Psychopathy and Aggression: Examining the Role of Empathy

by

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Dedication

To My Dad, My Guardian Angel: You will be forever celebrated!
And for all the times you asked me where the other 5% or 10% went . . . here it is!

To My Mom: Thank you for believing in me, for giving me the strength and courage to persevere, and for standing by me every step of the way.

To My Sister: Thank you for being there, for listening, and for keeping me sane. I couldn't have done it without you!

To My Husband: Thank you for your love and support, for your patience and understanding, and for encouraging me to follow my dreams.

To My Family & Friends: Thank you for reminding me that there is more to life than school and books! I am so lucky to be surrounded by so many wonderful people. Love to you all!

Abstract

Empirical research has consistently demonstrated a positive association between psychopathic traits and physical aggression (Campbell, Porter, & Santor, 2004; Gretton, Hare, & Catchpole, 2004; Raine et al., 2006; Spain, Douglas, Poythress, & Epstein, 2004). Moreover, research has also found that the emotional/interpersonal (Factor 1) psychopathy traits tend to be more closely associated with goal oriented, proactive aggression, whereas the social deviance (Factor 2) psychopathy characteristics have been more closely linked to reactive aggression, which is perpetrated in response to threat or provocation (Flight & Forth, 2007). Blair (2004; 2005; 2006) has recently proposed the Integrated Emotions Systems Model (IES), which posits that the association between Factor 1 psychopathy traits and proactive aggression is due to amygdala dysfunction leading to failed moral socialization. Consequently, individuals who exhibit Factor 1 psychopathy traits do not experience affective empathy in response to distress cues exhibited by others, thus, preventing the inhibition of proactive aggression. The current investigation sought to test this model by examining the associations among the emotional/interpersonal (Factor 1) psychopathy traits, proactive aggression, and affective empathy. After accounting for head injury, Factor 2 psychopathy traits, reactive aggression, and cognitive empathy, it was hypothesized that 1) Factor 1 psychopathy traits would predict proactive aggression, and 2) that affective empathy is a common cause of Factor 1 psychopathy traits, proactive aggression, and of the relationship between these two constructs. This hypothesis assumed that (a) affective empathy would uniquely predict Factor 1 psychopathy traits, (b) that affective empathy would uniquely predict proactive aggression, and (c) that affective empathy would account for the

relationship between Factor 1 psychopathy traits and proactive aggression. The total sample consisted of 137 male undergraduate students. Participants completed measures of psychopathy (SRP III; Paulhus, Hemphill, & Hare, in press), aggression (PCS; Marsee, Kimonis, & Frick, 2004; RPQ; Raine et al., 2006), dispositional cognitive and affective empathy (BES; Jolliffe & Farrington, 2006; TES; Spreng, McKinnon, Mar, & Levine, 2009), and situational cognitive and affective empathy in response to neutral and empathy eliciting video clips. Physiological indices (heart rate & electrodermal activity) of affective empathy were also obtained while participants viewed the neutral and empathy eliciting videos. Findings indicated that Factor 1 psychopathy traits predicted proactive aggression. In addition, results demonstrated that affective empathy predicted both Factor 1 psychopathy traits and proactive aggression. However, the association between affective empathy and proactive aggression appeared to be dependent on the conceptualization and measurement of affective empathy. Conversely, affective empathy did not appear to account for the relationship between Factor 1 psychopathy traits and proactive aggression. Overall, results demonstrated partial support for the IES model. Implications of the results, limitations of the study and future research directions are discussed.

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List of Acronyms and Abbreviations

Aff. Emp.	Affective Empathy
BES	Basic Empathy Scale
Cog. Emp.	Cognitive Empathy
Comp.	Composite Score
EDA	Electrodermal Activity
EV	Empathy Video
HR	Heart rate
IES	Integrated Emotions Systems Model
IRI	Davis Interpersonal Reactivity Index
NV	Neutral Video
PA	Proactive Aggression
PCS	Peer Conflict Scale
RA	Reactive Aggression
RPQ	Reactive-Proactive Aggression Questionnaire
SRP III	Self-Report Psychopathy Scale: Version III
TES	Toronto Empathy Scale

Introduction

For centuries researchers and psychologists have strived to achieve a heightened understanding of the potential causes of aggressive and violent behaviour. Theorists have continuously drawn on individual difference variables in their pursuit of such knowledge. From the time of Pinel (1809) and Lombroso (1876), to the slightly more recent works of Kraepelin (1915) and Cleckley (1941), researchers have sought to identify the specific characteristics and personality traits that predispose an individual to engage in such behaviour (Herpertz & Sass, 2000). In doing so, the defining features of psychopathy have repeatedly been identified as precursors or potential causes of violence and aggression (Campbell, Porter, & Santor, 2004; Flight & Forth, 2007; Fritz, Wiklund, Koposov, Klinteberg, & Ruchkin 2008; Gretton, Hare, & Catchpole, 2004; Raine et al., 2006; Spain, Douglas, Poythress, & Epstein, 2004). Although empirical literature has continuously demonstrated a significant relationship between psychopathy and aggression, the specific mechanisms of this relationship remain unclear. However, in an effort to provide a more comprehensive understanding, several theorists have suggested that lack of affective empathy may play an influential role in the aggressive and violent behaviour exhibited by psychopathic individuals (Blair, 2004; Rogstad & Rogers, 2008; Woodworth & Porter 2002). Despite these theoretical assertions, this perspective has yielded little empirical investigation. However, it is plausible that the emergence of both psychopathic traits and various forms of aggression are the result of the considerable lack of affective empathy identified in individuals who express these characteristics and behavioural predispositions. As such, the present study intended to empirically examine a common cause model in which affective empathy was identified as a common cause of

both proactive aggression, the emotional/interpersonal (Factor 1) traits of psychopathy, as well as the relationship between these two constructs. A review of the relevant empirical and theoretical literature on psychopathy, aggression, and empathy is presented below in order to operationalize the constructs examined in the present study.

Psychopathy

The nomenclature used to depict what is now termed "psychopathy" has undergone considerable changes over the past century, beginning with the classification "psychopathic personality", shifting to "sociopathic personality", followed by "antisocial personality" and coming full circle, back to the original term "psychopathic personality or psychopathy" (see Arrigo & Shipley, 2001 for a historical review of the nomenclature associated with psychopathy). The modern conceptualization of psychopathy emerged in the mid twentieth century with the influential works of Hervey Cleckley. In his infamous book, *The Mask of Sanity* (originally printed in 1941; 5th edition printed in 1976). Cleckley depicted the psychopath with a series of sixteen traits and behavioural tendencies, including:

"1. Superficial charm and good intelligence
2. Absence of delusions and other signs of irrational thinking
3. Absence of 'nervousness' or psychoneurotic manifestations
4. Unreliability
5. Untruthfulness and insincerity
6. Lack of remorse or shame
7. Inadequately motivated antisocial behaviour
8. Poor judgment and failure to learn by experience
9. Pathologic egocentricity and incapacity for love
10. General poverty in major affective reactions
11. Specific loss of insight
12. Unresponsiveness in general interpersonal relations
13. Fantastic and uninviting behaviour with drink and sometimes without
14. Suicide rarely carried out
15. Sex life impersonal, trivial, and poorly integrated
16. Failure to follow any life plan" (p. 338-339)

As will be seen in the following literature review, many of the traits and characteristics put forth by Cleckley have been retained in the current conceptualization and assessment of the psychopathic personality; most notably for the present study, the psychopath's lack of remorse, guilt, shame, and empathy. Cleckley (1976) also discussed a theoretical position on the psychopathic personality that was based primarily on the psychopath's lack of emotional experience and subsequent lack of affective empathy. He suggested that, although the psychopath may have the ability to mimic the full range of human emotion, examination of the lived experiences of true psychopaths revealed that they do not fully participate in the affective components of human existence and thus do not experience life in the same capacity as others. Moreover, Cleckley (1976) suggested that although a psychopath may not feel emotion in the same capacity as others, this lack of affectivity does not imply a lack of cognitive understanding and ability to mimic and intellectually express what may be interpreted by some as genuine emotion. Thus, Cleckley (1976) provided one of the first theoretical positions in which the psychopath's apparent capacity for cognitive empathy was distinguished from the extreme lack of affective empathy exhibited by these individuals. In this regard, Cleckley (1976) postulated that "it is entirely impossible for him (the psychopath) to see another person from the aspect of major affective experience, since he is blind to this order of things or blind in this mode of awareness" (p. 373). Consequently, the psychopath's lack of internal affective experience (or affective empathy) prevents him from learning from life experience and participating in appropriate goal directed behaviour. In his theoretical depiction of the psychopath, Cleckley (1976) also alluded to lack of emotional experience leading to boredom and abnormal situational responses, a disregard for the potential

consequence of misdeeds, and a lack of fulfillment and need for excitement and stimulation.

In addition to providing one of the first comprehensive reviews of the modern day psychopath, Cleckley (1976) also discussed how the psychopath may be differentiated from "the ordinary criminal". In a series of brief case studies Cleckley (1976) posited that a true psychopath can be distinguished from "the ordinary criminal" by his/her extreme and deep seated lack of loyalty, remorse, shame, and guilt. Moreover, Cleckley (1976) also discussed extreme superficial charm, egocentricity, and callousness as points of discrepancy. These apparent differences may be called upon to exemplify the divergence between what is currently referred to as "antisocial personality disorder" and that which we now know as "psychopathy". Most notably, it appears to be the deficient or dysfunctional affective and interpersonal traits and tendencies that distinguish "the psychopathic personality" from the solely "antisocial personality". Currently, antisocial personality disorder (ASPD) is defined as "a pattern of disregard for, and violation of, the rights of others" (pp. 685), and the specific diagnostic criteria relies heavily on observable behavioural patterns (American Psychiatric Association [*DSM-IV-TR*], 2000). Although the most recent version, the *DSM-IV-TR*, does list deceitfulness, manipulation, and lack of remorse as possible diagnostic criteria for ASPD, traits such as glibness and superficial charm, grandiosity and egocentricity, shallow emotions and lack of empathy remain specific to psychopathy (*DSM-IV-TR*, 2000; Hare, 1993).

The assessment measure utilized in the present study defines the construct of psychopathy as a combination of deficits in affective and interpersonal functioning and persistent impulsive and antisocial behaviour (Hare, 1993). From this perspective,

psychopathy is predominantly viewed as a two factor structure comprised of emotional/interpersonal traits (Factor 1) and social deviance characteristics (Factor 2; Hare, 1993). Factor 1 represents traits such as superficial charm, grandiosity and egocentricity, and deceitfulness and manipulation, as well as lack of remorse, empathy and guilt, shallow affect or callousness, and a failure to accept responsibility. Factor 2 comprises impulsivity, irresponsibility, and lack goal setting, in addition to poor behaviour controls, early behaviour problems, and juvenile delinquency (Neumann & Hare, 2008).

Empirical literature has demonstrated a correlation of .50 between Factor 1 and Factor 2 psychopathy scores, indicating that the two psychopathy factors are moderately related (Hare, 1991). However, researchers have also shown that each psychopathy factor has unique and differential correlates. For example, the two psychopathy factors are differentially related to the components of the Five-Factor Model of personality, such that Factor 1 of psychopathy has been associated with high levels of antagonism (vs. agreeableness), whereas Factor 2 of psychopathy has been found to be related to high levels of antagonism and low levels of contentiousness (Lynam, 2002; Widiger & Lynam, 1998). Moreover, research has also demonstrated that emotional/interpersonal (Factor 1) psychopathy traits are uniquely correlated with social desirability, self-absorption, self-admiration, and lower state and trait anxiety, whereas, the social deviance (Factor 2) psychopathy traits have been found to be uniquely related to exploitivenesss and entitlement (Zagon & Jackson, 1994). Therefore, based on the research outlined above, the construct of psychopathy can be viewed as two interrelated factors with

differential correlates, indicating that the two factors can fluctuate independent of one another.

A review of the recent empirical literature brings to light the issue of whether psychopathy should be viewed as categorical or dimensional in nature (Wright, 2009). Researchers who maintain a dimensional view of psychopathy (see Edens, Marcus, Lilienfeld, & Poythress, 2006; Guay, Ruscio, Knight, & Hare, 2007; Walters, Duncan, Mitchell-Perez, 2007) would assert that the personality traits traditionally associated with Factor 1 of psychopathy are of greater importance when examining the construct (Wright, 2009). This position would suggest that personality traits fall along a continuum with affected individuals falling at the extremes (Wright, 2009). In contrast, researchers who support a taxometric or categorical view of psychopathy (see Coid & Yang, 2008; Harris, Rice & Quinsey, 1994; Vasey, Kotov, Frick, & Loney, 2005) emphasize the behavioural tendencies generally associated with Factor 2 and contend that psychopaths are fundamentally different from other individuals based on the presence or absence of specific behaviours (Wright, 2009).

In response to the current debate over the structure of psychopathy, Edens and colleagues (2006) conducted an empirical study in which a sample of 867 offenders and substance abusers were assessed for psychopathic traits and behavioural tendencies. Results of various taxometric analyses, which were designed to identify potential qualitative differences between non- psychopaths and psychopaths, revealed that psychopathy is more accurately viewed as a dimensional construct. Moreover, Wright (2009) conducted a review of the available literature concerning the potential dimensional or taxometric structure of psychopathy and concluded that the dimensional approach

elicited greater consistency. However, Wright (2009) acknowledged the prematurity of this conclusion given the limited availability of research in this area and the extreme variability in assessment techniques and methodology in the currently available literature. In light of the conclusions drawn by Wright (2009) and Edens and colleagues (2006), the present study examined psychopathy as fundamentally dimensional in nature. Furthermore, the conceptualization of psychopathy presented herein contends that the key characteristics of Factor 1 (i.e., lack of empathy, remorse, and guilt) are defining features of the construct, and as these traits are more closely aligned with the personality based view of psychopathy, it followed that a dimensional approach was most appropriate.

In addition to the structural composition of psychopathy, researchers have also become interested in the relative stability of the psychopathic personality. Recent longitudinal research, in which 250 participants were assessed at age 13 and again at age 24, revealed that overall psychopathy scores were moderately correlated ($r = .31$; Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007). Furthermore after accounting for SES, parenting strategy, delinquency, and individual differences in impulsivity and IQ, the overall model accounted for 27% of the variance, and total psychopathy scores obtained at age 13 uniquely predicted total psychopathy scores obtained at age 24 ($\beta = .21$; Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007).

Further support for the stability of psychopathy from adolescence through to adulthood has been demonstrated in research conducted by Loney, Taylor, Butler and Iacono (2007). Participants were drawn from the Minnesota Twin and Family Study and included 475 men. Characteristics representing psychopathy (detachment and antisociality) were assessed at ages 16 - 18, and again six years later. Results indicated

moderate stability over the six year time span (*ICC's* = .40 and .41 for detachment and antisocial measures respectively).

Recent Theoretical Perspectives

In recent years, several theoretical positions concerning the psychopathic personality have been discussed. As will be demonstrated in subsequent sections of this review, the expression of psychopathic traits have been consistently linked to aggressive and violent behaviour (Campbell, Porter, & Santor, 2004; Flight & Forth, 2007; Fritz, Wiklund, Koposov, Klinteberg, & Ruchkin 2008; Gretton, Hare, & Catchpole, 2004; Raine et al., 2006; Spain, Douglas, Poythress, & Epstein, 2004). As such the theoretical perspectives regarding the psychopathic personality typically include explanatory mechanisms for the presence of specific traits and characteristics, as well as providing theoretical links for the robust psychopathy-aggression relationship. Some of the more widely recognized theoretical conceptualizations include Frontal Lobe or Executive Function Deficits (Blair, 2005; Gorenstein, 1982; Morgan & Lilienfeld, 2000), the Response Modulation Hypothesis (Newman & Kosson, 1986), the Violence Inhibition Model (Blair, 2001), the Low Fear or Fear Dysfunction Hypothesis (Blair, 2005; Fowles, 2009), the Dual Deficit Pathway Model (Fowles & Dindo, 2006; Fowles & Dindo, 2009), and finally the Integrated Emotion Systems Model (IES; Blair, 2004). The IES model will be discussed at length in subsequent sections of this review.

The Frontal Lobe or Executive Dysfunction Hypothesis posits that deficits in the frontal lobe and in executive functioning lead to aggressive, violent and anti-social behaviour (Blair, 2005; Gorenstein, 1982; Morgan & Lilienfeld, 2000). It is commonly accepted that executive function is closely associated with the frontal lobe region of the

brain and that these areas are responsible for inhibition, planning, organization, and attention. Moreover, executive functions are also thought to have a role in emotional regulation (Morgan & Lilienfeld, 2000). As such, this position suggests that the personality and behavioural characteristics associated with psychopathy are the result of frontal lobe and executive dysfunction. Support for this theory can be drawn from empirical research in which individuals with psychopathic traits and those with frontal lobe lesions obtain similar results on measures of frontal lobe function (Blair, 2005; Gorenstein, 1982). Moreover, a meta-analysis conducted by Morgan and Lilienfeld (2000), which examined the relationship between various indices of antisocial behaviour and executive functioning, demonstrated that groups considered to exhibit high levels of antisocial behaviour received significantly lower scores on measures of executive function than controls.

The Response Modulation Hypothesis has been described as an attention-based stage model (Blair, 2005; Patterson & Newman, 1993). With respect to psychopathy, this theoretical position suggests that psychopathic individuals may acquire a dominant response set for goal-directed behaviour driven by motivation for reward. In turn, this dominant response set negates attentional focus on subsequent aversive or punishment contingencies and therefore prevents passive avoidance learning and emotional processing (Blair, 2005; Patterson & Newman, 1993). Therefore, this position suggests that psychopaths are unable to accommodate novel information and adjust their behaviour accordingly (Blair, 2005; Patterson & Newman, 1993).

The Violence Inhibition Model of psychopathy (VIM: later adapted and combined with the low fear hypothesis to create the Integrated Emotion Systems model; Blair,

2005) provides a sufficient conceptualization of the well documented link between psychopathy and aggression (Campbell, Porter & Santor, 2004; Flight & Forth, 2007; Gretton, Hare, & Catchpole, 2004; Spain, Douglas, Poythress & Epstein, 2004). In brief, this position posits that, when a possible victim exhibits distress cues in the form of sad or fearful expressions, a potential perpetrator would have an aversive emotional response, which in turn would activate the violence inhibition mechanism and therefore prevent violent and aggressive behaviour. The VIM is thought to be defective among individuals high in psychopathy, providing a potential explanation for the aggressive behaviour observed among psychopathic individuals.

The low fear or fear dysfunction hypothesis, which was initially proposed by Lykken, is based on the notion that anticipation of punishment contingencies leads to appropriate moral socialization (Blair, 2005). Moreover, this theoretical perspective suggests that psychopaths lack the anticipatory fear that is typically associated with punishment contingencies. As such, individuals high in psychopathy do not inhibit inappropriate goal directed (and potentially aggressive) behaviour due to the fear of punishment (Blair, 2005; Fowles, 2009).

The final theoretical model is the Dual Deficit Pathway Model, which can be closely associated with assessment-based definitions of psychopathy (Fowles & Dindo, 2006, Fowles & Dindo, 2009). This theoretical model proposes two separate etiological pathways for each psychopathy factor. It is suggested that Factor 1 may be the result of an interaction between low levels of anticipatory fear (as proposed in the low fear hypothesis; Blair, 2005; Fowles, 2009) and social-environmental processes, and that Factor 2 may be better accounted for by cognitive regulatory and control processing

deficits, such as those outlined in the frontal lobe or executive function deficit hypothesis and the response modulation hypothesis. However, the authors did point out that the presence of distinct etiological pathways does not imply that psychopathic individuals will present with characteristics that represent only one or the other factor. Moreover, as discussed above, empirical research suggests that the two psychopathy factors are highly related to each other but also have unique external correlates (Fowles & Dindo, 2006; Fowles & Dindo, 2009; Lynam, 2002; Widiger & Lynam, 1998).

One potential limitation of the aforementioned theoretical perspectives is that these positions neglect to provide a clear and sufficient explanation for both the aggressive behaviour and extreme lack of remorse, guilt, shame, and specifically, empathy exhibited by psychopathic individuals. The Integrated Emotion Systems model (IES: discussed at length in subsequent pages of this review) accounts for such aggression and lack of affectivity and emotionality, and as such provided the theoretical foundation on which the present study is based. In brief, the IES model posits that psychopathic characteristics and behavioural tendencies result from dysfunction in the orbital/ventrolateral frontal cortex and the amygdala. Dysfunction in these regions of the brain are thought to prevent psychopathic individuals from effectively altering behavioural responses following contingency change, and from engaging in appropriate moral socialization, which in turn leads to higher rates of aggressive behaviour.

The construct of psychopathy is typically examined within incarcerated and forensic samples, however, the IES model may provide an explanation for the emergence of psychopathic traits among both forensic and community samples. Several theorists have proposed the existence of what has been termed "the successful psychopath" (Hare,

1993). These individuals tend to score high on subclinical measures of psychopathy, but have (thus far) avoided contact with the criminal justice system (Neumann & Hare, 2008). Despite the inclusion of the term "successful" in this depiction of the non-incarcerated subclinical psychopath, research has concluded that possessing the traits associated with psychopathy is unrelated to success in life (Ullrich, Farrington, & Coid, 2008). Moreover, negative outcomes of the psychopathic personality, such as higher rates of violent and aggressive behaviour have been identified within community samples (Neumann & Hare, 2008). However, more community based empirical research is needed to specify the intricacies of the psychopathy-aggression relationship, and to identify the specific role that empathy may play in this relationship.

Physical Aggression and Identified Subtypes

As previously noted, aggressive and violent human behaviour has captured the interest of psychological researchers for centuries. Bushman and Anderson (2001) have defined aggression as behaviour intended to be harmful to another individual. Moreover, this definition requires that the aggressor deem that the behaviour will in fact be harmful to the intended victim as well as that the intended victim should be motivated to avoid the harmful or aggressive behaviour.

A closer exploration of the characteristics of physical violence has led researchers to identify two specific subtypes of aggressive behaviour, namely reactive (hostile) and proactive (instrumental) aggression (Card & Little, 2006; Dodge, 1991). The distinction between the two subtypes is based primarily on motivation and function. Proactive aggression is defined as being instrumental in nature. It is motivated by potential attainment of personal goals and is perpetrated for personal gain (Dodge, 1991). In

contrast, reactive aggression is considered to be emotionally motivated, is perpetrated in response to perceived threat or provocation, and is generally accompanied by increased autonomic activity (Dodge, 1991).

These two types of aggression can be conceptualized as two independent but interrelated constructs. Support for this conceptualization comes from research conducted by Raine and colleagues (2006) in which the structure and external correlates associated with each form of aggression were examined. Both forms of aggression were assessed in a sample of 334 boys at age 16. Results indicated that the two factor model of proactive and reactive aggression was a better fit than the one factor model of general aggression. Due to the high intercorrelation between raw reactive and proactive scores ($r = .67$) the authors created residualized scores to examine the unique associations between each form of aggression and various potential external correlates. Results using the residualized aggression scores indicated that reactive aggression at age 16 was uniquely associated with impulsivity, lack of close friendships, and social anxiety, whereas proactive aggression at age 16 was uniquely associated with blunted affect, violent offending, and psychopathy. These findings provide support for the conceptualization of aggression as a two factor structure.

The body of literature concerning reactive and proactive aggression has primarily been limited to child and adolescent community and at-risk samples. Very few studies have examined these constructs within adult community samples. Perhaps the limited scope of this literature is the result of methodological issues surrounding the measurement and assessment of the aggression subtypes. For example, most available measurement indices were designed for use with offender samples and require coding of

file information, or were designed for use with children and adolescents and involve parent and teacher rating scales. However, a study conducted by Miller and Lynam (2006), which employed a newly designed measure of reactive and proactive aggression (the Reactive-Proactive Aggression Questionnaire; Raine et al., 2006) in a young adult community sample, provided support for the use of self-report measures designed to assess the subtypes of aggression. Although the measure was originally designed for use with adolescent populations, this study suggests it is also a useful index of reactive and proactive aggression among adult community samples. Additionally, this self-report measure was employed for the first time with an adult offender sample by Cima and Raine (2009) providing additional support for use of this measure with adults.

Theoretical Perspectives on Aggression

Various psychologists have proposed theoretical conceptualizations intended to provide etiological explanations for the presence and persistence of aggression and violence Some of the more widely recognized theoretical explanations include the social learning theory of aggression (Bandura, 1978), script theory (Huesmann & Eron, 1989), the frustration-aggression hypothesis, which was reformulated into the cognitive-neoassociationistic perspective (Berkowitz, 1989; Berkowitz, 1990), and finally, the general aggression model (Anderson & Bushman, 2002; Bushman & Anderson, 2002).

The social learning theory outlined by Bandura (1978) examines various origins, instigators, and regulators of aggressive behaviour. Bandura suggested that aggressive behaviour originates with observational learning, is instigated by modelling, aversive punishment and incentives, and is regulated by external, vicarious, and self-reinforcement, and punishment. Moreover, Bandura also indicated that the experience of

aversive reinforcement or punishment leads to emotional arousal and cognitive appraisal in the form of anticipation of consequence, which in turn can result in various behavioural responses, one of which is aggression. This theoretical perspective suggests that some individuals may engage in aggressive behaviour because they associate their aggressive acts with internal reinforcement in the form of enhanced self worth rather than with internal disapproval or feelings of remorse, guilt, shame, and empathy. Moreover, this theoretical position also implies that individuals may avoid self-evaluation completely through moral justification, minimization of potential consequences, displacement and diffusion of responsibility, and victim blame and dehumanization. This particular theory provides a potential explanation for engagement in "proactive" forms of aggression.

In contrast to the social learning theory, script theory (Huesmann & Eron, 1989) views aggressive behaviour as a personality trait that is innate to the individual. However, this position also posits that such a predisposition can be exacerbated or mitigated based on learning conditions. Script theory is a cognitive information processing model that incorporates the notion of behavioural scripts. It is suggested that cognitive scripts for behaviour are encoded and rehearsed and subsequently recalled from memory to guide an individual's actions by facilitating the assessment and understanding of environmental cues, and determining the appropriate behavioural response based on potential consequences and internalized social norms. According to this position, the emergence of habitual aggressive behaviour can occur for several reasons including: hostile interpretations of environmental cues promoting the retrieval of aggressive behavioural scripts; error in the evaluation and application of appropriate behavioural scripts due to an

inability to accurately foresee the consequences of aggressive behaviour as a result of previous positive reinforcement or repeated exposure to positively reinforced aggression; lack of internalized social norms regarding the inappropriateness of aggression; and finally, the emotional state or arousal level of the individual, such that aggressive scripts are more likely to be retrieved in states of anger or high arousal.

The cognitive-neoassociationistic model (Berkowitz, 1989; Berkowitz, 1990), derived from the frustration aggression model (not discussed here; see Dollard, Doob, Miller, Mowrer, & Sears, 1939 for details), proposes a link between negative affect, anger and aggression. More specifically, it is suggested that aversive, uncomfortable or unpleasant experiences produce feelings of negative affect resulting in two simultaneous automatic responses, escape and aggression. These automatic responses bring about specific memories, feelings, expressive motor reactions, and physiological changes. The strength of each response is influenced by learned, genetic, and situational factors. Awareness of escape reactions are considered to produce fear, whereas awareness of the aggression reaction is thought to result in anger. These initial automatic responses are followed by cognitive appraisal and attribution during which the initial automatic responses are either exacerbated or mitigated depending on arousal levels, and by the potential development of more complicated emotions such as depression, guilt, and anxiety. It is also during this stage of appraisal and attribution that individuals consider potential consequences and desired goals. This theoretical conceptualization can be drawn upon to explain why individuals might engage in "reactive" forms of aggression.

Finally, the general aggression model, proposed by Anderson and Bushman (2002) is an integration of several theoretical perspectives. This position focuses on

inputs (person or situation), routes of impact (arousal, cognition and affect), and outcomes (based on appraisal and decision making). Person inputs include variables such as sex, genetic predispositions, personality traits, attitudes and values, and desired goals, whereas situational inputs involve provocation, aggressive cues, incentives, frustration, and discomfort. The routes of cognitive impact include hostile thoughts, and aggressive behavioural scripts, whereas the routes of affective impact involve expressive motor responses (facial reactions), and mood and emotion (which can be related to personality variables). Finally, the arousal route of impact accounts for the influence of irrelevant sources of arousal and the potentially aversive states of high and low arousal. These various routes of impact are thought to be highly interconnected. Finally, the outcomes are based on automatic immediate appraisal (consideration of goals, affect, and intention) and cognitive reappraisal (if the perceived outcome of immediate appraisal is not in line with desired goals) followed by a decision to act in a given manner. The final behavioural response may or may not involve aggression, dependent on the inputs, the routes of impact, and the perceived outcomes. This particular theoretical position allows for consideration of the potential roles of the psychopathic personality and lack of empathy in promoting aggressive behaviour.

