The Relationships between Psychopathic Personality traits, Impulsivity, Anxiety, and Sensation Seeking.

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Declaration

I declare that this report does not incorporate without acknowledgment any material previously submitted for a degree in any University, College of Advanced Education, or other educational institution, and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in text.

I further declare that the ethical principles and procedures specified in the School of Social Sciences Human Research Ethics Committee document have been adhered to in the preparation of this report.

Name: Heather Frilay

Signed: ________________________________
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Abstract

A large body of literature suggests that impulsivity is a major risk factor for the development of antisocial behaviour and is a core component of the behavioural aspect of secondary psychopathy. The key aim of the current study was to contribute to the conceptualisation of impulsivity in relation to the psychopathy construct. To facilitate this aim the interaction between impulsivity and anxiety was investigated to determine how this interaction impacts on psychopathic personality traits. A further aim of the current study was to examine the relationships between psychopathic personality traits, impulsivity, anxiety, and sensation seeking in a community sample. The sample was composed of 107 participants of whom 83 were females and 24 were males, the average age was 24.41 (SD = 7.14) years. Participants completed a battery of self-report psychological measures that assessed impulsivity, anxiety, primary and secondary psychopathy and sensation seeking behaviour. The results indicated that the interaction between impulsivity and anxiety does influence psychopathic personality traits and that the effect of this differs depending on the psychopathic personality trait investigated. Furthermore, the different effect that this interaction has on the psychopathic personality traits may be influential in determining the form that antisocial behaviour takes within the psychopathy construct.
Overview

Historically, antisocial behaviour has been a complex and universal social phenomenon. The factors connected with the aetiology of antisocial behaviour are multiple; they include genetic, neurobiological, psychosocial, and environmental mechanisms. It is thought that it is the convergence of these factors that determines the heterogeneous forms that antisocial behaviour manifests (Eron, 1994).

Extensive research has identified specific personality traits that are considered to be major risk factors for antisocial behaviour. These personality traits can be found in the psychopathology that is considered an exemplary form of antisocial behaviour, that of psychopathy. Psychometric measures of psychopathy consistently identify a two-factor model. The first factor, that of primary psychopathy is composed of affective and interpersonal facets, in particular the personality traits of callousness, lack of empathy, manipulative, unemotional, and a remorseless use of others. The second factor, that of secondary psychopathy is composed of behavioural aspects, in particular high levels of impulsivity, and an antisocial and deviant lifestyle (Miller, Lynam, Widiger, & Leukefeld, 2001).

Of particular interest to the current study is the role of impulsivity within the construct of psychopathy. Impulsivity is defined as behaviour that occurs with minimal or no premeditation in relation to risk factors or future consequences (Eysenck, Pearson, Easting & Allsopp, 1985). Impulsivity is a core component of the psychopathy construct and research has found that impulsivity is an important characteristic of antisocial behaviour (Askenazy, Sorci, Lestideau, Myquel, & Lecrubier, 2003; Cleckley, 1976; Gray, Owen, Davis, & Tsaltas, 1983; Luengo,
Carrillo-de-la-Pena, Otero, & Romero, 1994; Robins, 1978). In addition, impulsivity as a personality trait may be associated with the development of long-term antisocial behaviour (Farrington 1991; Gorenstein & Newman, 1980; Moffitt, 1993). However, the dimension impulsivity takes in the psychopathy construct, and the role of impulsivity in the aetiology of psychopathy is yet to be established (Franzen, & Berg, 1998; Loeber, Farrington, Stouthamer-Loeber, Moffitt, Capsi, & Lynam, 2001).

As much attention in the literature on psychopathy has focused on the relationship between anxiety and the two factors of psychopathy it is theorised that the investigation of the relationship between impulsivity and anxiety may facilitate in defining impulsivity within the psychopathy construct. Research has consistently found that anxiety has either a weak or negative relationship with the affective-interpersonal aspects of primary psychopathy (for a review see Patrick, 1994). Conversely, anxiety has been found to have a positive relationship with the behavioural aspects of secondary psychopathy (Hare, Hart, & Harpur, 1991; Levenson, Kiehl, & Fitzpatrick, 1995; Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003).

The presence or absence of anxiety in relation to the primary and secondary factors of psychopathy supports the theory that these two constructs are distinct, and that they may be associated with separate aetiological processes (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Newman & Wallace, 1993). This contention is consistent with the literature on the developmental pathways of antisocial behaviour and denotes the importance of clear definitions of antisocial behaviour, as the presence of anxiety has implications for prevention and treatment of antisocial behaviour. Furthermore, the interaction between impulsivity and anxiety (Gray, 1987)
and the relevance that this interaction has in the development of psychopathy warrants further investigation.

Sensation seeking is another personality trait that is of particular interest to the current study. Research has found that the two factors of psychopathy are associated with different forms of sensation seeking behaviour (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003) and that the interaction between impulsivity and sensation seeking predict differing forms of antisocial behaviour (Joireman, Anderson & Strathman, 2003).

Moreover, the inclusion of sensation seeking and anxiety within the methodology of the current study aligns with one of the study’s key aims. This aim is to draw upon the conceptual framework of Gray’s (1987) Reinforcement Sensitivity Theory (RST) of personality to elucidate the complex relationship between impulsivity and anxiety in predicting behaviour. According to RST, impulsive sensation seeking and anxiety are the primary dimensions of personality and underpin the processes through which individuals are conditioned (Pickering, & Gray, 1990; Zuckerman, 1994).

Although primary and secondary psychopathy have been found to differ in their relationship with sensation seeking behaviour (Benning et al., 2003; Frick, O’Brien, Wooten, & McBurnett, 1994) no study to date has explored how the interaction between anxiety and impulsivity impacts on the relationship between psychopathic personality traits and sensation seeking behaviour in a non-clinical population. Additionally, it could be argued that the results of previous studies examining the relationship between impulsivity, anxiety and personality traits of psychopathy, and the correlates of the two factors have been confounded by the use of forensic and
clinic-referred samples (Lynam, Whiteside & Jones, 1999; Salekin, Trobst, & Krioukova, 2001). Therefore, a unique aspect of the current study is to examine these relationships within a non-clinical population.

A greater understanding of the psychopathy construct is imperative if effective intervention and treatment strategies are to be implemented to address the phenomenon of antisocial behaviour in society. As impulsivity is a core feature of the psychopathy construct (Hart & Dempster, 1997) the dimension that impulsivity takes in the psychopathy construct has great importance in the diagnosis of this psychopathology. Therefore the key aim of the current study is to investigate impulsivity within the psychopathy construct. To facilitate this aim the current study will examine the relationships between psychopathic personality traits, impulsivity, anxiety, and sensation seeking in a community sample.

The following review firstly defines the concept of psychopathy. Following this a broad interpretation of RST conceptualisation of the aetiology of the psychopathy construct is given. The review then emphasises the relevance of conduct disorder in the diagnosis of psychopathy and the research findings that demonstrate parallels in the child and adult literature on the development of antisocial behaviour are outlined. It will be argued that anxiety moderates the association between impulsivity and levels of psychopathic personality traits.

**Defining Psychopathy**

The definition of psychopathy has undergone dynamic transformation over the course of the history of psychopathology. Originally the term psychopathy had been used as a generic term that encompassed all forms of psychopathology, by the
twentieth century psychopathy had become the general term in use for personality disorders. Over the last half of a century, the term psychopathy has acquired a much narrower definition and is now clearly acknowledged as a form of personality disorder (Spielberger, Kling, & O’Hagan, 1978).

The fundamental aspects of a personality disorder as defined by the DSM-IV are a persistent, inflexible and maladaptive pattern of behaviour that is manifested in at least two of the following forms, the way individuals relate to others, the way they feel, the way they think, or the way they perceive their environment. This pattern of behaviour is required to have been consistent across a range of situational contexts. Additionally, this behaviour has been evident since early adulthood and results in individuals experiencing dysfunction and distress (American Psychiatric Association, 1994).

Utilising forensic samples, Cleckley’s seminal work on the construct of psychopathy identified sixteen major characteristics (Cleckley, 1976). According to Cleckley, psychopathy is a personality disorder that is characterised by a pattern of affective, interpersonal, and behavioural symptoms. Affectively, psychopaths are incapable of forming enduring emotional relationships with others, and appear to lack a capacity for guilt, and anxiety. Interpersonally, psychopaths are arrogant, superficial, callous, grandiose, and manipulative. Behaviourally, psychopaths are impulsive, irresponsible, and display antisocial and deviant acts (Hart & Dempster, 1997).
The two interrelated factors of the Psychopathy Checklist-Revised (PCL-R) operationalised the affective, interpersonal, and behavioural aspects of Cleckley’s conceptualisation of psychopathy (Hare, 1991). The affective and interpersonal aspects constitute primary psychopathy, and the behavioural aspects constitute secondary psychopathy. Past research has identified that the two factors are related to differential personality traits, behavioural, and demographic correlates. The PCL-R is considered to be the most valid measure of psychopathy in both clinical and research areas within forensic settings (Benning et al., 2003; Blonigen, Carlson, Krueger, & Patrick, 2001; Brinkley, Schmitt, Smith, & Newman, 2001; Cooke, 1998; Poythress, Edens, & Lilienfeld, 1998).

However, Cleckley maintained that psychopathy, although more prevalent in forensic samples also existed in the wider population (Miller et al., 2001). Measures such as the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) and the Levenson Self-Report Psychopathy Scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995) can be used as alternatives to the PCL-R in non-clinical samples.

The Levenson Self-Report Psychopathy scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995) was designed specifically to assess the two interrelated dimensions of the PCL-R, and can be used in both referred and non-referred samples (Brinkley et al., 2001; Lynam et al., 1999). Whereas the uncorrelated factors of the PPI were specifically developed to assess the personality traits of the psychopathy construct in community samples as a means to aid in the identification of specific variables that may either facilitate or hinder the likely trajectory of psychopathy (Lilienfeld, & Andrews, 1996).
Research that utilised a non-referred sample to compare the factor structure of PPI in comparison to the PCL-R has found that the PPI sub-scales of fearlessness, stress immunity, and social potency load onto the primary psychopathy factor of the PCL-R. Whereas the PPI sub-scales of Machiavellian egocentricity, alienation, carefree nonplanfulness, and impulsive nonconformity load onto the secondary factor of the PCL-R. The PPI sub-scale of coldheartedness failed to significantly load onto either factor (Benning et al., 2003).

