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Initial Development of the Reasons for Reckless and Destructive Behaviours Inventory: Expanding the Role of Dissociation in Self-Destructive Behaviours

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Abstract

Recent research has conceptualized self-destructive behaviours (SDB; e.g., self-injury) as being performed to serve specific functions; however, few measures exist that examine common functions across a range of SDB types. In addition, although dissociative experiences (e.g., depersonalization) are often endorsed by individuals who engage in SDB, measurement of these experiences as reasons for SDB are rarely assessed. In this thesis, we used a trauma-informed approach to evaluate motivations for SDB by initially developing the Reasons for Reckless and Destructive Behaviours Inventory (RRDI). Basic psychometric statistics of reliability, mean item-endorsement, convergent validity, and construct validity were performed across the scales of the RRDI. In addition, for the RRDI self-injury subsection, we evaluated the factor structure, sex invariance, and examined different profiles of individuals in terms of motivations for self-injury. This study has implications for research pertaining to Posttraumatic Stress Disorder and motivational models of self-injury.

Keywords

Self-destructive behaviour, dissociation, scale development, childhood trauma, latent profile analysis, latent class analysis

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Chapter 1

1 Introduction

A burgeoning volume of research in psychological science has focused on individuals who engage in behaviours which are ultimately harmful or have a negative effect on the self. This increase is at least partially due to recognition of the prevalence of these behaviours and their associated costs to the medical and mental health systems. For example, approximately one in ten Canadians will engage in non-suicidal self-injury (NSSI) in their lifetime (Heath, Toste, Nedecheva, & Charlebois, 2008; Nixon, Cloutier, & Jansson, 2008), and approximately one in 13 Canadians over the age of 15 meet criteria for abuse or dependence of alcohol or substances in the past year (Statistics Canada, 2012). Research has tended to focus on harmful behaviours in a "piecemeal" fashion, specifically examining a single behaviour in depth; however, this approach ignores the frequent co-occurrence between reckless and destructive behaviours. To illustrate, within inpatient and outpatient samples of individuals with eating disorders approximately 17-46% meet criteria for a comorbid substance use disorder (Harrop & Marlatt, 2010), and approximately 25-55% concurrently engage in NSSI (Svirko & Hawton, 2007). The frequent co-occurrence of various harmful or self-destructive behaviours (SDB) has led some researchers to theorize common etiological mechanisms across types of SDB (Zuckerman & Kuhlman, 2000; Svirko & Hawton, 2007), and common maintenance or functional purposes of SDB for individuals (Meuhlenkamp et al., 2009).

The current thesis describes an initial attempt at assessing the frequency and motivations for a range of potentially destructive or risky behaviours. A trauma-informed approach was utilized, as behaviours were chosen based on their established relationship with trauma-related diagnoses, and construct validity was established in reference to trauma-related symptoms and experiences.

1.1 Self-Destructive Behaviour

1.1.1 Defining Self-Destructive Behaviour

How best to define SDB, or what behaviours are associated with the term, has been discussed for decades in Psychology (Menninger, 1938; Fareborow, 1980; Schneidman, 1993). Some definitions have been criticized for being overly broad (e.g., Baumeister & Scher, 1988), as they include behaviours which entail choosing an unfavourable outcome when multiple options were available (i.e., tradeoffs), as opposed to including only behaviours which have a negative impact on health or well-being. For example, within their discussion of tradeoff behaviours as self-destructive, Baumeister and Scher (1988) include "shyness" as a SDB, because the individual chooses immediate anxiety relief at the cost of potential friendship or intimacy. Still, other definitions of SDB are considered overly narrow as they focus primarily on behaviours that are high in lethality, and are considered suicidal behaviours or suicide attempts (Orbach, 1996; Schneidman, 1993).

A useful conceptualization of SDB that accounts for the range of potential behaviours, but is not overly inclusive, was developed by Pattison and Kahan (1983) in their seminal paper describing the deliberate self-harm syndrome. Pattison and Kahan delineated SDB according to three primary variables identified in existing literature, 1) whether the behaviour was direct versus indirect in nature, 2) the level of lethality of the behaviour, and 3) the repetitiveness of the behaviour. For ease of discussion, Pattison and Kahan's (1983) model is reproduced in Figure 1. The elegance of Pattison and Kahan's model is it allows for comparison and classification of the entire spectrum of SDB such as chronic alcohol abuse and self-injury, through to more lethal behaviours such as high-risk stunts, or severe single-episode self-injury (e.g., eye enucleation), to high lethality behaviours that may be considered suicide attempts.

1.1.2 Direct versus Indirect Self-Destructive Behaviour

Direct SDB is defined as a behaviour that is deliberate and results in immediate damage to one or more parts of the body (Farberow, 1980). An example of direct SDB is non-suicidal self-injury (NSSI), in which the individual inflicts direct tissue damage

through behaviours such as burning or cutting the skin. In contrast, indirect SDB refers to behaviours that do result in damage to the individual, but only over the course of time or with high chronicity. Examples of indirect SDB include chronic alcohol abuse or engagement in sexual risk-taking.

High Lethality	Suicide Attempt SINGLE EPISODE	Termination of vital treatment such as dialysis SINGLE EPISODE
Medium Lethality	Suicide Attempts MULTIPLE EPISODE	High-risk performance (stunts) MULTIPLE EPISODE
	Atypical deliberate self-harm syndrome SINGLE EPISODE	Acute drunkenness SINGLE EPISODE
Low Lethality	Deliberate Self-Harm Syndrome MULTIPLE EPISODE	Chronic alcoholism, severe obesity, heavy cigarette smoking MULTIPLE EPISODE
	DIRECT	INDIRECT

Figure 1: Pattison and Kahan's Differential Classification of Self-Destructive Behaviour. Reprinted from The American Journal of Psychiatry, by the American Psychiatric Association, January 1983, Copyright by the American Psychiatric Association

Direct and indirect SDB often can be distinguished in several different ways. First, damage inflicted by indirect SDB often is realized only after chronic usage or engagement, whereas damage from direct SDB is immediate. For example, excluding cases of drug overdose or acute alcohol intoxication, single episode uses of drugs or alcohol are rarely destructive; however, prolonged usage of alcohol for several years, or even decades, can result in conditions such as chronic liver failure or liver cirrhosis.

Direct and indirect SDB also can be distinguished in relation to intentionality; specifically, as opposed to direct SDB, the intention behind indirect SDB is rarely to be destructive. For example, individuals may endorse they "like feeling high" when asked about substance abuse, or may say they are "too fat" when asked about eating restriction (Walsh, 2012).