Psychopathy and Proactive Aggression

Proactive aggression is often considered to be a correlate of psychopathy as the empirical literature has consistently demonstrated a significant positive relationship between psychopathic traits and proactive aggressive behaviour among adult offender populations (Cima & Raine, 2009; Woodworth & Porter, 2002). For example, research conducted by Woodworth and Porter (2002) on a sample of homicidal offenders, ages 18

to 67 years, found that 93% of the homicides committed by psychopaths could be classified as proactive. Moreover, the relationship between psychopathy and proactive aggression has also been indentified among adolescent offender populations. To demonstrate, a study conducted by Flight and Forth (2007), in which 51 incarcerated male adolescent (*M age* = 17.10, SD = 0.88) were assessed, reported that total psychopathy scores, as well as Factor 1 and Factor 2 scores were all significantly positively associated with proactive aggression (*r*'s = .38 - .59). These studies, among others, provide considerable support for the positive psychopathy-proactive aggression relationship.

In recent years, researchers have worked to provide a more precise representation of the psychopathy-proactive aggression relationship by placing greater emphasis on the role of the specific factors of psychopathy in determining the likelihood of heightened proactive aggression. This line of research has demonstrated that the emotional/interpersonal factor of psychopathy (Factor 1) is related to, and is the strongest predictor of, proactive aggression (Cima & Raine, 2009; Flight & Forth, 2007). Once again, support for this conclusion is predominantly found within offender samples. For example, the study conducted by Flight and Forth (2007; discussed above) reported that, when entered simultaneously into a logistic regression analysis, only the interpersonal/affective factor (Factor 1) contributed to a higher likelihood of proactive aggression. Additionally, research conducted by Cima and Raine (2009) on 121 adult male inmates found that Factor 1 (fearless dominance) of the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), which mirrors the external correlates of Hare's (1993) depiction of the emotional/interpersonal factor of psychopathy (Benning,

Patrick, Hicks, Blonigen, & Krueger, 2003), was significantly related to higher rates of self-reported proactive aggression.

As previously noted, the majority of psychopathy research is conducted with incarcerated samples and, as such, to date there has been very little research examining the relationship between subclinical psychopathy and proactive aggression in adult community samples. One such study conducted by Falkenbach and colleagues (2008) did explore the relationship between psychopathy and proactive aggression in a community university sample (*M age* = 21.46, *SD* = 4.56). In this study, aggression ratings were based on personal accounts of aggressive behaviour provided by the participants, and aggressive behaviour was coded as either combined (both proactive and reactive) or primarily reactive. The rationale for examining a combined group rather than a solely proactive group was that all participants who reported an act of proactive aggression also reported acts of reactive aggression. Additionally, the study examined psychopathy from a different theoretical position, in which individuals are classified as exhibiting primary or secondary psychopathy-like traits. From this perspective of the psychopathic construct, primary psychopathy characteristics include higher levels of emotional/interpersonal (Factor 1) traits, and secondary psychopathy characteristic reflect higher levels of social deviance (Factor 2) traits. Results of the study indicated that 51.2% of the individuals who were classified as having primary psychopathy traits reported incidents of proactive aggression (coded as combined), whereas only 18.8% of the individuals classified as having secondary psychopathy traits were involved in incidents of proactive aggression (coded as combined). As such, the presence of proactive aggression motives were more clearly represented among individuals who exhibited the emotional/interpersonal (Factor

1) traits of psychopathy. Therefore, the relationship between the emotional/interpersonal (Factor 1) traits of psychopathy and proactive aggression has been demonstrated in both incarcerated samples and in a community sample.

Psychopathy and Reactive Aggression

The association between psychopathy and reactive aggression is not quite as clear as the relationship between psychopathy and proactive aggression. Although some researchers have demonstrated a significant positive relationship between psychopathy and reactive aggression (Cima & Raine, 2009; Fite, Stoppelbein, & Greening, 2009; Flight & Forth, 2007), others have suggested that the constructs are unrelated (Vitacco, Rybroek, Rogstad, Yahr, Tomony, & Saewert, 2009). A significant positive relationship between the two constructs was demonstrated in the study conducted by Cima and Raine (2009; discussed above). Results of the study indicated that Factor 2 of the PPI (impulsive-antisociality), which is comparable to the social deviance (Factor 2) characteristics of psychopathy, was significantly associated with higher rates of reactive aggression. As previously noted, others have indicated that psychopathy and reactive aggression are unrelated constructs. For example, findings of a recent study in which 152 male forensic inpatients were assessed, indicated that psychopathic traits did not predict reactive aggressive tendencies (Vitacco et al., 2009).

As with proactive aggression, researchers have also tried to pinpoint the specific traits of psychopathy that contribute to higher rates of reactive aggression. Of the studies that did report a significant positive relationship between psychopathy and reactive aggression, it appears that the social deviance (Factor 2) traits are most clearly related to, and are the strongest predictors of, reactive aggression (Cima & Raine, 2009; Falkenbach

et al., 2008; Fite, Stoppelbein & Greening, 2009; Flight & Forth, 2007). Once again, support for this conclusion is primarily drawn from research conducted on offender samples. For example, the study discussed above conducted by Flight and Forth (2007) revealed that it was only the social deviance factor of psychopathy that predicted rates of reactive aggression.

Although a large portion of the research in this area has focused on forensic populations, there is some recent evidence that the association between the social deviance (Factor 2) traits of psychopathy and higher rates of reactive aggression can also be found within community samples. In the study conducted by Falkenbach and colleagues (2008; detailed methodology discussed above), it was reported that of the individuals classified as expressing the characteristics associated with secondary psychopathy (comparable to social deviance traits; Factor 2), 81.3% engaged in reactive aggression, whereas only 48.8% of the individuals classified as expressing primary psychopathy characteristics (comparable to emotional/interpersonal traits; Factor 1) engaged in reactive aggression. According to these results, it appeared that individuals scoring higher on the social deviance factor of psychopathy were more likely to engage in reactive forms of aggression. Thus, the positive social deviance (Factor 2) - reactive aggression relationship has been demonstrated in forensic samples, to a limited extent in community samples.

When reviewing the literature concerning the relationships among the factors of psychopathy and the subtypes of aggression, the relationship between the emotional/interpersonal (Factor 1) psychopathy traits and proactive aggression appears to be the more robust finding. As such, the present study was designed specifically to

examine the possible mechanisms underlying the link between Factor 1 psychopathy traits and proactive aggression while accounting for the possible relationship between Factor 2 psychopathy traits and reactive aggression.

As evidenced above, empirical research has demonstrated a significant positive relationship between psychopathy and aggression (Campbell, Porter, & Santor, 2004; Flight & Forth, 2007; Fritz, Wiklund, Koposov, Klinteberg, & Ruchkin 2008; Gretton, Hare, & Catchpole, 2004; Raine et al., 2006; Spain, Douglas, Poythress, & Epstein, 2004). However, it is important to address the possibility of potential measurement confounds when assessing these constructs. A review of the questionnaire items used to assess psychopathy and aggression revealed that a number of items used in the assessment of psychopathy are similar to those employed in the assessment of aggression. As such, it is possible that the repeatedly identified relationship between these two constructs is due to overlap in measurement. This issue is rarely discussed in the literature and therefore, the present study aimed to account for these possible measurement confounds.

Empathy

As indicated throughout the previous literature review, several theorists have suggested that lack of empathy may play an influential role in the psychopathy-aggression relationship (Blair, 2004; Rogstad & Rogers, 2008; Woodworth & Porter 2002). Empathy has been defined as "understanding and sharing in another's emotional state or context" (Cohen & Strayer, 1996, pp. 88). This definition of empathy conceptualizes the construct as being both an affective and a cognitive process (Blair, 2008). Cognitive empathy is based on perspective taking and displaying an accurate

cognitive understanding of another's feelings and situation. In contrast, affective empathy is defined as an emotional response to another's feelings. Because psychopaths are thought to be deficient in affective empathy, but not cognitive empathy (Cleckley, 1976; Blair, 2008), the present study focused primarily on affective empathy. Furthermore, as affective empathy is considered to be an emotional response and emotional responding is characterized by changes in physiological arousal levels (Lorber, 2004), the present study incorporated both self-report measures and measures of physiological arousal, including heart rate (HR) and electrodermal activity (EDA) as indices of affective empathy. Moreover, in an effort to assess general empathy levels, as well as empathic responding in specific situations, self-report measures of both dispositional and state (in response to an empathy eliciting video) empathy were included.

One theoretical perspective concerning empathic responding is the Organizational Model of Empathy (Davis, 1996). This is a process-based model that allows for consideration of both cognitive and affective empathic processes. The model posits that empathic episodes begin with antecedents, followed by specific processes that produce empathic responding and result in intrapersonal and interpersonal outcomes. The antecedents include both situational and person related variables and allow for consideration of specific personality traits and individual differences in the capacity to engage in both cognitive and affective empathy. The various processes identified in the model include: non-cognitive processes such as the automatically experienced affect in response to observed emotion and mimicry; simple cognitive process, including labelling or the association of a specific environmental cue with a given emotion; and advanced cognitive processes, which include role or perspective taking abilities. The intrapersonal

outcomes outlined in the model can include emotional responses such as parallel outcomes, where the observer experiences the same emotions as the observed individual, and reactive outcomes where the observer experiences an emotional reaction that is different from the emotion exhibited by the observed individual. The intrapersonal outcomes can also include non-affective outcomes such as interpersonal accuracy, which is the correct deduction of the other people's feelings and thoughts. Finally, the interpersonal outcomes are behaviourally based and can result in prosocial helping behaviour or aggressive behaviour. This model allows for consideration of the notion that psychopathic individuals do not have sufficient capacity to engage in affective empathy, which in turn prevents the automatic non-cognitive processes and the parallel intrapersonal outcomes from occurring, leading to potentially aggressive interpersonal outcomes.

A more recent conceptualization of empathy is the perception action model presented by Preston and De Waal (2002). This model is also a process-oriented conceptualization of empathy and relies on automatic and unconscious processes to explain the affective empathic response. It is suggested that when an individual's attentional focus is directed towards the emotional state of another person that the perception action mechanism is activated and, subsequently, the observer experiences automatically produced neural representations of the observed emotional state. This automatic neural representation then activates the automatic and somatic nervous system promoting a visible behavioural response. Thus, the observer experiences the same emotions as the individual being observed and as such should respond accordingly, typically with helping or sympathetic behaviour. The ease of this process is thought to be

facilitated by similarity and social closeness between the observer and the individual experiencing the emotion.

Mealey and Kinner (2002) suggested that this theoretical perspective can be applied to the psychopathic personality as they propose that psychopaths either do not possess the neural representations proposed to be automatically produced during the observation of another's emotions, or that these neural representations do not lead to the activation of the autonomic and somatic nervous systems. Thus, psychopaths do not respond to another individual's emotional displays in expected and appropriate ways because they do not personally experience or have cognitive representations of the full range of emotions, or that the elicitation of these cognitive representations does not naturally lead to helping or sympathetic behaviour.

In recent years, psychologists and researchers have sought out various methodologies for the assessment and measurement of affective and cognitive empathy. Whereas questionnaire and self-report measurement tools are generally employed in the examination of both forms of empathy, researchers have also used physiological indices such as heart rate and electrodermal activity to examine arousal based affective empathy. Affective empathic arousal is typically examined following the presentation of visual or auditory sensory stimuli.

Currently, there is considerable debate in the literature concerning the interpretation of physiological changes as an index of affective empathic responding. With respect to empathic arousal, Zhou, Valiente, and Eisenberg (2003) differentiate between feelings of sympathy which arise when attention is focused outward towards the emotional experience of others, and feelings of personal distress which occur when the

individuals is focused on their own internal emotional experiences. In this vein, sympathetic affective empathy arousal should be associated with decelerations in HR, whereas distress should be accompanied by HR acceleration. Additionally, Zhou, Valiente, and Eisenberg (2003) indicate that increases in electrodermal activity should be greater when experiencing internalized personal distress than when experiencing outward focused sympathy.

Conversely, in addressing the physiology of empathy other researchers (i.e. Levenson & Ruef, 1992; Preston & de Waal, 2002) have discussed the concept of physiological linkage, which implies a matching of physiology between the actor and the observer. In this instance the personal distress and heightened physiological arousal (HR and EDA) experienced by the actor should be mirrored in the observer, whereby accelerations in HR and increased EDA would indicate empathic responding. Thus, although researchers tend to agree that empathic arousal in some capacity (i.e., personal distress or physiological linkage) is likely to be associated with increased EDA, there appears to be some debate as to whether affective empathic arousal is associated with accelerations or decelerations in HR. To date there appears to be a considerable lack of empirical literature in which both physiological arousal and self-reported affective empathy have been assessed. As such, as stated above, the present study added to the literature by using both self-report and physiological measures of empathy.

Empathy and Psychopathy

From a theoretical perspective, it has been acknowledged that lack of empathy is one of the defining features of psychopathy. However, little empirical research has been done to examine the specific relationship between psychopathy and empathy.

Nevertheless, there is some empirical evidence indicating that higher levels of psychopathic traits predicts lower levels of empathy in both offender and community samples (Dadds et al., 2009; Flight & Forth, 2007; Mullins-Nelson, Salekin, & Leistico, 2006). For example, research conducted by Mullins-Nelson and colleagues (2006) on a community sample of undergraduate university students reported a significant negative relationship between psychopathy and affective empathy.

Additionally, a study conducted by Zagon and Jackson (1994), which was designed to assess the construct validity of an earlier version of the psychopathy measure being used in the present study (SRP III; Paulhus, Hemphill, & Hare, in press), found that within a sample of 149 undergraduate students, the total psychopathy score and both the emotional/interpersonal (Factor 1) and social deviance (Factor 2) scores were negatively related to scores on the personal distress subscale of the Davis Interpersonal Reactivity Index (IRI; Davis, 1980). The IRI is a self-report measure of empathy and the personal distress subscale was designed to assess an individual's personally experienced reaction to the distress of others. Furthermore, the study conducted by Flight and Forth (2007) discussed previously in this thesis also reported a significant negative relationship between empathy and total psychopathy scores, as well as the emotional/interpersonal (Factor 1) and social deviance (Factor 2) psychopathy scores.

As the current study utilizes physiological measures of empathy, a brief introduction to the typical physiological responding found among psychopathic individuals is warranted. Empirical research has demonstrated that individuals who exhibit psychopathic traits tend to display physiological hyporeactivity, specifically with respect to electrodermal activity. For example, Lorber (2004) conducted a meta-analysis

examining the relationship between psychopathic traits and physiological responding across multiple studies. The physiological indices of HR and EDA were classed as resting (during a baseline or resting state), task (in response to stimulus presentation), and reactivity (as a change in reactivity from a resting state as a function of stimulus presentation). Results of the meta-analysis demonstrated a significant negative association between psychopathy and EDA across all three classifications. Notably, the negative relationship between psychopathy and EDA in the task classification was specific to stimuli with negative valence. Although the reported effect sizes were small, results of the meta-analysis suggested that individuals displaying psychopathic traits tend to exhibit electrodermal hyporeactivity. Interestingly, across all three classifications, no relationship was found between HR and psychopathic traits, suggesting that the physiological hyporeactivity found among individuals who display psychopathic traits is limited to electrodermal activity. This line of research could indicate that the lack of physiological responsiveness generally found among psychopathic individuals may be indicative of a lack of affective empathic responding.

As with the psychopathy-aggression relationship, it is also important to address the possibility of measurement confounds as a potential explanation for the psychopathy-empathy relationship. Lack of empathy has been identified as a defining feature of psychopathy (Hare, 1993) and is included in the assessment of the construct. As such it is possible that the relationship between psychopathy and empathy is due to overlapping measurement items. Once again, this issue has not been adequately addressed in the empirical literature. Therefore, the current study accounted for the possibility of potential measurement confounds.

Empathy and Aggression

Empathy is often viewed as a positive characteristic that is associated with heightened levels of prosocial behaviour (Eisenberg, Eggum, & Edwards, 2010). As such, the research concerning empathy and aggression is limited. A study conducted by Mayberry and Espelage (2007) investigated the relationship between empathy and aggression among young adolescents and reported that when compared to individuals who did not exhibit aggressive behaviour, those who did exhibit aggressive behaviour scored significantly lower on measures of affective and cognitive empathy.

Additionally, research has also demonstrated that heightened levels of callous-unemotional traits are related to heightened rates of aggressive behaviour (Frick & White, 2007). Although callous-unemotional traits may not be synonymous with empathy, these traits do involve a lack of empathy, as well as a lack of guilt and the callous use of others. A literature review conducted by Frick and White (2007) in which a wide array of studies examining callous unemotional traits in youth and adolescence ages 5 to 18 were reviewed, indicated that 24 studies demonstrated relationships among callous unemotional traits and heightened rates of aggression, juvenile delinquency, or conduct problems.

The Integrated Emotion Systems Model (IES)

The links between psychopathy, aggression and empathy have been described above, however, empirical research and theoretical perspectives have generally focused on explaining individual relationships. One model that does attempt to explain the interrelationships between all three aforementioned variables was posited by Blair (2004). Blair's cognitive neuroscience model of psychopathy provides a sufficient explanation

for the empirically demonstrated relationships involving psychopathic traits, reactive and proactive aggression, and empathy. The Integrated Emotion Systems model (IES; Blair, 2004) is an expansion and integration of two previously proposed models of psychopathy, the fear dysfunction hypothesis (Fowles, 1980) and the violence inhibition model (Blair, 1995), and incorporates two forms of pathology. Briefly, the IES model suggests that the association between psychopathy and reactive aggression is due to dysfunction in the orbital/ventrolateral frontal cortex. These brain regions are proposed to be responsible for producing reinforcement *expectancies* and detecting when the expected reinforcements are not obtained. Additionally, they are also involved in producing an altered behavioural response following the change in expected reinforcement (Blair, 2004). The apparent dysfunction in these areas of the brain prevents individuals high in psychopathy from effectively altering their behavioural response when the expected reinforcement is not acquired. Moreover, an inability to obtain the expected reinforcement is thought to result in heightened levels of frustration, which in turn leads to heightened reactive aggressive tendencies (Blair, 2005).

Drawing on the empirical literature and following the logic presented in the IES model, it is likely that the social deviance (Factor 2) traits of psychopathy are the predominant force in promoting reactive aggression. For example, characteristics such as early behaviour problems, impulsivity and poor behaviour control are likely to present when an individual does not obtain an expected reward and is not able to alter their behavioural response in order to obtain the expected reward. In turn, the expression of these traits when an expected positive contingency is not acquired then results in frustration-based reactive aggression. Moreover, various other disorders including

borderline personality disorder, childhood bipolar disorder, and intermittent explosive disorder have also been linked to heightened reactive aggression (Blair 2005; Blair, 2006) and generally include some defining features that are similar to those included in the social deviance factor of psychopathy (Factor 2; i.e., impulsivity, poor behaviour control).

Particularly relevant to the present study, the IES model also provides an explanation for the reported relationships among psychopathy and proactive aggression. As previously noted, psychopathic traits have consistently been linked to heightened rates of aggression, specifically, proactive aggression (Cima & Raine, 2009; Falkenbach et al., 2008; Fite, Stoppelbein & Greening, 2009; Flight & Forth, 2007; Raine et al., 2006; Woodworth & Porter, 2002). Blair (2006) suggests that due to amygdala dysfunction, psychopaths are unable to effectively process distress cues such as sadness and fear and are also unable to engage in victim empathy. This lack of empathic responding is thought to be the result of failed moral socialization. Moral socialization occurs through the punishment of negative behaviours and the reinforcement of positive behaviours and it is the amygdala that is responsible for the formation of the stimulus-reinforcement (punishment and reward) associations (Blair, 2005). With respect to proactive aggression, the punishment association refers to the distress cues, such as sadness and fear, experienced by the victim. Thus, it is thought that individuals high in psychopathy do not form the stimulus-punishment association because they are unable to associate their own transgressions (the stimulus) with the fear, distress, and sadness of their victims (the punishment). Due to the lack of aversive stimulus-reinforcement association, individuals high in psychopathy do not learn to refrain from engaging in proactive aggression to

obtain their desired outcomes (Blair, 2005). Essentially this occurs because they do not experience the appropriate moral emotions (empathy) when they engage in proactive aggressive acts.

Blair's (2006) assertion that the deficits in affective empathy found among individuals high in psychopathy originates with amygdala dysfunction has been supported by recent neurological based empirical research (Yang, Raine, Narr, Colletti, & Toga, 2009). Yang and colleagues (2009) employed structural magnetic resonance imaging to examine the amygdala volumes of 27 psychopathic individuals and 32 control individuals. Results indicated structural abnormalities in the amygdala of psychopaths when compared to controls, such that the right amygdala was established to be 18.93% smaller in volume and the left amygdala was found to be 17.14% smaller in volume among psychopathic participants. Moreover, significant negative correlations between amygdala volume and total and factor level psychopathy scores were reported. Most importantly with respect to the present study, these negative correlations were strongest for the emotional/interpersonal (Factor 1) traits of psychopathy. Furthermore, it is important to note that research concerning amygdala function and emotional processing has identified the amygdala as an integral brain structure with respect to emotional responsivity, expression and regulation, and emotional memory and learning (Shirtcliff et al., 2009).

Based on the position put forth by the IES model as well as the previously demonstrated empirical support, it appears that the emotional/interpersonal (Factor 1) traits are primarily responsible for higher rates of proactive aggression among individuals high in psychopathy. The IES model also suggests that an inability to experience moral

emotions such as remorse, guilt, and specifically empathy leads to engagement in proactive aggression. Moreover, various other researchers have also focused on the role of callous-unemotional traits and lack of empathic responding to explain why individuals high in psychopathy tend to engage in elevated levels of proactive violence (Woodworth & Porter 2002; Rogstad & Rogers, 2008).

Thus, drawing on the IES model, the present study intended to provide an account of the relationships among the emotional/interpersonal (Factor 1) traits of psychopathy, affective empathy, and proactive aggression in which it is suggested that lack of empathy can be viewed as the common cause of psychopathic traits and characteristics, proactive physical aggression and the relationship between these two constructs.

Psychopathy, Empathy, and Proactive Aggression

Despite the fact that many researchers have identified empathy (or lack thereof) as playing a significant role in the relationship between psychopathy and proactive aggression (Blair, 2004; Rogstad & Rogers, 2008; Woodworth & Porter 2002), very little research has been conducted in which researchers have actually examined empathy as an independent construct in relationship to psychopathy and aggression.

To this writer's knowledge, the only study examining the relationships between the specific factors of psychopathy, empathy, and aggression subtypes is the study conducted by Flight and Forth (2007), which has been addressed at length in previous sections of this thesis. As noted, results did indicate that the emotional/interpersonal (Factor 1) traits of psychopathy were predictive of higher incidents of proactive aggression. Moreover, these traits were also found to be negatively related to self-reported empathy. However, when employing a forward conditional regression model,

results indicated that empathy did not account for any additional variance in proactive aggression above and beyond that accounted for by total psychopathy scores.

It is possible that these findings were the result of using total psychopathy scores rather than only the emotional/interpersonal (Factor 1) scores in the model. Doing so may have muted the potential role of empathy in the specific relationship between the emotional/interpersonal (Factor 1) traits and proactive aggression. However, it is important to note that in this study the social deviance (Factor 2) psychopathy traits were also found to be highly related to proactive aggression. In addition, it could be possible that empathy did not predict proactive aggression over and above Factor 1 psychopathy traits because the measurement tools designed to assess psychopathic traits generally include empathy related items.

Another possible explanation is that these findings could be the result of the measures and classifications used for both empathy and aggression subtypes. For example, the study employed the Davis Interpersonal Reactivity Index (IRI; Davis, 1980) as a measure of empathy (Flight & Forth, 2007). The IRI (Davis, 1980) includes four subscales including empathic concern, fantasy, perspective taking, and personal distress. Total empathy scores were used in the model, thus no differentiation was made between cognitive empathy and affective empathy. As previously stated, individuals high in psychopathy tend to show specific deficits in affective empathy only (Blair, 2008). Therefore, use of a measure that taps into both cognitive and affective empathy may have muted the specific role of affective empathy. The present study employed several measures of empathy designed to tap into affective empathic responding, separate from

cognitive empathy, including physiological indices such as heart rate and electrodermal activity.

Finally, the aggression classification used by Flight and Forth (2007) was based on observational findings obtained through structured interviews and institutional file reviews and in turn the aggression variable was viewed as categorical in nature. Conversely, the present study incorporated self-report measures of the aggression subtypes (RPQ; Raine et al., 2006) resulting in a continuous aggression variable. In light of the apparent inconsistencies in the literature, the present study attempted to clarify some of the discordance between the theoretical conceptualizations and the empirical research findings concerning psychopathy, empathy, and aggression.

The Present Study

The purpose of the present study was to investigate the relationships among psychopathy, empathy, and aggression. More specifically, this study sought to replicate and clarify previous research findings concerning the relationships between the emotional/interpersonal (Factor 1) psychopathy traits, affective empathy, and proactive aggression in a community based sample. The primary aim was to add to the present body of literature by empirically examining a common cause model in which affective empathy is thought to underlie the relationship between the emotional/interpersonal (Factor 1) psychopathy traits, and proactive aggression (Figure 1). Both self-report and physiological measures of empathy were employed.

Based on the empirical literature discussed above, as well as the theoretical position presented by the IES model, the following hypotheses were developed. First, it was expected that the emotional/interpersonal (Factor 1) traits of psychopathy would

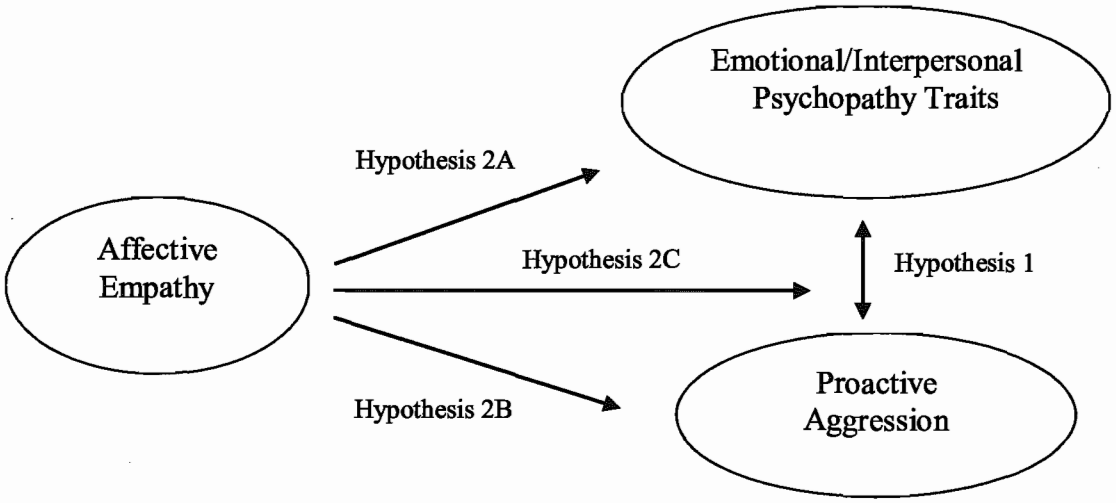

Figure 1. The common cause model of empathy, psychopathy, and aggression.

predict proactive aggression, over and above the social deviance (Factor 2) psychopathy characteristics and reactive aggression (Hypothesis 1). Second, it was hypothesized that affective empathy is a common cause of the emotional/interpersonal (Factor 1) psychopathy traits, proactive aggression, and of the relationship between these two variables (Hypothesis 2). This hypothesis assumed that after removing the variance accounted for by the social deviance (Factor 2) psychopathy traits, reactive aggression, and cognitive empathy, that (a) affective empathy would uniquely predict the emotional/interpersonal (Factor 1) traits of psychopathy (Hypothesis 2A), (b) affective empathy would uniquely predict proactive aggression (Hypothesis 2B), and (c) affective empathy would be the common cause of the relationship between the interpersonal/emotional traits of psychopathy and proactive aggression, such that affective empathy would account for the relation between Factor 1 psychopathy traits and proactive aggression.

Method

Ethical Clearance and Recruitment

Ethical clearance for the present study was obtained through the Brock University Research Ethics Board and throughout the data collection process two procedure modifications were approved (see Appendix A, B, & C). Poster advertisements were placed in various locations around the University to assist in recruiting study participants (see Appendix D). In addition, participants were also recruited through the Brock University on-line research system (SONA; see Appendix E). Individuals who consented to participate in the study were eligible to be entered into a draw for a $75.00 gift certificate and also received 1 course-related research participation credit.