As Benning and colleagues (2003) stated, the finding that Machiavellian egocentricity and alienation were found to load onto the secondary psychopathy factor was unanticipated and inconsistent with the profile of the psychopathy construct. However, an alternative implication of this finding and one that is consistent with the rationale for the development of the PPI is that these psychopathic personality traits might be instrumental in determining the developmental processes of antisocial behaviour in non-forensic samples. Furthermore, Machiavellian egocentricity has been found to assess both factors of the PCL-R in delinquent (Poythress et al., 1998) and community samples (Benning et al., 2003). Therefore, Machiavellian egocentricity and alienation are of particular interest to the current study.

Since the changes to the DSM-III in 1980, psychopathy has become a term that is now used interchangeably with the term Antisocial Personality Disorder (APD). Whereas psychopathy has been considered to manifestly tap into affective and interpersonal aspects the DSM-IV criteria for APD is largely behavioural based. There exists some divergence of opinion in relation to the DSM-IV’(s) criteria for the
diagnosis of APD to adequately define what has traditionally been recognised as the construct of psychopathy (Hare, 1991; Reid, 1995). Furthermore, it is theorised that psychopathy is related to, but essentially distinct from, the more behavioural based description of Anti-social Personality Disorder (APD) in the DSM-IV (Miller et al., 2001).

However, Karpman expressed concerns in relation to the typology of psychopathy prior to this time (1941, 1944, 1946, 1947, cited in Spielberger et al., 1978). Karpman emphasised that secondary psychopathy was manifestly underpinned by interacting factors that were related to individuals environment and neurotic temperament. This definition of secondary psychopathy explicitly acknowledges that the neurotic secondary psychopathy type behaves antisocially because of a heightened level of internal emotional conflict (Levenson et al., 1995; Skeem et al., 2003).

Theoretical perspectives on the aetiology of Psychopathy

Theoretical paradigms relating to the aetiology of psychopathy denote varying degrees of relevance to the role impulsivity plays in the development of psychopathy. For instance theorists such as Cleckley (1976), Hare (1991), Lykken (1995), focus on the relevance of the affective and interpersonal characteristics in the development of psychopathy. Additionally, Cleckley hypothesised that the external behavioural aspects of secondary psychopathy derived from the underlying affective and interpersonal facets of primary psychopathy. The common denominator amongst these conceptualisations of psychopathy is low anxiety.
Alternatively, theorists such as Gorenstein and Newman (1980) consider impulsivity to be the most relevant factor in the development of psychopathy. Furthermore, Newman and Wallace (1993) have utilised RST to elucidate pathways to disinhibitory psychopathology. Newman and Wallace hypothesised that individuals develop an over active reaction or hypersensitivity to reward (strong BAS) and either an under active reaction or hyposensitivity to punishment (weak BIS), or an over active reaction to punishment (strong BIS). In other words this pattern of behaviour links psychopathy more with disinhibition rather than impulsivity (Hart & Dempster, 1997). Furthermore, this implies that the lowering of inhibitions is a learned response that involves processes of sensitisation and de-sensitisation to cues of reward and punishment that are related to individual differences in impulsivity and anxiety.

Gray’s (1987) Reinforcement Sensitivity Theory (RST)

Gray’s (1987) Reinforcement Sensitivity Theory (RST) of personality is one of the major aetiological theories that have been applied to psychopathy. Gray hypothesised that the Behavioural Inhibition System (BIS) is a regulatory system that is involved in responding to conditioned stimuli that represents cues of punishment and non-reward. Activation of the BIS is reflected in behavioural responses that facilitate individuals to move away from cues of punishment. The emotions of anxiety and fear are theorised to accompany the BIS response style.

In contrast, the Behavioural Activation System (BAS) is a regulatory system that is involved in responding to conditioned stimuli that represent cues of reward. Activation of the BAS is reflected in behavioural responses that facilitate individuals to move towards cues of reward or non-punishment. The personality traits of
impulsivity and sensation seeking are theorised to be associated with the BAS response style. Therefore, individual differences in response to conditioned stimuli that represent cues of reward and punishment are proposed to be largely dependent on, or regulated by differences in individuals’ anxiety, impulsivity and sensation seeking traits. According to RST it is these personality traits that constitute the primary dimensions of personality (Pickering, & Gray, 1990; Zuckerman, 1994).

Gray’s theory was first utilised by Fowles (1980) as a perspective that could be applied to the study of psychopathy. Following the Fowles-Gray model of psychopathy the primary psychopath would have a weak BIS and a normal BAS. This would equate to a weak inhibition of behaviour in relation to cues of punishment or non-reward that would be represented by a relative absence of anxiety or fear. In contrast the secondary psychopath would have a normal BIS and a strong BAS. As a result of this aforementioned combination of BIS and BAS the secondary psychopath would display impulsive (approach) behaviour in relation to cues of reward accompanied by normal levels of anxiety (avoidance) (Lykken, 1995).

Gray’s model in essence postulates that it is the biologically determined differences to reward and punishment, shaped through social learning mechanisms that dictate individuals propensity for antisocial behaviour. Therefore, weak anxiety and high impulsivity constitute major risk factors for the development of antisocial behaviour. Allied with this are the research findings that speculate that the probability of a prognosis of severe and long-term antisocial behaviour is heightened within individuals who have the callous and unemotional (C/UN) personality traits of
primary psychopathy combined with the personality trait of impulsivity (Hare et al., 1991).

Therefore the conceptualisation of RST may provide a useful framework to investigate the role of impulsivity and anxiety in psychopathy. The following section of the review will demonstrate how the divergence in the literature between personality and behaviour in relation to the aetiology of adult psychopathy is paralleled in the literature on the development of CD in children.

*Conduct Disorder (CD) a prerequisite for the diagnosis of APD*

Although there appears little doubt that psychopathic symptoms exist in youth samples, the relevance of these symptoms in youths to accurately predict psychopathy in adulthood is yet to be established (Loeber et al., 2001). Conduct Disorder (CD) is a prerequisite for the diagnosis of APD and the symptomatology of CD can occur either during childhood, that is prior to ten years of age, or during adolescence (APA, 1994). The earlier onset of CD rather than the later onset has greater association with the development of psychopathy. (Bloch, & Singh, 2001; McBurnett, & Pfiffner, 1998; Moffitt, 1993; Robins, 1978).

Theoretical perspectives in relation to the subtypes of antisocial behaviour posit that children displaying proactive styles of antisocial behaviour may differ in epidemiological and aetiological basis of aggression compared to the children found to display reactive styles of antisocial behaviour. The proactive style of antisocial behaviour is characterised by low levels of emotional affect and is thought to be motivated by a reward dominant response style (Bandura, 1983; Dodge, 1991) that is
largely influenced by reinforcement mechanisms in the environment (Krueger, Silva, McGee, & Moffitt, 1996b).

In contrast, the reactive style of antisocial behaviour displays heightened levels of affect such as, hyperactivity, fear and anger to cues of punishment (Berkowitz, 1989; Dodge, 1991) and is thought to be underpinned by neuropsychological factors (Krueger et al., 1996b). These neuropsychological factors when exposed to adverse environmental factors in relation to attachment and parenting styles or childhood abuse may become primed to a reactive aggression response style (Dodge, 1991).

This is consistent with social-learning theory that posits that individual differences in antisocial behaviour may be explained by variances in the availability of aggressive models to imitate, and the extent of which aggressive behaviour can be observed in the individual’s environment. Both of these factors have a positive relationship to aggressive behaviour. Variables that may determine how effectively the observed behaviour is learnt are reinforcement and rehearsal of the behaviour (McAdams, 2001).

Gray’s RST model of personality is one of the many theoretical paradigms that can be shown to apply to how individual differences in personality can effect the socialisation process of moral development (for a review see Kochanska, 1993). According to RST both primary and secondary psychopathy have attributes that may cause individuals to be difficult to condition when subjected to the normal conditioning processes. For example, the low anxiety component of primary psychopathy would cause individuals to be insensitive to cues of punishment.
Consistent with this are research findings that have found that youth who have high levels of the callous and unemotional personality traits (C/UN) of primary psychopathy displayed conduct problems regardless of parenting styles. In contrast children without high levels of C/UN traits were found to have greater conduct problems associated with ineffective parenting (Wootton, Frick, Shelton, & Silverthorn, 1997).

Alternatively, the high impulsivity component of secondary psychopathy might exacerbate individuals inability to tolerate delay and this in turn might increase the probability that antisocial behaviour would be relied upon to solve frustrating situations. The use of antisocial behaviour as a problem solving device would in turn become problematic in the developmental process, causing individuals to be alienated or punished by their family and peers. Consistent with this is research that has found that an inability to delay gratification has been strongly related to, and may be a risk factor for future antisocial behaviour (Krueger, Capsi, Moffitt, & White, 1996a).

Overall the theoretical and empirical evidence is consistent with RST for primary psychopathy being characterised by low anxiety. However, although high impulsivity is associated with secondary psychopathy, the RST emphasis on normal anxiety for the secondary psychopathy construct is incongruent with the large body of literature. Consistent with this claim was a recent study that utilised psychometric measures of BIS and BAS to distinguish between the two factors of psychopathy in a forensic sample (Newman, MacCoon, Vaughn, & Sadeh, 2005). Furthermore, Newman and colleagues concluded that the inclusion of an anxiety scale when assessing the factors of psychopathy was necessary to safeguard against misinterpretation when
distinguishing between primary and secondary psychopathy. The following section will review the research that further demonstrates the relevance of anxiety in differentiating between the two factors of psychopathy.

