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Subtyping psychopathy: Exploring the roles of degree of punishment, cognitive dissonance and optimism

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Subtyping Psychopathy: Exploring The Roles Of Degree Of Punishment, Cognitive Dissonance And Optimism

by

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ABSTRACT

For over half of a century, social and behavioral scientists have been investigating the construct of psychopathy. Even so, psychopathy is still a highly misunderstood personality construct. Even though it has been estimated that psychopaths make up only about 1% of the general population, they are believed to consist of 15-25% of the prison population (Hare, 1996). However, not all psychopaths are in prison. Psychopaths can also be found in such fields as the legal profession, the business world and in politics (Babiak, 1995). In terms of criminal behaviors, psychopaths are arrested at earlier ages, have a higher rate of offending, commit a wider array of offenses, are more likely to have used weapons and threatened violence, and are more likely to have used violence (Hart and Hare, 1997; Hare and McPherson, 1984; Serin, 1991; Wong, 1985). Also, once released from an institution, rates of recidivism for psychopaths are found to be higher than those for other criminals regarding both violent and non-violent criminal acts (Hemphill, Hare & Wong, 1998). Therefore, the societal importance of the psychopathy construct demanded that more research be conducted to better understand its underlying etiology, potential variants in typology, clinical course and potential treatment.

Prior theories have proposed subtypes of psychopathy based on cognitive variables (passive avoidance errors) and on physiological variables (BIS/BAS) and on

environmental variables (supportive upbringing or not). This study utilized self-report measures to assess the presence of psychopathy and to test the validity of the cognitive and physiological explanations for subtypes of psychopathy. A cognitive dissonance task tested the validity of the physiological theory and an alteration of a punishment task which increases the degree and strength of punishment tested the cognitive theory. Further, for the first time the construct of optimism was tested to determine it's role in parsing out two types of psychopathy.

Introduction

For over half of a century, a small yet ever increasing group of social and behavioral scientists have been investigating the construct of psychopathy. Even so, of all the psychiatric determinants of criminal behavior, psychopathy is still likely the least understood and agreed upon condition. Cleckley, in his 1941 book entitled The Mask of Sanity, may have had the greatest early influence on the study of this construct. In the original 1941 version, Cleckley detailed 19 criteria (e.g., lack of remorse, superficial charm) that defined the "primary" psychopathic personality. He later condensed these 19 criteria to 16 by the time he wrote the 4th edition (Cleckley, 1976). These criteria have subsequently directed much of the research on psychopathy and have served as the basis for diagnostic measures of the construct, such as Hare's Psychopathy Checklist (PCL; PCL-R)(Hare, 1991; Lykken, 1995).[1]

Undoubtedly, what interests many researchers about psychopaths is the negative impact that such individuals often have on the rest of society, combined with a lack of remorse that they often display about these effects. Such individuals have long invoked both morbid curiosity and great concern at the same time. Regarding the negative impact on others, the behaviors of psychopaths has led some to characterize them as intra-

[1] Much of the psychopathy research focuses on studies using the PCL-R with offender samples. By convention investigators have applied the term "psychopath" to individuals whose score on the PCL-R exceeded some minimum level (commonly, but not consistently, 29). However, psychopathy is not a recognized diagnosis in the American Psychiatric Association's Diagnostic and Statistical Manual, and recent research on psychopathy indicates that it is a dimensional rather than categorical construct (Edens, Marcus, Lilienfeld & Poythress, 2006; Marcus, John & Edens, 2004). Thus, categorical language in this dissertation regarding "psychopaths" is conventional and intended to connote individuals who attained, or are likely to attain, high scores on whatever psychopathy measure is being discussed.

species predators (Hare 1996). Even though it has been estimated that they make up only about 1% of the general population, psychopaths are believed to make up 15-25% of the prison population (Hare, 1996). However, not all psychopaths are violent criminals who end up in prison. For example, the individuals that Cleckley based his observations on were all non-prisoners coming from sources such as psychiatric hospitals and the community (Cleckley, 1976). Psychopaths can be found in such fields as the legal profession, the business world and in politics (Babiak, 1995). Such non-criminal psychopaths often use times of upheaval to violate social norms, gain power over others and cold-bloodedly use others for their own benefit.

In terms of criminal behaviors, psychopaths are arrested at earlier ages, have a higher rate of offending, commit a wider array of offenses, are more likely to have used weapons and threatened violence, and are more likely to have used violence (Hart and Hare, 1997; Hare and McPherson, 1984; Serin, 1991). Continual problems with these individuals even after they are caught is not surprising since the disorder is considered to be stable and lifelong in its presentation (Harpur and Hare, 1994). Therefore, it should not be surprising that psychopathy has been found to be predictive of recidivism after release from prison and of behavioral problems for currently institutionalized individuals.

Regarding institutional misbehavior, researchers have found that institutionalized psychopaths behave inappropriately (both violently and non-violently) at rates higher than non-psychopathic institutionalized individuals (Hare, 1996). For example, correlations between PCL-R scores and general institutional misbehavior have been found to be quite high ($r = .80$) in those psychopaths who were serving sentences of at least 7 months in length (Cooke, 1995). Two recent meta-analyses (Guy, Edens, Anthony & Douglas (2005); Walters (2003)) indicate that of the two PCL-R factors of

psychopathy (factor 1 capturing the interpersonal and affective aspects of the construct and factor 2 capturing the antisocial and socially deviant lifestyle aspects of the construct), it is factor 2 of the PCL-R that has been found to be most highly associated with institutional misconduct. Also, Guy et al. (2005) found that it was the non-violent modes of misconduct that showed the largest effect sizes regardless of whether the PCL-R total score, factor 1 or 2 was examined. Further, regardless of which part of the PCL-R was used, Guy et al. (2005) found that the smallest effect sizes were found for the physically violent modes of misconduct. Lastly, psychopaths are often found to be released later into their sentences and under closer supervision than non-psychopathic offenders (Serin, Peters & Barbaree, 1990).

Once released from an institution, rates of recidivism for psychopaths are found to be higher than those for other criminals regarding both violent and non-violent criminal acts (Hemphill, Hare & Wong, 1998). Furthermore, released psychopaths have been shown to violate the conditions of their release more frequently and pose more frequent supervision problems while on release than do non-psychopaths (Hart, Kropp & Hare, 1988). In fact, as predicted by PCL-R scores, rates of violent recidivism by psychopaths were found to be three to five times higher than that of non-psychopaths over a one-year period directly after release from an institution (Hemphill, Hare & Wong, 1998). Most important, the PCL-R has been found to predict recidivism better than other more widely used predictor variables such as past criminal behavior, demographic variables or other diagnoses related to criminal conduct such as Anti-Social Personality Disorder (ASPD) (Hart, Kropp & Hare, 1988; Hemphill, Hare & Wong, 1998).

Despite the large and growing body of evidence of the utility of the construct of psychopathy, it has yet to become officially recognized as a psychiatric disorder. For

some time, psychopathy researchers have been lobbying to have psychopathy included in the Diagnostic and Statistical Manual of Mental Disorders (DSM) as a clinical diagnosis. Their position has been that the diagnosis of ASPD (the official psychiatric diagnosis with the strongest relations to criminality) is too broad and is, to a great extent, simply a diagnosis based on the number of previous criminal behaviors. Therefore, ASPD as a diagnosis would appear to be over inclusive and is being given to many people who may at worst have only mild forms of a lesser psychiatric disorder, but who are being diagnosed with ASPD because they are criminals who simply commit enough antisocial or illegal acts to receive the diagnosis. In fact, the estimates of the percentage of prisoners who fulfill the criteria for the ASPD diagnosis range from 50% to 80% depending on sources (Hare, 1996; Hare, Forth & Strachan, 1992). On the other hand, as mentioned previously, psychopathy has long been defined in terms of personality characteristics that do not necessarily have anything to do with criminal behavior. As far back as Cleckley, the most fundamental features of psychopathy are actually believed to be affective and interpersonal characteristics rather than criminal behaviors per se (Patrick, 2006). Furthermore, the Psychopathy Checklist-Revised (PCL-R), the best validated measure for assessing psychopathy in offenders, has been factor analyzed and found to be underpinned by two correlated factors. Criminal behavior indicators contribute to only one of these two factors, the other comprising mainly interpersonal and affective features. Because a diagnosis of psychopathy is less behavior-based than is ASPD, only about 15-25% of prisoners meet PCL-R criteria for a diagnosis of psychopathy (Hare, 1996). However, as mentioned earlier, it is the psychopathic offenders who commit more criminal acts in the community and are more problematic in correctional and forensic institutions.

Clearly, the societal importance of the psychopathy construct demands that more research be conducted to better understand its underlying etiology, potential variants in typology, clinical course and potential treatment. This dissertation study will investigate aspects of psychopathy theory that detail potential underlying mechanisms for the distinction between previously proposed subtypes of psychopathy. It is hoped that through a clearer understanding of the etiology of the construct, it will be more likely that psychopathy will be fully integrated into the DSM as a clinical diagnosis and that future methods of treatment will also be possible.

Theories of the Construct of Psychopathy

Cleckley's theory. Cleckley's apparent motivation in writing the original 1941 edition of The Mask of Sanity was simply to detail the characteristics of the syndrome and in the 1976 edition he suggested that once the construct was better defined, it could be "further differentiated" (p. 229). Since Cleckley's initial 1941 work, investigators in the psychopathy field have come to call a psychopath characterized by his criteria as the "primary psychopath".

Karpman's theory. Cleckley's contemporary, Benjamin Karpman, also contributed to early theoretical considerations about the existence of subtypes of psychopathy. Karpman's work (1941; 1948) moved the field strongly towards examining psychopathy as a construct with two distinct subtypes labeled "primary" and "secondary". While acknowledging that on the surface, the behaviors of both types of psychopath appeared similar, Karpman (1941; 1948) made intriguing distinctions between the "primary" and "secondary" psychopaths in their etiology. He considered "primary" psychopaths to have a constitutional (biological) deficit that rendered them unlikely to be responsive to any treatment. He considered the behavior of "secondary" psychopaths to

be a product of their environment, without any underlying biological deficits, and that, unlike the primary psychopath, "secondary" psychopaths may benefit from treatment (Karpman, 1941; 1948).

Fowles'/Gray's BIS/BAS theory. Fowles (1980) developed a coherent theoretical framework pertaining to the "primary" type of psychopath as an individual who has a biological etiology to his/her psychopathy. Fowles utilized Gray's (1975) two factor learning theory that proposes the existence of three arousal systems within the autonomic nervous system which, when activated, are believed to trigger specific types of behavioral responses (Fowles, 1980). One of these systems is the behavioral activation system (BAS). Activation of the BAS results in appetitive, approach oriented, reward-seeking behavior. The BAS becomes activated in response to conditioned stimuli for rewards (Fowles, 1980). The second system of note here is the behavioral inhibition system (BIS). Activation of the BIS results in inhibition of behavior, which has been conditioned to signal either response contingent punishment or frustrative non-reward (Fowles, 1980). In terms of research evidence for his position, Fowles (1980) presented a number of experimental outcomes that support his position that a weak BIS is the basis for psychopaths' behavior. This evidence includes studies which showed that psychopath's had worse classical conditioning to aversive unconditioned stimuli than did non-psychopaths, psychopaths showed smaller increases in skin conductance levels when awaiting aversive stimuli, and psychopaths showed no reduction in HR in anticipation of shock or aversive stimuli (Hare, 1978). In fact psychopaths' HR accelerated in anticipation of aversive stimuli and that pointed to a potentially stronger BAS as well as a weaker BIS in psychopaths. The results also showed that psychopaths were deficient in electrodermal activities that were believed to be mediated by the BIS system alone.

Based on his theorizing and this research data relating to the BIS and BAS systems, Fowles (1980) proposed that a weak or deficient BIS system was at the root of the clinical characteristics (low anxiety, low negative affect, inability to inhibit behavior when faced with threats of punishment or non-reward) of the "primary" type of psychopath.

Lykken's theory. Lykken (1995) has also argued that differential BIS and BAS functioning could help to distinguish the etiologies of secondary and primary psychopaths. Originally Lykken (1957) proposed that primary psychopaths had a deficient ability to experience fear, and that this led to an inability to learn from punishment, which in turn, led to their antisocial behaviors. As Lykken described in his 1995 book, he conducted the first experiment to support the low-fear hypothesis in 1954. He utilized subjects who fit all 16 of Cleckley's criteria for a psychopath (group 1), had antisocial behavior but did not fit all 16 criteria (group 2) and 15 normal subjects (matched for age, gender and education with the two psychopath groups) (group 3). Lykken found that the group 1 individuals showed less fearfulness as measured by self-reported subjective ratings of the level of fearfulness of situations that they read about. Lykken also found that those in group 1 showed lower electro-dermal responses to conditioned punishing stimuli than other groups. Lastly, Lykken showed that participants from group 1 showed more passive avoidance learning errors when they more often made a mistake in choosing a punishing response while learning a task. Lykken (1995) has stated that his low-fear hypothesis has not only been supported experimentally by himself, but has also been repeatedly replicated by others as well.

Once Fowles proposed his theory, Lykken saw the inherent similarities in their proposals and melded them together into what he called the Fowles-Gray-Lykken theory

(Lykken ,1995). The Fowles-Gray-Lykken theory proposes that primary psychopathy is a consequence of an inherently fearless temperament that is reflected in a weak BIS system and which may lead to poor socialization. Lykken (1995) also stated that: "it seems to me, in fact, that the Fowles-Gray-Lykken theory provides the firmest available foundation on which to build the future experimental study of psychopathic personality. It assimilates the Lykken low-fear theory, now the "weak BIS" theory; it suggests a....secondary psychopath(y), the "strong BAS" individual...." (p. 163). As further support, in a 2005 article, Newman et al., investigated the usefulness of the BIS/BAS constructs in the distinction between types of psychopaths. In the 2005 article, Newman and colleagues utilized Carver and White's (1994) BIS/BAS scales to determine if low anxious psychopaths (primary) and high anxious psychopaths (secondary) differed on self-reported trait manifestations of these hypothetical physiological constructs. The results of this study suggested that primary psychopaths were indeed characterized by a weak BIS and normal BAS as previously hypothesized by the Fowles-Gray-Lykken theory (See figure 1 for a theoretical construction of how primary, secondary and non-psychopaths should score on various indices according to the theories covered to this point).

Status of the construct, taxon or dimensional? As appears to be the case regarding many psychiatric diagnoses already included in the DSM, even with the longstanding history of research on psychopathy, there has still been a good deal of disagreement regarding whether psychopathy should be considered a taxon or dimensional construct. A clear example of the taxonic viewpoint to psychopathy, is the use of cut off scores (which are indicative of a categorical construct) in scoring the gold standard measure of the construct (Hare's PCL, and later revision, the PCL-R).

An early attempt to determine if psychopathy is dimensional or categorical was conducted by Harris, Rice, and Quinsey (1994). These authors analyzed data acquired through administering the PCL-R to a group of mentally ill offenders residing in a psychiatric facility. They concluded from these analyses that psychopathy is a taxonic construct. They also went as far as to propose what the appropriate cut off scores should be for the use of the PCL-R in identifying psychopaths (Harris, Rice, and Quinsey, 1994). The results of this study have strongly influenced many researcher's perceptions of the construct.

However, those who felt that the construct was more likely dimensional in nature have recently published findings based on new statistical techniques which rather strongly refute the prior findings from Harris, Rice, and Quinsey (1994). First, Marcus, John and Edens (2004) used three independent taxometric procedures to investigate the structure of the construct and their results showed that psychopathy has a dimensional structure when the construct is measured with the Psychopathic Personality Inventory (Lilienfeld & Andrews, 1996). Further, Edens, Markus, Lilienfeld and Poythress (2006) followed up on Markus et al. (2004), by using four independent taxometric procedures to investigate the same question while using the PCL-R as the measure of psychopathy. Their results indicating that psychopathy is best considered a dimensional construct were consistent with the earlier findings by Markus et al. (2004).

Measures of Psychopathy

Hare's Psychopathy Checklist (PCL). In terms of the assessment of psychopathy, Robert Hare (1980) developed the semi-structured interview called the Psychopathy Checklist (PCL) and its later revision (PCL-R) (Hare, 1991, 2003). In conducting an assessment of psychopathy, data from the semi-structured interview are combined with

collateral information gathered from any available file reviews (such as department of corrections records) are combined to make ratings of the degree to which any individual's exhibited traits and behaviors match prototypes of 20 separate features. Hare (1996) has written that "the total score for the PCL-R provides an estimate of the extent to which a given individual matches the prototypical psychopath, as exemplified, in the 1976 work of Cleckley" (p. 30). Factor analyses of the PCL and the PCL-R have shown that the measures are composed of two factors. Factor 1 comprises items that incorporate the affective and interpersonal features of psychopathy such as shallow affect, lack of remorse and manipulative behavior, whereas factor 2 comprises items that incorporate the features associated with impulsivity, social deviance and anti-social behaviors (Hare, 1996).

Although the PCL-R's two factors have been shown to be correlated at approximately ($r = .5$), they also show differential correlations with many external variables (Hare, 1996). For example, Factor 1 is significantly negatively correlated with anxiety (Hare, 1991; Hare, 1996, Patrick, 1994), neuroticism (Brinkley et al., 2004; Hare, 1991), negative emotional responses (stress reactions) (Hicks et al., 2004; Hicks & Patrick, 2006; Patrick, 1994), fear/distress responses (Buss and Plomin, 1984; Hicks & Patrick, 2006), and negative affectivity (Patrick, 1994). Conversely, factor 2 shows a significant positive correlation with anxiety (Hare, 1991; Hare, 1996, Patrick, 1994), neuroticism (Brinkley et al., 2004; Hare, 1991), negative emotional responses (stress reactions) (Hicks et al., 2004; Hicks & Patrick, 2006; Patrick, 1994), fear/distress responses (Buss and Plomin, 1984; Hicks & Patrick, 2006) and negative affectivity (Patrick, 1994). These two factors are also differentially correlated with planning (in regards to aggressive behavior), such that factor 1 is positively correlated and factor 2 is

negatively correlated with this construct (Hart and Dempster, 1997). Regarding variables preferentially associated with only one of the two factors, factor 1 has been found to be highly related to personality constructs such as narcissism and histrionic personality disorder, whereas factor 2 has shown to be preferentially associated with a diagnosis of ASPD, suicidality and substance abuse (Hare, 1996; Hare, Forth & Strahan, 1992; Reardon, Lang & Patrick, 2002; Verona, Patrick & Joiner, 2001). These differential relations between PCL-R factors and criterion variables appear to be most reliably demonstrated when partial correlations are used (Benning et al., 2003). Specifically, for those variables that tap into the negative emotionality construct, this may be due to suppressor effects which can effect the strength of a relationship of two correlated predictors (such as factor 1 and 2 from the PCL-R) when their relationship to a third criterion variable is assessed (Hicks & Patrick, 2006).