Participants

The total sample included 137 male undergraduate students who currently attend Brock University in St. Catharines, Ontario. The sample was limited to men only, as they tend to exhibit a wider range of psychopathy and aggression scores than women, who typically demonstrate low scores on these constructs. Participant age ranged from 17 to 30 years (M = 19.60, SD = 2.05) and the sample was predominantly Caucasian (65.7%, n = 90). Of the participants who reported their current year of study (n = 135), 75.6 % (n = 102) indicated being in year 1 and the remaining 24.4% (n = 33) reported having completed at least 1 year of university.

Additionally, as discussed below, participants were also asked to report whether or not they had ever experienced a head injury or concussion, and if they had ever been diagnosed with a neurological or psychological disorder. Of the total sample (N = 137), 42.3% of participants (n = 58) reported having experienced a head injury or concussion,

whereas 12.4% ($n = 17$) indicated that they had been diagnosed with a neurological or psychological disorder.

Two additional measures (Toronto Empathy Scale, Spreng, McKinnon, Mar, & Levine, 2009; Peer Conflict Scale, Marsee, Kimonis, & Frick, 2004; discussed below) were added after a preliminary review of the data obtained from the first 40 participants. The additional aggression measure was included to address concerns regarding use of a restricted range on the original scale (The Reactive-Proactive Aggression Questionnaire, Raine et al., 2006). The additional empathy scale was added to account for possible concerns surrounding the predictive validity of the original measure (The Basic Empathy Scale, Jolliffe & Farrington, 2006). Of the total sample ($N = 137$), 94 participants completed all measures. All analyses conducted involving the additional measures were completed using a possible sample size of 94.

Measures

Demographics. The demographics questionnaire was used to acquire information concerning the age, ethnicity, and education level of participants (see Appendix H). Recent research conducted by Baker and Good (2009) has reported that individuals who have experienced mild head injury or concussion tend to exhibit physiological hyporeactivity and as the current study involves measurement of electrodermal activity and heart rate, participants were also asked to report as to whether or not they had ever experienced head injury or concussion. Additionally, experienced head injury and concussion have been linked to a greater propensity towards antisocial behaviour and violent offending (Leon-Carrion & Ramos, 2003; Perron & Howard, 2008). Obtaining this information allowed for consideration of potential confounds during data analysis.

Finally, participants were also asked to report on previously diagnosed neurological and psychological disorders. Responses to the head injury and previous diagnosis variables were coded as "0" (no) and "1" (yes).

The Self-report Psychopathy Scale: Version III (SRP III; Paulhus, Hemphill, & Hare, in press). The SRP III was used to examine sub-clinical levels psychopathy (not included in appendices due to copyright). The scale contains 64 items and includes four 16 item subscales. The four subscales are designed to assess interpersonal manipulation, callous affect, erratic lifestyle, and anti-social behaviour. Participants were asked to rate each of the items on a five point scale ranging from 1 (*disagree strongly*) to 5 (*agree strongly*).

To test the present hypotheses and to allow for better comparison between the present data and previously published literature, composite scores representing the two factor model of psychopathy were computed. After reverse scoring all necessary items, the emotional/interpersonal variable representing Factor 1 was computed by summing participant responses to the 32 items from the interpersonal manipulation and callous affect subscales. The social deviance variable representing Factor 2 was computed by summing participant responses to the 32 erratic lifestyle and antisocial behaviour subscale items. Factor 1 and 2 scores were computed for all participants who responded to at least 80% of the items on each subscale (missing items were given mean values for the items on their subscale). Possible scores on the Factor 1 and 2 subscales ranged from 32 to 160 with higher scores representing greater psychopathic tendencies. Previous research conducted by Reidy, Zeichner, and Foster (2009) reported high internal consistency for the emotional/interpersonal (Factor 1) composite score ($\alpha = .85$) and the

social deviance (Factor 2) composite score (α = .85). In accordance with previous research, the present study also found high reliabilities for the composite scores (Factor 1, α = .87; Factor 2, α = .86).

The Basic Empathy Scale (BES; Jolliffe & Farrington, 2006). The BES is a measure of dispositional empathy and contains 20 items that are each scored on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*; scale not included in appendices due to copyright). The measure includes two subscales designed to assess cognitive (9 items) and affective (11 items) empathy. After reverse scoring all necessary items, subscale scores were computed by summing the participant's responses. Possible scores ranged from 9 to 45 and 11 to 55 for the cognitive and affective empathy subscales respectively, and higher scores on each subscale indicated greater cognitive or affective empathy. The internal consistencies in the present study (α = .71 and α = .80 for the cognitive and affective subscales respectively) were in line with previous research, which demonstrated acceptable internal consistency for the cognitive empathy subscale (α = .74 - .79) and high internal consistency for the affective empathy subscale (α = .85 - .86; Albiero, Matricardi, Speltri, & Toso, 2009; Jolliffe & Farrington, 2006). Additionally, the BES has been shown to be positively correlated with other widely used measures of empathy such as the empathic concern and perspective taking subscales of the Interpersonal Reactivity Index (Albiero et al., 2009; IRI; Davis, 1980; Jolliffe & Farrington, 2006).

The Reactive-Proactive Aggression Questionnaire (RPQ; Raine et al., 2006). The RPQ is a self-report measure that was designed to assess reactive and proactive forms of aggression (see Appendix I). The RPQ includes two subscales (reactive and

proactive) and contains a total of 23 items, each scored on a 3-point scale ranging from 0 (*never*) to 2 (*often*). For each participant a score for reactive aggression (11 items) and proactive aggression (12 items) was calculated by summing the participant's responses to the items in the appropriate subscale. Possible scores ranged from 0 to 22 for the reactive subscale and from 0 to 24 for the proactive subscale. Higher scores on each subscale represented greater aggressive tendencies. Raine and colleagues (2006) have reported high internal consistency for both the reactive (α = .81 - .86) and proactive (α = .84 - 87) subscales. In accordance with previous findings, the present study demonstrated similar internal consistencies (α = .82 and α = .78 for reactive and proactive aggression respectively).

Video Clips. Two video clips were used in the present study; 1) a neutral video clip, and 2) a video meant to induce affective empathy. The neutral video clip was 1:13 minutes in length and depicted a woman providing advice on how to make a good impression in a job interview. The video clip was intended to be neutral such that it would not elicit an emotional reaction on behalf of the participants. The empathy eliciting video was 1:38 minutes in length and depicted a mother discussing the tragic loss of her 9-year-old daughter. The mother was visibly upset as she described how her daughter was hit by a car while riding her bike. The driver of the car was talking on his cell phone.

A repeated measures analysis (statistical results discussed below) revealed that the empathy video did induce emotional arousal, as indicated by significant changes in HR and EDA. However results (discussed below) also suggested that the neutral video was eliciting unwanted physiological arousal. As such, the neutral video responses were not

included in the final analyses and baseline physiological measurements were used in their stead.

Self-Reported Empathy in Response to Video Clips. Brief questionnaires were used to assess self-report affective and cognitive empathy in response to each video clip. After viewing the neutral video clip, participants were asked to complete a short questionnaire containing two subscales designed to assess affective empathy (3 items) and cognitive empathy (3 items; see Appendix J). Participants were asked to respond to each question on a scale of 1 (*not at all*) to 5 (*very much*). Responses on each subscale were summed to create total affective and cognitive empathy scores with a possible range of 3 to 15, with higher scores indicating a greater empathic response.

Internal consistency for the cognitive and affective subscales for the neutral video clip were $\alpha = .78$ and $\alpha = .57$ respectively. An identical questionnaire was also administered following the viewing of the empathy video clip (see Appendix K). Internal consistency for the cognitive and affective subscales for the empathy video clip were $\alpha = .80$ and $\alpha = .57$ respectively. Results of a paired samples t-test (statistical analyses discussed below) indicated that self-reported affective empathy was higher in response to the empathy eliciting video than the neutral video. Self-reported cognitive empathy did not differ as a function of the videos (discussed below). Although the physiological responding to the neutral video was not included in the analyses, the self-reported cognitive and affective empathy in response to the neutral video was retained in all analyses to provide a control for self-reported empathy responses to the empathy eliciting video.

Physiological Responding. Affective empathic responding was also assessed using physiological indices. Polygraph Professional equipment (2008), manufactured by Limestone Technologies Inc. (Kingston, Ontario) was used to examine electrodermal activity (EDA) and heart rate (HR). Data were obtained using the Datapac USB™ 16-bit Data Acquisition Instrument and was extracted using Polygraph Professional Suite Software. A pulse oximeter was attached to the participant's middle finger to monitor HR and 2 finger pads plated with silver-silver chloride were fastened to the index and fourth fingers of the participant's non-dominant hand to monitor EDA. The polygraph instrument provides optical isolation to 3500 volts. For EDA, the instrument uses a constant voltage (the operating range is 22K – 9.0 Mega Ohms) and there was a 0.5 sec latency period in recording after stimulus onset. Additionally, the physiological measurements were sampled 25 to 50 times per second and the EDA and HR channels were self-calibrated (automatically), ensuring that measurement was linear and precise.

Baseline HR and EDA measures were obtained during an initial 90 second resting period. Subsequently, HR and EDA were monitored while the participants viewed the neutral and empathy eliciting video clips (described above). Frequency data for EDA and HR were examined using cycles per minute. Final EDA and HR scores were derived by obtaining a count of the number of fluctuations that occurred in the relevant time interval and converting to a number out of 60. Empathic responding was defined as changes in heart rate frequency and increases in EDA frequency.

One issue with physiological arousal data is that there are large individual differences in responsivity. To account for these differences, the intention was to include physiological responding to the neutral video as a covariate in all analyses that included

HR and EDA as predictors. This allowed for examination of arousal to the empathy video clip while also having the benefit of controlling for arousal levels during the neutral video. However, a repeated measures analysis (statistical results discussed below) revealed that the neutral video was eliciting arousal and as such, baseline data recorded during the resting period was included as a covariate (rather than response to the neutral video) in all analyses examining physiological data.

Additional Measures

Toronto Empathy Scale (TES; Spreng, McKinnon, Mar, & Levine, 2009). This measure examines affective empathy using 16 items rated on a five point likert scale ranging from 0 (*never*) to 4 (*always:* see Appendix L). After reverse scoring all necessary items, total scores were computed by summing participant responses on each item. Possible scores ranged from 0 to 64 and higher scores represented greater empathy. In line with previous research conducted by Spreng, McKinnon, Mar, and Levine (2009; α = .85), the internal consistency in the present study was high (α = .82). In addition, research has demonstrated that the TES is positively correlated with the empathic concern, perspective taking, and fantasy subscales of the widely used Interpersonal Reactivity Index (IRI; Davis, 1980; Spreng, McKinnon, Mar, and, Levine, 2009). As previously stated, this measure was added following a preliminary review of the data obtained from the first 40 participants to account for possible concerns regarding predictive validity of the original self-report empathy measure (BES; Jolliffe & Farrington, 2006).

Peer Conflict Scale (PCS; Marsee, Kimonis, & Frick, 2004). The PCS contains four subscales designed to measure overt and relational proactive and reactive aggression (see Appendix M). The scale contains 40 items that are each rated on a likert scale

ranging from 0 (*not at all true*) to 3 (*definitely true*). For the purpose of the present study the overt and relational items were collapsed to produce total reactive aggression (20 items) and total proactive aggression (20 items) subscales. Subscale scores were computed by summing the appropriate items for each subscale. Possible scores for each subscale ranged from 0 to 60 and higher scores indicated greater self-reported aggression. Internal consistencies in the present study were $\alpha = .81$ and $\alpha = .82$ for the proactive and reactive subscales respectively. As mentioned above, this scale was included following preliminary analyses of the data obtained from the first 40 participants to address possible concerns regarding range restrictions in the original aggression measure (RPQ; Raine et al., 2006).

Procedure

Upon arrival, participants were given a verbal introduction to the study during which the confidentiality and anonymity of their data was emphasized (see Appendix F). They were then asked to sign two consent forms (see Appendix G), one of which was kept for their own records and the other was retained by the researcher.

Participants then completed the BES (Jolliffe & Farrington, 2006), the RPQ (Raine et al., 2006), and the SRP-III (Paulhus, Hemphill, & Hare, in press), the TES (Spreng, McKinnon, Mar, & Levine, 2009) and, the PCS (Marsee, Kimonis, & Frick, 2004). After completing the questionnaires, the pulse oximeter was attached to the participant's middle finger and silver-silver plated chloride finger pads were fastened to the index and fourth fingers of the participant's non-dominant hand. First, participants were first asked to relax for a 90 second resting period while their HR and EDA was monitored and recorded. Participants then viewed each of the video clips, completing the

neutral video clip questionnaire and the demographics form between viewing the neutral and empathy eliciting videos. After viewing the empathy video clip participants completed the empathy video clip questionnaire. Following completion of the final questionnaire, participants were provided with a feedback form and asked not to discuss the study with other potential participants (see Appendix N).

Results

Data Screening: Self-Report Measures

Descriptive statistics for all self-report variables included in the present study are presented in Table 1. Before conducting analyses, all data were screened for violations of assumptions and possible univariate outliers.

Table 1

Descriptive Statistics for all Self-Report Variables

Variable	*N*	*M*	*SD*	$Z_{Skewness}$	$Z_{Kurtosis}$
BES Cognitive Empathy	137	35.95	3.56	-.42	-.12
BES Affective Empathy	137	36.18	6.28	2.56	1.98
TES Affective Empathy	93	43.91	6.95	.13	.08
RPQ Proactive Aggression	135	3.60	3.31	4.86	.81
RPQ Reactive Aggression	134	9.75	4.13	.73	.07
PCS Proactive Aggression	94	4.19	4.30	5.44	3.51
PCS Reactive Aggression	91	7.89	5.67	3.35	.18
SRP III Factor 1	137	86.83	15.26	.88	-.16
SRP III Factor 2	137	74.67	15.74	1.60	-.46
Post Neutral Video Cognitive Empathy	137	9.24	2.62	-1.96	-1.05
Post Neutral Video Affective Empathy	137	6.64	2.07	2.91	.61
Post Empathy Video Cognitive Empathy	137	9.44	3.20	2.10	-1.70
Post Empathy Video Affective Empathy	137	11.82	4.59	3.89	1.68

Note. Possible range of scores for each measure can be found in the methods section.

Examination of the descriptive statistics revealed possible normality problems with the PCS and RPQ proactive aggression subscales, the PCS reactive aggression subscale, and the post empathy video affective empathy subscale. As standardized skewness and/or kurtosis values for these variables exceeded the acceptable range of |3|, attempts were made to normalize the distributions using square root and $\log^{10}$ transformations. Although these transformations did improve the skewness and kurtosis statistics, visual examination of the histograms revealed little improvement in the normality of the distribution. As such, the original subscale scores were included in all analyses and the shape of the distributions should be considered when interpreting the results of the present study.

As mentioned, data were also examined for the presence of univariate outliers. Across all self-report measures, 5 potential outliers were identified as indicated by standardized scores greater than |3|. Further inspection indicated that all of these participants were likely to be appropriate candidates for inclusion in the present study as each of these individuals only obtained standardized scores exceeding the acceptable value of |3| on one measure. Standardized scores on all remaining measures were less than |3|. Therefore, these participants were retained for further analyses. Finally scatter plots between all predictor and criterion variables were examined and appeared to indicate linear relationships between all relevant variable

Data Screening: Physiological Measures

Due to technical problems, physiological data for the baseline recording and the neutral and empathy videos were not obtained for all participants (see Table 3 for final *N*). Descriptive statistics for HR and EDA are presented in Table 2. The physiological

data were also examined for possible violation of assumptions and univariate outliers. Standardized skewness and kurtosis values and histograms were examined for each HR and EDA variable.

Table 2

Descriptive Statistics for Physiological Variables (Cycles per Minute)

Variable	*N*	*M*	*SD*	$Z_{Skewness}$	$Z_{Kurtosis}$
Baseline EDA	128	8.96	2.92	9.84	16.73
Neutral Video EDA	131	10.69	4.59	14.13	30.89
Empathy Video EDA	132	10.03	3.56	8.80	12.25
Baseline HR	128	69.26	9.61	-.28	-.18
Neutral Video HR	131	72.17	10.31	-1.50	-1.09
Empathy Video HR	132	70.96	10.03	-1.30	-1.31

For HR, all indicators suggest a normal distribution. However, according to the standardized skewness and kurtosis values, and visual examination of the histograms, the EDA variables appear to be violating the assumption of normality. Upon closer inspection several univariate outliers who obtained standardized scores greater than |3| for the baseline recording and the neutral and empathy video clips were identified. Due to software limitations, researchers were not able to set a minimum amplitude threshold at which observed fluctuations should be counted as cycles. As a result, small and likely insignificant fluctuations were observed as cycles for several participants leading to unusually high frequencies. Accordingly, these individuals were also identified as outliers as per the standardized EDA scores. These individuals ($n = 7$) were not included in

further analyses. Visual inspection of the histograms with the outliers removed appeared to assist in normalizing the distribution. Descriptive statistics for the remaining participants are presented in Table 3. It should be noted that EDA in response to the neutral video remained positively skewed and leptokurtic.

Table 3

Descriptive Statistics for EDA Measures with Outliers Removed

Variable	*N*	*M*	*SD*	$Z_{Skewness}$	$Z_{Kurtosis}$
Baseline EDA	125	8.65	2.16	2.91	1.26
Neutral Video EDA	128	10.18	3.09	5.50	7.87
Empathy Video EDA	128	9.60	2.63	3.13	1.93

Demographic Variables

As previously mentioned, demographic information was collected regarding the presence or absence of head injury and neurological or psychological disorders. Two independent samples t-tests were conducted to determine if mean scores on relevant study variables differed as a function of head injury/concussion and diagnosis. Levene's test for equality of variances was examined for all variables and the assumption of homogeneity of variance was met unless otherwise noted. Normality of the distributions was discussed above.

Results of the independent samples t-test revealed that HR frequency and mean scores on several self-report variables differed as a function of head injury/concussion (see Table 4 and 5). Participants who had experienced a head injury or concussion reported higher scores for the RPQ (Raine at al., 2006) proactive and reactive aggression

subscales and for Factor 1 and Factor 2 psychopathy scores. However, head injury status did not significantly predict baseline EDA, neutral video clip EDA, or empathy video clip EDA. Alternatively, head injury status did appear to impact baseline HR, neutral video clip HR, and empathy video clip HR, such that participants who reported having experienced a head injury displayed significantly lower HR across all three time intervals. As head injury does appear to influence responding on several relevant variables (e.g., proactive and reactive aggression, Factor 1 and 2 psychopathy, and HR), head injury was included as a covariate in all analyses.

Results of the independent samples t-test for previous diagnosis indicated that individuals who had and had not been previously diagnosed with a neurological or psychological disorder did not differ significantly on any relevant study variables (see Tables 6 and 7). As such, previous diagnosis was not included as a covariate the analyses.

Physiological Data and Post Video Self-Reported Empathy

A paired samples t-test was conducted to compare self-reported cognitive and affective empathy in response to the neutral and empathy video clips. As expected, self-reported affective empathy in response to the empathy video ($M = 11.82$, $SD = 2.15$) was significantly higher than in response to the neutral video ($M = 6.64$. $SD = 2.07$), $t\,(136) = -21.80$, $p < .001$. Self-reported cognitive empathy did not significantly differ in response to the neutral ($M = 9.25$, $SD = 2.62$) and empathy video clips ($M = 9.45$, $SD = 3.20$), $t\,(136) = -.57$, $p > .05$. These findings provide some evidence that the empathy video clip was effective in eliciting an affective empathic response among participants. Table 8 provides correlations between all video related self-reported empathy subscales.

Table 4

Mean Scores on Self-Report Measures for Participants with and without Head Injury

Variable	Head Injury Status			Head Injury Status *n*	
	No Head Injury	Head Injury	*t*	No Head Injury	Head Injury
BES Cognitive Empathy	35.70 (3.64)	36.29 (3.46)	-.97	79	58
BES Affective Empathy	35.76 (6.22)	36.74 (6.38)	-.90	79	58
TES Affective Empathy	43.23 (7.45)	44.83 (6.21)	-1.10	53	40
RPQ Proactive Aggression	3.10 (3.30)	4.28 (3.24)	-2.07*	78	57
RPQ Reactive Aggression	8.92 (4.19)	10.86 (3.80)	-2.75*	77	57
PCS Proactive Aggression	3.70 (4.41)	4.83 (4.10)	-1.27	53	41
PCS Reactive Aggression	7.04 (5.31)	8.98 (5.99)	-1.63	51	40
SRP III Factor 1	84.41 (14.80)	90.14 (15.37)	-2.20*	79	58
SRP III Factor 2	70.92 (14.51)	79.77 (16.04)	-3.37*	79	58
Post Neutral Video Cognitive Empathy	9.19 (2.52)	9.33 (2.77)	-.30	79	58
Post Neutral Video Affective Empathy	6.76 (2.04)	6.48 (2.11)	.77	79	58
Post Empathy Video Cognitive Empathy	9.46 (3.17)	9.43 (3.26)	.04	79	58
Post Empathy Video Affective Empathy	11.84 (2.08)	11.79 (2.25)	.11	79	58

Note. *SD* in parentheses. *$p < .05$.

Table 5

Mean Scores on Physiological Measures for Participants with and without Head Injury

Variable	Head Injury Status			Head Injury Status *n*	
	No Head Injury	Head Injury	*t*	No Head Injury	Head Injury
Baseline EDA	8.49	8.88	-1.00	74	51
	(2.28)	(1.97)			
Neutral Video EDA	10.16	10.20	-.07	75	53
	(2.99)	(3.26)			
Empathy Video EDA	9.79	9.34	.95	74	54
	(2.81)	(2.36)			
Baseline HR	71.55	66.02	3.33**	75	53
	(8.71)	(9.97)			
Neutral Video HR	74.89	68.29	3.78**	77	54
	(9.34)	(10.48)			
Empathy Video HR	73.43	67.50	3.49**	77	55
	(9.06)	(10.37)			

Note. *SD* in parentheses. ** $p \leq .001$, *$p < .05$.

Table 6

Mean Scores on Physiological Variables for Participants with and without Neurological or Psychological Diagnosis

Variable	Diagnosis Status			Diagnosis Status *n*	
	No Diagnosis	Diagnosis	*t*	No Diagnosis	Diagnosis
Baseline EDA	8.59	9.15	-.88	112	13
	(.20)	(.65)			
Neutral Video EDA	10.28	9.45	1.00	112	16
	(.30)	(.55)			
Empathy Video EDA	9.71	8.79	1.94	112	16
	(.26)	(1.59)			
Baseline HR	68.89	72.29	-1.25	114	14
	(9.54)	(2.69)			
Neutral Video HR	71.73	75.37	-1.33	115	16
	(.94)	(2.87)			
Empathy Video HR	70.57	73.77	-1.20	116	16
	(.93)	(2.47)			

Note. *SD* in parentheses. Empathy Video EDA = equal variances not assumed.

Table 7

Mean Scores on Self-Report Measures for Participants with and without Diagnosis

Variable	Diagnosis Status			Diagnosis Status *n*	
	No Diagnosis	Diagnosis	*t*	No Diagnosis	Diagnosis
BES Cognitive	35.80	37.00	-1.30	120	17
Empathy	(3.46)	(4.20)			
BES Affective	36.39	34.65	1.07	120	17
Empathy	(6.02)	(7.91)			
TES Affective	43.92	43.90	.01	83	10
Empathy	(6.98)	(7.03)			
RPQ Proactive	3.59	3.69	-.11	119	16
Aggression	(3.32)	(3.38)			
RPQ Reactive	9.71	10.00	-.27	117	17
Aggression	(4.22)	(3.54)			
PCS Proactive	4.00	5.64	-1.19	83	11
Aggression	(4.37)	(3.50)			
PCS Reactive	7.69	9.50	-.95	81	10
Aggression	(5.60)	(6.24)			
SRP III Factor 1	85.88	93.53	-1.95	120	17
	(15.04)	(15.53)			
SRP III Factor 2	73.77	81.03	-1.80	120	17
	(15.12)	(18.89)			
Post Neutral Video	9.28	9.06	.32	120	17
Cognitive Empathy	(2.57)	(3.03)			
Post Neutral Video	6.68	6.41	.49	120	17
Affective Empathy	(2.05)	(2.24)			
Post Empathy Video	9.39	9.82	-.52	120	17
Cognitive Empathy	(3.26)	(2.81)			
Post Empathy Video	11.93	11.06	1.57	120	17
Affective Empathy	(2.07)	(2.56)			

Note. *SD* in parentheses.

Table 8

Correlations between Video Related Self-Report Empathy Subscales

Variables	1	2	3	4
1. Post Neutral Video Cognitive Empathy	___	.50**	.04	.05
2. Post Neutral Video Affective Empathy		___	.18*	.13
3. Post Empathy Video Cognitive Empathy			___	.50**
4. Post Empathy Video Affective Empathy				___

Note. $N = 137$. *$p < .05$, **$p < .001$, two-tailed.

Two separate repeated measures analyses were conducted to examine differences in EDA and HR for the resting period, and in response to the neutral and empathy video clips. For EDA, Mauchly's test of sphericity indicated that this assumption was met, $W(2) = 1.00$, $p > .05$. The main effect for the baseline, neutral, and empathy time intervals was significant, $F(2, 236) = 16.55$, $p < .001$. The Bonferroni adjustment was used in post hoc comparisons. The pairwise comparisons revealed that baseline EDA ($M = 8.53$, $SD = 2.05$) was significantly lower than both the neutral video EDA ($M = 10.07$, $SD = 2.92$; $p < .001$) and the empathy video EDA ($M = 9.61$, $SD = 2.54$; $p = .001$). However, EDA in response to the neutral and empathy videos did not differ significantly ($p > .05$). These findings indicate that when compared to a resting period, participants displayed increased EDA in response to both videos, however EDA responses to the neutral and empathy video clips did not differ from one another. The results of the repeated measures analysis, in conjunction with the non-normal distribution of the neutral video EDA, led to the decision to use baseline EDA as the control for EDA during the empathy video. Correlations between each EDA variable can be found in Table 9.

Table 9

Correlations between all Physiological Variables

Variables	1	2	3	4	5	6
1. Baseline EDA	___	.31**	.12	.00	-.03	.00
2. Neutral Video EDA		___	.43**	-.05	.02	.01
3. Empathy Video EDA			___	.07	-.03	.03
4. Baseline HR				___	.77**	.81**
5. Neutral Video HR					___	.86**
6. Empathy Video HR						___

Note. $N = 119$. $^{**}p \leq .001$, two-tailed.

In the repeated measures analysis examining HR, Mauchly's test of sphericity revealed that this assumption had been violated, $W(2) = 1.00$, $p < .05$, and as such results were interpreted using the Greenhouse-Geisser correction. The main effect for the baseline, neutral and empathy video intervals was significant, $F(1.9, 236.6) = 13.39$, $p < .001$ and again, post hoc comparisons were made using the Bonferroni adjustment. Pairwise comparisons revealed that baseline HR ($M = 69.18$. $SD = 9.66$) was significantly lower than HR in response to both the neutral video ($M = 71.89$, $SD = 10.32$; $p < .05$) and empathy video ($M = 70.77$, $SD = 9.78$, $p < .05$). The difference in HR in response to the neutral, and empathy video clips approached significance ($p = .054$). Results indicated that when compared to baseline, HR increased in response to both stimuli, and the analysis comparing HR responses to the neutral and empathy video clips was marginally significant. In light of these findings, as well as a desire to maintain consistency, baseline

HR (rather than HR in response to the neutral video) was used as the covariate in all analyses. Table 9 provides correlations between each HR variable.

Data Analyses

A series of 3 hierarchical and 2 simultaneous multiple regressions were conducted to test the hypotheses outlined above. As previously mentioned, the present study included two self-report measures of empathy (BES, Jolliffe & Farrington, 2006; and TES, Spreng, McKinnon, Mar, & Levine, 2009) and two self-report measures designed to assess aggression (RPQ, Raine et al., 2006, and PCS, Marsee, Kimonis, & Frick, 2004).

The main analyses utilized affective empathy scores obtained using the TES and aggression scores obtained using the RPQ. In reviewing the BES scale items, it was noted that some questions appeared to be more interpersonal in nature and included specific reference to empathy towards friends (e.g. "After being with a friend who is sad about something, I usually feel sad"; "I often get swept up in my friends feelings"). Whereas other items seemed to address empathy on a more general level (e.g. "I get caught up in other people's feelings easily"; "other people's feelings don't bother me at all", reverse scored). It is possible that these two question types address different, albeit related, empathy constructs. For the full sample ($N = 137$), the correlations between the friend and non-friend cognitive empathy items, and between the friend and non-friend affective empathy items were $r = .45$ and $r = .69$, respectively (Spearman-Brown split half =.62 and .82). These correlations lend support to the assertion that perhaps the interpersonal and general items are not tapping the same construct. Therefore, the TES was the preferred empathy measure in the main analysis because when compared to the BES, it appeared to include items that are less interpersonal in nature and more concordant with

the empathy construct of interest in the present study. However, it should be noted that the cognitive empathy subscale from the BES was still included in the analysis to account for cognitive empathy when examining affective empathy.

