FUNCTIONS OF NON-SUICIDAL SELF-INJURY IN INCARCERATED MEN: A MODEL-BASED CLUSTER ANALYSIS

by

LAUREN ALANA SEIBERT

(Under the Direction of Amos Zeichner)

**ABSTRACT**

The current study sought to identify clusters of incarcerated men based on history and functions of non-suicidal self-injury (NSSI). Functions of NSSI are considered to be either automatic (i.e., intrapersonal) or social (i.e., interpersonal). NSSI is highly prevalent within forensic populations, and is associated with significant financial and psychological burden on the inmates and correctional institutions. However, few studies have examined men and none have examined function of NSSI within this population. Ninety-five incarcerated men completed measures of NSSI as well as pertinent environmental and personality variables. Approximately two-thirds of the sample reported a history of NSSI. Within the inmates with histories of NSSI, a model-based cluster analysis identified four groups comprising different levels, type counts, and functions of NSSI. Following external validation procedures, three of the groups reported higher general psychopathology, while one NSSI group was similar in profile to the Non-NSSI Comparison Group. Implications for prevention and intervention are discussed.

INDEX WORDS: Self-Injury, Men, Prison

# FUNCTIONS OF NON-SUICIDAL SELF-INJURY IN INCARCERATED MEN: A MODEL-BASED CLUSTER ANALYSIS

by

LAUREN ALANA SEIBERT

B.A., Wake Forest University, 2005

M.S., University of Georgia, 2009

A Dissertation Defense Submitted to the Graduate Faculty of the University of Georgia in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

Athens, Georgia

2012

# FUNCTIONS OF NON-SUICIDAL SELF-INJURY IN INCARCERATED MEN: A MODEL-BASED CLUSTER ANALYSIS

by

LAUREN ALANA SEIBERT

| | |
|---|---|
| Major Professor: | Amos Zeichner |
| Committee: | Sarah Fischer |
| | Joshua Miller |

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
August 2012

## ACKNOWLEDGEMENTS

I will be forever indebted to my advisor, Amos Zeichner, for giving me the opportunity to explore my passion. My dedication to social justice, evident within this line of research, has been nourished throughout my training at the University of Georgia. My research assistant, Steven Rausher, also provided invaluable help with data collection as well as keeping me awake for the early morning drives to the prison. Looking back, I must express appreciation for my parents, Steve and Leila Seibert, who instilled in me a commitment to education and repeatedly demonstrated selflessness and sacrifice to support me. My partner, Daniel Hatalsky, has demonstrated the importance of balancing acceptance with change, a skill that has taught me more about the human condition than anything else. Finally, I must thank the men of Baldwin State Prison who participated in the study with the hope of leaving a place better than when they came.

# TABLE OF CONTENTS

## LIST OF TABLES AND FIGURES

Page

# CHAPTER 1

## INTRODUCTION

The act of deliberately harming oneself with no intent to commit suicide began to gain the attention of the psychiatric community in the late twentieth century in what Graff and Mallin (1967) labeled the "wrist cutter syndrome." Since Graff and Mallin's seminal paper, the phenomenon of intentionally injuring oneself without suicidal intent has grown to encompass multiple forms of self-injury beyond cutting. Although cutting appears to be the most common form of self-injury, individuals also engage in burning, scratching, banging or hitting body parts, interfering with healing of wounds, and ingestion of dangerous chemicals (Breire & Gil, 1998; Favazza & Conterio, 1989; Gratz, 2001; Herpertz, 1995, Klonsky, 2007). Additionally, most individuals utilize multiple methods to self-harm (Favazza & Conterio, 1989; Gratz, 2001). The behavior has taken on several labels, including deliberate self-harm (Morgan, Burns-Cox, Pocock, & Pottle, 1975), deliberate self-injury (Franklin, 1988; Herpertz, 1995), moderate self-mutilation (Favazza & Rosenthal, 1993), self-wounding (Tantam & Whittaker, 1992), parasuicide (Ogundipe, 1999), and non-suicidal self-injury (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). The utilization of so many terms for seemingly related behavior is troubling in that conceptualizations of the behavior differ among researchers. Some terms (e.g., self-mutilation) refer to a select form of self-injurious behavior (e.g., cutting), while others do not clearly elucidate the nature of the behavior that necessarily obviates suicidality, thereby muddying comparisons between research and treatment studies. For these reasons, the term non-suicidal self-injury (NSSI), defined as the "direct, deliberate destruction of one's own body

tissue in the absence of intent to die" (Nock, 2009, p. 9) appears to most accurately capture the true nature of this behavioral phenomenon.

Prevalence of NSSI also appears to be increasing (Favazza, 2009); however, some argue that little attention was paid to self-injurious behavior until recently (Ross & Heath, 2002), and that increased awareness may at least partially account for higher estimates of prevalence. Additionally, media coverage of NSSI has become widespread (Whitlock, Purington, & Gershkovich, 2009), as many report learning of NSSI either from the media or from a friend who encountered it in media coverage (Favazza, 2009). The phenomenon of NSSI has become surprisingly prevalent within non-clinical populations, ranging from 14-21% among high school students (Ross & Heath, 2002; Zoroglu et al., 2003) and 17-41% among college students (Gratz, 2001; Paivio & McCulloch, 2004). Alarming as the unexpectedly high prevalence of NSSI within non-clinical populations appears, the prevalence of NSSI in forensic settings is even more troubling. Estimates of incarcerated individuals who engage in NSSI are as high as 50% (Gray et al., 2003). While NSSI and suicide are distinct behavioral phenomena, a link between the two seems to exist. In fact, a history of NSSI is predictive of suicide attempts. Furthermore, owing to a likely desensitization process (Joiner, 2005), individuals with a history of NSSI report using more lethal means in suicide attempts than those without such a history (Andover & Gibb, 2010).

Despite its increasing prevalence, NSSI continues to be absent as a diagnostic category in the DSM-IV-TR (American Psychological Association, 1994). At present, it is only considered a diagnostic symptom of borderline personality disorder (BPD; APA, 1994) and, indeed, demonstrates a strong and consistent relationship with this disorder (Gratz & Gunderson, 2006; Klonsky, Oltmanns, & Turkheimer, 2003). However, NSSI has been associated with mood, anxiety, and eating disorders, substance use, schizophrenia, and personality disorders distinct

from BPD (Haw, Hawton, Houston, & Townsend, 2001; Herpertz, Sass, & Favazza, 1997; Klonsky et al., 2003). Over the past several decades, researchers have argued to have NSSI recognized as a discrete diagnosis (see Pattison & Kahan, 1983). Pertinently, recent findings suggest that a NSSI disorder is different from NSSI within the context of BPD, provides clinically meaningful data and, therefore, should be a separate diagnostic category (Selby, Bender, Gordon, Nock, & Joiner, 2011).

In addition to the behavior's prevalence, the nature of NSSI has been troubling to mental health care providers who often respond with shock and fear to client disclosures of self-injurious behavior, frequently resulting in fearfulness, diminished empathy, or lack of confidence in the individual's ability to treat the client (McAllister, Creedy, Moyle, & Farrugia, 2002). This situation is omnipresent in the prison population. NSSI within this setting is particularly problematic owing to the unique environmental context in which it occurs. Not only are prisons rife with mental illness, but are also minimally equipped with mental health services. Given the limited means available, prisoners have reportedly "swallowed pins, inserted pencils in their penises and paperclips in their abdomens, bitten chunks of flesh from their arms, slashed and gashed themselves" (Human Rights Watch, 2003; p. 174). Prisoners who harm themselves often require immediate medical attention and, based on the resources available at the institution and the severity of the injury, may require transportation with correctional officer escorts to hospitals or crisis units housed in different prisons (Young, Justice, Erdberg, 2006). Additionally, access to mental health care providers may be limited, as contact is most often with corrections officers who possess minimal to no training in mental health matters, particularly the causes or functions of NSSI (Gough & Hawkins, 2000). Data suggest that attitudes of officers toward inmates who

self-harm are generally negative and the behavior is often viewed as attention-seeking (Ireland & Quinn, 2007).

Although NSSI may function as a form of communication to others, particularly within the prison environment, few studies have examined the functions of NSSI in the forensic setting. The psychological and financial burden that NSSI presents to both the individual and the system is apparent and without an adequate understanding of the causes of NSSI in this population little progress can be expected to be made in selecting and implementing effective treatment. To understand NSSI, identification of risk factors and probable functions of NSSI, particularly as they relate to differential consequences within the prison environment, is warranted.

**Environmental Correlates of NSSI**

The most documented pathways to the development of NSSI are those experienced during childhood and adolescence. Studies have found associations between the experience of childhood sexual or physical abuse and NSSI (Boudewyn & Liem, 1995; Briere & Gil, 1998). With regard to sexual abuse, the findings suggest that after controlling for other forms of abuse or neglect, sexual abuse maintained a significant zero-order relationship with NSSI (Gratz, Conrad, & Roemer, 2002). However, a meta-analytic review of the effect of childhood sexual abuse on the initiation of NSSI reported that the effect of childhood sexual abuse, while large in comparison to other forms of abuse, often becomes non-significant when other environmental factors are taken into consideration (Klonsky & Moyer, 2008). Therefore, childhood sexual abuse may best be conceptualized as a proxy risk factor for NSSI in the likely presence of co-occurring familial factors, including parental psychopathology. Klonsky and Moyer (2008) argue that, if anything, the relationship between childhood sexual abuse and NSSI is mediated by emotional difficulties such as depression and anxiety.

Adding to the discrepancies in understanding the role of childhood sexual abuse in NSSI, elucidation of the role of physical abuse has proven even more tenuous. Gratz (2003) suggested that equivocal findings may result from a failure to consider gender as a relevant moderator of the relationship between physical abuse and NSSI. Specifically, it appears that physical abuse may account for unique variance for men only. Recent data have also indicated that type of abuse may result in different pathways. Whereas child physical abuse related primarily to NSSI that occurred sporadically and was interpersonal in nature (e.g., communicating distress, seeking attention), child sexual abuse appeared strongly related to chronic NSSI enacted to regulate emotions or to punish oneself (Gratz et al., 2002). Aside from abuse, there appears to be a relationship between loss of a caregiver, primarily fathers, and NSSI in men (Gratz et al., 2002).

**Personality Correlates of NSSI**

Differences in temperament and personality account for a significant proportion of variance in predicting NSSI and an interaction of both person and environmental characteristics ultimately predispose an individual to engage in NSSI. As hypothesized by Linehan (1993) and Gratz (2003), temperamental differences resulting in heightened emotional reactivity and intensity may serve as precursors to the development of NSSI. Although no longitudinal studies exist to date, the biosocial theory suggests that the interaction of risk factors such as sexual and physical abuse with an invalidating environment may very likely increase the likelihood that an individual will resort to NSSI (Linehan, 1993; Wagner & Linehan, 1997). Relatedly, several lines of research have investigated personality correlates of NSSI. High levels of negative affect were found to differentiate individuals who engage in NSSI from those who do not (Baetens, Claes, Willem, Muehlenkamp, & Bijttebier, 2011). This is consistent with the finding that NSSI is a symptom of BPD, a disorder characterized by intense emotional lability and dysregulation

(Linehan, 1993). Upon closer examination, it appears that urgency, or the proclivity to behave impulsively when experiencing negative affect, is most predictive of NSSI (Glenn & Klonsky, 2010).

The data supporting the relationship between affective instability and NSSI are evident. However, a disparate characterization of emotional functioning, that of psychopathy, has demonstrated some alternative explanations for NSSI. Psychopathy, conceptualized as a personality disorder characterized by shallow affect, superficial charm, behavior motivated by secondary gain, lack of remorse, and grandiosity (Cleckley, 1941; Hare, 2003), has also been related to NSSI behavior (Young et al., 2006). Psychopathy has traditionally been parsed into two factors. The first factor comprises the interpersonal and affective components, while the second factor represents an antisocial behavioral style, including impulsivity, substance use, and aggression (Hare, 1991; Hare, 2003; Harpur, Hakstian, & Hare, 1988). As for the relationship between psychopathy and NSSI, Young and colleagues (2006) found a positive correlation between Factor 2 Psychopathy (e.g., antisocial lifestyle) as measured by the Psychopathy Checklist-Revised (PCL-R; Hare, 2003) and NSSI. However, Gray and colleagues (2003) failed to find any relationship between self-harm and psychopathy using the same measure. Given the dearth of research examining these variables, no firm conclusion regarding their risk impact can be reached at this time.

