



An Analysis of Psychopathy, Substance Use, and Stress

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Abstract

Psychopathy is a complex personality disorder characterized by a number of traits including glibness, superficial charm, pathological lying, and antisocial behaviour (R. Hare, 1991). The current study examined relationships among this variable, substance use disorders (SUD), and stress. Prior research has suggested that these disorders may be interrelated (Z. Walsh, L. C. Allen & D. S. Kosson, 2006). We hypothesized that stress mediates the relationship between psychopathy and SUD. We also hypothesized that the stress and SUD relationship varies by level of psychopathy. Neither of these hypotheses were confirmed; however, this study supports prior findings, which suggest that negative affect is suppressed across factors of the Psychopathy Checklist.

An Analysis of Psychopathy, Substance Use, and Stress

Psychopathy is a complex personality disorder characterized by a cluster of distinct traits. Cleckley's classical view of psychopathy included traits such as inadequately motivated antisocial behaviour, failure to learn by experience, absence of nervousness, and fantastic behaviour with drink and sometimes without (Cleckley, 1976). Cleckley's conception of psychopathy also argues that psychopathic individuals are relatively unaffected by stress. However, recent studies have suggested that this is actually not the case (Hicks & Patrick, 2006). The psychopath appears to be relatively immune to the effects of negative affect (NA) because of a suppressor effect across factors of psychopathy. That is, the interpersonal and affective aspects of the psychopathic personality result in relative resilience to the effects of NA; on the other hand, the impulsive and antisocial behaviours common among psychopaths are positively associated with NA.

There has been considerable research that suggests that stress, which is one aspect of NA, is also associated with Substance Use Disorders (SUD) (e.g., Cerbone & Larison, 2000). Furthermore, studies have shown that psychopathic individuals are particularly prone to SUD (e.g., Rutherford, Alterman, & Cacciola, 2000). However, few studies have examined the mechanism behind this association. The present study is an attempt to elucidate these relationships.

Given that NA and SUD are both associated with the impulsive and antisocial aspects of psychopathy, it could be that NA is the mechanism linking psychopathy to SUD. The present study will consider stress as a representation of NA in an effort to clarify the psychopathy and SUD relationship. More specifically, we propose that stress mediates the relationship between psychopathy and SUD. That is, psychopaths are affected by stress, which leads to increased substance use. Alternatively, the classical hypothesis is that psychopaths are relatively unaffected

by stress. Thus, under this model we would predict that those with high levels of psychopathy are immune to the effects of stress, and as such, are not more inclined to use substances as a result of stress. Thus, we propose that psychopathy moderates the relationship between stress and substance use.

Psychopathy Checklist – Revised Assessment of Psychopathy

The Psychopathy Checklist – Revised (PCL-R) is the most widely used measure of psychopathy across both clinical and experimental domains (Hare & Neumann, 2007). The Psychopathy Checklist (PCL) family of measures assess psychopathy using a semi-structured interview and a file review. Included in this family, are similar measures designed for youth (PCL: YV) and quicker preliminary screening (PCL: SV). Although the PCL: YV and the PCL: SV are conceptually similar to the PCL-R, there are some important differences among the measures. The PCL: SV is a shorter 12 item version of the 20 item PCL-R. On the other hand, the PCL: YV has modified items which are age-appropriate for youth. Beyond these differences, the PCL family of measures are structurally similar, as each item is scored on a 3-point scale (0 = *the item is not present*, 2 = *the item is definitely present*). Also, all of the measures exhibit acceptable and similar psychometric properties (Cooke, Mitchie, Hart, & Hare, 1999; Forth et al., 2003; Hare, 1991; Hart et al., 1995). Finally, these derivatives exhibit similar factor structure (Hill, Neumann, & Rogers, 2004).

The creators of the PCL measures argue that the construct is best explained in a four-facet model (Hare, 2003). However, there are some studies that argue that a three-factor model is more appropriate (Cooke, Mitchie, & Hart, 2007). They argue that it is superior as it represents only predictive personality variables, and not behaviours that result from the nature of the psychopathic individual. Accordingly, Cooke, Mitchie, and Hart removed the PCL-R items that

measure antisocial behaviour rather than core personality traits in order to form this model. The four-facet model, on the other hand, retains almost all of the items originally in the PCL-R. This model is divided into two correlated dimensions: Factor 1 (F1), which measures grandiose and callous traits; the second Factor (F2), which measures the impulsive, antisocial lifestyle. Further, these factors can each be divided into two facets. Factor 1 is comprised of a facet measuring grandiose and defective interpersonal behaviours (Facet 1a), and a facet measuring deficient affective experience (Facet 1b). Factor 2 is comprised of a facet measuring impulsive lifestyle (Facet 2a) and a facet measuring antisocial behaviour (Facet 2b). This factor structure has been confirmed for each PCL measure in recent studies (Hare & Neumann, 2007). However, some other studies report good fit for the three-factor model but not the four-facet model (Cooke et al., 2004). The extent to which one model is superior to the other remains controversial.