Lilienfeld's Psychopathic Personality Inventory (PPI). Recently a number of self-report measures of psychopathy have also been developed. One of these is Lilienfeld's Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996). As mentioned, this measure employs a self-report format in contrast to the lengthy semi-structured interview with file review required for the PCL-R. The PPI also has shown a clear two-factor structure (Benning et al., 2003), although the PPI factors are uncorrelated with each other. These two PPI factors have shown substantial similarity in their external correlations to those of the two factors of the more resource intensive PCL-R. As with PCL-R factor 1, PPI Factor I is negatively correlated with trait anxiety, stress reactions, negative emotionality, while having negligible relation to with drug and abuse as well as anti-social behavior (Benning et al., 2003; Patrick et al., 2006). Similar to PCL-R factor 2, PPI factor II is positively related to drug and alcohol abuse, poor

planning, aggressiveness, anti-social behavior, negative emotionality and anxiety (Benning et al., 2003; Patrick et al., 2006). One study which was conducted before the two factor structure of the PPI was discovered showed that convergent validity between the PPI total score and PCL-R was .54 for factor 1, .40 for factor 2 and .54 with the PCL-R total score (Poythress et al., 1998). However, it was also found in the Poythress et al. study that most of the unique variance of the PPI scores was associated with the PCL-R factor 1 scale. This would seem to indicate that the PPI may tap more into the core affective-interpersonal factors of psychopathy which is what PCL-R factor 1 is believed to measure.

Levenson's Self-Report Psychopathy Scale (SRPS). Levenson and colleagues also created a self-report measure of psychopathy that is called the Self-Report Psychopathy Scale (SRPS; Levenson, Kiehl & Fitzpatrick, 1995). Like Lilienfeld's measure, the SRPS was designed to be used with non-offender populations. Some of the main benefits of this scale are its brevity (it consists of only 26 questions) and the fact that when factor analyzed, it can be parsed into 2 scales that are purported to be similar to factor's 1 and 2 from Hare's PCL-R measure. The primary scale of the SRPS consists of 16 questions that are analogous to Hare's factor 1 of the PCL-R. The secondary scale of the SRPS consists of 10 items and is analogous to Hare's factor 2 of the PCL-R. Lynam, Whiteside and Jones (1999) conducted a validation study of the SRPS and concluded that there was good evidence for the validity of this measure in a college student sample. They also determined that over an 8-week period, the test-retest reliability of the SRPS was quite high ($r = .83$). Brinkley et al. (2001), also validated this measure (this time against the PCL-R) in a prison sample and reported that the SRPS showed good internal consistency and was significantly correlated with the total score and factor scores of the PCL-R.

However, the magnitude of the correlations were small to modest, suggesting that the SRPS measures a somewhat different construct than the PCL-R. Although originally developed for use with non-offender populations, this scale is currently being studied in groups institutionalized in a correctional setting to determine its validity and reliability with such populations.

Research on Subtyping Psychopathy

Newman's response modulation deficit. Even with the evident abundance of work on the construct, presently there is still no single theory to explain the different etiologies of subtypes of psychopaths that receives unequivocal support. In the last decade however, it has been the physiological theories that have appeared to have received the lion's share of the attention from researchers. Perhaps it was only a matter of time before researchers more closely focused on physiology for answers as to what makes psychopaths tick. One specific line of psychopathy research that, in part, falls under the physiological umbrella (depending on what level of analysis one prefers to focus on) has been conducted by Joseph Newman and his colleagues. Since the 1980's, Newman and colleagues have been examining the difficulty that psychopaths were theorized to exhibit in passively avoiding punishment or non-reward to learned conditioned stimuli (Arnet, Howland, Smith, & Newman, 1993; Newman & Kosson, 1986; Newman, Widom & Nathan, 1985; Patterson, Kosson & Newman, 1987; Newman et al., 1990). In their experiments, Newman and colleagues have compared the performance of both high anxious psychopaths (secondary psychopaths) and low anxious psychopaths (primary psychopaths) with that of non-psychopaths on tasks that could be used to assess the ability to engage in passive avoidance.

While not originally stated as such by Newman and colleagues, their line of inquiry appears to fit well with the work of Fowles (1980), who theorized that those low in BIS are likely to exhibit difficulty passively avoiding a stimulus after being operantly conditioned to respond. Further, Fowles (1988) cited studies by Newman and colleagues (Newman & Kosson, 1986; Newman, Widom & Nathan, 1985) as evidence for the role of the BIS system in poor passive avoidance learning. Utilizing a learning theory approach Newman and colleagues have shown in a number of studies that psychopaths with low levels of anxiety (similar to what many would consider a primary psychopath) do have a more difficult time than do non-psychopaths in discontinuing their responding to a stimulus once it is no longer advantageous for them to continue responding (Arnet, Howland, Smith, & Newman, 1993; Newman, Patterson & Kosson, 1987; Newman, Widom & Nathan, 1985; Newman et al., 1990).

Based on his previous work, Newman has proposed a cognitive theory to explain why the low anxious psychopaths are poor at passively avoiding the punishments in his paradigm. In this theory (called the response modulation hypothesis), psychopaths become too narrowly focused on the behavior which has been conditioned as rewarding and do not notice the change in payoffs as they proceed through the experimental protocol, during which time, the originally rewarded behavior becomes punished instead (Newman, Patterson & Kosson, 1987). More recently, Newman (1997) conducted research directed at determining the relation between behavioral inhibition and the differing types of psychopathy. While in this article he did not find a relation between psychopathy and his measure of BIS, he did acknowledge the likelihood that a psychobiological process may be at the heart of the passive avoidance learning deficit that he and his group have been investigating for over a decade. However, there have

also been studies that have not been supportive of the deficiencies that psychopaths are thought to exhibit in passive avoidance tasks. First, Schmauk (1970) did not find that low anxious (primary) psychopaths differed from controls on measures of skin conductance when they took part in a passive avoidance task involving the potential loss of money as part of the task. Second, Howard, Payamal & Neo (1997), attempted to replicate earlier work by Newman and his colleagues and did not find that psychopaths differed from non-psychopaths on passive avoidance tasks.

Even though some of the above studies only infer physiological processes while others directly measure it, it still stands that they suggest that the physiological underpinnings of psychopathy are not yet fully understood. Yet this is understandable when considering the many different social behaviors and physiological responses that have been studied both within and across laboratories. Also, following from Cacioppo and Bernston's (1992) doctrine of multilevel analysis, it should be clear that while macro level (social) behaviors are most completely understood only when their micro level (biological) antecedents are examined, for any macro level behavior there could be multiple micro level antecedents and conversely any micro level antecedent may produce many differing macro level behaviors depending on macro level conditions. A classic example given by Cacioppo and Bernston (1992) describes a researcher observing the behavior of a group of chimpanzees. The researcher is confused about why they were not mating as anticipated. After taking blood samples, it is found that there is nothing wrong with them hormonally yet they do not mate. Only later is it discovered that the makeup of their social order in their cages was incorrect. Once this social (macro level) problem was understood and corrected, the chimpanzees soon began to mate as was expected. If researchers had only relied on the hormonal (micro level) information, they never would

have understood what was wrong and why the chimpanzees were not mating. But through an investigation at multiple levels of analysis, researchers were able to more fully understand the situation.

This complexity involved in best understanding any construct and its operating mechanisms (or etiology) could easily explain why the results from some studies are not universally supportive of the physiological position (Howard, Payamal & Neo, 1997; Newman, 1997; Schmauk, 1970). However, this lack of consistent support for the physiological (BIS/BAS arousal) position simply supports the case for more research to be conducted on the various macro level conditions that may elicit different behaviors from the two subtypes of psychopaths (different both from each other as well as from non-psychopaths as well).

Newman's procedure for assessing passive avoidance deficits. At this point it is appropriate to describe in some detail the task that Newman and colleagues have used to assess passive avoidance learning. While some minor aspects of the task can vary, the basic conditions are that participants are presented with stimuli and when they respond incorrectly (i.e., they make a response, rather than withholding a response) they commit a passive avoidance error. The basic design of the task consists of numbers being presented sequentially on a computer screen and participants must learn on their own to distinguish the stimuli (which numbers on a screen) that are rewarded (e.g., earning a dime) for responding (pressing a button) from those that are punished (e.g., losing a dime) for responding (pressing a button). Conceptually it is expected that, after being presented with an initial practice block of stimuli that contains a high proportion of rewarding stimuli, participants should become conditioned to actively respond to stimuli which are presented on the screen. Once active responding has been established as a

dominant response set, then the reward schedule changes. Over the course of numerous blocks of trials, rewarding and punishing stimuli are presented equally as often within each block. In fact, if a participant responded to every stimulus that is presented they would be rewarded half of the time and punished half of the time. The only difference within each block is the order in which rewarding and punishing stimuli are presented. Further, when participants respond to the various task stimuli, they are either monetarily rewarded (for correct responses) or punished (for incorrect responses, otherwise known as passive avoidance errors). It is at this point that participants must exhibit their ability to passively (on their own through experience) learn to avoid making errors. If the participant can withhold responding to non-rewarding stimuli at this point, then he/she has learned to passively avoid committing errors. If the participant does not withhold responses to non-rewarding stimuli, then that person has not learned to passively avoid committing errors.

While Newman and colleagues have accumulated evidence for the presence of this passive avoidance deficit, they have still utilized a rather narrow range of macro level stimuli (this being a stimulus at a more observable, social level) to produce the effect. In essence, they have only determined that their primary type of psychopath shows passive avoidance decrements when rewards and punishments are given out equally in an experiment. This leaves open the question of whether passive avoidance is a broad macro level problem or not. What is lacking and has not been attempted as of yet is to dramatically change the reward/punishment pattern for psychopaths within an experiment to see if an abrupt change in the payoffs will lead to improved passive avoidance learning.

As a point of departure, let us again examine the rate of reward and punishment in previous experiments. As mentioned above, the rate of payoffs in Newman's passive avoidance task has been intermittent in nature, with half of the stimuli in each block being rewarding and half punishing, but the order of these outcomes is variable. What has not been examined is the response of psychopathic individuals to an experimental situation in which they are faced with a sudden, large increase in the frequency of non-rewarded stimuli. Also, none of the Newman experiments increased the severity of the punishment during the protocol. The results from decades of research on the effects of rewards and punishments on animals and humans has clearly shown that increasing either the intensity or frequency of a punishment will decrease a target behavior and that increasing both is the strongest method of all to decrease an unwanted target behavior (Appel, 1968; Bradshaw, Szabadi & Bevan, 1979; Critchfield, et al., 2003; Johnston, 1972; Lande, 1981; Moffitt, 1983; Sizemore & Maxwell, 1985). Therefore, as a first purpose for this dissertation, I propose to extend the work by Newman and colleagues by utilizing a protocol that while similar to their previous designs, will differ substantially in the intensity and frequency of punishments experienced by participants and thereby extend the field's knowledge about the macro level conditions under which the different subtypes of psychopaths (as compared to each other and to non-psychopaths) exhibit passive avoidance deficits.

P*hysiological responses to emotionally provoking stimuli*. A second and more physiologically based course of investigation in the psychopathy literature involves the deficit or even complete absence of normal responses that psychopaths are believed to exhibit in response to various emotion-provoking stimuli (Cleckley, 1976; Day and Wong, 1996; Patrick, Bradley, & Lang, 1993; Patrick, 2001; Williamson, Hare, & Wong,

1987). Whereas some investigators suggest that this condition accounts for poor passive avoidance learning (due to a lack of the production of a fear or anxiety response which should inhibit responding), this condition could potentially lead to other behaviors in the psychopath as well. First, what is the supporting research evidence that psychopaths in general, and any subtype specifically may lack normal emotional responses to stimuli? While the support for this position is not unanimous, a number of researchers have provided evidence that in a number of contexts, psychopaths show a decrement in their responses to words, pictures or vignettes that elicit emotional reactions from normal individuals (Christiansen et al., 1996; Kiehl, Hare, McDonald & Brink, 1999; Patrick, 1994; Steuerwald & Kosson, 2000; Williamson, Harpur & Hare, 1991). Furthermore, it has been shown in a number of studies that decrements in emotional responding are associated preferentially with features associated with primary psychopathy (e.g., PCL-R Factor 1) (Lorenz and Newman, 2002; Patrick, Bradley & Lang, 1993; Patrick, 1994).

Proposed New Directions in Subtyping Psychopathy

Cognitive dissonance. An experimental model that could capitalize on the deficits in affective responding described above would provide a valuable vehicle for investigating the differentiation of psychopathic subtypes. Just such a paradigm is outlined in the theory of cognitive dissonance. Festinger originally proposed the theory of cognitive dissonance in 1957 and since that time the theory has been extensively researched. In cognitive dissonance theory Festinger (1957) outlined what would happen when 2 or more cognitions that people held, or also when cognitions people held and behaviors they engaged in, were dissonant. Festinger (1957) proposed that when people recognized that their cognitions alone or cognitions and behaviors together were in a state of dissonance, they would experience an uncomfortable state of psychological tension

and would be driven to reduce that tension (usually through means of attitude change regarding one of the cognitions involved in the dissonant state). It has long been believed that this state of tension is directly caused by physiological arousal. Even though the theory as Festinger originally proposed it has undergone revisions, the notion that physiological arousal is at the core of the dissonance state has remained integral to the theory.

Support for this aspect of the theory has come from a number of sources. Early on, researchers used misattribution approaches to infer that arousal was present when dissonance was induced (Zanna and Cooper, 1974). The misattribution approach required researchers to convince participants that they would be feeling either aroused or relaxed due to some clear external source. Once participants were convinced that the external source was causing them to feel as they did (either aroused or relaxed), the researchers then engaged participants in a dissonance induction manipulation. The researchers hypothesized that those individuals who were led to attribute their arousal to an external source would not show attitude change in response to the dissonance induction. Conversely, it was hypothesized that participants led to believe that they would be relaxed by the external source would show attitude change due to the dissonance induction. Researchers believed this would be the case, because those participants who already believed that something else was making them feel aroused would not feel the need to change their attitudes (in order to reduce the arousal created by the dissonance induction) because they could easily attribute their arousal to the external source. However, those who had nothing to misattribute their aroused state to would correctly perceive that the aroused feeling they were experiencing was due to the

dissonant action they had just engaged in, and they would change their attitudes to deal with their feelings of arousal. This in fact is exactly what researchers found.

Since the early days of cognitive dissonance research, many new experimental paradigms for inducing dissonance have been designed to create dissonance. One of the most well known and most frequently used involves a writing task. In this paradigm, participants write counter-attitudinal statements under conditions of either high or low choice about the topic they write on. The idea behind this paradigm was that when people write something they do not believe in, that it would create a dissonant condition between the expressed statement made in the writing task and their personal beliefs. Further, if individuals were able to tell themselves that they had no choice but to write what they were told to write, then they would have an excuse for why they committed the act that was dissonant and they would not feel the arousal due to the dissonant act. However, if they freely chose to write the counter-attitudinal statements, then they would feel arousal due to the knowledge that they had freely acted in a dissonant fashion because they would not be able to blame their actions on anyone but themselves. The creation of arousal and the following change in target attitudes after the dissonance induction writing task is exactly what researchers found when they have tested the counter attitudinal essay paradigm (Cooper & Fazio, 1984; Losch & Cacioppo, 1990).

Continuing work on the writing paradigm has also revealed various conditions under which the writing task can be carried out and still create dissonance in the participants. For instance, it has been found that it is possible to create dissonance in participants who write the counter attitudinal statements in an anonymous fashion by either not writing their name on the paper they write on, by throwing away the paper afterwards or both (Harmon-Jones, Brehm, Greenberg, Simon & Nelson, 1996). Also, it

has been found that dissonance can be created even when participants are "forced" to write on a specific topic (Gaes, Melburg & Tedeschi, 1986; Harmon-Jones, Brehm, Greenberg, Simon & Nelson, 1996; Stone, 2003). On the surface, this would seem to go against the necessity of having the high choice/low choice conditions mentioned earlier. However, what has been found is that if participants are merely politely persuaded or asked to write on a specific topic, and if they are also told a number of times that they don't have to write about that topic if they don't really want to, they will often perceive that they are writing about the topic of their own free will, even though in the end they are really writing on the exact topic that the experimenter wanted them to. Lastly, it has also been found that if participants are provided with the statements to make and merely follow what they are told to say, that they will feel dissonance just as strongly as do people who come up with their own personal arguments (Elkin & Leippe, 1986; Gaes, Melburg & Tedeschi, 1986).

Croyle and Cooper (1983) provided the first direct physiological evidence that dissonance does indeed produce an arousal response. These authors used nonspecific skin conductance responses (SCRs) to measure participant's autonomic arousal to provide evidence that cognitive dissonance does indeed create physiological arousal. These authors placed one group of participants in a situation where they freely made their own choice to write a counter-attitudinal essay. As compared to a second group which was given no choice but to write a counter-attitudinal essay, and a third group that wrote a pro-attitudinal essay, the authors found that only the first group showed physiological arousal (as measured by SCRs) due to the task of writing an essay. Croyle and Cooper (1983) concluded that freely acting in a counter-attitudinal manner does indeed induce arousal in people. Subsequent experiments also used physiological means to confirm the

previous findings that arousal was present when dissonance was induced (Etgen and Rosen, 1993; Elkin and Leippe, 1986).

Most important, Losch and Cacioppo (1990) showed that it was not simply general physiological arousal that led to dissonance reduction efforts, but instead it was a state of negatively affectively laden arousal that was at work. If it is true that primary psychopaths are less affected by emotionally negative stimuli, experience low levels of negative affect (if they experience any at all), and are deficient in their learned responses to punishment (as exhibited in poor passive avoidance learning and low BIS arousal), then compared to secondary psychopaths and non-psychopaths, they should show clear differences in their responses to a cognitive dissonance induction. Furthermore, Cooper and Fazio (1984) proposed that based on the evidence about dissonance theory, dissonance arousal could be thought of as a conditioned emotional response. Given the previous research suggesting that primary psychopaths are deficient in their BIS activation to conditioned punishments, it should follow that they would not show the arousal response that would lead to feelings of dissonance. Therefore, as the second purpose for this dissertation, I propose to utilize a cognitive dissonance induction paradigm to test the hypothesis that after the induction paradigm has been completed, primary psychopaths will not attempt to reduce cognitive dissonance (because they do not feel the uncomfortable arousal which would drive them to do so), whereas secondary psychopaths and non-psychopaths will behave as normal individuals would and attempt to reduce feelings of arousal due to dissonance. If this is the case, this will further extend the field's knowledge about the psychopathy construct. It may also help explain why primary psychopaths feel no remorse for their actions and find it so easy to lie and manipulate individuals. Without the physiological feelings that give rise to cognitive

dissonance, they would not be bothered when their actions or words are dissonant with their later behaviors.

Optimism. Lastly, a previously unstudied construct in the field of psychopathy research will be investigated in this study. This construct is that of positive expectancy (which has most frequently been studied under the rubric of optimism and has been conceptualized as a general expectation that good outcomes will come from one's efforts (Scheier & Carver, 1985; Scheier, Carver & Bridges, 1994)). This construct is of interest here in part because of it's strong prior relations with variables that have been consistently shown to help differentiate between primary and secondary psychopaths. The construct of optimism has been discussed since Descartes (Domino & Conway, 2001), yet it was the work of Carver and Scheier in the 1980's that really moved the construct into the respectable mainstream of psychological research. Even though the construct was not new, Scheier and Carver made great strides regarding the construct when they developed the first important measures of trait optimism called the Life Orientation Test (LOT) (Scheier & Carver, 1985) and its later revision (LOT-R) (Scheier, Carver & Bridges, 1994), by far the most widely used research measures of optimism or of any conceptualization of positive expectancy.