**Characteristics of Incarcerated Men**

The pathways to NSSI are particularly relevant to the histories of incarcerated men. High rates of childhood sexual and physical abuse are reported within this population (McClellan, Farabee, & Crouch, 1997). Weeks and Widom (1998) reported prevalence rates of childhood abuse (sexual or physical) of 68% within a sample of incarcerated men. Although

fewer studies have examined the prevalence of childhood sexual abuse in samples of incarcerated men compared to women, there is evidence that a large majority of offenders have experienced sexual abuse during childhood. Johnson and colleagues (2006) found that in a random sample of incarcerated men held at a county jail, approximately 60% endorsed occurrences of sexual assault prior to the age of 13. The experience of physical abuse during childhood among incarcerated men appears even more prevalent. Ball (2009) found that approximately 90% of a sample of incarcerated men reportedly experienced childhood physical abuse, and approximately 50% reported to have experienced childhood physical abuse of a severe nature (e.g., being punched, kicked, beat, burned, choked, or slammed against a wall). Unfortunately, once incarcerated, the pattern of abuse appears to perpetuate itself. In one study, 1 in 10 inmates reported being physically assaulted within a 6-month period from the onset of incarceration, suggesting that being incarcerated makes one 10 times more likely to be assaulted compared to the community at large (Wolff, Blitz, Shi, Siegel, & Bachman, 2007). Estimates of sexual assault during incarceration fluctuate around 5% (Wolff & Shi, 2009). Additionally, those who have experienced previous sexual assault prior to age 18 are at greater risk for re-victimization in prison (Wolff, Blitz, & Shi, 2007).

Not surprising given high levels of childhood abuse, personality profiles of inmates differentiate them from the general population. High levels of affective instability consistent with borderline personality disorder, as well as higher levels of impulsivity, are present within this population (Black et al., 2007; Cuomo et al., 2008; Ireland & Archer, 2008). Furthermore, criminal acts, particularly those of a violent nature, are disproportionately committed by psychopathic offenders (Hare, 1991; Hare, 2003; Harpur et al., 1988; Hare & Mcpherson, 1984). Rates of mental illness are considerable within this population, as much as three times higher

than that in general population (Roskes & Feldman, 1999). A recent study that examined the prevalence of mental illness found that approximately one quarter of inmates in state institutions met criteria for a psychological disorder (Wilper et al., 2009). Reasons cited for this alarming prevalence include the deinstitutionalization of individuals from mental hospitals, incarceration of mentally ill offenders for minor crimes, more rigid criteria for commitment to non-correctional mental health facilities, and lack of adequate support systems or community mental health agencies (Gostin, 2008; Soderstrom, 2007). Environmental stress experienced by incarcerated individuals is, not surprisingly, higher than that experienced by non-incarcerated individuals as evidenced by findings of higher state anxiety (Blaauw, Kerkhof, & Vermunt 1998), attributable to the conditions particular to prison, including lack of heterosexual contact, lack of personal autonomy, and lack of personal security. Historically, mental health care within the prison system has been criticized as dismal due to under-funding and, although appropriate steps are being taken to correct this problem, there is still much work to be done (Brooker & Gojkovic, 2009).

**NSSI in Incarcerated Individuals**

The study of NSSI within incarcerated samples has been plagued by multiple pitfalls, including discrepant definitions of the behavior, lack of control groups, and a relative dearth of assessment of NSSI in men. In a recent review of the risk factors for NSSI in incarcerated individuals, Lohner and Konrad (2007) noted that differences in both definitions of self-harm behavior and sample selection vary greatly among studies, rendering generalization of findings weakened. Often, self-harm and suicidal behaviors are not treated as distinct phenomena and intent is determined *post hoc* through categorization based on medical seriousness (Lohner & Konrad, 2006). Using medical criteria as a proxy for lethality and determination of motivation is

not only unclear at best, but dangerous as severity is variable within suicidal and non-suicidal behavior (Verona, Sachs-Ericsson, & Joiner, 2004). Additionally, the majority of studies of self-harm behavior in forensic settings examined samples of women, despite the fact that women comprise only a small percentage of the overall population of incarcerated individuals (Fulwiler, Forbes, Santangelo, & Folstein, 1997).

Despite these pitfalls, research has demonstrated that some risk factors can distinguish NSSI from self-injurious behavior motivated by suicidal intent (Muehlenkamp & Gutierrez, 2004). Having any psychiatric diagnosis is one of the strongest predictors of self-injurious behavior, whether suicidal or not (Goss, Peterson, Smith, Kalb, & Brodey, 2002; Meltzer, Jenkins, Singleton, Charlton, & Yar, 2003). While research on the impact of sociodemographic risk factors such as age, gender, marital status, and education remains unclear, homelessness (Ivanoff, 1992) and Caucasian ethnicity (Maden, Chamberlain, & Gunn, 2000) both have documented support for their role in NSSI. As suggested by Lohner and Konrad (2007), it is important, particularly within the population of incarcerated individuals, to understand some variables as dynamic rather than static risk factors. For example, gender and childhood history can be viewed as static risk factors, but prison time served is inherently dynamic as its impact changes at each point of assessment. Study results, including suicidal behavior, still seem to be equivocal, with some findings suggesting that being at an early phase of incarceration was associated with self-injurious behavior (Kerkhof & Bernasco, 1990; Maden et al., 2000), while others have found contradictory results (Goss et al, 2002).

**Functions of NSSI**

In his review of the literature, Klonsky (2007) identified seven functions that NSSI may serve, comprising affect-regulation, anti-dissociation, anti-suicide, interpersonal influence,

interpersonal boundaries, self-punishment, and sensation-seeking. Nock and Prinstein (2004, 2005) have hypothesized that each of these functions can be subsumed within two categories – automatic or social function. On the one hand, NSSI of an automatic nature is descriptive of intrapersonal processes (e.g., emotion regulation). On the other hand, NSSI can serve social or interpersonal functions (e.g., fitting in with others, benefitting from secondary gain). Within each category, Nock and Prinstein (2005) further noted differences in mode of reinforcement – either negative (i.e., removing an undesirable or unfavorable stimulus) or positive (i.e., adding a favorable or desirable stimulus). For example, the consequence of an attempt to eliminate negative affect would be described as automatic negative reinforcement, while receiving attention following NSSI would be described as social positive reinforcement. Additionally, Klonsky (2007) argued that there are likely multiple functions operating in NSSI even within one act, and an understanding of all possible motivations for NSSI is crucial.

The function of NSSI that has received wide empirical support is that of affect-regulation. Researchers hypothesized that NSSI is likely to follow experiencing negative affect as a means of reducing its intensity and attendant arousal. In clinical studies of women diagnosed with BPD, many patients endorsed statements indicating that they engage in NSSI "to stop bad feelings" or "to reduce anxiety and despair that I feel I can't control otherwise" (Brown, Comtois, & Linehan, 2002; Shearer, 1994). Haines and colleagues (1995), utilizing personalized imagery scripts, found evidence for a tension-reduction hypothesis within a mixed forensic sample, supported by both subjective (e.g., self-report) and psychophysiological measurement (e.g., decreases in heart rate and skin conductance). Similar findings have been reported in general inpatient samples (e.g., individuals with diagnoses other than BPD; Briere & Gil, 1998), non-clinical adult samples (Herpertz, 1995; Osuch, Noll, & Putnam, 1999), and adolescents

(Nock & Prinstein, 2004; Penn, Esposito, Schaeffer, Fritz, & Spirito, 2003). These data support a general tendency to regulate negative emotional states including anxiety, depression, and anger as the function of NSSI. Congruently, in Klonsky's (2007) review, every noted study that included a measure of affect-regulatory function of NSSI, regardless of gender or sample type (i.e., inpatient, outpatient, forensic, non-clinical), received empirical support for this function. Providing further support and clarification for the role of emotion regulation in the act of self-harm, Gratz and Roemer (2008) found, in a sample of college females, that a lack of emotional clarity and lack of emotion regulation strategies were particularly salient in acts of NSSI.

Self-punishment as motivation for NSSI behavior has received moderate empirical support as well. Linehan's (1993) biosocial theory provides a basis for consideration of self-punishment as a motivator, in that behaviors typical of individuals diagnosed with borderline personality disorder are likely to have developed, been maintained, and exacerbated in an invalidating environment. Reports of self-derogation in self-injurers (e.g., Herpertz et al., 1997; Klonsky et al., 2003) provide evidence for this function, suggesting that NSSI is a form of self-invalidation. Endorsement of self-punishing statements are variable, but have reached 80% in some studies (Briere & Gil, 1998, Laye-Gindhu & Schonert-Reichl, 2005; Nixon, Cloutier, & Aggarwal, 2002). Klonsky (2007) reported that in young adults with a history of skin-cutting, affect regulation functions of NSSI were rated as primary motivation, while self-punishment was endorsed as a secondary motivation.

The anti-dissociation model was proposed by Gunderson (1984) and posits that an individual engages in NSSI to interrupt periods of dissociation or depersonalization. Gunderson (1984) proposed that sensations of physical injury shock the system and may generate certain types of affect to disrupt potential feelings of numbness. Empirical support for this theory has

been less robust than for other models of NSSI motivation, with endorsement ranging from 7% (Shearer, 1994) up to over 50% (Brown et al., 2002) in inpatient samples of women diagnosed with borderline personality disorder. Findings within forensic samples have been mixed, with some investigators finding strong support for anti-dissociation (men and women; Penn et al., 2003), while other findings have been weaker (in women; Wilkins & Coid, 1991). Similarly, the anti-suicide function of NSSI was postulated by Suyemoto (1998) as an attempt to thwart urges to commit suicide. Few studies have empirically investigated the anti-suicide function of NSSI, however, endorsement of a function to prevent one from killing himself or herself was endorsed by nearly 50% of self-harming adolescents in several studies (Laye-Gindhu & Schonert-Reichl, 2005; Nixon et al., 2002).

Several researchers have suggested that NSSI serves to influence others in a manner that would be favorable to the patient (Allen, 1995). Examples of this interpersonal-influence function of NSSI may include avoiding abandonment, seeking reassurance from others, or eliciting desired and reinforcing responses from other individuals, including authority figures within correctional facilities. Allen (1995) and Dear, Thomson, and Hills (2000) noted that this is often presumed to be the function, particularly within mental health care facilities where providers are apt to label such behavior "attention-seeking or "manipulative." The argument that an individual may engage in NSSI without suicidal intent in an attempt to attain a goal such as avoiding duty or avoiding punishment was first introduced in the military literature (Tucker & Gorman, 1967) as soldiers would harm themselves to avoid active military duty.

Although debate ensued over whether or not an individual would engage in NSSI solely as a means to influence others, evidence suggests that threats or gestures of self-harm are made for purposes of communication which, in and of itself, can serve as secondary gain (Nock,

Holmberg, Photos, & Michel, 2007). Qualitative reports of NSSI that serves an interpersonal influence function have been published (e.g., Jeglic, Vanderhoff, & Donovick, 2005), but these have not been subjected to quantitative empirical examination. Jeglic and colleagues (2005) suggested that secondary gain, otherwise viewed as problem-solving behavior within the prison system, may comprise a desire to exchange housing placements within or between facilities, convince others that discipline problems are psychologically-related resulting in diminished punitive consequences, or to intimidate corrections staff. Despite endorsement of secondary gain as motivation for NSSI, Dear and colleagues (2000) determined that self-injurious behavior was frequently of moderate severity; nonetheless, differentiation of self-injurious behavior with and without suicidal ideation or intent was not established by these authors.

The NSSI functions with the least empirical support are affirmation of interpersonal boundaries and sensation-seeking (Klonsky, 2007). The first function stems from psychoanalytic object-relations theory and posits that NSSI results from insecure attachment and serves to affirm the boundaries between the self and others, thereby asserting identity and autonomy (Friedman, Glasser, Laufer, Laufer, & Wohl, 1972). This function appears more hypothetical in nature and, to date, has received little empirical support; it has been evaluated mostly in inpatient, female samples, with individuals endorsing attempts to maintain "ownership of body" via NSSI (Briere & Gil, 1998; Shearer, 1994). Sensation-seeking as a function of NSSI lacks both strong theoretical or empirical foundation. Proponents have argued that NSSI may serve to generate excitement and exhilaration akin to other risky behaviors, such as sky-diving or bungee-jumping. Sensation-seeking has not been examined in a forensic setting, and has exhibited only modest rates of endorsement (e.g., ranging from 0 – 10%) in clinical samples of women diagnosed with

borderline personality disorder and non-clinical populations of youth who engage in NSSI (Klonsky, 2007).