Unfortunately, extensive argument for or against each model is beyond the scope of this paper.

Negative Affect

The psychopathic personality is generally considered to be resilient to stress and other measures of NA. Indeed, classical descriptions of psychopathy describe a relative immunity to affective responses (Cleckley, 1976). Furthermore, Cleckley noted that psychopaths fail to experience emotions such as guilt and shame, which causes their callousness. Additionally, psychopaths generally fail to develop anxiety disorders, suggesting their relative immunity to stress to the point of a general attenuation of reactivity to negative affect (Hicks & Patrick, 2006). Negative affect can be considered as individual differences in the ability to experience negative affective states (Hicks & Patrick, 2006). Some of these traits include fear, sadness, guilt, stress, and worry. Generally, findings regarding the relationship between NA and psychopathy are paradoxical. For example, Harpur, Hare, and Hakstian (1989) found that trait

anxiety was negatively correlated with F1, but relatively unrelated to total score. Shine and Hobson (1997) found that F1 is inversely related to self-criticism, whereas F2 was positively related. Furthermore, Hale and colleagues (2004) found significant positive associations between F2 and NA, whereas F1 was unrelated. Verona, Patrick, and Joiner (2001) found that stress was inversely associated with F1, but directly related to F2. The paradoxical relationship between NA and psychopathy can be simply stated by saying that F1 is inversely related to NA, while F2 is positively related to NA. The result of these relationships is known as a suppressor effect. Hicks and Patrick (2006) defined suppression as occurring when the beta coefficient of two correlated predictors is greater than its bivariate validity coefficient. In other words, NA exhibits opposing relationships across the factors of psychopathy.

Theories of Psychopathy and Anxiety

There are a number of theories which might help to indirectly explain the propensity for criminal behaviour in psychopathic individuals as a result of relative immunity to stressors. In fact, recent studies suggest that psychopathy is paradoxical in that these individuals feel the stress associated with their criminal behaviours; yet, the callous and uncaring nature of the psychopathic individuals is relatively robust to the effects of stress (Hicks & Patrick, 2006). Classical descriptions of psychopathy suggest that psychopathic individuals will commit crimes for surprisingly small stakes, and despite large risks (Cleckley, 1976). Furthermore, the psychopath has a general poverty of major affective reactions – in fact, a more profound defect than what was found in patients with hysteria (Cleckley, 1976). Similarly, Lykken's (1957) low fear hypothesis argues that psychopaths show poor avoidance of negative consequences such as electrical shocks. Furthermore, Newman, Widom, and Nathan (1985) found similar results when the punishment involved losing money. Along the same lines, Newman, Patterson, and Kosson

(1987) found that psychopaths continued to take risks after the probability of punishment exceeded the probability of reward. These studies all support the idea that psychopathic criminal behaviour is related to a low fear of punishment. The important commonality among these theories is the relative immunity to the effects of NA among psychopathic individuals.

As opposed to a relative immunity to the effects NA, some theories seem to suggest an inability to process NA. For example, Gray (1970) suggested that psychopaths seek rewards without regard to potential punishment. He argued that this results from a weak behavioural inhibition system combined with a strong, or overactive behavioural approach system. Quay (1965) argued that psychopaths have an abnormally strong tendency to seek thrills because of an inability to tolerate routine and boredom. Sensation seeking then could potentially involve breaking the law. Newman's (1980) response modulation hypothesis also focuses on impulsivity; however, it explains psychopathic impulsivity as a result of an inability to understand environmental cues. That is, psychopaths are unable to shift their attention from the goal even when environmental cues suggest that it is a bad idea to continue pursuing the goal. The basic idea central to these hypotheses is that something inherent in the psychopathic individual causes them to be unable to process affective information, either negative or positive.

To summarize, there are two broad conceptualizations of psychopathic immunity to stress: a relative immunity in which stress is processed, but it does not cause an inhibition of behaviour as it would in normal individuals; and incapability to process affective information, that is, a profound inability to link the current behaviour with punishment.

Substance Use

Substance use is perhaps the most frequent issue encountered in psychiatric treatment. Indeed, there are a large number of psychosocial risk factors for substance use. Some of these

include physical or sexual abuse and negative family atmosphere (Rumpold et al., 2006). The comorbidity between substance use disorders (SUD) and psychiatric disorders has been established; Wittchen, Nelson, and Lachner (1998) found that 35% of all subjects with any DSM-IV diagnosis could also be diagnosed with at least one lifetime substance-related diagnosis. That is, mental disorders and SUD commonly occur comorbidly. More specifically to personality, Alterman et al. (1998) found that one third of opioid users are diagnosed with antisocial personality disorder. Furthermore, Collins, Schlenger, and Jordan (1988) have identified positive relationships between SUD in general and APD. However, some researchers suggest that these relationships result from shared diagnostic criteria among SUD and antisocial personality disorder (Verheul, van den Brink, & Hartgers, 1995). Other researchers argue that these diagnoses share traits, for example, impulsivity, disinhibition, and negative affectivity (Trull, Waudby, & Sher, 2004).