Although direct and indirect SDB can be distinguished in terms of immediacy of damage and intention, these behaviours are frequently found to co-occur (Claes & Muelhenkamp, 2014; St. Germain & Hooley, 2012). For example, St. Germain and Hooley (2012) assessed 156 individuals recruited from the community, and specifically investigated whether there were pertinent differences between individuals who engage in only direct SDB versus those who only performed in indirect self-destructive acts. Importantly, all 50 individuals found to engage in direct SDB also engaged in at least one form of indirect SDB. Furthermore, individuals who engaged in direct SDB scored similarly to individuals who only engaged in indirect SDB on several clinical variables including: depression, anxiety, dissociation, self-esteem, borderline symptoms, and impulsivity. Individuals who engaged in direct SDB were found to report a more self-critical personal style, and a greater history of suicide attempts compared to individuals who only engaged in indirect SDB.

1.1.3 Levels of Lethality and Single Versus Multiple Episodes

The current research is focused on behaviours that would be considered "low lethality" per Pattison and Kahan's (1983) model. However, it is worth noting that research has found low lethality behaviours to predict engagement in higher severity behaviours. For example, Klonsky, May, and Glenn (2013) found across four separate samples that NSSI was a robust predictor of making a suicide attempt ($\phi = .36$), and in multivariate logistic regression analyses evidenced a significant association with suicide attempts after controlling for symptoms of borderline personality disorder (BPD), depression, anxiety, and impulsivity. In addition to low lethality behaviours, the current research program is focused on behaviours that are often engaged in for multiple episodes.

SDB in this thesis is defined as engagement in a behaviour that, either directly or indirectly, places an individual at a substantial risk for harm, and reflects an underlying tendency towards engagement in destructive acts without considering the consequence of the action, or to damage or derogate the self or goals of the self (Baumeister & Scher, 1988; Sadeh & Baskin-Sommers, 2016; Steinberg, 2008). From a measurement standpoint, this definition would suggest that a wide variety of behaviours apply as being self-destructive, consistent with Pattison and Kahan's (1983) previous conceptualization. In the scope of the current project, 10 main behaviours were considered for further investigation, based on their relationship with other variables in the current project, as well as their history in research on SDB. These 10 behaviours are NSSI, alcohol abuse, substance abuse, binge eating, purging behaviours, eating restriction, gambling, sexual risk-taking, medical risk-taking (e.g., not taking prescribed medications), and physical risk-taking (e.g., starting fights).

1.2 Childhood Maltreatment, Early Adversity, and Self-Destructive Behaviour

The current thesis utilizes psychotraumatology as a framework for understanding SDB. This perspective views SDBs as emanating from early invalidating and abusive environments where frequent adverse and potentially overwhelming experiences across developmental periods lead to the deployment of behavioural options that, while ultimately harmful, do offer strong short-term modulations of thoughts and feelings or the social environment (Herman, 1992; Khantzian, 1985, 1997; Linehan, 1993; Nock, 2010; Yates, 2004). In effect, these environments lead to deficits in self-regulatory capacities and resources across different forms of biopscyhosocial functioning, such as emotion regulation, relational strategies, and self-representation (e.g., Cicchetti & Toth, 1995). These deficits may in turn lead to the over-reliance and persistence of behaviours, that are considered self-destructive, as a compensatory strategy for stress and dysphoric states later in life.

A review of relevant research generally supports the finding that experiences of childhood abuse, neglect, and adversity are associated with engagement in a variety of destructive behaviours including self-injury, alcohol and substance misuse, disordered

eating patterns, pathological gambling, and risk-taking. Systematic and meta-analytic reviews report a small to moderate effect size of adverse childhood experiences in populations engaging in SDB compared to healthy controls or clinical control groups, this includes NSSI (Klonsky & Moyer, 2008), eating disorders (Caslini et al., 2016; Smolak & Murnen, 2002), and risky sexual behaviour (Abajobir et al., 2017; Arriola, Louden, Doldren, & Fortenberry, 2005; Fransisco et al., 2008). Although meta-analyses and systematic reviews have not been undertaken examining the rates of childhood trauma in individuals who abuse alcohol or substances, several studies have demonstrated that these individuals often experience traumatic events (Brown, Stout, & Mueller, 1999) and have high prevalence rates of PTSD (Hien, Cohen, & Campbell, 2005; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1999; Swendsen et al., 2010).

The small effect size found in meta-analytic studies has resulted in some researchers proposing that adverse childhood experiences should be considered distal risk factors in the development of SDB rather than the experiences as being a direct cause of the behaviour (e.g., Klonsky & Moyer, 2008). Adverse childhood experiences are therefore postulated as exerting their effects through the often-associated affective (e.g., PTSD, depression), cognitive (e.g., negative urgency), and social (e.g., difficulty maintaining relational boundaries) difficulties that are associated with experiences of abuse and neglect. Several studies have supported this framework across several different SDB types. For example, Muehlenkamp and colleagues (2011) found that the relationship between childhood maltreatment and NSSI was fully mediated by two indirect pathways, one from childhood abuse through low self-esteem and body dissatisfaction, and another from childhood abuse through psychopathology symptoms and dissociation. Hund and Espelage (2006) demonstrated that the relationship between childhood sexual abuse and bulimic behaviours was fully mediated by general emotional distress and alexithymia. Corroborating these results, Burns, Fischer, Jackson, and Harding (2012) found that the relationship between childhood emotional abuse and eating disorder symptoms was mediated by emotion dysregulation. In examining the relationship between documented experiences of childhood abuse and neglect and substance abuse problems, White and Widom (2008) found that symptoms of PTSD and experiencing stressful life events in

adolescence and adulthood mediated the relationship between childhood abuse and illicit drug use later in life.

In summary, the existing research suggests that early experiences of abuse, neglect, and adversity are important to understanding the development of SDB. However, as opposed to being a proximal, direct cause of SDB, childhood adversity is best viewed as a distal factor that indirectly effects the development of SDB through psychological symptoms that are frequently associated with these experiences.