The RPQ was included in the main analysis, because when compared to the PCS, the items appear to be more age appropriate. The PCS scale was originally designed for use with children and adolescents however the present study sought to use the PCS in a sample of young adults. Examination of item statistics for the present sample revealed that some items appeared to be rated systematically lower than other items (e.g., "When others make me angry, I try to steal their friends from them"; "When others make me mad, I write mean notes about them and pass the notes around"; "I spread rumours and lies about others to get what I want"; "I like to hurt kids smaller than me"). As mentioned, it is plausible that these items were rated lower due to age inappropriateness, as these items may not be applicable to older samples. Because it did not share the issue of age inappropriate content, the original aggression measure (RPQ; Raine et al., 2006) was the preferred measure in the main analyses.

The current study also includes 3 sets of supplementary analyses in which the hypotheses were examined using alternative possible combinations of the self-reported empathy and aggression measures. The first set of supplementary analysis utilized the original empathy (BES) and aggression (RPQ) measures. This set of regressions was carried out to allow for examination of results based on the total sample, thereby increasing statistical power. As these regressions utilized the same aggression measure (RPQ) as was included in the main analyses, the results of regression 1, which did not

include affective empathy as a predictor variable, were the same as reported in the main analyses.

The second set of supplementary analyses was conducted utilizing composite scores for affective empathy, reactive aggression and proactive aggression. The composite scores were derived by averaging the standardized scores obtained from the multiple self-report measures for each construct. Correlations between the self-reported empathy and aggression scores are reported in Table 10.

Table 10

Correlations between Self-reported Affective Empathy and Aggression

Variable	1	2	3	4	5	6
1. BES Affective Empathy	___	.57**	-.14	.01	-.07	.07
2. TES Affective Empathy		___	-.36**	-.16	-.32*	-.07
3. RPQ Proactive Aggression			___	.62**	.75**	.63**
4. RPQ Reactive Aggression				___	.42**	.66**
5. PCS Proactive Aggression					___	.58**
6. PCS Reactive Aggression						___

Note. $N = 87$. *$p < .01$, **$p \leq .001$, two-tailed.

As discussed in the introduction, the construct of psychopathy is, in part, defined by a lack of empathy and a heightened propensity towards anti-social behaviour. Therefore each of the five regressions was conducted for a final time with the empathy and aggression related items removed from the SRP III to determine if the relationships between psychopathy, empathy and aggression would hold (see Appendix O for a list of items omitted from the SRP III for these analyses). The RPQ aggression and TES

affective empathy measures from the main analyses were used for this set of regressions. The final regression equations for all regressions included in the present study can be found in Appendix P.

Assumptions and Multivariate Outliers

For each regression, an analysis of the residuals was conducted to ensure that all assumptions were met. Scatter plots of the relationships between standardized residuals and each predictor variable were examined to assess the assumption of linearity. In all regression analyses, this assumption appeared to have been met. The assumption of homoscedasticity was examined using scatter plots of the relationship between the standardized predicted values and the standardized residuals with quadrant lines set at the "0" point on the X and Y axes. It should be noted that, in all analyses in which proactive aggression was entered as the criterion, the scatter plot of standardized predicted values and standardized residuals revealed slight heteroscedasticity. The residuals did not seem to be evenly distributed, with what appeared to be less variability in the lower left quadrant. All regressions that included the emotional/interpersonal (Factor 1) psychopathy traits as the criterion appeared to have met the assumption of homoscedasticity. Additionally, the assumption regarding independence of residuals was assessed by ensuring that the Durbin-Watson statistic was in the acceptable range of 1.5 to 2.5. This assumption was met for all regressions. Finally, normal p-p plots and histograms of the standardized residuals were examined to address normality. The reader should be aware that p-p plots revealed slight to moderate deviations from normality in all regression analyses. In addition, for several regression analyses, the histograms of standardized residuals appeared slightly positively skewed and leptokurtic.

For each regression the data were also screened for multivariate outliers. Several different approaches were used in this process. Standardized residual values exceeding |3| were identified through casewise diagnostics and examined further. Cooks' distances were examined using a cut off of 1.0 (Cohen, Cohen, West, & Aiken, 2003). Mahalanobis values were explored and compared to the χ^2 distribution with the appropriate number of predictors at the .005 level. Centered leverage plots were also examined and cases were considered to be influential if the centered leverage value was greater than $3k/N$, with k representing the number of predictors in the regression. Finally, DFBETA values were also assessed to ensure all values fell below |1| (Cohen, Cohen, West, & Aiken, 2003). Only cases that appeared across multiple approaches were considered to be influential. Results indicated that no multivariate outliers were present in the main analyses or any of the supplementary analyses.

Examining Hypothesis 1

A hierarchical multiple regression was conducted to determine if emotional/interpersonal psychopathy traits (Factor 1) predicted proactive aggression over and above reactive aggression and social deviance psychopathy characteristics (Factor 2). Proactive aggression was entered as the criterion, head injury status, reactive aggression and Factor 2 were entered on the first step, and Factor 1 was entered on the second step. These steps were followed for the main analysis and the subsequent supplementary analyses.

Hypothesis 1: Main Analysis

Hypothesis 1 was first examined using RPQ aggression scores and TES affective empathy scores. Descriptive statistics and correlations among all variables included in the

model are presented in Table 11.

Table 11

Hypothesis 1, Main Analysis: Descriptive Statistics and Correlations between Head Injury Status, Psychopathy, and Aggression

Variable	*M*	*SD*	2	3	4	5
1. Head Injury	.42	.50	.17*	.23*	.17*	.25*
2. RPQ Proactive Aggression	3.54	3.29	___	.56**	.62**	.64**
3. RPQ Reactive Aggression	9.74	4.14		___	.37**	.47**
4. SRP III Factor 1	86.83	15.24			___	.56**
5. SRP III Factor 2	74.52	15.53				___

Note. $N = 133$. Correlations from regression analysis: $*p < .05$, $**p < .001$, one-tailed.

Results indicated that the overall model was significant accounting for 56.9% of the variance in proactive aggression, $R^2 = .57$, $F(4, 128) = 42.25$, $p < .001$. The first step in the model was significant, $F\Delta(3, 129) = 42.00$, $p < .001$, accounting for 49.4% of the variance. Here, head injury was not a significant predictor of proactive aggression. However proactive aggression was positively associated with reactive aggression and Factor 2 psychopathy characteristics. On the second step, Factor 1 traits accounted for an additional 7.5% of the variance, $R^2\Delta = .08$, $F\Delta(1, 128) = 22.25$, $p < .001$, and were a significant predictor of proactive aggression, such that higher Factor 1 scores were associated with higher proactive aggression scores. Table 12 provides beta, t, and sr^2 coefficients.

Table 12

Hypothesis 1, Main Analysis: Summary of Hierarchical Multiple Regression Analysis Predicting Proactive Aggression

Predictors	Step 1			Step 2		
	β	t	sr^2	β	t	sr^2
Head Injury	-.03	-.53	.00	-.04	-.66	.00
RPQ Reactive Aggression	.34**	4.69**	.09	.29**	4.34**	.06
SRP III Factor 2	.49**	6.82**	.18	.32**	4.31**	.06
SRP III Factor 1				.34**	4.72**	.07

Note. $N = 133$. Correlation from regression analysis: $^{**}p < .001$, one-tailed.

Hypothesis 1: Supplementary Analysis 1 (Original Measures, Total Sample)

As the supplementary analysis with the total sample included the same aggression measure as was utilized in the main analysis, the results of the first hierarchical multiple regression used to examine hypothesis 1 were the same as those discussed above.

Hypothesis 1: Supplementary Analysis 2 (Composite Scores)

As described above, Hypothesis 1 was also examined using composite aggression scores. Table 13 provides descriptive statistics and correlations among the variables included in the model. The overall model was significant accounting for 66.1% of the variance in proactive aggression, $R^2 = .66$, $F(4, 82) = 39.97$, $p < .001$. Step 1 in the model accounted for 52.2%, $F\Delta(3, 83) = 30.16$, $p < .001$. Once again, head injury was not a significant predictor of proactive aggression. However, composite reactive aggression and Factor 2 psychopathy both predicted proactive aggression such that higher Factor 2 scores and composite scores for reactive aggression were both associated with

Table 13

Hypothesis 1, Supplementary Analysis 2 (Composite Scores): Descriptive Statistics and Correlations between Head Injury Status, Psychopathy, and Aggression

Variable	*M*	*SD*	2	3	4	5
1. Head Injury	.44	.50	.16	.25*	.20*	.24*
2. Comp. Proactive Aggression	.09	1.49	___	.66**	.70**	.63**
3. Comp. Reactive Aggression	.13	1.33		___	.42**	.59**
4. SRP III Factor 1	87.83	15.36			___	.56**
5. SRP III Factor 2	74.67	16.04				___

Note. $N = 87$. Correlations from regression analysis: *$p < .05$, **$p < .001$, one-tailed.

higher proactive aggression scores. Factor 1 traits accounted for an additional 13.9% of the variance on the second step of the model, $R^2\Delta = .14$, $F\Delta\ (1, 82) = 33.73$, $p < .001$, and were positively associated with composite proactive aggression scores. Table 14 provides Beta, *t*, and sr^2 coefficients.

Hypothesis 1: Supplementary Analysis 3 (Adjusted Psychopathy Scores)

Hypothesis 1 was also tested utilizing adjusted psychopathy scores from which the empathy and aggression items were removed. Descriptive statistics and correlations among the variables are included in Table 15. The overall model accounted for 55.3% of the variance in proactive aggression, $R^2 = .55$, $F\ (4, 128) = 39.61$, $p < .001$. Step one in the model accounted for 45.5% of the variance in proactive aggression, $F\Delta\ (3, 129) = 35.84$, $p < .001$. Once again, proactive aggression was not significantly predicted by head injury. However, as was found in the previous analysis, reactive aggression and Factor 2 psychopathy were both positively associated with proactive aggression. An additional

Table 14

Hypothesis 1, Supplementary Analysis 2 (Composite Scores): Summary of Hierarchical Multiple Regression Analysis Predicting Proactive Aggression

Predictors	Step 1			Step 2		
	β	t	sr^2	β	t	sr^2
Head Injury	-.04	-.50	.00	-.07	-.96	.00
Comp. Reactive Aggression	.45**	4.74**	.13	.39**	4.85**	.10
SRP III Factor 2	.37**	3.87**	.09	.15	1.70	.01
SRP III Factor 1				.46**	5.81**	.14

Note. $N = 87$. Correlation from regression analysis: **$p < .001$, one-tailed.

Table 15

Hypothesis 1, Supplementary Analysis 3 (Adjusted Psychopathy Scores): Descriptive Statistics and Correlations between Head Injury Status, Psychopathy, and Aggression

Variable	M	SD	2	3	4	5
1. Head Injury	.42	.50	.17*	.23*	.19*	.26**
2. RPQ Proactive Aggression	3.54	3.29	___	.56**	.64**	.58**
3. RPQ Reactive Aggression	9.74	4.14		___	.38**	.42**
4. SRP III Factor 1 (Adj.)	74.51	13.75			___	.59**
5. SRP III Factor 2 (Adj.)	56.86	11.78				___

Note. $N = 133$. Correlations from regression analysis: *$p < .05$, **$p \leq .001$, one-tailed.

9.9% of the variance in proactive aggression was accounted for by Factor 1 psychopathy traits on step 2. Thus, Factor 1 psychopathy traits were positively associated with proactive aggression. Beta, *t* and sr^2 coefficients can be found in Table 16.

Table 16

Hypothesis 1, Supplementary Analysis 3 (Adjusted Psychopathy Scores): Summary of Hierarchical Multiple Regression Analysis Predicting Proactive Aggression

Predictors	Step 1			Step 2		
	β	*t*	sr^2	β	*t*	sr^2
Head Injury	-.04	-.52	.00	-.04	-.66	.00
RPQ Reactive Aggression	.39**	5.41**	.12	.33**	4.94**	.09
SRP III Factor 2 (Adj.)	.42**	5.80**	.14	.22*	2.81*	.03
SRP III Factor 1 (Adj.)				.40**	5.32**	.10

Note. $N = 133$. Correlation from regression analysis: *$p < .01$, **$p < .001$, one-tailed.

Hypothesis 1 Conclusion

Results of the main analysis, as well as the subsequent supplementary analysis utilizing the total sample, composite scores, and adjusted psychopathy scores, all provide support for Hypothesis 1 indicating that after removing the variance associated with social deviance psychopathy characteristics (Factor 2) and reactive aggression (and head injury status), Factor 1 psychopathy traits significantly predicted proactive aggression.

Examining Hypothesis 2A

A second hierarchical multiple regression was conducted to examine Hypothesis 2A, which stated that after accounting for covariates (head injury, reactive aggression, social deviance (Factor 2) psychopathy traits, and cognitive empathy), affective empathy

would uniquely predict the emotional/interpersonal (Factor 1) psychopathy characteristics. Reactive aggression was included in these analyses to promote consistency (included as a covariate in all regressions) and because Factor 1 psychopathy traits and reactive aggression were positively correlated. Head injury, reactive aggression, Factor 2 psychopathy traits, cognitive empathy (BES), baseline physiological measures (HR and EDA), post neutral video affective empathy, and post video cognitive empathy for both videos, were entered on the first step. On the second step, affective empathy, physiological measures (HR and EDA) for the empathy video and post empathy video affective empathy were entered. Factor 1 psychopathy traits were entered as the criterion. The steps outlined above were used in the main analysis and the supplementary analyses.

Hypothesis 2A: Main Analysis

Hypothesis 2A was first tested using the RPQ aggression measure and the TES affective empathy measure. Descriptive statistics and correlations among variables included in the regression are presented in Table 17. The overall model was significant, accounting for 59.1% of the variance in Factor 1 psychopathy traits, $R^2 = .59$, F (13, 66) = 7.34, $p < .001$. The first step in the model accounted for 46% of the variance in Factor 1 traits, $R^2\Delta = .46$, $F\Delta$ (9, 70) = 6.62, $p < .001$, and the second step in the model accounted for an additional 13.1% of the variance in Factor 1 traits, $R^2\Delta = .13$, $F\Delta$ (4, 66) = 5.30, p = .001. Beta, t and sr^2 coefficients are provided in Table 18.

Table 17

Hypothesis 2A, Main Analysis: Descriptive Statistics and Correlations for Variables included in the Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14
1. SRP III Factor 1	87.14 (15.31)	.25*	.58**	.49**	-.02	-.07	.04	-.17	-.27*	-.06	-.52**	-.19*	-.10	-.18†
2. Head Injury	.44 (.50)	___	.21*	.30*	.18	-.24*	.11	.11	-.03	.15	.04	-.26*	-.03	-.05
3. SRP III Factor 2	73.36 (15.86)		___	.52**	.02	-.27*	.09	-.06	-.04	-.03	-.15	-.30*	-.16	-.19*
4. RPQ RA	3.76 (3.35)			___	-.08	-.16	.06	-.06	-.06	-.09	-.23*	-.17	-.03	-.10
5. BES Cog. Emp.	35.66 (3.23)				___	-.09	.23*	.13	-.05	.14	.17	-.04	-.20*	.01
6. Baseline HR	69.10 (9.23)					___	.01	-.23*	-.16	.05	-.13	.76*	.02	.00
7. Baseline EDA	8.90 (2.13)						___	.06	-.16	.03	.00	-.04	.13	.04
8. Post NV Cog, Emp.	9.18 (2.39)							___	.45**	.10	.42**	-.17	.05	.16
9. Post NV Aff. Emp.	6.41 (1.85)								___	.08	.39**	-.05	-.10	.18†
10. Post EV Cog. Emp.	9.02 (3.14)									___	.16	.01	.04	.53**
11. TES Aff. Emp.	43.74 (6.85)										___	.00	.23*	.27*
12.EV HR	71.73 (9.53)											___	-.01	-.06
13. EV EDA	9.45 (2.56)												___	.02
14. Post EV Aff. Emp.	11.68 (1.99)													___

Note. $N = 80$. RA=Reactive Aggression, NV = Neutral Video, EV = Empathy Video Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy. Correlations from regression analysis: $^{\dagger}p < .055$ $*p < .05$, $**p < .001$, one-tailed.

Table 18

Hypothesis 2A, Main Analysis: Summary of Hierarchical Multiple Regression Analysis Predicting Emotional/Interpersonal Psychopathy Traits

Predictors	Step 1			Step 2		
	β	t	sr^2	β	t	sr^2
Head Injury	.11	1.17	.01	.14	1.56	.02
SRP III Factor 2	.46**	4.29**	.14	.46**	4.53**	.13
RPQ Reactive Aggression	.22*	2.06*	.03	.13	1.32	.01
BES Cognitive Empathy	-.01	-.11	.00	.07	.80	.00
Baseline HR	.07	.76	.00	.09	.71	.00
Baseline EDA	-.06	-.67	.00	-.08	-.95	.00
Post NV Cognitive Empathy	-.02	-.18	.00	.08	.82	.00
Post NV Affective Empathy	-.23*	-2.22*	.04	-.10	-.98	.00
Post EV Cognitive Empathy	-.02	-.21	.00	-.03	-.31	.00
TES Affective Empathy				-.45**	-4.41**	.12
Empathy Video HR				-.05	-.37	.00
Empathy Video EDA				.09	1.02	.00
Post EV Affective Empathy				.07	.66	.00

Note. $N = 80$. NV = Neutral video, EV = Empathy Video. $*p < .05$, $**p \leq .001$.

On the first step of the model, Factor 2 psychopathy traits, reactive aggression, and post neutral video affective empathy predicted the emotional/interpersonal (Factor 1) psychopathy characteristics. Here, higher reactive aggression and Factor 2 scores and lower post neutral video affective empathy scores were associated with higher Factor 1 psychopathy traits. Additionally, on the second step of the regression lower affective empathy as assessed by the TES significantly predicted higher Factor 1 psychopathy traits. However the physiological variables of HR and EDA, and the self-reported affective empathy, in response to the empathy eliciting video clip were not significant predictors. Therefore, as anticipated, results indicated that after accounting for head injury, reactive aggression, social deviance (Factor 2) psychopathy traits, and cognitive empathy, affective empathy was a significant predictor of the emotional/interpersonal (Factor 1) psychopathy characteristics.

Hypothesis 2A: Supplementary Analysis 1 (Original Measures, Total Sample)

Hypothesis 2A was also examined using the total sample (RPQ aggression measure and BES affective empathy measure). Descriptive statistics and correlations between all relevant variables are presented in Table 19. The model was significant and accounted for 56.9% of the variance in Factor 1 psychopathy traits, $R^2 = .57$, $F\,(13, 1.3) = 10.46$, $p < .001$. Step one accounted for 43.1% of the variance in Factor 1 traits, $R^2\Delta = .43$, $F\Delta\ (9, 107) = 8.99$, $p < .001$, and an additional 13.8% of the variance was accounted for in step 2, $R^2\Delta = .14$, $F\Delta\ (4, 103) = 8.26$, $p < .001$. Table 20 includes beta, t and sr^2 coefficients.

On step one, Factor 1 psychopathy traits were predicted by Factor 2 psychopathy traits, reactive aggression, and post neutral video affective empathy. Here, higher scores

Table 19

Hypothesis 2A, Supplementary Analysis 1 (Total Sample): Descriptive Statistics and Correlations for Variables included in the Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14
1. SRP III Factor 1	85.66 (14.86)	.17*	.59**	.44**	.01	-.01	.07	-.04	-.20*	-.04	-.44**	-.09	-.12	-.13
2. Head Injury	.41 (.50)	___	.24*	.26*	.12	-.23*	.11	.01	-.10	.00	.05	-.27**	-.06	-.06
3. SRP III Factor 2	72.91 (14.88)		___	.46**	.12	-.17*	.05	.04	.01	-.06	-.13	-.23*	-.13	-.13
4. RPQ RA	9.59 (4.17)			___	-.03	-.07	.07	-.05	-.07	-.15*	-.01	-.03	-.01	-.08
5. BES Cog. Emp.	35.75 (3.37)				___	.00	.11	.11	-.01	.12	.03	-.04	-.16*	-.01
6. Baseline HR	69.47 (9.16)					___	-.02	-.01	-.11	.04	.06	.76**	.06	.01
7. Baseline EDA	8.54 (2.06)						___	.11	-.07	.01	-.04	.02	.12	.02
8. Post NV Cog, Emp.	9.17 (2.50)							___	.51**	.10	.21*	.06	.12	.15†
9. Post NV Aff. Emp.	6.49 (1.87)								___	.20*	.28**	.03	-.05	.18*
10. Post EV Cog. Emp.	9.19 (3.16)									___	.17*	.00	.02	.51**
11. BES Aff. Emp.	36.05 (6.08)										___	.06	.08	.31**
12.EV HR	71.16 (9.55)											___	.04	-.05
13. EV EDA	9.60 (2.57)												___	.07
14. Post EV Aff. Emp.	11.84 (2.08)													___

Note. $N = 117$, RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: $^{\dagger}p < .055$, $*p < .05$,$**p < .001$, one-tailed.

Table 20

Hypothesis 2A, Supplementary Analysis 1 (Total Sample): Summary of Hierarchical Multiple Regression Analysis Predicting Emotional/Interpersonal Psychopathy

Predictors	Step 1			Step 2		
	β	t	sr^2	β	t	sr^2
Head Injury	.01	.07	.00	.04	.56	.00
SRP III Factor 2	.51**	6.05**	.19	.43**	5.46**	.12
RPQ Reactive Aggression	.21*	2.42*	.03	.25**	3.27**	.04
BES Cognitive Empathy	-.07	-.86	.00	-.07	-.95	.00
Baseline HR	.07	.86	.00	.16	1.50	.01
Baseline EDA	.01	.16	.00	.01	.08	.00
Post NV Cognitive Empathy	.06	.69	.00	.11	1.40	.01
Post NV Affective Empathy	-.23*	-2.52*	.03	-.13	-1.61	.01
Post EV Cognitive Empathy	.07	.85	.00	.10	1.16	.00
BES Affective Empathy				-.40**	-5.47**	.13
Empathy Video HR				-.08	-.71	.00
Empathy Video EDA				-.07	-.96	.00
Post EV Affective Empathy				.04	.43	.00

*Note. N = 117. NV = Neutral video, EV = Empathy Video. *p < .05, **p ≤ .001.*

on Factor 2 and reactive aggression were associated with higher Factor 1 scores and lower post neutral video affective empathy scores were related to higher Factor 1 psychopathy scores. These findings were in line with those presented in the main analysis. As was the case with the main analysis, BES affective empathy was a significant predictor of Factor 1 psychopathy traits on the second step of the model. The physiological indices of affective empathy (HR and EDA) and the self-reported affective empathy in response to the empathy video were not significant.

Hypothesis 2A: Supplementary Analysis 2 (Composite Scores)

Hypothesis 2A was also examined using composite aggression and affective empathy scores. See Table 21 for descriptive statistics and correlations between all variables included in the analysis. Results indicated that the overall model was significant and accounted for 65.5% of the variance in Factor 1 psychopathy traits, $R^2 = .66$, F (13, 63) = 9.21, $p < .001$. Step one in the model accounted for 46.5% of the variance in Factor 1 traits, $R^2\Delta = .47$, $F\Delta$ (9, 67) = 6.47, $p < .001$, whereas step 2 accounted for an additional 19% of the variance in Factor 1 traits, $R^2\Delta = .19$, $F\Delta$ (4, 63) = 8.68, $p = .001$. Table 22 provides Beta, t and sr^2 coefficients.

Factor 1 psychopathy traits were predicted by post neutral video affective empathy (nearing significance, $p = .051$) and Factor 2 psychopathy characteristics on step 1, whereby lower post neutral video affective empathy scores and higher Factor 2 scores were related to higher Factor 1 psychopathy traits. Contrary to the results found in the main analysis using RPQ reactive aggression scores, composite reactive aggression scores were not predictive of Factor 1 traits. However, most importantly, in step 2 lower composite affective empathy scores were associated with higher Factor 1 psychopathy

Table 21

Hypothesis 2A, Supplementary Analysis 2 (Composite Scores): Descriptive Statistics and Correlations for Variables included in the Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14
1. SRP III Factor 1	87.17 (15.20)	.25*	.59**	.48**	.00	-.05	-.03	-.21*	-.27*	-.02	-.60**	-.18	-.10	-.18
2. Head Injury	.44 (.50)	____	.26*	.28*	.16	-.24*	.14	.08	-.02	.15	-.05	-.28*	-.04	-.05
3. SRP III Factor 2	73.31 (15.52)		____	.56**	.08	-.26*	.04	-.04	-.04	.01	-.19†	-.30*	-.16	-.18
4. Comp. RA	.06 (1.29)			____	-.03	-.16	-.01	-.02	.00	-.05	-.08	-.19*	-.04	-.11
5. BES Cog. Emp.	35.62 (3.21)				____	-.11	.29*	.12	-.04	.12	.01	-.05	-.20*	-.02
6. Baseline HR	69.10 (9.36)					____	.04	-.23*	-.17	.04	-.09	.76**	.03	-.01
7. Baseline EDA	8.77 (1.94)						____	.06	-.15	.08	.05	.02	.19*	.05
8. Post NV Cog, Emp.	9.18 (2.40)							____	.48**	.11	.39**	-.18	.05	.16
9. Post NV Aff. Emp.	6.43 (1.88)								____	.08	.43**	-.06	-.11	.19†
10. Post EV Cog. Emp.	9.00 (3.15)									____	.19†	-.01	.05	.52**
11. Comp. Aff. Emp.	-.14 (1.33)										____	.05	.15	.35*
12.EV HR	71.90 (9.65)											____	-.02	-.07
13. EV EDA	9.52 (2.58)												____	.03
14. Post EV Aff. Emp.	11.65 (2.02)													____

Note., $N = 77$. RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video.
Correlations from regression analysis: $^{\dagger}p < .055$, $*p < .05$, $**p < .001$, one-tailed.

Table 22

Hypothesis 2A, Supplementary Analysis 2 (Composite Scores): Summary of Hierarchical Multiple Regression Analysis Predicting Emotional/Interpersonal Psychopathy Traits

Predictors	Step 1			Step 2		
	β	t	sr^2	β	t	sr^2
Head Injury	.10	1.02	.00	.08	.92	.00
SRP III Factor 2	.47**	4.24**	.14	.40**	4.08**	.09
Comp. Reactive Aggression	.19	1.73	.02	.21*	2.32*	.03
BES Cognitive Empathy	-.01	-.15	.00	-.01	-.09	.00
Baseline HR	.08	.81	.01	.07	.59	.00
Baseline EDA	-.08	-.87	.01	-.05	-.60	.00
Post NV Cognitive Empathy	-.07	-.64	.00	.03	.32	.00
Post NV Affective Empathy	-.21†	-1.99†	.03	-.04	-.42	.00
Post EV Cognitive Empathy	.00	-.02	.00	.02	.22	.00
Comp. Affective Empathy				-.53**	-5.73**	.18
Empathy Video HR				-.02	-.14	.00
Empathy Video EDA				.05	.57	.00
Post EV Affective Empathy				.10	1.09	.01

Note. $N = 77$. Comp. = Composite, NV = Neutral video, EV = Empathy Video. $^{\dagger}p < .055$, $*p < .05$, $**p \leq .001$.

characteristics, as was seen in the main analysis using the TES empathy scores. Once again, the physiological variables and the self-reported affective empathy in response to the empathy video, were not found to be significant predictors of Factor 1 psychopathy traits.

Hypothesis 2A: Supplementary Analysis 3 (Adjusted Psychopathy Scores)

Hypothesis 2A was examined for a final time using the adjusted psychopathy scores (empathy and aggression items removed). Correlations and descriptive statistics for relevant variables are provided in Table 23. The overall model accounted for 57.8% of the variance in Factor 1 psychopathy traits, $R^2 = .58$, $F(13, 66) = 6.96$, $p < .001$. Step one accounted for 45.2% of the variance in Factor 1 traits, $R^2\Delta = .45$, $F\Delta(9, 70) = 6.43$, $p < .001$ and step 2 accounted for an additional 12.6% of the variance, $R^2\Delta = .13$, $F\Delta(4, 66) = 4.92$, $p = .002$. Table 24 provides a summary of the beta, t and sr^2 coefficients.

Coinciding with the main analysis, Factor 1 psychopathy traits were predicted by reactive aggression, Factor 2 psychopathy characteristics, and post neutral video affective empathy on the first step of the model. Higher Factor 1 psychopathy scores were associated with lower post neutral video affective empathy scores and higher reactive aggression and Factor 2 psychopathy scores. Similar to the main analysis, higher Factor 1 psychopathy traits were predicted by lower affective empathy scores on step 2. Once again, self-reported affective empathy in response to the empathy video and the physiological variables of HR and EDA, were not significant.