**The Present Study**

The present study sought to understand the functionality of NSSI in a sample of incarcerated men. With regard to NSSI, men are a significantly understudied population. Even in studies of incarcerated individuals, NSSI or other self-injurious behavior is studied in females significantly more than in their male counterparts. The study of NSSI is particularly important in incarcerated populations as prevalence rates have been reported as high as 50% in the context of poorly trained mental health and general staff, and scarce resources available to effectively manage the behavior. Individuals within the prison system exhibit high rates of psychopathology, a greater likelihood for decompensation given the stressors present with their environment, and an arguably stronger motivation to seek secondary gain owing to the unique environmental context of incarceration. Additionally, previous studies of NSSI have been confounded by varied conceptualizations of self-injurious behavior, coupled with a failure to recognize NSSI and suicidal behavior as distinct behaviors. Moreover, no study has examined the many functions of NSSI jointly and systematically in this population. Therefore, the purpose of this study was to identify function-specific markers of groups of male inmates to better understand etiological factors in NSSI and to predict its occurrence. With a better understanding of the function of NSSI and associated personality characteristics, mental health care providers can more accurately construct and tailor treatment for the affected inmate.

**Hypotheses**

First, as demonstrated in the extant literature, we hypothesized that functions of an automatic nature would be most frequently endorsed as motivators of NSSI (Klonsky, 2007;

Klonsky & Glenn, 2008; Nock & Prinstein 2004). Second, we hypothesized that distinct clusters of individuals who engage in NSSI could be identified on the basis of function of NSSI as has been demonstrated within a college sample of self-injurers (see Klonsky & Olino, 2008). As no comprehensive, qualitative study has yet elucidated the relationship between all functions of NSSI and self-harm in a sample of incarcerated men, our hypotheses regarding the nature of the clusters were exploratory in nature. We hypothesized that these clusters would differ meaningfully from one another on measures of personality and environmental experiences.

Bearing the novelty in our approach and given previously documented correlations of NSSI with emotion dysregulation (Gratz & Roemer, 2008; Klonsky, 2007), we hypothesized that individuals who endorse greater emotion dysregulation, a symptom characteristic of borderline personality disorder, would show elevations in endorsement of automatic functions of NSSI, specifically the affect regulation function, compared to other groups of self-injuring inmates. It follows that these individuals would also report greater levels of affective distress and would be more likely to report histories of childhood abuse and neglect. Furthermore, we hypothesized that another cluster group would be differentiated by greater endorsement of social functions of NSSI. Social functions such as interpersonal influence, particularly of a negative nature (e.g., to avoid punishment or undesirable housing assignments), was posited to relate to increased psychopathy and related constructs. Finally, following literature suggesting that impulsivity can distinguish self-injurers from non-self-injurers (Glenn & Klonsky, 2010), we hypothesized that impulsivity would be positively associated with NSSI and that specific facets may differentially predict cluster membership.

# CHAPTER 2

# METHOD

## Participants

Initially, 201 inmates responded to flyers soliciting participants for the study. Once contacted, 52 inmates indicated that they were no longer interested in participating or failed to present for sessions. Inmates were scheduled three times for each session before being excluded from further scheduling. Additionally, 18 inmates completed the literacy screen and signed the informed consent but failed to present for the questionnaire session. Twenty-one inmates presented for the literacy screen but were excluded due to an inability to read or for meeting criteria for exclusion (e.g., diagnosis of mental retardation or schizophrenia). Fifteen inmates were excluded because they were no longer at Baldwin State Prison or were on job details that prevented them from attending the study sessions. Therefore, the sample was reduced to 95 adult male inmates. Four inmates were excluded from further analyses due to invalid responses on the ISAS, resulting in 91 inmates being included in the final sample.

Inmates included in the final sample ranged in age from 18 to 63 (Mean = 35.5). Self-identified racial/ethnic composition was as follows: 46.2% White/Caucasian, 41.1% Black/African American, 4.2% American Indian, 3.2% Hispanic/Latino, 5.3% Other. A majority of the sample indicated that they were currently receiving mental health services at the prison (68.4%). Relationship status was primarily single, never married (56.8%). Education levels were reported as follows: 2.1% reported having less than seven years of schooling, 38.9% reported some high school education, 23.2% were high school graduates, 26.3% reported some college or

vocational training, 2.1% were graduates of four-year colleges, and 2.1% had received graduate or professional training.

**Clustering Variables**

**Inventory of Statements about Self-Injury** (ISAS). The ISAS (Klonsky & Glenn, 2009) was developed as an expansion of Klonsky's literature review (2007) in which he identified possible functions of NSSI. The ISAS initially assesses the lifetime count of 12 self-harm behaviors, (e.g., cutting, burning, scratching, hitting self). Following this, the functions of NSSI are assessed via 40 statements that are rated by the individual as not relevant, somewhat relevant, or very relevant. These functions fall into two categories - social and automatic. The functions include affect-regulation, anti-dissociation, anti-suicide, autonomy, interpersonal influence, interpersonal boundaries, marking distress, peer bonding, revenge, self-care, self-punishment, toughness, and sensation-seeking. NSSI of an automatic nature is descriptive of intrapersonal processes, and according to a recent exploratory factor analysis (Klonsky & Glenn, 2008), comprise the affect-regulation, anti-dissociation, anti-suicide, marking distress and self-punishment functions. NSSI of a social nature comprises the functions of autonomy, interpersonal influence, interpersonal boundaries, peer bonding, revenge, sensation-seeking and toughness. Coefficient alpha in the current sample for the endorsement of NSSI type was *.72*, for the functions of NSSI reliability was *.96*.

**External Validation Variables**

**Demographic Information**. Demographic data including age, gender, and ethnicity, were assessed. Information pertinent to the individual's incarceration was also collected, including disciplinary reports and whether or not the inmate is on the mental health caseload.

**Childhood Trauma Questionnaire – Short Form** (CTQ). The CTQ (Bernstein et al., 2003) requires participants to rate the frequency with which they encountered stressful or traumatic experiences during childhood, including physical, emotional, and sexual abuse. Reliability within the current sample was *.92*.

**Dirty Dozen**. The Dirty Dozen (Jonason & Webster, 2010) is a brief measurement of narcissism, psychopathy, and Machiavellianism based on the conceptualization of the "dark triad" by Paulhus and Williams (2002). According to these researchers, the dark triad consists of "overlapping, but distinct" construct. As a composite, the dark triad together represents a social strategy which serves to avoid punishment and maximize gain (Jonason, Li, Webster, & Schmitt, 2009). The Dirty Dozen scale was derived from three widely used measures of dark triad constructs, the Narcissistic Personality Inventory (Raskin & Terry, 1998), the Self-Report Psychopathy Scale – III (Paulhus, Hemphill, & Hare, in press) and the Mach IV (Christie & Geis, 1970). The current coefficient alpha for the dirty dozen was *.84*.

**Patient–Reported Outcomes Measurement Information System: Emotional Distress** (PROMIS). The PROMIS scales (Pilkonis et al., 2011**)** scales measure an individual's experience of emotional distress separately across three domains – depression anxiety, and anger -- over the past seven days. Responses range from "1" (not at all) to "5" (very much). Coefficient alpha for the subscales were as follows: anger - *.90,* anxiety – *.91,* depression - *.95*.

**McLean Scale**. The McLean Scale (Zanarini et al., 2003) measures symptomatology characteristic of individuals with borderline personality disorder as described within the DSM-IV-TR (American Psychological Association, 1994). The questions are consistent with the characterization of borderline personality disorder as characterized by affective instability, difficulties with anger, chaotic relationships, and identity disturbance. The question regarding

previous self-harm was not included to provide a clearer picture of symptomatology outside of NSSI. Coefficient alpha for the McLean scale was *.81*.

**UPPS Impulsive Behavior Scale**. The UPPS Impulsive Behavior Scale (Whiteside & Lynam, 2001) is a 59-item self-report measure designed to assess four impulsivity-related traits. The facets comprise *Urgency* (difficulty controlling urges or craving when experiencing emotion), *Lack of Premeditation* (difficulty to consider potential consequences prior to acting), *Lack of Perseverance* (difficulty to persist in the face of boredom or fatigue) and *Sensation Seeking* (differences in interest and enjoyment to engage in behaviors that involve danger and novelty). The reliability of the *Urgency*, *Lack of Premeditation*, *Lack of Perseverance*, and *Sensation Seeking* were .89, .84, .74., and .80, respectively.

**Procedure**

Recruitment involved placing fliers advertising the study in each dormitory in the prison. Study advertisements informed the inmates that the study was investigating the relationship between personality and behavior with the ultimate goal of better informing both prevention and intervention efforts within the prison system. To facilitate recruitment, a large envelope was posted in each dorm to serve as a drop-box for the inmates to place their names on a sheet of paper. The inmates were also notified that they could contact their counselor directly or through institutional mail to indicate interest to participate in the study. The researcher then collected the names and met individually with inmates to review and sign the consent form and perform a literacy screen. The literacy screen required reading aloud a text description of the study. This screen was performed to determine whether the inmate could speak and understand English, and whether or not he would complete the questionnaires during a standardized procedure (e.g., standard paper and pencil administration with minimal assistance) or in a session in which the

questions were read aloud individually. To avoid stigmatizing individuals with lower levels of literacy, the screen was administered prior to the questionnaire session. Both general population inmates and inmates currently receiving mental health services were eligible to participate in the study. Once individuals completed the literacy screen and provided informed consent, they were scheduled for a session in which they completed the questionnaires via paper and pencil. Participants with reading difficulties identified during the literacy screen were scheduled for separate assessment sessions in which the researcher read aloud each questionnaire item. The researchers were present throughout each testing session to answer questions and ensure that the protocol was properly followed.

# CHAPTER 3

# RESULTS

## Prevalence and Nature of NSSI

Lifetime prevalence for any act of NSSI was endorsed by 65% of the sample. Of those who endorsed any episode of NSSI, over 50% reported that they cut themselves, providing evidence that this is the most frequent type of self-injurious behavior. Approximately one third of self-injuring inmates reported banging a body part and intentionally interfering with wound healing. There was significant variability among inmates who endorsed NSSI. Most inmates reported using more than one form of NSSI, with different types endorsed ranging from 1 to 10, *Mean* = 3.2, *SD* = 2.19. Total count for NSSI behavior ranged in frequency from 1 to over 1,000, *Mean* = 138.0, *SD* = 264.31. Skewness and kurtosis values for NSSI total indicated that the variable was non-normally distributed, NSSI total skewness = 3.26, kurtosis = 10.38. Therefore, NSSI total was log-transformed for all analyses except for the cluster analysis, when scores were standardized. Following log transformations, values of skewness and kurtosis for NSSI total were .53 and -.89, respectively.

As seen in Table 1, a differential pattern of correlations emerged when function of NSSI were examined. Automatic functions were positively correlated with both overall frequency and type total at $p < .01$. Social functions of NSSI were correlated with both NSSI variables as well, but to a lesser degree of significance ($p < .05$) with regard to overall frequency. A paired samples t-test was computed to examine endorsement of automatic versus social functions of NSSI. Results indicated that automatic functions (*M* = 2.3, *SD* = 1.66) were endorsed with significantly

greater frequency than social functions ($M$ = 1.5, $SD$ = 1.30) of NSSI, $t$ (59) = 5.14, $p$ < .001. Overall correlations between NSSI variables, including total frequency, type count, and functions of NSSI and external validation variables are presented in Table 2. NSSI variables demonstrated consistent correlations with a history of traumatic events experienced during childhood. Moreover, affective measures, including negative urgency, symptoms of BPD, and increased anger, depression, and anxiety reliably demonstrated positive correlations with NSSI variables.