1.3 Self-Destructive Behaviour and Posttraumatic Stress Disorder

Posttraumatic Stress Disorder (PTSD) is recognized in the *Diagnostic and Statistical Manual of Mental Disorders* (5th edition; DSM-5; APA, 2013) among the Trauma and/or Stressor Related Disorders and consists of four symptom clusters: Reexperiencing (e.g., intrusive, involuntary, and intrusive memories of traumatic events), Avoidance (i.e., avoiding external reminders of traumatic events and avoiding thoughts, feelings, and memories of traumatic events), Negative Alterations in Cognition and Mood (e.g., persistent and exaggerated negative beliefs about the self, world, and others), and Alterations in Arousal and Reactivity (e.g., exaggerated startle response) (see Armour et al., 2015 for descriptions of alternative PTSD models). The DSM-5 also has recognized a dissociative subtype of PTSD (D-PTSD) based on clinical (for a review see Hansen, Ross, & Armour, 2017) and neurobiological research (Lanius et al., 2010, 2012; Nicholson et al., 2015, 2016) suggesting a sizeable minority of individuals with PTSD experience significant depersonalization and derealization symptoms in addition to PTSD symptoms along the four recognized clusters. Epidemiological research has found that most individuals will experience at least one traumatic event in their lifetime, however, only a fraction will develop PTSD. A recent study by Kilpatrick and colleagues (2013) reported that in large community sample, 89% of individuals experienced at least one traumatic event recognized by the DSM-5, however, approximately 8% of individuals met criteria for lifetime PTSD.

Although individuals with PTSD do not uniformly engage in SDB, there is increasing recognition that traumatic experiences, and PTSD presentations, are associated with engagement in behaviours that are reckless, dangerous, or defeating. Importantly, the PTSD criteria was revised from DSM-IV to DSM-5 to include a symptom of "reckless and self-destructive behaviour" (Friedman & Resick, 2014) reflecting the clinical importance of these behaviours to individuals with PTSD. Pietrzak, Goldstein, Southwick, & Grant (2011) conducted a large epidemiological study (N = 34, 653) of PTSD comorbidity and reported increased odds of alcohol abuse (OR = 1.6), substance abuse (OR = 2.4), and suicide attempts (OR = 5.1) among individuals with full PTSD versus no PTSD, after correcting for sociodemographic characteristics. In a sample of 222 veterans with probable PTSD, Lusk, Sadeh, Wolf, and Miller (2017) reported that 74.4% of the sample engaged in at least one form of reckless or SDB in the previous five years, and that 61.3% of participants engaged in two or more types. Corroborating these results, Thomsen et al. (2011) reported in their sample of veterans returning from active duty that a trauma history before deployment was a significant predictor of post-deployment engagement in SDB, and that engagement in one SDB was associated with increased risk for engagement in multiple SDBs.

PTSD also has high comorbidity rates with diagnoses that necessitate engagement in one or more SDB. Reported rates of comorbidity between PTSD and eating disorders range from approximately 10-50% (Gleaves, Eberenz, & May, 1998; Mitchell, Mazzeo, Schlesinger, Brewerton, & Smith, 2012; Swinbourne & Touyz, 2007; Swinbourne et al., 2012). In addition, rates of comorbid substance use disorders and alcohol use disorders among individuals with PTSD range from approximately 14-60% (Mills et al., 2006; Pietrzak et al., 2011). Individuals with comorbid PTSD and substance use disorders have been reported to have a greater severity of PTSD symptoms (Read, Brown, & Kahler, 2004), increased psychiatric comorbidity (Blanco et al., 2013), and is associated with greater risk of relapse following treatment for substance abuse (Ford, Hawke, Alessi, Ledgerwood, & Petry, 2007) and alcohol abuse (Back, Brady, Sonne, & Verduin, 2006). Similarly, in populations with eating disorders, PTSD comorbidity has been associated with greater eating psychopathology (Grilo, White, Barnes, & Masheb, 2012), greater variety of purging strategies (Brewerton, Dansky, O'Neil, & Kilpatrick, 2015), and a

greater risk for obesity (Hirth, Mahbubur, & Berenson, 2011). In addition, researchers have suggested that PTSD comorbidity may be an important maintenance factor of eating disorder symptoms during and following treatment (Trottier, Monson, Wonderlich, & Olmstead, 2017; Trottier, Wonderlich, Monson, Crosby, & Olmstead, 2016).

1.4 Motivational Models of Self-Destructive Behaviour

Two primary classification approaches for potentially destructive behaviours can be identified in the literature – disease/syndromal and functional (Hayes, Wilson, Gifford, & Follette, 1996). Disease models identify collections of signs and symptoms (syndromes), and presume that identification of these syndromes are necessary to understand the etiology and course of the syndrome, and ultimately for successful treatment. In contrast, functional classification schemes organize behaviours, or sets of behaviours, in pertinence to the functional purpose they serve to an individual. Both classification frameworks have their own advantages and disadvantages, which is beyond the scope of this thesis. However, functional models have garnered increased prominence in conceptualizations of SDB. Broadly, across multiple behaviour phenotypes, functional models tend to recognize two continuous dimensions that differentiate the reasons why individuals engage in SDB. The first dimension has been labeled "self – other", "intrapersonal – interpersonal", "personal – social", and reflects motivations that are either specifically for the individual and directed internally, or are intended to serve a function for others or social needs (e.g., Nock & Prinstein, 2004). The second dimension commonly identified is usually referred to as "avoidance – approach", and is consistent with Gray's (1972) Behavioural Activation System and Behavioural Inhibition System. In general, this dimension reflects whether an individual is motivated to avoid a particular state or outcome, or desires to gain a certain psychological state or outcome.

Pertaining to functional models of SDB, the greatest research evidence exists for a Intrapersonal Avoidance (IAV) function. Specifically, IAV models of SDB posit that negative emotional states such as depression, guilt, or shame build-up within an individual to levels of unbearable tension. SDB are engaged in to terminate, and in effect, avoid these negative affective states. If the SDB is successful in terminating the tension or negative arousal, then this behaviour is negatively reinforced to be used in future

situations (Klonsky, 2007; Kober, 2014; Leehr et al., 2015). Several other IAV functions have been identified in the literature including self-punishment and anti-dissociation. Self-punishment is marked by experiences of intense self-hatred, feelings of worthlessness, or guilt, that may be diminished or terminated after the individual inflicts harm on themselves; for example, through injury, overdosing on substances or medication, abstaining from taking necessary medication, or eating too much (e.g., Walsh, 2012). Anti-dissociation is marked by increasing feelings of emotional numbess or being dead inside, depersonalization/derealization, or flashback memories that the individual is highly motivated to terminate. This is usually accomplished by inflicting feelings of pain to ground oneself in the present, or performing dangerous/risky behaviours that flood arousal systems (e.g., Walsh, 2012)

Conversely, research has also found evidence that individuals engage in SDB for intrapersonal-approach (IAP) reasons. For example, individuals may endorse that they engage in frequent drinking or substance abuse "feel high", "feel loose or free", or "to have a good time". Although IAP reasons are endorsed less frequently than IAV reasons, research supports an IAP motivation across several types of SDB including: NSSI (Klonsky & Glenn, 2009), sexual risk-taking (Cooper, Shapiro, & Powers, 1998), binge eating (Dawe & Loxton, 2004), and alcohol or substance use (Walsh, 2012). Interpersonal approach behaviours (e.g., toughness, communicating thoughts and feelings), and interpersonal avoidance behaviours (e.g., social isolation, avoiding tasks or responsibilities) have also been identified in previous research on SDB, particularly behaviours that may involve social interactions such as sexual risk-taking (Cooper, et al., 1998), risk-taking in general (Cooper, Agocha, & Sheldon, 2000), and alcohol or substance use (Dawe & Loxton, 2004).