Hypothesis 2A Conclusion

Results from the main analysis, and supplementary analyses conducted with the total sample, composite scores, and adjusted psychopathy scores all supported hypothesis

Table 23

Hypothesis 2A, Supplementary Analysis 3 (Adjusted Psychopathy): Descriptive Statistics and Correlations for Variables included in the Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Factor 1 (Adj.)	74.76 (13.95)	.25*	.58**	.48**	-.05	-.07	.01	-.16	-.24*	-.05	-.49**	-.19*	-.07	-.17
2. Head Injury	.44 (.50)	___	.26*	.30*	.18†	-.24*	.11	.10	-.03	.15	.04	-.26*	-.03	-.05
3. Factor 2 (Adj.)	56.51 (12.13)		___	.46**	.02	-.28*	.10	-.09	-.03	-.02	-.14	-.29*	-.18†	-.16
4. RPQ RA	3.76 (3.35)			___	-.08	-.16	.05	-.05	-.06	-.09	-.23*	.17	-.03	-.10
5. BES Cog. Emp.	35.66 (3.23)				___	-.09	.23*	.13	-.05	.14	.17	-.04	-.20*	.01
6. Baseline HR	69.10 (9.23)					___	.01	-.23*	-.16	.05	-.13	.76**	.02	.00
7. Baseline EDA	8.90 (2.13)						___	.06	-.16	.03	.00	-.04	.12	.04
8. Post NV Cog, Emp.	9.18 (2.39)							___	.45**	.10	.42**	-.17	.05	.16
9. Post NV Aff. Emp.	6.41 (1.85)								___	.08	.39**	-.05	-.10	.18†
10. Post EV Cog. Emp.	9.02 (3.14)									___	.16	.00	.04	.53**
11. TES Aff. Emp.	43.74 (6.85)										___	.00	.23*	.27*
12.EV HR	71.73 (9.53)											___	-.01	-.06
13. EV EDA	9.45 (2.56)												___	.02
14. Post EV Aff. Emp.	11.68 (1.99)													___

Note. $N = 80$. RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: $^{\dagger}p < .055$, $*p < .05$, $**p < .001$, one-tailed.

Table 24

Hypothesis 2A, Supplementary Analysis 3 (Adjusted Psychopathy Scores): Summary of Hierarchical Multiple Regression Analysis Predicting Emotional/Interpersonal Psychopathy Traits

Predictors	Step 1			Step 2		
	β	t	sr^2	β	t	sr^2
Head Injury	.09	.88	.01	.11	1.19	.01
SRP III Factor 2 (Adj.)	.48**	4.53**	.16	.48**	4.84**	.15
RPQ Reactive Aggression	.23*	2.23*	.04	.15	1.50	.01
BES Cognitive Empathy	-.04	-.43	.00	.05	.54	.00
Baseline HR	.08	.85	.01	.12	.91	.01
Baseline EDA	-.09	-.92	.01	-.11	-1.27	.01
Post NV Cognitive Empathy	.02	.16	.00	.11	1.08	.01
Post NV Affective Empathy	-.22*	-2.11*	.03	-.08	-.81	.00
Post EV Cognitive Empathy	-.02	-.18	.00	-.02	-.24	.00
TES Affective Empathy				-.44**	-4.21**	.11
Empathy Video HR				-.07	-.55	.00
Empathy Video EDA				.13	1.36	.01
Post EV Affective Empathy				.05	.49	.00

Note. $N = 80$. NV = Neutral video, EV = Empathy Video. *$p < .05$, **$p \leq .001$.

2A demonstrating that affective empathy was a significant predictor of Factor 1 psychopathy traits over and above head injury status, reactive aggression, Factor 2 psychopathy characteristics, and cognitive empathy.

Examining Hypothesis 2B

A third hierarchical multiple regression was conducted to examine hypothesis 2B, which suggested that affective empathy would be a significant predictor of proactive aggression after accounting for social deviance (Factor 2) psychopathy traits, reactive aggression, and cognitive empathy. It should be noted that Factor 2 psychopathy traits were included in the model to maintain consistency (included as a covariate in all regressions) and because Factor 2 was positively correlated with proactive aggression. On the first step of the model, head injury status, reactive aggression, Factor 2 psychopathy traits, cognitive empathy (BES), baseline physiological measures (HR and EDA), post neutral video affective empathy, and post video cognitive empathy for both videos, were entered. Affective empathy, physiological measures (HR and EDA) for the empathy video and post empathy video affective empathy were entered on the second step of the model. Proactive aggression was entered as the criterion. The main analysis and the supplementary analyses all follow the steps outlined above.

Hypothesis 2B: Main Analysis

Hypothesis 2B was first examined using TES affective empathy scores and RPQ reactive aggression scores. Table 25 includes descriptive statistics and correlations among variables included in this regression. The overall model accounted for 64.3% of the variance in proactive aggression, $R^2 = .64$, $F\,(13, 66) = 9.16$, $p < .001$. Step 1 of the model accounted for 52% of the variance, $R^2\Delta = .52$, $F\Delta\,(9, 70) = 8.43$, $p < .001$ and step

Table 25

Hypothesis 2B, Main Analysis: Descriptive Statistics and Correlations for Variables included in the Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14
1. RPQ PA	3.76 (3.35)	.18†	.65**	.57**	-.02	-.09	-.01	-.12	.00	-.05	-.36**	-.24*	.00	-.18†
2. Head Injury	.44 (.50)	___	.21*	.30*	.18†	-.24*	.11	.10	-.03	.15	.04	-.26*	-.03	-.05
3. SRP III Factor 2	73.36 (15.86)		___	.51**	.02	-.27*	.09	-.06	-.04	-.03	-.15	-.30*	-.16	-.19*
4. RPQ RA	3.76 (3.35)			___	-.08	-.16	.05	-.05	-.06	-.09	-.23*	-.17	-.03	-.10
5. BES Cog. Emp.	35.66 (3.23)				___	-.09	.23*	.13	-.05	.14	.17	-.04	-.20*	.01
6. Baseline HR	69.10 (9.23)					___	.01	-.23*	-.16	.05	-.13	.76**	.02	.00
7. Baseline EDA	8.90 (2.13)						___	.06	-.16	.03	.00	-.04	.12	.04
8. Post NV Cog, Emp.	9.18 (2.39)							___	.45**	.10	.42**	-.17	.05	.16
9. Post NV Aff. Emp.	6.41 (1.85)								___	.08	.39**	-.05	-.10	.18†
10. Post EV Cog. Emp.	9.02 (3.14)									___	.16	.00	.04	.53**
11. TES Aff. Emp.	43.74 (6.85)										___	.00	.23*	.27*
12.EV HR	71.73 (9.53)											___	-.01	-.06
13. EV EDA	9.45 (2.56)												___	.02
14. Post EV Aff. Emp.	11.68 (1.99)													___

Note. $N = 80$. RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: $^{\dagger}p < .055$, $^{*}p < .05$, $^{**}p < .001$, one-tailed.

2 accounted for an additional 12.3% of the variance in proactive aggression, $R^2\Delta = .12$, $F\Delta\ (4, 66) = 5.70$, $p = .001$. Table 26 includes Beta, t and sr^2 coefficients.

On the first step of the model, Factor 2 Psychopathy characteristics and reactive aggression were significant predictors of proactive aggression such that higher Factor 2 and reactive aggression scores were associated with higher proactive aggression scores. In addition, affective empathy as measured by the TES significantly predicted proactive aggression on the second step of the model, revealing that lower affective empathy scores were related to higher proactive aggression. Moreover, higher empathy video EDA frequency was also associated with higher proactive aggression scores in step 2.

Hypothesis 2B: Supplementary Analysis 1 (Original Measures, Total Sample)

Hypothesis 2B was then examined using the measures completed by the total sample (RPQ aggression and BES affective empathy). See Table 27 for descriptive statistics and correlations among relevant variables. The model accounted for 50.9% of the variance in proactive aggression, $R^2 = .51$, $F\ (13, 102) = 8.14$, $p < .001$. Step 1 of the model accounted for 48.6% of the variance in proactive aggression, $R^2\Delta = .49$, $F\Delta\ (9, 106) = 11.15$, $p < .001$. Step 2 in the model was not significant, $F\Delta\ (4, 102) = 1.19$, $p > .05$. Beta, t and sr^2 coefficients are presented in Table 28.

As was the case with both the main analysis, proactive aggression was significantly predicted by Factor 2 psychopathy traits and reactive aggression, such that higher scores on the aforementioned variables were associated with higher proactive aggression scores. In contrast to the main analysis, self-reported affective empathy (as assessed by the BES), the empathy video physiological measures, and the post empathy video affective empathy measure did not predict proactive aggression.

Table 26

Hypothesis 2B, Main Analysis: Summary of Hierarchical Multiple Regression Analysis Predicting Proactive Aggression

Predictors	Step 1			Step 2		
	β	t	sr^2	β	t	sr^2
Head Injury	.02	.26	.00	.03	.32	.00
SRP III Factor 2	.51**	5.13**	.18	.52**	5.49**	.16
RPQ Reactive Aggression	.32*	3.12*	.07	.25*	2.69*	.04
BES Cognitive Empathy	.04	.41	.00	.15	1.80	.02
Baseline HR	.10	1.13	.01	.25*	2.12*	.02
Baseline EDA	-.07	-.82	.00	-.11	-1.43	.01
Post NV Cognitive Empathy	-.09	-.94	.01	-.04	-.49	.00
Post NV Affective Empathy	.08	.88	.01	.23*	2.56*	.04
Post EV Cognitive Empathy	-.02	-.22	.00	-.02	-.21	.00
TES Affective Empathy				-.35**	-3.61**	.07
Empathy Video HR				-.22	-1.80	.02
Empathy Video EDA				.24*	2.80*	.04
Post EV Affective Empathy				.00	-.02	.00

Note. N = 80. NV = Neutral video, EV = Empathy Video. *p < .05, **p ≤ .001.

Table 27

Hypothesis 2B, Supplementary Analysis 1 (Total Sample): Descriptive Statistics and Correlations for Variables included in the Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14
1. RPQ PA	3.40 (3.16)	.18*	.62**	.54**	-.03	-.03	.06	-.04	-.05	-.15	-.10	-.12	.06	-.13
2. Head Injury	.41 (.50)	____	.23*	.26*	.11	-.25*	.10	-.02	-.11	-.01	.03	-.29*	-.06	-.07
3. SRP III Factor 2	72.91 (14.88)		____	.46**	.09	-.21*	.04	-.01	.00	-.08	-.16*	-.25*	-.13	-.16*
4. RPQ RA	9.59 (4.17)			____	-.04	-.07	.07	-.06	-.07	-.16*	-.02	-.03	-.01	-.08
5. BES Cog. Emp.	35.75 (3.37)				____	-.02	.11	.08	-.02	.10	.01	-.06	-.16*	-.03
6. Baseline HR	69.47 (9.16)					____	-.03	-.05	-.12	.03	.03	.75**	.06	-.02
7. Baseline EDA	8.54 (2.06)						____	.11	-.08	.01	-.04	.01	.12	.02
8. Post NV Cog, Emp.	9.17 (2.50)							____	.50**	.08	.19*	.03	.12	.12
9. Post NV Aff. Emp.	6.49 (1.87)								____	.19*	.28*	.02	-.05	.17*
10. Post EV Cog. Emp.	9.19 (3.16)									____	.16*	-.01	.02	.51**
11. BES Aff. Emp.	36.05 (6.08)										____	.04	.08	.30*
12.EV HR	71.16 (9.55)											____	.04	-.07
13. EV EDA	9.60 (2.57)												____	.08
14. Post EV Aff. Emp.	11.84 (2.08)													____

Note. $N = 116$. PA = Proactive Aggression, RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: $*p < .05$, $**p < .001$, one-tailed.

Table 28

Hypothesis 2B, Supplementary Analysis 1 (Total Sample): Summary of Hierarchical Multiple Regression Analysis Predicting Proactive Aggression

Predictors	Step 1			Step 2		
	β	t	sr^2	β	t	sr^2
Head Injury	.02	.29	.00	.02	.19	.00
SRP III Factor 2	.50**	6.16**	.18	.49**	5.78**	.16
RPQ Reactive Aggression	.30**	3.69**	.07	.31**	3.77**	.07
BES Cognitive Empathy	-.06	-.86	.00	-.04	-.57	.00
Baseline HR	.11	1.43	.01	.21	1.88	.02
Baseline EDA	.03	.43	.00	.02	.32	.00
Post NV Cognitive Empathy	-.01	-.15	.00	-.03	-.39	.00
Post NV Affective Empathy	.01	.07	.00	.05	.52	.00
Post EV Cognitive Empathy	-.06	-.79	.00	-.03	-.75	.00
BES Affective Empathy				-.02	-.29	.00
Empathy Video HR				-.14	-1.25	.01
Empathy Video EDA				.13	1.73	.01
Post EV Affective Empathy				.01	-.09	.00

Note. $N = 116$. NV = Neutral video, EV = Empathy Video. *$p < .05$, **$p \leq .001$.

Hypothesis 2B: Supplementary Analysis 2 (Composite Scores)

Hypothesis 2B was also testing using the composite scores. Descriptive statistics and correlations between all variables included in the regression are presented in Table 29. Results indicated that the overall model accounted for 56.3% of the variance in composite proactive aggression scores, $R^2 = .56$, $F(13, 63) = 6.24$, $p < .001$. Step 1 of the model accounted for 49.8% of the variance, $R^2\Delta = .50$, $F\Delta (9, 67) = 7.40$, $p < .001$. Contrary to the results obtained in the main analysis, step 2 was only approaching significance and accounted for an additional 6.4% of the variance in composite proactive aggression scores, $R^2\Delta = .06$, $F\Delta (4, 63) = 2.32$, $p = .067$. Beta, t and sr^2 coefficients are presented in Table 30.

As was the case in the main analysis, Factor 2 psychopathy characteristics and composite reactive aggression scores were positively associated with composite proactive aggression scores on step 1 of the model. The results of this analysis revealed that when entered on the second step, composite affective empathy scores did not predict Factor 1 psychopathy traits, nor did any other affective empathy related variables, including HR and EDA.

Hypothesis 2B: Supplementary Analysis 3 (Adjusted Psychopathy Scores)

The third hierarchical multiple regression in the series was conducted for a final time to examine hypothesis 2B, using adjusted psychopathy scores (empathy and aggression items removed). Table 31 provides descriptive statistics and correlations. The overall model accounted for 61.2% of the variance in proactive aggression, $R^2 = .61$, $F(13, 66) = 7.99$, $p < .001$. The first step accounted for 48% of the variance in proactive aggression, $R^2\Delta = .48$, $F\Delta (9, 70) = 7.18$, $p = .001$ and the second step accounted for an

Table 29

Hypothesis 2B, Supplementary Analysis 2(Composite Scores): Descriptive Statistics and Correlations for Variables included in the Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Comp. PA	.01 (1.40)	.20*	.58**	.64**	.02	-.09	-.08	-.06	-.01	-.04	-.23*	-.23*	.03	-.16
2. Head Injury	.44 (.50)	___	.26*	.28*	.16	-.24*	.14	.07	-.02	.15	-.05	-.27*	-.04	-.05
3. SRP III Factor 2	73.31 (15.52)		___	.56**	.08	-.26*	.04	-.04	-.04	.01	-.19†	-.30*	-.16	-.18
4. Comp. RA	.06 (1.29)			___	-.03	-.16	-.01	-.02	.00	-.05	-.08	-.19*	-.04	-.11
5. BES Cog. Emp.	35.62 (3.21)				___	-.11	.29*	.12	-.04	.12	.01	-.05	-.20*	-.02
6. Baseline HR	69.10 (9.36)					___	.04	-.23*	-.17	.04	-.09	.76**	.03	-.01
7. Baseline EDA	8.77 (1.94)						___	.06	-.15	.08	.05	.02	.19*	.05
8. Post NV Cog, Emp.	9.18 (2.40)							___	.48**	.11	.39**	-.18	.05	.16
9. Post NV Aff. Emp.	6.43 (1.88)								___	.08	.43**	-.06	-.11	.19†
10. Post EV Cog. Emp.	9.00 (3.15)									___	.19†	-.01	.05	.52**
11. Comp. Aff. Emp.	-.14 (1.33)										___	.05	.15	.35*
12.EV HR	71.90 (9.65)											___	-.02	-.07
13. EV EDA	9.52 (2.58)												___	.03
14. Post EV Aff. Emp.	11.65 (2.02)													___

Note. $N = 77$. Comp. PA = Composite Proactive Aggression, Comp. RA = Composite Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: $^{\dagger}p < .055$, $^{*}p < .05$, $^{**}p < .001$, one-tailed.

Table 30

Hypothesis 2B, Supplementary Analysis 2 (Composite Scores): Summary of Hierarchical Multiple Regression Analysis Predicting Proactive Aggression

Predictors	Step 1			Step 2		
	β	t	sr^2	β	t	sr^2
Head Injury	.01	.14	.00	-.01	-.12	.00
SRP III Factor 2	.34*	3.15*	.07	.32*	2.93*	.06
Comp. Reactive Aggression	.46**	4.28**	.14	.46**	4.40**	.13
BES Cognitive Empathy	.05	.56	.00	.11	1.14	.01
Baseline HR	.08	.87	.01	.25	1.84	.02
Baseline EDA	-.10	-1.07	.01	-.12	-1.34	.01
Post NV Cognitive Empathy	-.03	-.27	.00	-.03	-.29	.00
Post NV Affective Empathy	.02	.19	.00	.12	1.16	.01
Post EV Cognitive Empathy	-.02	-.25	.00	.00	-.04	.00
Comp. Affective Empathy				-.15	-1.45	.01
Empathy Video HR				-.23	-1.67	.02
Empathy Video EDA				.17	1.82	.02
Post EV Affective Empathy				-.03	-.27	.00

Note. $N = 77$. Comp. = Composite, NV = Neutral video, EV = Empathy Video. *$p < .05$, **$p \leq .001$.

Table 31

Hypothesis 2B, Supplementary Analysis 3 (Adjusted Psychopathy): Descriptive Statistics and Correlations for Variables included in the Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14
1. RPQ PA	3.76 (3.35)	.18*	.59**	.57**	-.02	-.09	-.01	-.12	.00	-.05	-.36**	-.24*	.00	-.18*
2. Head Injury	.44 (.50)	___	.26*	.30**	.18	-.24*	.11	.10	-.03	.15	.04	-.26*	-.03	-.05
3. Factor 2 (Adj.)	56.51 (12.13)		___	.46**	.02	-.28*	.10	-.09	-.03	-.02	-.14	-.29**	-.18	-.16
4. RPQ RA	3.76 (3.35)			___	-.08	-.16	.05	-.05	-.06	-.09	-.23*	-.17	-.03	-.10
5. BES Cog. Emp.	35.66 (3.23)				___	-.09	.23*	.13	-.05	.14	.17	-.04	-.20*	.01
6. Baseline HR	69.10 (9.23)					___	.01	-.23*	-.16	.05	-.13	.76**	.02	.00
7. Baseline EDA	8.90 (2.13)						___	.06	-.16	.03	.00	-.04	.12	.04
8. Post NV Cog, Emp.	9.18 (2.39)							___	.45**	.10	.42**	-.17	.05	.16
9. Post NV Aff. Emp.	6.41 (1.85)								___	.08	.39**	-.05	.10	.18*
10. Post EV Cog. Emp.	9.02 (3.14)									___	.16	.00	.04	.53**
11. TES Aff. Emp.	43.74 (6.85)										___	.00	.23*	.27*
12.EV HR	71.73 (9.53)											___	-.01	-.06
13. EV EDA	9.45 (2.56)												___	.02
14. Post EV Aff. Emp.	11.68 (1.99)													___

Note. $N = 80$. PA = Proactive Aggression, RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: $^{*}p < .05, ^{**}p < .001$, one-tailed.

additional 13.1% of the variance, $R^2\Delta = .13$, $F\Delta\ (4, 66) = 5.59$, $p = .001$. Beta, t and sr^2 coefficients can be found in Table 32.

As was found in the main analysis, on the first step of the model, Factor 2 psychopathy characteristics and reactive aggression were positively associated with proactive aggression. Also coinciding with the main analysis, affective empathy was negatively associated with proactive aggression and empathy video EDA was positively associated with proactive aggression on the second step of the model. Contrary to the main analysis, empathy video HR was also a significant predictor of proactive aggression such that a lower HR in response to the empathy video was related to higher proactive aggression scores.

Hypothesis 2B Conclusion

Hypothesis 2B was supported in the main analysis, which utilized the RPQ aggression measure and the TES affective empathy measure, as well as in the supplementary analysis, which was also based on the RPQ aggression measure and the TES affective empathy measure, but included adjusted psychopathy scores. Thus the current findings, employing these self-report scales provide support for Hypothesis 2B demonstrating that affective empathy was a significant predictor of proactive aggression after accounting for head injury, social deviance (Factor 2) psychopathy traits, reactive aggression, and cognitive empathy. However, in the supplementary analysis based on the total sample (RPQ and BES) and the analysis based on the composite aggression and affective empathy scores, hypothesis 2B was not supported, such that affective empathy was not a significant predictor of proactive aggression over and above head injury, Factor 2 psychopathy characteristics, reactive aggression, and cognitive empathy.

Table 32

Hypothesis 2B, Supplementary Analysis 3 (Adjusted Psychopathy Scores): Summary of Hierarchical Multiple Regression Analysis Predicting Proactive Aggression

Predictors	Step 1			Step 2		
	β	t	sr^2	β	t	sr^2
Head Injury	-.01	-.14	.00	-.02	-.23	.00
SRP III Factor 2 (Adj.)	.44**	4.35**	.14	.45**	4.72**	.13
RPQ Reactive Aggression	.39**	3.82**	.11	.32**	3.47**	.07
BES Cognitive Empathy	.04	.48	.00	.16	1.78	.02
Baseline HR	.09	.97	.01	.27*	2.17*	.03
Baseline EDA	-.07	-.79	.00	-.11	-1.34	.01
Post NV Cognitive Empathy	-.08	-.76	.00	-.03	-.32	.00
Post NV Affective Empathy	.08	.76	.00	.23*	2.41*	.03
Post EV Cognitive Empathy	-.02	-.17	.00	.01	.08	.00
TES Affective Empathy				-.34**	-3.34**	.07
Empathy Video HR				-.26*	-2.06*	.02
Empathy Video EDA				.23*	2.62*	.04
Post EV Affective Empathy				-.05	-.49	.00

Note. $N = 80$. Adj. = Adjusted, NV = Neutral video, EV = Empathy Video. *$p < .05$, **$p \leq .001$.

Examining Hypothesis 2C

Finally, two simultaneous multiple regressions were conducted to examine Hypothesis 2C which posits that affective empathy is the common cause of the relationship between Factor 1 psychopathy traits and proactive aggression. In the first simultaneous multiple regression all affective empathy variables were excluded from the model, whereas in the second analysis all affective empathy variables were included in the model. For this hypothesis to be supported, the first simultaneous regression should reveal that Factor 1 psychopathy scores were a significant predictor of proactive aggression whereas in the second simultaneous regression, Factor 1 psychopathy scores should no longer significantly predict proactive aggression. Head injury, Factor 2 psychopathy traits, reactive aggression, cognitive empathy, post empathy and neutral video cognitive empathy and baseline physiological responding (HR and EDA) were included in both regressions.

Hypothesis 2C: Main Analysis

As was done for the previous hypotheses, hypothesis 2C was first examined using the RPQ aggression and TES affective empathy measures. Descriptive statistics and correlations for relevant variables are provided in Tables 33 and 34. The results of the first simultaneous multiple regression (affective empathy variables excluded), indicate that the overall model accounted for 59.6% of the variance in proactive aggression, R^2 = .60, F (9, 70) = 11.46, $p < .001$. In addition, the results of the second simultaneous regression (affective empathy variables included) also found the overall model to be significant, accounting for 68.2% of the variance in proactive aggression, $R^2 = .68$, F (14, 65) = 9.94, $p < .001$. Table 35 provides Beta, t and sr^2 coefficients for both analyses.

Table 33

Hypothesis 2C, Main Analysis: Descriptive Statistics and Correlations for First Simultaneous Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10
1. RPQ PA	3.76 (3.35)	.18†	.65**	.57**	-.02	-.08	-.01	-.12	-.05	.67**
2. Head Injury	.44 (.50)	____	.21*	.30*	.18	-.24*	.11	.11	.15	.25*
3. SRP III Factor 2	73.36 (15.86)		____	.52**	.02	-.27*	.09	-.06	-.03	.58**
4. RPQ RA	10.03 (4.01)			____	-.08	-.16	.06	-.06	-.09	.49**
5. BES Cog. Emp.	35.66 (3.23)				____	-.09	.23*	.13	.14	-.02
6. Baseline HR	69.10 (9.23)					____	.01	-.23*	.05	-.07
7. Baseline EDA	8.90 (2.13)						____	.06	.03	.04
8. Post NV Cog, Emp.	9.18 (2.39)							____	.10	-.17
9. Post EV Cog. Emp.	9.03 (3.14)								____	-.06
10. SRP III Factor 1	87.14 (15.31)									____

Note. $N = 80$. PA = Proactive Aggression, RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. . Correlations from regression analysis: †$p < .055$, *$p < .05$, **$p < .001$, one-tailed.

Table 34

Hypothesis 2C, Main Analysis: Descriptive Statistics and Correlations for Second Simultaneous Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. RPQ PA	3.76 (3.35)	.18†	.65**	.57**	-.02	-.09	-.01	-.12	-.05	.00	-.18†	-.36**	-.24*	.01	.67**
2. Head Injury	.44 (.50)	____	.21*	.30**	.18	-.24*	.11	.11	.15	-.03	-.05	.04	-.26*	-.03	.25*
3. SRP III Factor 2	73.36 (15.86)		____	.51**	.02	-.27*	.09	-.06	-.03	-.04	-.19*	-.15	-.30**	-.16	.58**
4. RPQ RA	10.03 (4.01)			____	-.08	-.16	.05	-.05	-.09	-.06	-.10	-.23*	-.17	-.03	.49**
5. BES Cog. Emp.	35.66 (3.23)				____	-.09	.23*	.13	.14	-.05	.01	.17	-.04	-.20*	-.02
6. Baseline HR	69.10 (9.23)					____	.01	-.23*	.05	-.16	.00	-.13	.76**	.02	-.07
7. Baseline EDA	8.90 (2.13)						____	.06	.03	-.16	.04	.00	-.04	.12	.04
8. Post NV Cog, Emp.	9.18 (2.39)							____	.10	.45**	.16	.42**	-.17	.05	-.17
9. Post EV Cog. Emp.	9.02 (3.14)								____	.08	.53**	.16	.00	.04	-.06
10. Post NV Aff. Emp.	6.41 (1.85)									____	.18†	.39**	-.05	-.10	-.27*
11. Post EV Aff. Emp.	11.68 (1.99)										____	.27*	-.06	.02	-.18†
12. TES Aff. Emp.	43.74 (6.85)											____	.00	.23*	-.52**
13. EV HR	71.73 (9.53)												____	-.01	-.19*
14. EV EDA	9.45 (2.55)													____	-.10
15. SRP III Factor 1	87.14 (15.31)														____

Note. $N = 80$. PA = Proactive Aggression, RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: †$p \leq .055$, *$p < .05$, *$p < .05$, **$p < .001$, one-tailed.

Table 35

Hypothesis 2C, Main Analysis: Summary of Simultaneous Multiple Regression Results Predicting Proactive Aggression with and without Affective Empathy Variables in the Model

Predictors	Affective Empathy Excluded			Affective Empathy Included		
	β	t	sr^2	β	t	sr^2
Head Injury	-.03	-.37	.00	-.02	-.20	.00
SRP III Factor 2	.35**	3.38**	.07	.38**	3.67**	.07
RPQ Reactive Aggression	.23*	2.39*	.03	.21*	2.34*	.03
BES Cognitive Empathy	.03	.34	.00	.13	1.61	.01
Baseline HR	.06	.73	.00	.23†	1.97†	.02
Baseline EDA	-.08	-.96	.01	-.09	-1.16	.01
Post NV Cognitive Empathy	-.01	-.10	.00	-.07	-.79	.00
Post EV Cognitive Empathy	.00	-.01	.00	-.01	-.11	.00
Post NV Affective Empathy				.26*	3.00*	.04
Post EV Affective Empathy				-.02	-.25	.00
TES Affective Empathy				-.21*	-2.00*	.02
Empathy Video HR				-.20	-1.76	.02
Empathy Video EDA				.21*	2.57*	.03
SRP III Factor 1	.37**	3.74**	.08	.31*	2.80*	.04

Note. $N = 80$. NV = Neutral Video, EV = Empathy Video. †$p < .055$, *$p < .05$, **$p \leq .001$.

