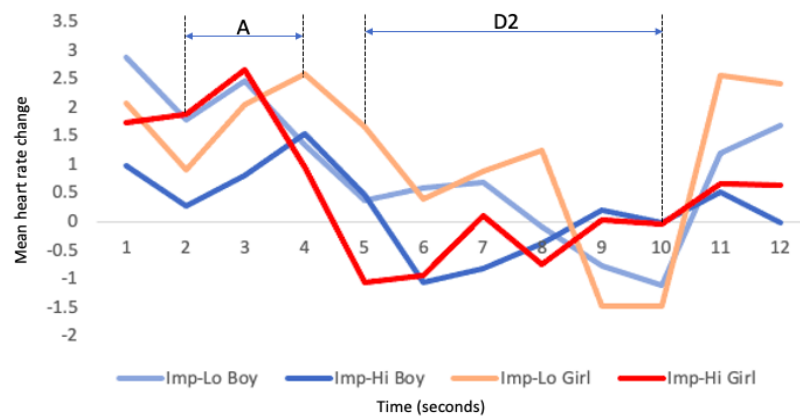
Mean heart rate (HR) change during the A and D2 components for groups with high and low impulsivity traits across sex

a)



Note: Mean HR change for high/low self-reported impulsivity

b)

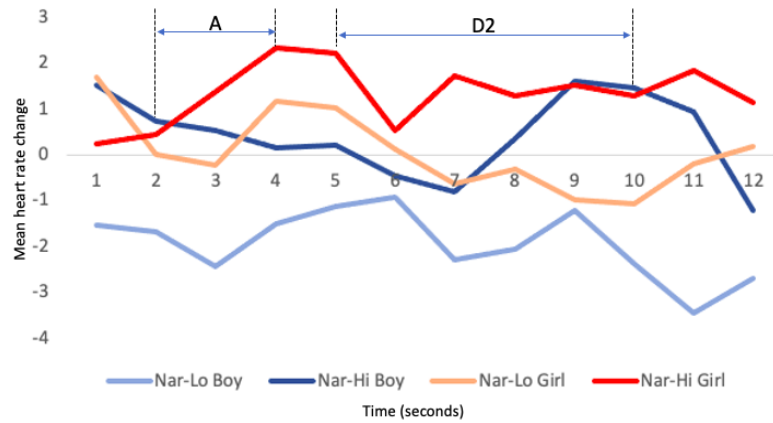


Note: Mean HR change for high/low parent-reported impulsivity

Figure 4

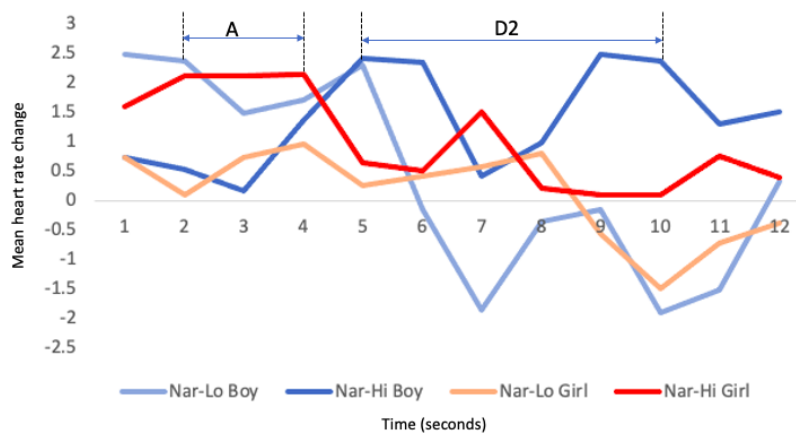
Mean heart rate (HR) change during the A and D2 components for groups with high and low narcissism traits across sex

a)



Note: Mean HR change for high/low self-reported narcissism

b)



Note: Mean HR change for high/low for parent reported narcissism

DISCUSSION

Individuals with psychopathic traits are more likely to commit wrongdoings which can lead to harm in others and create problems for society. As a result, researchers study psychopathic traits to determine the underpinnings and etiology of this condition. By doing so, effective treatment and intervention strategies can be developed to prevent further consequences from occurring. Although there are various studies on psychopathic adults, the development of such traits within the childhood population is still not well known.