To date, most of the research on optimism has focused on topics such as health outcomes (Carver et al., 1993; Irving et al., 1998; Scheier & Carver, 1985; Scheier et al., 1986; Snyder, 1996, 1998; Snyder, Feldman et al., 2000), risky behaviors (among them alcohol and drug abuse) (Brown et al., 2002; Carvajal, Clair, Nash & Evans, 1998; Carvajal, Evans, Nash & Getz, 2002; Grunbaum et al., 2000; Kashani et al., 1997; Magura et al., 2003; McCauley Ohannessian et al., 1993; Scheier, Carver & Bridges, 1994; Willinger et al., 2002), personal achievement (Currey, Snyder et al., 1997; Snyder,

Michael & Cheavens, 1999; Snyder, Hoza et al., 1997) and coping (Aspinwall & Taylor, 1992; Carver et al., 1993; Cozzarelli, 1993; Scheier, Carver & Bridges, 1994; Scheier, Weintraub & Carver, 1986; Shifren & Hooker, 1995; Strutton & Lumpkin, 1992).

It is interesting that even with all of the research on optimism noted above, after 20 years there are no published studies in which attempts have been made to relate optimism (as measured with the LOT or LOT-R) to propensity for criminal behavior per se (the only illegal behaviors previously related to LOT measured optimism has been illegal substance use (Carvajal, Clair, Nash & Evans, 1998; Carvajal, Evans, Nash & Getz, 2002; McCauley Ohannessian et al., 1993; Scheier, Carver & Bridges, 1994; Strack, Carver & Blaney, 1987)). This lack of research on criminality and optimism is likely due to the fact that people do not seem to associate an optimistic attitude with criminal behavior. Instead, people tend to think of optimism in regards to positive and/or socially acceptable behaviors such as those listed earlier.

Since optimism has not been studied in association with crime per se, it should come as no surprise that optimism has not been studied relative to its potential relations with psychopathy. Yet previous research would seem to indicate that this construct is likely to be useful in differentiating between the two types of psychopaths. For example, positive expectancies (not always as measured by the LOT or LOT-R) have been found to have associations with a number of external correlates that parallel those, summarized above, found with primary psychopathy. For example, positive expectancies are inversely related to anxiety (Campbell & Kwon, 2001; Kwon, 2002; Lewis & Kliewer, 1995; Raikkonen et al., 1999; Scheier, Carver & Bridges, 1994), negative affect (Chang & Sanna, 2001; Kashani et al., 1997; Lucas, Diener & Suh, 1996; Raikkonen et al., 1999), neuroticism (Mascaro, Rosen & Morey, 2004; Scheier, Carver & Bridges, 1994),

suicide (Beck, Steer, Kovacks & Garrison, 1985; Kaslow et al., 2002; Meadows & Kaslow, 2002) and substance abuse (Bolland, 2003; Brown et al., 2002; Carvajal, Clair, Nash & Evans, 1998; Carvajal, Evans, Nash & Getz, 2002; Grunbaum et al., 2000; McCauley Ohannessian et al., 1993; Scheier, Carver & Bridges, 1994; Willinger et al., 2002). Positive expectancies have also been found to be positively related to positive affect (Chang & Sanna, 2001; Kashani et al., 1997; Lucas, Diener & Suh, 1996; Raikkonen et al., 1999), narcissism (Harpur et al., 1989; Hickman, Watson & Morris, 1996; McHoskey, Worzel & Szyarto, 1998; Reiss, Grubin & Meux, 1999), success/achievement (Curry, Snyder et al., 1997; Snyder, Michael & Cheavens, 1999; Snyder, Hoza et al., 1997), planning (Scheier, Carver & Bridges, 1994; Snyder et al., 1991), persistence (Polivy & Herman, 2002), and conscientiousness (Mascaro, Rosen & Morey, 2004). (see appendix A for citations and for a matrix of optimism/primary psychopathy relations).

Conversely, indicators of secondary psychopathy and measures of positive expectancies show opposing correlations with external criteria as, anxiety, neuroticism, suicide, negative affect, and substance abuse. For all of these variables, responses by secondary psychopaths show positive correlations and responses from those high on positive expectancies show negative relations to these variables (see appendix B for citations and for matrix of optimism/secondary psychopathy relations). On the other hand, indicators of secondary psychopathy are negatively correlated with measures of planning and conscientiousness, whereas the measures of positive expectancies have been found to be positively correlated with these same measures (see appendix B for citations and for matrix of optimism/secondary psychopathy relations).

Based on the patterns of findings described above, it is hypothesized that (similar to anxiety) measures of trait optimism may differentiate between primary and secondary psychopaths. Further, recent research suggests that optimism may also serve as a mediator between psychopathy and performance on some cognitively based tasks. Segerstrom (2001) showed that optimists show an unconscious attentional bias for positive stimuli. Using a stroop task as a measure of unconscious automatic processing, Segerstrom showed that attentional bias for positive words increased as optimism increased, while attentional bias for negative stimuli decreased as optimism increased. This means that the more optimistic a person is, the more they unconsciously attend to positive stimuli in their environment at the expense of attending to the negative stimuli in their environment. She also found that pessimism was related to faster skin conductance response rates than optimism when negative stimuli were presented. This suggests that either optimists were not taking in all of the negative information they were presented, or that perhaps they were not as threatened by the negative information as were pessimists. Reviewing Newman's studies in light of the findings of Segerstrom's study, it would seem plausible that Newman's low anxious psychopaths may react the way they do to the passive avoidance tasks (commit more errors of commission) because of high levels of optimism which make them focus much more on positive stimuli (winning money at the task for making responses) and not feel as threatened by negative information such as losing money for making an error of commission.

Further, Gibson and Sanbonmatsu (2004) found that optimists and pessimists differed in their expectations of winning when gambling and in the degree to which they would persevere in gambling even while losing. To begin with, the authors found that optimists reported having stronger beliefs than pessimists that they could win at

gambling. Also, optimists were found to maintain this belief in their ability to win even in the face of losses. In contrast, pessimists lowered their expectations about future wins when they recently lost money. According to Cohen's (1988) terminology, there was also a medium and statistically significant correlation (.37) between scores on the LOT-R and the belief that one could win in the long run. This correlation indicated that optimists felt positive about their long term prospects of winning if they just persisted in their gambling behavior. Also, these authors found that pessimists preferred to bet less after losses while optimists seemed insensitive to failure and did not change their betting habits after losses.

Further, according to the authors, optimists tended to overestimate past performance while pessimists tended to underestimate past performance. Perhaps this was most clearly shown when all participants were put into identical controlled situations in which wins and losses were equal for everyone. In this situation, optimists tended to recall more "near wins" in the lose condition than did pessimists, while there was no difference in "near win" perceptions for the win condition. Therefore, the results of the Gibson and Sanbonmatsu (2004) study paints a picture of the optimistic gambler as someone who has higher expectations for winning, will bet more for longer and perceives many "near wins" in their losses.

A number of studies paint a similar picture of psychopaths as overly confident in their ability to win. In the first of such studies, Seigel (1978), had psychopaths and non-psychopaths play card games in which they could win or lose money depending on the type of card they turned over next from a preordered deck of cards. Seigel (1978) found that psychopaths committed more errors of commission and also reported significantly higher beliefs than non-psychopaths that the next card they turned over would be a

winner. Newman, Patterson and Kosson (1987) also used a card turning task in continuing to investigate deficits in passive avoidance in psychopaths. They found that psychopaths showed perseveration in their behaviors as exhibited by continuing to play significantly further through a deck of cards (which had a steadily increasing rate of punishment per every 10 cards played) than did non-psychopaths. When again this is considered in relation to optimism and its relations to the continued errors of commission committed by psychopaths in passive avoidance tasks, it seems plausible that optimism may be mediating the relationship between psychopathy and performance on passive avoidance tasks.

The Present Study

Hypotheses

For the purpose of testing hypotheses 1-3, groups were created through means of cluster analyses techniques (details of the methods for this clustering are described in the results section). Following from previous methodology in psychopathy research, clusters were created through the use of multiple measures that theoretically should separate primary and secondary psychopaths from each other (as well as from non-psychopathic individuals) in their responses. Measures previously used for this purpose that I utilized for this study were: Levenson Self-Report Psychopathy Scale (SRSP), BIS/BAS scales, and the Harm Avoidance scale from the Multidimensional Personality Questionnaire (MPQ-HA). Through use of these measures and the clustering techniques, I attempted to form groups whose cluster profiles best reflected the theoretical profiles of either primary psychopathy, secondary psychopathy or neither (which will be considered to be a non-psychopath comparison group). These groups were then used to test the following hypotheses:

1(a). When engaging in a passive avoidance task (as designed and used in previous studies by Newman and colleagues), members of the primary psychopath cluster will commit significantly more passive avoidance errors than will either members of the secondary psychopath cluster or those in the non-psychopathic cluster. These results will serve as a replication of much of the previous work on this topic, as well as setting up the necessary condition to test hypothesis 1(b).

1(b). Punishment frequency and intensity will act to moderate the number of passive avoidance errors for members of the primary psychopath cluster. Specifically, at higher levels of intensity and frequency of punishment, members of the primary psychopathy group will show significantly reduced levels of passive avoidance errors as compared to their own level of passive avoidance errors when frequency and intensity of punishment is lower.

2. Those in the primary psychopath cluster will exhibit significantly less attitude change following a cognitive dissonance induction task, than will those in either the secondary psychopath cluster or the non-psychopathic cluster.

3. Members of the primary psychopath cluster will score significantly higher on the LOT-R than will those in the secondary psychopath cluster.

4. Optimism, as measured on the LOT-R, will mediate the relationship between primary psychopathy and the number of errors of commission made on a card playing passive avoidance task.

Method

Participants

Participants consisted of a convenience sample drawn from the population of a court ordered drug treatment program in southwestern Florida. Participants were volunteers who were notified that they had the right to withdraw from the study at any time without fear of punishment. Participants from this type of facility were used for this study due to the fact that in such a criminally convicted population, there was likely to be a higher proportion of individuals high on psychopathic traits than would be found in university classroom populations or other community samples. To be eligible for participation, individuals had to have been: (a) be male; (b) be between the ages of 20 and 50 inclusive; (c) be White, Black or Latino; (d) be English speaking; (e) be able to read and comprehend at at least a 9th grade level; (f) not be experiencing active symptoms of psychosis; (g) not have an IQ below 70.

Measures

Demographics questionnaire. This questionnaire asked basic demographic questions about age, education level, family makeup, and criminal history. This questionnaire is being newly created for this study.

Intelligence. Quick Test (QT; Ammons & Ammons, 1962). The QT is a brief intelligence test based on perceptual-verbal performance. Participants are asked to look at an 8.5 X 11 inch card with 4 different pictures on it. Sequentially, a series of words is presented and the participant's task is to point to the picture that illustrates the object or idea represented in each word. The words steadily increase in difficulty level and the test

ends when the participant fails on 6 consecutive responses. Reliability of the QT with an adult sample has been high at .86 and correlations with other IQ tests are also acceptable (.77 with Stanford-Binet and .96 with Wechsler Adult Intelligence Scale).

Reading level. Basic Reading Inventory (BRI; Johns, J. L., 1981). The BRI is a reading and comprehension inventory. If participants indicated that they had less than a 9th grade education, the BRI was given to determine if they could read and comprehend at at least a 9th grade level. The BRI consists of reading a 1 page multi-paragraph passage and answering a standardized set of questions about the passage afterwards.

Psychopathy. Levinson Self-Report Psychopathy Scale (SRPS; Levenson, Kiehl & Fitzpatrick, 1995). The SRPS Is a 26-item self-report questionnaire designed to measure psychopathy. Although designed for use with non-institutionalized samples, it has also been used with institutionalized groups as well (Brinkley et al., 2001). Factor analyses have shown that 16 items load onto a factor which Levenson contends are conceptually similar to primary psychopathy and the remaining 10 items load onto a factor that Levenson believes to be conceptually similar to the characteristics of secondary psychopathy. The 26 items are completed by using a 4-point scale, which ranges from "Disagree strongly" on one end, to "Agree strongly" on the other. Internal reliability for the primary psychopathy items has been found to be .82 and for the secondary psychopathy items internal reliability has been found to be .63 (Levenson, Kiehl & Fitzpatrick, 1995). Test-retest reliability over an 8 week period has been found to be .83 (Lynam, Whiteside & Jones, 1999). The SRPS was used as the psychopathy measure of choice for this study due to previous relations that have been found between Newman's Go-No-Go task and psychopathy (as assessed by the SRPS (Brinkley et al., (2001); Lynam, Whiteside & Jones (1999)). These previous relations were important in

showing that the passive avoidance effects have been replicated before I assessed how increases in the severity and frequency of punishment may moderate those same effects.

Anxiety. Welsh Anxiety Scale (WAS; Welsh, 1956). The WAS is a 39-item true-false scale derived from the MMPI that measures anxiety and relates to negative affect more generally. The items from the WAS tap four aspects of anxiety: trouble concentrating, negative affect, low energy/pessimism, personal sensitivity. Previous study of the WAS has determined that it has excellent internal consistency of between .92-.94 (Graham, 1987; Hale et al., 2004)

Behavioral inhibition/behavioral activation. Behavioral Inhibition/Behavioral Activation Scales (BIS/BAS; Carver and White, 1994). These scales were created to assess individuals' responses to potentially rewarding or punishing events. This measure consists of 20 items which are completed by using a 4-point scale, which ranges from "Agree strongly" on one end, to "Disagree strongly" on the other. Of the 20 items, the BIS scale consists of 7 items and the BAS scale consists of 13 items. Further, within the BAS scale there are 3 correlated subscales: Reward Responsiveness (5); Drive (4 items); Fun Seeking (4 items). Previous use of the BIS/BAS scales have shown that these measures have acceptable internal reliability (Cronbach's alpha = .76 (BIS) and .83 (BAS)) and test-retest reliability for the BAS ranging from .59 (Reward Responsiveness) to .69 (Fun Seeking) (Jorm et al., 1999).

Attitudes. Cognitive Dissonance Attitude Measure. This measure contained 10 questions asking participants to rate their attitudes on a number of topics relating to current personal issues. The items were completed using a 10-point scale that ranged from "Strongly Agree" on one end, to "Strongly Disagree" on the other. On this measure, 9 of the 10 items are distracter items intended to keep the participant from focusing on

the 1 item that they will be writing about during the cognitive dissonance induction task (described below). Participants completed this measure twice (once before the cognitive induction task and once again immediately after the task). This measure was newly created for this study.

Manipulation check. Freedom of choice manipulation check. Participants were asked to rate how free they felt to choose to write the statement that they wrote in the cognitive dissonance induction task. The question was administered at the end of the experiment and consisted of an 11-point scale which ranges from "Not at all free to choose" on one end to "Completely free to choose" on the other.

Optimism. Life Orientation Test-Revised (LOT-R; Scheier, Carver & Bridges, 1994). The LOT-R was developed to tap generalized positive expectancies. This scale consists of 10 items (4 of which are filler items) that are completed by using a 5-point scale, which ranges from "Strongly disagree" on one end, to "Strongly agree" on the other. Higher scores on the LOT-R indicate greater dispositional optimism. Previous use of the LOT-R has shown this measure to have acceptable internal reliability (Cronbach's alpha = .78) and test-retest reliability (r = .79) over 28 months (Scheier, Carver & Bridges, 1994).

Fearlessness. Multidimensional Personality Questionnaire--Harm Avoidance scale (MPQ-HA; Tellegen**,** in press). The full MPQ is an omnibus index of normal personality traits consisting of 11 primary scales and 3 higher order factors. In order to assess the personality trait of fearfulness, the Harm Avoidance scale from the MPQ was used. The Harm Avoidance scale consists of 28 questions on which an individual must either choose which of two presented scenarios are preferable to engage in, or confirm or

deny that they would like to engage in a singularly presented scenario. Internal reliability for this scale is acceptable at .76 (Patrick, Curtin and Telligen, 2002).

Go-No-Go passive avoidance task. Go-No-Go task. Following Newman and colleagues' methods, participants were presented with 10 blocks of trials in which one of ten, 2-digit numbers appeared alone on a computer screen. In each block, half (5) of the numbers were positive stimuli that rewarded the participant for a response (rewarded by winning 10 cents) and the other half punished the participant for a response (punished by losing 10 cents). Within each block, the order of the stimuli were controlled such that no more than three consecutive rewarding or punishing stimuli were presented. The task of the participant was to press a button only when a rewarding stimulus was on the computer screen and to withhold responding when a punishing stimulus was presented on the screen. The trials began with an unrecorded practice session consisting of ten consecutive rewarded stimuli. This practice session existed to promote operant conditioning of a button pushing response set. After the practice block, the recorded portion of the task began. Participants were presented with all trials and it was up to them to decide whether to respond to the presented stimuli. Further, the participants had an appropriate number of poker chips (representing 10 cents each) placed in front of them or taken away from them to make salient how much money they were winning or losing for each response they gave. White chips were placed in front of each participant to show how much had been won at any point in the task. When any participant lost enough to come to the point of being under 0 cents, then red poker chips (also representing 10 cents each) were placed in front of the participant to show how much had been lost for the responses given.

Modified Go-No-Go passive avoidance task. In order to determine if increasing the frequency and intensity of punishment reduced the commission of passive avoidance errors by those in the primary psychopathy group, the Go-No-Go task as described above was modified. As with the usual version of the task, 10 blocks of trials were presented which contained 10 stimuli per block. The task also still presented 10 stimuli (half of which were rewarded and half of which were punished for responding to) to participants. Unlike the normal version of this task, the frequency and intensity of the presentation of the punishing stimuli increased across the 10 blocks of trials. To begin with, the participants were again given an unrecorded practice session consisting of ten consecutive rewarded stimuli. After the practice session, the recorded portion of the task began. In the case of this modified task, the first 4 presented blocks proceeded as normal with this task. That is, half of the stimuli presented were rewarded and half were punished for responses. Further, on each of these first 4 trials, participants were punished by losing 10 cents for each improper press of the response button. To increase the frequency and intensity of punishment, the next 3 trials (5th through 7th) presented rewards only 30% of the time with the punishment for each improper pressing of the response button increased to 20 cents. To further increase the frequency and intensity of punishment, the final 3 trials (8th through 10th) presented no rewarding stimuli at all and punishment for each improper pressing of the response button was increased to 30 cents. As with the normal version of the Go-No-Go task, participants were presented with all trials and it was up to them to decide on their own how often to respond to the presented stimuli. Also, as with the normal Go-No-Go task, participants had an appropriate number of white or red poker chips (representing 10 cents each) placed in front of them or taken

away from them to make salient how much money they were winning or losing for each response they gave.

Card playing perseveration task. Following Newman's methods (Newman, Patterson and Kosson, 1987), participants were presented with a series of trials in which a series of 100 cards were presented face down (and one at a time) on a computer screen. Some of the cards were rewarding stimuli and some were punishing stimuli. The trials were presented beginning with a practice block of ten trials, in which all stimuli presented were rewarding stimuli. Following this practice block, 10 blocks were presented in which the percentage of potentially rewarding stimuli decreased by 10% with each block starting with 90% in the initial block (i.e. 9 out of the first 10 were rewarding, then 8 out of the next 10 and so on). The blocks ended with 0% of the stimuli being presented being rewarding stimuli.