The research findings in relation to psychopathy that parallel the child and adult literature

Research that has utilised an emotional lexical decision task in their methodology has found that the response time to emotional stimulus differs in delinquents as a function of individual differences in Callous and Unemotional (C/UN) aspects of primary psychopathy and Impulsivity-Conduct Problem (I/CP) behavioural traits of secondary psychopathy. Specifically, individuals with high levels of I/CP were found to show faster response times for negative emotional stimuli compared to individuals that had lower levels of I/CP characteristics. Furthermore, the positive relationship between impulsivity and response time was found to increase when the levels of C/UN traits were statistically controlled for (Loney, Frick, Clements, Ellis, & Kerlin, 2003). These findings are consistent with research that has found no psychophysiological differentiation between emotional and neutral words in children diagnosed with CD (Blair, 1999), or in adults diagnosed with psychopathy (Patrick, 1994; Williamson, Harpur, & Hare, 1991).

Loney and colleagues (2003) suggest that adolescents with high C/UN traits may display antisocial behaviour because they merely have no regard of the effect of their behaviour on themselves or on other individuals. Consistent with this was research that found an apparent lack concern in relation to behaviour problems that was expressed for adolescents diagnosed with CD who had high C/UN traits. Similar
results were not found for those adolescents who had high impulsivity without C/UN traits (Barry, Frick, DeShazo, McCoy, Ellis, & Loney, 2000; O’Brien, & Frick, 1996).

Alternatively, Loney and colleagues (2003) suggested that the findings imply that youth with high levels of (I/CP) and low levels of (C/UN) demonstrate an increased sensitivity to negative stimuli and possibly experience a heightened level of emotional distress compared to youth who do not have high levels of I/CP. This is consistent with research that has found that anxiety positively and highly correlated with control problems in a clinic-referred child sample. The converse relationship was found for anxiety and C/UN and this negative relationship increased when I/CP was controlled for (Frick et al., 1999).

Interestingly, within psychopathology, the relevance of negative affect has mainly been emphasised in relation to the internalising disorders, such as depression and anxiety. However, research has found that high levels of anxiety indicators differentiate both internalising and externalising psychopathology groups from control groups and this finding suggests that negative affect is also relevant in the externalising disorders of CD, substance abuse and APD (Krueger et al., 1996b). Furthermore this is consistent with the high comorbidity rate that is found for individuals who experience both APD and anxiety disorders (Frick et al., 1999). The past research verifies the relevance of anxiety to the psychopathy construct. However, what has not been addressed by the previous research is the interaction between anxiety and impulsivity. The investigation of how this interaction impacts on the psychopathic personality traits is a unique aspect of the current study.
Additionally, the research that has utilised an emotional lexical decision task demonstrates that the emotional response of adolescents who are antisocial and have low levels of C/UN indicate a nonplanning reaction to perceived provocation. This is consistent with research that has found that the component of impulsivity that had the greatest association with antisocial behaviour in adolescents was nonplanning (Luengo, Carrillo-de-la-Pena, Otero, & Romero, 1994). Nonplanning has been defined as a propensity to live in the present, and for individuals to display a lack of forethought and disregard in relation to the consequences of their actions. Additionally, this is consistent with the research that has found stronger links between the behavioural components of impulsivity and delinquency compared to the cognitive components of impulsivity (Luengo et al., 1994; White, Moffitt, Capsi, Bartusch, Needles, & Stouthamer-Loeber, 1994).

Furthermore, Luengo and colleagues (1994) concluded that the high correlations found between the Eysenck I6 impulsivity scale and antisocial behaviour supported the use of this scale when exploring the relationship between impulsivity and antisocial behaviour in future studies. Consistent with this claim is that Eysenck’s Impulsivity scale in the context of Eysenck’s three dimensional personality theory has been found to align more with the dimension of psychoticism in both males and females (Eysenck, 2004).

Zuckerman claims that sensation seeking is also found on the extreme psychoticism dimension of personality. In particular the disinhibition and boredom susceptibility aspects have been found to be related to anger and aggression and are theorised to be among the personality traits that depict the psychopathy construct.
(Zuckerman, 1991; 1994). High levels of sensation seeking have been found to be associated with high-risk life-style such as alcohol and substance abuse and criminal activities (Zuckerman, & Kulman, 2000).

As reported by Hur and Bouchard (1997), past research has found that the strength of the relationship between impulsivity and sensation seeking depending on the impulsivity measure utilised, ranges between .20 to .40. It is theorised that this relationship is largely influenced by the biological factors each has in common. Therefore, within the broader context of impulsivity, sensation seeking behaviour is considered to be a subtrait of impulsivity (Hur & Bouchard 1997; Pickering, 2004; Zuckerman & Kuhlman, 2000). It is worthy of note that sensation seeking has no relationship with anxiety whereas impulsivity has a positive relationship with anxiety (Zuckerman, 1994). In addition, the Sensation Seeking Scale (SSS) Form V (Zuckerman, 1994) is considered to be the psychometric measure most widely utilised for assessing individual differences in sensation seeking behaviour (Zuckerman, 1994).

Research that has explored sensation seeking in relation to the two factors of psychopathy as measured by the PCL-R in forensic samples have found that secondary psychopathy has been positively associated with Disinhibition (Dis.,) and Boredom Susceptibility (BS), whereas primary psychopathy has been found to be relatively uncorrelated with these sensation seeking behaviours (Benning et al., 2003). In contrast, research that has explored the relationship between the two factors of the LSRP in community samples have found that Dis., and BS were associated with both primary and secondary psychopathy factors, but that primary psychopathy had a
greater association with these sensation seeking behaviours. Furthermore, this research found that the variables that were the greatest predictors of antisocial behaviour were, in order of magnitude, disinhibition, primary psychopathy, gender, and secondary psychopathy (Levenson et al., 1995).

Although research has found that thrill and adventure seeking is a negative predictor of antisocial behaviour (Zuckerman, 1994; Levenson et al., 1995; Daderman, 1999) research has also found that the C/UN traits significantly predicted TAS in clinic-referred samples (Frick et al., 1999; Frick et al., 1994). Whereas I/CP traits although non-significant had a greater association with social disinhibition and drug and alcohol attitudes (Frick et al., 1994).

Collectively, the research has found that it is the SSS sub-scales of disinhibition and boredom susceptibility that are associated with antisocial behaviour. Furthermore, research has found higher levels of sensation seeking traits and impulsivity with delinquents, substance abusers, and psychopaths compared to controls. Therefore, impulsivity and sensation seeking are related to both psychopathy and the disinhibitory psychopathologies that have been found to co-occur with psychopathy (Sher, Bartholow, & Wood, 2000; Zuckerman, 1994).

Consistent with RST conceptualisation of primary psychopathy the theoretical and empirical evidence demonstrates that the affective and interpersonal components of primary psychopathy are constituted by personality traits that are underpinned by low anxiety and fearlessness. Therefore the current study is particularly interested in investigating how the PPI sub-scale of fearlessness is associated with the secondary
psychopathy components of impulsivity and anxiety. Furthermore, the PPI sub-scales of Machiavellian egocentricity and alienation have demonstrated that they may be instrumental in determining the developmental processes of antisocial behaviour in non-forensic samples. Therefore the current thesis will focus on the interaction between impulsivity and anxiety and how this interaction impacts on these psychopathic personality traits.

Research Aims

The large body of literature suggests that impulsivity is a major risk factor for the development of antisocial behaviour and is a core component of the behavioural aspect of secondary psychopathy. Therefore, the current thesis aims to contribute to the conceptualisation of impulsivity in relation to the psychopathy construct by investigating the interaction between impulsivity and anxiety and how this interaction impacts on psychopathic personality traits. A further aim of the current study is to draw upon RST to examine the relationships between psychopathic personality traits, impulsivity, anxiety, and sensation seeking in a non-referred sample.
Hypotheses

Anxiety

It is hypothesised that anxiety will have a negative relationship with LSRP factor one. Conversely, it is expected that anxiety will have a positive relationship with LSRP factor two.

Additionally, it is expected that anxiety will have a negative relationship with the PPI-I sub-scales of stress immunity, and social potency. Conversely, it is expected that anxiety will have a positive relationship with the PPI-II sub-scales of Machiavellian egocentricity, alienation, carefree nonplanfulness, and impulsive nonconformity.

Impulsivity

It is expected that the PPI sub-scales of fearlessness, stress immunity and social potency will account for the greatest variance in LSRP 1 mean scores compared to the other PPI sub-scales. In addition, it is hypothesised that the PPI sub-scales of carefree nonplanfulness and impulsive nonconformity will account for the greatest variance in LSRP 2 mean scores when compared to the other PPI sub-scales.

Anxiety x Impulsivity

It is expected that anxiety will significantly moderate the association between impulsivity and the LSRP factor one mean scores. Specifically, it is hypothesised that low levels of anxiety and high levels of impulsivity will predict higher levels of LSRP factor one mean scores compared to high levels of anxiety and high levels of impulsivity.
Additionally, it is predicted that anxiety will significantly moderate the association between impulsivity and the psychopathic personality traits of Machiavellian egocentricity; alienation and fearlessness as measured by the PPI. Specifically, low levels of anxiety and high levels of impulsivity are hypothesised to predict higher levels of Machiavellian egocentricity; alienation; and fearlessness mean scores when compared to high levels of anxiety and high levels of impulsivity.

**Sensation seeking**

It is further predicted that the SSS Form V sub-scales of disinhibition and boredom susceptibility will account for the greatest variance in LSRP 1 mean scores and LSRP 2 mean scores compared to the thrill and adventure seeking and experience seeking sub-scales.

In addition, it is predicted that of the eight PPI sub-scales, Machiavellian egocentricity and carefree nonplanfulness will account for the greatest variance in the SSS Form V sub-scales of disinhibition and boredom susceptibility. Also it is hypothesised that the PPI sub-scale of fearlessness will account for the greatest variance in the SSS Form V sub-scale of thrill and adventure seeking.
Method

Participants

The sample was composed of 107 participants of whom 83 were females and 24 were males. The participants ages ranged from 18 to 40 years ($M = 24.41$, $SD = 7.14$). Of the 107 participants, 83 per cent were currently undertaking university studies, the remaining 17 per cent reported being of non-student status. The country of origin reported by 82 per cent of the participants was Australia. The remaining 18 per cent were from European, Asian and New Zealand backgrounds.