There are many deficits that have been associated with psychopathic traits and callous-unemotional traits such as affective impairments, one of which is the lack of anticipatory fear. Our study extends the findings of previous literature to demonstrate the deficient psychophysiological responses in anticipation of a noxious event in adolescents with psychopathic traits. To examine the relationship of anticipatory fear in adolescents with psychopathic traits, we used the countdown task. We hypothesized boys with psychopathic traits will show a lower deceleration in heart rate. Consistent with our hypothesis and previous literature (Wang et al., 2012), our findings revealed that high Callousness was associated with lower deceleration in boys. Furthermore, we found that high callous-unemotional traits were associated with higher heart rate acceleration in girls. Although most of our correlations did not reach statistical significance, probably due to low power, many of the values were close to significance. Therefore, future studies with larger sample sizes are needed to replicate our findings to substantiate this result. Overall, our findings provided further evidence for sex differences in the etiology of psychopathy.

Heart rate acceleration may be contributed to other factors such as anxiety or even disgust. Appraisals of a stimulus that elicits threat or danger can determine possible contributions

to disgust and fear suggesting that heart rate acceleration indicates fear, while heart rate deceleration indicates disgust (Woody & Teachman, 2000). This demonstrates how there is physiologically a distinction from fear and disgust. It is possible that this can be a confound to our study.

An acceleration in heart rate may also contribute to anxiety. When a verbal stimulus is paired with shock, individuals often demonstrate an increased heart rate in anticipation of the aversive stimuli (Deane & Zeaman, 1958; Lacey & Smith, 1954). The change in heart rate may be attributed to increased anxiety levels. Deane and Zeaman (1958) theorized that an aversive stimulus, such as a shock, may either reduce anxiety or convert anxiety into fear. For instance, participants may be relieved that the shock is not as strong as they thought it was. Therefore, researchers believed that heart rate acceleration may indicate strong anxiety, while heart rate deceleration may indicate reduced anxiety. Heart rate acceleration may also be a result of converting anxiety into fear, such that participants become worried just before the onset of the aversive stimulus even though they stopped worrying about the mild shock in advance of it.

Future studies on childhood psychopathy should consider having larger sample sizes. The small sample size in the study is a limitation; only 92 adolescents participated in the experiment. Because of this, the statistical power is low which decreases the chance that a statistically significant result demonstrates an accurate effect size. Measurements of psychopathy also have their shortcomings such as the poor internal consistency from the APSD (de Wied, van der Baan, Raaijmakers, de Ruiter, & Meeus, 2014; Frick et al., 2000). Another shortcoming is how the ICU only measures the component of callous-unemotional traits (Macdougall et al., 2019).

Another issue that requires more research is on the sex differences regarding the physiological correlates of psychopathic traits. The physiological responses in males and females

may differ especially when in response to an aversive stimulus. Regarding the association of physiology and psychopathic traits, the assessment of psychopathic traits may partially influence the sex differences in adolescents. For instance, girls may take part in different forms of antisocial behaviors such as the early use of alcohol and drugs (Wang et al., 2012). Furthermore, the non-specific skin conductance in females differs by season and time of day, a pattern that is not found in males (Venables & Mitchell, 1996; Wang et al., 2012). This can be interpreted as females responding more to changes in their environment compared to males (Venables & Mitchell, 1996). Because research regarding childhood psychopathy is scarce, these findings should be interpreted carefully until there are more replications of these findings in the future.

CONCLUSION

The aim of this thesis was to examine how heart rate abnormality in the countdown paradigm was associated with the affective, impersonal, and behavioral dimensions of psychopathic traits, as well as the anticipatory fear deficits in females and males. Findings revealed that high parent-reported callousness was associated with lower heart rate deceleration among boys. Among girls, high self-reported callous-unemotional traits were associated with higher heart rate acceleration. These findings present further evidence of sex differences in the etiology of psychopathy and call for more research in this area.

APPENDIX

Appendix A

ICU and APSD (Youth Version)

ICU and APSD

(Youth Version)

Instructions: Please read each statement and decide how well it describes you. Mark your answer by circling the appropriate number for each statement. Do not leave any statement unrated.