Substance Use and Psychopathy

The co-occurrence of SUD and antisocial personality disorders (APD) has raised questions about the genetic heterogeneity of these disorders (Smith & Newman, 1990). Indeed, some researchers argue this is the result of a shared genetic vulnerability between SUD and APD (Hicks, Krueger, Iacono, McGue, & Patrick, 2004). Accordingly, the comorbidity between SUD and psychological disorders which include antisocial behaviours is well established (Rutherford et al., 2000). Indeed, it has been found inmates with an antisocial personality diagnosis are significantly more likely to have either alcohol or drug disorders (Smith & Newman, 1990). However, the extent to which the relationship between psychopathy and SUD extends beyond general antisociality has not been extensively explored. Some studies have attempted to determine with more accuracy which aspect of the psychopathic personality that is related to

SUD. In one of the first studies examining these variables, Hart and Hare (1989) found correlations between total PCL-R scores and F2 scores and SUD; however, there was an inverse relationship between F1 and SUD. Furthermore, Reardon and colleagues (1990) argue that the association between psychopathy and SUDs is largely accounted for by F2. Walsh, Allen, and Kosson (2007) argued that the relationship between F2 and SUD is not clear because there is considerable overlap between antisociality and F2. A further purpose of this study was to examine the psychopathy and SUD relationship in the four-factor model. They predicted that Facet 2a would be associated with SUD, and that this relationship would persist even when controlled for Facet 2b. Their results confirmed this hypothesis, and started to elucidate the relationship between psychopathy and SUD.

Stress and Substance Use

There are a large number of stressors which may be associated with substance use. Some of these stressors include natural disasters, poverty, stressful life events, and daily hassles (Cerbone & Larison, 2000). Furthermore, stress plays a prominent role in the perpetuation of drug addiction (Goeders, 2003). Numerous studies have found that SUD are consistently positively related to stress. For example, Agnew and White (1992) found that negative life events were modestly related to alcohol, marijuana, and other illicit drug use. Brown (1989) found that substance-using adolescents reported more stressful life events than non-substance users. King, Beals, Manson, and Trimble, (1992) found that higher stress led to greater illicit drug use, but not alcohol use. Cerbone and Larison (2000) concluded that stress does primarily lead to substance use; however, the relationship is not unidirectional. That is, individuals can use substances in an attempt to self-medicate for their stress, or stress can result from substance use. Furthermore, stress is associated with drug cravings and addiction relapse (Sinha, 2008). In fact, low overall

stress, ability to cope, and social support may predict abstaining from further drug use (Hyman & Sinha, 2009). Indeed there are many previous studies which suggest coping positively with stress (Beutler, Moos, & Lane, 2003) and supportive relationships (Broome, Simpson, & Joe, 2002) facilitate SUD recovery.

However are a large number of studies which have found little relationship between psychopathy and stress. Hicks and Patrick (2006) argue that this is a result of suppressor effects between the factor scores of psychopathy. They argue that the psychopathy construct is paradoxical in that the factors of the PCL-R show diverging relations with various facets of NA. That is, the relations for both factors increased in opposing directions when they were used to predict emotional distress. In addition, findings that SUD is correlated with F2 and occurs comorbidly with elevated scores of emotional distress point to a potential interaction with stress (Krueger et al., 1996).

The Current Study

Walsh and colleagues (2007) provided some evidence for the relationship between psychopathy and substance use criteria. Additionally, it has been found that stress is a robust correlate of SUD (Cerbone & Larison, 2000). Finally, some research suggests there is an association between NA (which includes stress) and F2 of PCL-R scores (Hicks & Patrick, 2006). These three findings suggest that stress may be the key variable in explaining the relationship between SUD and psychopathy.

In the present study, we propose to examine two hypotheses regarding the relationships among psychopathy, stress, and SUD. First, we propose that stress mediates the relationship between psychopathy and SUD. That is, stress resulting from psychopathic behaviours may account for increased substance use among high psychopathic individuals. This hypothesis

examines the idea that psychopaths use substances as a method of self-medicating for the stress experienced as a result of their F2 behaviours. More specifically, we propose that stress mediates the relationship between PCL F2 scores and SUD.