Results of the first analysis indicated that reactive aggression and both Factor 1 and Factor 2 psychopathy traits significantly predicted proactive aggression such that higher scores on the aforementioned variables were related to higher proactive aggression scores. Contrary to expectation, in the second analysis, Factor 1 traits still significantly predicted proactive aggression after all affective empathy variables were included in the model. Factor 2 traits and reactive aggression were also still significant predictors of proactive aggression. Results were in the same direction as the first analysis.

Several affective empathy variables including affective empathy as assessed by the TES, empathy video EDA and, post neutral video affective empathy, were also significant predictors of proactive aggression in the second analysis. As anticipated, lower scores on the TES affective empathy measure were associated with high proactive aggression scores. Higher frequencies for empathy video EDA and, higher scores for the post neutral video affective empathy were related to higher proactive aggression. Post neutral video cognitive empathy and post empathy video cognitive and affective empathy were unrelated. Interestingly, whereas HR in response to the empathy eliciting video was not a significant predictor of proactive aggression, baseline HR was nearing significance ($p = .053$) such that a higher HR (CPM) in response to the neutral video was associated with higher scores on proactive aggression.

Hypothesis 2C: Supplementary Analysis 1 (Original Measures, Total Sample)

Hypothesis 2C was tested again utilizing the total sample (RPQ aggression and BES affective empathy measures). Tables 36 and 37 include descriptive statistics and correlations for both simultaneous regressions. The results of the first simultaneous multiple regression (affective empathy variables excluded) were the same as those

Table 36

Hypothesis 2C, Supplementary Analysis 1 (Total Sample): Descriptive Statistics and Correlations for First Simultaneous Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10
1. RPQ PA	3.40 (3.16)	.18*	.62**	.54**	-.03	-.03	.06	-.04	-.15	.65**
2. Head Injury	.41 (.50)	____	.23*	.26*	.11	-.25*	.10	-.02	-.01	.18*
3. SRP III Factor 2	72.91 (14.88)		____	.46**	.09	-.21*	.04	-.01	-.08	.59**
4. RPQ RA	9.59 (4.17)			____	-.04	-.07	.07	-.06	-.16*	.44**
5. BES Cog. Emp.	35.75 (3.37)				____	-.02	.11	.08	.10	.00
6. Baseline HR	69.47 (9.16)					____	-.03	-.05	.03	-.02
7. Baseline EDA	8.54 (2.06)						____	.11	.01	.07
8. Post NV Cog, Emp.	9.17 (2.50)							____	.08	-.06
9. Post EV Cog. Emp.	9.19 (3.16)								____	-.05
10. SRP III Factor 1	85.66 (14.86)									____

Note. $N = 116$. PA = Proactive Aggression, RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. . Correlations from regression analysis: *$p < .05$, **$p < .001$, one-tailed.

Table 37

Hypothesis 2C, Supplementary Analysis 1 (Total Sample): Descriptive Statistics and Correlations for Second Simultaneous Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. RPQ PA	3.40 (3.16)	.18*	.62**	.54**	-.03	-.03	.06	-.04	-.15	-.05	-.13	-.10	-.12	.06	.65**
2. Head Injury	.41 (.50)	___	.23*	.26**	.11	-.25**	.10	-.02	-.01	-.11	-.07	.03	-.29**	-.06	.18*
3. SRP III Factor 2	72.91 (14.88)		___	.46**	.09	-.21*	.04	-.01	-.08	.00	-.16*	-.16*	-.25**	-.13	.58*
4. RPQ RA	9.59 (4.17)			___	-.04	-.07	.07	-.06	-.16*	-.07	-.08	-.02	-.03	-.01	.44**
5. BES Cog. Emp.	35.75 (3.37)				___	-.02	.11	.08	.10	-.02	-.03	.01	-.06	-.16*	.00
6. Baseline HR	69.47 (9.16)					___	-.03	-.05	.03	-.12	-.02	.03	.75**	.06	-.02
7. Baseline EDA	8.54 (2.06)						___	.11	.01	-.08	.02	-.04	.01	.12	.07
8. Post NV Cog, Emp.	9.17 (2.50)							___	.08	.50**	.12	.19*	.03	.12	-.06
9. Post EV Cog. Emp.	9.18 (3.16)								___	.19*	.51**	.16*	-.01	.02	-.04
10. Post NV Aff. Emp.	6.49 (1.87)									___	.17*	.28**	.02	-.05	-.20*
11. Post EV Aff. Emp.	11.84 (2.08)										___	.30**	-.07	.08	-.14
12. BES Aff. Emp.	36.05 (6.08)											___	.04	.08	-.46**
13.EV HR	71.16 (9.55)												___	.04	-.10
14. EV EDA	9.60 (2.57)													___	-.12
15. SRP III Factor 1	85.66 (14.86)														___

Note. $N = 116$. PA = Proactive Aggression, RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: *$p < .05$, **$p < .001$, one-tailed.

discussed in the main analysis and indicated that the overall model accounted for 56.3% of the variance in proactive aggression, $R^2 = .56$, $F(9, 106) = 15.17$, $p < .001$. The overall model in the second simultaneous multiple regression (affective empathy variables included) was also significant, accounting for 61.7% of the variance in proactive aggression, $R^2 = .62$, $F(14, 101) = 11.60$, $p < .001$. Table 38 includes beta, t and sr^2 coefficients.

As was found in the main analysis, results of the first simultaneous regression demonstrated that proactive aggression was positively associated with Factor 2 psychopathy traits and reactive aggression. Also coinciding with the main analysis, higher Factor 1 psychopathy traits significantly predicted higher proactive aggression in the first model. Contrary to expectation, Factor 1 psychopathy traits were still a significant predictor of proactive aggression when affective empathy variables were included in the model. As was the case in the main analysis, empathy video EDA was a significant predictor of proactive aggression, with higher EDA frequencies predicting higher proactive aggression scores, whereas empathy video HR was not a significant predictor. In the second simultaneous multiple regression, reactive aggression, Factor 2 psychopathy traits, and affective empathy as assessed by the BES were all positively associated with proactive aggression. Self-reported affective and cognitive empathy in response to the neutral and empathy video clips were not significantly associated with proactive aggression in either model.

Hypothesis 2C: Supplementary Analysis 2 (Composite Scores)

Hypothesis 2C was examined once again using the composite aggression and affective empathy scores. Descriptive statistics and correlations for the simultaneous

Table 38

Hypothesis 2C, Supplementary Analysis 1 (Total Sample): Summary of Simultaneous Multiple Regression Results Predicting Proactive Aggression with and without Affective Empathy Variables in the Model

Predictors	Affective Empathy Excluded			Affective Empathy Included		
	β	t	sr^2	β	t	sr^2
Head Injury	.01	.11	.00	-.01	-.07	.00
SRP III Factor 2	.32**	3.70**	.06	.28**	3.33**	.04
RPQ Reactive Aggression	.23*	2.97*	.04	.19*	2.42*	.02
BES Cognitive Empathy	-.05	-.68	.00	.01	-.15	.00
Baseline HR	.07	.98	.00	.13	1.32	.01
Baseline EDA	.02	.26	.00	.02	.32	.00
Post NV Cognitive Empathy	.01	.09	.00	-.08	-1.15	.01
Post EV Cognitive Empathy	-.07	-1.03	.00	-.11	-1.44	.01
Post NV Affective Empathy				.11	1.41	.01
Post EV Affective Empathy				-.03	-.33	.00
BES Affective Empathy				.17*	2.23*	.02
Empathy Video HR				-.10	-1.03	.00
Empathy Video EDA				.16*	2.43*	.02
SRP III Factor 1	.36**	4.31**	.08	.50*	5.32*	.11

Note. $N = 116$. NV = Neutral Video, EV = Empathy Video. *$p < .05$, **$p \leq .001$

regressions can be found in Tables 39 and 40. The first model (affective empathy variables excluded) accounted for 64.2% of the variance in composite proactive aggression scores, $R^2 = .64$, $F(9, 67) = 13.37$, $p < .001$. The overall model was also significant in the second analysis (affective empathy variables included), accounting for 70.9% of the variance in composite proactive aggression scores, $R^2 = .70$, $F(14, 62) = 10.80$, $p < .001$. Beta, t and sr^2 coefficients for both analyses are presented in Table 41.

Results of the first analysis demonstrated that composite reactive aggression scores and Factor 1 psychopathy scores were positively associated with composite proactive aggression scores. Unlike the main analysis, Factor 2 psychopathy scores were not a significant predictor of proactive aggression when using composites. No other variables were significantly associated with proactive aggression in the first simultaneous regression. As was found in the main analysis and contrary to the prediction outlined in hypothesis 2C, Factor 1 traits were still a significant predictor of composite proactive aggression after all affective empathy variables were included in the second model. In addition, reactive aggression scores also still significantly predicted proactive aggression, such that higher scores on one form of aggression were associated with higher scores for the other form of aggression. In opposition to the main analysis, the second simultaneous regression revealed that the affective empathy variables including composite affective empathy, empathy video EDA and HR, and post video affective empathy, did not significantly predict proactive aggression.

Hypothesis 2C: Supplementary Analysis 3 (Adjusted Psychopathy Scores)

Lastly, Hypothesis 2C was examined for a final time using adjusted psychopathy scores (aggression and empathy items removed). Descriptive statistics and correlations

Table 39

Hypothesis 2C, Supplementary Analysis 2 (Composite Scores): Descriptive Statistics and Correlations for First Simultaneous Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10
1. Comp. PA	.01 (1.39)	.20*	.58**	.64**	.02	-.09	-.08	-.06	-.04	.71**
2. Head Injury	.44 (.50)	____	.26*	.28*	.16	-.24*	.14	.08	.15	.25*
3. SRP III Factor 2	73.31 (15.51)		____	.56**	.08	-.26*	.04	-.04	.01	.59**
4. Comp. RA	.06 (1.29)			____	-.03	-.16	-.01	-.02	-.05	.48**
5. BES Cog. Emp.	35.62 (3.21)				____	-.11	.29*	.12	.12	.00
6. Baseline HR	69.09 (9.36)					____	.04	-.23*	.04	-.05
7. Baseline EDA	8.77 (2.40)						____	.06	.08	-.03
8. Post NV Cog, Emp.	9.18 (2.40)							____	.11	-.21*
9. Post EV Cog. Emp.	9.00 (3.15)								____	-.02
10. SRP III Factor 1	87.17 (15.20)									____

Note. $N = 77$. Comp. PA = Composite Proactive Aggression, Comp. RA = Composite Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: *$p < .05$, **$p < .001$, one-tailed.

Table 40

Hypothesis 2C, Supplementary Analysis 2 (Composite Scores): Descriptive Statistics and Correlations for Second Simultaneous Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Comp. PA	.01 (1.40)	.20*	.58**	.64**	.02	-.09	-.08	-.06	-.04	-.01	-.16	-.23*	-.23*	.03	.71**
2. Head Injury	.44 (.50)	___	.26*	.28*	.16	-.24*	.14	.07	.15	-.02	-.05	-.05	-.27*	-.04	.24*
3. SRP III Factor 2	73.31 (15.52)		___	.56**	.08	-.26*	.04	-.04	.01	-.04	-.18	-.19†	-.30*	-.16	.59**
4. Comp. RA	.06 (1.29)			___	-.03	-.16	-.01	-.02	-.05	.00	-.11	-.08	-.19*	-.04	.48**
5. BES Cog. Emp.	35.62 (3.21)				___	-.11	.29*	.12	.12	-.04	-.02	.01	-.05	-.20*	.00
6. Baseline HR	69.10 (9.36)					___	.04	-.23*	.04	-.17	-.01	-.09	.76**	.03	-.05
7. Baseline EDA	8.77 (1.94)						___	.06	.08	-.15	.05	.05	.02	.19*	-.03
8. Post NV Cog, Emp.	9.18 (2.40)							___	.11	.48**	.16	.39**	-.18	.05	-.20*
9. Post EV Cog. Emp.	9.00 (3.15)								___	.08	.52**	.19†	-.01	.05	-.02
10. Post NV Aff. Emp.	6.43 (1.88)									___	.19†	.43**	-.06	-.11	-.26*
11. Post EV Aff. Emp.	11.65 (2.02)										___	.35*	-.07	.03	-.18
12. Comp. Aff. Emp.	-.14 (1.33)											___	.05	.15	-.60**
13.EV HR	71.90 (9.64)												___	-.02	-.18
14. EV EDA	9.52 (2.58)													___	-.10
15. SRP III Factor 2	87.17 (15.20)														___

Note. $N = 77$. Comp. PA = Composite Proactive Aggression, Comp. RA = Composite Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: $^{\dagger}p \leq .055$, $*p < .05$,$**p < .001$, one-tailed.

Table 41

Hypothesis 2C, Supplementary Analysis 2 (Composite Scores): Summary of Simultaneous Multiple Regression Results Predicting Proactive Aggression with and without Affective Empathy Variables in the Model

Predictors	Affective Empathy Excluded			Affective Empathy Included		
	β	t	sr^2	β	t	sr^2
Head Injury	-.04	-.54	.00	-.06	-.79	.00
SRP III Factor 2	.10	.94	.00	.06	.61	.00
Composite Reactive Aggression	.37**	3.97**	.08	.32**	3.57**	.06
BES Cognitive Empathy	.05	.66	.00	.11	1.46	.01
Baseline HR	.03	.40	.00	.20	1.82	.02
Baseline EDA	-.08	-.98	.01	-.09	-1.21	.01
Post NV Cognitive Empathy	.07	.83	.00	-.05	-.57	.00
Post EV Cognitive Empathy	-.01	-.18	.00	-.02	-.20	.00
Post NV Affective Empathy				.15	1.70	.01
Post EV Affective Empathy				-.10	-1.08	.01
Composite Affective Empathy				.20	1.84	.02
Empathy Video HR				-.22	-1.93	.02
Empathy Video EDA				.14	1.81	.02
SRP III Factor 1	.51**	5.20**	.14	.65**	5.59**	.15

Note. $N = 77$. NV = Neutral Video, EV = Empathy Video. *$p < .05$, **$p \leq .001$.

for both simultaneous regressions are provided in Tables 42 and 43. The overall model in the first simultaneous multiple regression (affective empathy variables excluded) accounted for 59.1% of the variance in proactive aggression, $R^2 = .59$, $F(9, 70) = 11.22$, $p < .001$. Additionally, the overall model in the second simultaneous multiple regression (affective empathy variables included) was also significant, accounting for 67.3% of the variance in proactive aggression $R^2 = .67$, $F(14, 65) = 9.54$, $p < .001$. For both analyses, beta, t and sr^2 coefficients are presented in Table 44.

As was found in the main analysis, Factor 1 and 2 psychopathy traits and reactive aggression were positively associated with proactive aggression in the first analysis. Contrary to prediction, proactive aggression was still predicted by Factor 1 psychopathy traits as well as Factor 2 psychopathy characteristics and reactive aggression, after the affective empathy variables were included in the second analysis. Moreover, contrary to the main analysis, affective empathy as measured by the TES was not a significant predictor of proactive aggression when all variables were included in the regression. However, post neutral video affective empathy was once again, positively associated with proactive aggression, as was empathy video EDA. Both baseline HR and empathy video HR were nearing significance ($p = .057$ and .051 respectively) in the second regression, such that higher baseline HR and lower empathy video HR were associated with higher proactive aggression scores.

Hypothesis 2C Conclusion

The results of the main analysis and the supplementary analyses indicated that hypothesis 2C was not supported, such that Factor 1 traits continue to significantly predict proactive aggression after accounting for affective empathy and, therefore,

Table 42

Hypothesis 2C, Supplementary Analysis 3 (Adjusted Psychopathy Scores): Descriptive Statistics and Correlations for First Simultaneous Regression

Variable	*M* *(SD)*	2	3	4	5	6	7	8	9	10
1. RPQ PA	3.76 (3.35)	.18†	.59**	.57**	-.02	-.09	-.01	-.12	-.05	.69**
2. Head Injury	.44 (.50)	____	.26*	.30*	.18	-.24*	.11	.11	.15	.25*
3. Factor 2 (Adj.)	56.51 (12.13)		____	.46**	.02	-.28*	.10	-.09	-.02	.58**
4. RPQ RA	10.03 (4.01)			____	-.08	-.16	.06	-.06	-.09	.48**
5. BES Cog. Emp.	35.66 (3.23)				____	-.09	.23*	.13	.14	-.0
6. Baseline HR	69.10 (9.23)					____	.01	-.23*	.05	-.07
7. Baseline EDA	8.90 (2.13)						____	.06	.03	.01
8. Post NV Cog, Emp.	9.18 (2.39)							____	.10	-.16
9. Post EV Cog. Emp.	9.03 (3.14)								____	-.05
10. Factor 1 (Adj.)	74.76 (13.95)									____

Note. $N = 80$. PA = Proactive Aggression, RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: †$p < .055$, *$p < .05$, **$p < .001$, one-tailed.

Table 43

Hypothesis 2C, Supplementary Analysis 3 (Adjusted Psychopathy Scores): Descriptive Statistics and Correlations for Second Simultaneous Regression

Variable	*M* (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. RPQ PA	3.76 (3.35)	.18†	.59**	.57**	-.02	-.09	-.01	-.12	-.05	.00	-.18†	-.36**	-.24*	.00	.69**
2. Head Injury	.44 (.50)	___	.26*	.30*	.18	-.24*	.11	.10	.15	-.03	-.05	.04	-.26*	-.03	.25
3. Factor 2 (Adj.)	56.51 (12.13)		___	.46**	.02	-.28*	.10	-.09	-.02	-.03	-.16	-.14	-.29*	-.18	.58**
4. RPQ RA	10.03 (4.01)			___	-.08	-.16	.05	-.05	-.09	-.06	-.10	-.23*	-.17	-.03	.48**
5. BES Cog. Emp.	35.66 (3.23)				___	-.09	.23*	.13	.14	-.05	.01	.17	-.04	-.20*	-.05
6. Baseline HR	69.10 (9.23)					___	.01	-.23*	.05	-.16	.00	-.13	.76**	.02	-.07
7. Baseline EDA	8.90 (2.13)						___	.06	.03	-.16	.04	.00	-.04	.12	.01
8. Post NV Cog, Emp.	9.18 (2.39)							___	.10	.45*	.16	.42**	-.17	.05	-.16
9. Post EV Cog. Emp.	9.03 (3.14)								___	.08	.53**	.16	.00	.04	-.05
10. Post NV Aff.. Emp.	6.41 (1.85)									___	*.18*	.39**	-.05	-.10	-.24
11. Post EV Aff. Emp.	11.68 (1.99)										___	.27*	-.06	.02	-.17
12. TES Aff. Emp.	43.74 (6.85)											___	.00	.23	-.49**
13. EV HR	71.73 (9.53)												___	-.01	-.19*
14. EV EDA	9.45 (2.56)													___	-.07
15. Factor 1 (Adj.)	74.76 (13.95)														___

Note. $N = 80$. PA = Proactive Aggression, RA = Reactive Aggression, Cog. Emp. = Cognitive Empathy, Aff. Emp. = Affective Empathy, NV = Neutral Video, EV = Empathy Video. Correlations from regression analysis: $^{\dagger}p \leq .055$, $*p < .05$, $**p < .001$, one-tailed.

Table 44

Hypothesis 2C, Supplementary Analysis 3 (Adjusted Psychopathy Scores): Summary of Simultaneous Multiple Regression Results Predicting Proactive Aggression with and without Affective Empathy Variables in the Model

Predictors	Affective Empathy Excluded			Affective Empathy Included		
	β	t	sr^2	β	t	sr^2
Head Injury	-.07	-.76	.00	-.06	-.76	.00
SRP III Factor 2 (adjusted)	.24*	2.35*	.03	.27*	2.60*	.03
RPQ Reactive Aggression	.28*	2.99*	.05	.27*	3.06*	.05
BES Cognitive Empathy	.05	.61	.00	.14	1.68	.01
Baseline HR	.04	.48	.00	.23†	1.94†	.02
Baseline EDA	-.06	-.78	.00	-.07	-.89	.00
Post NV Cognitive Empathy	-.01	-.08	.00	-.07	-.80	.00
Post EV Cognitive Empathy	.00	.05	.00	-.02	-.19	.00
Post NV Affective Empathy				.26*	2.93*	.04
Post EV Affective Empathy				-.07	-.74	.00
TES Affective Empathy				-.17	-1.60	.01
Empathy Video HR				-.23†	-1.99†	.02
Empathy Video EDA				.18*	2.23*	.02
SRP III Factor 1 (adjusted)	.44**	4.43**	.11	.38**	3.49**	.06

Note. $N = 80$. NV = Neutral Video, EV = Empathy Video. †$p < .057$, *$p < .05$, **$p \leq .001$.

affective empathy does not appear to play a causal role in the relationship between Factor 1 psychopathy traits and proactive aggression. In the main analysis (RPQ and TES), as well as the supplementary analysis utilizing the total sample (RPQ and BES) and the supplementary analysis utilizing adjusted psychopathy scores (aggression and affective empathy items removed), proactive aggression was significantly predicted by Factor 1 psychopathy traits, as wells as several affective empathy related variables. However, in the supplementary analysis involving composite scores, only Factor 1 psychopathy traits significantly predicted proactive aggression. Regardless, the current findings did not support Hypothesis 2C.

Discussion

The current study was designed to examine one component of the Integrated Emotions Systems model of psychopathy, which provides a plausible explanation for the reported relationships between emotional/interpersonal (Factor 1) psychopathy traits, affective empathy, and proactive aggression (IES: Blair, 2004, 2005, 2006). Recall that the IES model suggests that proactive aggression may result from a lack of appropriate moral socialization, which in turn inhibits the development and expression of empathic responding. In appropriate moral socialization, empathic induction should occur when a transgressor attends to the distress and pain exhibited by a victim and should then facilitate appropriate prosocial, helping behaviour. The association between the transgression and the resultant victim distress takes place in the amygdala, which is in part responsible for forming stimulus reinforcement associations, whereby the victim distress should function as a punishment for the transgression. As a result of amygdala dysfunction, individuals who display psychopathic traits, specifically Factor 1 characteristics, do not form the association between their own transgressions and the resulting victim distress and as such they do not experience or display the appropriate empathic responding which is imperative in the avoidance and inhibition of ongoing goal oriented aggressive behaviour. Therefore, the IES model suggests that amygdala dysfunction and the consequent lack of affective empathy may play an important causal role in the emergence of Factor 1 psychopathy characteristics and in the facilitation of aggression, specifically, proactive aggression.

The current study examined several hypotheses derived from this theoretical model and as outlined in the methods and results sections, each hypothesis was examined

utilizing various combinations of self-reported empathy and aggression measures. Moreover, each hypothesis was also examined after removing the aggression and empathy items from the assessment of psychopathy to address possible confounds resulting from overlap in measurement. Overall, the portion of the IES model that was tested in the present study was only partially supported. Whereas empathy predicted both Factor 1 psychopathy traits and proactive aggression, it did not fully account for the relationship between Factor 1 and proactive aggression. In other words, Factor 1 has a unique impact on proactive aggression, over and above the effect of empathy (or lack thereof).

The Physiological Component of Empathy

In addition to the use of self-reported empathy measures, physiological indices of affective empathy, including HR and EDA were also included in the examination of each hypothesis. Results demonstrated that, when compared to baseline responding, participants displayed increased EDA and accelerated HR in response to a video clip intended to elicit affective empathy. This pattern of response can be interpreted in at least two ways. According to Zhou, Valiente, and Eisenberg (2003) increased EDA and accelerated HR indicate that the participants were experiencing personal distress that resulted from a focus on internalized emotions caused by viewing the empathy eliciting video. Conversely, Preston and de Waal (2002) would suggest that participants were indeed experiencing an empathic response that mirrored the personal distress exhibited by the women in the video. Regardless of interpretation, participants did appear to display a change in arousal in response to the empathy stimulus. In addition, participants also reported experiencing more affective empathy in response to the empathy video, than in

response to a neutral video (HR and EDA in response to this video were not utilized due to over responding). Thus, it appeared that based on physiological indices, as well as self-reports of situational affective empathy, participants did demonstrate the intended affective empathic response.

Hypothesis 1

Results demonstrated full support for Hypothesis 1, which stated that the emotional/interpersonal psychopathy traits (Factor 1) would be predictive of proactive aggression after accounting for reactive aggression and social deviance psychopathy characteristics (Factor 2). All combinations of self-report aggression scales examined provided the same results, indicating that inclusion of Factor 2 psychopathy characteristics and reactive aggression as covariates was appropriate such that individuals who possessed higher Factor 2 psychopathy scores and a greater tendency towards reactive aggression also demonstrated a heightened propensity towards proactive aggression. Most importantly, after accounting for these relationships, individuals who reported a greater degree of emotional/interpersonal (Factor 1) psychopathy traits did demonstrate heightened levels of proactive aggression. Impressively, this association cannot be attributed to measurement confound as these relationships held even after removing aggression and empathy related items from the psychopathy assessment. Head injury was also included as a covariate as it was found to be correlated with heightened levels of psychopathy and aggression; however, after including the other variables in the model, head injury was not significantly associated with proactive aggression.

These findings are in line with the large body of literature that has demonstrated a robust positive relationship between psychopathy and proactive aggression, and more

specifically between the emotional/interpersonal psychopathy traits and proactive aggression (Cima & Raine, 2009; Flight & Forth, 2007; Woodworth & Porter, 2002). It should be noted that in the present study, the social deviance (Factor 2) psychopathy characteristics were also related to proactive aggression. Regardless, this does not negate the considerable amount of evidence found in the literature for the assertion that individuals who exhibit Factor 1 psychopathy traits, such as grandiosity, superficial charm, deceitful and manipulative tendencies, callousness and lack of remorse, empathy and guilt, are likely to display goal oriented, proactive aggressive tendencies. Moreover, the present study adds to the body of literature concerning psychopathy and aggression by demonstrating that the relationship between these two constructs is not due to overlap in measurement items. The current findings suggest a need for explanatory models such as the IES in order to facilitate a clearer understanding of the specific mechanisms involved in the relationship between psychopathic traits (both Factor 1 and 2) and physical aggression.

Hypothesis 2A

Hypothesis 2A predicted that after accounting for reactive aggression, social deviance (Factor 2) psychopathy characteristics, and cognitive empathy, that affective empathy would predict emotional/interpersonal (Factor 1) psychopathy traits. Results from all sets of analyses supported this assertion. With respect to the covariates included the model, as expected, elevated levels of social deviance (Factor 2) psychopathy characteristics and reactive aggression were associated with higher emotional/interpersonal (Factor 1) psychopathy traits. This pattern of results was found in all sets of analyses with the exception of the analysis conducted using composite scores,

which demonstrated no association between reactive aggression and Factor 1 characteristics. In addition, the covariates of head injury, cognitive empathy, baseline HR and EDA, and self-reported cognitive empathy in response to the neutral and empathy video clips were also not significantly associated with emotional/interpersonal (Factor 1) psychopathy traits.

Interestingly, the covariate of self-reported affective empathy in response to the neutral video clip was negatively associated with the emotional/interpersonal (Factor 1) psychopathy traits in all analyses (a trend towards significance was identified in the analysis utilizing composite scores). This measure was originally included in the current study as a comparison point for self-reported affective empathy in response to the empathy video clip, and thus participants were not expected to report high levels of affective empathy on this measure. The negative association found here may suggest that individuals who exhibit heightened emotional/interpersonal (Factor 1) psychopathy characteristics are less able to identify with the emotional experiences of others across various contexts, including those that do not explicitly elicit empathic responding. This may help to explain why individuals with psychopathic traits are inept at building and maintaining positive interpersonal relationships (Cleckley, 1976).

Most notably with respect to hypothesis 2A, after accounting for the aforementioned relationships, lower levels of self-reported affective empathy did predict heightened levels of emotional/interpersonal (Factor 1) psychopathy traits. Interestingly, the physiological indices of affective empathy (HR and EDA) and self-reported affective empathy in response to the empathy video clip were not associated with Factor 1 psychopathy characteristics. Once again, these findings were maintained even after

removing the aggression and empathy related items from the psychopathy assessment, suggesting that results were not attributable to overlapping measurement confounds.

These results coincide with previous research in which Factor 1 psychopathy traits were found to be negatively associated with dispositional measures of affective empathy (Dadds et al., 2009; Flight & Forth, 2007; Mullins-Nelson, Salekin, & Leistico, 2006; Zagon & Jackson, 1994). However, results also suggest that perhaps this association does not extend to objective indices of affective empathy such as HR and EDA or to situational measures of affective empathy. Thus, results indicate that lack of dispositional affective empathy specifically, is a significant contributor to heightened emotional/interpersonal (Factor 1) psychopathy characteristics. Although the IES model does not explicitly differentiate between trait and situationally-based empathy, the current findings suggest that the role of affective empathy as discussed in the IES model may be most appropriately conceptualized as trait-based or dispositional in nature. Therefore traits such as callousness, deceitfulness, and egocentricity, as well as lack of remorse and guilt may emerge in part from an inability to affectively experience the emotions of others. Overall, the findings concerning hypothesis 2A lend support to the IES model suggesting that amygdala dysfunction leading to a lack of affective empathy may contribute to the emergence of emotional/interpersonal (Factor 1) psychopathy traits.