Materials

Participants completed a questionnaire that contained demographic questions, and a battery of self-report psychological measures (see Appendix A for a complete copy of the questionnaire).

*The Levenson Self-Report Psychopathy scale.* The Levenson Self-Report Psychopathy scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995) was used to measure the two-factors of the psychopathy construct. The LSRP contains 26-items, (16 = factor 1; 10 = factor 2). Item examples were “I enjoy manipulating other people’s feelings” (factor 1); “I am often bored” (factor 2). Scored on a 4 point Likert scale, scores range from 16 to 64 (factor 1); and from 10 to 40 (factor 2).

Participants were required to rate their level of agreement for each statement on a 4 point Likert scale (1 = disagree strongly, 2 = disagree somewhat, 3 = agree somewhat,
& 4 = agree strongly). Scores range from 16 to 64 factor 1; 10 to 40 factor 2. Higher scores for factor 1, and factor 2 represent greater levels of these constructs. Levenson and colleagues (1995) reported that the internal reliability for Primary psychopathy was .82 and Secondary psychopathy was .63. The LSRP has been found to be a robust measure to assess the two-factors of the psychopathy construct in male and female community samples (Lynam et al., 1999).

The Psychopathic Personality Inventory. The Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) was used in the current study to measure the psychopathic personality traits. The PPI contains 187 questions, scored on a 4 point Likert scale (1 = false; 2 = mostly false; 3 = mostly true; & 4 = true). The PPI gives a Total score and 8 sub-scale scores. The Total score contains (163 items) and scores range from (163 to 652). The 8 sub-scales are: Social Potency (24 items); Fearlessness (19 items); Stress Immunity (11 items); Coldheartedness (21 items); Impulsive Nonconformity (17 items); Alienation (18 items); Carefree Nonplanfulness (20 items); and Machiavellian Egocentricity (30 items). Higher scores reflect higher levels of psychopathic personality traits. Of the 187 items, 14 are related to deviant responding.

Item examples for the PPI sub-scales are “I almost always feel very sure of myself when I’m around other people” (social potency); “I occasionally do something dangerous because someone has dared me to do it” (fearlessness); “When I want to, I can usually put fears and worries out of my mind” (stress immunity); “When someone is hurt by something I say or do, I usually consider that to be their problem” (coldheartedness); I’ve always considered myself to be something of a rebel”
(impulsive nonconformity); “I often get blamed for things that aren’t my fault”
(alienation); “I haven’t thought much about what I want to do with my life” (carefree
nonplanfulness); and “I often find myself resenting people who give me orders”
(Machiavellian egocentricity).

Convergent and discriminant validity has been found for the PPI in that high and
significant correlations have been reported between the PPI and other self-report
psychopathy measures. Across four samples internal consistency of the PPI Total
score ranged from .90 to .93 and the eight sub-scales ranged from .70 to .90. Test-
retest reliability for the PPI Total score over a 26 day time period was \( r = .95 \) and \( r = .82 \) to .94) for the eight sub-scales (Lilienfeld, & Andrews, 1996).

*The Impulsiveness Questionnaire version 7.* The Impulsiveness Questionnaire
version 7 (I7) (Eysenck, Pearson, Easting & Allsopp, 1985) is utilised to measure
impulsiveness. The I7 defines impulsivity as behaviour that occurs with minimal or
no premeditation in relation to risk factors or future consequences, or psychological
capacity for delay. The (19) impulsivity items that have been isolated from the I7 for
use in the current study are reported to measure impulsivity that aligns more with the
personality dimension of psychoticism (Eysenck et al., 1985). In addition, sub-scale of
the I7 was developed as a uni-dimensional measure therefore the isolation of the
impulsivity sub-scale is permissible (Parker, & Bagby, 1997).

Participants were required to indicate if they agreed or disagreed with the
statements (No = 1; Yes = 2). Total scores range from (19 to 38). An example item is
“When people shout at you, do you shout back?” Higher scores indicate greater levels
of impulsiveness. Adequate psychometric properties have been reported for the impulsiveness sub-scale ($\alpha = .84$) (Eysenck et al., 1985). The construct validity has been confirmed and the test-retest reliability was found to be .76 after a one-year period (Luengo, Carillo-De-La-Pena, & Otero, 1991).

*The State-Trait Anxiety Inventory.* The State-Trait Anxiety Inventory (STAI; Spielberger, Gorusuch, Lushene, Vagg, & Jacobs, 1983) contains 20-items that relate to State-anxiety and 20-items that relate to Trait-anxiety. The current study utilised the 20 trait-items to measure Trait-anxiety. The 20 STAI-T items are comprised of subjective statements such as “I feel nervous and restless” and “I feel like a failure”. Participants are required to respond by indicating how they generally feel about the statement on a 4-point scale (1=almost never; 2=sometimes; 3=often; 4=almost always). Total scores range from 20 to 80. Higher scores reflect greater levels of anxiety.

The psychometric properties of the STAI-T indicate excellent internal validity ($\alpha = .89$ to .91) and test-retest reliability over a 104 day time period ($r = .73$ for males, & $r = .77$ for females) (Spielberger et al., 1983). Additionally, the factor structure of the STAI-T is reported to be robust indicating that both factors can be used in isolation (Kaplan, & Saccuzzo, 2001).

*The Sensation Seeking Scale.* Sensation Seeking Scale (SSS) Form V (Zuckerman, 1994). The SSS contains 40 forced-choice items, 10-items relate to each of the 4 sub-scales. Each sub-scale has 10 items, scores summed with a possible range of 0-10, the
total score range was between 0-40. A higher score indicated a higher propensity to undertake sensation-seeking activities.

The four sub-scales are, Thrill and Adventure Seeking (TAS); Experience Seeking (ES); Boredom Susceptibility (BS); and Disinhibition (Dis). The sub-scale of TAS includes items that demonstrate a desire to participate in activities and sports that involve risk-taking and danger. An item example is “I would like to try surfboard riding / I would not like to try surfboard riding”.

The sub-scale of ES includes items that indicate that the source of stimulation is derived from art, travel, associating with unconventional company, this search for mental stimulus can also include the use of drugs. An item example is “I have tried marijuana or would like to / I would never smoke marijuana”.

The sub-scale of BS includes items that demonstrate if individuals become restless and bored when there is repetition in their lives. An item example is “I get bored seeing the same old faces / I like the comfortable familiarity of everyday friends”.

The sub-scale of Dis., includes items that demonstrate sensation seeking through social and sexual means. An item example is “I like to date persons who are physically exciting / I like to date persons who share my values”.

The internal reliabilities of the sub-scales ranged from (TAS, .77 to .82; ES, .61 to .67; BS, .56 to .65; Dis., .74 to .78). The internal reliability of the Total scale ranged from (.83 to .86). Adequate reliability scores have been reported for the two sub-
scales that the current study is mainly concerned with, that of Dis., and TAS (Zuckerman, 1994). Construct validity of Zuckerman’s sensation seeking traits have received empirical support in that behaviours such as, high risk-taking activities and drug use have been found to be correlated with sensation seeking (McAdams, 2001).

Procedure

Of the 107 participants, 81 were Undergraduate Psychology students recruited through the Swinburne University’s Research Experience Program (REP) from the Hawthorn campus. The students’ participation in the REP was part of their course requirement. The remaining 26 participants were recruited from the wider community using a snowballing technique. The confidentiality and anonymity of questionnaire responses was conveyed to all participants via the explanatory information cover-sheet attached to each questionnaire. The cover-sheet also specified that the return of the questionnaire would be interpreted as evidence of the participant’s informed consent. The questionnaires were completed at a time and place convenient to the participant. Completed questionnaires were returned to an allocated mailbox on the University campus. Alternatively the questionnaires were returned by mail in replied paid envelopes that were provided to the participants.
RESULTS

Preliminary Data Screening

The data was analysed using the Statistical Package for the Social Sciences (SPSS) version 11.0. Preliminary data analyses were conducted to investigate the suitability of the data for further analysis. Three cases were deleted from the data set as they were found to be missing more than 30% of their data. Boxplots of the variables identified no univariate outliers that were three standard deviations or more above the mean. Mahalanobis distance value was calculated to examine the data set for multivariate outliers. No cases in the data set were found to have a Mahalanobis distance value greater than the critical value ($\chi^2 (df, 16) = 39.25, p = .001$). An examination of the scatterplots of the residuals established that the assumptions of linearity, and homoscedasticity had been met. The histograms and P-P Plots of residual values demonstrated that the variables of stress immunity and thrill and adventure seeking were negatively skewed and the variables of disinhibition, boredom susceptibility, experience seeking, alienation, carefree nonplanfulness, and the I7 were all positively skewed. Although none of these variables substantially deviated from normality the Kolmogorov-Smirnov and Shapiro Wilks statistics indicated that the distributions of these variables statistically deviated from normality. However, these variables are expected to be skewed in the normal population and as the Kolmogorov-Smirnov and Shapiro Wilks tests of normality are highly sensitive and the regression analysis is robust to violations of normality it was considered unnecessary to
transform these variables (Francis, 1999). All observations were deemed independent of each other. Furthermore, Pearson’s correlations between the variables demonstrated that the assumption of multicollinearity had not been violated. Cronbach’s alpha was calculated for each scale utilised in the study to determine the internal consistency of these variables within the current study’s sample. As Table 1 demonstrates, with the exception of LSRP 2, boredom susceptibility and experience seeking acceptable levels of internal consistency were found for all the variables in the current study. Levenson and colleagues (1995) stated that the Cronbach alpha of .63 that was found for secondary psychopathy in their research was considered to be an acceptable level for a scale that contained 10 items. The low internal reliability found for boredom susceptibility and experience seeking is comparable to Zuckerman (1994).
Table 1