Our second hypothesis is that psychopathy moderates the relationship between stress and SUD. That is, the strength of the relationship will be attenuated at higher levels of psychopathy. This hypothesis is related to the low fear hypothesis common in the theory of psychopathy. That is, psychopaths use substances as a method of sensation seeking, without regards to potential punishment. The psychopath is less affected by stress; thus stress will not reliably predict substance use.

It is important to examine these hypotheses across factors, as there is evidence to suggest that there is a suppression effect between the factors regarding stress (Hicks & Patrick, 2006). Accordingly, we expect that examining either hypothesis with PCL-R total score would result in non-significant results due to suppression. In our hypotheses, we are focusing on Factor 2 as previous studies suggest it is related with SUD (Walsh, Allen, & Kosson, 2007); focusing on Factor 1 would result in insignificant results due to the negative relationship with both SUD and stress.

Method

The MacArthur Violence Risk Assessment was conceived to determine the relevant risk factors for violence among psychiatric patients, with an aim to develop a violence risk assessment tool (Monahan et al., 2001). Across the study, 1,136 patients were recruited from three different inpatient facilities. Participants were English speakers, between the ages of 18 and 40 years. All participants were White, African-American, or Hispanic, and all participants were diagnosed with a thought or affective disorder, personality disorder, or a history of substance

abuse. Participants gave informed consent before being interviewed.

Some studies have been conducted which related to psychopathy and substance use among this data (e.g., Neumann & Hare, 2008); suggesting that it is indeed reasonable to examine these variables in this study.

Participants

Participant in this study ($n = 765$) were a subsample of those described above. The reduction in number was a result of removing those participants who did not have a score on all of the variables in question. There were 437 men and 328 women, and the average age was 30 years old. Detailed demographic statistics are presented in Table 1.

Measures

Psychopathy. Psychopathy was measured using Hare's Psychopathy Checklist: Screening Version (PCL: SV). The PCL: SV is a 12-item version of the PCL-R intended for use with non-criminals and psychiatric patients. The PCL: SV is administered across a structured clinical interview and a review of the participants case file. It is scored on a 3-point scale (0 = *the variable is not present*; 2 = *the variable is definitely present*). Total scores can range between 0 and 24. The mean PCL: SV score was 8.52 ($SD = 5.60$).

Substance use. Substance use disorders were conceptualized as a diagnosis of alcohol or substance dependence across the lifetime. Diagnoses of substance dependence were based on the DSM-III-R criteria. Of the participants, 62.30% met SUD criteria, with 48.50% meeting alcohol dependence criteria and 48.20% meeting drug dependence criteria at some point across the lifetime. Substance abuse was not used because the majority of the sample met the criteria.

Stress. Stress was examined using Cohen's Perceived Stress Scale (PSS). This scale contains 15 items, measured on a 5-point scale (0 = *never*; 4 = *very often*). The measure

demonstrates good psychometric properties (Mitchell, Crane, & Kim, 2008). The PSS can be explained with two factors: perceived distress and inability to cope (Hewitt, Flett, & Mosher, 1992). As we were concerned with only stress in this study, we focused primarily on the perceived distress factor; the mean score for this factor was 16.68 ($SD = 4.99$), which reflects an average score of 2.38 on each item.

Procedure

Participants were examined with the above measures at different points in time. Substance use and psychopathy were examined in the baseline interview. Stress however was examined across 5 follow-up interviews. However, for the purposes of this study we only considered the stress score during the first follow-up interview in order to examine cross-sectional data.

Design

In this study, we will examine mediation and moderation hypotheses among the variables of interest. This will be accomplished using the procedures suggested by Baron and Kenny (1986). In order to test mediation, we will need to conduct four regressions: psychopathy and SUD, stress and SUD, psychopathy and stress, and all variables together. If the first three regressions are all significant, and in the predicted direction, and the final regression shows a decrease in the effect of psychopathy on SUD when stress is added, mediation has been established. For the moderation hypothesis, stress and psychopathy will be entered onto the first step of the regression, and a Stress \times Psychopathy interaction term on the second step. For moderation to be established, we would expect the interaction term to be significant beyond the variance accounted for by the other variables. All statistical analyses will be conducted using version 17 of the Statistical Package for the Social Sciences.

Results

Before conducting the analyses, we examined the assumptions related to regression: normality, linear relationships, and homoscedasticity, and two related to logistic regression: independent errors and multicollinearity (Garson, 2010).

Normality

Perceived distress showed appropriate normality: skewness was $-.03$, and kurtosis was $-.45$. For PCL F2, skewness was $-.51$, while kurtosis was -1.74 . Normality was not examined for SUD as it is a dichotomous variable. Visual inspection of the P-P plots suggested that neither of the variables diverted significantly from normality.