ICU

	Not at all True	Somewha t True	Very true	Definitely True
1. I express my feelings openly.	0	1	2	3
2. What I think is "right" and "wrong" is different from what other people think.	0	1	2	3
3. I care about how well I do at school or work.	0	1	2	3
4. I do not care who I hurt to get what I want.	0	1	2	3
5. I feel bad or guilty when I do something wrong.	0	1	2	3
6. I do not show my emotions to others.	0	1	2	3
7. I do not care about being on time.	0	1	2	3
8. I am concerned about the feelings of others.	0	1	2	3
9. I do not care if I get into trouble.	0	1	2	3
10. I do not let my feelings control me.	0	1	2	3
11. I do not care about doing things well.	0	1	2	3
12. I seem very cold and uncaring to others.	0	1	2	3
13. I easily admit to being wrong.	0	1	2	3
14. It is easy for others to tell how I am feeling.	0	1	2	3
15. I always try my best.	0	1	2	3
16. I apologize ("say I am sorry") to persons I hurt.	0	1	2	3
17. I try not to hurt others' feelings.	0	1	2	3
18. I do not feel remorseful when I do something wrong.	0	1	2	3
19. I am very expressive and emotional.	0	1	2	3
20. I do not like to put the time into doing things well.	0	1	2	3
21. The feelings of others are unimportant to me.	0	1	2	3
22. I hide my feelings from others.	0	1	2	3
23. I work hard on everything I do.	0	1	2	3
24. I do things to make others feel good.	0	1	2	3

APSD

	Not at all True	Sometimes True	Definitely True
1. You blame others for your mistakes.	0	1	2
2. You engage in illegal activities.	0	1	2
3. You act without thinking of the consequences.	0	1	2
4. Your emotions are shallow and fake.	0	1	2
5. You lie easily and skillfully.	0	1	2
6. You brag a lot about your abilities, accomplishments, or possessions.	0	1	2
7. You get bored easily.	0	1	2
8. You use or "cons" other people to get what you want.	0	1	2
9. You tease or make fun of other people.	0	1	2
10. You do risky or dangerous things.	0	1	2
11. You act charming and nice to get things you want.	0	1	2
12. You get angry when corrected or punished.	0	1	2
13. You think you are better or more important than other people	0	1	2
14. You do not plan ahead or you leave things until the "last minute".	0	1	2

Appendix B
ICU and APSD (Parent Version)

ICU and APSD

(Parent Version)

Completed by: Mother Father Other: _____

Instructions: Please complete the background information above. Then read each statement and decide how well it describes your child. Mark your answer by circling the appropriate number for each statement. Do not leave any statement unrated.

ICU

	Not at all True	Somewhat True	Very true	Definitely True
1. Expresses his/her feelings openly.	0	1	2	3
2. Does not seem to know "right" from "wrong".	0	1	2	3
3. Is concerned about schoolwork.	0	1	2	3
4. Does not care who he/she hurts to get what he/she wants.	0	1	2	3
5. Feels bad or guilty when he/she has done something wrong.	0	1	2	3
6. Does not show emotions.	0	1	2	3
7. Does not care about being on time.	0	1	2	3
8. Is concerned about the feelings of others.	0	1	2	3
9. Does not care if he/she is in trouble.	0	1	2	3
10. Does not let feelings control him/her.	0	1	2	3
11. Does not care about doing things well.	0	1	2	3
12. Seems very cold and uncaring.	0	1	2	3
13. Easily admits to being wrong.	0	1	2	3
14. It is easy to tell how he/she is feeling.	0	1	2	3
15. Always tries his/her best.	0	1	2	3
16. Apologizes ("says he/she is sorry") to persons he/she has hurt.	0	1	2	3
17. Tries not to hurt others' feelings.	0	1	2	3
18. Shows no remorse when he/she has done something wrong.	0	1	2	3
19. Is very expressive and emotional.	0	1	2	3
20. Does not like to put the time into doing things well.	0	1	2	3
21. The feelings of others are unimportant to him/her.	0	1	2	3
22. Hides his/her feelings from others.	0	1	2	3
23. Works hard on everything.	0	1	2	3
24. Does things to make others feel good.	0	1	2	3