**Model-Based Cluster Analysis**

To differentiate subtypes of individuals, a model-based cluster analysis was performed. Model-based cluster analysis has been applied to a number of clinical phenomena to accurately identify subtypes, including substance use, aggression, and psychopathy in adolescents and young adults (Hicks, Markon, Patrick, Krueger, & Newman, 2004; Hicks, Vaidyanathan, & Patrick, 2010; Mun, Windle, & Schainker, 2008; Skeem, Johansson, Andershed, Kerr, & Louden, 2007). Pertinently, the MCLUST program, developed for R statistical software by Fraley and Raftery (2006), is based on a clustering approach which utilizes probability distributions to identify the most appropriate identification of subtypes (Banfield & Raftery, 1993). Model-based cluster analyses are viewed as superior to traditional clustering approaches such as hierarchical and k-means clustering in that the model-based approach does not require an a priori number of groups to be specified, does not produce different cluster classifications from the same dataset, does not impose a solution on data that do not actually have a cluster structure (e.g., will reflect a one-dimensional solution if it is most appropriate), and provides a statistic calculation of the goodness-of-fit for cluster solutions (Aldenderfer & Blashfield, 1978). This goodness-of-fit statistic, known as the Bayesian Information Criterion (BIC), takes into consideration the following factors: 1) non-normal distribution of clusters, 2) clusters that differ

with regard to structure, orientation, size, and shape, and 3) "noise" in the data (Banfield & Raftery, 1993).

Only inmates who endorsed any lifetime act of NSSI were included in the cluster analysis. Similar to Klonsky and Olino (2008), standardized scores from the ISAS, represented as total NSSI, a count of all endorsed types of NSSI, and summed scores for automatic and social functions of NSSI were entered into the analysis. To determine the most appropriate number of clusters, the BIC for each model was examined and the highest BIC value (e.g., least negative BIC) was selected. The best-fitting model (BIC = - 477.01) indicated a 4-factor solution diagonal in shape with varying volume. Due to BIC value, this model was retained over a 2-factor solution (BIC = - 485.09). Standardized scores for each of the cluster-defining variables are depicted in Figure 1. Means and standard deviations for each of the clusters are displayed in Table 3.

The next analyses were performed to examine differences among the clusters on cluster-defining (e.g., NSSI) variables. A series of one-way ANOVAs were performed to elucidate differences amongst self-harming groups identified within the cluster analysis (see Table 4). To control for Type I error, a *p*-value of .01 was considered to be significant. With regard to frequency total of NSSI, Cluster Four was significantly higher than all other groups, while Cluster One was significantly higher than Clusters Two and Three, which did not differ from each other. In comparing endorsement of different types of NSSI, a similar pattern emerged. Cluster Four was significantly higher on type count than all other clusters. Cluster One was significantly higher than Clusters Two and Three. .

One-way ANOVAs were then performed to analyze differences amongst clusters with regard to function. As seen in Table 4, endorsement of social functions of NSSI, Cluster Two

obtained the highest value, which was significantly higher than all other clusters. Clusters One and Four did not differ significantly from each other, but were still higher than endorsement of social functions for Cluster Three. Results of automatic functions of NSSI were less variable. Clusters One, Two, and Four were all significantly higher than Cluster Three but otherwise did not differ from one another. Taken together, these findings indicate that the clusters differ from one another in meaningful ways. Cluster Four demonstrated the greatest endorsement of both frequency and type of NSSI behavior and therefore will be referred to as the "High Risk" group. Cluster One also demonstrated elevated NSSI behavior compared to clusters Two and Three, but did not differ with regard to function of NSSI. Cluster One is best characterized as a "Medium Risk" group. Cluster Two endorsed fewer NSSI behaviors compared to the High Risk and Medium Risk clusters. Of interest, Cluster Two endorsed significantly greater social functions and will therefore be referred to as "Social NSSI." Finally, Cluster Three was reliably diminished in responses to NSSI variables. Given these consistent findings, Cluster Three will be referred to as "Low Risk NSSI."

**External Validation of Clusters**

Next, a series of one-way ANOVAs were performed to examine differences across the clusters on environmental and personality variables. Group membership was determined based on the cluster analysis, utilizing inmates who denied any history of NSSI as a comparison sample (N = 31), herein referred to as the Non-NSSI Comparison Group. This resulted in the comparison of five groups. Post hoc analyses were performed and $p < .01$ was interpreted as significant. Effect sizes were calculated using partial eta-squared. Means and standard deviations on external validation clusters for each of the NSSI groups and the Non-NSSI Comparison group are presented in Table 5.

Histories of abuse were elevated within the Medium Risk, Social, and High Risk NSSI groups compared to the Non-NSSI Comparison Group (see Table 5). Rates of childhood abuse and neglect between the Low Risk NSSI and Non-NSSI Comparison Group were comparable. Although groups were differentiable based on the CTQ-SF, symptoms of Borderline Personality Disorder (BPD) as measured via the McLean Scale was the most powerful predictor of NSSI (partial $\eta^2 = .37$). Three of the four self-injuring groups, specifically High Risk, Medium Risk, and Social NSSI groups were significantly higher than the Non-NSSI Comparison group. The Low Risk group was lower on BPD symptoms compared to the other three NSSI groups. No BPD symptomatology differences between the Low Risk group and Non-NSSI Comparison group were found.

The PROMIS Scales provided further information for the role of emotion (and potential dysregulation) in the use of NSSI. The PROMIS Anger, Depression, and Anxiety scales demonstrated similar results for each of the three emotions as seen in Table 5. Across all three scales, the Non-NSSI Comparison group was significantly lowest in reports of anger, depression, and anxiety reportedly experienced within the previous week. The High Risk, Medium Risk, and Social NSSI groups reported greater anger than the Low Risk or Non-NSSI Comparison group. Results were similar for reports of depression and anxiety. The Medium Risk and Social NSSI groups reported greater levels of depression and anxiety than the Non-NSSI Comparison group. The High and Low Risk groups did not differ from the Medium Risk and Social NSSI groups or from the Non-NSSI Comparison group. The Low Risk group was, however, elevated in comparison to the Non-NSSI Comparison group and High Risk group in report of anxiety.

Scores on the Dirty Dozen, the measure of psychopathy, narcissism, and Machiavellianism did not differ among any of the groups, including the Non-NSSI Comparison

Group, as seen in Table 5. Relatedly, on the UPPS measure of impulsivity, few differences were found among groups. Only responses on two subscales, Negative Urgency and Perseverance, indicated group differences. Higher scores on the Negative Urgency subscale, indicating greater propensity to act impulsively when distressed, differentiated all NSSI groups (Low Risk, Medium Risk, Social NSSI, and High Risk) from the Non-NSSI Comparison group. NSSI groups, however, were mutually indistinguishable on the basis of scores on the Negative Urgency subscale. The Medium Risk group reported greater difficulty persisting when bored or fatigued via the Perseverance subscale in relation to inmates belonging to the Social NSSI and Non-NSSI Comparison Groups. As seen in Table 5, no differences were found among any of the groups on the UPPS Premeditation and Sensation Seeking scales.

Finally, as seen in Table 5, the only difference among the groups with regard to disciplinary report history related to acts of physical aggression. The High Risk group had received significantly more disciplinary reports for physical aggression compared to other NSSI groups and the Non-NSSI Comparison group. No group differences were found for disciplinary reports due to verbal aggression or non-aggressive acts (e.g., theft, failure to follow instructions).

# CHAPTER 4

# DISCUSSION

This represents the first study to systematically examine group similarities and differences with regard to the functionality of NSSI in a sample of 95 incarcerated men. Clusters of inmates were identified based on histories of NSSI, environmental correlates, and personality measures. Historically, NSSI has been less frequently studied in men, and even less research has examined the context of NSSI during incarceration. This dearth of research is most problematic given the high prevalence of NSSI, stressful nature of incarceration, and unique system of reinforcement and punishment within this environment. Until recently, studies of NSSI were predominated by female samples; an awareness of both similarities and differences in self-harming men and women is needed to understand and inform intervention (Andover, Primack, Gibb, & Pepper, 2010). Quite notably, over half of the sample reported a history of NSSI behavior, demonstrating that NSSI, even when studied independent of suicidal self-injury, is indeed a common behavior within this population (Gray et al., 2003).

Before examining group differences, it is important to clarify the variables that demonstrated robust relationships with NSSI, independent of cluster group. Consistent with previous studies, prevalence of traits of borderline personality disorder, experience of neglect and abuse during childhood and adolescence, and negative urgency emerged as powerful predictors of NSSI (Boudewyn & Liem, 1995; Briere & Gil, 1998, Glenn & Klonsky, 2010; Gratz, 2003). Greater reports of anger, anxiety, and depression were also clearly elevated in self-injuring groups relative to the Non-NSSI Comparison Group. This replicates recent findings of

increased negative affect within individuals who are engaging in NSSI (Baetens et al., 2011). Research suggests that the experience of negative affect is already elevated for incarcerated individuals due to unique environmental stressors (e.g., lack of personal security or autonomy, increased risk for violence or assault; Blaauw et al., 1998). Consequently, higher rates of BPD diagnoses in incarcerated women (see Black et al, 2007) should not preclude consideration of these traits in men. Indeed, functions of an automatic nature such as affect regulation were endorsed more frequently than social functions. The elevation of automatic relative to social functions is consistent with previous findings (Klonsky, 2007; Klonsky & Glenn, 2008; Nock & Prinstein 2004). Finally, use of more types of NSSI (e.g., cutting, banging) was more predictive of psychopathology then overall frequency of NSSI. It appears that individuals in greater need of relief from psychological distress may resort to more varied and destructive forms of self-injury to minimize suffering in the short-term.

While a majority of the sample did report a history of NSSI, there were meaningful distinctions on measures of NSSI, environment, and personality. As hypothesized, these groups of inmates could be differentiated from one another on multiple measures, especially type and frequency of NSSI. Group differences were also found, albeit less pronounced, based on environmental and personality variables. However, the clusters also shared a great deal of overlap, and some variables that were hypothesized to differentiate groups did not contribute to the variance. The differences were most pronounced when comparing the self-injuring groups from the non-self-injuring group. Inmates in the Non-NSSI Comparison group reliably reported less psychopathology overall. This group reported fewer episodes of neglectful or abusive behavior experienced as a child or adolescent, fewer symptoms of BPD, less negative urgency, and less anger, anxiety, and depression. Contrary to hypotheses, the Non-NSSI Comparison

Group did not differ from any of the other groups on psychopathy, narcissism, and Machiavellianism, nor in number of disciplinary reports, regardless of type.

Of the NSSI groups, the Low Risk group reported similarly reduced levels of psychopathology despite endorsing a history of NSSI. Individuals belonging to this cluster reported fewer total episodes of NSSI and fewer types of NSSI than the other clusters of inmates. This cluster was also markedly lower on symptoms of BPD. This group, representing approximately one quarter of the self-injuring sample, most closely resembled that described by Klonsky and Olino in a sample of young adults (2008) as an "Experimental NSSI" group. Reports of self-injury were less frequent, less chronic, and less associated with more severe pathological difficulties.

The Medium Risk, Social NSSI, and High Risk NSSI groups were similar along a number of dimensions, and represented 33%, 30%, and 13% of the sample, respectively. Among the three groups, total amount of NSSI endorsed and type count of NSSI were similar, as well as environmental and personality variables. These groups endorsed similar levels of childhood neglect/abuse and more experiences of anger, depression, and anxiety. Relatedly, they reported greater endorsement of BPD traits. All three reported equal endorsement of automatic functions for NSSI; the main distinctions among the clusters were the significantly greater endorsement of NSSI for social functions by the Social NSSI group relative to all other groups and the elevated rates of NSSI within the High Risk group relative to all other groups. The High Risk group is arguably under-powered to make substantial comparisons; however, the significantly elevated NSSI behavior underscores a considerable increase in risk for future NSSI.

An absence of findings relative to personality trait measures is remarkable. Psychopathy and related constructs were elevated at similar levels within the entire sample, including inmates

who denied a history of NSSI. Behavioral indices of psychopathy measured via disciplinary reports within the current sample were similarly unable to differentiate groups. There are two plausible reasons for this. The first speculation is that, in contrast with anecdotal reports and some previous empirical data positing that NSSI behavior is driven by psychopathic motives to manipulate others (Young et al., 2006), such a relationship does not exist. This lack is consistent with data from Gray and colleagues (2003), who failed to find a relationship between self-harm and psychopathy. Conversely, it is possible that the measure of psychopathy used in the current sample was not sensitive enough to capture the multidimensional nature of psychopathy in sample that is elevated relative to the general population (Hare & McPherson, 1984). Social functions of NSSI such as interpersonal influence are consistent with conceptualizations of psychopathic behavior, but null correlations in the present study do not lend support for this speculation.