Descriptive Statistics and Reliabilities of the Variables in the Current Study

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Psychopathy (LSRP)</td>
<td>28.68</td>
<td>6.47</td>
<td>17.00 - 47.00</td>
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<td>Secondary Psychopathy (LSRP)</td>
<td>20.46</td>
<td>4.30</td>
<td>12.00 - 34.00</td>
<td>.65</td>
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<td>Machiavellian Egocentricity</td>
<td>60.89</td>
<td>11.57</td>
<td>34.00 - 88.00</td>
<td>.87</td>
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<td>Social Potency</td>
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<td>10.94</td>
<td>29.00 - 83.00</td>
<td>.88</td>
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<tr>
<td>Fearlessness</td>
<td>44.24</td>
<td>11.53</td>
<td>20.00 - 68.00</td>
<td>.89</td>
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<td>Coldheartedness</td>
<td>41.61</td>
<td>7.43</td>
<td>25.00 - 58.00</td>
<td>.76</td>
</tr>
<tr>
<td>Impulsive Nonconformity</td>
<td>36.57</td>
<td>8.24</td>
<td>21.00 - 61.00</td>
<td>.83</td>
</tr>
<tr>
<td>Alienation</td>
<td>34.63</td>
<td>8.91</td>
<td>18.00 - 57.00</td>
<td>.88</td>
</tr>
<tr>
<td>Carefree Nonplanfulness</td>
<td>38.31</td>
<td>9.04</td>
<td>21.00 - 67.00</td>
<td>.87</td>
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<td>Stress Immunity</td>
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<td>Impulsivity I$_7$</td>
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<td>9.36</td>
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<td>Disinhibition</td>
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<td>0.00 - 10.00</td>
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<tr>
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<tr>
<td>Thrill &amp; Adventure Seeking</td>
<td>5.91</td>
<td>2.82</td>
<td>0.00 - 10.00</td>
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<tr>
<td>Experience Seeking</td>
<td>5.73</td>
<td>2.07</td>
<td>2.00 - 10.00</td>
<td>.57</td>
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Note. (N = 107)
In order to examine the hypotheses in relation to the intercorrelations between the variables, Pearson’s correlations were calculated and are shown below in Table 2.
Table 2

*Intercorrelations Between Psychopathic Personality Traits, Impulsivity, Anxiety, Sensation Seeking and the Two Factors of LSRP*

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<td>-.06</td>
<td>.33**</td>
<td>.30**</td>
<td>.29**</td>
<td>.28**</td>
<td>.18</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note. *p < .05; **p < .01 (N = 107)*
**Correlation Analyses**

**Anxiety**

As predicted, anxiety clearly differentiated between the two-factors of LSRP. Specifically, there was a significant moderate positive relationship between anxiety and LSRP 2 and only a weak positive relationship between anxiety and LSRP 1. Also as predicted anxiety had a significant moderate negative relationship with the PPI sub-scales of stress immunity and social potency and significant and positive associations with the PPI sub-scales of Machiavellian egocentricity, alienation and carefree nonplanfulness. Furthermore, anxiety had no association with the PPI sub-scales of fearlessness and impulsive nonconformity.

**Impulsivity**

As predicted greater associations were observed between measures of impulsivity and LSRP 2 when compared to LSRP 1. Also as predicted the SSS sub-scales were found to have significant positive relationships with all three measures of impulsivity. The only finding that was inconsistent with this pattern was that impulsivity as measured by the PPI sub-scale of carefree nonplanfulness and thrill and adventure seeking failed to reach significance. This finding is consistent with carefree nonplanfulness greater association with anxiety and LSRP 2 when compared to the other indicators of impulsivity. In addition, as predicted anxiety was significantly and positively related to impulsivity as measured by the I7 and carefree nonplanfulness. However, the finding that impulsive nonconformity had no relationship with anxiety deviated from expectation.
**Standard multiple regression analyses**

**Psychopathic personality traits and LSRP factor one**

In order to test the hypothesis that of the eight PPI sub-scales, fearlessness, stress immunity and social potency would account for the greatest variance in LSRP 1 mean scores compared to the other PPI sub-scales a standard multiple regression analysis was conducted. This analysis found that when the PPI sub-scales were all entered into the model, 61% of the variance was explained in LSRP 1 mean scores and this model was significant ($R = .78, F (8, 95) = 18.40, p < .001$). However, Machiavellian egocentricity was found to be the only significant predictor of LSRP 1 and uniquely accounted for 30% of the variance in LSRP 1 mean scores ($\beta = .86, p < .001$). [In contrast, fearlessness ($\beta = -.02, p > .05$), stress immunity ($\beta = .13, p > .05$) and social potency ($\beta = -.07, p > .05$) all failed to reach significance]. The standardised Beta coefficients for the remaining PPI sub-scales were: coldheartedness ($\beta = .06, p > .05$); impulsive nonconformity ($\beta = -.12, p > .05$); alienation ($\beta = .05, p > .05$); and carefree nonplanfulness ($\beta = -.07, p > .05$).

**Psychopathic personality traits and LSRP factor two**

In order to test the hypothesis that carefree nonplanfulness and impulsive nonconformity would account for the greatest variance in LSRP 2 mean scores compared to the other PPI sub-scales a standard multiple regression was conducted. This analysis demonstrated that when the PPI sub-scales were all entered into the model, 63% of the variance in LSRP 2 was accounted for and this model was significant ($R = .79, F (8, 95) = 20.34, p < .001$). Carefree nonplanfulness ($\beta = .42, p$
< .001), alienation (β = .26, p < .01), coldheartedness (β = .17, p < .05) and stress immunity (β = -.27, p < .01) were all shown to be significant predictors of LSRP 2. Carefree nonplanfulness was the greatest predictor of LSRP 2 and uniquely accounted for 12% of the variance in LSRP 2 mean scores. Following this, alienation accounted for 4% and coldheartedness accounted for 2% of the variance in LSRP 2. Stress immunity was found to be a negative predictor of LSRP 2 and uniquely accounted for 4% of the variance in LSRP 2. [In contrast, impulsive nonconformity failed to reach significance (β = .09, p > .05)]. The standardised Beta coefficients for the remaining PPI sub-scales were: Machiavellian egocentricity (β = .16, p > .05); social potency (β = .03, p > .05); and fearlessness (β = 03, p > .05).

**Sensation seeking & LSRP factor one and two**

To test the hypothesis that disinhibition and boredom susceptibility would account for the greatest variance in LSRP 1 & LSRP 2 mean scores compared to thrill and adventure seeking and experience seeking two standard multiple regression analyses were conducted with LSRP 1 as the dependent variable; and following this LSRP 2 as the dependent variable. The results of the first analysis indicated that the model accounted for 28% of the variance in LSRP 1 mean scores and this model was significant (R = .53, F(4, 101) = 9.68, p < .001). Disinhibition (β = .24, p < .05) and boredom susceptibility (β = .35, p < .001) were significant and positive predictors of LSRP 1 and experience seeking (β = -.31, p < .01) was a significant and negative predictor of LSRP 1. The semi-partial correlations indicated that boredom susceptibility was the most important predictor of LSRP 1, and uniquely explained 11% of the variance in LSRP 1 mean scores. In addition, disinhibition uniquely accounted for 4% and experience seeking uniquely accounted for 8% of the variance.
in LSRP 1 mean scores. The association between thrill and adventure seeking and LSRP 1 failed to reach significance ($\beta = .17, p > .05$).

The results of the second multiple regression analysis indicated that the model accounted for 11% of the variance in LSRP 2 mean scores and this model was significant ($R = .33, F(4,101) = 3.04, p < .05$). However, boredom susceptibility ($\beta = .30, p < .01$) was the only significant predictor of LSRP 2 and the semi-partial correlation indicated that the unique contribution of BS to the model was 8%. In contrast, the association between disinhibition ($\beta = -.01, p > .05$); thrill and adventure seeking ($\beta = .07, p > .05$); and experience seeking ($\beta = .05, p > .05$) and LSRP 2 failed to reach significance.

*Psychopathic personality traits & Sensation seeking*

Standard multiple regression analyses were conducted to test the hypotheses that Machiavellian egocentricity and carefree nonplanfulness would account for the greatest variance in disinhibition and boredom susceptibility. Additionally, it was predicted that fearlessness would account for the greatest variance in thrill and adventure seeking. The regression analyses statistics are shown below in Tables 3 to 6.
Table 3

Summary of Standard Regression Analysis for the PPI Sub-Scales Predicting Disinhibition Mean Scores

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Std error</th>
<th>Beta</th>
<th>Sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mach – Ego</td>
<td>.08</td>
<td>.03</td>
<td>.36**</td>
<td>.05</td>
</tr>
<tr>
<td>Social Potency</td>
<td>-.03</td>
<td>.03</td>
<td>-.13</td>
<td>-.01</td>
</tr>
<tr>
<td>Fearlessness</td>
<td>.04</td>
<td>.03</td>
<td>.17</td>
<td>.02</td>
</tr>
<tr>
<td>Coldheartedness</td>
<td>-.09</td>
<td>.04</td>
<td>-.24*</td>
<td>-.04</td>
</tr>
<tr>
<td>INCF</td>
<td>.05</td>
<td>.04</td>
<td>.14</td>
<td>.01</td>
</tr>
<tr>
<td>Alienation</td>
<td>-.08</td>
<td>.03</td>
<td>-.26*</td>
<td>-.04</td>
</tr>
<tr>
<td>CFNP</td>
<td>.05</td>
<td>.03</td>
<td>.15</td>
<td>.01</td>
</tr>
<tr>
<td>Stress Immunity</td>
<td>.04</td>
<td>.07</td>
<td>.08</td>
<td>.01</td>
</tr>
</tbody>
</table>

R² = .32

Note. Mach – Ego = Machiavellian Egocentricity; CFNP = Carefree Nonplanfulness; INCF = Impulsive Nonconformity
(N = 107) * p < .05; ** p < .01; *** p < .001

Although the model was found to be significant (R = .56, F (8,95) = 5.58, p < .001) as shown above in Table 3, Machiavellian egocentricity, coldheartedness and alienation were the only predictor variables that were found to have a significant relationships with disinhibition.
Table 4