CUNY
 University Integrated IRB

APSD

	Not at all True	Sometimes True	Definitely True
1. Blames others for his/her mistakes.	0	1	2
2. Engages in illegal activities.	0	1	2
3. Acts without thinking of the consequences.	0	1	2
4. His/her emotions seem shallow and not genuine.	0	1	2
5. Lies easily and skillfully.	0	1	2
6. Brags excessively about his/her abilities, accomplishments, or possessions.	0	1	2
7. Gets bored easily.	0	1	2
8. Uses or "cons" other people to get what he/she wants.	0	1	2
9. Teases or makes fun of other people.	0	1	2
10. Engages in risky or dangerous activities.	0	1	2
11. Can be charming at times, but in ways that seem insincere or superficial.	0	1	2
12. Becomes angry when corrected or punished.	0	1	2
13. Seems to think that he or she is better or more important than other people.	0	1	2
14. Does not plan ahead, or leaves things to the "last minute."	0	1	2

REFERENCES

- Abend, R., Gold, A. L., Britton, J. C., Michalska, K. J., Shechner, T., Sachs, J. F., & Winkler, A.M. (2020). Anticipatory threat responding: Associations with anxiety, development, and brain structure. *Society of Biological Psychiatry*., 87, 916-925.
doi:<https://doi.org/10.1016/j.biopsych.2019.11.006>
- Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist and 1991 Profile*.
Burlington: University of Vermont, Department of Psychiatry
- American Psychiatric Association [APA] (1952). *Diagnostic and Statistical Manual of Mental Disorders*. Washington, DC: American Psychiatric Pub. 1st ed.
- American Psychiatric Association [APA] (1968). *Diagnostic and Statistical Manual of Mental Disorders*. Washington, DC: American Psychiatric Publ. 2nd ed.
- American Psychiatric Association [APA] (2013). *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*. Maine Avenue SW: American Psychiatric Pub.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blauuw, and L. Sheridan (Eds.), *Psychopaths: Current International Perspectives* (pp. 131–158). The Hague, Netherlands: Elsevier.
- Anderson, N. E., & Kiehl, K. A. (2012). The psychopath magnetized: Insights from brain imaging. *Trends in Cognitive Sciences*, 16(1), 52-60. doi:[10.1016/j.tics.2011.11.008](https://doi.org/10.1016/j.tics.2011.11.008)
- Abend, R., Gold, A. L., Britton, J. C., Michalska, K. J., Shechner, T., Sachs, J. F., & Winkler, A. M. (2020). Anticipatory threat responding: Associations with anxiety, development, and brain structure. *Society of Biological Psychiatry*., 87, 916-925.
doi:<https://doi.org/10.1016/j.biopsych.2019.11.006>
- Anderson, N. E., & Kiehl, K. A. (2012). The psychopath magnetized: Insights from brain

- imaging. *Trends in Cognitive Sciences*, 16(1), 52-60. doi:10.1016/j.tics.2011.11.008
- Arnett, P. A. (1997). Autonomic responsivity in psychopaths: A critical review and theoretical proposal. *Clinical Psychology Review*, 17, 903–936.
- Barry, C. T., Frick, P. J., Deshazo, T. M., McCoy, M., Ellis, M., & Loney, B. R. (2000). The importance of callous–unemotional traits for extending the concept of psychopathy to children. *Journal of Abnormal Psychology*, 109(2), 335-340. doi:10.1037/0021-843x.109.2.335
- Beauchaine, T. P., Hong, J., & Marsh, P. (2008). Sex differences in autonomic correlates of conduct problems and aggression. *Journal of the American Academy of Child and Adolescent Psychiatry*, 47 (7), 788–796.
- Benning, S. D., Patrick, C. J., & Iacono, W. G. (2005). Psychopathy, startle blink modulation, and electrodermal reactivity in twin men. *Psychophysiology*, 42(6), 753-762. doi:10.1111/j.1469-8986.2005.00353.x
- Block, J., & Block, J. H. (1980). *The California Child Q-Set*. Palo Alto, CA: Consulting Psychologists Press.
- Brazil, K., & Forth, A. (2016). Psychopathy checklist: Youth Version (PCL:YV). *Encyclopedia of Personality and Individual Differences*, 1-5. doi:10.1007/978-3-319-28099-8_1102-1
- Casey, H., Rogers, R. D., Burns, T., & Yiend, J. (2012). Emotion regulation in psychopathy. *Biological Psychology*, 92(3), 541-548. doi:10.1016/j.biopsycho.2012.06.011
- Charles, N. E., Acheson, A., Mathias, C. W., Furr, R. M., & Dougherty, D. M. (2012). Psychopathic traits and their association with adjustment problems in girls. *Behav. Sci. Law* 30, 631–642. doi: 10.1002/bsl.2029
- Christian, R. E., Frick, P. J., Hill, N. L., Tyler, L., & Frazer, D. R. (1997). Psychopathy and