Reasons or motivations for SDB may be functionally related to psychopathology, supporting the utility of taking both a syndromal and motivational approach to the study of SDB. For example, as described earlier, individuals with PTSD often experience intrusive recollections of traumatic experiences which can lead to states of elevated dysphoria. In response to these states individuals may drink alcohol or use substances, resulting in a decrease of PTSD symptoms and reinforcing future SDB. Conversely,

individuals with PTSD experiencing states of high dissociation and hypoarousal may take substances that result in increased arousal (e.g., opioids; Somer, 2009), or may engage in risky behaviours to counteract dissociative states. This functional relationship may provide a partial explanation for the comorbidity between PTSD diagnoses and disorders with a component of SDB (e.g., eating disorders, substance abuse disorders).

1.5 Dissociation

1.5.1 Defining Dissociation

Dissociation is a complex psychological construct that has been used to describe a variety of processes, symptoms, and phenomena. Primarily, the current manuscript uses the terms "dissociation" and "dissociative experience" interchangeably to describe this array of phenomena. Dissociation as a construct has been broken down into dissociation which is normative (e.g., day-dreaming, religious experiences; Butler, 2006) versus dissociation which is pathological (e.g., derealization and depersonalization; Waller, Putnam, & Carlson, 1996). The current research focuses on experiences of pathological dissociation, but note that individuals who experience pathological dissociation often have elevated levels of normative dissociation (see Butler, 2006). Broadly, pathological dissociation is defined in the DSM-5, as a disruption in the usually integrated functions of: consciousness, memory, awareness of self or body, environment, and identity (APA, 2013; also see Spiegel et al., 2011, 2013). Pathological dissociation is seen across a range of psychological disorders including Posttraumatic Stress Disorder (PTSD), BPD, and Dissociative Disorders (DD). Other definitions of dissociation have been proffered to more specifically define the range of experiences/symptoms that can occur.

For example, Cardeña and Carlson (2011) define dissociation as, (a) the subjective loss of continuity of experience with involuntary and unwanted intrusions into awareness and behaviour, (b) an inability to access information or control mental functioning, that under normal conditions is amenable to access/control, and (c) a general sense of experiential disconnectedness (i.e., detachment). Similarly, Holmes and colleagues (2005) outline a rubric for recognizing two distinct forms of pathological dissociation, namely psychological 'compartmentalization' of experience, which they

define as an inability to control processes or actions that normally can be controlled, and ‘detachment’, defined as an altered state of consciousness with a subjective experience of separation from their body, sense of self, and/or the environment. Bernstein and Putnam (1986) developed the most commonly used self-report instrument of dissociation, the *Dissociative Experiences Scale*, which has been most commonly found to have a three-factor solution. The first factor has been labeled Absorption, and is considered an index of normative dissociative experience; the second and third factors are consistent with the concept of pathological dissociation and are labeled Dissociative Amnesia and Depersonalization-Derealization. Dissociative amnesia is considered a hallmark symptom of “compartmentalization” and depersonalization and derealization are most commonly recognized as “detachment” experiences.

Therefore, although the specific types of dissociative symptoms recognized across definitions may vary, a sense of experiential detachment and/or psychological compartmentalization of experience is a common thread through most recognized definitions of dissociation.

1.5.2 Dissociation and Childhood Trauma and Adversity

Dissociative experiences are frequently hypothesized to stem from early adverse experiences and early traumatic experiences (Dalenberg et al., 2012, 2014), particularly at the hands of caregivers (Putnam, 1997). The Trauma-Model of Dissociation holds that dissociation is an important component of the psychobiological response to threat and danger that enhances the probability of survival in the wake of adverse/traumatic events (Bremner & Marmar, 1998; Putnam, 1991; Spiegel, 1984). In a meta-analysis of 38 studies with a rigorous inclusion methodology, Dalenberg and her colleagues (2012) reported a consistent positive association between early traumatic experiences and dissociative symptoms with a moderate effect size (r ~.32). Critically, a similar effect size was found for studies that used an objective measure of trauma exposure (i.e., corroborated case reports with child services).

Early negative environments, characterized by a paucity of positive child-caregiver interactions and poor relational bonds, as compared to overt instances of abuse

and neglect, also have been empirically linked to dissociative symptoms later in life. In a prospective longitudinal study of 168 children at high-risk, Ogawa and colleagues (1997) found that disorganized attachment at 2 years significantly predicted dissociative symptoms in adolescence; furthermore, psychological unavailability of parents, inattentive parenting style, and disorganized attachment at age 2 predicted dissociative symptoms in young adulthood. Carlson (1998) corroborated the results reported by Ogawa et al. (1997) with finding that disorganized attachment at 24 months predicted dissociative symptoms at age 19 over and above behaviour problems in middle childhood and family relationship quality in early adolescence. Recently, Dutra and her colleagues (2009) found that the quality of early care in the first 18 months of life accounted for approximately 50% of the variability in dissociation symptoms in young adulthood (~20yrs of age). Therefore, combined evidence suggests that overt experiences of trauma as well as more subtle disruptions in attachment and relational processes are empirically related to dissociative experiences, and this has been demonstrated across a range of research methodologies and populations.

1.5.3 Dissociation and Self-Destructive Behaviour

Dissociative experiences have a well-documented relationship with several types of SDB including NSSI (Brodsky, Cloitre, & Dulit, 1995; Connors, 1996; van der Kolk et al., 1991), disordered eating (Demitrack, Putnam, Brewerton, Brandt, & Gold, 1990; Hallings-Pott, Waller, Watson, Scragg, 2005; Vanderlinden, Vandereycken, van Dyck, & Vertommen, 1993), substance abuse (Najavits, 2002; Zlotnick et al., 1997), risky sexual behaviour (Bancroft & Vukadinovic, 2004; Gold & Seifer, 2002; Zurbriggen & Freyd, 2004). Since most research is correlational in nature the dissociation-SDB link can be understood as: 1) dissociation causes the individual to perform a self-destructive act (e.g., feelings of being numb or dead inside causes the individual to engage in NSSI), 2) SDB results in dissociative experiences (e.g., chronic use of psychoactive drugs results in frequent depersonalization experiences), and 3) a common variable (e.g., trauma history) leads to both the development of dissociation and SDB and accounts for the association.