The relationship between facets of impulsivity and NSSI warrants further discussion. Clearly, negative urgency, or the likelihood to act without forethought when experiencing negative emotions, was a robust predictor of NSSI. This is consistent with findings from an undergraduate sample of young adults with histories of NSSI (Glenn & Klonsky, 2010). The only other group difference involved lack of Perseverance (inability to persist at a task until completion) in that the Social NSSI and Non-NSSI Comparison groups were less impulsive in this manner. That the Non-NSSI Comparison group would show reduced scores on Perseverance is intuitive, but the Social NSSI group requires further explication. Given the higher endorsement of social functions, NSSI within this group may function more to influence or bond with others rather than serve an intrapersonal function. Unlike individuals who self-injure for intrapersonal reasons that are unchanging, those who self-injure socially are arguably more

susceptible to environmental changes and, for this reason, may be less likely to continue with task-driven behavior. Relatedly, there was a significant correlation between endorsement of social functions of NSSI and sensation-seeking, suggesting that individuals who seek excitement may engage in behavior that is subject to social contagion such as NSSI (Hoffman & Kress, 2010).

This study, albeit novel, is limited in several ways. The sample is small and inmates who were receiving mental health services at the time of data collection were overrepresented within the sample. Participation in the study was entirely voluntary, but individuals who were experiencing greater difficulties may have been more motivated to participate and contribute to efforts to improve mental health services, resulting in an overestimation of prevalence of NSSI within the sample. Second, in an effort to obtain data as efficiently as possible while limiting fatigue in participants, shorter instruments were often selected over longer, more comprehensive instruments that have been validated within a forensic population. This is most apparent with the selection of the Dirty Dozen as the primary measure of psychopathy. The Dirty Dozen employs a 4-question approach to the measurement of psychopathy, a much briefer assessment than other measures of psychopathy. While the Dirty Dozen may be quite effective at capturing psychopathy within the general population, it is has only been validated with college samples (Jonason, Koening, & Tost, 2010; Jonason, Valentine, Li, & Harbeson, 2011; Jonason & Webster, 2010). Therefore, it is likely that the brief measure was insufficient in its ability to identify an adequate rang of variability within sample known to be elevated on psychopathy.

The study is also limited in scope. Present results are inconclusive as to the chronology of NSSI within the sample, as there was no data to indicate whether initiation of self-harm behavior occurred prior to or following incarceration. Regardless, the high prevalence of the

behavior suggests that it is likely that social contagion, including an awareness of the efficacy of NSSI as a means to avoid undesirable contingencies (e.g., obtains alternative housing placements, avoids being served disciplinary reports), may partially account for the frequency with which NSSI is observed in the prison population. Additional limitations of the study's scope pertain to the steadfast approach to the study of non-suicidal self-injury independent of suicidal self-injury. Therefore, the ability to inform understanding of suicidal behavior is absent. Joiner (2005) posited that NSSI may function as a precursor to suicidal behavior through desensitization to self-injurious behavior, and previous research has found that history of NSSI is predictive of future suicide attempts (Whitlock & Knox, 2007). It is possible that an examination of suicide attempts may have further differentiated this study's groups, as has been seen in previous research (see Klonsky & Olino, 2008).

The data analytic strategy has advantages and disadvantages. Model-based cluster analyses are useful in guiding research toward an understanding of more complex relationships than that offered through examination of main effects, but any method that reduces sample size through statistical group formation is limited. Similar analyses have been used effectively within other small samples (Lee, Salekin, Iselin, 2010; Mun, von Eye, Bates, & Vaschillo, 2008; Mun et al., 2008). Differentiation of the Low Risk NSSI group from the other groups was a major benefit of this analytic approach. While group differences are posited to represent different etiologies (Hicks et al., 2004), group size is variable and is data-driven. Within the current study, the creation of a High Risk NSSI group comprised of eight inmates limited power and generalizability. Further, this group demonstrated substantial overlap with the Medium Risk and Social NSSI groups, and may represent a shared etiology with slight differences in outcomes. While this group was successfully validated on the basis of NSSI cluster membership, the High

Risk NSSI, Medium Risk NSSI, and Social NSSI failed to demonstrate significant differences via the external validation process. The Low Risk NSSI group, however, was differentiable such that group members reported less psychopathology compared to the other NSSI groups. The lack of elevations on many of the measures of psychopathology within the Low Risk group may indicate a different etiological pathway to self-harm. Pertinently, Selby and colleagues (2011) identified a group of individuals with histories of NSSI wherein BPD traits were absent. This group provided the foundation for a proposal for an NSSI disorder within the DSM-V (Selby et al., 2011). It is plausible, then, that the Low Risk NSSI group may be characteristically more similar to the group identified in the Selby study than to the other three self-injuring groups, all of which were elevated on BPD traits relative to the Low Risk group. Whether representing separate etiologies or not, clear differences emerged between inmates with histories of NSSI and those without, but were less apparent within NSSI groups.

Present results clearly demonstrate that a 'one size fits all' approach to interventions for NSSI is likely to be ineffectual. This problematic behavior serves varied functions for different individuals in multiple contexts. Results of this study echo recommendations put forth by Klonsky and Olino (2008). First, clinicians should not assume that the presence or history of NSSI is necessarily indicative of higher levels of psychopathology. Assuming that NSSI is always predictive of significant risk and fatality (Fortune, 2006) is not consistent with the current findings, particularly data from the Low Risk NSSI group. Therefore, thorough assessments of functions following discovery of NSSI are likely to be more productive than rapid decision-making based on invalid clinical assumptions. Although this may be more costly with regard to initial time spent with the client, it is likely to be advantageous to clinicians and clients in the long-term. It may also reduce the financial burden associated with healthcare and prisoner

transportation that results from discovery of NSSI by prison staff when the behavior is assumed to be suicidal regardless of intent. Prison staff, particularly correctional officers who interact with inmates on a regular basis, may also benefit from additional training. While most officers endorse negative attitudes toward self-harming inmates and operate under the assumption that NSSI is always attention-seeking (Ireland & Quinn, 2007), it is possible that a brief educational intervention may facilitate improved communication between inmates and officers, resulting in quicker intervention and possible mitigation of NSSI behavior.

Second, there is a well-documented relationship between dysregulated emotion and NSSI (Gratz, 2007; Gratz & Roemer, 2004 Hasking et al., 2010; Muehlenkamp, Kerr, Bradley, & Larsen, 2010). This was confirmed within the current research, as automatic functions of NSSI were most frequently endorsed. Consequently, treatment targeting deficits in managing dysregulated emotions is needed. Notably, treatment efficacy may be hampered by the variance among inmates' backgrounds. On the one hand, there are inmates who may already possess skills that enable them to cope with emotions. These inmates are likely to benefit most from motivational interviewing approaches aimed at reducing ambivalence associated with maladaptive behavior. This may be more effectively accomplished through adjustment of environmental contingencies that reinforce adaptive behavior and punish maladaptive behavior (e.g., being written up for self-injurious behavior). On the other hand, other inmates may have encountered developmental experiences that limit their ability to learn to effectively and adaptively regulate emotions. Pertinently, two therapeutic approaches have evinced efficacy in reducing NSSI. The first approach attends to skill deficits through therapeutic strategies formulated by Linehan (2003) within a Dialectical Behavior Therapy framework. This approach delineates hierarchical treatment targets, including NSSI, in individual sessions. Individual

therapy is offered in conjunction with skills training in the areas of emotion regulation, mindfulness, distress tolerance, and emotion regulation. A second approach, drawing heavily from DBT and Acceptance-based work (Hayes, Strosahl, & Wilson, 1999) has been offered by Gratz (2007). This approach incorporates emotional awareness and acceptance within a group format. Both approaches have empirical support for effectiveness and their implementation within the forensic setting has the potential to reduce reliance upon NSSI as an affect regulatory strategy.

The prison offers a unique environment in which stimulus control can be achieved on a more widespread basis. The most prevalent form of NSSI in most samples, and clearly in this sample, was the act of cutting. Cutting is most often accomplished by using razor blades from razors that are freely distributed to inmates. Therefore, removal of disposable razors from correctional institutions would eliminate access to means, regardless of function of NSSI. With an appreciation for the relationship between negative urgency and NSSI, the removal of implements (or minimized access) may introduce a longer latency between ideation and action. Alternative shaving options could be considered, including electric razors and, for women, hair removal creams. While these alternatives carry disadvantages, the removal of razors would eliminate one source of threat of self-harm as well as harm to others when used as weapons, undoubtedly a major security threat. Stimulus control via razor removal would not preclude inmates from resorting to other means to cut themselves, especially those who perform the behavior for intrapersonal functions. Further, it would not prevent inmates from utilizing other forms of NSSI such as banging, burning, or ingesting dangerous chemicals. Other forms of NSSI are still problematic and minimizing or eliminating access to harsh chemicals, irons, or other heating tools may also be necessary. Certainly, research examining how the prevalence of

NSSI may be affected by the removal of a major stimulus and method for NSSI within the prison is warranted.

Undoubtedly, the consequences of NSSI are numerous, including physical harm, costs of healthcare and human resources, potential for suicidal escalation, and long-term maintenance of psychological distress. This study differentiated groups of incarcerated men who engage in NSSI, thus, helping to clarify a complex behavioral phenomenon. Significant differences emerged when examining NSSI, as well as when comparing groups on environmental and personality variables. It is clear that NSSI serves different functions, and that these functions need to be considered in order to provide the most effective treatment. Moreover, the sample was diverse with regard to race, ethnicity, age, and education and, as such, provides further evidence that this destructive behavior is present within individuals from different backgrounds. Although there may be environmental characteristics unique to this specific prison setting, it is likely that these results generalize to other forensic samples, particularly those with high prevalence of NSSI. By enabling a thorough understanding of the nature and function of NSSI within incarcerated men, it is hoped that proactive measures can be taken to minimize NSSI within the facility. Furthermore, it is hoped that reactions to NSSI within forensic settings are based in empirically supported therapeutic interventions undertaken to reduce the personal and societal burden of this deleterious behavior.

References

Aldenderfer, M., & Blashfield, R. (1978). Computer programs for performing hierarchical cluster analysis. *Applied Psychological Measurement, 2,* 405-413. doi:10.1177/014662167800200315

Allen, C. (1995). Helping with deliberate self-harm: Some practical guidelines. *Journal of Mental Health, 4,* 243-250. doi:10.1080/09638239550037523

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental Disorders (4th Ed, Text Revised).* Washington, DC: Author.

Andover, M. S., & Gibb, B. E. (2010). Non-suicidal self-injury, attempted suicide, and suicidal intent among psychiatric inpatients. *Psychiatry Research, 178,* 101-105. doi:10.1016/j.psychres.2010.03.019

Andover, M. S., Primack, J. M., Gibb, B. E., & Pepper, C. M. (2010). An examination of non-suicidal self-injury in men: Do men differ from women in basic NSSI characteristics?. *Archives of Suicide Research, 14,* 79-88. doi:10.1080/13811110903479086

Baetens, I., Claes, L., Willem, L., Muehlenkamp, J., & Bijttebier, P. (2011). The relationship between non-suicidal self-injury and temperament in male and female adolescents based on child- and parent-report. *Personality and Individual Differences, 50,* 527-530. doi:10.1016/j.paid.2010.11.015

Ball, J. D. (2009). Intergenerational transmission of abuse of incarcerated fathers: A study of the measurement of abuse. *Journal of Family Issues, 30,* 371-390. doi:10.1177/0192513X08326327

Banfield, J.D., & Raftery, A.E. (1993). Model-based Gaussian and non-Gaussian clustering. *Biometrics, 49,* 803-821. doi:10.2307/2532201

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., & ... Zule, W. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse & Neglect, 27*, 169-190. doi:10.1016/S0145-2134(02)00541-0

Blaauw, E., Kerkhof, A., & Vermunt, R. l. (1998). Psychopathology in police custody. *International Journal of Law and Psychiatry, 21*, 73-87. doi:10.1016/S0160-2527(97)00019-8

Black, D. W., Gunter, T., Allen, J., Blum, N., Arndt, S., Wenman, G., & Sieleni, B. (2007). Borderline personality disorder in male and female offenders newly committed to prison. *Comprehensive Psychiatry, 48,* 400-405. doi:10.1016/j.comppsych.2007.04.006

Boudewyn, A. C., & Liem, J. H. (1995). Childhood sexual abuse as a precursor to depression and self-destructive behavior in adulthood. *Journal of Traumatic Stress, 8,* 445-459. doi:10.1007/BF02102969

Briere, J., & Gil, E. (1998). Self-mutilation in clinical and general population samples: Prevalence, correlates, and functions. *American Journal of Orthopsychiatry, 68,* 609-620. doi:10.1037/h0080369

Brooker, C., & Gojkovic, D. (2009). The second national survey of mental health in-reach services in prisons. *Journal of Forensic Psychiatry & Psychology, 20*, S11-S28. doi:10.1080/14789940802638325

Brown, M. Z., Comtois, K. A., & Linehan, M. M. (2002). Reasons for suicide attempts and nonsuicidal self-injury in women with borderline personality disorder. *Journal of Abnormal Psychology, 111,* 198-202. doi:10.1037//0021-843X.111.1.198

Christie, R., & Geis, F. L. (1970). *Studies in Machiavellianism*. New York, NY: Academic Press.