- conduct problems in children: II. Implications for subtyping children with conduct problems. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(2), 233-241. doi:10.1097/00004583-199702000-00014
- Cleckley, H. M. (1941). *The mask of sanity*. St. Louis, MO: Mosby Co.
- Cleckley, H. M. (1976). *The mask of sanity (5th ed.)*. St. Louis, MO: Mosby Co.
- Cleckley, H. M. (1988). *The mask of sanity: An attempt to clarify some issues about the so-called psychopathic personality*. Augusta, GA: E.S. Cleckley.
- Deane, G. E., & Zeaman, D. (1958). Human heart rate during anxiety. *Perceptual and Motor Skills*, 8(3), 103-106. doi:10.2466/pms.1958.8.3.103
- DeMatteo, D., Heilbrun, K., & Marczyk, G. (2005). Psychopathy, risk of violence, and protective factors in a noninstitutionalized and noncriminal sample. *International Journal of Forensic Mental Health*, 4(2), 147-157. doi:10.1080/14999013.2005.10471220
- Essau, C. A., Sasagawa, S. & Frick, P. J. (2006). Callous-unemotional traits in a community sample of adolescents. *Assessment*, 13, 454-469.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). *The Psychopathy Checklist: Youth version*. Toronto, ON: Multi-Health Systems.
- Fowles, D. C. (2000). Electrodermal hyporeactivity and antisocial behavior: Does anxiety mediate the relationship? *Journal of Affective Disorders*, 61, 177–189.
- Frick, P. J. (2003). *The Inventory of Callous-Unemotional Traits*. Unpublished rating scale, The University of New Orleans, New Orleans, LA.
- Frick, P. J. (2009). Extending the construct of psychopathy to youth: Implications for

- understanding, diagnosing, and treating antisocial children and adolescents. *Canadian Journal of Psychiatry*, 54(12), 803-812. doi:<https://doi.org/10.1177/070674370905401203>
- Frick, P. J., O'Brien, B. S., Wootton, J. M., & McBurnett, K. (1994). Psychopathy and conduct problems in children. *Journal of Abnormal Psychology*, 103, 700–707.
- Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the Psychopathy Screening Device. *Psychological Assessment*, 12(4), 382-393. doi:10.1037/1040-3590.12.4.382
- Frick, P. J., & Hare, R. D. (2001). *The Antisocial Processes Screening Device*. Toronto, ON: Multi-Health Systems.
- Frick, P. J., & White, S. F. (2008). Research review: the importance of callous-unemotional traits for developmental models of aggressive and antisocial behavior. *Journal of Child Psychology and Psychiatry*, 49(4), 359–375.
- Psychological Assessment*, 12, 382–393. <https://doi.org/10.1037/1040-3590.12.4.382>
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Can callous-unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents? A comprehensive review. *Psychol. Bul.* 140:1–57. doi:10.1037/a0033076
- Fung, M.T., Raine, A., Loeber, R.; Lynam, D.R., Steinhauer, S.R., Venables, P.H., Stouthamer-Loeber, M. (2005). Reduced electrodermal activity in psychopathy-prone adolescents. *Journal of Abnormal Psychology*, 114(2), 187–196. doi:10.1037/0021-843x.114.2.187
- Hall, J. R., & Benning, S. D. (2006). The “successful” psychopath: Adaptive and subclinical