All three explanations have garnered empirical support from research. For example, the anti-dissociative function of NSSI and purging behaviours has been

recognized by several studies (for a review see Klonsky, 2007; McShane & Zirkel, 2008), such that NSSI and purging provide "shocks" to the system and helps ground an individual in the present when experiencing emotional numbess, depersonalization, or having frequent flashback memories. Research also supports that some SDB can elicit dissociative experiences. For example, Somer (2009) describes the chemical dissociation effects of opiod substances, such that when faced with untolerable affect individuals may use opiod substances due to their numbing effects. Finally, as described earlier, there is substantial evidence to suggest that adverse childhood experiences increase the risk for the development of both dissociation and SDB, and the association between the two variables is accounted for by this common variable.

Perhaps the strongest support for the relation between dissociation and SDB is the overwhelmingly high rates of these behaviours in populations with dissociative disorders. Foote, Smolin, Neft, and Lipschitz (2008) compared patients consecutively administered to a general hospital, 24 with dissociative disorders and 58 with a non-dissociative disorder diagnosis (primarily major depressive disorder). Among persons meeting dissociative disorder criteria, all but one met criteria for major depressive disorder, 88% met criteria for PTSD, and 83% for BPD, 67% met criteria for drug abuse or dependence, 50% for alcohol abuse or dependence, and 67% had chronic suicide ideation. Although rates of these diagnoses and behaviours were elevated in the psychiatric controls, the prevalence was substantially less. Importantly, in logistic regression analysis, Foote et al. reported a 15-fold increase in the risk for multiple suicide attempts for individuals with a dissociative disorder, compared to a 25% increased risk for a PTSD diagnosis, and 74% increased risk for BPD diagnosis. Kessler and colleagues (2015) in their investigation of suicides completed by military service members after hospital discharge, found that a dissociative disorder diagnosis was the strongest psychiatric risk factor with a 5.6-fold increase in risk for suicide. Although dissociative disorders are rare, it is relevant to note that as centrality of dissociative symptoms increases, the greater the likelihood of significant engagement in SDB.

1.6 Development of the Reasons for Reckless and Destructive Behaviours Inventory

With the recent inclusion of "reckless and destructive behaviours" in the DSM-5 symptom criteria for PTSD, validated measurement tools for assessment of SDB is a potentially fruitful area of future research. Although some instruments have been developed to assess the spectrum of destructive behaviours as well as the frequency of these behaviours, there is a dearth of assessment instruments that examine the *reasons* or *functions* of these behaviours in depth. Recently, Sadeh and Baskin-Sommers (2016) developed and validated the *Risky, Impulsive, and Self-Destructive Behavior Questionnaire* (RISQ) which contained two items that query about the affective triggers preceding several SDBs. As discussed earlier, there are several functions of SDB that do not specifically involve affective triggers, but are important for the maintenance of SDB, including anti-dissociation and self-punishment. Furthermore, the RISQ does not assess the range of dissociative experiences that are often reported by individuals who engage in SDB. Other measures of reasons for SDB often focus on a specific behaviour alone, which makes direct comparisons of reasons across behaviours difficult. Examples of these measures include the *Inventory of Statements About Self-Injury* (Klonsky & Glenn, 2009), *Drinking Motives Questionnaire* (Cooper et al., 1992), the *Sex Motives Measure* (Cooper et al., 1998), and the *Gambling Experiences Measure* (Ledgerwood & Petry, 2006a).

For these reasons, within the current thesis the *Reasons for Reckless and Self-Destructive Behaviours Inventory* (RRDI) was developed and evaluated. The RRDI involves the assessment of multiple SDB including NSSI, alcohol and substance abuse, disordered eating behaviours, sexual risk-taking, medical risk-taking, and general risk-taking. The frequency of these behaviours was assessed over the past month, six months, and year. Crucially, the RRDI assesses several well-recognized reasons for engagement in SDB, as well as a broader range of dissociative experiences in relation to SDB.

1.7 Aims and Hypotheses

The primary goal of the current research was to develop and initially validate the RRDI in terms of reliability, convergent validity, and construct validity. Furthermore, the current research is especially focused on validating the utility of an item-set specifically querying whether individuals engaged in SDB to elicit dissociative experiences, or because dissociative experiences were present throughout the self-destructive episode, as these experiences have not been formally evaluated in previous research. The utility of the dissociation item-set will be established via construct validity with measures of PTSD, dissociation, depression, and anxiety symptoms, as well as experiences of childhood and lifetime trauma. In addition, latent profile analysis (LPA) will be used to demonstrate that a sizeable minority of participants who engage in SDB endorse these dissociative items as being a common reason for why they engage in SDB. To this end, it is hypothesized that a profile of individuals will be identified that endorses significant experiences of dissociation during SDB, and this group will endorse more reasons on average than other participants for engagement in SDB, and will endorse more severe symptoms of PTSD, dissociation, and a more severe history of developmental trauma, compared to individuals who do not endorse dissociative reasons for SDB engagement. Finally, a secondary goal of this research project is to demonstrate the utility of assessing a broad range of destructive behaviours. We hypothesize that several classes of individuals, representing a majority of participants, will be identified that endorse engagement in multiple behaviours, and that these individuals will have more frequent PTSD, depression, and anxiety symptoms, and will have greater exposure to developmental and lifetime trauma compared to individuals who primarily engage in one behaviour.

Chapter 2

2 Method

2.1 Participants

2.1.1 Full Sample – General Population, Oversampled for Self-Injury History

The final sample consisted of 1056 participants. There were relatively equal numbers of males (*N* = 538, 50.5%) and females (*N* = 513, 40.9%), primarily of young adult to middle age (Range = 18-60; *M* = 33.31, *SD* = 10.09). Approximately half the population was Caucasian (*N* = 547, 51.3%), single (*N* = 495, 46.4) or married (*N* = 460, 43.2%), a majority had completed some post-secondary education (*N* = 917, 86.8%), was working part or full time or as a student (*N* = 820, 76.9%), and did not have a history of psychiatric illness (*N* = 687, 64.4%).