Summary of Standard Regression Analysis for the PPI Sub-Scales Predicting Boredom Susceptibility Mean Scores

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Std error</th>
<th>Beta</th>
<th>Sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mach – Ego</td>
<td>.06</td>
<td>.02</td>
<td>.33*</td>
<td>.04</td>
</tr>
<tr>
<td>Social Potency</td>
<td>.02</td>
<td>.02</td>
<td>.01</td>
<td>.00</td>
</tr>
<tr>
<td>Fearlessness</td>
<td>.02</td>
<td>.02</td>
<td>.10</td>
<td>.00</td>
</tr>
<tr>
<td>Coldheartedness</td>
<td>.04</td>
<td>.03</td>
<td>.13</td>
<td>.01</td>
</tr>
<tr>
<td>INCF</td>
<td>.03</td>
<td>.03</td>
<td>.13</td>
<td>.01</td>
</tr>
<tr>
<td>Alienation</td>
<td>-.02</td>
<td>.03</td>
<td>-.07</td>
<td>.00</td>
</tr>
<tr>
<td>CFNP</td>
<td>.01</td>
<td>.02</td>
<td>.05</td>
<td>.00</td>
</tr>
</tbody>
</table>

Stress Immunity .03 .05 .07 .00

\( R^2 = .28 \)

Note. Mach – Ego = Machiavellian Egocentricity; CFNP = Carefree Nonplanfulness; INCF = Impulsive Nonconformity (N = 107) * \( p < .05; ** p < .01; *** p < .001 \)

The model was found to be significant \( (R = .53, F(8,94) =4.48, p < .001) \) and as shown above in Table 4, Machiavellian egocentricity was the only predictor variable that was found to have a significant positive relationship with boredom susceptibility.
Table 5

Summary of Standard Regression Analysis for the PPI Sub-Scales Predicting Thrill and Adventure Seeking Mean Scores

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Std error</th>
<th>Beta</th>
<th>Sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mach – Ego</td>
<td>-.03</td>
<td>.02</td>
<td>-.14</td>
<td>-.01</td>
</tr>
<tr>
<td>Social Potency</td>
<td>.02</td>
<td>.02</td>
<td>.08</td>
<td>.00</td>
</tr>
<tr>
<td>Fearlessness</td>
<td>.22</td>
<td>.03</td>
<td>.91***</td>
<td>.32</td>
</tr>
<tr>
<td>Coldheartedness</td>
<td>.09</td>
<td>.03</td>
<td>.02</td>
<td>.00</td>
</tr>
<tr>
<td>INCF</td>
<td>-.08</td>
<td>.03</td>
<td>-.19*</td>
<td>-.02</td>
</tr>
<tr>
<td>Alienation</td>
<td>.01</td>
<td>.03</td>
<td>.04</td>
<td>.00</td>
</tr>
<tr>
<td>CFNP</td>
<td>.03</td>
<td>.02</td>
<td>.11</td>
<td>.00</td>
</tr>
</tbody>
</table>

Stress Immunity

R² = .59

Note. Mach – Ego = Machiavellian Egocentricity; CFNP = Carefree Nonplanfulness; INCF = Impulsive Nonconformity
(N = 107) * p < .05; ** p < .01; *** p < .001

The model was found to be significant (R = .77, F (8,95) = 16.98, p < .001), as shown above in Table 5 there was a significant positive relationship between thrill and adventure seeking and fearlessness and impulsive nonconformity.
The model was found to be significant ($R = .67$, $F (8,95) = 9.91$, $p < .001$), as shown above in Table 6 there was a significant and positive relationship between experience seeking and impulsive nonconformity.
Moderation Analyses: Anxiety and impulsivity on LSRP factor one; fearlessness; machiavellian egocentricity; and alienation

In order to test the hypotheses that anxiety will moderate the association between impulsivity and LSRP 1; and impulsivity and the psychopathic personality traits of fearlessness, and Machiavellian egocentricity moderation analyses were conducted. The three impulsivity indicators of carefree nonplanfulness; and impulsive nonconformity as measured by the PPI and impulsivity as measured by the I7 were sequentially subjected to the three-stage hierarchical regression procedure. Preliminary analyses revealed that of these three impulsivity indicators, carefree nonplanfulness provided the greatest efficacy for the moderation model. Therefore the only impulsivity measure reported in the following analyses is that of carefree nonplanfulness.

Prior to conducting the regression analysis, the predictor variables of carefree nonplanfulness and anxiety were centred. The process of centring the predictor variables facilitates the interpretation of the regression coefficients and reduces the possible occurrence of multicollinearity between the variables (Aiken, & West, 1991). An interaction term between the two-centred predictor variables was then computed (CFNP X ANX) to test the hypothesis that anxiety moderates the influence of impulsivity on psychopathic personality traits as measured by LSRP factor one. The regression analyses statistics are shown below in Table 7
Table 7

Summary of Hierarchical Regression Analysis for Anxiety, Carefree Nonplanfulness, and the Interaction with LSRP Factor One as the Dependent Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>STAGE 1</th>
<th>STAGE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std error</td>
</tr>
<tr>
<td>CFNP</td>
<td>.17</td>
<td>.07</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.03</td>
<td>.07</td>
</tr>
<tr>
<td>Interaction CFNP X ANX</td>
<td>-0.01</td>
<td>.01</td>
</tr>
</tbody>
</table>

R Square = .07*  
Adjusted R Square = .05*  
R Square Change = .08**

Note. CFNP = Carefree Nonplanfulness; ANX = Anxiety.  
(N = 107) * p < .05; ** p < .01; *** p < .001

Moderation Analysis: LSRP factor one

At stage 1 of the regression equation carefree nonplanfulness and anxiety accounted for 7% of the variation in LSRP 1 mean scores (R = .26, F (2,104) = 3.89, p < .05). At stage 2, the addition of the interaction term accounted for an additional 8% of the variance in LSRP 1 mean scores over and above the unique contributions of impulsivity and anxiety (F (1,103) = 9.75, p < .01).

To facilitate further interpretation of the interaction effect the interaction was probed according to the procedure outlined by Aiken and West (1991). Scores on LSRP 1 are plotted: low ( -1 SD); average ( + 0 SD); and high ( + 1 SD) for impulsivity and anxiety. The interaction is shown below in Figure 1.
Figure 1. Moderating effect of anxiety on the relationship between impulsivity and LSRP 1 mean scores
( \( N = 107 \) )

As Figure 1 depicts, the influence of impulsivity of LSRP1 mean scores depends on the anxiety levels of individuals. Higher LSRP 1 mean scores were found for individuals who reported high levels of anxiety and high levels of impulsivity compared to individuals who reported low levels of anxiety and high levels of impulsivity. High and low levels of impulsivity did not appear to influence LSRP 1 mean scores for individuals who reported low levels of anxiety. Lower LSRP 1 mean scores were found for individuals who reported high levels of anxiety and low levels of impulsivity.
Moderation analysis: Fearlessness

The second hierarchical regression investigated the hypothesis that anxiety moderates the influence of impulsivity on the psychopathic personality traits of fearlessness as measured by the PPI. The results of stage 1 of the regression equation indicated that carefree nonplanfulness and anxiety combined explain 9% of the variance in fearlessness mean scores ($R^2 = .30$, $F(2,103) = 4.89, p < .01$). When the interaction term was entered at stage 2, an additional 4% of the variance in fearlessness mean score was explained ($F(1,102) = 4.31, p < .05$). The regression analyses statistics are shown below in Table 8 and the interaction is depicted below in Figure 2.

Table 8

Unstandardised and Standardised Beta Coefficients, Standard Error and Squared Semi-partial Correlation Associated with Moderation of Fearlessness

<table>
<thead>
<tr>
<th>Variable</th>
<th>STAGE 1</th>
<th>STAGE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>$Std$ $error$</td>
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<tr>
<td>CFNP</td>
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<td>.13</td>
</tr>
<tr>
<td>Anxiety</td>
<td>-.01</td>
<td>.12</td>
</tr>
<tr>
<td>Interaction CFNP X ANX</td>
<td></td>
<td>-.02</td>
</tr>
</tbody>
</table>

$R^2 = .09**$  $R^2$ Change = .04*

Adjusted $R^2 = .07**$

Note. CFNP = Carefree Nonplanfulness; ANX = Anxiety.

( $N = 106$ ) * $p < .05$; ** $p < .01$; *** $p < .001$
As figure 2 depicts impulsivity appears to be the moderator variable in relation to fearlessness. The influence of anxiety on fearlessness depends on the impulsivity levels of individuals. As levels of impulsivity increase individuals that report lower levels of anxiety also report higher levels of fearlessness. Lower fearlessness mean scores were found for individuals who reported low levels of anxiety and low levels of impulsivity.

Figure 2. Moderating effect of impulsivity on the relationship between anxiety and fearlessness mean scores (N=107)
Moderation analysis: Machiavellian egocentricity

The following hierarchical regression analysis tested the hypothesis that anxiety moderates the influence of impulsivity on the psychopathic personality trait of Machiavellian egocentricity as measured by the PPI.

The regression analyses statistics shown below in Table 9 demonstrate that at stage 1, the regression analysis indicated that carefree nonplanfulness and anxiety accounted for 24% of the variance in Machiavellian egocentricity mean scores ($R^2 = .49$, $F(2,102) = 16.55, p < .001$). When the interaction term was entered at stage 2, an additional 6% of the variance in Machiavellian egocentricity mean scores was explained ($F(1,101) = 8.41, p < .01$). The interaction is shown below in Figure 3.