- manifestations of psychopathy in the general population. In C. J. Patrick (Ed.), *Handbook of psychopathy*. New York: Guilford Press.
- Hare, R. D. (1965a). Temporal gradient of fear arousal in psychopaths. *Journal of Abnormal Psychology*, 70(6), 442-445. doi:10.1037/h0022775 (a)
- Hare, R. D. (1965b). Acquisition and generalization of a conditioned-fear response in psychopathic and nonpsychopathic criminals. *The Journal of Psychology*, 59(2), 367-370. doi:10.1080/00223980.1965.10544625
- Hare, R. D. (1965c). Psychopathy, fear arousal, and anticipated pain. *Psychological Reports*, 16, 499–502.
- Hare, R. D. (1978). Electrodermal and cardiovascular correlates of psychopathy. In R. D. Hare and D. Schalling (Eds.), *Psychopathic behavior: Approaches to research* (pp. 107–144). New York: Wiley.
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality and Individual Differences*, 1(2), 111-119. doi:10.1016/0191-8869(80)90028-8
- Hare, R.D. (1985a). *The Psychopathy Checklist*. Unpublished manuscript, Department of Psychology, University of British Columbia, Vancouver, Canada.
- Hare, R.D. (1985b). Comparison of procedures for the assessment of psychopathy. *Journal of Consulting and Clinical Psychology*, 53, 7–16.
- Hare, R. D. (1991). *The Hare Psychopathy Checklist—Revised*. Toronto, ON: Multi-Health Systems.
- Hare, R. D. (2003). *The Hare Psychopathy Checklist—Revised (2nd ed.)*. Toronto, ON: Multi-Health Systems.

- Hare, R. D., & Craigen, D. (1974). Psychopathy and physiological activity in a mixed-motive game situation. *Psychophysiology*, *11*(2), 197-206. doi:10.1111/j.1469-8986.1974.tb00839.x
- Hare, R.D., & Frazelle, J. (1980). *Some preliminary notes on the use of a research scale for the assessment of psychopathy in criminal populations*. Unpublished manuscript, Department of Psychology, University of British Columbia, Vancouver, Canada.
- Hare, R. D., Frazelle, J., & Cox, D. N. (1978). Psychopathy and physiological responses to threat of an aversive stimulus. *Psychophysiology*, *15*(2), 165-172. doi:10.1111/j.1469-8986.1978.tb01356.x
- Hosker-Field, A. M., Gauthier, N. Y., & Book, A. S. (2016). If not fear, then what? A preliminary examination of psychopathic traits and the Fear Enjoyment Hypothesis. *Personality and Individual Differences*, *90*, 278-282. doi:10.1016/j.paid.2015.11.016
- Huang, Y., Wu, T., Gao, Y., Luo, Y., Wu, Z., Fagan, S., . . . Li, X. (2019). The Impact of callous-unemotional traits and externalizing tendencies on neural responsivity to reward and punishment in healthy adolescents. *Frontiers in Neuroscience*, *13*. doi:10.3389/fnins.2019.01319
- Koenigs, M. (2012). The role of prefrontal cortex in psychopathy. *Reviews in the Neurosciences*, *23*(3). doi:10.1515/revneuro-2012-0036
- Lacey, J. I., & Smith, R. L. (1954). Conditioning and generalization of unconscious anxiety. *Science*, *120*(3130), 1045-1052. doi:10.1126/science.120.3130.1045
- Lacey, B. C., & Lacey, J. I. (2017). Studies of heart rate and other bodily processes in sensorimotor behavior. *Cardiovascular Psychophysiology*, 538-564. doi:10.4324/9781315081762-31

- Lang, P. J., Bradley, M., Cuthbert, B. N. (1999). *International affective picture system (IAPS)*. University of Florida, NIMH Centre for the Study of Emotion and Attention.
- Lang, P. J., Davis, M., & Ohman, A. (2000). Fear and anxiety: Animal models and human cognitive psychophysiology. *Journal of Affective Disorders*, 61, 137–159. [http://dx.doi.org/10.1016/S0165-0327\(00\)00343-8](http://dx.doi.org/10.1016/S0165-0327(00)00343-8).
- Levenston, G.K., Patrick, C.J., Bradley, M.M., & Lang, P.J. (2000). The psychopath as observer: Emotion and attention in picture processing. *Journal of Abnormal Psychology* 109 (3), 373.
- Lykken, D. T. (1995). *The antisocial personalities*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers
- Lynam, D. R. (1997). Pursuing the psychopath: Capturing the fledgling psychopath in a nomological net. *Journal of Abnormal Psychology*, 106(3), 425–438. doi:10.1037/0021-843x.106.3.425
- Macdougall, E. A., Salekin, R. T., & Gillen, C. T. (2019). Adolescent psychopathy, heart rate, and skin conductance. *Psychophysiology*, 56(6). doi:10.1111/psyp.13344
- Mechias, M., Etkin, A., & Kalisch, R. (2010). A meta-analysis of instructed fear studies: Implications for conscious appraisal of threat. *NeuroImage*, 49(2), 1760-1768. doi:10.1016/j.neuroimage.2009.09.040
- Mehmet, M.K., Homewood, J., & Stevenson, R. J. (2008). The characteristics of non-criminals with high psychopathy traits: Are they similar to criminal psychopaths?. *Journal of Research in Personality*, 42(3), 679–692. doi:10.1016/j.jrp.2007.09.002
- Munoz, L. C., & Frick, P. J. (2007). The reliability, stability, and predictive utility of the