2.1.2 Participants Endorsing Self-Injury History

In total, 368 participants endorsed that they have engaged in self-injury at some point in their life. Further study analyses were performed on this subgroup of participants. Of the 368 persons in this sample, 193 were female (52.4%), 201 participants were Caucasian (54.6%), 322 (87.5%) have completed some post-secondary education, 172 were single (46.7%), 157 were married (42.7%), 283 were employed part-time or full-time (74.9%). In total, 167 participants endorsed that they have never been diagnosed with a psychiatric illness (45.4%), 116 participants endorsed that they have a current mental health diagnosis (31.5%), and 62 participants said they do not current have a mental health diagnosis, but they have in the past (16.8%). In terms of NSSI frequency, 192 (55.1%) participants endorsed engaging in some form at least once within the past month, 240 (65.2%) participants endorsed NSSI behaviour at least once in the past six months, and 263 (71.5%) endorsed NSSI behaviour at least once in the past year.

In terms of the other measured destructive behaviours endorsed by this population over the past year, 156 (42.4%) endorsed heavy alcohol use on at least one occasion, 93 (25.3%) endorsed using a substance(s) at least once, 36 (9.8%) reported gambling

problematically at least once, 89 (24.1%) reported binge eating at least once, 19 (5.7%) reported purging behaviour at least once, 67 (18.2%) endorsed eating restriction at least once, 77 (20.9%) endorsed engaging in risky sexual behaviour, 24 (6.5%) endorsed medical risk-taking behaviour, and 39 (10.6%) endorsed taking unnecessary risks in general.

2.1.3 Participants Endorsing Lifetime Engagement in Self-Destructive Behaviour

An analysis was also conducted on individuals who engaged in one of the ten assessed SDB at least once in their life. We briefly describe demographic info here, as well as how many individuals endorsed "yes" to each behaviour category. In total, 781 participants reported engaging in at least one of the ten assessed destructive behaviour categories. Of these, 403 (51.6%) were male and Caucasian, 682 (87.3%) had completed some amount of post-secondary education, 358 (45.8%) were single and 247 (44.4%) were married, 601 (77%) were employed full or part-time, and 70 (9.0%) were students. In total, 154 (19.7%) persons indicated they have a current mental health diagnosis, and 107 (13.7) responded that they have had a diagnosis in the past, but not currently.

2.2 Measures

2.2.1 Reasons for Reckless and Destructive Behaviours Inventory (RRDI)

The RRDI was developed for this thesis to measure reasons for engagement in several SDB. In total, ten classes of behaviours were included, based on their established relationship with PTSD or childhood traumatic experiences: non-suicidal self-injury (NSSI), alcohol use, drug use, gambling, binge eating, purging, restricted eating, sexual risk-taking, medical risk-taking, and general risk-taking. Although many other behaviours could apply to the survey, some preference was given for brevity, as other measures would be included in the final survey.

For each SDB, the participant was provided with a definition of the behaviour; a definition from the existing literature was provided if possible, but not all behaviours had an agreed upon definition. The participant was then asked if they have EVER engaged in

this behaviour, and endorsed either “Yes”, “No”, or “Choose Not To Say”. If the participant clicked “No” or “Choose Not To Say”, they were not asked any further questions for that behaviour, and were then taken to the next behaviour definition on the list. If the participant clicked, “Yes”, they were then asked how often they engaged in this behaviour over the past month, six months, and year on an ordinal scale from 0 (*Not at All*) to 7 (*Daily or Almost Daily for Most of the Day*).

Following questions regarding frequency of the behaviour, the participant was presented with a 22-item list of subjective reasons for why they engaged in that behaviour (see Figure 1). The 22-items were intended to reflect five content domains previously recognized in research on SDB, as well as two domains assessing dissociative experiences in relation to SDB. An initial item-list of 25-items were sent to experts in the fields of PTSD and/or SDB. Feedback from four experts resulted in the deletion of three items. Specifically, 15-items assessed emotion regulation, punishment, anti-dissociation, thrill-seeking, and self-challenge reasons for SDB (i.e., five content areas with three items each), five-items assessed dissociative experiences occurring during SDB, and two-items assessed engaging in SDB to elicit dissociative experiences (e.g., depersonalization, emotional numbing).

The participant saw a stem at the top of the list for each item (e.g., “When you injure yourself intentionally, how often is it…”) and then looked at the item (e.g., “to feel less emotionally overwhelmed”). Participants responded to each item on a slider bar ranging from 0 (*Never*) to *10* (Always). Participants could endorse every reason at any value of importance to them. This procedure was completed for all ten behaviours. The full RRDI can be seen in Appendix B.

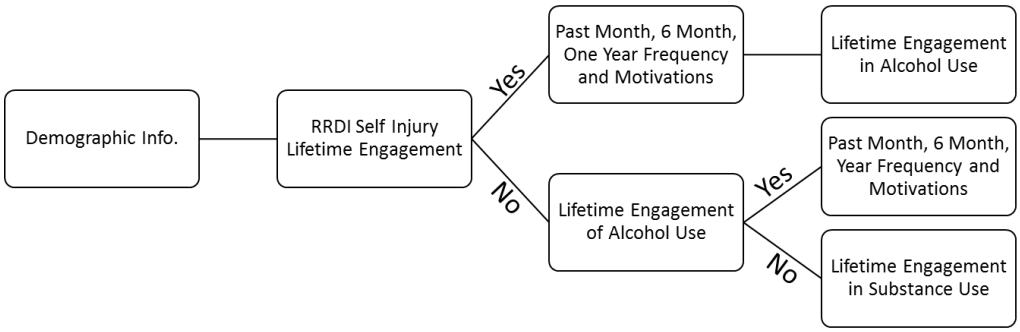

Figure 2: RRDI procedure. This process is followed 8 more times for all 10 assessed SDB. After completing the RRDI the participant completed the rest of the study measures.

2.2.2 Inventory of Statements About Self-Injury (ISAS)

The ISAS (Klonsky & Glenn, 2009) is a 39-item inventory of statements that measures 13 different functions of NSSI across 13, 3-item scales. The 13 domains are: affect regulation, self-punishment, self-care, anti-dissociation/feeling generation, anti-suicide, interpersonal boundaries, sensation-seeking, peer-bonding, interpersonal influence, toughness, marking distress, revenge, and autonomy. The ISAS also assesses the frequency of 13 recognized NSSI behaviours (e.g., cutting, skin biting), as well as items that query the age of onset of NSSI, the most recent date of NSSI, whether pain is experienced during NSSI, whether NSSI is performed alone or not, and the amount of time between the urge to commit NSSI and engagement in the behaviour. Each function item begins with the stem, "When I self-harm, I am…", and participants report the importance of that item to why they engage in NSSI, on a scale from 0 (*Not relevant for you at all*) to 2 (*Very Relevant for you*). Previous research has supported a two-factor

model of the ISAS including Intrapersonal and Interpersonal reasons for self-injury. These scales have demonstrated good internal consistency (i.e., α's = .80 and .88; Klonsky & Glenn, 2009), one year test-retest reliability (i.e., stability *r*'s = .60 and .82; Glenn & Klonsky, 2011), and criterion validity of the ISAS with measures of depression, anxiety, BPD, suicide ideation and attempts (Klonsky & Glenn, 2009).