Table 9

Unstandardised and Standardised Beta Coefficients, Standard Error and Squared Semi-partial Correlation Associated with Moderation of Machiavellian egocentricity

<table>
<thead>
<tr>
<th>Variable</th>
<th>STAGE 1</th>
<th>STAGE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std error</td>
</tr>
<tr>
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<td>.12</td>
</tr>
<tr>
<td>Anxiety</td>
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<td>.11</td>
</tr>
<tr>
<td>Interaction CFNP X ANX</td>
<td>-.02</td>
<td>.01</td>
</tr>
</tbody>
</table>

$R^2 = .24***$  
$R^2$ Change = .06**

Adjusted $R^2 = .23***$

Note. CFNP = Carefree Nonplanfulness; ANX = Anxiety. 
(N = 105) * $p < .05$; ** $p < .01$; *** $p < .001$
As Figure 3 depicts, the influence of anxiety on Machiavellian egocentricity mean scores depends on the impulsivity levels of individuals. Specifically, when individuals report high levels of impulsivity high Machiavellian egocentricity mean scores are found regardless of the anxiety levels that individuals report. Low Machiavellian egocentricity mean scores were found for individuals who reported low anxiety and low impulsivity.

**Figure 3.** Moderating effect of impulsivity on the relationship between anxiety and machiavellian egocentricity mean scores (N = 107)
**Moderation analysis: Alienation**

The final moderation analysis investigated the hypothesis that anxiety moderates the influence of impulsivity on the psychopathic personality trait of alienation as measured by the PPI.

At stage 1, the regression analysis indicated that carefree nonplanfulness and anxiety accounted for 25% of the variance in Alienation mean scores, and this contribution to the regression model was significant ($R = .50, F(2,103) = 17.35, p < .001$). When the interaction term was entered at stage 2, an additional 3% of the variance in Alienation mean scores was explained. The interaction term significantly contributed to the regression model ($F(1,102) = 4.91, p < .05$). The regression analyses statistics are shown below in Table 10 and the interaction is shown below in Figure 4.

**Table 10**

-Unstandardised and Standardised Beta Coefficients, Standard Error and Squared Semi-partial Correlation Associated with Moderation of Alienation-

<table>
<thead>
<tr>
<th>Variable</th>
<th>STAGE 1</th>
<th></th>
<th>STAGE 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>Std error</td>
<td>Beta</td>
<td>$Sr^2$</td>
</tr>
<tr>
<td>CFNP</td>
<td>-.04</td>
<td>.09</td>
<td>-.04</td>
<td>.00</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.49</td>
<td>.09</td>
<td>.52***</td>
<td>.23</td>
</tr>
<tr>
<td>Interaction CFNP X ANX</td>
<td>-01</td>
<td>.01</td>
<td>-.19*</td>
<td>-.03</td>
</tr>
</tbody>
</table>

$R^2 = .25***$

$R^2$ Change = .03*

Adjusted $R^2 = .24***$

*Note.* CFNP = Carefree Nonplanfulness; ANX = Anxiety.  
(N = 106) * $p < .05$; ** $p < .01$; *** $p < .001$
Figure 4. Moderating effect of anxiety on the relationship between impulsivity and alienation mean scores 
($N=107$)

As Figure 4 depicts the influence of impulsivity on alienation mean scores depends on the anxiety levels of individuals. The highest alienation mean scores were found for individuals who reported high anxiety and low impulsivity. Overall the impulsivity levels individuals reported appeared to have negligible effect on the relationship between anxiety and alienation mean scores. Lowest alienation mean scores were found for individuals who reported low anxiety and low impulsivity.
Discussion

Overview of aims and findings

The overall aim of this study was to contribute to the conceptualisation of impulsivity within the psychopathy construct. Specifically, in order to facilitate this, the key aim of the current study was to investigate how the interaction between impulsivity and anxiety influence the association between impulsivity and the affective-interpersonal aspects of primary psychopathy. A further aim of the current study was to explore the relationships between impulsivity, anxiety, psychopathic personality traits and sensation seeking behaviour in a community sample.

The relationships between primary and secondary psychopathy, anxiety and the PPI sub-scales

Consistent with the large body of literature ((Hare et al., 1991; Levenson et al., 1995; Patrick, 1994; Skeem et al., 2003; Williamson et al., 1991) and as predicted anxiety was found to differentiate between the primary and secondary factors of psychopathy as measured by the LSRP. Specifically, anxiety was found to have a weak positive relationship with primary psychopathy and a significant positive relationship with secondary psychopathy. Aligned with this and consistent with expectations were the observations that anxiety was negatively associated with stress immunity and social potency and positively associated with carefree nonplanning, Machiavellian egocentricity and alienation.
Contrary to expectations Machiavellian egocentricity was a significant predictor of primary psychopathy whereas fearlessness, stress immunity and social potency were not found to be significant predictors of the affective-interpersonal aspects of primary psychopathy. Similar findings have been reported by Lynam and colleagues (1999), who speculated that the reason for these counter-intuitive findings might be that both the LSRP and the PCL-R are lacking in items that assess anxiety. Furthermore, these results aid in reinforcing Newman and colleagues (2005) conclusion that as low anxiety is a hallmark of the psychopathy construct, a measure assessing anxiety is necessary to differentiate between the two factors of psychopathy.

In contrast, and as predicted carefree nonplanning was a significant predictor of secondary psychopathy. This observation is consistent with previous research that has found that the component of impulsivity that has the greatest association with antisocial behaviour is that of nonplanning (Luengo et al., 1994; White et al., 1994). Contrary to expectations impulsive nonconformity was not found to be a significant predictor of the behavioural aspects of secondary psychopathy.

The findings above are congruent with RST conceptualisation of the construct of psychopathy, and suggest that individuals with higher levels of anxiety may report increased levels of primary psychopathy whilst individuals heightened impulsivity appears to be more related to increased levels of secondary psychopathy. However, consistent with previous research the observation that anxiety exhibited a significant positive relationship with secondary psychopathy was incongruous with the RST conceptualisation of the psychopathy construct (Newman et al., 2005).
Furthermore the above findings demonstrate that anxiety and impulsivity may be influential in the development of psychopathy. However, as the following section in relation to the findings of the moderation analyses will demonstrate it is the investigation of the interaction between impulsivity and anxiety that may advance the conceptualisation of impulsivity within the psychopathy construct. The interaction between impulsivity and anxiety has largely been ignored in the literature and is a unique aspect of the current study.

The interaction between impulsivity and anxiety

Drawing on RST the current study predicted there is likely a complex interplay between impulsivity and anxiety that impacts on the affective-interpersonal aspects of psychopathy. Consistent with this prediction was the observation that the effect of the interaction between anxiety and impulsivity was found to differ depending on which psychopathic personality trait was examined. Specifically, impulsivity was observed to influence the association between anxiety and Machiavellian egocentricity and fearlessness. Conversely, anxiety was observed to influence the association between impulsivity and alienation and the primary psychopathy factor as measured by the LSRP.

Contrary to expectations higher levels of the affective-interpersonal aspects of primary psychopathy were not found for low anxiety and high impulsivity. Specifically, higher primary psychopathy mean scores were found for high anxiety and high impulsivity. These findings imply that the interaction between impulsivity and anxiety increases the association between impulsivity and the affective-interpersonal aspects of primary psychopathy.
As expected high impulsivity and low anxiety were associated with high fearlessness mean scores. In contrast low impulsivity and low anxiety was associated with lower fearlessness mean scores. These findings imply that when impulsivity interacts with anxiety higher levels of fearlessness are found. Inconsistencies in the literature exist in relation to fearlessness and the psychopathy construct. For instance, theorists such as Lykken (1995) have proposed that fearlessness is a strong predictor of the psychopathy construct. Alternatively other theorists such as Levenson and colleagues (1995) have speculated that fearlessness is not necessarily a greater risk factor for psychopathy.

However, the results of the current study have found that the interaction between impulsivity and anxiety impact on the levels of fearlessness that are found in the psychopathy construct. This suggests that prior research which has examined the independent influence of anxiety and impulsivity on psychopathic traits may be providing an incomplete account of the association. The findings reported here indicate that the joint influence of anxiety and impulsivity may be crucial in understanding the complex association between personality and psychopathy (Pickering, & Gray, 1990).

Aligned in part with the predictions, high levels of impulsivity was associated with Machiavellian egocentricity mean scores, regardless of the levels of anxiety found. However, low impulsivity and low anxiety were associated with lower Machiavellian egocentricity mean scores. These findings imply that when impulsivity interacts with
anxiety higher impulsivity is associated with higher levels of Machiavellian egocentricity.

The results indicated that anxiety does influence the association between impulsivity and alienation. Contrary to expectation the highest alienation scores were found for individuals who reported high anxiety and low impulsivity. In contrast, the lowest alienation scores were found for individuals who reported low anxiety and low impulsivity. These findings imply that the interaction between impulsivity and anxiety increases the association between impulsivity and alienation. This is an interesting finding as previous research has suggested a link between anxiety, alienation and substance abuse (Krueger et al., 1996b).

Furthermore, Krueger and colleagues (1996b) study advanced the contention that aspects of anxiety may be influential in differentiating between internalised and externalised psychopathologies. The results of the current study indicate that the interaction between impulsivity and anxiety does influence psychopathic personality traits, and that the interaction effect differs depending on which personality trait is being investigated. The different effect that this interaction has on the psychopathic personality traits may be influential in determining the form that antisocial behaviour takes within the psychopathy construct. Therefore the current study in finding that it is imperative to investigate the interaction between anxiety and impulsivity when investigating the psychopathy construct has added to the literature on psychopathy. Moreover, the speculation that anxiety and impulsivity may be the major constructs underpinning the processes through which antisocial behaviour is developed is congruent with and supportive of Gray’s (1987) RST of personality.
The relationships between sensation seeking and primary and secondary psychopathy as measured by the LSRP

As predicted boredom susceptibility was found to be the greatest predictor of both the primary and secondary factors of psychopathy. Additionally, disinhibition was found to predict primary psychopathy. However, contrary to expectation disinhibition was not found to be a predictor of secondary psychopathy. Consistent with Levenson and colleagues (1995) study both boredom susceptibility and disinhibition were found to have greater association with primary psychopathy compared to secondary psychopathy. These results imply that individuals who tend to become bored and restless and seek out mental stimulus through drugs, sexual or social means were found to be display the affective-interpersonal aspects of primary psychopathy.