Participants were rewarded with 10 cents for each press of a button which revealed a rewarding stimuli (a winning card was turned up) and were punished by losing 10 cents for every press of a button which revealed a punishing stimulus (a losing card was turned up). Participants were informed that during the course of the task, after each stimulus was presented, they were allowed to press a button to either continue onwards with the task, and see if the next card was a winner or loser, or to press a different button to quit the task immediately. They were also informed that the task did not include a standard deck of cards so that they could not predict how many of each card would appear. The objective was to record how far through the deck different types of individuals would continue to play before they either choose to end the task or they ran out of the 100 cards to play through. Objectively, once the 50% point of rewarding and punishing stimuli per block was reached, it was no longer advantageous to continue to

play the game. As with the Go-No-Go task, the participants had an appropriate number of white or red poker chips (representing 10 cents each) placed in front of them or taken away from them to make salient how much money they were winning or losing for each response they gave.

Procedure

Recruitment and consenting procedures. With approval from DACCO, a sign up sheet was made available to clients of the residential drug treatment program so that those with interest in participating or finding out more about the study could voluntarily sing up to have the researcher speak to them later about participating in the study. One at a time, the researcher introduced himself to each individual whose name was on the list, and if the potential participant reported continued interest in the study, then the researcher privately sat down with the potential participant and determined if all eligibility requirements were met. Informed consent was obtained using procedures approved by the University of South Florida Institutional Review Board. If the potential participant met eligibility criteria then the researcher described the study in greater detail and had the interested individual fully read the consent form and discuss its contents. If after reading over and discussing the consent form, the potential participant was still interested in participating, then they were asked to sign the consent form and were then considered an enrolled participant in the study.

Protocol. After the study began, the enrolled participant was brought to a private room inside DACCO for the experiment. The study began with the use of the cognitive dissonance attitude measure to determine the participant's attitudes on a specific topic. As mentioned earlier, this measure had 10 items, however, only one of the ten was a critical item on which attitude change was expected to been detected after the cognitive

dissonance manipulation had been completed. All of the other nine questions were designed to be distracter items. Once the attitudes measure was completed, the participant completed the LOT-R and MPQ-HA on paper, and completed the computerized card task on a laptop computer.

Following these tasks, the participant took part in the dissonance induction task. For this task, the participant was given a piece of paper containing three short statements of equivalent length and compositional structure. Participants were asked to choose which of the three statements they felt made the best argument for a topic and then to copy their choice of the "best" argument onto another piece of paper. With the assistance of DACCO personnel, the specific content of all three of the statements to choose from were designed such that they would have a very high likelihood of being counter-attitudinal to those who were receiving services at DACCO. Before the participant chose and copied a statement from the given list, they were asked to not write their name on the paper, thus leaving themselves anonymous in the end. Once the statement had been completely copied, the participant was asked to tear up and throw away the paper they just wrote on. Once this was done, the cognitive induction task was over. Following this task, the participant filled out the cognitive dissonance attitude measure again to determine if there had been any attitude change on the critical item due to the cognitive dissonance induction.

Next they completed the WAS, SRPS, and BIS/BAS scales. Across participants, the LOT-R/MPQ-HA and WAS/SRPS/BIS/BAS questionnaires were administered in a counter-balanced order (pre or post the cognitive induction task) in an effort to reduce the possibility of order effects for these measures. Lastly, the computerized Go-No-Go and modified Go-No-Go tasks were completed. The participants were informed prior to

beginning the computerized tasks that the person with the highest combined scores from these tasks would receive an extra $20 from the experiment. This was done in an effort to increase the degree of cognitive engagement by the participants regarding their performance on the computerized tasks. Once the participant completed these computer tasks, the freedom of choice question was given to confirm that the participant felt free to choose what to write on in the cognitive induction task. When this was completed, the experiment was over and the participant was paid $10 (into their institutional account at DACCO) for their time and effort.

Analysis Plan

Clustering Technique

Cluster analysis was used in an effort to identify groups of individuals with profiles on clustering variables that most closely fit the characteristics of primary and secondary psychopathy. This type of analysis has successfully been used in previous studies to understand psychopathy and its subtypes (Hicks et al., 2004). Model-based clustering was conducted with a computer package called MCLUST (Fraley, 1998). Model-based clustering is designed to analyze the data and estimate the number of subpopulations and then assign each individual to a subpopulation using cluster algorithms. Then, the Bayesian Information Criterion (BIC) (Fraley and Raftery, 2003) is used to evaluate the fit of each model produced by the algorithms.

In MCLUST, the BIC value represents the goodness of fit of any of the models that are created by the program. The BIC balances this goodness of fit with parsimony in each model and the better fitting models will have less negative BIC values associated with them (Raftery, 1995). By rule of thumb, models that have BIC values that differ by more than 6 from the best fitting model are not considered to be viable for explaining the relations of the data. For example, a BIC difference of 10 would indicate that the least negative BIC value has a 150:1 chance of being the better fitting model for the data (Raftery, 1995). On the other hand, a model that has a BIC value that differs by 6 has a 20:1 chance (20:1 being equivalent to $p = .05$) of being the better fitting model for the data (Raftery, 1995). Therefore, cluster solutions within 6 BIC values of the best fitting

model are considered viable and the appropriateness of each of those solutions should be evaluated based on the predictions of relations between variables from prior theory.

The variables used to cluster participants into groups for this study consisted of factor or subscale scores from the SRPS, BIS, BAS, and MPQ-HA measures that have theoretically prescribed associations that have previously been shown to help differentiate individuals into primary or secondary psychopathic experimental groups. It was determined before the start of this study that should any of the MCLUST analyses with these measures yield a multi-group solution that included groups with profiles consistent with the theoretical profiles for primary, secondary and a non-psychopathic group, then hypothesis testing would proceed as detailed below with participants separated into the 3 groups (primary, secondary and non-psychopathic) as formed by the clustering technique.

It was further decided that should the MCLUST techniques not produce a multi-group solution as expected, then the formation of primary, secondary and non-psychopathic groups would proceed in a similar fashion as Newman and colleagues have used in the majority of their studies. Newman's method has been to group individuals based on their scores on a psychopathy measure and an anxiety measure. Newman has taken those who both score at or above the cut off of 30 on the PCL-R and also score below the median on an anxiety measure (usually the WAS) and labels that group "low anxiety psychopaths" (which is analogous to primary psychopaths). He then takes those who score both above the cut off of $\geq$30 on the PCL-R and also score above the median on the anxiety measure and labels that group "high anxiety psychopaths" (which is analogous to secondary psychopaths). Anyone who scores below 20 on the PCL-R is considered non-psychopathic.

Due to the highly intensive and time consuming nature of the PCL-R, a brief self-report measure of psychopathy was used. When the need arose to create groups based on scores from a single psychopathy measure (as Newman has done in the past), the SRPS was used in combination with an accompanying anxiety measure (the WAS) to split the sample into three different groups for hypothesis testing. For the purposes of this study, those participants who scored > .5 standard deviations above the mean on the SRPS have been considered psychopathic individuals. Greater than .5 standard deviations above the mean was believed to be appropriate in capturing those with the requisite traits, since recent studies have supported a dimensional construct rather than a categorical one which may require a more extreme cut off.

Regardless of which method was used to create the groups for hypothesis testing, the statistical tests used to test the hypotheses were conducted with variables other than those used in the initial grouping of participants (i.e., the SRPS, BIS, BAS, and HA scales). This was done in order to ensure that the grouping variables and criterion variables were independent from one another.

Planned Statistical Analyses

Regarding hypotheses 1(a) and 1(b) and their predictions about the performance by members of the primary psychopathy cluster on passive avoidance tasks. A repeated measures ANOVA was planned to determine if significant differences existed between groups on the normal Go-No-Go task, as well as to determine if there was an interaction between punishment intensity/frequency levels and group membership in regards to the number of passive avoidance errors committed on the modified Go-No-Go task. To use a repeated measures ANOVA, it was necessary to have one or more independent variables (one of which must be within subjects) and one dependent variable. For this study, there

existed three levels of punishment regarding the two Go-No-Go tasks. These levels of punishment served as a within subjects independent variable in the repeated measures design. Level one consisted of the normal Go-No-Go task as used in previous studies. Level two consisted of the modified levels of punishment intensity/frequency when a participant was punished 70% of the time and each punishment cost the participant 20 cents instead of the normal 10 cents. Level three consisted of the highest modified levels of punishment intensity/frequency when a participant is punished 100% of the time and each punishment cost the participant 30 cents instead of the previous 10 or 20 cents. This study also contained a between groups independent variable, which was psychopathy group membership (primary, secondary, non-psychopathic). Lastly, the dependent variable measured for this analysis was the number of passive avoidance errors committed on the two Go-No-Go tasks. The repeated measures ANOVA was proposed to test hypothesis 1(a) by determining if there was a significant difference across the between groups dependent variable at the first level of the Go-No-Go task. Hypothesis 1(b) was to be assessed through testing for an interaction between the within subjects variable (levels of punishment intensity/frequency) and the between subjects variable (psychopathy group) on the number of passive avoidance errors committed. A significant interaction term for this analysis would be indicative of the presence of moderation (Baron & Kenny, 1986). Specifically, it was expected that those in the primary psychopathy group would show a reduction in the number of passive avoidance errors as the intensity and frequency of punishment increased, while the number of passive avoidance errors from the other two groups would remain statistically unchanged.

Regarding hypothesis (2) and its prediction about participant's degree of attitude change in response to a dissonance induction protocol. Orthogonal planned comparisons

utilizing a one-way ANCOVA (with pre cognitive dissonance induction attitudes serving as the covariate) were utilized to determine if a significant difference in attitudes existed between the primary psychopathy group, the secondary psychopathy group and the non-psychopathic group after completing the cognitive induction task.

Regarding hypothesis (3) and its prediction regarding group differences in optimism as measured by the LOT-R. A t-test was used to determine whether the mean score for the primary psychopathy group was significantly higher on the LOT-R than that of the secondary psychopathy group.

Regarding hypothesis (4), that optimism would mediate between primary psychopathy and the number of errors of commission. For this analysis, participants were no longer be grouped according to clustering techniques described earlier. Participant's scores on the SRPS were used to determine the extent to which they showed primary psychopathic traits. Further, statistical methods outlined by Baron and Kenny (1986) were used to test for mediation in this predicted relation. Optimism (as measured by the LOT-R) would be considered to have been a mediator if the following were met: (a) variations in the level of primary psychopathy significantly accounted for variations in optimism, (b) variations in optimism significantly accounted for variations in the number of cards played (i.e. passive avoidance errors), (c) variations in level of primary psychopathy significantly accounted for variations in number of cards played, (d) after controlling statistically for optimism, a previously significant relation between level of primary psychopathy and number of cards played was no longer significant. In order to statistically test for relations (a) thru (d), three regression equations were to be conducted. First, optimism was to be regressed onto primary psychopathy. Second, number of cards played (i.e. passive avoidance errors) was to regressed onto primary psychopathy. Third,

number cards played was to be regressed onto optimism followed by primary psychopathy. If primary psychopathy affected optimism in the first equation and primary psychopathy affected number of cards played in the second equation and primary psychopathy affected number cards played less in the third equation than in the second equation, then mediation by optimism will have been shown to exist.

Statistical Power

Sample size was determined by considerations of statistical power as described by Cohen (1988). Regarding hypotheses 1a and 1b, a repeated measures ANOVA was planned for use to analyze the data. With an pre-study estimated medium effect size of .25, and a p level of .05, a sample size of 52 participants would have been required to give a power of .80 to detect a difference between group means for this analysis. Regarding the second hypothesis, a one-way ANCOVA was to be utilized to analyze the data. With a pre-study estimated medium effect size of .25, and a p level of .05, a sample size of 52 participants would have been required to give a power of .80 to detect a difference between group means for this ANCOVA analysis. Regarding the third hypothesis, t-tests were planned for use to analyze the data. With a pre-study estimated medium effect size of .40 for t-tests, and a p level of .05, a sample size of 100 participants would have been required to give a power of .80. Regarding the fourth hypothesis utilizing regressions to determine mediation, by rule of thumb, using 3 independent variables in a simultaneous regression equation would require 74 participants to achieve a power level of .8. The number of variables being entered at any one time for the regression analyses being used to analyze the fourth hypothesis (mediation by optimism) was to have been no more than 3, which means that the analysis for this hypothesis would not require more participants to reach a power level of .8, than

did hypothesis two. Lastly, using a simple rule of thumb, it was expected that 150 participants would have been required to create sufficiently stable groups (based on the MCLUST technique) in order to produce reliable outcomes from the hypothesis testing. Therefore, since this analysis demanded the most participants, 150 participants were recruited to achieve pre-study estimates of appropriate power for all planned analyses.

Results

MCLUST Outcomes

Responses to the SRPS, BIS, BAS and HA scales were used to attempt to cluster participants into discrete groups. For analyses, the data from these measures were converted into Z-scores, and once in Z-score form, the data was ready for MCLUST analyses. Optimal cluster solutions were selected according to BIC criterion (described earlier). The patterns of mean Z-scores on clustering variables for the emergent groups were then examined to determine if they included profiles consistent with the theoretical profiles for primary and secondary psychopathic individuals.

Several MCLUST analyses were conducted in an attempt to identify groups whose profiles were plausibly interpretable as representing primary and secondary psychopathy. Initially all participants were included in cluster analyses that used various plausible combinations of the above variables (see Table 1 for examples of plausible combinations used) that would potentially lead to groupings of cases that should fit theory regarding personality profiles of primary and secondary psychopathy. However, none of these analyses yielded cluster solutions that included group profiles that adequately matched the theory-based a priori profiles for psychopathy subtypes as previously detailed in Figure 1.

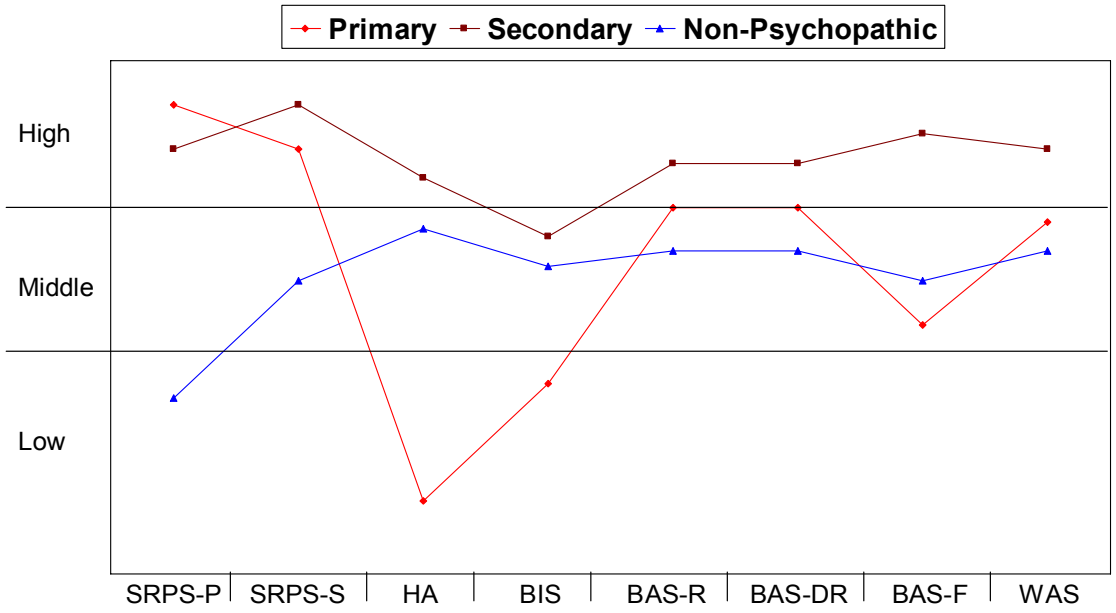
Table 1

Examples of Plausible Combinations of Clustering Variables Used in MCLUST Analyses

-SRPS total score, HA total score
-SRPS total score, HA total score, BIS, BAS
-SRPS total score, HA total score, BIS, BAS-Drive, BAS-Reward Responsiveness
-SRPS total score, HA total score, BIS, BAS-Fun
-SRPS -Primary scale, SRPS -Secondary scale, HA total score
-SRPS -Primary scale, SRPS -Secondary scale, HA total score, BIS, BAS

Figure 1

Theory-Based A Priori Profiles for Psychopathy Subtypes



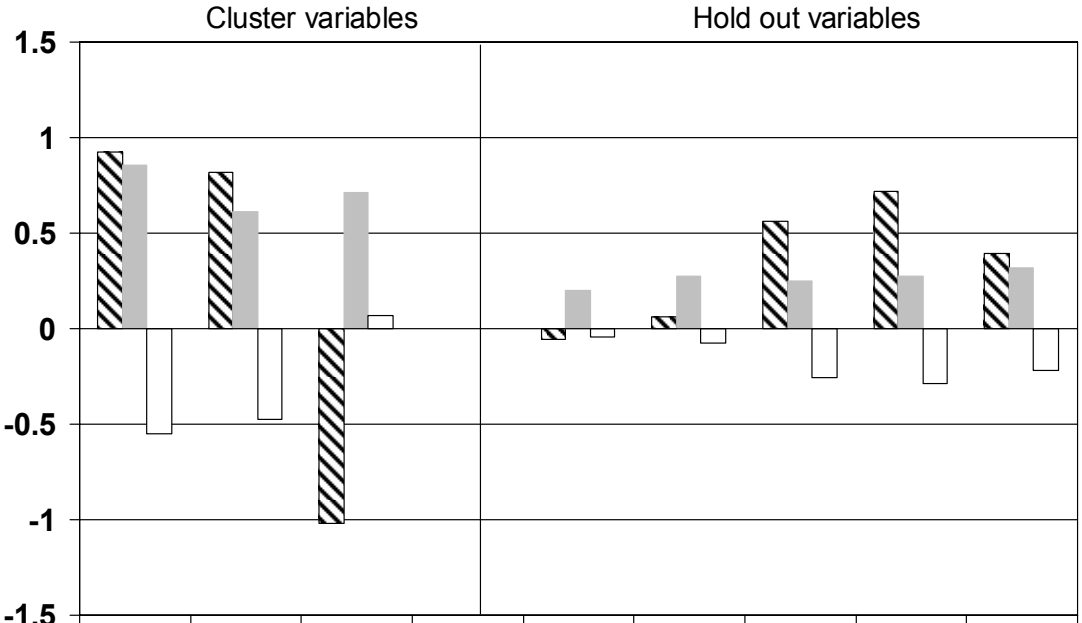
Therefore, a secondary clustering strategy was employed. First, the sample was split into two parts by using a cut score of .5 standard deviations above the mean on the total score for the psychopathy measure (SRPS). Those individuals who scored below this cut score were then considered to be non-psychopathic. Those with SRPS total scores $\geq$ .5 standard deviations above the mean were defined as psychopathic and their responses on the clustering measures were subjected to the same MCLUST procedures as before. Unlike the initial cluster analyses that utilized all subjects, with this new sample, it was no longer necessary to find a three-group solution to create the groups for later analyses of the study hypotheses. What was needed at this point was a solution that included at least two groups, whose cluster variable profiles, when plotted using mean Z-scores, approximately matched the a priori profiles that represent primary and secondary psychopathy.

The subsequent MCLUST results yielded a single solution that best fit the data according to BIC criteria and which had aspects which approximately fit a priori theory regarding psychopathy when scores on criterion variables were plotted using Z-scores (see Figure 2). Of the various plausible combinations of the above variables that were used, this solution used scores from the primary and secondary SRPS scales and the HA scale to identify the clusters.