2.2.3 Adverse Childhood Experiences Scale (ACE)

The ACE questionnaire assesses whether a respondent was exposed to any of 10 different categories of adverse life experiences: psychological abuse, physical abuse, sexual abuse, emotional neglect, physical neglect, substance abuse by parent, parent with a mental illness, domestic violence towards respondent's mother, parental separation or divorce, and criminal behaviour by household member (Dube et al., 2003). All questions begin with the stem "While you were growing up during your first 18 years of life…" and participants indicate whether they experienced a particular event by responding either "Yes" or "No". The ACE questionnaire has been used in several studies and has shown a graded dose-response pattern with several major mental and physical health outcomes (Anda et al., 2002; Dube et al., 2001, 2003; Edwards et al., 2003), including engagement in NSSI (Kaess et al., 2013) and suicidal behaviour (Felitti et al., 1998), as well as other SDBs such as alcohol abuse, substance abuse, and sexual risk-taking (Felitti et al., 1998). Consistent with previous research, in the current study participants received a total score between 0 and 10 depending on the number of ACE categories to which they were exposed (Dube et al., 2003).

2.2.4 Childhood Trauma Questionnaire (CTQ)

The CTQ (Bernstein et al., 2003) is a 28-item self-report instrument that measures experiences of emotional, physical, and sexual abuse, as well as experiences of emotional and physical neglect. Three items on the CTQ are validity items to detect bias responses and tendency to minimize past experiences. Each abuse/neglect scale contains five-items and responses are made on a 5-point Likert scale ranging from 0 (*Never True*) to 5 (*Very Often True*), indicating the severity of experiences. Several reports have supported the reliability (α's = .8-.95; physical neglect subscale lower ~ .6-.7), discriminant validity, and criterion-validity of the CTQ (e.g., moderate correlations with depression and anxiety

symptoms) across age, sex, and cultures (Bernstein, Ahluvalia, Pogge, Handelsman, 1997; Bernstein et al., 1994; Klinitzke, Romppel, Häuser, Brähler, Glaesmer, 2012; Pavio & Cramer, 2004; Wright et al., 2001).

2.2.5 Life Events Checklist for DSM-5 (LEC-5)

The LEC-5 assesses 16 potentially traumatizing events recognized by the DSM-5. The LEC-5 allows participants to endorse whether an event "happened to me", "witnessed it", "learned about it", "part of my job", "not sure", "doesn't apply". For the purposes of this research, for each potentially traumatic event participants were asked if it "happened to me/witnessed it" or whether the event "doesn't apply". A total score ranging from zero to 16 was calculated based on participant responses to the items. Although developed as an index measure, research by Gray and colleagues (2004) has shown that the LEC has convergent validity with other assessments of traumatic life experiences, good test-retest reliability, and is a significant predictor of psychological symptoms and life satisfaction. Although no psychometric studies of the LEC-5 have been performed, the minimal changes between the LEC-4 and the LEC-5 would lead to few differences to be expected. A final item on the LEC-5 was included but not analyzed (i.e., "any other stressful or uncomfortable experience"). From a self-report nature, this item seems subjective and unclear, so was not included in total score calculations.

2.2.6 Patient Health Questionnaire-4 (PHQ-4)

The PHQ-4 is a brief screening instrument containing two items assessing the core components of major depressive disorder and general anxiety disorder, respectively. Respondents are asked how much each of four symptoms have bothered them over the past two weeks on a 4-point scale: 0 (*not at all*), 1 (*several days*), 2 (*more than half the days*), and 3 (*nearly every day*). Sensitivity and specificity analyses have demonstrated that scores of 3 or greater on the PHQ-depression (Sensitivity = 83%, Specificity = 92%) or PHQ-anxiety (i.e., area under the curve analyses >= .80) subscale is indicative of probable major depression or a anxiety disorder. The reliability, factorial (item cross-loadings below .35) and construct validity of the PHQ-4 has been established in previous

research, as well as the invariance of scores across sex and age groups (Löwe et al., 2010; Kroenke, Spitzer, Williams, & Löwe, 2009).

2.2.7 Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5)

The 20-item PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013; Wortmann et al., 2016) was administered to assess overall PTSD severity according to DSM-5 PTSD criteria. Recent work has highlighted the replicability of a 7-factor structure of the PCL-5 (Armour et al., 2015; Bovin et al., 2015; Liu et al., 2014; Pietrzak et al., 2015) with items comprising: *Intrusion* (e.g., "Repeated, disturbing, and unwanted memories of the stressful experience?"), *Avoidance* (e.g., "Avoiding memories, thoughts, or feelings related to the stressful experience?"), *Negative Alterations in Cognition and Mood* (e.g., "Blaming yourself or someone else for the stressful experience or what happened after it?"), *Anhedonia* (e.g., "Feeling distant or cut off from other people?"), *Externalizing Behaviour* (e.g., "Taking too many risks, or doing things that could cause you harm?"), *Anxious Arousal* (e.g., "Feeling jumpy or easily startled?"), and *Dysphoric Arousal* (e.g., "Trouble falling or staying asleep?"). Responses were made on a past week frequency scale from 0 (*Not at all*) to 4 (*Extremely*). Scores on the total PCL-5 therefore range from 0-80, with higher scores indicating greater severity of PTSD symptoms and a score of 33 recommended as a cut-off for a probable PTSD diagnosis (Bovin et al., 2015; Weathers et al., 2013; Wortmann et al., 2016).

2.2.8 Trauma-Related Altered States of Consciousness Item List (PCL-TRASC)

Using the same item anchors and instruction line as for the PCL-5, 10 items were appended to the PCL-5 (i.e., as items 21-30) to measure various trauma-related dissociative experiences (i.e., trauma related altered states of consciousness [TRASC]; Frewen & Lanius, 2014, 2015). Two items were developed to assess experiences of depersonalization and derealization, respectively, in accordance with the diagnosis of the dissociative subtype of PTSD in the DSM-5. The TRASC-list was shown to have excellent reliability in a previous study ($\alpha > .90$; Frewen, Brown, & Lanius, 2017), and

was adequately able to distinguish between non-dissociative and dissociative PTSD (Frewen et al., 2017; Frewen, Brown, Steuwe, & Lanius, 2015).