Hypothesis 2B

Hypothesis 2B stated that proactive aggression would be predicted by affective empathy after removing the variance associated with social deviance (Factor 2) psychopathy traits, reactive aggression, and cognitive empathy. Results examining this hypothesis varied depending on which self-report measure of affective empathy was

included in the model. When hypothesis 2B was examined using the total sample (*BES* & RPQ; Jolliffe & Farrington, 2006; Raine et al., 2006), results demonstrated that self-reported dispositional affective empathy, physiological indices of affective empathy (HR and EDA) and the situational measure of affective empathy (self-reported affective empathy in response to the empathy eliciting video) were not predictive of proactive aggression. Moreover, the only covariates that were significantly associated with proactive aggression were the social deviance (Factor 2) psychopathy characteristics and reactive aggression whereby elevated levels on the aforementioned variables resulted in a greater tendency towards proactive aggression. When composite empathy and aggression scores were included in the model, the pattern of results was the same as those reported above.

Conversely, in the main analysis, (*TES* & RPQ; Spreng, McKinnon, Mar, & Levine, 2009, Raine et al., 2006) results demonstrated support for hypothesis 2B. Once again, social deviance (Factor 2) characteristics and reactive aggression were positively associated with proactive aggression, and no other covariates included in the model were significant. Most importantly, self-reported affective empathy was uniquely associated with proactive aggression such that lower affective empathy scores predicted heightened levels of proactive aggression. Also of interest, increased electrodermal activity in response to the empathy eliciting video was significantly associated with higher proactive aggression, whereas HR and self-reported situational affective empathy (affective empathy in response to the empathy eliciting video clip) were unrelated.

If increased electrodermal activity is an index of empathic responding as would be suggested by Preston and de Waal (2002) or inward focused personal distress resulting

from exposure to another's distressed state as would be suggested by Zhou, Valiente, and Eisenberg (2003), then the present results concerning the positive association between electrodermal activity and proactive aggression, conflict with the negative association between self-reported affective empathy and proactive aggression found in the same analysis. Moreover, these findings are also in opposition to previous research in which empathy has been found to be negatively related to aggression (Mayberry & Espelage, 2007). That being said, there has been some recent research indicating that electrodermal activity obtained during a resting state among children ages 6-13 was positively associated with proactive aggression (Scarpa, Haden, & Tanaka, 2010). In addition, a meta-analysis conducted by Lorber (2004) reported a positive association between electrodermal reactivity (as a change from baseline) and aggression, although no distinction was made between reactive and proactive forms of aggression. Therefore, it appears that the positive association between electrodermal activity and proactive aggression observed here coincides with previous research concerning physiological activity and proactive aggression, rather than the literature addressing empathy and proactive aggression. Changes in electrodermal activity can result from a number of sources and the interpretation and meaning of these changes is dependent on the specific stimuli utilized (Andreassi, 2007). It is possible that the empathy video used in the current study elicited affective empathy, as well as other emotions such as anger or disgust, which may be differentially associated with proactive aggression. As such, the positive EDA-proactive aggression relationship observed here may indicate that participants exhibited arousal that was not specific to the experience of affective empathy.

Importantly, results were comparable when hypothesis 2B was examined after removing the empathy and aggression items from the psychopathy assessment. It should be noted that the TES empathy and RPQ aggression measures were utilized in this analysis. The only differential finding was that HR in response to the empathy eliciting video clip was also negatively associated with proactive aggression.

The current findings coincide with research conducted by Van Voorhees and Scarpa (2002) on aggression in children in which a lower HR was associated with proactive aggression. Additionally, previous research has also reported an association between lower HR and self-reported aggression among adults (Scarpa, Fikretoglu, & Luscher, 2000). If HR acceleration is associated with empathic responding as suggested by Preston and de Waal (2002), these findings support the assertion that lower levels of affective empathy were associated with heightened levels of proactive aggression. Conversely, if HR deceleration is indicative of empathic or sympathetic responding as suggested by Zhou, et al., (2003), then the current findings conflict with the present hypothesis and previous research, which typically demonstrates a negative association between affective empathy and proactive aggression (Mayberry & Espelage, 2007). Recall however, that Zhou, et al., (2003) also suggested that HR acceleration can indicate feelings of personal distress resulting from a focus on internally experienced emotions. According to this perspective, participants in the current study may be viewed as experiencing personal distress rather than empathy, which would explain the negative HR-proactive aggression relationship. Such that, lower HR indicated lower levels of personal distress in response to the empathy video, which was associated with greater self-reported proactive aggression. In light of the previous literature regarding empathy

and proactive aggression (Mayberry & Espelage, 2007), it seems unlikely that empathic responding would be positively associated with proactive aggression. As such, it appears that the physiological response in HR found among participants in the current study may have resulted from either emotionally experienced empathy or distress. Regardless of which emotion participants were experiencing, the negative association between HR and proactive aggression suggests that individuals who are less likely to experience an emotional reaction to the distress cues of others are more likely to engage in proactive aggression.

Overall, the analyses examining hypothesis 2B produced mixed results. It appears that the differential findings may have been influenced by use of the Basic Empathy Scale (BES; Jolliffe & Farrington, 2006), as the analysis based on this measure did not produce a significant association between affective empathy and proactive aggression. Conversely, the analysis utilizing the Toronto Empathy Scale (TES; Spreng, McKinnon, Mar, & Levine, 2009) did generate a significant negative association between affective empathy and proactive aggression. Although these two empathy scales were moderately related (r =.58), the differential predictive patterns demonstrated here suggest that the items included in each of the scales may be assessing two slightly different (albeit related) affective empathy constructs. For example, as discussed above, the BES includes several items that appear to address empathy on a more interpersonal level (e.g. "After being with a friend who is sad about something, I usually feel sad"; "I often get swept up in my friends feelings"), whereas the TES seems to address empathy on a more general level (e.g. "I can tell when others are sad even when they do not say anything"; "I am not really interested in how other people feel", reversed scored). In addition, the negative

association between proactive aggression and affective empathy as assessed by the TES (Spreng, McKinnon, Mar, & Levine, 2009), is more in line with the findings reported in previous research (Mayberry & Espelage, 2007).

If the Toronto Empathy Scale (TES; Spreng, McKinnon, Mar, & Levine, 2009) in some way represents a more accurate depiction of the dysfunctional affective empathic capacity of individuals who engage in proactive aggression, then results suggest that a lower capacity to respond emotionally to the feelings of others contributes to a higher likelihood to engage in aggression motivated by personal gain or goal attainment. It appears that overall, findings regarding hypothesis 2B demonstrated partial support for the IES model, in which amygdala function resulting in lack of affective empathy is thought to contribute to a heightened propensity towards proactive aggression; in the present work these links were observed only when dispositional affective empathy was examined using the TES (Spreng, McKinnon, Mar, & Levine, 2009) and not when this construct was assessed with the BES (Jolliffe & Farrington, 2006).

Hypothesis 2C

The final hypothesis (2C) predicted that affective empathy is a common cause of the relationship between the emotional/interpersonal (Factor 1) traits of psychopathy and proactive aggression. Support for this assertion required that the emotional/interpersonal (Factor 1) psychopathy characteristics be associated with proactive aggression when affective empathy variables were excluded from the model, but not when affective empathy variables were included in the model. Results based on all combinations of self-reported aggression and affective empathy scales indicated that this hypothesis was not supported.

In all analyses in which affective empathy measures were excluded, higher emotional/interpersonal (Factor 1) psychopathy traits and reactive aggression were associated with elevated levels of proactive aggression. In addition, in all analyses with the exception of the analysis utilizing composite scores, social deviance (Factor 2) psychopathy traits were also positively associated with proactive aggression. No other covariates were significant.

For all sets of analyses, when affective empathy measures were included in the model, the relationship between Factor 1 and proactive aggression was still significant. Therefore, the emotional/interpersonal (Factor 1) psychopathy characteristics were still positively associated with proactive aggression after accounting for affective empathy.

In the supplementary analysis utilizing composite scores, no additional significant relationships were identified. However, in the main analysis utilizing the TES (Spreng, McKinnon, Mar, & Levine, 2009) and the RPQ (Raine et al., 2006), several affective empathy variables were also found to be significantly associated with proactive aggression. For example, lower levels of self-reported dispositional affective empathy and elevated electrodermal activity in response to the empathy video were both associated with higher proactive aggression.

The findings regarding self-reported affective empathy and proactive aggression coincide with previous results found in the literature (Mayberry & Espelage, 2007). However, once again, the positive association between electrodermal activity and proactive aggression appeared to coincide more with the literature concerning physiology and proactive aggression (Lorber, 2004; Scarpa, Haden, & Tanaka, 2010), than empathy and proactive aggression (Mayberry & Espelage, 2007). Again, as mentioned above this

finding may suggest that the empathy video utilized in the present study elicited arousal associated with emotions such as anger or disgust, in addition to empathy, which may explain the positive EDA-proactive aggression relationship found here.

Oddly, in this analysis self-reported affective empathy in response to the neutral video was positively associated with proactive aggressive tendencies. Once again, this measure was intended to be used as a comparison point for self-reported affective empathy in response to the neutral video and as such, participants were not expected to report high levels of affective empathy on this measure. Moreover, the video that this measure was based on was not intended to represent a situation in which people would typically express empathy. However, as was found with the physiological measures in response to the neutral video, the positive association between the self-reported affective empathy in response to the neutral video and proactive aggression may indicate that the neutral video was more arousing than intended.

In the supplementary analysis in which the empathy and aggression items were removed from the assessment of psychopathy (TES & RPQ), results regarding the affective empathy measures were slightly different. Elevated electrodermal activity in response to the empathy video and higher self-reported affective empathy in response to the neutral video were still related to a greater tendency towards proactive aggression. However, the relationship between self-reported dispositional affective empathy and proactive aggression was no longer significant. Recall that the results of Hypothesis 2B, utilizing the RPQ and TES accounting for Factor 2 psychopathy traits, both with and without the empathy and aggression items included in the psychopathy assessment, found that dispositional affective empathy was significantly negatively associated with

proactive aggression. As this was not the case in testing Hypothesis 2C, and Factor 1 psychopathy was the only additional variable in this analysis, results suggest that the significant negative relationship between affective empathy and proactive aggression demonstrated in the main analysis may be attributable to overlap in measurement, such that empathy-related items included in the assessment of the emotional/interpersonal (Factor 1) traits of psychopathy may play an important role the relationship between affective empathy and proactive aggression.

Finally, the supplementary analysis utilizing the BES (Jolliffe & Farrington, 2006) and the RPQ (Raine et al., 2006), demonstrated some additional discrepant findings. As was the case in several previous analyses, this analysis indicated that elevated electrodermal activity in response to the empathy video was positively associated with proactive aggressive tendencies. However, oddly enough, self-reported dispositional affective empathy was also found to be positively associated with proactive aggression. This finding conflicts with previous research concerning the empathy-aggression relationship (Mayberry & Espelage, 2007), and to this writer's knowledge no previously published literature has reported a similar result. Moreover, according to the IES model, as well as various other theorists, empathy is generally thought to promote prosocial behaviour and inhibit aggressive behaviour (Blair, 2004, 2005; Eisenberg, Eggum, & Edwards, 2010). As such, further research is required to determine the validity and reliability of this finding. Additionally, as was the case in testing Hypothesis 2B, it appeared that analyses utilizing the TES and BES empathy measures demonstrated inconsistent findings regarding the prediction of proactive aggression. This, in conjunction with the previous literature concerning the empathy-aggression relationship,

suggests that the TES may more accurately depict the general deficiency in empathic capacities thought to be represented among individuals who engage in proactive aggression.

The findings discussed above with respect to hypothesis 2C suggest that lack of affective empathy may not appear to play a direct causal role in the relationship between the emotional/interpersonal (Factor 1) psychopathy traits and proactive aggression. This suggests that beyond a lack of affective empathy, there is something unique about the emotional/interpersonal (Factor 1) psychopathy traits that leads to proactive aggression (see conclusions regarding IES). Therefore, the findings concerning hypothesis 2C did not provide support for the IES.

Conclusion Regarding the IES Model

Taken together, the findings discussed above provide partial support for the Integrated Emotions Systems model (Blair, 2004, 2005, 2006; see Figure 2). As expected,

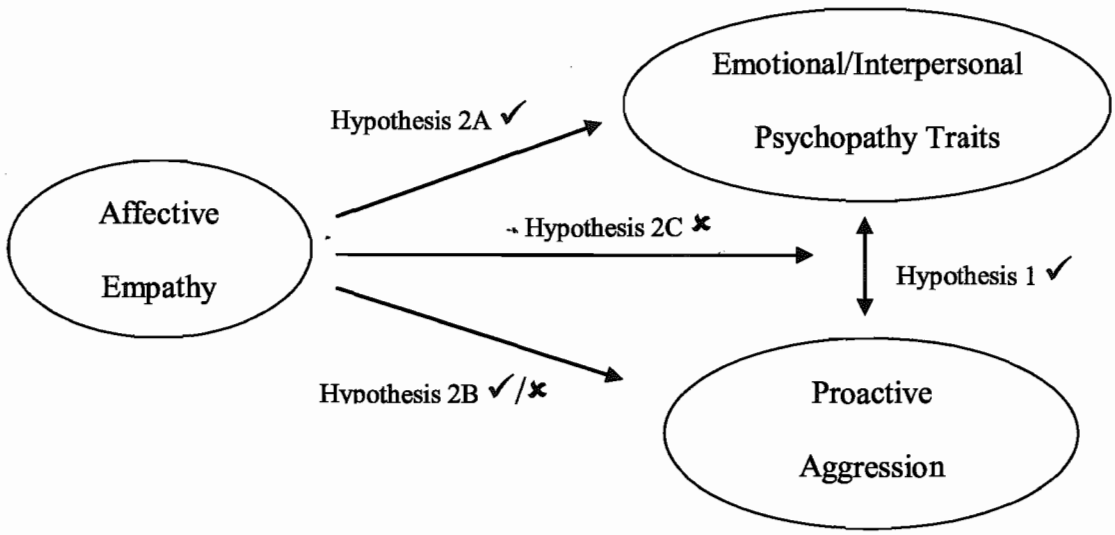

Figure 2. Results for the common cause model of empathy, psychopathy, and aggression.

the emotional/interpersonal (Factor 1) psychopathy traits predicted proactive aggressive tendencies. In addition, lack of affective empathy appeared to play an important role in predicting Factor 1 psychopathy traits, such as shallow affect, lack of guilt and remorse, deceitful and manipulative tendencies, superficial charm, grandiosity, and egocentricity. Moreover, lack of affective empathy, defined as an inability to affectively experience the emotions of others, also predicts a greater propensity towards goal oriented aggression, perpetrated for personal gain. However, this association appeared to be dependent on the way in which affective empathy was conceptualized and measured. These relationships also appear to be limited to dispositional measures of affective empathy and did not extend to self-reported situational assessments of affective empathy. Although a lower capacity to emotionally identify with the experiences of other individuals did predict both Factor 1 psychopathy traits and proactive aggression, it did not appear to account for the relationship between these two constructs. Thus, results did not support the prediction, based on the IES model, in which empathy (or lack thereof) is thought to explain the link the between Factor 1 psychopathy traits and proactive aggression.

In the adolescent risk behaviour literature, a distinction between a 'common predictive factor' and a 'linkage factor' has been proposed by Busseri, Willoughby, and Chalmers (2007), that may provide insight into the nature of the identified relations among Factor 1 psychopathy traits, affective empathy, and proactive aggression, found in the current investigation. Busseri et al., suggested that a predictor can encompass three possible roles, including a) explaining the variance in one criterion variable, b) explaining the variance in multiple criterion variables (a common predictive factor), and c) explaining the variance shared among variables (a linkage factor). In the current

investigation, affective empathy may be viewed as a common predictive factor as it accounts for some of the variance in both the emotional/interpersonal (Factor 1) psychopathy traits, as well as in proactive aggression. However, affective empathy cannot be described as a linkage factor as it did not appear to account for the covariance among Factor 1 psychopathy traits and proactive aggression.

Perhaps there are other mechanisms not addressed in the current study that play an influential role in the co-variation between emotional/interpersonal (Factor 1) psychopathy traits and proactive aggression. For example, alternative theoretical perspectives such as the Executive Function Hypothesis (Blair, 2005; Gorenstein, 1982; Morgan & Lilienfeld, 2000) or the Violence Inhibition Model (Blair, 2005) suggest that deficits or dysfunction in executive function or the violence inhibition mechanism may contribute to the psychopathy-aggression relationship. Moreover, it is possible that traits more closely aligned with the interpersonal aspects of Factor 1 such as grandiosity and egocentricity, and manipulative and deceitful tendencies may play an influential or causal role.

Another possibility for the results demonstrated in the current study centers on the use of an undergraduate sample of participants. Recall, the IES model implicates the amygdala as the brain structure that is in part responsible for producing the lack of affective empathy found among individuals who exhibit Factor 1 psychopathic traits. Perhaps within an undergraduate sample, the amygdala is not sufficiently dysfunctional to demonstrate the associations inherent in the IES model. Accordingly, examination of the IES model utilizing a clinical or forensic sample may generate findings that adhere to the predictions outlined above. If this is indeed the case, then perhaps this would suggest

that psychopathy can be conceptualized as a taxon rather than a continuum, as suggested by Coid and Yang (2008), Harris, Rice and Quinsey (1994), and Vasey, Kotov, Frick, and Loney (2005). This would indicate that psychopaths are fundamentally different from other individuals, whereby the specific relationships and causal mechanisms outlined by the IES model, may only be found among individuals who are psychopathic and not within subclinical populations. Alternatively, the associations outlined by the IES model may only be found at the extreme end of the dimensional construct of psychopathy, which is more likely to present within forensic clinical samples.

Implications, Limitations and Future Directions

The current study has various implications with respect to understanding the complex relationship between psychopathy and aggression. Before discussing the role of affective empathy, the implications of the interrelations found among Factor 1 and 2 psychopathy characteristics and reactive and proactive aggression should be considered. In the current investigation, these constructs were moderately to highly correlated in all analyses (r's = .37 to .71), suggesting a considerable amount of shared variance. As noted in the introduction, theoretical perspectives concerning psychopathy generally address these interrelations by providing explanatory mechanisms for both the emergence of psychopathic traits and characteristics, as well as for the tendency towards aggressive behaviour. However, despite the moderate to high correlations among the psychopathy factors and aggression subtypes, each of these constructs maintains some unique variance that is not shared. Moreover, these constructs have been shown to be differentially related to various external correlates. For example, as discussed previously, research has found that Factor 1 psychopathy traits were negatively related to state and trait anxiety, and

positively related to social desirability, self-admiration, and self-absorption (Zagon & Jackson, 1994). Conversely, Factor 2 psychopathy traits have been associated with entitlement and exploitivenesss (Zagon & Jackson, 1994). Moreover, as mentioned above, research has also demonstrated differential correlates among the aggression subtypes, such that reactive aggression was associated with a lack of close interpersonal relationships, social anxiety, and impulsivity, and proactive aggression was related to violent offending and blunted affect (Raine et al., 2006). The body of literature outlining the differential external correlates of the psychopathy factors and the subtypes of aggression suggest that although highly related, reactive and proactive aggression, and the emotional/interpersonal (Factor 1) and social deviance (Factor 2) psychopathy characteristics are unique, independent constructs.

With respect to the role of affective empathy, the findings discussed above provide some evidence that lack of affective empathy predicts both Factor 1 psychopathy characteristics, as well as goal oriented aggression, perpetrated for personal gain. However, contrary to the commonly held belief that empathy may be a key construct in understanding *why* individuals who exhibit Factor 1 psychopathy traits engage in proactive aggressive acts (Blair, 2004; Rǒgstad & Rogers, 2008; Woodworth & Porter 2002), results suggested that lack of affective empathy was not responsible for the relationship between these variables. Therefore, in accordance with the distinction between 'common predictive factors' and 'linkage factors' proposed by Busseri, Willoughby, and Chalmers (2007) and applied above to the current findings, interventions targeted at promoting affective empathic responding may influence the expression of Factor 1 psychopathic traits and possibly reduce the likelihood of engaging

in proactive aggression. However, as affective empathy did not appear to explain the relationship between these two variables, on an individual basis such interventions would not likely assist in preventing emotional/interpersonal (Factor 1) psychopathy traits and proactive aggression from co-occurring. Therefore, future research should seek to examine alternative casual mechanisms, such as those mentioned above (e.g., executive function deficits or dysfunction in the violence inhibition mechanism), that may be responsible for the robust relationship observed between Factor 1 psychopathy traits and proactive aggression. Identification of the specific causal mechanisms or 'linkage factors' involved may assist in the development of more effective intervention programs that may prevent at risk individuals who exhibit these personality and behavioural tendencies from progressing towards more risky criminal behaviour.

As is the case with all research, the current study is not without limitations. For example, some of the analyses in the present study contained as few as 77 participants, which resulted in lower than optimal statistical power. Additional research in this area utilizing a larger sample size in order to maximize statistical power would be beneficial. In addition, although physiological measures (HR and EDA) were used to examine the construct of affective empathy, the current study relied heavily on self-report assessment tools, which are subject to socially desirable responding. Moreover, concerns regarding socially desirable responding may be exacerbated in the current study due to the nature of the constructs under investigation (i.e., aggression, empathy, psychopathy). The specific items in several of the questionnaires (i.e., RPQ, PCS, SRP III) may conjure negative and detrimental connotations and participants may have been inclined to provide prosocial responses that were not an accurate representation of their true emotional capacities and

behavioural tendencies. It may be beneficial for future research to include assessment techniques designed to detect socially desirable responding among participants.

Moreover, it may also be useful to include additional objective measures of aggression. For example, future research may seek to utilize and adapt a more objective coding scheme such as that developed by Cornell and colleagues (1996) for use with community samples. Researchers may also want to make use of objective computerized measures of aggression such as the point subtraction aggression paradigm (Cherek, 1992), where the variable is behavioural, rather than self-report, in nature. Additionally, as the current findings appeared to differ depending on which self-report measure of affective empathy was included in the analyses, future research examining the relationships among psychopathy, empathy, and aggression should consider replication of the current study utilizing the measures employed here, as well as incorporation of alternative empathy measures. Moreover, although the current study found that the relationships between affective empathy and the emotional/interpersonal (Factor 1) psychopathy traits, and affective empathy and proactive aggression, were limited to dispositional measures of affective empathy, the situational self-report measures of affective empathy utilized here demonstrated low internal consistency ($\alpha = .57$, for affective empathy in response to both the neutral and empathy eliciting video clips). As such, future research should include alternative measures of situational affective empathy, that demonstrate higher internal consistency, to provide additional support for the specific role of dispositional affective empathy in predicting the emotional/interpersonal (Factor 1) psychopathy traits, as well as proactive aggression.

As mentioned in the results section, the software used to examine physiological responding in the present investigation was subject to several limitations. When examining EDA frequency data, researchers typically set a minimum threshold at which a change in response should be counted as a cycle. The software utilized in the current study did not allow for this and as such, frequency data in the present study may be higher than is typically found in the literature. Moreover, an inability to extract amplitude values in appropriate units of measurement (microsiemens or micromhos) prevented analysis of EDA amplitude data. Finally, there were also various problems concerning the extraction of HR data. However, the HR data appeared to be in line with what is typically reported in the literature. Finally, the software utilized in the present study was not originally intended for continuous measurement and the difficulties in extraction inherent in the current investigation suggest alternative software options would be more appropriate for physiological research requiring continuous recording of HR and EDA. Future research would benefit from utilizing alternative software packages that would be more suited to the methodological design utilized here.

In a related vein, results indicated that participants in the present study demonstrated heightened physiological arousal (HR and EDA in CPM) in response to the video that was originally intended to be a neutral stimuli and as such baseline recording obtained during a resting state was used in all analyses. It is possible that the unintended arousal to neutral video was the result of the introduction of a novel stimulus. Additionally, as the neutral video was viewed after the baseline resting period and prior to the empathy video, it is possible that the unintended heightened state of arousal observed during the neutral video influenced subsequent responding to the empathy

video. Therefore, future investigations should consider utilizing more appropriate neutral video stimuli and counter balancing techniques. Future research concerning the physiology associated with empathy and aggression would also be beneficial in informing the results of the current investigation, as this research may assist in providing theoretical and empirical clarification for the current findings regarding the relationships between HR and EDA (as indices of empathic responding), and proactive aggression.

As discussed above, it is possible that the current findings were in part due to use of a non-clinical sample. Research utilizing clinical or forensic samples may be more likely to demonstrate full support for the IES model. This notion can be linked to the current debate in the literature regarding the categorical or dimensional nature of the construct of psychopathy (Edens, Marcus, Lilienfeld, & Poythress, 2006; Wright, 2009), such that if indeed psychopathy is more accurately viewed as a taxometric construct, the relationships proposed within the IES model may be more prominent and detectable in a forensic sample. Moreover, it should be noted that proactive aggression scores obtained in this sample were quite low. Thus, future research should seek to examine the IES model within clinical or forensic samples, in which both psychopathy and proactive aggression scores would likely be higher.

As outlined in the methods section, the current study examined psychopathy as a 2 Factor structure, however the SRP III also includes four subscales that allow for examination of the four facets that underlie the 2 Factors, namely interpersonal manipulation, callous affect, erratic lifestyle, and anti-social behaviour. Future research concerning the IES model may be informed by examination of the four facets of psychopathy in relation to empathy and aggression.

In the current literature, there is much debate concerning the definition and factor structure of psychopathy. Whereas some researchers favour the traditional 2 Factor or, 4 Facet structure (Hare & Neumann, 2010), others contend that a 3 Factor structure is more appropriate (Skeem & Cooke, 2010). Moreover, other researchers utilize alternative assessment techniques, such as the psychopathic personality inventory (Lilienfeld & Andrews, 1996), which conceptualizes psychopathy slightly differently, placing considerable emphasis on the role of personality. Research is also conducted utilizing Levenson's psychopathy scale (Levenson, Kiehl, & Fitzpatrick, 1995), which is based on the traditional 2 Factor structure of the PCL-R, but employs primary-secondary psychopathy language and has roots in Lykken's typology theory (see Lykken, 1995). In light of the various conceptualizations and measurement tools intended to examine the construct of psychopathy, future research would benefit from examining the IES model using additional and/or alternative perspectives and assessment measures.

Finally, the current study sought to examine the relationships among the emotional/interpersonal psychopathy traits (Factor 1), affective empathy, and proactive aggression from the perspective of the IES model. Although not addressed in the current investigation, as outlined in the introduction, the IES model also provides a theoretical account of the relationship between the social deviance psychopathy characteristics (Factor 2) and reactive aggression. As such, future research should work towards examining the additional component of the IES model.

Conclusion

The current investigation provided partial support for the IES model, demonstrating that an inability to affectively experience the emotions of others predicts

emotional/interpersonal (Factor 1) psychopathy traits and a greater tendency to engage in proactive aggression (depending on the empathy measure utilized). However, results of the present study did not find that lack of affective empathy is primarily responsible for the robust relationship between the emotional/interpersonal psychopathy traits and proactive aggression that is found in the literature. As such, future empirical investigations with both community and forensic samples utilizing additional/alternative psychopathy, empathy, and aggression measures is needed to further explore the IES model.

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Appendix A

Certificate of Ethics Clearance for Human Participant Research

Brock University
Research Ethics Board
Tel: 905-688-5550 ext. 3035
Email: reb@brocku.ca

DATE: 8/31/2010
PRINCIPAL INVESTIGATOR: BOOK, Angela - Psychology
FILE: 10-029 - BOOK
TYPE: Masters Thesis/Project STUDENT: Ashley Hosker
SUPERVISOR: Angela Book
TITLE: Personality, Emotion and Behaviour

ETHICS CLEARANCE GRANTED
Type of Clearance: NEW Expiry Date: 8/31/2011
The Brock University Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement. Clearance granted from **8/31/2010 to 8/31/2011**. The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before **8/31/2011**. Continued clearance is contingent on timely submission of reports. To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Research Ethics web page.

In addition, throughout your research, you must report promptly to the REB:
a) Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) All adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
c) New information that may adversely affect the safety of the participants or the conduct of the study;
d) Any changes in your source of funding or new funding to a previously unfunded project.
We wish you success with your research.

Approved:
Michelle McGinn, Chair
Research Ethics Board (REB)

Note: Brock University is accountable for the research carried out in its own jurisdiction or under its auspices and may refuse certain research even though the REB has found it ethically acceptable. If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of research at that site.