Cleckley, H. (1941). *The mask of sanity; an attempt to reinterpret the so-called psychopathic personality*. Oxford England: Mosby.

Cuomo, C., Sarchiapone, M., Giannantonio, M., Mancini, M., & Roy, A. (2008). Aggression, impulsivity, personality traits, and childhood trauma of prisoners with substance abuse and addiction. *The American Journal of Drug and Alcohol Abuse, 34,* 339-345. doi:10.1080/00952990802010884

Dear, G. E., Thomson, D. M., & Hills, A. M. (2000). Self-harm in prison: Manipulators can also be suicide attempters. *Criminal Justice and Behavior, 27,* 160-175. doi:10.1177/0093854800027002002

Favazza, A. R., & Conterio, K. (1989). Female habitual self-mutilators. *Acta Psychiatrica Scandinavica, 79,* 283-289. doi:10.1111/j.1600-0447.1989.tb10259.x

Favazza, A. R. (2009). A cultural understanding of nonsuicidal self-injury. In M. Nock (Ed.) *Understanding nonsuicidal self-injury: Origins, assessment, and treatment.* (pp. 19-35). Washington, DC US: American Psychological Association. doi:10.1037/11875-002

Favazza, A. R., & Rosenthal, R. J. (1993). Diagnostic issues in self-mutilation. *Hospital & Community Psychiatry, 44,* 134-140. Retrieved from EBSCO*host*.

Fortune, S. A. (2006). An Examination of Cutting and Other Methods of DSH among Children and Adolescents Presenting to an Outpatient Psychiatric Clinic in New Zealand. *Clinical Child Psychology and Psychiatry, 11,* 407-416. doi:10.1177/1359104506064984

Fraley, C. and Raftery, A.E. (2006). MCLUST Version 3 for R: Normal Mixture Modeling and Model-Based Clustering. Technical Report no. 504, Department of Statistics, University of Washington.

Franklin, R. K. (1988). Deliberate self-harm: Self-injurious behavior within a correctional mental health population. *Criminal Justice and Behavior, 15*, 210-218. doi:10.1177/0093854888015002007

Friedman, M., Glasser, M., Laufer, E., Laufer, M. & Wohl, M. (1972). Attempted suicide and self-mutilation in adolescence: Some observations from a psychoanalytic research project. *International Journal of Psycho-Analysis, 53*, 179-183.

Fulwiler, C., Forbes, C., Santangelo, S. L., & Folstein, M. (1997). Self-mutilation and suicide attempt: Distinguishing features in prisoners. *Journal of the American Academy of Psychiatry and the Law, 25*, 69-77.

Glenn, C., & Klonsky, E. (2010). A multimethod analysis of impulsivity in nonsuicidal self-injury. *Personality Disorders: Theory, Research, and Treatment, 1*, 67-75. doi:10.1037/a0017427

Goss, J. R., Peterson, K., Smith, L. W., Kalb, K., & Brodey, B. B. (2002). Characteristics of suicide attempts in a large urban jail system with an established suicide prevention program. *Psychiatric Services, 53*, 574-579. doi:10.1176/appi.ps.53.5.574

Gostin, L. (2008). 'Old' and 'new' institutions for persons with mental illness: Treatment, punishment or preventive confinement? *Public Health, 122*, 906-913. doi:10.1016/j.puhe.2007.11.003

Gough, K., & Hawkins, A. (2000). Staff attitudes to self-harm and its management in a forensic psychiatric service. *The British Journal of Forensic Practice, 2,* 22-28. doi:10.1108/14636646200000030

Graff, H., & Mallin, R. (1967). The syndrome of the wrist cutter. *The American Journal of Psychiatry, 124*, 36-42.

Gratz, K. L. (2001). Measurement of deliberate self-harm: Preliminary data on the Deliberate Self-Harm Inventory. *Journal of Psychopathology and Behavioral Assessment, 23*, 253-263. doi:10.1023/A:1012779403943

Gratz, K. L. (2003). Risk factors for and functions of deliberate self-harm: An empirical and conceptual review. *Clinical Psychology: Science and Practice, 10,* 192-205. doi:10.1093/clipsy.bpg022

Gratz, K. L. (2007). Targeting emotion dysregulation in the treatment of self-injury. *Journal of Clinical Psychology, 63,* 1091-1103. doi:10.1002/jclp.20417

Gratz, K. L., Conrad, S. D., & Roemer, L. (2002). Risk factors for deliberate self-harm among college students. *American Journal of Orthopsychiatry, 72,* 128-140. doi:10.1037//0002-9432.72.1.128

Gratz, K. L., & Gunderson, J. G. (2006). Preliminary Data on Acceptance-Based Emotion Regulation Group Intervention for Deliberate Self-Harm Among Women with Borderline Personality Disorder. *Behavior Therapy, 37,* 25-35. doi:10.1016/j.beth.2005.03.002

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment, 26,* 41-54. doi:10.1023/B:JOBA.0000007455.08539.94

Gratz, K. L., & Roemer, L. (2008). The relationship between emotion dysregulation and deliberate self-harm among female undergraduate students at an urban commuter university. *Cognitive Behaviour Therapy, 37*, 14-25. doi:10.1080/16506070701819524

Gray, N. S., Hill, C., McGleish, A., Timmons, D., MacCulloch, M. J., & Snowden, R. J. (2003). Prediction of violence and self-harm in mentally disordered offenders: A prospective study of the efficacy of HCR-20, PCL-R, and psychiatric symptomatology. *Journal of Consulting and Clinical Psychology, 71*, 443-451. doi:10.1037/0022-006X.71.3.443

Gunderson, J. G. (1984). Borderline personality disorder. Washington, DC: American Psychiatric Press.

Haines, J., Williams, C., Brain, K., & Wilson, G. (1995). The psychophysiology of self-mutilation. *Journal of Abnormal Psychology, 104*, 471-489. doi:10.1037//0021-843X.104.3.471

Hare, R. D. (1991). *The Hare Psychopathy Checklist-Revised (PCL-R).*

Hare, R. D. (2003). *Manual for the Revised Psychopathy Checklist*.

Hare, R. D., & McPherson, L. M. (1984). Violent and aggressive behavior by criminal psychopaths. *International Journal of Law and Psychiatry, 7*, 35-50. doi:10.1016/0160-2527(84)90005-0

Harpur, T. J., Hakstian, A. R., & Hare, R. D. (1988). Factor structure of the Psychopathy Checklist. *Journal of Consulting and Clinical Psychology, 56*, 741-747. doi:10.1037//0022-006X.56.5.741

Hasking, P. A., Coric, S. J., Swannell, S., Martin, G., Thompson, H., & Frost, A. J. (2010). Brief report: Emotion regulation and coping as moderators in the relationship between

personality and self-injury. *Journal of Adolescence, 33,* 767-773. doi:10.1016/j.adolescence.2009.12.006

Haw, C., Hawton, K., Houston, K., & Townsend, E. (2001). Psychiatric and personality disorders in deliberate self-harm patients. *British Journal of Psychiatry, 178,* 48-54. doi:10.1192/bjp.178.1.48

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York, NY US: Guilford Press.

Herpertz, S. (1995). Self-injurious behaviour: Psychopathological and nosological characteristics in subtypes of self-injurers. *Acta Psychiatrica Scandinavica, 91,* 57-68. doi:10.1111/j.1600-0447.1995.tb09743.x

Herpertz, S., Sass, H., & Favazza, A. (1997). Impulsivity in self-mutilative behavior: Psychometric and biological findings. *Journal of Psychiatric Research, 31,* 451-465. doi:10.1016/S0022-3956(97)00004-6

Hicks, B. M., Markon, K. E., Patrick, C. J., Krueger, R. F., & Newman, J. P. (2004). Identifying Psychopathy Subtypes on the Basis of Personality Structure. *Psychological Assessment, 16,* 276-288. doi:10.1037/1040-3590.16.3.276

Hicks, B. M., Vaidyanathan, U., & Patrick, C. J. (2010). Validating female psychopathy subtypes: Differences in personality, antisocial and violent behavior, substance abuse, trauma, and mental health. *Personality Disorders: Theory, Research, and Treatment, 1,* 38-57. doi:10.1037/a0018135

Hoffman, R. M., & Kress, V. E. (2010). Adolescent nonsuicidal self-injury: Minimizing client and counselor risk and enhancing client care. *Journal of Mental Health Counseling, 32,* 342-347.

Human Rights Watch (2003). Ill-equipped: U.S. Prisons and Offenders with Mental Illness. New York: Human Rights Watch.

Ireland, J., & Archer, J. (2008). Impulsivity among adult prisoners: A confirmatory factor analysis study of the Barratt impulsivity scale. *Personality and Individual Differences, 45,* 286-292. doi:10.1016/j.paid.2008.04.012

Ireland, J. L., & Quinn, K. (2007). Officer attitudes towards adult male prisoners who self-harm: Development of an attitudinal measure and investigation of sex differences. *Aggressive Behavior, 33,* 63-72. doi:10.1002/ab.20168

Ivanoff, A. (1992). Background risk factors associated with parasuicide among male prison inmates. *Criminal Justice and Behavior, 19,* 426-436. doi:10.1177/0093854892019004006

Jeglic, E. L., Vanderhoff, H. A., & Donovick, P. J. (2005). The Function of Self-Harm Behavior in a Forensic Population. *International Journal of Offender Therapy and Comparative Criminology, 49,* 131-142. doi:10.1177/0306624X04271130

Johnson, R. J., Ross, M. W., Taylor, W. C., Williams, M. L., Carvajal, R. I., & Peters, R. J. (2006). Prevalence of childhood sexual abuse among incarcerated males in county jail. *Child Abuse & Neglect, 30,* 75-86. doi:10.1016/j.chiabu.2005.08.013

Joiner, T. (2005). *Why people die by suicide*. Cambridge, MA US: Harvard University Press.

Jonason, P. K., Koenig, B. L., & Tost, J. (2010). Living a fast life: The Dark Triad and life history theory. *Human Nature, 21,* 428-442. doi:10.1007/s12110-010-9102-4

Jonason, P. K., Li, N. P., Webster, G. D., & Schmitt, D. P. (2009). The dark triad: Facilitating a short-term mating strategy in men. *European Journal of Personality, 23,* 5-18. doi:10.1002/per.698

Jonason, P. K., Valentine, K. A., Li, N. P., & Harbeson, C. L. (2011). Mate-selection and the Dark Triad: Facilitating a short-term mating strategy and creating a volatile environment. *Personality and Individual Differences, 51,* 759-763. doi:10.1016/j.paid.2011.06.025

Jonason, P. K., & Webster, G. D. (2010). The dirty dozen: A concise measure of the dark triad. *Psychological Assessment, 22,* 420-432. doi:10.1037/a0019265

Kerkhof, A. J., & Bernasco, W. (1990). Suicidal behavior in jails and prisons in The Netherlands: Incidence, characteristics, and prevention. *Suicide and Life-Threatening Behavior, 20,* 123-137.

Klonsky, E. D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review, 27,* 226-239. doi:10.1016/j.cpr.2006.08.002

Klonsky, E. D., & Glenn, C. R. (2008). Resisting urges to self-injure. *Behavioural and Cognitive Psychotherapy, 36,* 211-220. doi:10.1017/S1352465808004128

Klonsky, E. D., & Glenn, C. R. (2009). Assessing the functions of non-suicidal self-injury: Psychometric properties of the Inventory of Statements About Self-injury (ISAS). *Journal of Psychopathology and Behavioral Assessment, 31,* 215-219. doi:10.1007/s10862-008-9107-z

Klonsky, E.D. & Moyer, A. (2008). Childhood sexual abuse and non-suicidal self-injury: Meta-analysis. *The British Journal of Psychiatry, 192,* 166-170. doi:10.1192/bjp.bp.106.030650

Klonsky, E.D. & Olino, T.M. (2008). Identifying clinically distinct subgroups of self-injurers among young adults: A latent class analysis. *Journal of Consulting and Clinical Psychology, 76,* 22-27. doi:10.1037/0022-006X.76.1.22

Klonsky, E. D., Oltmanns, T. F., & Turkheimer, E. (2003). Deliberate self-harm in a nonclinical population: Prevalence and psychological correlates. *The American Journal of Psychiatry, 160*, 1501-1508. doi:10.1176/appi.ajp.160.8.1501

Laye-Gindhu, A., & Schonert-Reichl, K. A. (2005). Nonsuicidal self-harm among community adolescents: Understanding the 'Whats' and 'Whys' of Self-Harm. *Journal of Youth and Adolescence, 34*, 447-457. doi:10.1007/s10964-005-7262-z

Lee, Z., Salekin, R. T., & Iselin, A. R. (2010). Psychopathic traits in youth: Is there evidence for primary and secondary subtypes?. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology, 38*, 381-393. doi:10.1007/s10802-009-9372-7

Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York, NY US: Guilford Press.