Figure 2

Results of MCLUST Analysis

P = Primary
S = Secondary
N = Non-Psychopathic



	srps-p	srps-s	ha		bis	bas-r	bas-dr	bas-f	was
p	0.927	0.819	-1.02		-0.057	0.061	0.561	0.716	0.393
s	0.857	0.611	0.71		0.199	0.273	0.252	0.278	0.316
n	-0.553	-0.472	0.066		-0.042	-0.074	-0.254	-0.287	-0.221

Further details about the outcome from the plotting of Z-scores using criterion variables should be mentioned. As shown in Figure 2, the solution positioned those in one cluster as highest on the primary and secondary scales of the SRPS (and well above those in the non-psychopathic group). It also placed those in this same cluster much lower on the HA scale than either those in the other cluster or those in the previously carved out non-psychopathic group. Plots also indicated that those in the cluster with the highest primary SRPS scores, had a weaker BIS than those in the other cluster. However, the plots for the BAS scales were less clear in their theoretical support of this solution.

The BAS reward responsiveness subscale agreed with prior theory, however, scores for the BAS drive and fun subscales were more elevated for the cluster that was highest on the SRPS scale. Overall though, Figure 2 shows that the profiles for the two groups which contained participants who were .5 standard deviations above the mean on the SRPS scale were an imperfect match to prior theory as to what would be expected of primary and secondary psychopathic groups. Although the fit to prior theory was not perfect, there appeared to be enough similarity (i.e., one group high on fearfulness and the other low as Lykken contended) to move forward with testing the study hypotheses. For testing the hypotheses, the cluster that is highest on the SRPS scale will be labeled the primary psychopathy group, and the other group created by the clustering solution will be labeled the secondary psychopathy group. Finally, the group with SRPS scores less than .5 standard deviations above the mean was designated the non-psychopathic group. Due to the imperfect fit of the MCLUST groupings, groups were also formed and analyzed according to the built in back up strategy (i.e., Newman's method) for testing hypotheses.

Participant Characteristics

Data was collected from 150 male participants at a local residential drug treatment agency. Characteristics that were assessed included: age, race, education level, and criminal history (i.e., convictions of misdemeanors and felonies, and number of times sent to prison). Table 2 details the demographic characteristics for the total sample as well as for the two psychopathic and one non-psychopathic group formed after utilizing the MCLUST program.

Table 2

Participant Characteristics

	Total (N=150)	Non-Psychopathic (N=93)	Primary (N=27)	Secondary (N=30)
Age (years)				
Mean (SD)	32.8(9.6)	33.1(9.6)	32.9(10.4)	31.7(9.9)
Race/Ethnicity				
White	59%	59%	70%	50%
Black	26%	26%	15%	36%
Hispanic	15%	15%	15%	14%
Education				
< high school	55%	52%	52%	67%
If < high school, have GED? (%yes)	51%	50%	50%	52%
High school diploma	31%	32%	37%	22%
At least some college	14%	16%	11%	11%
Criminal history				
% convicted of past misdemeanors	83%	80%	85%	89%
# of misdemeanor convictions				
Mean (SD)	3.2(3.5)	2.9(3.2)	4.3(4.7)	3.2(3.3)
% convicted of past felonies	82%	80%	89%	82%
# of felony convictions				
Mean (SD)	3.5(5.6)	3.2(5.5)	3.5(3.4)	4.6(7.5)
% sent to prison for a past crime	29%	26%	30%	36%
# times in prison				
Mean (SD)	.68(1.5)	.65(1.6)	.56(1.2)	.92(1.8)

Demographic Analyses

The demographic responses from members of all three groups were compared using ANOVA and chi-square analyses to determine if there were significant differences in their responses (see Tables 3-5). None of the ANOVA analyses reached a

conventional significance level of .05 (age: F (2,143) = .21, p = .81; # of misdemeanors: F (2,140) = 1.64, p = .20; # of felonies: F (2,141) = .54, p = .58; # of times in prison: F (2,142) = .46, p = .63). Further, for the categorical variables (race, education level) neither of the chi-square analyses reached a traditional level of significance (race: χ^2 (1, N = 147) = 3.31, p = .51; education: χ^2 (1, N = 147) = 2.88, p = .58). These results indicate that the groups formed by the MCLUST procedure did not differ significantly from each other on demographic characteristics. Therefore, any differences that might be found among these groups on other variables of interest should not be due to differences on these demographic variables.

Table 3

Demographic Analyses

Variable	Non-Psychopathic M (SD)	Primary M (SD)	Secondary M (SD)	F	df	p
Age	33.1 (9.6)	32.9 (10.4)	31.7 (9.9)	.21	2,143	.81
# of misdemeanor convictions	2.9 (3.2)	4.3 (4.7)	3.2 (3.3)	1.64	2,140	.20
# of felony convictions	3.2 (5.5)	3.5 (3.4)	4.6 (7.5)	.54	2,141	.58
# of times in prison	.65 (1.6)	.56 (1.2)	.92 (1.8)	.46	2,142	.63

Table 4

Demographic Analyses (Race)

Variable	White %	Black %	Hispanic %	χ^2
				χ^2 = 3.31, p = .51
Non-psychopathic	59%	26%	15%	
Primary	70%	15%	15%	
Secondary	50%	36%	14%	

Table 5

Demographic Analyses (Education Level)

Variable	< High school %	High school %	At least some college %	χ^2
				$\chi^2 = 2.88$, p = .58
Non-psychopathic	52%	32%	16%	
Primary	52%	37%	11%	
Secondary	67%	22%	11%	

Analyses of Study Hypotheses[2]

Hypothesis 1(a) and 1(b). Due to the fact that both parts of hypothesis 1 (1(a) and 1(b)) were tested by a repeated measures ANOVA, their results will both be discussed together. Part 1(a) of hypothesis 1 predicted that when engaging in a passive avoidance task, members of the primary psychopath group would commit significantly more passive avoidance errors than would either members of the secondary psychopath group or those in the non-psychopathic group. This would serve as a conceptual replication of much of the previous work on this topic, as well as setting up the necessary condition to test hypothesis 1(b). Part 1(b) of hypothesis 1 predicted that punishment frequency and intensity would act to moderate the number of passive avoidance errors for members of the primary psychopath group. Specifically, at higher levels of intensity and frequency of punishment, members of the primary psychopathy group were expected to show

[2] Using boxplots produced by SPSS' "explore" function, the data set was checked for the presence of outliers. The resulting boxplots indicated that the data sets used for hypotheses 1 and 3 did contain outliers. Consequently, the statistical analyses for these two hypotheses were conducted both with and without the outliers present in the data sets. The resulting analyses were not changed by retaining or eliminating the outliers from the analyses (i.e., a non-significant result did not change to become significant and vice verse). Therefore, the results presented are with outliers retained in the data sets.

significantly reduced levels of passive avoidance errors as compared to their own level of passive avoidance errors when frequency and intensity of punishment was lower.

A repeated measures ANOVA was conducted to determine if there were significant differences between groups at either time period, within groups across time, or in the interaction between groups across time. For part 1(a) of hypothesis 1 to receive support, the between groups part of this analysis must be significant. The results from this ANOVA showed that there were no differences among the three groups regarding the number of passive avoidance errors that were committed during the Go-No-Go or the Modified Go-No-Go tasks ($F(2,137) = .78$, $p = .46$) (see Table 6 for means and standard errors).

Table 6

Outcomes for Hypothesis 1

Variable	Non-Psychopathic M (SE)	Primary M (SE)	Secondary M (SE)
Go-No-Go	4.1 (.12)	4.1 (.21)	3.8 (.22)
Modified-Go-No-Go	2.7 (.17)	3 (.3)	2.5 (.31)

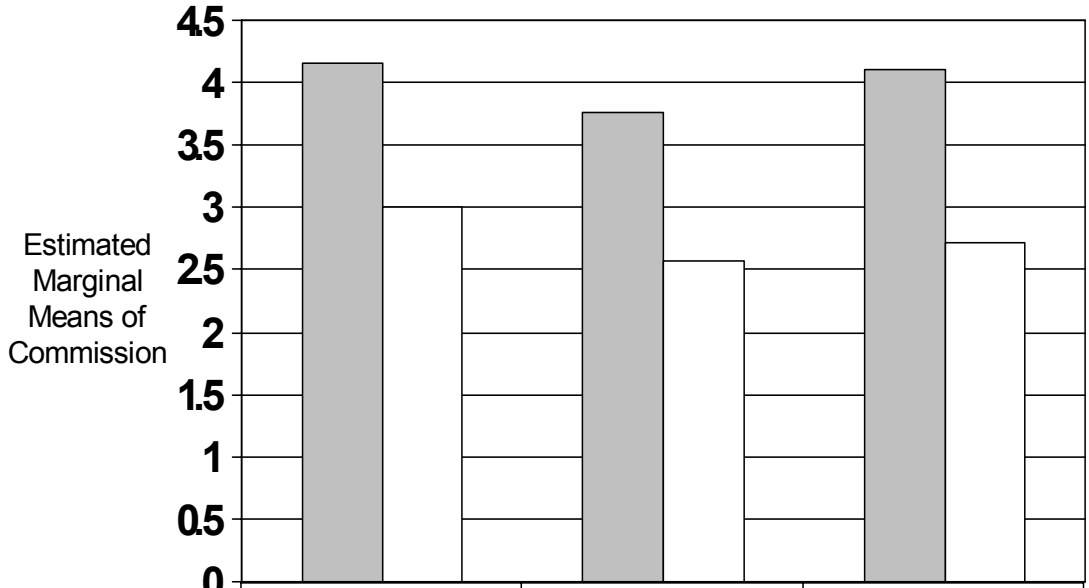
To assess the validity of part 1(b) of hypothesis 1, the interaction term of the repeated measures ANOVA was also examined. For part 1(b) to be supported, the interaction must be significant. The interaction between the within factors variable and the between subjects variable was not significant ($F(2,137) = .55$, $p = .58$).

Lastly, the multivariate within subjects analysis was also examined. The results showed that there was a significant difference within groups regarding the number of

passive avoidance errors committed across the two tasks (Go-No-Go and Modified Go-No-Go) ($F(1,137) = 96.1$, $p < .01$) (see Figure 3).

Figure 3

Mean Errors of Commission by Group on Go-No-Go and Modified Go-No-Go Tasks



	Primary	Secondary	Non-Psychopath
Go-No-Go	4.16	3.77	4.11
MGo-No-Go	3.01	2.57	2.71

These results indicate that neither part of hypothesis 1 was supported by the data collected in this study. However, there was a significant drop in the commission of passive avoidance errors found within all 3 groups across the two tasks.

A post hoc repeated measures ANOVA was conducted that combined subject's responses across the two tasks (Go-No-Go and Modified Go-No-Go). Because the first 4 trials of the Modified Go-No-Go are identical to the standard trials of the Go-No-Go task, the reward contingencies for subjects are the same and these trials can be conceived, for

analytic purposes, as an extension of the Go-No-Go task. Now the second part of the within subjects factor consisted of all 3 trials that involved the first incremental increase in the severity and frequency of punishment in the Modified Go-No-Go task, and the third part of the within subjects factor consisted of all 3 trials that involved the second increase in the severity and frequency of punishment in the Modified Go-No-Go task. The results from this second ANOVA showed that there were no differences between the three groups regarding the number of passive avoidance errors that were committed during the any of the three new Go-No-Go task groupings ($F(2,137) = .41$, $p = .66$) (see Table 7 for means and standard errors).

Table 7

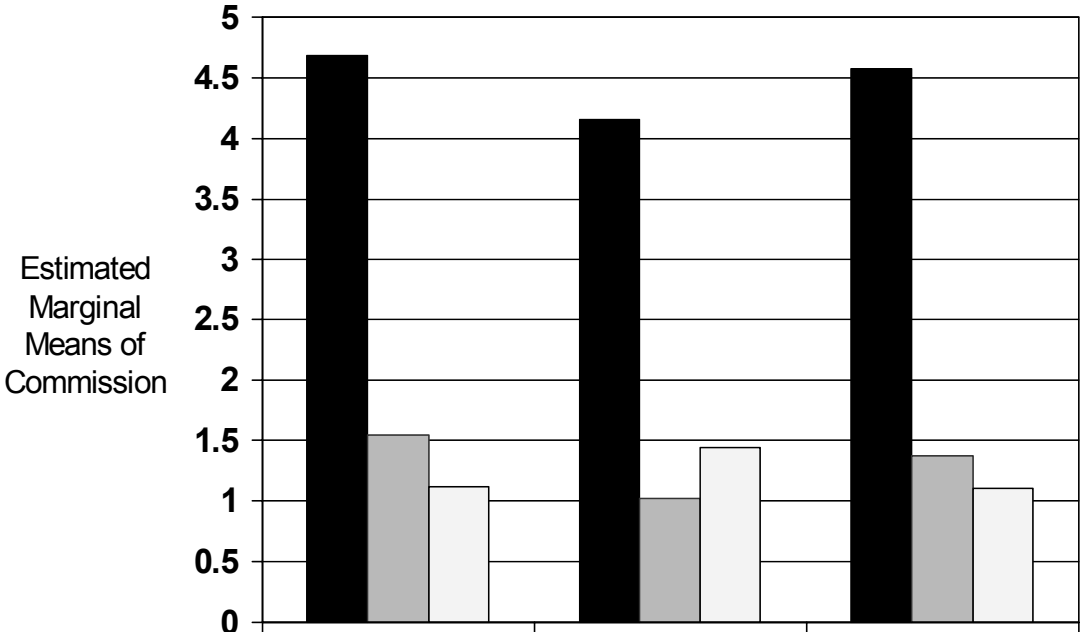
Re-Analysis of Outcomes for Hypothesis 1

Variable	Non-Psychopathic M (SE)	Primary M (SE)	Secondary M (SE)
Go-No-Go	4.6 (.14)	4.7 (.25)	4.2 (.26)
Modified-Go-No-Go (first increase in punishment severity and frequency)	1.4 (.12)	1.5 (.21)	1 (.21)
Modified-Go-No-Go (second increase in punishment severity and frequency)	1.1 (.12)	1.1 (.21)	1.4 (.22)

To again assess the validity of part 1(b) of hypothesis 1, the interaction term of the repeated measures ANOVA was examined. This interaction was significant ($F(4,274) = 4.31$, $p < .01$). Lastly, the multivariate within subjects' outcomes were also analyzed. The results showed that there was also a significant difference within groups regarding the number of passive avoidance errors committed across the 3 new Go-No-Go task groupings ($F(2,136) = 466.85$, $p < .01$) (see Figure 4).

Figure 4

Mean Errors of Commission by Group on Traditional Go-No-Go Trials, Modified Go-No-Go L1 (First Increase in Intensity and Severity of Punishment) and Modified Go-No-Go L2 (Second Increase in Intensity and Severity of Punishment)



	Primary	Secondary	Non-Psychopath
■ Go-No-Go	4.69	4.15	4.57
▒ M Go-No-Go L1	1.54	1.02	1.38
□ M Go-No-Go L2	1.12	1.44	1.11

Evaluation of hypothesis 1 within-subjects contrasts. Due to the fact that there were multiple levels of the within subjects' factor for this analysis, the specific contrast effects can be examined. The results of the repeated measures ANOVA indicate that there was an interaction between the within subjects factor and the between groups factor. An examination of the contrasts was therefore necessary to determine the nature of the interaction and whether it supported part 1(b) of hypothesis 1. The contrasts

showed that the significant group by task interaction occurred only when the errors committed between the two modified portions of the Go-No-Go were considered ($F(2, 137) = 8.25$, $p < .01$) (see figure 4). An examination of the marginal means showed that whereas those in the primary and non-psychopathic clusters continued to lower the number of passive avoidance errors as the frequency and severity of punishment continued to increase, those in the secondary psychopathy cluster actually increased the number of errors that they committed from the first increase in punishment to the second and most extreme increase in punishment. While this is an interesting post hoc finding, it does not do anything to change the lack of support for part 1(b) of hypothesis 1.

Although neither the between groups effects, nor the closer examination of the significant interaction effects supported either part of hypothesis 1, there was still found to be a significant drop in the commission of passive avoidance errors found within all 3 groups across the 3 new stages of the tasks. Further analysis of the within subjects contrasts indicated that the significant differences in commission of passive avoidance errors was driven by a significant drop in the number of such errors between the regular Go-No-Go task and the first increase in punishment severity and frequency ($F(1,137) = 1029.88$, $p < .01$) (see figure 4). There was no further decrease in the number of errors within the groups when they proceeded from the first increase in punishment frequency and severity to the second increase in punishment ($F(1,137) = 1.21$, $p = .27$).

Hypothesis 2. This hypothesis predicted that those in the primary psychopath cluster would exhibit significantly less attitude change following a cognitive dissonance induction task, than would those in either the secondary psychopath cluster or the non-psychopathic cluster. The test of this hypothesis was conducted using orthogonal

planned comparisons utilizing a one-way ANCOVA (with pre-cognitive dissonance induction attitudes serving as the covariate).

Before proceeding with the ANCOVA, it was important to check for 2 conditions. First, it had to be determined that there was no significant interaction between the covariate (pre cognitive dissonance induction attitudes) and the independent factor (group membership) on post cognitive dissonance induction attitudes. Analyses indicated that there was no such relationship between these two variables ($F(2,141) = 1.11$, $p = .80$). Second, correlations between the covariate and the dependant variable (post cognitive dissonance induction attitudes) were conducted to be sure that they were linearly related as required for ANCOVA's. The correlation between these two variables was significant ($r(145) = .58$, $p < .01$).

The results of the ensuing ANCOVA analysis showed that there were no significant differences in post cognitive dissonance induction attitudes among the 3 groups ($F(2,143) = 2.19$, $p = .12$) (see Table 8). Although there were no significant differences among the 3 groups, the estimated means showed that those in the secondary group were the highest ($M = 6.8$), with the non-psychopathic group in the middle ($M = 6.0$) and those in the primary group the lowest ($M = 5.6$). Further, responses on the freedom to choose manipulation check were explored to determine if differences on this measure may explain the results. As a whole, the sample had a mean of 7.44, which is above the midpoint of the scale and represented feelings on the part of participants that they felt free to choose the topic that they wrote on. Further, when assessed by group, there were no differences on this measure ($F(2, 144) = 1.27$, $p = .28$) [Primary (7.11), Secondary (8.25), Non-psychopathic (7.28)].

Table 8

Outcomes for Hypothesis 2

Variable	Non-Psychopathic M (SE)	Primary M (SE)	Secondary M (SE)	F	df	p
Post cognitive induction attitudes	6.0 (.23)	5.6 (.42)	6.8 (.41)	2.19	2,143	.12

Inspection of the data revealed that 14% of the sample had reported a pre-dissonance induction attitude that was already at the ceiling of the measure used to assess their attitudes. This situation makes it impossible for any of those 14% to show cognitive dissonance since they cannot move any higher on the scale at post test than they had already answered at pre-test. To determine if this problem negatively impacted support for this hypothesis, the ANCOVA was run again after excluding this 14% from the analyses.

As with the earlier analysis, the two important assumptions for ANCOVA's had to be checked. Analyses indicated that there was no interaction between the covariate and the group factor ($F(2,120) = .11$, $p = .89$) on post cognitive dissonance induction attitudes. Second, the correlation between the covariate and the dependant variable was significant ($r(122) = .58$, $p < .01$).