Appendix B

Certificate of Ethics Clearance for Human Participant Research

Brock University
Research Ethics Board
Tel: 905-688-5550 ext. 3035
Email: reb@brocku.ca

DATE: September 21, 2010
PRINCIPAL INVESTIGATOR: BOOK, Angela - Psychology
FILE: 10-029 - BOOK
TYPE: Masters Thesis/Project STUDENT: AshleyHosker
SUPERVISOR: Angela Book
TITLE: Personality, Emotion and Behaviour

ETHICS CLEARANCE GRANTED
Type of Clearance: MODIFICATION Expiry Date: 8/31/2011
The Brock University Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri- Council Policy Statement. Clearance granted from **9/21/10 to 8/31/2011.** The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before **8/31/2011**. Continued clearance is contingent on timely submission of reports. To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Research Ethics web page.

In addition, throughout your research, you must report promptly to the REB:
a) Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) All adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
c) New information that may adversely affect the safety of the participants or the conduct of the study;
d) Any changes in your source of funding or new funding to a previously unfunded project.
We wish you success with your research.

Approved:
Michelle McGinn, Chair
Research Ethics Board (REB)

Note: Brock University is accountable for the research carried out in its own jurisdiction or under its auspices and may refuse certain research even though the REB has found it ethically acceptable. If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of research at that site.

Appendix C

Certificate of Ethics Clearance for Human Participant Research

Brock University
Research Ethics Board
Tel: 905-688-5550 ext. 3035
Email: reb@brocku.ca

DATE: September 28, 2010
PRINCIPAL INVESTIGATOR: BOOK, Angela - Psychology
FILE: 10-029 - BOOK
TYPE: Masters Thesis/Project STUDENT: AshleyHosker
SUPERVISOR: Angela Book
TITLE: Personality, Emotion and Behaviour

ETHICS CLEARANCE GRANTED
Type of Clearance: MODIFICATION Expiry Date: 8/31/2011
The Brock University Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement. Clearance granted from **8/31/2010 to 8/31/2011**. The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual
report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before **8/31/2011**. Continued clearance is contingent on timely submission of reports.
To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Research Ethics web page.

In addition, throughout your research, you must report promptly to the REB:
a) Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) All adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
c) New information that may adversely affect the safety of the participants or the conduct of the study;
d) Any changes in your source of funding or new funding to a previously unfunded project.
We wish you success with your research.

Approved:
Michelle McGinn, Chair
Research Ethics Board (REB)

Note: Brock University is accountable for the research carried out in its own jurisdiction or under its auspices and may refuse certain research even though the REB has found it ethically acceptable. If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of research at that site.

Appendix D

ATTENTION STUDENTS!!

If you are a **man** between the **ages of 17 and 30**,

WE WANT YOU . . .

To participate in a research study about personality, emotion, and behaviour.

How long will it take?
ONLY **30 minutes !!!**

What will you do?
Watch 2 video clips while your heart rate and sweating are monitored by computer and complete a few questionnaires.

Why should you sign up?
Your name will be entered in a draw to **win a $75.00 Tim Hortons gift certificate!!!** And you will receive 1 research participation credit that you can use as a basis for course assignments

How to sign up?
Go to the Psychology Department research website
http://brocku.sona-systems.com/

Look for the "Personality, Emotion, and Behaviour" study after signing in.

Please refer questions to Ashley Hosker (ah03ez@brocku.ca)
Faculty supervisor: Dr. Angela Book (abook@brocku.ca)
This study has been reviewed and received ethical clearance through the Office of Research Ethics Board (File # 10-029-Book)

Appendix E

SONA Online Study Advertisement

Study Name: Personality, Emotion, and Behaviour

Abstract: Obtain research participation experience by taking part in our personality study

Description: Participants will view video clips while their heart rate and sweating are monitored by computer. Additionally, participants will complete a series of questionnaires regarding personality, emotion, and behaviour.

Purpose: To investigate the relations among personality, emotion, and behaviour

Eligibility: Must be a Brock student between the ages of 17 and 30.

Requirements: Males only

Sign up: on SONA or through e-mail at ah03ez@brocku.ca

Restrictions: Males ONLY

Duration: 30 minutes

Credits: 1 Credit – Use your participation towards the completion of course assignments (PSYC 1F90 and other applicable courses)
Your name will be entered in a draw to **win a $75.00 Tim Hortons Gift Certificate!!!**

Researchers: Ashley Hosker, Amber Knuff

Faculty Superviser: Dr. Angela Book

This study has been reviewed and received ethics clearance through the Office of Research Ethics Board (REB File # 10-029-Book).

Appendix F

Verbal Script

During this study you will be asked to view two video clips while your heart rate and sweating are monitored by computer. Your heart rate will be monitored using a finger clip and your sweating will be monitored using two metal electrodes that will be attached to the index and ring fingers of your non-dominant hand. After viewing the each video clip you will be asked to complete a short questionnaire relating to the videos. I ask that you focus your attention on the speakers in each of the clips while viewing the videos. You will then be asked to complete various questionnaires relating to personality, emotion and behaviour. I would like to assure you that the responses you provide today will remain confidential and anonymous and will in no way be linked to your name. I would also like to remind you that you have the right to withdraw from the study at anytime if you feel in any way uncomfortable and that you will still be able to use this experience toward completion of course work or assignments.

Appendix G

Consent Form

Date: 2010-2011 Academic Year
Project Title: Personality, Emotion, and Behaviour

Principal Student Investigator: Ashley Hosker
Department of Psychology
Brock University
ah03ez@brocku.ca
abook@brocku.ca

Faculty Supervisor: Dr. Angela Book
Department of Psychology
Brock University
(905) 688-5550 Ext. 5223

Co-Investigator: Amber Knuff
Department of Psychology
Brock University
ak06va@brocku.ca

INVITATION
You are invited to participate in a study that involves empirical research. The purpose of this study is to examine various dimensions of personality, emotion, behaviour.

WHAT'S INVOLVED
As a participant, you will be asked to view two video clips while your heart rate and sweating are monitored by computer. This portion of the study will involve attaching a clip to your middle finger to monitor heart rate and attaching metal electrodes to the index and ring fingers of your non-dominant hand to monitor sweating. You will also be asked to complete several self-report questionnaires that address topics such as specific personality traits, emotional responses and behavioural tendencies. Participation will take approximately 30 minutes of your time.

POTENTIAL BENEFITS AND RISKS
Your participation in this study will contribute to the development of an enhanced psychological understanding of the relations among personality, emotion, and behaviour. Additionally, you are able to use your participation experience as the basis for your assignment in the Introduction to Psychology Course (or other courses offering such opportunities). Finally, if you wish to take part, your name will be entered in a draw to win a $75.00 Tim Hortons gift certificate.
You may experience some strong emotional responses during your participation and may withdraw from the study at any time without penalty. Additionally, if participation in this study causes an aversive emotional response, you may contact any of the researchers involved in the study, or Brock University Counselling Services at (905)688-5550, ext. 3240, free of charge.

CONFIDENTIALITY
The data you provide during your participation in the present study will remain confidential and anonymous. Your physiological recordings and questionnaire responses will be coded with an arbitrary number that will not be associated in any way with your name. Additionally, data collected during this study will be stored in the Forensic Research Lab at Brock University and will be kept for 5 years after publication, at which

time the data will be destroyed. Access to this data will be restricted to Ashley Hosker, Amber Knuff and Dr. Angela Book.

VOLUNTARY PARTICIPATION

As previously stated, your participation in the present study is completely voluntary and you may decline to respond to any questions asked of you. Additionally, you may withdraw at any point with no penalty or consequence. Should you choose to withdraw prior to the completion of your participation, any data that has already been collected will be destroyed, and you will still be able to use the experience towards your course assignment. However, once data has been submitted you will be unable to withdraw from the study, as your data will not be linked to your name and as such, researchers will be unable to identify or remove your data.

RESULTS

The results of this study will be incorporated into a Master's level Thesis as well as into an Honour's level Thesis. Additionally, the results of this study may be published in professional journals or academic books and presented at empirical research conferences. Feedback concerning the results of the study will be available in the summer of 2011 and you may contact Ashley Hosker, Amber Knuff or Dr. Angela Book if you wish to obtain a copy of the results.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact the Principal Investigator or the Faculty Supervisor using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (file # 10-029-Book). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca. Thank you for your assistance in this project. Please keep a copy of this form for your records.

CONSENT FORM

I agree to participate in the study described above. I have made this decision based on the information I have read in the Consent Form. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Participant Name: _____

Participant Signature: _____ Date: _____

Investigator Signature: _____

This research has been funded in part by the Social Sciences and Humanities Research Council of Canada (SSHRC)

Appendix H

Demographics

1. Age: _____

2. Ethnicity: _____

3. Year of University: _____

4. University Major: _____

5. Have you ever experienced a head injury or concussion? (Please circle)

   Y N

6. Have you ever been previously diagnosed with a neurological or psychological disorder?
   (i.e. epilepsy, depression, etc)

   Please circle and indicate which disorders:

   Y N

   _____

Appendix I

The Reactive-Proactive Aggression Questionnaire (RPQ)

Instructions: There are times when most of us feel angry, or have done things we should not have done. Rate each of the items below by putting a circle around 0 (never), 1 (sometimes), or 2 (often). Do not spend a lot of time thinking about the items—just give your first response. Make sure you answer all the items (see below).

How often have you . . .	Never	Sometimes	Often
1. Yelled at others when they have annoyed you	0	1	2
2. Had fights with others to show who was on top	0	1	2
3. Reacted angrily when provoked by others	0	1	2
4. Taken things from other students	0	1	2
5. Gotten angry when frustrated	0	1	2
6. Vandalized something for fun	0	1	2
7. Had temper tantrums	0	1	2
8. Damaged things because you felt mad	0	1	2
9. Had a gang fight to be cool	0	1	2
10. Hurt others to win a game	0	1	2
11. Become angry or mad when you don't get your way	0	1	2
12. Used physical force to get others to do what you want	0	1	2
	Never	Sometimes	Often

How often have you . . .	Never	Sometimes	Often
13. Gotten angry or mad when you lost a game	0	1	2
14. Gotten angry when others threatened you	0	1	2
15. Used force to obtain money or things from others	0	1	2
16. Felt better after hitting or yelling at someone	0	1	2
17. Threatened and bullied someone	0	1	2
18. Made obscene phone calls for fun	0	1	2
19. Hit others to defend yourself	0	1	2
20. Gotten others to gang up on someone else	0	1	2
21. Carried a weapon to use in a fight	0	1	2
22. Gotten angry or mad or hit others when teased	0	1	2
23. Yelled at others so they would do things for you	0	1	2
	Never	Sometimes	Often

Appendix J

Self-Reported Empathy in Response to the Neutral Video Clip

Please answer the following questions on a scale of 1 (not at all) to 5 (very much)

	Not at all				Very Much
1. To what extent can you imagine what it would be like to be the woman in the video clip?	1	2	3	4	5
2. To what extent can you feel what the woman would be feeling in this situation?	1	2	3	4	5
3. To what extent do you think you can put yourself into the woman's place?	1	2	3	4	5
4. How sad, distressed or uneasy does the woman's story make you feel?	1	2	3	4	5
5. To what extent can you imagine this situation from the woman's point of view?	1	2	3	4	5
6. How much compassion and sympathy do you feel for the woman in the video clip?	1	2	3	4	5
	Not at all				Very Much

Appendix K

Self-Reported Empathy in Response to the Empathy Video Clip

Please answer the following questions on a scale of 1 (not at all) to 5 (very much)

	Not at all				Very Much
1. To what extent can you imagine what it would be like to be the mother in the video clip?	1	2	3	4	5
2. To what extent can you feel what the mother would be feeling in this situation?	1	2	3	4	5
3. To what extent do you think you can put yourself into the mother's place?	1	2	3	4	5
4. How sad, distressed or uneasy does the mother's story make you feel?	1	2	3	4	5
5. To what extent can you imagine this situation from the mother's point of view?	1	2	3	4	5
6. How much compassion and sympathy do you feel for the mother in the video clip?	1	2	3	4	5
	Not at all				Very Much

Appendix L

Toronto Empathy Scale (TES)

Below is a list of statements. Please read each statement *carefully* and rate how frequently you feel or act in the manner described. Circle your answer on the response form. There are no right or wrong answers or trick questions. Please answer each question as honestly as you can.

	Never	Rarely	Sometimes	Often	Always
1. When someone else is feeling excited, I tend to get excited too	0	1	2	3	4
2. Other people's misfortunes do not disturb me a great deal	0	1	2	3	4
3. It upsets me to see someone being treated disrespectfully	0	1	2	3	4
4. I remain unaffected when someone close to me is happy	0	1	2	3	4
5. I enjoy making other people feel better	0	1	2	3	4
6. I have tender, concerned feelings for people less fortunate than me	0	1	2	3	4
7. When a friend starts to talk about his/her problems, I try to steer the conversation towards something else	0	1	2	3	4
8. I can tell when others are sad even when they do not say anything	0	1	2	3	4
9. I find that I am "in tune" with other people's moods	0	1	2	3	4
10. I do not feel sympathy for people who cause their own serious illnesses	0	1	2	3	4
11. I become irritated when someone cries	0	1	2	3	4
12. I am not really interested in how other people feel	0	1	2	3	4

| | Never | Rarely | Sometimes | Often | Always |

	Never	Rarely	Sometimes	Often	Always
13. I get a strong urge to help when I see someone who is upset	0	1	2	3	4
14. When I see someone being treated unfairly, I do not feel very much pity for them	0	1	2	3	4
15. I find it silly for people to cry out of happiness	0	1	2	3	4
16. When I see someone being taken advantage of, I feel kind of protective towards him/her	0	1	2	3	4

Never Rarely Sometimes Often Always

Appendix M

Peer Conflict Scale (PCS)

Instructions: Please read each statement and decide how well it describes you. Mark your answer by circling the appropriate number (0-3) for each statement. Do not leave any statement unrated.

	Not at all true	Somewhat true	Very true	Definitely true
1. I have hurt others to win a game or contest	0	1	2	3
2. I enjoy making fun of others	0	1	2	3
3. When I am teased, I will hurt someone or break something	0	1	2	3
4. I gossip about others when I'm angry at them	0	1	2	3
5. I start fights to get what I want	0	1	2	3
6. I deliberately exclude others from my group, even if they haven't done anything to me	0	1	2	3
7. I spread rumors and lies about others when they do something wrong to me	0	1	2	3
8. When someone hurts me, I end up getting into a fight	0	1	2	3
9. I try to make others look bad to get what I want	0	1	2	3
10. When someone upsets me, I tell my friends to stop liking that person	0	1	2	3
11. I threaten others when they do something wrong to me	0	1	2	3
12. When I hurt others, I feel like it makes me powerful and respected	0	1	2	3
13. I tell others' secrets for things they did to me a while back	0	1	2	3
14. When someone threatens me, I end up getting into a fight	0	1	2	3

	Not at all true	Somewhat true	Very true	Definitely true
15. I make new friends to get back at someone who has made me angry	0	1	2	3
16. I hurt others when I'm angry at them	0	1	2	3
17. When others make me mad, I write mean notes about them and pass the notes around	0	1	2	3
18. I threaten others to get what I want	0	1	2	3
19. I gossip about others to become popular	0	1	2	3
20. If others make me mad, I hurt them	0	1	2	3
21. I am deliberately cruel to others, even if they haven't done anything to me	0	1	2	3
22. When I am angry at others, I try to make them look bad	0	1	2	3
23. To get what I want, I try to steal others' friends from them	0	1	2	3
24. I carefully plan out how to hurt others	0	1	2	3
25. When someone makes me mad, I throw things at them	0	1	2	3
26. When I gossip about others, I feel like it makes me popular	0	1	2	3
27. I hurt others for things they did to me a while back	0	1	2	3
28. I enjoy hurting others	0	1	2	3
29. I spread rumors and lies about others to get what I want	0	1	2	3
30. When I have gotten into arguments or physical fights, it is usually because I acted without thinking	0	1	2	3
31. If others make me mad, I tell their secrets	0	1	2	3
32. I ignore or stop talking to others in order to get them to do what I want	0	1	2	3
33. I like to hurt kids smaller than me	0	1	2	3
34. When others make me angry, I try to steal their friends from them	0	1	2	3

	Not at all true	Somewhat true	Very true	Definitely true
35. I threaten others, even if they haven't done anything to me	0	1	2	3
36. When I get angry, I will hurt someone	0	1	2	3
37. I have gotten into fights, even over small insults from others	0	1	2	3
38. When I have started rumors about someone, it is usually because I acted without thinking	0	1	2	3
39. I say mean things about others, even if they haven't done anything to me	0	1	2	3
40. When someone makes me angry, I try to exclude them from my group	0	1	2	3

Appendix N

Feed Back Form

Date: 2010-2011 Academic Year
Project Title: Personality, Emotion, and Behaviour

Principal Student Investigator: Ashley Hosker
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Faculty Supervisor: Dr. Angela Book
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(905) 688-5550 Ext. 5223
abook@brocku.ca

Co-Investigator: Amber Knuff
Department of Psychology
Brock University
ak06va@brocku.ca

The purpose of this form is to provide you with additional information about the current study. In this study you were asked to view two video clips, while your heart rate and sweating were monitored by computer. You were then asked to fill out several questionnaires pertaining to antisociality, aggression, empathy, and impulsivity. The first video clip you viewed was a neutral clip and was included to obtain a measure of your base line physiological responding (i.e. your heart rate and amount of sweating on a general, everyday basis). The second video clip you viewed was designed to promote empathetic responding, and your heart rate and sweat response will be used as physiological measures of empathy. The remaining questionnaires assessed antisociality, aggression, empathy, and impulsivity.

The general purpose of this study is to investigate the relationships between antisocial behaviour, aggression, empathy, and impulsivity. More specifically, we are interested in determining if empathy and impulsivity are causally related to aggression and antisociality. Results of the study will help to provide a clearer understanding of why people may behave in aggressive and antisocial ways.

Please be assured that the responses you provided in this study will remain anonymous and confidential. Your data will be given an arbitrary number and will in no way be linked to your name. Additionally, all data provided will be kept in a locked laboratory and will be destroyed 5 years after the publication of the results of the study.

This study has been reviewed and received ethical clearance from the Brock University Research Ethics Board (REB# 10-029-Book). If you have any questions regarding the purpose or results of the study, please contact Ashley Hosker, Amber Knuff, or Dr. Angela Book. Results will be made available in the summer of 2011. Additionally, if you have any questions concerning your rights as a research participant, please contact the Research Ethics Officer (mail to reb@brocku.ca, 688-5550, ext. 3035). Finally, if you have experienced any negative emotions as a result of participating in this research study and wish to speak with a counselor, please contact Brock University Counseling Services (688-5550. ext. 3240).

This research has been funded in part by the Social Sciences and Humanities Research Council of Canada (SSHRC)

Thank you for your participation!

Appendix O

Items removed from the The Self-Report Psychopathy Scale: Version III

6. I have never stolen a truck, car or motorcycle (aggression)

11. It tortures me to see an injured animal (empathy)

12. I have assaulted a law enforcement official or social worker (aggression)

18. I have never tried to force someone to have sex (aggression)

21. I have never attacked someone with the idea of injuring them (aggression)

26. I feel sorry when I see a homeless person (empathy)

29. I have broken into a building or vehicle in order to steal something or vandalize (aggression)

33. I never cry at movies (empathy)

46. I never shoplifted from a store (aggression)

52. Every now and then I carry a weapon (knife or gun) for protection (aggression)

53. People cry way too much at funerals (empathy)

56. I never feel guilty over hurting others (empathy)

57. I have threatened people into giving me money, clothes, or makeup (aggression)

59. I admit that I often "mouth off" without thinking (aggression)

63. I purposely tried to hit someone with the vehicle I was driving (aggression)

Appendix P

Final Regression Equations for all Regressions

Hypothesis 1: Main Analysis
Proactive aggression = -9.98 + (-.26)(head injury) + (.23)(reactive aggression) + (.07)(Factor 2) + (.07)(Factor 1)

Hypothesis 1: Supplementary Analysis 1 (Original Measures, Total Sample)
(See Hypothesis 1: Main Analysis)

Hypothesis 1: Supplementary Analysis 2 (Composite Scores)
Composite proactive aggression = -4.80 + (-.19)(head injury) + (.44)(composite reactive aggression) + (.01)(Factor 2) + (.04)(Factor 1)

Hypothesis 1: Supplementary Analysis 3 (Adjusted Psychopathy Scores)
Proactive aggression = -9.36 + (-.27)(head injury) + (.26)(reactive aggression) + (.06)(Factor 2) + (.10)(Factor 1)

Hypothesis 2A: Main Analysis
Factor 1 = 70.89 + (4.31)(head injury) + (.44)(Factor 2) + (.50)(reactive aggression) + (.34)(cognitive empathy) + (.15)(baseline HR) + (-.58)(baseline EDA) + (.50)(post neutral video cognitive empathy) + (-.79)(post neutral video affective empathy) + (-.15)(post empathy video cognitive empathy) + (-1.02)(affective empathy) + (-.08)(empathy video HR) + (.55)(empathy video EDA) + (.51)(post empathy video affective empathy)

Hypothesis 2A: Supplementary Analysis 1 (Original Measures, Total Sample)
Factor 1 = 79.23 + (1.20)(head injury) + (.42)(Factor 2) + (.90)(reactive aggression) + (-.28)(cognitive empathy) + (.25)(baseline HR) + (.04)(baseline EDA) + (.64)(post neutral video cognitive empathy) + (-1.05)(post neutral video affective empathy) + (.43)(post empathy video cognitive empathy) + (-.96)(affective empathy) + (-.12)(empathy video HR) + (-.38)(empathy video EDA) + (.25)(post empathy video affective empathy)

Hypothesis 2A: Supplementary Analysis 2 (Composite Scores)
Factor 1 = 43.07 + (2.33)(head injury) + (.39)(Factor 2) + (2.51)(reactive aggression) + (-.04)(cognitive empathy) + (.12)(baseline HR) + (-.39)(baseline EDA) + (.18)(post neutral video cognitive empathy) + (-.31)(post neutral video affective empathy) + (.10)(post empathy video cognitive empathy) + (-6.10)(affective empathy) + (-.03)(empathy video HR) + (.28)(empathy video EDA) + (.78)(post empathy video affective empathy)

Hypothesis 2A: Supplementary Analysis 3 (Adjusted Psychopathy Scores)
Factor 1 = 58.95 + (3.04)(head injury) + (.55)(Factor 2) + (.50)(reactive aggression) + (.21)(cognitive empathy) + (.18)(baseline HR) + (-.72)(baseline EDA) + (.62)(post neutral video cognitive empathy) + (-.60)(post neutral video affective empathy) + (-.10)(post empathy video cognitive empathy) + (-.90)(affective empathy) + (-.10)(empathy video HR) + (.68)(empathy video EDA) + (.35)(post empathy video affective empathy)

Hypothesis 2B: Main Analysis
Proactive aggression = -8.76 + (.18)(head injury) + (.11)(Factor 2) + (.21)(reactive aggression) + (.16)(cognitive empathy) + (.09)(baseline HR) + (-.18)(baseline EDA) + (-.06)(post neutral video cognitive empathy) + (.42)(post neutral video affective empathy) + (-.02)(post empathy video cognitive empathy) + (-.17)(affective empathy) + (-.08)(empathy video HR) + (.31)(empathy video EDA) + (-.003)(post empathy video affective empathy)

Hypothesis 2B: Supplementary Analysis 1 (Original Measures, Total Sample)
Proactive aggression = -7.55 + (.10)(head injury) + (.10)(Factor 2) + (.24)(reactive aggression) + (-.04)(cognitive empathy) + (.07)(baseline HR) + (.04)(baseline EDA) + (-.04)(post neutral video cognitive empathy) + (.08)(post neutral video affective empathy) + (-.06)(post empathy video cognitive empathy) + (-.01)(affective empathy) + (-.05)(empathy video HR) + (.16)(empathy video EDA) + (-.01)(post empathy video affective empathy)

Hypothesis 2B: Supplementary Analysis 2 (Composite Scores)
Proactive aggression = -4.26 + (.03)(head injury) + (.03)(Factor 2) + (.49)(reactive aggression) + (.05)(cognitive empathy) + (.04)(baseline HR) + (-.09)(baseline EDA) + (-.02)(post neutral video cognitive empathy) + (.09)(post neutral video affective empathy) + (-.002)(post empathy video cognitive empathy) + (-.16)(affective empathy) + (-.03)(empathy video HR) + (.09)(empathy video EDA) + (-.02)(post empathy video affective empathy)

Hypothesis 2B: Supplementary Analysis 3 (Adjusted Psychopathy Scores)
Proactive aggression = -7.48 + (-.14)(head injury) + (.12)(Factor 2) + (.27)(reactive aggression) + (.16)(cognitive empathy) + (.10)(baseline HR) + (-.18)(baseline EDA) + (-.04)(post neutral video cognitive empathy) + (.41)(post neutral video affective empathy) + (.01)(post empathy video cognitive empathy) + (-.16)(affective empathy) + (-.09)(empathy video HR) + (.30)(empathy video EDA) + (-.08)(post empathy video affective empathy)

Hypothesis 2C: Main Analysis

Simultaneous Regression 1
Proactive aggression = -11.94 + (-.21)(head injury) + (.07)(Factor 2) + (.19)(reactive aggression) + (.03)(cognitive empathy) + (.02)(baseline HR) + (-.12)(baseline EDA) + (-.01)(post neutral video cognitive empathy) + (.00)(post empathy video cognitive empathy) + (.08)(Factor 1)

Simultaneous Regression 2
Proactive aggression = -13.51 + (-.11)(head injury) + (.08)(Factor 2) + (.18)(reactive aggression) + (.13)(cognitive empathy) + (.08)(baseline HR) + (-.14)(baseline EDA) + (-.10)(post neutral video cognitive empathy) + (.48)(post neutral video affective empathy) + (-.01)(post empathy video cognitive empathy) + (-.04)(post empathy video affective empathy) + (-.10)(affective empathy) + (-.07)(empathy video HR) + (.27)(empathy video EDA) + (.07)(Factor 1)

Hypothesis 2C: Supplementary Analysis 1 (Original Measures, Total Sample)

Simultaneous Regression 1
Proactive aggression = -9.48 + (.05)(head injury) + (.07)(Factor 2) + (.17)(reactive aggression) + (-.04)(cognitive empathy) + (.02)(baseline HR) + (.03)(baseline EDA) + (.01)(post neutral video cognitive empathy) + (-.07)(post empathy video cognitive empathy) + (.08)(Factor 1)

Simultaneous Regression 2
Proactive aggression = -15.93 + (-.03)(head injury) + (.06)(Factor 2) + (.14)(reactive aggression) + (-.01)(cognitive empathy) + (.05)(baseline HR) + (.03)(baseline EDA) + (-.11)(post neutral video cognitive empathy) + (.19)(post neutral video affective empathy) + (-.11)(post empathy video cognitive empathy) + (-.04)(post empathy video affective empathy) + (.10)(affective empathy) + (-.03)(empathy video HR) + (.20)(empathy video EDA) + (.11)(Factor 1)

Hypothesis 2C: Supplementary Analysis 2 (Composite Scores)

Simultaneous Regression 1
Proactive aggression = -5.59 + (-.12)(head injury) + (.01)(Factor 2) + (.40)(reactive aggression) + (.02)(cognitive empathy) + (.01)(baseline HR) + (-.06)(baseline EDA) + (.04)(post neutral video cognitive empathy) + (-.01)(post empathy video cognitive empathy) + (.05)(Factor 1)

Simultaneous Regression 2
Proactive aggression = -6.85 + (-.17)(head injury) + (.01)(Factor 2) + (.34)(reactive aggression) + (.05)(cognitive empathy) + (.03)(baseline HR) + (-.07)(baseline EDA) + (-.03)(post neutral video cognitive empathy) + (.11)(post neutral video affective empathy) + (-.01)(post empathy video cognitive empathy) + (-.07)(post empathy video affective empathy) + (.21)(affective empathy) + (-.03)(empathy video HR) + (.08)(empathy video EDA) + (.06)(Factor 1)

Hypothesis 2C: Supplementary Analysis 3 (Adjusted Psychopathy Scores)

Simultaneous Regression 1
Proactive aggression = -12.04 + (-.44)(head injury) + (.07)(Factor 2) + (.23)(reactive aggression) + (.05)(cognitive empathy) + (.02)(baseline HR) + (-.10)(baseline EDA) + (-.01)(post neutral video cognitive empathy) + (.004)(post empathy video cognitive empathy) + (.11)(Factor 1)

Simultaneous Regression 2
Proactive aggression = -12.88 + (-.42)(head injury) + (.07)(Factor 2) + (.22)(reactive aggression) + (.14)(cognitive empathy) + (.08)(baseline HR) + (-.11)(baseline EDA) + (-.10)(post neutral video cognitive empathy) + (.47)(post neutral video affective empathy) + (.02)(post empathy video cognitive empathy) + (-.11)(post empathy video affective empathy) + (-.08)(affective empathy) + (-.08)(empathy video HR) + (.24)(empathy video EDA) + (.09)(Factor 1)