Lohner, J., & Konrad, N. (2006). Deliberate self-harm and suicide attempt in custody: Distinguishing features in male inmates' self-injurious behavior. *International Journal of Law and Psychiatry, 29*, 370-385. doi:10.1016/j.ijlp.2006.03.004

Lohner, J., & Konrad, N. (2007). Risk factors for self-injurious behaviour in custody: Problems of definition and prediction. *International Journal of Prisoner Health, 3*, 135-161. doi:10.1080/17449200701321654

Maden, A., Chamberlain, S., & Gunn, J. (2000). Deliberate self-harm in sentenced male prisoners in England and Wales: Some ethnic factors. *Criminal Behaviour and Mental Health, 10*, 199-204. doi:10.1002/cbm.357

McAllister, M., Creedy, D., Moyle, W., & Farrugia, C. (2002). Study of Queensland emergency department nurses' actions and formal and informal procedures for clients who self harm.

*International Journal of Nursing Practice, 8,* 184-190. doi:10.1046/j.1440-172X.2002.00359.x

McClellan, D. S., Farabee, D., & Crouch, B. M. (1997). Early victimization, drug use, and criminality: A comparison of male and female prisoners. *Criminal Justice and Behavior, 24*, 455-476. doi:10.1177/0093854897024004004

Meltzer, H., Jenkins, R., Singleton, N., Charlton, J., & Yar, M. (2003). Non-fatal suicidal behaviour among prisoners. *International Review of Psychiatry, 15*, 148-149. doi:10.1080/0954026021000046083

Morgan, H. G., Burns-Cox, C. J., Pocock, H., & Pottle, S. (1975). Deliberate self-harm: Clinical and socio-economic characteristics of 368 patients. *British Journal of Psychiatry, 127*, 564-574. doi:10.1192/bjp.127.6.564

Muehlenkamp, J. J. & Gutierrez, P. M. (2004). An Investigation of Differences Between Self-Injurious Behavior and Suicide Attempts in a Sample of Adolescents. *Suicide and Life-Threatening Behavior, 34,* 12-23. doi:10.1521/suli.34.1.12.27769

Muehlenkamp, J. J., Kerr, P. L., Bradley, A. R., & Larsen, M. (2010). Abuse subtypes and nonsuicidal self-injury: Preliminary evidence of complex emotion regulation patterns. *Journal of Nervous and Mental Disease, 198,* 258-263. doi:10.1097/NMD.0b013e3181d612ab

Mun, E., von Eye, A., Bates, M. E., & Vaschillo, E. G. (2008). Finding groups using model-based cluster analysis: Heterogeneous emotional self-regulatory processes and heavy alcohol use risk. *Developmental Psychology, 44,* 481-495. doi:10.1037/0012-1649.44.2.481

Mun, E. Y., Windle, M., & Schainker, L.M. (2008). A model-based cluster analysis approach to adolescent problem behaviors and young adult outcomes. *Development and Psychopathology, 20*, 291-318. doi:10.1017/S095457940800014X

Nixon, M. K., Cloutier, P. F., & Aggarwal, S. (2002). Affect regulation and addictive aspects of repetitive self-injury in hospitalized adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry, 41*, 1333-1341. doi:10.1097/00004583-200211000-00015

Nock, M. K. (2009). Why do people hurt themselves?: New insights into the nature and functions of self-injury. *Current Directions in Psychological Science, 18*, 78-83. doi:10.1111/j.1467-8721.2009.01613.x

Nock, M. K., Holmberg, E. B., Photos, V. I., & Michel, B. D. (2007). Self-Injurious Thoughts and Behaviors Interview: Development, reliability, and validity in an adolescent sample. *Psychological Assessment, 19*, 309-317. doi:10.1037/1040-3590.19.3.309

Nock, M., Joiner, T., Gordon, K., Lloyd-Richardson, E., & Prinstein, M. (2006). Non-suicidal self-injury among adolescents: Diagnostic correlates and relation to suicide attempts. *Psychiatry Research, 144*, 65-72. doi:10.1016/j.psychres.2006.05.010

Nock, M. K., & Prinstein, M. J. (2004). A functional approach to the assessment of self-mutilative behavior. *Journal of Consulting and Clinical Psychology, 72*, 885-890. doi:10.1037/0022-006X.72.5.885

Nock, M. K., & Prinstein, M. J. (2005). Contextual features and behavioral functions of self-mutilation among adolescents. *Journal of Abnormal Psychology, 114*, 140-146. doi:10.1037/0021-843X.114.1.140

Ogundipe, L. O. (1999). Suicide attempts versus deliberate self-harm. *British Journal of Psychiatry, 175*. doi:10.1192/bjp.175.1.90a

Osuch, E. A., Noll, J. G., & Putnam, F. W. (1999). The motivations for self-injury in psychiatric inpatients. *Psychiatry: Interpersonal and Biological Processes, 62,* 334-346.

Paivio, S. C., & McCulloch, C. R. (2004). Alexithymia as a mediator between childhood trauma and self-injurious behaviors. *Child Abuse & Neglect, 28*, 339-354. doi:10.1016/j.chiabu.2003.11.018

Paulhus, D. L., Hemphill, J., & Hare, R. (in press). *Manual for the Self-Report Psychopathy Scale (SRP–III)*. Toronto, Canada: Multi-Health Systems.

Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism and psychopathy. *Journal of Research in Personality, 36,* 556-563. doi:10.1016/S0092-6566(02)00505-6

Pattison, E. M., & Kahan, J. (1983). The deliberate self-harm syndrome. *The American Journal of Psychiatry, 140*, 867-872.

Penn, J. V., Esposito, C. L., Schaeffer, L. E., Fritz, G. K., & Spirito, A. (2003). Suicide attempts and self-mutilative behavior in a juvenile correctional facility. *Journal of the American Academy of Child & Adolescent Psychiatry, 42,* 762-769. doi:10.1097/01.CHI.0000046869.56865.46

Pilkonis, P. A., Choi, S. W., Reise, S. P., Stover, A. M., Riley, W. T., & Cella, D. (2011). Item banks for measuring emotional distress from the Patient-Reported Outcomes Measurement Information System (PROMIS): Depression, anxiety, and anger. *Assessment, 18,* 263-283. doi:10.1177/1073191111411667

Raskin, R. N., & Terry, H. (1988). A principal components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology, 54,* 890–902. doi:10.1037//0022-3514.54.5.890

Roskes, E., & Feldman, R. (1999). A collaborative community-based treatment program for offenders with mental illness. *Psychiatric Services, 50,* 1614-1619. doi:10.1023/A:1018790613585

Ross, S., & Heath, N. (2002). A study of the frequency of self-mutilation in a community sample of adolescents. *Journal of Youth and Adolescence, 31,* 67-77. doi:10.1023/A:1014089117419

Selby, E. A., Bender, T. W., Gordon, K. H., Nock, M. K., & Joiner, T. R. (2011). Non-suicidal self-injury (NSSI) disorder: A preliminary study. *Personality Disorders: Theory, Research, and Treatment, 3,* 167-175. doi:10.1037/a0024405

Shearer, S. L. (1994). Phenomenology of self-injury among inpatient women with boderline personality disorder. *Journal of Nervous and Mental Disease, 182,* 524-526.

Skeem, J., Johansson, P., Andershed, H., Kerr, M., & Louden, J. E. (2007). Two subtypes of psychopathic violent offenders that parallel primary and secondary variants. *Journal of Abnormal Psychology, 116,* 395-409. doi:10.1037/0021-843X.116.2.395

Soderstrom, I. (2007). Mental illness in offender populations: Prevalence, duty and implications. *Journal of Offender Rehabilitation, 45,* 1-17. doi:10.1300/J076v45n01_01

Suyemoto, K. L. (1998). The functions of self-mutilation. *Clinical Psychology Review, 18,* 531-554. doi:10.1016/S0272-7358(97)00105-0

Tantam, D., & Whittaker, J. (1992). Personality disorder and self-wounding. *British Journal of Psychiatry, 161,* 451-464. doi:10.1192/bjp.161.4.451

Tucker, G. J., & Gorman, E. R. (1967). The significance of the suicide gesture in the military. *The American Journal of Psychiatry, 123,* 854-861.

Verona, E., Sachs-Ericsson, N., & Joiner, T. E., Jr. (2004). Suicide Attempts Associated With Externalizing Psychopathology in an Epidemiological Sample. *The American Journal of Psychiatry, 161*, 444-451. doi:10.1176/appi.ajp.161.3.444

Wagner, A. W., Linehan, M. M. (1997). Biosocial perspective on the relationship of childhood sexual abuse, suicidal behavior, and borderline personality disorder. In M. Zanarani (Ed.) *Role of sexual abuse in the etiology of borderline personality disorder.* (pp. 203-223). Washington, DC US: American Psychiatric Association.

Weeks, R., & Widom, C. S. (1998). Self-reports of early childhood victimization among incarcerated adult male felons. *Journal of Interpersonal Violence, 13*, 346-361.

Whiteside, S., & Lynam, D. (2001). The Five Factor Model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences, 30*, 669-689. doi:10.1016/S0191-8869(00)00064-7

Whitlock, J., & Knox, K. L. (2009). Intervention and prevention in the community. In M. K. Nixon, N. L. Heath, M. K. Nixon, N. L. Heath (Eds.), *Self-injury in youth: The essential guide to assessment and intervention* (pp. 173-194). New York, NY US: Routledge/Taylor & Francis Group.

Whitlock, J., Purington, A., Gershkovich, M. (2009). Media, the Internet, and nonsuicidal self-injury. In M. Nock (Ed.) *Understanding nonsuicidal self-injury: Origins, assessment, and treatment.* (pp. 139-155). Washington, DC US: American Psychological Association. doi:10.1037/11875-008

Wilkins, J., & Coid, J. (1991). Self-mutilation in female remanded prisoners: I. An indicator of severe psychopathology. *Criminal Behaviour and Mental Health, 1*, 247-267.