Linear Relationships and Homoscedasticity

This was only examined for the relationship between psychopathy and stress, as the rest of the regressions were logistic regressions. Examinations of the residual plots (standardised residuals vs. standardized predicted values) suggested the relationship was in fact linear. The plot also suggested that the data met the assumption homoscedasticity.

Independent Errors

In order for this assumption to be satisfied, each data point should not be a part of a dependent sample design (e.g., longitudinal or matched pairs). Although stress was examined at multiple points in time, we only considered the first point in time. Thus, the errors can be assumed to be independent.

Multicollinearity

In order to test this assumption, we examined the correlations among the independent variables. Garson (2010) suggests that multicollinearity is a problem when intercorrelations among independent variables exceeds $.80$; however, the intercorrelation among these variables

was .18, suggesting that multicollinearity is not a problem.

Preliminary Analyses

We conducted some preliminary analyses to determine if our theoretical justification for examining our hypotheses at the factor level was appropriate. For the meditational hypothesis, we confirmed that F2 was associated with SUD ($\chi^2 = 75.71, p < .001$) beyond the variance accounted for by F1 ($\chi^2 = 1.42, p > .05$). Further, there was no interaction among the PCL factors in predicting SUD ($\chi^2 = .07, p > .05$). Thus, we determined that we were justified in examining the mediation hypothesis using only PCL F2. Further, we found that inability to cope was not significantly related to SUD ($\chi^2 = .53, p > .05$); however, perceived distress was uniquely associated with SUD ($\chi^2 = 6.07, p < .05$). There was no interaction among these predictors ($\chi^2 = .28, p > .05$). Thus, we were justified in focusing only on PSS F1, or perceived distress.

Mediation

The mediation hypothesis was examined using a binary logistic regression with two steps. Psychopathy (PCL F2) was regressed on substance use in the first step. This regression was significant, suggesting that psychopathy is predictive of substance use ($\chi^2 = 90.98, p < .001$). However, when stress was entered on the second step, it did not significantly weaken the relationship between psychopathy and substance use ($\chi^2 = 1.03, p > .05$). This result suggests that in this sample, stress is not a mediator of the relationship between psychopathy and substance use.

Moderation

The moderation hypothesis was examined with a three-step binary logistic regression. In the first step, stress was regressed on substance use and was found to be significant ($\chi^2 = 7.78, p < .01$). Psychopathy was entered on the second step and was shown to be significant beyond the

variance controlled for by stress ($\chi^2 = 85.99, p < .001$). Finally, a Stress \times Psychopathy interaction term was entered on the third step; however, it was not found to be significant ($\chi^2 = .53, p > .05$). These results suggest that the ability of stress to predict substance use does not vary by level of psychopathy in this sample. Thus, neither of the theories proposed were confirmed in this study.

Unique Correlations

Some interesting results were found when the unique contributions of each PCL: SV factor was examined for perceived distress and SUD – these results are summarized in Table 3. When controlling for PCL: SV F1, F2 was associated with both stress and SUD. Alternatively, when controlling for PCL: SV F2, a slight negative relationship remained between F1 and both SUD and stress, however, this relationship did not reach significance.

Discussion

The results of this study have further elucidated the relationships among NA, SUD, and psychopathy. Prior studies have shown that NA shares a paradoxical relationship with psychopathy (Hicks & Patrick, 2006). That is, it is negatively associated with PCL F1, and positively associated with PCL F2. We also know that SUD is positively associated with PCL F2 (Walsh, Allen, & Kosson, 2007). These prior studies suggest that an aspect of NA might be the linking mechanism between psychopathy and SUD. The results of this study suggest that although stress is a portion of NA, it is not the linking mechanism between psychopathy and SUD. As there are a large number of factors that make up the concept of NA – some of which include sadness, guilt, and fear – this study should not be considered evidence that NA is not the linking mechanism between psychopathy and SUD. Rather, it could be that another factor of NA would further elucidate this relationship. Alternatively, it could be that the entire concept of NA

is necessary to capture the variance required to elucidate this relationship.

In a nod to classical descriptions, we examined the relative immunity to stress which has been considered quintessential to psychopathy (Cleckley, 1976). We proposed that if psychopathy included an inherent immunity to stress, then stress should not be predictive of SUD among those high in psychopathy. We predicted this because prior studies have found that stress is predictive of substance use (Cerbone & Larison, 2000). Thus, if psychopaths are immune to the effects of stress, it should not predict substance use. However, the results of this study suggest that stress is predictive of SUD across levels of psychopathy. These results should be interpreted cautiously as the number of participants meeting the cut point for psychopathy was relatively low. Of the 765 participants in this study, only 54 scored above 18, which is the point recommended by Hare and Neumann (2007) for diagnosing psychopathy. Baron and Kenny (1986) suggested that one possible method of examining moderation was to artificially dichotomise the variable of interest if the relationship was assumed to change at a set point. It could be that if this hypothesis was examined in that manner, a significant result may be found. Further, given that the median psychopathy score is 8, it could be that there was not enough power to detect a significant relationship. Indeed, sample size can impact the ability to achieve significance (Garson, 2010).