- self-report version of the Antisocial Process Screening Device. *Scandinavian Journal of Psychology*. 48,299–312.
- Patrick, C. J., Cuthbert, B. N., & Lang, P. J. (1994). Emotion in the criminal psychopath: fear image processing. *Journal of Abnormal Psychology*, 103 (3), 523.
- Patrick, C. J., & Bernat, E. M. (2009). Neurobiology of psychopathy: A two-process theory. In G. G. Berntson and J. T. Cacioppo (Eds.), *Handbook of neuroscience for the behavioral sciences* (pp. 1110– 1131). New York: Wiley.
- Pechorro, P., Ribeiro da Silva, D., Andershed, H., Rijo, D., & Abrunhosa Gonçalves, R. (2016). The youth psychopathic Traits Inventory: Measurement invariance and psychometric properties among Portuguese youths. *International Journal of Environmental Research and Public Health*, 13(9), 852. doi:10.3390/ijerph13090852
- Pihet, S., Etter, S., Schmid, M., & Kimonis, E. R. (2015). Assessing callous-unemotional traits in adolescents: validity of the inventory of callous-unemotional traits across gender, age, and community/institutionalized status. *J. Psychopathol. Behav. Assess.* 37, 407–421. doi: 10.1007/s10862-014-9472-8
- Pihet, S., Suter, M., Meylan, N., & Schmid, M. (2014). Factor structure of the Youth Psychopathic Traits Inventory using the total score, three scale scores, and/or 10 subscale scores. *Crim. Justice Behav.* 41,1214–1231. doi: 10.1177/0093854814540287.
- Ogloff, J. R.P., & Wong, S. (1990). Electrodermal and cardiovascular evidence of a coping response in psychopaths. *Criminal Justice and Behavior*, 17(2), 231–245. doi:10.1177/0093854890017002006
- Raine, A. (1997). *The psychopathology of crime: criminal behavior as a clinical disorder*. London: Academic.

- Ray, J. V., Hall, J., Rivera-Hudson, N., Poythress, N. G., Lilienfeld, S. O., & Morano, M. (2013). The relation between self-reported psychopathic traits and distorted response styles: A meta-analytic review. *Personality Disorders: Theory, Research, and Treatment*, 4(1), 1-14. doi:10.1037/a0026482
- Rutherford, M. J., Alterman, A. I., Cacciola, J. S., & Snider, E. C. (1995). Gender differences in diagnosing antisocial personality disorder in methadone patients. *The American Journal of Psychiatry*, 152(9), 1309–1316.
- Venables, P. H., & Mitchell, D. A. (1996). The effects of age, sex and time of testing on skin conductance activity. *Biological Psychology*, 43(2), 87–101.
- Vitacco, M. J., Rogers, R., & Neumann, C. S. (2003). The Antisocial Process Screening Device: An examination of its construct and criterion-related validity. *Assessment*, 10(2), 143–150. doi:10.1177/1073191103010002005
- Wang, P., Baker, L. A., Gao, Y., Raine, A., & Lozano, D. I. (2012). Psychopathic traits and physiological responses to aversive stimuli in children aged 9–11 years. *Journal of Abnormal Child Psychology*, 40(5), 759-769. doi:10.1007/s10802-011-9606-3
- Wechsler, D. (2016). *WISC-V: Wechsler Intelligence Scale for Children*. London: NCS Pearson.
- Woody, S. R., & Teachman, B.A. (2000). Intersection of disgust and fear: Normative and pathological views. *Clinical Psychology: Science and Practice*, 7(3), 291-311. doi:10.1093/clipsy/7.3.291