Wilper, A. P., Woolhandler, S., Boyd, J. W., Lasser, K. E., McCormick, D., Bor, D. H., et al. (2009). The health and health care of US prisoners: Results of a nationwide survey. *American Journal of Public Health, 99,* 666-672. doi:10.2105/AJPH.2008.144279

Wolff, N., Blitz, C. L., & Shi, J. (2007). Rates of sexual victimization in prison for inmates with and without mental disorders. *Psychiatric Services, 58,* 1087-1094. doi:10.1176/appi.ps.58.8.1087

Wolff, N., Blitz, C. L., Shi, J., Siegel, J., & Bachman, R. (2007). Physical violence inside prisons: Rates of victimization. *Criminal Justice and Behavior, 34,* 588-599. doi:10.1177/0093854806296830

Wolff, N., & Shi, J. (2009). Contextualization of physical and sexual assault in male prisons: Incidents and their aftermath. *Journal of Correctional Health Care, 15,* 58-77. doi:10.1177/1078345808326622

Young, M. H., Justice, J. V., & Erdberg, P. (2006). Risk of harm: Inmates who harm themselves while in prison psychiatric treatment. *Journal of Forensic Sciences, 51,* 156-162. doi:10.1111/j.1556-4029.2005.00023.x

Zanarini, M. C., Vujanovic, A., Parachini, E. A., Boulanger, J. L., Frankenburg, F. R., & Hennen, J. (2003). A screening measure for BPD: The Mclean Screening Instrument for Borderline Personality Disorder (MSI-BPD). *Journal of Personality Disorders, 17,* 568-573. doi:10.1521/pedi.17.6.568.25355

Zoroglu, S. S., Tuzun, U., Sar, V., Tutkun, H., Savas, H. A., Ozturk, M., et al. (2003). Suicide attempt and self-mutilation among Turkish high school students in relation with abuse, neglect and dissociation. *Psychiatry and Clinical Neurosciences, 57,* 119-126. doi:10.1046/j.1440-1819.2003.01088.x

# APPENDIX A

## COPYRIGHTED INSTRUMENTS

**Childhood Trauma Questionnaire – Short Form** (CTQ)

| | |
|---|---|
| 1. As a child did you feel unwanted or emotionally neglected? | 0 1 2 3 4 |
| 2. Did your parents insult you or call you names? | 0 1 2 3 4 |
| 3. Were there traumatic or upsetting sexual experiences when you were a child or teenager that you couldn't speak to adults about? | 0 1 2 3 4 |
| 4. Did you ever think you wanted to leave your family and live with another family? | 0 1 2 3 4 |
| 5. As a child or teenager, did you feel disliked by either of your parents? | 0 1 2 3 4 |
| 6. As a child did you feel that your home was charged with the possibility of unpredictable physical violence? | 0 1 2 3 4 |
| 7. Did you feel safe living at home? | 0 1 2 3 4 |
| 8. Did your parents ever verbally lash out at you when you did not expect it? | 0 1 2 3 4 |
| 9. Did you have traumatic sexual experiences as a child or teenager? | 0 1 2 3 4 |
| 10. Did your parents yell at you? | 0 1 2 3 4 |
| 11. Did your parents ever hit or beat you when you did not expect it? | 0 1 2 3 4 |
| 12. Did your relationship with your parents ever involve a sexual experience? | 0 1 2 3 4 |
| 13. Were you physically mistreated as a child or teenager? | 0 1 2 3 4 |
| 14. Was your childhood stressful? | 0 1 2 3 4 |

# APPENDIX B

## TABLES AND FIGURES

Table 1. *Correlations among NSSI variables*

| | Type Total | Automatic | Social |
|---|---|---|---|
| NSSI Total | .86** | .54** | .25* |
| Type Total | | .52** | .32** |
| Automatic | | | .75** |

*Note: * p <.05, ** p <.01*

Table 2. *Correlations between NSSI and external validation variables*

| | DD | NU | Prem | Pers | SS | BPD | Anger | Dep | Anx | CTQ | PA | VA | NA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NSSI | .08 | .40** | .19 | .29** | .14 | .37** | .23* | .23* | .13 | .31** | .19 | -.07 | .05 |
| Type | .27 | .43** | .21* | .28** | .15 | .46** | .26* | .28** | .23** | .32** | .21* | -.03 | .10 |
| Auto | .14 | .52** | .16 | .18 | .13 | .53** | .41** | .42** | .37** | .50** | .15 | .04 | .01 |
| Social | .16 | .40** | -.11 | -.04 | .24* | .41** | .32** | .33** | .41** | .42** | .11 | .01 | -.06 |

*Note: * p <.05, ** p <.01.* Auto = Automatic NSSI functions, Social = Social NSSI functions, DD = Dirty Dozen Total, NU = UPPS Negative Urgency, Prem = UPPS Premeditation, Pers = UPPS Perseverance, SS = UPPS Sensation Seeking, BPD = McLean Scale, Anger = PROMIS Anger Scale, Dep = PROMIS Depression Scale, Anx = PROMIS Anxiety Scale, CTQ = Childhood Trauma Questionnaire, PA = Disciplinary Reports for Physical Aggression, VA = Disciplinary Reports for Verbal Aggression, NA = Disciplinary Reports for Non-Aggression

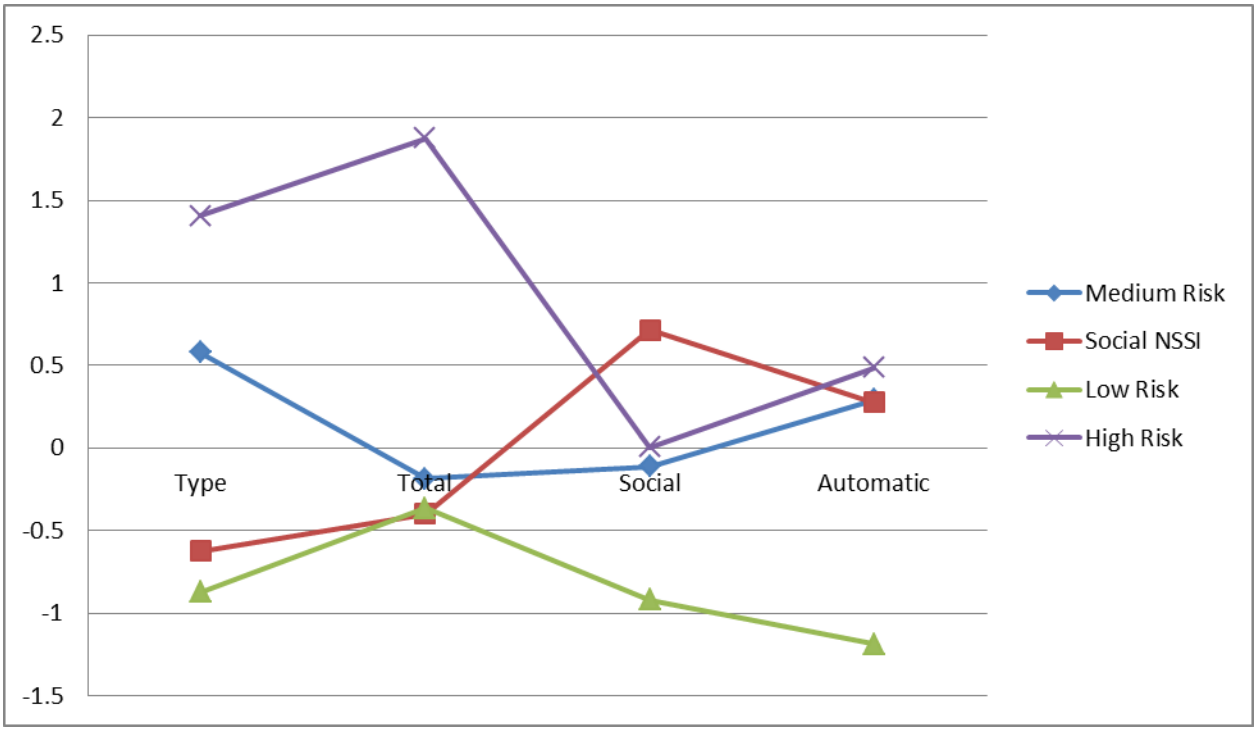


Figure 1. *Standardized scores on cluster-defining NSSI variables.*

Table 3. *Descriptive statistics for NSSI variables*

| Cluster | NSSI Type | | NSSI Total | | Automatic | | Social | |
|---|---|---|---|---|---|---|---|---|
| | Mean | *SD* | Mean | *SD* | Mean | *SD* | Mean | *SD* |
| 1 | 4.5 | *1.32* | 92.2 | *64.62* | 2.8 | *1.51* | 1.3 | *.71* |
| 2 | 1.9 | *.68* | 9.8 | *6.40* | 2.9 | *1.40* | 2.5 | *1.46* |
| 3 | 1.4 | *.50* | 20.6 | *34.68* | .3 | *.45* | .3 | *.40* |
| 4 | 6.5 | *2.45* | 725.8 | *320.04* | 3.1 | *1.40* | 1.4 | *1.27* |

Table 4. *Comparison of NSSI clusters on cluster-defining variables*

| | Cluster 1 (n = 20) | | Cluster 2 (n = 18) | | Cluster 3 (n = 14) | | Cluster 4 (n = 8) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | *SD* | Mean | *SD* | Mean | *SD* | Mean | *SD* | *F(3,56)* | *p* | $\eta^2$ |
| NSSI Total | 4.2[a] | *1.08* | 2.2[b] | *.74* | 2.1[b] | *1.40* | 6.5[c] | *.50* | *44.36* | *<.001* | *.71* |
| NSSI Type | 4.6[a] | *1.32* | 1.9[b] | *.68* | .1.4[b] | *.50* | 6.5[c] | *2.45* | *43.83* | *<.001* | *.70* |
| Automatic Functions | 2.8[a] | *1.51* | 2.9[a] | *1.40* | .34[b] | *.45* | 3.06[a] | *1.40* | *13.88* | *<.001* | *.43* |
| Social Functions | 1.3[a] | *.71* | 2.5[b] | *1.46* | .29[c] | *.40* | 1.4[a] | *1.27* | *12.52* | *<.001* | *.40* |

*Note:* Means with common superscripts do not differ from one another (*p <.01)*.

Table 5. *Comparison of NSSI clusters with Non-NSSI Comparison Group on external validation variables*

| | Medium Risk NSSI (n = 20) | | Social NSSI (n=18) | | Low Risk NSSI (n =14) | | High Risk NSSI (n=8) | | Non-NSSI Comparison (n=31) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | *SD* | Mean | *SD* | Mean | *SD* | Mean | *SD* | Mean | *SD* | *F(4,86)* | *p* | $\eta^2$ |
| CTQ | 31.7[a] | *15.26* | 33.1[a] | *14.10* | 20.2[b] | *15.70* | 30.1[a,b] | *15.50* | 17.3[b] | *13.23* | 5.31 | .001 | .20 |
| BPD | 6.8[a] | *1.78* | 6.4[a] | *1.97* | 4.7[b] | *2.67* | 7.0[a] | *2.00* | 3.8[b] | *2.43* | 8.50 | <.001 | .28 |
| DD | 32.2[a] | *9.44* | 32.6[a] | *10.07* | 29.9[a] | *9.34* | 32.4[a] | *11.10* | 29.5[a] | *10.01* | .45 | *ns* | .02 |
| NU | 36.4[a] | *6.51* | 34.8[a] | *5.78* | 32.4[a] | *7.55* | 34.9[a] | *8.32* | 25.8[b] | *6.64* | 9.81 | <.001 | .31 |
| Prem | 22.4[a] | *5.90* | 20.3[a] | *6.42* | 20.8[a] | *5.04* | 21.2[a] | *5.80* | 19.2[a] | *5.04* | 1.01 | *ns* | .05 |
| Pers | 20.7[a] | *5.00* | 17.4[b] | *4.59* | 19.5[a,b] | *2.63* | 18.5[a,b] | *5.46* | 18.2[b] | *4.40* | 3.84 | <.01 | .15 |
| SS | 35.7[a] | *6.53* | 33.5[a] | *9.12* | 30.7[a] | *6.85* | 33.3[a] | *5.68* | 31.9[a] | *7.51* | 1.17 | *ns* | .05 |
| Anger | 25.1[a] | *7.54* | 27.5[a] | *6.35* | 23.0[a,b] | *7.04* | 25.9[a] | *6.29* | 18.9[b] | *5.53* | 6.16 | <.001 | .22 |
| Depression | 25.6[a] | *9.49* | 23.9[a] | *6.07* | 21.8[a,b] | *8.89* | 21.5[a,b] | *10.60* | 16.6[b] | *7.82* | 4.27 | <.01 | .17 |
| Anxiety | 22.1[a] | *5.99* | 22.6[a] | *5.96* | 20.6[a] | *7.60* | 18.9[a,b] | *8.49* | 16.1[b] | *5.44* | 4.25 | <.01 | .17 |
| PA | .3[a,b] | *.57* | .8[a] | *.38* | 0.0[a] | *0.0* | .6[b] | *.75* | .2[a] | *.58* | 2.14 | *ns* | .09 |
| VA | .1[a] | *.31* | .1[a] | *.32* | .1[a] | *.70* | .1[a] | *.35* | .1[a] | *.34* | .09 | *ns* | .00 |
| NA | 2.9[a] | *3.18* | 1.9[a] | *2.29* | 1.6[a] | *2.65* | 3.0[a] | *2.67* | 2.0[a] | *3.13* | .60 | *ns* | .03 |

*Note.* CTQ = Childhood Trauma Questionnaire, BPD = McLean Scale. DD = Dirty Dozen Total, NU = UPPS Negative Urgency, Prem = UPPS Premeditation, Pers = UPPS Perseverance, SS = UPPS Sensation Seeking, Anger = PROMIS Anger Scale, Depression = PROMIS Depression Scale, Anxiety = PROMIS Anxiety Scale, PA = Disciplinary Reports for Physical Aggression, VA = Disciplinary Reports for Verbal Aggression, NA = Disciplinary Reports for Non- Aggression.
Means with common superscripts do not differ from one another (*p <.05)*.