The results of the ensuing ANCOVA analysis showed that there were still no significant differences in post cognitive induction attitudes among the 3 groups ($F(2,122) = 1.54$, $p = .22$) (see Table 9). Again, although there were no significant differences between the groups, the estimated means were still in the same order as they were for the previous analysis of this hypothesis (secondary group (M = 6.4), non-psychopathic group (M = 5.7), primary group (M = 5.3)). Further, responses on the

freedom to choose manipulation check were also explored without these 14%. As a whole, the sample now had a mean of 7.36, which is above the midpoint of the scale and represented feelings on the part of participants that they felt free to choose the topic that they wrote on. Further, as before, when assessed by group, there were no differences on this measure (F (2, 123) = .96, p = .38) [Primary (7.13), Secondary (8.12), Non-psychopathic (7.18)].

Table 9

Re-analysis of Outcomes for Hypothesis 2

Variable	Non-Psychopathic M (SE)	Primary M (SE)	Secondary M (SE)	F	df	p
Post cognitive induction attitudes	5.7 (2.5)	5.3 (4.6)	6.4 (4.4)	1.54	2,120	.22

Hypothesis 3. This hypothesis predicted that members of the primary psychopath cluster would score significantly higher on the LOT-R than would those in the secondary psychopath cluster. This hypothesis was tested using a t-test on the mean LOT-R scores for the primary and secondary psychopathy groups. The results of this analysis indicate that there was no difference between the two groups on their levels of optimism (t (53) = -.47, p = .64) (see Table 10).

Table 10

Outcomes for Hypothesis 3

Variable	Primary M (SD)	Secondary M (SD)	t	df	p
LOT-R	19.2 (4.8)	19.8 (4)	-.47	53	.64

Hypothesis 4. This hypothesis predicted that optimism, as measured on the LOT-R, would mediate the relationship between primary psychopathy scores and the number of errors of commission made on a card playing passive avoidance task. Because testing this hypothesis involved a variable-level rather than a person-level analysis, participants were no longer grouped according to the MCLUST solutions. To determine if this hypothesis was supported, it would first have to have been shown that scores on the primary psychopathy subscale of the SRPS, optimism and the number of errors of commission were all significantly correlated with each other. Only if this condition was met, would it be proper to move onto the next step of using regression equations to test for mediation.

Results showed that the LOT-R was significantly correlated with scores on the primary psychopathy subscale of the SRPS ($r\ (147) = -.21$, $p < .01$). This negative association was contrary to what had been expected (i.e., a positive, not a negative correlation between the LOT-R and the primary subscale of the SRPS was predicted). Further analyses also showed that the LOT-R was not correlated with the number of errors committed on the card playing task ($r\ (147) = .05$, $p = .26$), nor were scores on the SRPS primary subscale correlated with the number of errors on the card playing task ($r\ (147) = -.02$, $p = .39$) (see Table 11). Due to the fact that the first condition for testing hypothesis 4 was not met (i.e., that all three variables be significantly related to each other) there was no need to continue further by assessing the potential mediating effects of optimism with regression analyses. The failure to find significant correlations between the three variables indicates that hypothesis 4 was not supported in this study.

Table 11

Correlation Outcomes for Hypothesis 4

	SRPS Primary scale	# of cards played
LOT-R	-.21*	.05
SRPS Primary scale		-.02

* p <.01. N = 147.

Re-Formulation of Groups Using Newman's Method

As mentioned earlier, the initial MCLUST analyses did not provide a usable 3 group solution (i.e., primary, secondary and non-psychopathic) to test the study hypotheses. The previous analyses were conducted after clustering only those scoring high on the measure of psychopathy, which yielded primary and secondary psychopathy groups whose cluster variable profiles only partially matched theoretical expectations. Thus, the original back-up strategy of following Newman's methods for partitioning individuals into one of the three experimental groups was also followed to determine if different outcomes would be found in regards to testing the hypotheses. The following analyses mirrored those previously conducted and detailed for the groups produced by the MCLUST solution.

Participant Characteristics

Table 12 details the demographic characteristics for the total sample as well as for the two psychopathic and one non-psychopathic group formed using the methods of Newman and colleagues.

Table 12

Participant Characteristics (Newman's Method)

	Total (N=150)	Non-Psychopathic (N=93)	Primary (N=17)	Secondary (N=40)
Age (years)				
Mean (SD)	32.8(9.6)	33.1(9.6)	32.9(10.3)	32.1(10.1)
Race/Ethnicity				
White	59%	59%	63%	59%
Black	26%	26%	25%	26%
Hispanic	15%	15%	12%	15%
Education				
< high school	55%	52%	63%	59%
If < high school, have GED? (%yes)	51%	50%	73%	42%
High school diploma	31%	32%	31%	28%
At least some college	14%	16%	6%	13%
Criminal history				
% convicted of past misdemeanors	83%	80%	88%	87%
# of misdemeanor convictions				
Mean (SD)	3.2(3.5)	2.9(3.1)	4.5 (5.5)	3.4 (3.3)
% convicted of past felonies	82%	80%	81%	87%
# of felony convictions				
Mean (SD)	3.5(5.6)	3.3(5.5)	5.4 (7.8)	3.4 (4.9)
% sent to prison for a past crime	29%	26%	44%	28%
# times in prison				
Mean (SD)	.68(1.5)	.66 (1.6)	1.1 (1.7)	.62 (1.4)

Demographic Analyses

The demographic responses from members of all three groups were compared using ANOVA and chi-square analyses to determine if there were significant differences in their responses (see tables 13-15). None of the ANOVA analyses were significant at the .05 level (age: $F(2,143) = .15$, $p = .87$; # of misdemeanors: $F(2,140) = 1.55$, $p = .22$; # of felonies: $F(2,141) = 1.0$, $p = .4$; # of times in prison: $F(2,142) = .54$, $p = .59$). Chi-

square analyses for the categorical variables (race, education level) also did not reach a .05 level of significance (race: χ^2 (4, N = 147) = .11, p = .99; education: χ^2 (4, N = 147) = 1.55, p = .82). These results indicate that the groups formed according to Newman's methods did not differ significantly from each other on demographic characteristics. Therefore, any differences that might be found among these groups on other variables of interest should not be due to differences on these demographic variables.

Table 13

Demographic Analyses (Newman's Method)

Variable	Non-Psychopathic M (SD)	Primary M (SD)	Secondary M (SD)	F	df	p
Age	33.1 (9.5)	32.9 (10.3)	32.1 (10.1)	.15	2,143	.87
# of misdemeanor convictions	2.9 (3.1)	4.5 (5.5)	3.4 (3.3)	1.6	2,140	.22
# of felony convictions	3.3 (5.5)	5.4 (7.8)	3.4 (4.9)	.97	2,141	.38
# of times in prison	.66 (1.6)	1.1 (1.7)	.62 (1.4)	.54	2,142	.59

Table 14

Demographic Analyses (Race) (Newman's Method)

Variable	White %	Black %	Hispanic %	χ^2
				χ^2 = .11, p = .99
Non-psychopathic	59%	26%	15%	
Primary	63%	25%	12%	
Secondary	59%	26%	15%	

Table 15

Demographic Analyses (Education Level) (Newman's Method)

Variable	< High school %	High school %	At least some college %	χ^2
				$\chi^2 = 1.55$, p = .82
Non-psychopathic	52%	32%	16%	
Primary	63%	31%	6%	
Secondary	59%	28%	13%	

Analyses of Study Hypotheses[3]

Hypothesis 1(a) and 1(b). Parts 1(a) and 1(b) of the first hypothesis will again be discussed together. Again, for part 1(a) of hypothesis 1 to receive support, the between groups part of a repeated measures ANOVA must be significant. As with the analyses of the MCLUST groups, the results from this ANOVA showed that there were no differences among the three groups regarding the number of passive avoidance errors that were committed during the Go-No-Go or the Modified Go-No-Go tasks (F (2,135) = .30, p = .74) (see Table 16 for means and standard errors). For part 1(b) to be supported, the interaction term of the repeated measures ANOVA must be significant. The interaction between the within factors variable and the between subjects variable was not significant (F (2,135) = .59, p = .55). Lastly, the multivariate within subjects analysis was also examined. The results showed that there was a significant difference within groups regarding the number of passive avoidance errors committed across the two tasks (Go-

[3] As with the MCLUST analyses, using boxplots produced by SPSS' "explore" function, the data set was checked for the presence of outliers. The resulting boxplots indicated that the data sets used for hypotheses 1 and 3 did contain outliers. Consequently, the statistical analyses for these two hypotheses were conducted both with and without the outliers present in the data sets. The resulting analyses were not changed by retaining or eliminating the outliers from the analyses (i.e., a non-significant result did not change to become significant and vice verse). Therefore, the results presented are with outliers retained in the data sets.

No-Go and Modified Go-No-Go) ($F(1,135) = 98.48$, $p < .01$) (see Figure 5). As was the case with the groups as formed by the MCLUST procedure, these results indicate that neither part of hypothesis 1 was supported. However, there was again a significant drop in the commission of passive avoidance errors found within all 3 groups across the two tasks.

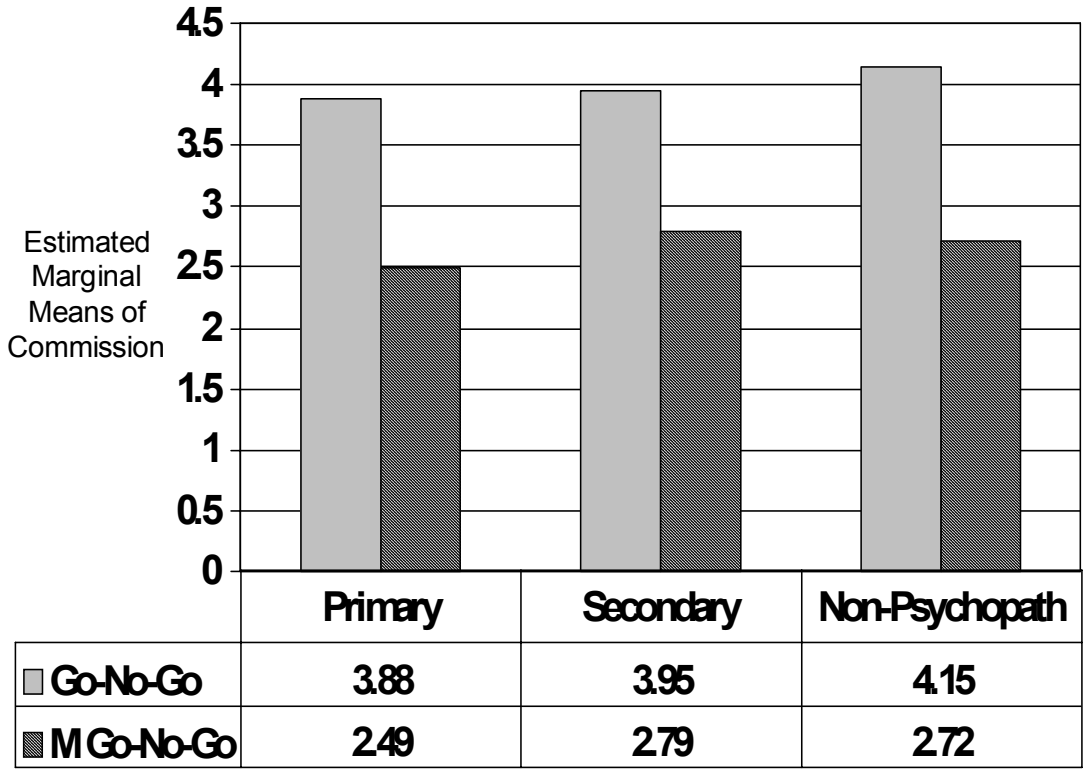
Table 16

Outcomes for Hypothesis 1 (Newman's Method)

Variable	Non-Psychopathic M (SE)	Primary M (SE)	Secondary M (SE)
Go-No-Go	4.2 (.12)	3.9 (.28)	4 (.18)
Modified-Go-No-Go	2.7 (.17)	2.5 (.38)	2.8 (.26)

Figure 5

Mean Errors of Commission by Group on Go-No-Go and Modified Go-No-Go Tasks for Groups Created Through Newman's Method



	Primary	Secondary	Non-Psychopath
Go-No-Go	3.88	3.95	4.15
M Go-No-Go	2.49	2.79	2.72

A post hoc repeated measures ANOVA was again conducted using the combined subject' responses across the two tasks (Go-No-Go and Modified Go-No-Go) to produce three levels of analysis for the Go-No-Go task. The results from this ANOVA again showed that there were no differences between the three groups regarding the number of passive avoidance errors that were committed during the any of the three newly formed Go-No-Go task groupings ($F(2,134) = .18$, $p = .84$) (see Table 17 for means and standard errors).

Table 17

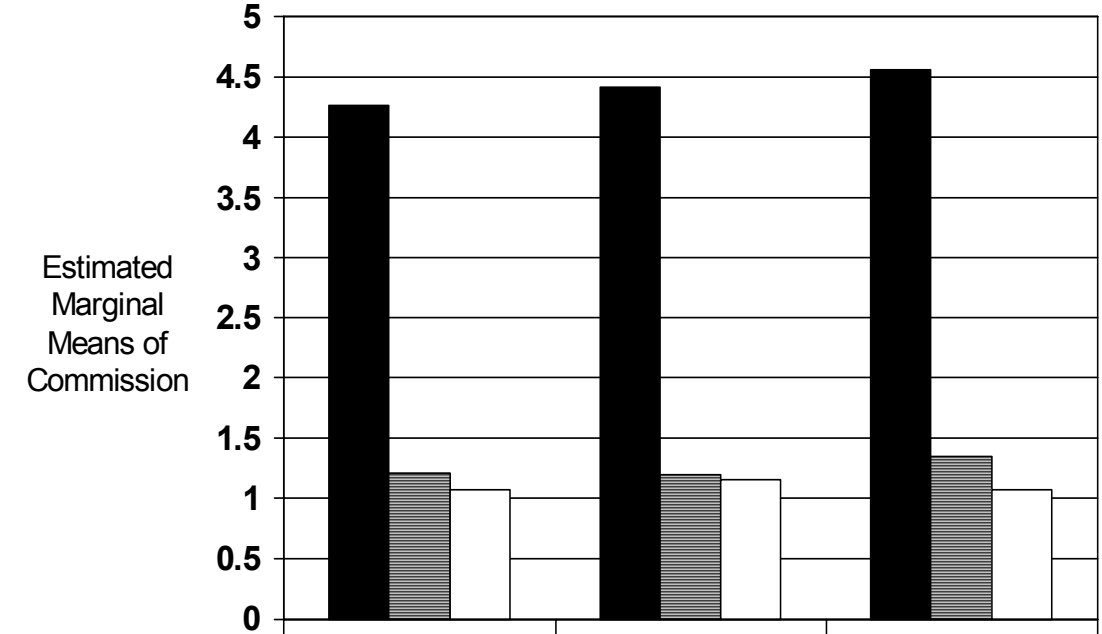
Re-analysis of Outcomes for Hypothesis 1 (Newman's Method)

Variable	Non-Psychopathic M (SE)	Primary M (SE)	Secondary M (SE)
Go-No-Go	4.6 (.14)	4.3 (.38)	4.4 (.22)
Modified-Go-No-Go (first increase in punishment severity and frequency)	1.4 (.12)	1.2 (.27)	1.2 (.18)
Modified-Go-No-Go (second increase in punishment severity and frequency)	1.1 (.11)	1.1 (.25)	1.2 (.17)

To assess part 1(b) of hypothesis 1 with this altered configuration of the Go-No-Go task, the interaction term of the repeated measures ANOVA was examined. This interaction was not significant ($F(4,268) = .63$, $p = .62$). Lastly, the multivariate within subjects' outcomes were also analyzed. The results showed that there was a significant difference within groups regarding the number of passive avoidance errors committed across the 3 new Go-No-Go task groupings ($F(2,133) = 414.02$, $p < .01$) (see Figure 6).

Figure 6

Mean Errors of Commission by Group on Traditional Go-No-Go Trials, Modified Go-No-Go L1 (First Increase in Intensity and Severity of Punishment) and Modified Go-No-Go L2 (Second Increase in Intensity and Severity of Punishment) for Groups Created Through Newman's Method



	Primary	Secondary	Non-Psychopath
■ Go-No-Go	4.26	4.42	4.56
▤ M Go-No-Go L1	1.21	1.2	1.35
□ M Go-No-Go L2	1.08	1.16	1.07

Evaluation of hypothesis 1 within-subjects contrasts. With the groups formed by the MCLUST procedure, an interaction was present, which upon examination was found to indicate that those in the secondary psychopathy group increased their levels of responding (i.e., committed more passive avoidance errors) in the final stage of the task when they were being most frequently and intensely punished for responding incorrectly.

No such interaction between group and level of the task was found for the groups as formed through Newman's method.

Although neither part of hypothesis 1 was supported, as with the previous analyses using the MCLUST groupings, those in the primary group still showed a significant drop in the commission of passive avoidance errors across the new 3 stages of the Go-No-Go tasks. This significant reduction in the commission of passive avoidance errors was again driven by a significant drop in the number of such errors between the regular Go-No-Go task and the first increase in punishment severity and frequency ($F(1,134) = 731.40$, $p < .01$) (see Figure 6). There was no further decrease in the number of errors within the groups when they proceeded from the first increase in punishment frequency and severity to the second increase in punishment ($F(1,134) = 2.71$, $p = .10$) (see Figure 6).

Hypothesis 2. This hypothesis predicted that those in the primary psychopath cluster would exhibit significantly less attitude change following a cognitive dissonance induction task, than would those in either the secondary psychopath cluster or the non-psychopathic cluster. The test of this hypothesis was again conducted using orthogonal planned comparisons utilizing a one-way ANCOVA (with pre-cognitive dissonance induction attitudes serving as the covariate).

As with the previous ANCOVA analysis, 2 important conditions were necessary to confirm. Analyses indicated that there was no interaction between the covariate and the independent factor ($F(2,141) = .06$, $p = .94$). Second, correlations between the covariate and the dependant variable (post cognitive dissonance induction attitudes) were conducted to ensure that they were linearly related as required for ANCOVA's. The correlation between these two variables was significant ($r(145) = .58$, $p < .01$). The

resulting ANCOVA showed that there were no significant differences in post cognitive dissonance induction attitudes among the 3 groups (F (2,143) = .20, p = .82) (see Table 18). The responses on the freedom to choose manipulation check were again explored. As before, the sample mean was still 7.44 since this does not split groups in any way. Again, this shows that participants felt free to choose the topic that they wrote on. There were no differences on this measure (F (2, 144) = .42, p = .66) [Primary (8.00), Secondary (7.56), Non-psychopathic (7.28)] when participants were assigned to groups by Newman's method.

Table 18

Outcomes for Hypothesis 2 (Newman's Method)

Variable	Non-Psychopathic M (SE)	Primary M (SE)	Secondary M (SE)	F	df	p
Post cognitive induction attitudes	6.1 (.23)	6.0 (.56)	6.3 (.36)	.20	2,143	.82

As with the previous MCLUST groupings, to determine if the 14% of the participants who were at the ceiling of the attitude measure at time 1 negatively impacted support for this hypothesis, the ANCOVA was run again after excluding this 14% from the analyses. As with the earlier analysis, the two important assumptions for ANCOVA's had to be checked. Analyses indicated that there was no interaction between the covariate and the group factor (F (2,120) = .11, p = .89) on post cognitive dissonance induction attitudes. Second, the correlation between the covariate and the dependant variable was significant (r (122) = .58, p < .01). The results of the ensuing ANCOVA analysis again showed that there were still no significant differences in post cognitive induction attitudes among the 3 groups (F(2,122) = .26, p = .77) (see Table 19). The

responses on the freedom to choose manipulation check were again explored without these 14%. As before, without this 14%, the whole sample now had a mean of 7.36, which represents that participants felt free to choose the topic that they wrote on. Further, as before, when assessed by group, there were no differences on this measure (F (2, 123) = .34, p = .71) [Primary (7.71), Secondary (7.62), Non-psychopathic (7.18)].