A unique finding was that individuals who tended to behave in an experience seeking manner were more likely to display aspects of primary psychopathy. This finding may be attributable to the systematic bias that was observed in the data in relation to the experience seeking items that assess drug use. The SSS sub-scale of disinhibition also has items that assess drug use and previous research has reported that disinhibition is a confounding measure in studies that evaluate alcohol use (Darkes, Greenbaum, & Goldman, 1998). Alternatively these findings suggest that individuals who tend to have a preference for alcohol and drug use also tend to demonstrate the affective-interpersonal aspects of primary psychopathy in comparison to the behavioural aspects of secondary psychopathy.
Contrary to expectations the results found no evidence that suggested that individuals who indicate a preference for high-risk taking activities are more likely to display the affective-interpersonal aspects of primary psychopathy or the behavioural aspects of secondary psychopathy. The weak positive relationship that was found between thrill and adventure seeking and the affective-interpersonal aspects of primary psychopathy appears to be influenced by the shared variance between thrill and adventure seeking and fearlessness. Consistent with this is the overt similarities that are evident in the item contents of both these scales. However, the results of the present study remain inconclusive as to the association between TAS and the psychopathy construct and are non-consistent with the research that reported that TAS was a negative predictor of antisocial behaviour (Daderman, 1999; Levenson et al., 1995; Zuckerman, 1994).

**The relationships between the PPI sub-scales and sensation seeking**

Additionally, as predicted the results suggest that individuals who tend to be fearless were more likely to participate in high-risk taking activities. This is consistent with the low-fear hypothesis of primary psychopathy (Lykken, 1995) and the low harm avoidance conceptualisation of the fearlessness construct (Lilienfeld, & Andrews, 1996). Further results suggested that individuals who tend to behave in an impulsive manner that demonstrates a lack of regard for social values were less likely to participate in high-risk taking activities and had a greater association with and were more likely to display an experience seeking style of sensation seeking.

As anticipated individuals who tend to be cunning and egotistical were more likely to demonstrate an inability to cope with repetition and were inclined to seek out social
and sexual means of sensation seeking behaviour. This observation aligns with the research that suggests that Machiavellian egocentricity compared to the other PPI sub-scales has greater association with antisocial behaviour (Lilienfeld, & Andrews, 1996; Poythress et al., 1998). Whereas the results implied that individuals who tend to be coldhearted and to blame others for their problems were less likely to demonstrate a propensity for social and sexual means of sensation seeking behaviour.

The moderate positive relationship found amongst the four sensation seeking sub-scales was replicated in the pattern of correlations found for the relationship between the sensation seeking sub-scales and the three impulsivity measures. These observations are consistent with the large body of literature that posit that sensation seeking is related to, but distinct from impulsivity (Hur & Bouchard 1997; Pickering, 2004; Zuckerman & Kuhlman, 2000). The only exception to this finding was that individuals who tend to engage in high-risk taking activities were not found to be associated with impulsive behaviour that was characterised by a lack of forethought and planning. This finding is consistent with the observation that individuals who tend to behave in an impulsive nonplanning manner have a greater association with anxiety compared with the other impulsivity indicators.

Impulsivity is acknowledged to be a multi-dimensional construct and it is thought to be for this reason that past research has consistently found that measures of impulsivity have not been highly correlated (Gerbing, Ahadi, & Patton, 1987). Of interest to the current study were the observations that the I7 was significantly associated with the PPI sub-scales of carefree nonplanfulness and impulsive nonconformity; and the primary and secondary factors of the LSRP. These findings
are consistent with Luengo and colleagues (1994) assessment of the I7 as being a viable measure to use when investigating the relationship between impulsivity and antisocial behaviour. Overall, the findings suggest that the component of impulsivity that has the greatest association with psychopathy is that of carefree nonplanfulness.

*Sensation seeking and the psychopathy construct*

Of interest to the current study was to investigate the relationship between sensation seeking and the psychopathy construct. Consistent with previous research the results suggest that it is the sensation seeking traits of boredom susceptibility and disinhibition that have the greatest association with psychopathy (Zuckerman, 1991; 1994). According to RST (Gray, 1987) sensation seeking would be theorised to have a greater association with the behavioural aspects of secondary psychopathy. However, as the results suggested it was more likely to be the affective-interpersonal aspects of primary psychopathy, such as ruthlessness and narcissism, that predicted boredom to repetition and a propensity to engage in social and sexual disinhibited behaviours.

Also there were a couple of observations that were incompatible with the literature in relation to the conceptualisation of the secondary factor of psychopathy (Benning et al., 2003). The first was that sensation seeking had a greater association with the affective-interpersonal aspects compared to the behavioural aspects of psychopathy. The second was that impulsivity did not predict sensation seeking behaviour. These are particularly interesting and contradictory findings in light of the literature on the relationships between impulsivity and sensation seeking and the externalising disorder of substance abuse. Specifically, the literature states that impulsivity and sensation
seeking are high risk factors for substance abuse (Ball, 2004; Sher et al., 2000). The comorbidity rate between Antisocial personality disorder and substance abuse is high when compared to non-psychopaths (Zuckerman, 1991; 1994). Additionally, research has found in forensic samples that substance abuse is associated with the behavioural aspects of secondary psychopathy and not the affective-interpersonal aspects of primary psychopathy (Smith, & Newman, 1990).

Given that the findings in forensic samples align with the conceptual framework of RST, it could be deduced from the results of the present study that the personality traits of psychopathy may influence the association between impulsivity and sensation seeking behaviour, in particular the sensation seeking behaviours that are related to boredom susceptibility and disinhibition.

Additionally, as Zuckerman (1994) claims, the expression that sensation seeking takes may be determined by individuals environments and the accessibility and variability of stimulation experienced by them during their developmental process. Consistent with this contention is that substance abuse, low socioeconomic status and poor academic achievement are highly correlated with secondary psychopathy (Benning et al., 2003).

Consistent with past research the finding that anxiety had no relationship with fearlessness was anticipated (Frick et al., 1999). Nevertheless this result remains an intriguing finding and one that is consistent with the premise that the emotional response of anxiety differs physiologically and psychologically from the emotional response of fear (Barlow, 2002; Barlow, & Durand, 2002). Additionally, this
observation is supportive of Frick and colleague’s contention that the lack of clear definitions in relation to the distinction between fear and anxiety might be systematically confounding the research on psychopathy

**Interpreting psychopathy as a dimensional construct**

The observation that the psychopathic personality trait of Machiavellian egocentricity assessed both factors of psychopathy is consistent with previous research that utilised the PCL-R on delinquent (Poythress et al., 1998) and community (Benning et al., 2003) samples. The current study also found that the psychopathic personality traits of alienation, carefree nonplanfulness and fearlessness were also positively associated with both the affective interpersonal aspects of primary psychopathy and the behavioural aspects of secondary psychopathy. This may suggest that the psychopathy construct could be used as a template to explore the multiple integrative pathways that lead to the psychopathology of psychopathy. Furthermore the utilisation of the PPI facilitates the investigation of the processes between the affective-interpersonal and behavioural aspects of psychopathy without the confounding variables related to psychopathology and deviant lifestyle. These findings are consistent with the supposition that the two factors of psychopathy contrary to being interpreted as separate categories may be interpreted on a personality continuum. Therefore these findings support the contention that the construct of psychopathy can be interpreted as an extreme variation of normal dimensions of personality (Miller et al., 2001; Salekin et al., 2001; Widiger, 1998).
Implications of the current study

The findings of the current study have implications for the clinical assessment of psychopathy. The personality traits of psychopathy have been found to be mainly heritable (Blonigen et al., 2001) and the greatest predictor of future criminal behaviour has been found to be individual’s level of aggression at eight years of age (Huesmann, Eron, & Dubow, 2002). Given the high cost to society of psychopathy and coupled with the phenomenon that the diagnosis of psychopathy has experienced such poor prognosis in relation to intervention strategies and treatment the earliest detection of psychopathic symptoms is of great importance (McBurnett, & Pfiffner, 1998).

Therefore, this reinforces the need for primary prevention and intervention programs that are school and community-based that address early detection of learning and behavioural problems, particularly in those individuals who experience heightened levels of impulsivity. Additionally, the environmental factors that may contribute to the development of psychopathy should not be understated (Bloch, & Singh, 2001; Paris, 1998). Early education programs for parenting and pro-social sensation seeking activities for children and adolescents, in particular those children and adolescents that are from low socioeconomic backgrounds are warranted.

Limitations of the current study and proposed direction for future research

Previous research has found that higher levels of sensation seeking behaviour are found in younger individuals and that sensation seeking levels appear to peak when individuals are in their early twenties (Zuckerman, 1994). Therefore, as the average
age of participants in the current study was twenty-four years, caution is warranted when the results in relation to sensation seeking are interpreted.

Another limitation of the present study was that the sample utilised was unrepresentative of the population. Therefore the results of the present study are non-generalisable to the wider population. Additionally, self-report measures may not accurately represent the behaviours that will be displayed when individuals are presented with the stimuli in real life situations. A final limitation of the current study was that the methodology utilised a cross-sectional design. Therefore, cause and effect relationships can not be deduced from the results of the current study.

The comorbidity between psychopathy and substance use disorders has been found to be the most prevalent and complex comorbidity of psychopathy (Dahl, 1998). The methodology of the present study was unable to address research questions in relation to psychopathy and drug abuse. However, the results of the current study suggest that psychopathic personality traits may mediate the association between impulsivity and sensation seeking. Therefore, future studies that address these methodology limitations may be warranted.

Conclusion

In utilising a community sample, the current study aimed to investigate the association between impulsivity and the personality traits that characterise the psychopathy construct. It was proposed that anxiety would be found to moderate the association between impulsivity and levels of psychopathic personality traits. The results of the current study revealed that the interaction between anxiety and
impulsivity might be influential in affecting psychopathic personality traits. The effect this interaction has on psychopathic personality traits differs according to which psychopathic personality trait is investigated. This thesis has added to the literature on the conceptualisation of impulsivity within the psychopathy construct in finding that the interaction between impulsivity and anxiety in the development of psychopathy may be of great importance in determining the form that antisocial behaviour takes within the psychopathy construct.
References


Appendix A