In examining the hypotheses, some interesting results were noted. Correlations among the variables of interest suggested support for the results found by Hicks and Patrick (2006). Factor 1 of the PCL: SV was found not found to be associated with substance use and PSS Factor 1 (perceived distress), and marginally associated with PSS Factor 2 (inability to cope) (see Table 2). However, Factor 2 of the PCL: SV was found to be significantly associated with stress, but not an inability to cope. Finally, the PCL: SV total score was found to be significantly associated

with perceived distress, but not an inability to cope.

Perhaps the most interesting result of this study came from the unique correlations. As one can see from table 3, PCL F2 was significantly positively associated with both perceived distress and SUD. On the other hand, PCL F1 was somewhat negatively associated with these variables; however, this relationship did not reach significance. This is interesting as it represents some support for a suppressor effect of stress across psychopathy. Hicks and Patrick (2006) suggest that one of the possible effects of suppressor variables is mediation. The inclusion of stress into the psychopathy and SUD relationship should provide a more valid indicator of the relationship. As mediation was not established in this study we must consider alternatives. There is a special case of suppression called crossover, which occurs when the beta value of the initial predictor reverses sign, while the beta of the suppressor variable increases relative to its initial validity coefficient. In this sample, we found initial positive validity coefficients between F1 and stress ($r = .08$) and F2 and stress ($r = .18$). When both F1 and F2 were entered into the same model, we saw a reversal in sign and an attenuation of the effect size of F1 ($\beta = -.06$) and an increase in validity for F2 ($\beta = .31$). These results suggest that perhaps we are approaching a crossover effect however it is not appropriate to say so with certainty as the relationship between F1 and stress did not reach significance when combined with F2 into the same model. Perhaps the lack of significance was caused by low power due to the relatively small number of individuals who reached the cut-off score for psychopathy.

There were a number of limitations in this study. Primarily, there were a relatively low number of participants who reached the cut off score for psychopathy. This can cause problems in that there is reduced power for detecting significant relationships. Further, as the sample consisted of civil psychiatric patients, there could be contamination in that participants may have

met the criteria for other disorders beyond psychopathy which could have impacted the results.

In the future it would be interesting to examine these relationships in more detail. We considered stress in this study, which is only one aspect of NA. It could be that any aspect of NA or the concept as a whole that serves as the linking mechanism between psychopathy and SUD. Further, this study could be repeated among individuals in the community, who would be less likely to have psychiatric diagnoses that may influence the results. Finally, this study could be repeated in a sample that includes a higher base rate of psychopathy. Indeed, in this sample, half of the participants had a score of 8 or below on the PCL: SV. Thus, a sample that includes more individuals with high PCL scores might be more likely to confirm our second hypothesis.

References

- Agnew, R., and White, H. (1992). An empirical test of general strain theory. *Criminology*, 30(4), 475-499.
- Alterman, A. I., McDermott, P. A., Cacciola, J. S., Rutherford, M. J., Boardman, C. R., McKay, J. R., & Cook, T. G. (1998). A typology of antisociality in methadone patients. *Journal of Abnormal Psychology*, 107, 412-422.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1184.
- Beutler, L. E., Moos, R. H., & Lane, G. (2003). Coping, treatment planning, and treatment outcome: Discussion. *Journal of Clinical Psychology*, 59(10), 1151-1167.
- Broome, K. M., Simpson, D. D., & Joe, G. W. (2002). The role of social support following short-term inpatient treatment. *The American Journal on Addictions*, 11(1), 57-65.
- Brown, S. A. (1989). Life events of adolescents in relation to personal and parental substance abuse. *American Journal of Psychiatry*, 146, 484-489.
- Cerbone, F. G., & Larison, M. A. (2000). A bibliographic essay: The relationship between stress and substance use. *Substance Use & Misuse* 35(5), 757-786.
- Collins, J. J., Schlenger, W. E., & Jordan, B. K. (1988). Antisocial personality and substance abuse disorders. *Bulletin of the American Academy of Psychiatry and the Law*, 16, 187-198.

Cooke, D. J., Mitchie, C., & Hart, S. D. (2007). Facets of clinical psychopathy: Toward clearer measurement. In C. J. Patrick (Ed.), *Handbook of Psychopathy* (pp. 91-107). New York, NY: Guilford Press.

Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. A. (2004). Reconstructing psychopathy: Clarifying the significance of antisocial and socially deviant behaviour in the diagnosis of psychopathic personality disorder. *Journal of Personality, 18*, 337-357.