Table 19

Re-analysis of Outcomes for Hypothesis 2 (Newman's Method)

Variable	Non-Psychopathic M (SE)	Primary M (SE)	Secondary M (SE)	F	df	p
Post cognitive induction attitudes	5.7 (.25)	5.5 (.59)	6.0 (.38)	.26	2,122	.77

Hypothesis 3. This hypothesis predicted that members of the primary psychopath cluster would score significantly higher on the LOT-R than would those in the secondary psychopath cluster. Unlike the results with the MCLUST groupings, the results of this analysis indicated that there was a significant difference between the two groups on their levels of optimism (t (45) = 2.86, p < .01) (see Table 20). Inspection of the group means confirmed the hypothesis that those in the primary psychopathy group showed more optimism (M = 21.9), than did those in the secondary group (M = 19.1). [While this does support the hypothesis, it is not surprising that when groups are created by utilizing differing levels of anxiety (i.e., high vs. low) as a grouping factor, that they would then also be significantly different on their levels of optimism. This is due to the fact that research (Campbell & Kwon, 2001; Lewis & Kliewer, 1995; Scheier, Carver & Bridges, 1994) has previously shown that optimism is significantly and negatively correlated to anxiety (i.e., those high on anxiety like secondary psychopaths would also likely be low

on optimism and vice verse for primary psychopaths).] Because of the relationship between optimism and anxiety, a post hoc ANCOVA was conducted with anxiety as the covariate to determine if the primary and secondary groups differed on optimism when anxiety is controlled for. Prior to conducting the ANCOVA, it was determined that the covariate (anxiety) was indeed correlated with the dependent variable (optimism) ($r(55) = -.25$, $p < .05$). The results indicated that there was no longer a difference between the groups after anxiety was controlled for ($F(1, 52) = .02$, $p = .89$).

Table 20

Outcomes for Hypothesis 3 (Newman's Method)

	Primary	Secondary			
Variable	M (SD)	M (SD)	t	df	p
LOT-R	21.9 (2.3)	19.1 (4.6)	2.86	45	.01

Hypothesis 4. Because the analysis of this hypothesis was to be conducted with regressions and did not rely on participants being partitioned into groups, the outcome for this analysis would be no different from the previous analysis of hypothesis 4.

Discussion

General Discussion of Results

The present study was designed to investigate issues regarding the psychopathy construct that are as of yet still poorly understood. There are practical necessities in better understanding this construct due to the great degree of trouble that individuals with high degrees of psychopathy can cause society. Understanding what makes highly psychopathic individuals as they are may help society better deal with them once they are identified. Hopefully understanding the etiology of the problem may lead to the development of interventions to keep people from ever becoming highly psychopathic in the first place. For example, following from previous research and theorizing by Lykken (1995) it would be expected that many individuals with a fearless temperament are at higher risk to develop psychopathic traits than are those who have more normal levels of fearfulness. Understanding this etiological link to developing higher levels of psychopathy led Lykken (1995) to theorize that the type of parenting that a relatively fearless child gets will have an influence on whether that child can be successfully socialized. Therefore, through attempting to understand the etiology of the construct as Lykken did, it may be possible to propose ways to attempt to disrupt the course of fearless youths towards developing psychopathic traits and antisocial behaviors.

The current study attempted to add to the research base regarding the construct of psychopathy in two ways. First, it sought empirical confirmation of various patterns of personality traits suggested by theory to identify different types of psychopathic individuals. This was accomplished by clustering the participants into discrete groups

using various trait measures (i.e., anxiety, fearfulness, behavioral inhibition and activation, etc.) that have previously been hypothesized to help distinguish between primary and secondary psychopaths and comparing the emergent profiles to the theoretical ones.

Second, this study tested four hypotheses that were designed to expand the base of knowledge regarding the psychopath construct by exploring a number of situations in which subtypes of psychopaths were expected to show different responses to experimental manipulations. Theoretical subtypes were expected to differ in terms of (1) number of passive avoidance errors and (2) responses to increases in frequency and intensity of punishment on a passive avoidance task, (3) perseverance on a card playing task, and (4) attitudinal change in response to a cognitive dissonance task. Further, the role of a previously untested construct (positive expectancies) in regards to subtyping psychopaths was also explored.

Regarding the empirical confirmation of theoretical subtypes, there was only partial correspondence between the group profiles that emerged through MCLUST and those suggested by prior theory regarding the psychopathy construct. Whereas prior theorizing by Lykken (1995) and Fowles (1980) posit that clustering a sample of offenders on measures of psychopathy, fearlessness, and behavioral inhibition and activation should lead to distinct groupings of psychopathic individuals (i.e., primary, secondary and non-psychopathic), in this study, it was only when the most psychopathic individuals (those who were .5 standard deviations above the mean on the SRPS) were separated from the larger group and then clustered on psychopathy and fearlessness that usable groups emerged. Even so, when Z-scores were plotted for these groups on the hold out variables (i.e., bis, bas, anxiety) the profiles only weakly fit prior theory as to the

mean strength of each group on these traits relative to the other groups. This lead to testing the study hypotheses using both these imperfect groupings produced using MCLUST and secondly, using alternative groupings created through using Newman's more traditional method based on elevated psychopathy scores and a median split on a measure of anxiety.

Regardless of the method used to parse the sample into putative psychopathic sub-groups, in general the results were unsupportive of the hypotheses examined (unless specifically stated, the following comments will pertain to the results from both methods).

Hypotheses 1(a) and 1(b) proposed that compared to the other experimental groups, primary psychopaths would commit a significantly higher number of passive avoidance errors on a successive Go-No-Go task, and that this difference in commission of errors by the primary group could be eliminated by increasing the frequency and intensity of punishment given during the task. This state of affairs did not occur exactly as hypothesized a priori.

Although it was found that primary psychopaths were indeed responsive to increases in punishment frequency and intensity across the Go-No-Go and modified Go-No-Go tasks, there were no differences among the experimental groups in terms of the number of errors of commission (passive avoidance errors) during the Go-No-Go part of the task (which violates an assumption of part 1a of the hypothesis). This finding of no difference between groups in terms of passive avoidance errors on the Go-No-Go task is contrary to the majority of the previous work on this topic (Arnet, Howland, Smith, & Newman, 1993; Newman & Kosson, 1986; Newman et al., 1990; Patterson, Kosson & Newman, 1987), although this is not the only study to find such a result (Howard,

Payamal & Neo, 1997) and it is unknown how many other null findings may never have been published. Further, the finding in the present study that rates of responding by those in the primary psychopathy group were reduced in response to increases in punishment frequency and intensity is consistent with findings previously reported by Blair et al. (2004).

Even though the responses given by those in the primary group on the standard version of the Go-No-Go did not turn out as predicted, the fact that primary psychopaths were responsive to changes that occurred as they progressed into the modified Go-No-Go part of the task suggests that they are indeed capable of noticing changes in the demands of a task even after a response set consisting of a high responding has been previously set. Further, as part of one of the other study hypotheses, perseveration on a card-playing task was also explored. On this task, there were also no differences among groups on how far through a deck of cards participants would play regardless of the change in payoffs that occurred as participants played further through the deck. This too is contrary to what others have previously found (Newman, Patterson & Kosson, 1987) and indicates that primary psychopaths, as identified in the two methods in the present study, may not differ from controls and secondary psychopaths in their ability to notice changing contingencies.

These findings relating to passive avoidance and perseveration in psychopaths, are contrary to the response modulation hypothesis as proposed by Newman and colleagues (Lorenz & Newman, 2002; Newman, Patterson & Kosson, 1987; Newman, Widom & Nathan, 1985). The response modulation hypothesis states that low anxious (i.e., primary) psychopaths are unable to notice changing payoffs in reward/punishment and perseveration tasks due to a deficiency in their ability to perform brief and automatic

shifts in attention. These shifts in attention would allow them to monitor cues peripheral to their current tasks that would inform them to change their current dominant response set (Lorenz & Newman, 2002; Newman, Patterson & Kosson, 1987; Newman, Widom & Nathan, 1985).

The present finding suggests a number of possibilities regarding the response modulation hypothesis of Newman and colleagues. First, it may be that they are completely incorrect in their thinking as to why primary psychopaths commit more passive avoidance errors than do secondary or non-psychopaths. However, based on the large amount of empirical support that they have developed so far, it seems more likely that they are instead partially correct in their hypothesis. As stated in the introduction for this study, there was a need to further test the responses of psychopathic individuals in a broader range of contexts than had previously been done. In doing so in this study, it may have been shown that the response modulation hypothesis is no longer supported when peripheral cues to a task are of sufficient strength or frequency. Therefore, this study's results put into question the degree to which primary psychopaths have difficulty in learning reward/punishment based contingencies as well as whether these same individuals really do suffer from an inability to automatically shift focus from a dominant task as the response modulation hypothesis from Newman and colleagues would contend.

The second hypothesis predicted that primary psychopaths would not show as much attitude change as those in the other two groups after a cognitive dissonance induction procedure. This was predicted due to previous literature that indicated that psychopaths, especially those with primary psychopathic features, are less physiologically responsive (i.e., decreased levels of arousal, emotional responses) to negatively laden stimuli (Patrick, 1994; Patrick, Bradley & Lang, 1993). If this is true,

then attitude change due to the effects of cognitive dissonance (which has been shown to be produced most strongly by negatively laden arousal (Losch & Cacioppo, 1990)) should not occur in this group, or at least should be quite deficient in comparison to the other groups. The results to the ANCOVA analyses showed that there was no difference in the degree of attitude change across the three groups. This was true even though the secondary and non-psychopathy groups showed significant time 1-time 2 changes in attitudes whereas those in the primary group showed no significant change across time.

A further examination of the results showed that even though there was no significant degree of attitude change for the primary group, there was still movement in attitudes from time 1 to time 2, which evidently was enough to keep the attitudes between groups from being significantly different from each other at time 2. An examination of the effect sizes of the primary and secondary psychopathy groups revealed that the secondary group had a larger effect size (MCLUST method (.51); Newman's method (.40)) that turned out to be approximately twice the size of that from the primary group (MCLUST method (.16); Newman's method (.21)). This indicates that the primary group was much less responsive to the manipulation than were those in the secondary group. However, since the primary group's effect size was not zero, this also indicates that those in this group did have some response to the task and that this should serve as support for the notion that they are partly deficient rather than being completely devoid of the ability to produce arousal to negatively affective stimuli.

The third hypothesis was designed to explore the potential of a construct new to psychopathy research to help explain differences in the behavior of primary and secondary psychopaths. A wealth of previous research revealed that associations with positive (or negative) expectancies (or optimism as specifically used in this study)

parallel those with primary and secondary psychopathy across a wide variety of criterion variables; this research suggests that primary psychopaths should hold optimistic attitudes, whereas secondary psychopaths should hold pessimistic attitudes (see appendices A and B for citations**).** When this hypothesis was tested however, it was found that those in the primary group were not only not more optimistic than those in the secondary group as was predicted, but were also less optimistic than those in the non-psychopathic cluster.

To attempt to clarify what scores on the LOT-R may mean, it has been proposed that the scale can be divided into two subscales (one purported to measure only optimism and the other to measure only pessimism) (Chang, Maydeu-Olivares & D'Zurilla, 1997). When the groups derived using MCLUST and Newman's method were compared on these separate subscales, it was found that (as with the LOT-R total scores) primary and secondary psychopaths did not statistically differ from each other on either the optimism or pessimism subscales of the LOT-R. However, when all psychopathic individuals were combined together into one group, it was found that they did differ from the non-psychopathic group in terms of having statistically higher scores on the pessimism subscale. This seems to indicate that compared to non-psychopathic individuals, that psychopaths have an equivalent ability to feel optimistic about life situations, but tend to be more amenable to pessimism when the opportunity arises as well.

The final hypothesis predicted that primary psychopaths would persist further through a deck of cards than would other groups and that this behavior would be mediated by high optimism. Those in the primary psychopathy group did not on average play further through the deck of cards than those in the other groups, nor (as was just mentioned above) were they more optimistic on average than those in the other two

groups. A comparison of results from a previous card playing study using a highly comparable paradigm (Newman, Patterson & Kosson, 1987) shows that the mean number of cards played by those in the non-psychopathic groups is comparable across studies (68 cards played in the current study and 63 cards played in the comparison study). However, the average number of cards which were played by those in the psychopathy groups was much lower in the current study as compared to the previous study by Newman et al. In the current study, those in the primary group played an average of 65 cards and those in the secondary group played an average of 60 cards (total when the two groups were combined into one group was 62). Newman et al. (1987), did not separate his psychopathic participants into subtype groups and as such, he found that his psychopathic group played an average of 90 out of the 100 cards in the deck before stopping. This is clearly much higher than the average 62 cards that were played in the present study when combining the two psychopathic groups into one group. Therefore, the results from this study indicate that non-psychopaths were declining to continue through the deck of cards at a very similar point in both studies, yet the psychopathic individuals in the present study were declining to continue at a point much earlier than in the previous work by Newman et al. (1987).

Study Limitations

The present study has limitations that may have hindered the hypotheses being adequately supported. Because one of the interests of this research was to replicate a previous study that had examined rewards/punishments and Go-No-Go tasks, it was decided to use the same self-report measure of psychopathy that had been previously used in that study (Brinkley, Schmitt, Smith & Newman (2001); Lynam, Whiteside and Jones (1999)). The decision to use the same self-report measure was made in order to

hold steady what otherwise would have been a major source of variation between the studies when trying to compare their results. However, a limitation of using the same self-report measure (the SRPS) is that the SRPS may have some difficulty in discerning between primary and secondary types of psychopaths (Lilienfeld & Fowler, 2006). In two studies, it has been found that the SRPS factor which purports to assess primary psychopathic characteristics relates highly to scales on other measures which assess secondary psychopathic characteristics. Sometimes the SRPS primary scale even relates to these other secondary scales more highly than with the primary scales of the same measures (i.e., with the two scales of the PPI for instance) (Lilienfeld & Fowler, 2006). For instance, Lilienfeld, Skeem, and Poythress (2004) found that the primary subscale of the SRPS was correlated at .62 with PPI-II, which is associated with secondary features, and only .16 with PPI-I, which is associated with primary psychopathy features. Further, Brinkley et al., 2001, found that the primary scale of the SRPS was correlated as strongly (.31) with factor 2 of the PCL-R as with factor 1 (.30). This cross contamination of secondary psychopathic features in the SRPS's primary scale makes it harder to correctly divide groups into relatively "pure" primary and secondary groups and could limit the ability to find differences between the groups on dependent variables.

A second limitation is that the participants for this study come from a group that resides at a residential drug treatment program rather than a prison as is the case for most of the prior research conducted with psychopaths and especially in regards to psychopaths and their performance on passive avoidance and perseveration tasks. While it is true that a great majority of the participants in this study have been arrested in the past (123 of the participants have been arrested for committing past felony crimes) and 29% have spent at least some time in prison. It is then also true that 71% have never

been sent to prison for their past criminal behaviors. Therefore, even though it is possible to be quite psychopathic yet manage to avoid being sent to prison, it is also likely that the individuals in this study (mostly individuals who have never been to prison) were not as psychopathic (at least on the secondary scale) as those in prior studies. If this is true, then the responses on the passive avoidance and perseveration tasks would not be expected to be as persistent as would be predicted based on a literature which heavily depends on the outcomes from more psychopathic individuals.

Another limitation is that since the construct of positive expectancy had not yet been explored in relation to psychopathy, it is entirely possible that optimism was not the ideal way to conceptualize positive expectancies as they relate to psychopathy and its subtypes. It may be the case that another measure of the positive expectancy construct (i.e., hope) would have been more effective in showing the theorized relations.

Another limitation is that the monetary incentive provided for the participants to play the Go-No-Go, modified Go-No-Go, and card playing tasks was minimal and not guaranteed. Prior to completing the tasks, participants were notified that a single award of $20 would be given to the one participant who attained the highest combined scores across the tasks. Because the monetary incentive was small, distant and not guaranteed, it is possible that participants were only minimally engaged in performing the tasks. This is problematic because without being properly engaged in the tasks, the differences between the primary psychopaths and the non-psychopaths are less explainable as a failure of Newman's response modulation theory. This is because this theory contends that it is a lack of an ability to momentarily disengage attention from a task to see changing contingencies that differs between primary psychopaths and others. If the primary psychopaths were never really engaged in the task in the first place, then it is not

unexpected that they could see the changing contingencies and perform just as well as those from the other groups, which is what the results showed.

Still regarding the passive avoidance and perseveration tasks, it is not known to what degree the participants discussed these tasks among themselves and may have provided strategies (either willingly or unwittingly) to future participants that helped them perform better than they may otherwise have done. This especially pertains to the card playing task in which the average number of cards played for all three groups were quite similar in regards to the point at which they stopped playing through the deck of cards. This is again contrary to Newman's research, which has found that primary psychopathic individuals played much further than those in the other two groups. It could be that those who might otherwise have played further through the deck if they were naïve to the procedure (i.e., those in the primary group) heard about a winning strategy (i.e., only play about half of the cards) and performed better because of this.

Lastly, resource limitations precluded the use of the PCL-R as the measure of psychopathy and contemporaneous recording of physiological responses from the participants to the tasks that they took part in. Utilizing physiological measures (such as skin conductance levels, or cardiac impedance) would have been helpful in determining if there were differences in physiological reactivity between groups when they were engaged in the cognitive dissonance task as well as when they were responding to the stimuli on the Go-No-Go style tasks and the card playing task. It may be the case that physiological differences would be significant where differences on self-report measures or game playing tasks were not.

Future Directions for Psychopathy Research

First, it seems desirable to continue to conduct research on psychopathy self-report measures to facilitate greater study of the construct. Even though the PCL-R is often considered the measure of choice to best assess psychopathy in offender populations, its undeniable time and resource intensive nature makes it difficult for all researchers to use. Expending more effort to perfect self-report measures (such as the new PPI-R by Lilienfeld, (2005) may help the field move towards being able to more precisely assess psychopathy and its subtypes. The development of valid self-report psychopathy measures may allow research to move more easily into many situations that couldn't be explored before due to time constraints, or limited access to appropriate records.

Second, regarding expanding the subject base on which psychopathy research has traditional been conducted, recent research indicates that psychopathy is more likely a dimensional construct rather than a taxonic one (Marcus, John & Edens, 2004; Edens, Markus, Lilienfeld & Poythress, 2006). Thus, it seems appropriate to conduct more research using participants from populations which are not incarcerated in prisons and other non-offender samples. To conduct research with populations in less "locked down" criminal offender facilities and even the general public at large would inform the field regarding how individuals with differing levels of psychopathy behave. For example, it would be beneficial to understand how the somewhat psychopathic, yet successful individual behaves relative to a more criminally involved psychopaths and what underlying aspects of psychopathy makes them different.

Lastly, with the wealth of psychophysiological methods available today, it is surprising that the majority of work isn't being done on this construct with such

measures. This is especially true given the importance that contemporary theories of the construct place on a biological root. For example, Newman's position that anxiety has a strong role in differentiating between types of psychopaths could be tested by drug blockade studies or any paradigm that assesses activity of the sympathetic nervous system (chiefly through using cardiac impedance to determine preejection period (PEP) in response to arousing events). Further, if Newman is correct in his response modulation theory, that psychopaths get so focused on tasks that they can't shift attention to notice peripheral cues regarding changing rates of payoffs, then perhaps some sort of acoustic oddball task could be set up to test that theory in a psychophysiological manner.

Overall, the results from this study did not support the hypotheses as stated a priori. However, these negative findings do not provide sufficient basis for discarding the hypotheses because of concerns about the specific measures used in this study. It may still be fruitful to test these hypotheses using other, better validated measures of psychopathy or other key constructs (e.g. hope versus optimism) as suggested herein. Further exploration along these lines may result in new knowledge about the potential for primary psychopaths to change their goal driven behavior in response to changing contingencies and to the nature of the relationship between positive expectancies and psychopathy subtypes. These findings are important because only through such continued exploration of the construct can psychopathy be understood to the point where society may be able to manage the behaviors of these troubling individuals.

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Appendices

Appendix A

Relation to high optimism	Variable	Relation to Primary Psychopathy
Negative correlation Cites: Scheier, Carver & Bridges, 1994; Lewis & Kliewer, 1995; Raikkonenet al., 1999; Campbell & Kwon, 2001; Kwon, 2002.	**Anxiety**	Negative correlation Cites: Harpur et al., 1989; Hare, 1991; Patrick, 1994; Smith & Newman, 1990; Verona et al., 2001.
Negative correlation Cites: Scheier, Carver & Bridges, 1994; Mascaro, Rosen & Morey, 2004.	**Neuroticism**	Negative correlation Cites: Harpur et al., 1989; Hare, 1991; Widiger & Lynam, 1998; Verona et al., 2001; Miller et al., 2001.
Negative correlation Cites: Kashani et al., 1997; Lucas, Diener & Suh, 1996; Raikkonen et al., 1999; Chang & Sanna, 2001.	**Negative Affect**	Negative correlation Cites: Patrick, 1994; Verona et al., 2001; Benning et al., 2003; Patrick et al., 2003.
Positive Correlation Cites: Hickman, Watson & Morris, 1996.	**Narcissism**	Positive Correlation Cites: Harpur et al., 1989; Reiss, Grubin & Meux, 1999; McHoskey, Werzel & Szyaro, 1998.

Appendix A: (Continued)

Positive Correlation Cites: Kashani et al., 1997; Lucas, Diener & Suh, 1996; Raikkonen et al., 1999; Chang & Sanna, 2001.	**Positive Affect**	Positive Correlation Cites: Patrick, 1994.
Positive Correlation Cites: Currey, Snyder et al., 1997; Snyder, Hoza et al., 1997; Snyder, Michael & Cheavens, 1999.	**Success/ Achievement**	Positive Correlation Cites: Verona et al., 2001; Benning et al., 2003.
Positive Correlation Cites: Snyder et al, 1991; Scheier, Carver & Bridges, 1994; Irving et al., 2004.	**Planning**	Positive Correlation Cites: Hart and Dempster, 1997.

Appendix B

Relation to high optimism	Variable	Relation to Secondary Psychopathy
Negative correlation Cites: Scheier, Carver & Bridges, 1994; Lewis & Kliewer, 1995; Raikkonenet al., 1999; Campbell & Kwon, 2001; Kwon, 2002.	**Anxiety**	Positive Correlation Cites: Harpur et al., 1989; Hare, 1991; Patrick, 1994; Levenson, Kiehl & Fitzpatrick, 1995; Blackburn, 1998; Verona et al., 2001.
Negative correlation Cites: Scheier, Carver & Bridges, 1994; Mascaro, Rosen & Morey, 2004.	**Neuroticism**	Positive Correlation Cites: Harpur et al., 1989; Hare, 1991; Widiger & Lynam, 1998; Lynam, Whiteside & Jones, 1999; Verona et al., 2001.
Negative correlation Cites: Kashani et al., 1997; Lucas, Diener & Suh, 1996; Raikkonen et al., 1999; Chang & Sanna, 2001.	**Negative Affect**	Positive Correlation Cites: Patrick, 1994; Verona et al., 2001; Benning et al., 2003; Patrick et al., 2003.
Negative correlation Cites: Meadows & Kaslow, 2002; Kaslow et al., 2002.	**Suicide behavior**	Positive Correlation Cites: Verona et al., 2003.

Appendix B: (Continued)

Negative correlation Cites: McCauley Ohannessian et al., 1993; Scheier, Carver & Bridges, 1994; Carvajal, Clair, Nash & Evans, 1998; Grunbaum et al., 2000; Carvajal, Evans, Nash & Getz, 2002; Willinger et al., 2002; Brown et al., 2002; Bolland, 2003.	**Substance Abuse**	Positive Correlation Cites: Smith & Newman, 1990; Hemphill, Hart & Hare, 1994; Reardon, Long & Patrick, 2002; Benning et al., 2003.
Positive Correlation Cites: Snyder et al, 1991; Scheier, Carver & Bridges, 1994; Irving et al., 2004.	**Planning**	Negative correlation Cites: Lillienfeld & Andrews, 1996; Hart and Dempster, 1997.
Positive Correlation Cites: Mascaro, Rosen & Morey, 2004.	**Conscientiousness**	Negative correlation Cites: Widiger & Lynam, 1998; Lynam, Whiteside & Jones, 1999.

Appendix C

Demographic Questionnaire

What is your birthday? _____ (MM/DD/YY)

Which best describes the racial/ethnic group you belong to? (circle one below)

Caucasian/White African American/Black Hispanic/Latino

Marriage status (circle one): Single Married Divorced Separated

What was the last grade in school that you completed?_____

If you **did not** finish high school, do you have a GED?_____

Have you ever been convicted of a **misdemeanor** crime?

If yes to above, how many times has this happened?_____

Have you ever been convicted of a **felony** crime?

If yes to above, how many times has this happened?_____

Have you ever been sent to prison for a crime?

If yes to above, how many times has this happened?_____

How many times have you been arrested?_____

Appendix D

Attitudes Questionnaire

1. The crime that I am in trouble for should not carry the degree of punishment that it does.

1	2	3	4	5	6	7	8	9	10
Strongly Agree		Somewhat Agree		Slightly Agree	Slightly Disagree		Somewhat Disagree		Strongly Disagree

2. The court system made a fair and correct decision in my case.

1	2	3	4	5	6	7	8	9	10
Strongly Agree		Somewhat Agree		Slightly Agree	Slightly Disagree		Somewhat Disagree		Strongly Disagree

3. The judicial system is biased against minorities and the poor.

1	2	3	4	5	6	7	8	9	10
Strongly Agree		Somewhat Agree		Slightly Agree	Slightly Disagree		Somewhat Disagree		Strongly Disagree

4. In the future, people who commit crimes should not get the breaks I have had.

1	2	3	4	5	6	7	8	9	10
Strongly Agree		Somewhat Agree		Slightly Agree	Slightly Disagree		Somewhat Disagree		Strongly Disagree

5. I think that most people in trouble with the law got themselves there.

1	2	3	4	5	6	7	8	9	10
Strongly Agree		Somewhat Agree		Slightly Agree	Slightly Disagree		Somewhat Disagree		Strongly Disagree

6. Since I am not in jail/prison, I don't think I should have a probation officer watching me.

1	2	3	4	5	6	7	8	9	10
Strongly Agree		Somewhat Agree		Slightly Agree	Slightly Disagree		Somewhat Disagree		Strongly Disagree

7. Most crime has something to do with drugs.

1	2	3	4	5	6	7	8	9	10
Strongly Agree		Somewhat Agree		Slightly Agree	Slightly Disagree		Somewhat Disagree		Strongly Disagree

8. Since I am forced to be here, I should not have to pay for the services I receive.

1	2	3	4	5	6	7	8	9	10
Strongly Agree		Somewhat Agree		Slightly Agree	Slightly Disagree		Somewhat Disagree		Strongly Disagree

9. People who commit crimes should not be able to avoid jail/prison time.

1	2	3	4	5	6	7	8	9	10
Strongly Agree		Somewhat Agree		Slightly Agree	Slightly Disagree		Somewhat Disagree		Strongly Disagree

10. A person's childhood experiences have a lot of effect on their adult behaviors.

1	2	3	4	5	6	7	8	9	10
Strongly Agree		Somewhat Agree		Slightly Agree	Slightly Disagree		Somewhat Disagree		Strongly Disagree

Appendix E

Writing Assignment

Below are 3 paragraphs to choose from. We would like you to give each one a quick read and then choose the 1 that you feel makes the best argument for its point. Then copy that 1 paragraph that you like the best onto the other blank piece of paper. Please do not put your name on the paper that you write on and copy what is written exactly as it is on this paper.

I think that too many people who get into trouble with the law are allowed to get off easy for too long. Research has shown that many people who break the law had received light punishments for years before they were in big trouble. Many who have broken the law repeatedly said that they never changed because they had gotten off light many times before and they never felt they were going to get into any real trouble. I think that if people would be punished early on with out getting off light, that they would learn their lesson earlier in life and not cause so much trouble later on. I don't think that the justice system should give breaks to those who break the law.

I think that those who break the law should have to do their part to help pay part of the costs of their trial, jail time, probation etc. Research shows that the prosecution and supervision of those who commit crimes costs this country more each year. If money that was put into criminal justice was put into something else, then people who were in need could be helped. I think that it just makes sense for those who commit a crime to be the ones who pay for the process to be played out and for all the post-incarceration costs such as probation too. I think that if people did more to pay for the costs of their actions that maybe they would have a better sense of what they were costing society.

I think that those who have committed crimes in the past should have law enforcement keeping an eye on them for a while in the future. Research has shown that those who commit one crime are likely to commit another one in the future. Many of those who have not been under the supervision of someone like a probation officer have felt free to commit crimes again. I think that individuals like probation officers serve a real purpose in making sure that those who have gone wrong in the past will not be as likely to go wrong again in the future. I think that society is better off when offenders on probation have someone watching over them until they are off probation.

Appendix F

Date: _____

SRPS

Listed below are a number of statements. Each represents a commonly held opinion and there are no right or wrong answers. You will probably disagree with some items and agree with others. Please read each statement carefully and circle the number which best describes the extent to which you agree or disagree with each statement, or the extent to which each statement applies to you.

Item	Disagree Strongly	Disagree Somewhat	Agree Somewhat	Agree Strongly
1. Success is based on survival of the fittest; I am not concerned about the losers.	1	2	3	4
2. For me, what's right is whatever I can get away with.	1	2	3	4
3. In today's world, I feel justified in doing anything I can get away with to succeed.	1	2	3	4
4. My main purpose in life is getting as many goodies as I can.	1	2	3	4
5. Making a lot of money is my most important goal.	1	2	3	4
6. I let others worry about higher values; my main concern is with the bottom line.	1	2	3	4
7. People who are stupid enough to get ripped off usually deserve it.	1	2	3	4
8. Looking out for myself is my top priority.	1	2	3	4
9. I tell other people what they want to hear so that they will do what I want them to do.	1	2	3	4
10. I would be upset if my success came at someone else's expense.	1	2	3	4
11. I often admire a really clever scam.	1	2	3	4
12. I make a point of trying not to hurt others in pursuit of my goals.	1	2	3	4
13. I enjoy manipulating other people's feelings.	1	2	3	4
14. I feel bad if my words or actions cause someone else to feel emotional pain.	1	2	3	4
15. Even if I were trying very hard to sell something, I wouldn't lie about it.	1	2	3	4

Appendix F: (Continued)

Item	Disagree Strongly	Disagree Somewhat	Agree Somewhat	Agree Strongly
16. Cheating is not justified because it is unfair to others.	1	2	3	4
17. I find myself in the same kinds of trouble, time after time.	1	2	3	4
18. I am often bored.	1	2	3	4
19. I find that I am able to pursue one goal for a long time.	1	2	3	4
20. I don't plan anything very far in advance.	1	2	3	4
21. I quickly lose interest in tasks I start.	1	2	3	4
22. Most of my problems are due to the fact that other people just don't understand me.	1	2	3	4
23. Before I do anything, I carefully consider the possible consequences.	1	2	3	4
24. I have been in a lot of shouting matches with other people.	1	2	3	4
25. When I get frustrated, I often "let off steam" by blowing my top.	1	2	3	4
26. Love is overrated.	1	2	3	4

Appendix G

LOT-R

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer. To answer a question put the letter corresponding to the answer you wish to give on the line next to each question. For example, if your answer to a question is “A” meaning “I agree a lot”, then put an “A” on the line to the right of that question, and so forth.

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

1. In uncertain times, I usually expect the best. _____
2. It's easy for me to relax. _____
3. If something can go wrong for me, it will. _____
4. I'm always optimistic about my future. _____
5. I enjoy my friends a lot. _____
6. It's important for me to keep busy. _____
7. I hardly ever expect things to go my way. _____
8. I don't get upset too easily. _____
9. I rarely count on good things happening to me. _____
10. Overall, I expect more good things to happen to me than bad. _____

Appendix H

Attitudes Towards Situations Questionnaire

These items are statements that you might use to describe your opinions and feelings regarding various situations. For each item you should circle either T or F. The meaning of these two possible answers is given below.

T = Definitely or Probably true
F = Definitely or Probably false

So if the statement is definitely or probably true for you, then you should circle T. If the statement is definitely or probably false for you, then you should circle F.

Other items contain two statements marked A or B. For these items you should circle either A or B for your answer. The meaning of these two possible answers is given below.

A = Definitely or Probably A
B = Definitely or Probably B

(1) Of the following two situations I would like the **LEAST**:

(A) Running a steam presser in a laundry for a week
(B) Being caught in a blizzard

(2) Of the following two situations I would like the **LEAST**:

(A) Being in a bank when suddenly three masked men with guns come in and make everyone raise their hands
(B) Sitting through a two-hour concert of bad music

(3) It might be fun and exciting to experience an earthquake

T
F

(4) Of the following two situations I would like the **LEAST**:

(A) Attempting to beat a railroad train at a crossing
(B) Spraining my ankle so that I can't walk on it

(5) Of the following two situations I would like the **LEAST**:

(A) Standing in line for something
(B) Getting an electric shock as part of a medical experiment

(6) Of the following two situations I would like the **LEAST**:

(A) Balancing along the top rail of a picket fence
(B) Walking up four flights of stairs

(7) I might enjoy riding in an open elevator to the top of a tall building under construction

T
F

(8) Of the following two situations I would like the **LEAST**:

(A) Walking a mile when it's 15 degrees below zero
(B) Being near when a volcano erupts

(9) I would not enjoy fighting a forest fire

T
F

(10) Of the following two situations I would like the **LEAST**:

(A) Having to walk around all day on a blistered foot
(B) Sleeping out on a camping trip in an area where there are rattlesnakes

(11) Of the following two situations I would like the **LEAST**:

(A) Having a pilot announce that the plane has engine trouble and that he may have to make an emergency landing
(B) Working in the fields digging potatoes

(12) It would be fun to explore an old abandoned house at night

T
F

(13) Of the following two situations I would like the **LEAST**:

(A) Being out on a sailboat during a great storm at sea
(B) Having to stay home every night for two weeks with a sick relative

(14) I would enjoy trying to cross the ocean in a small but seaworthy sailboat

T
F

(15) Of the following two situations I would like the **LEAST**:

(A) Riding a long stretch of rapids in a canoe
(B) Waiting for someone who's late

(16) It might be fun to walk a tightrope

T
F

(17) Of the following two situations I would like the **LEAST**:

(A) Being in a circus when two lions suddenly get loose in the ring
(B) Bringing my whole family to the circus and then not being able to get in because a clerk sold us tickets for the wrong night

(18) Of the following two situations I would like the **LEAST**:

(A) Having to drive alone for a day and a half without stopping for sleep because I stayed on my vacation too long
(B) Jumping from a third story window into a fireman's net

(19) I would not like to try skydiving

T
F

(20) Of the following two situations I would like the **LEAST**:

(A) Finding out my car was stolen when I don't have theft insurance
(B) Riding a runaway horse

(21) Of the following two situations I would like the **LEAST**:

(A) Being chosen as the "target" of a knife throwing act
(B) Being sick to my stomach for 24 hours

(22) I like (or would like) to dive off a high board

T
F

(23) Of the following two situations I would like the **LEAST**:

(A) Tying up a truck full of newspapers for a paper sale
(B) Seeing a tornado cloud moving toward me when I'm driving in the country

(24) Of the following two situations I would like the **LEAST**:

(A) Being in a flood
(B) Carrying a ton of coal from the backyard into the basement

(25) I would enjoy learning to handle poisonous snakes

T
F

(26) Of the following two situations I would like the **LEAST**:

(A) Realizing the ice is unsafe when I'm standing in the middle of a frozen lake
(B) Finding that someone has slashed all four of my tires

(27) Of the following two situations I would like the **LEAST**:

(A) Being seasick every day for a week while on an ocean voyage
(B) having to stand on the ledge of the 25th floor of a hotel because there's a fire in my room

(28) Of the following two situations I would like the **LEAST**:

(A) Burning my arm badly by leaning against a hot water pipe
(B) Swimming where sharks have been reported

Appendix I

Written Assignment Questionnaire

Please answer the question below by circling a number on the scale below.

Earlier you were asked to write some sentences on a topic of your choosing. How free did you feel to choose the topic that you wrote about?

0	1	2	3	4	5	6	7	8	9	10
Not at all free to choose										Completely free to choose

Appendix J

BIS/BAS

Each item of this questionnaire is a statement that a person may either agree with or disagree with. For each item, indicate how much you agree or disagree with what the item says. Please respond to all the items; do not leave any blank. Choose only one response to each statement. Please be as accurate and honest as you can be. Respond to each item as if it were the only item. That is, don't worry about being "consistent" in your responses.

1. If I think something unpleasant is going to happen I usually get pretty "worked up."

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

2. I worry about making mistakes.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

3. Criticism or scolding hurts me quite a bit.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

4. I feel pretty worried or upset when I think or know somebody is angry at me.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

5. Even if something bad is about to happen to me, I rarely experience fear or nervousness.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

6. I feel worried when I think I have done poorly at something.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

7. I have very few fears compared to my friends.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

8. When I get something I want, I feel excited and energized.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

9. When I'm doing well at something I love to keep at it.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

10. When good things happen to me, it affects me strongly.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

11. It would excite me to win a contest.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

12. When I see an opportunity for something I like I get excited right away.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

13. When I want something I usually go all-out to get it.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

14. I go out of my way to get things I want.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

15. If I see a chance to get something I want I move on it right away.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

16. When I go after something I use a "no holds barred" approach.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

17. I will often do things for no other reason than that they might be fun.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

18. I crave excitement and new sensations.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

19. I'm always willing to try something new if I think it will be fun.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

20. I often act on the spur of the moment.

1	2	3	4
Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly

About the Author

John "Chip" Weir graduated from the University of California at Davis with a bachelors degree in psychology in 1996. In 1999, while studying social and health psychology, he received a Masters of Science from the University of Utah. As a graduate student at USF, he developed an interest in conducting research on the construct of psychopathy. He has co-authored an article on psychopathy measurement in youth which was published in *Law and Human Behavior*. Further, he is also co-author on two manuscripts which have been submitted for publication on the topics of youth substance use, criminal involvement and intervention services. Lastly, in 2006 he received a dissertation award from the American Academy of Forensic Psychology for the current study.