Cooke, D. J., Mitchie, C., Hart, S. D., & Hare, R. D. (1999). The functioning of the Clinical Version of the Psychopathy Checklist: An item response theory analysis. *Psychological Assessment, 11*, 3-13.

Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby.

Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). *The Psychopathy Checklist: Youth Version manual*. Toronto, ON, Canada: Multi-Health Systems.

Garson, G. David (2010). "Assumptions, Testing of", from *Statnotes: Topics in Multivariate Analysis*. Retrieved 02/03/2010 from <http://faculty.chass.ncsu.edu/garson/pa765/statnote.htm>.

Garson, G. David (2010). "Regression analysis", from *Statnotes: Topics in Multivariate Analysis*. Retrieved 03/15/2010 from <http://faculty.chass.ncsu.edu/garson/pa765/statnote.htm>.

Goeders, E. (2003). The impact of stress on addiction. *European Neuropsychopharmacology, 13*(6), 435-441.

- Gray, J. A. (1970). The psychophysiological basis of introversion-extraversion. *Behaviour Research and Therapy*, 8, 241-266.
- Hale, L. R., Goldstein, D. S., Abramowitz, C. S., Calamari, J. E., & Kosson, D. S. (2004). Psychopathy is related to negative affectivity but not to anxiety sensitivity. *Behaviour Research and Therapy*, 42, 697-710.
- Hare, R. D. (1991). *The Hare Psychopathy Checklist-Revised*. Toronto, ON, Canada: Multi-Health Systems.
- Hare, R. D. (2003). *The Hare Psychopathy Checklist-Revised 2nd edition*. Toronto, ON, Canada: Multi-Health Systems.
- Hare, R. D. & Neumann, C. S. (2007). The PCL-R assessment of psychopathy: Development, structural properties, and new directions. In C. J. Patrick (Ed.), *Handbook of Psychopathy* (pp. 58-88). New York, NY: Guilford Press.
- Harpur, T. J., Hare, R. D., & Hakstian, R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, 1, 6-17.
- Hart, S. D., & Hare, R. D. (1989). Discriminant validity of the Psychopathy Checklist in a forensic psychiatric population. *Psychological Assessment*, 1, 211-218.
- Hart, S. D., Cox, D., & Hare, R. D. (1995). *Manual for the Psychopathy Checklist: Screening Version (PCL: SV)*. Toronto, ON, Canada: Multi-Health Systems.

- Hewitt, P. L., Flett, G. L., & Mosher, S. W. (1992). The perceived stress scale: Factor structure and relation to depression symptoms in a psychiatric sample. *Journal of Psychopathology and Behavioural Assessment, 14*(3), 247-257.
- Hicks, B. M., & Patrick, C. J. (2006). Psychopathy and negative emotionality: Analyses of suppressor effects reveal distinct relations with emotional distress, fearfulness, and anger-hostility. *Journal of Abnormal Psychology, 115*(2), 276-287.
- Hicks, B. M., Krueger, R. F., Iacono, W. G., McGue, M., & Patrick, C. J. (2004). Family transmission and heritability of externalizing disorders: A twin-family study. *Archives of General Psychiatry, 61*, 922-928.
- Hill, C., Neumann, C. S., & Rogers, R. (2004). Confirmatory factor analysis of the Psychopathy Checklist: Screening Version (PCL: SV) in offenders with axis I disorders. *Psychological Assessment, 16*, 90-95.
- Hyman, S. M., & Sinha, R. (2009). Stress-related factors in cannabis use and misuse: Implications for prevention and treatment. *Journal of Substance Abuse Treatment, 36*(4), 400-413.
- King, J., Beals, J., Manson, S. M., & Trimble, J. E. (1992). A structural equation model of factors related to substance use among American Indian adolescents. *Drugs & Society, 6*(3-4), 253-268.
- Krueger, R. F., Caspi, A., Moffitt, T. E., Silva, P. A., & McGee, R. (1996). Personality traits are differentially linked to mental disorders: A multitrait-multidiagnosis study of an adolescent birth cohort. *Journal of Abnormal Psychology, 105*, 299-312.

- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology, 55*, 6–10.
- Mitchell, A. M., Crane, P. A., & Kim, Y. (2008). Perceived stress in survivors of suicide: Psychometric properties of the perceived stress scale. *Research in Nursing & Health, 31*(6), 576-585.
- Monahan, J., Steadman, H., Silver, E., Appelbaum, P., Robbins, P., Mulvey, E., Roth, L., Grisso, T., & Banks, S. (2001). *Rethinking Risk Assessment, The MacArthur Study of Mental Disorder and Violence*. New York, NY: Oxford University Press.
- Neumann, C. S., & Hare, R. D. (2008). Psychopathic traits in a large community sample: Links to violence, alcohol use, and intelligence. *Journal of Consulting and Clinical Psychology, 76*(5), 893-899.
- Newman, J. P. (1980). The role of response perseveration in the learning deficits of psychopaths. *Dissertation Abstracts International, 40*(10-B), 5012-5013.
- Newman, J. P., Patterson, C. M., & Kosson, D. S. (1987). Response preservation in psychopaths. *Journal of Abnormal Psychology, 107*, 145-148.
- Newman, J. P., Widom, C. S., & Nathan, S. (1985). Passive avoidance in syndromes of disinhibition: Psychopathy and extraversion. *Journal of Personality and Social Psychology, 48*(5), 1316-1327.
- Quay, H. C. (1965). Psychopathic personality as pathological stimulation seeking. *American Journal of Psychiatry, 122*, 180-183.

- Rumpold, G., Klingseis, K. D., Kopp, M., Doering, S., Hofer, S., Mumelter, B., & Schubler, G. (2006). Psychotropic substance abuse among adolescents: A structural equation model on risk and protective factors. *Substance Use & Misuse, 41*, 1155-1169.
- Rutherford, M. J., Alterman, J. S., & Cacciola, A. I. (2000). Psychopathy and substance abuse: A bad mix. In C. B. Gacono (Ed.). *The Clinical and Forensic Assessment of Psychopathy: A Practitioner's Guide* (pp. 351-368). Mahwah, New Jersey: Laurence Erlbaum Associates.
- Shine, J. H., & Hobson, J. A. (1997). Construct validity of the Hare Psychopathy Checklist—Revised on a U.K. prison population. *Journal of Forensic Psychiatry, 8*, 546–561.
- Sinha, R. (2008). Chronic stress, drug use, and vulnerability to addiction. *Annals of the New York Academy of Sciences, 1141*, 105-130.
- Smith, S. S., & Newman, J. P. (1990). Alcohol and drug abuse disorders in psychopathic and nonpsychopathic criminal offenders. *Journal of Abnormal Psychology, 99*, 430-439.
- Trull, T. J., Waudby, C. J., & Sher, K. J. (2004). Alcohol, tobacco, and drug use disorders and personality disorder symptoms. *Experimental Clinical Psychopharmacology, 12*, 65-75
- Verheul, R., van den Brink, W., & Hartgers, C. (1995). Prevalence of personality disorders among alcoholics and drug addicts: An overview. *European Addiction Research, 1*(4), 166-177.
- Verona, E., Patrick, C. J., & Joiner, T. E. (2001). Psychopathy, antisocial personality, and suicide risk. *Journal of Abnormal Psychology, 110*, 462-470.

Walsh, Z., Allen, L. C., & Kosson, D. S. (2007). Beyond social deviance: Substance use disorders and the dimensions of psychopathy. *Journal of Personality Disorders, 21*(3), 273-288.

Wittchen, H. U., Nelson, C. B., Lachner, G. (1998). Prevalence of mental disorders and psychosocial impairments in adolescents and young adults. *Psychological Medicine, 28*, 109–126.

Table 1

Demographic Statistics

	Total <i>n</i>	Mean (<i>SD</i>) Age	Race ¹		
			White	Black	Hispanic
Men	437	29.95 (6.26)	296	132	9
Women	328	29.95 (6.13)	235	84	9
White	531	29.64 (6.33)	—	—	—
Black	216	30.84 (5.80)	—	—	—
Hispanic	18	28.17 (6.29)	—	—	—

¹ Number of participants across race.

Table 2

Summary of Correlations among the Factors and Total Score of the Psychopathy Checklist Screening Version and the Factors of the Perceived Stress Scale and Substance Use

Measure	1	2	3	4	5	6
1. PCL: SV Total	—					
2. Interpersonal / Affective	.86**	—				
3. Impulsive / Antisocial	.89**	.55**	—			
4. Perceived Distress	.15**	.08*	.18**	—		
5. Inability to cope	.02	.06	-.02	-.26**	—	
6. Substance Use	.31**	.16**	.36**	.10**	-.04	—

Note. Correlations among the variables examined in this study are presented.

^aFactor 1 includes the personality traits common to psychopaths, such as a lack of remorse, grandiosity, glibness, and pathological lying.

^bFactor 2 includes antisocial behaviours, impulsivity, and proneness to boredom.

^cPerceived Stress Scale Factor 1 is designed to tap an individual's perceived distress.

^dFactor 2 is designed to tap an individual's inability to cope.

** $p < .01$.

* $p < .05$.

Table 3

Unique Correlations between PCL: SV Factors, Stress and Substance Use

	Stress		SUD		
	β	t	β	χ^2	Odds Ratio
Interpersonal / Affective	-.06	-.77	-.04	1.42	.96
Impulsive / Antisocial	.31	4.73**	.28	75.71	1.32**

** $p < .01$.