2.2.9 Dissociative Symptoms Scale (DSS)

The DSS (Carlson et al., 2016) is a 20-item self-report questionnaire that measures the frequency of moderately severe dissociative symptoms occurring over the past month. Items on the DSS assess four content domains: 1) depersonalization, 2) derealization, 3) gaps in awareness or memory, and 4) dissociative re-experiencing. Responses are made on a 5-point ordinal scale from 0 (*Not at all*) to 4 (*More than 10 times*). The DSS showed good reliability and construct validity across non-clinical, clinical and veteran populations (Carlson et al., 2016). Item-response theory analyses demonstrated that items on the DSS have threshold and discrimination values assessing mild to moderate dissociative symptoms. This contrasts with other measures of dissociative experiences which tend to assess only pathological dissociative experiences that are infrequently endorsed, and therefore do not discriminate well in the general population (Carlson et al., 2016).

2.3 Statistical Analysis

SPSS software was used to evaluate basic psychometric properties of the RRDI, which included descriptive statistics, Cronbach's Alpha, and correlation and regression analyses with outcome variables of interest. The self-injury section of the RRDI was examined in greater detail in terms of its factor structure, invariance across sexes, and participant profiles across the 22-items, MPlus 7.4 (Muthén & Muthén, 2014) software was used to conduct these analyses. In addition, MPlus was used to assess the fit of a latent class model of lifetime engagement in SDB within the current population. SPSS software was used in comparing different classes or profiles on outcome variables of interest.

2.3.1 Exploratory Structural Equation Modeling (ESEM)

To determine the factor structure of the NSSI items of the RRDI exploratory structural equation modeling (ESEM) was performed based on the procedures outlined by

Asparouhov and Muthén (2009). ESEM has been likened to a combination of both exploratory and confirmatory factor analysis (Marsh, Morin, Parker, & Kaur, 2014; Marsh et al., 2009). Confirmatory factor analytic procedures constrain item cross-loadings to 0 to obtain a simple structure; although psychometrically elegant, this structure in practice is rarely feasible and often results in researchers needing to perform several modifications to the model to obtain adequate fit (e.g., Marsh et al., 2014), and often results in erroneously high factor correlations. However, ESEM is similar to exploratory factor analytic procedures in that item cross-loadings are permitted to exceed 0, without degradation to model fit. ESEM procedures however are often confirmatory in nature such that researchers often approach model testing with a factor structure in mind, and an idea of how items will behave in terms of their cross-loadings. ESEM procedures also allow the researcher to obtain traditional CFA fit indices such as the chi-square goodness of fit, root mean square error of approximation (RMSEA), comparative fit index (CFI), and the Tucker-Lewis index (TLI). Finally, several factor rotation methods allow for more a priori approaches from researchers, particularly in the case of a ESEM target rotation. Target rotation allows researchers to specify items that will load on a particular factor, while setting other items to cross-load on that factor to a specified predetermined value. This allows a simple structure to be approximated, without fully constraining the item loadings.

For the purposes of this research, MPlus 7.4 software (Muthén & Muthén, 2015) was used to develop and test ESEMs of the RRDI self-injury subsection. Specifically, ESEM with a maximum likelihood estimator and a target rotation with cross-loadings specified to approximately zero was performed on the 22-items of the RRDI. A seven-factor structure was initially specified, based on the seven content areas of the RRDI (i.e., emotion regulation, punishment, anti-dissociation, sensation-seeking, self-challenge, dissociation elicitation, and peri-dissociation). The suitability of this model was evaluated through examination of the model fit indices specified earlier, item-loadings on the principal factor exceeding .3, and item cross-loadings near zero and less than item-loadings on the principal factor. Items judged to be poor would be modified and, if necessary, removed. Any modifications to the model would be done individually, and model fit would be reassessed at each step.

2.3.2 Confirmatory Factor Analysis (CFA)

Following completion of ESEM procedures, a CFA was performed on the items of the RRDI to determine the adequacy of a simple structure (i.e., cross-loadings fixed at zero). Although criticisms of the simple structure approach were mentioned earlier, CFA is still held to be a necessary and rigorous step in scale development (e.g., Brown, 2014; DeVellis, 2016; Floyd & Widaman, 1995; Worthington & Whittaker, 2006). The initial model tested in the CFA was the final obtained model from the ESEM procedure outlined earlier. Model fit indices, item-loadings, factor correlations, and modification indices guided successive steps in determining the best fitting model to the data. Model fit indices examined were the chi-square goodness of fit test, RMSEA and corresponding 95% confidence intervals, CFI, TLI, and SRMR. Modification indices were requested in terms of reducing the chi-square value by a minimum 20 units.

2.3.3 Sex Invariance Analyses

The first step was to run the final model (determined following the CFA) in both males and females separately and examine fit indices and regression coefficients to ensure the model fit was adequate in both groups. Following this, modification indices were examined to ensure that the best fitting model was estimated before continuing with invariance procedures.

The invariance procedure used in the current research followed a model-building approach outlined in Kline (2016). First, configural invariance was tested by unconstraining the parameters, with latent means fixed at zero, the loading equality across groups constraint removed, and allowing all intercepts free with a mean of zero. Fit indices and unstandardized loadings were inspected to determine whether configural invariance was achieved. Next, metric (weak) invariance was tested, which constrains the item-loadings across groups. A Chi-square difference test as well as ΔCFI (i.e., $< .005$) and ΔRMSEA (i.e., $< .01$) were conducted to determine if the fit of the constrained model was not significantly different than the fit of the unconstrained model (Chen, 2007; Cheung & Rensvold, 2002; Kline, 2016); if the fit was non-significantly different, then

metric invariance was supported. Finally, scalar (strong) invariance of the RRDI was estimated.

In addition to constrained loadings, scalar invariance procedures further constrain intercepts across groups. Again, chi-square difference tests, as well as ΔCFI and ΔRMSEA were inspected to determine if the strong invariance model was non-significantly different from the weak invariance model; if the fit was non-significantly different, then scalar invariance was assumed. Since scalar invariance was the last invariance step for the current research, if scalar invariance was not achieved, modification indices would be examined to determine which item intercepts were interfering with adequate model fit. I would relax the constraint on items individually until adequate model fit was found, in this case partial measurement invariance would be achieved, and group mean comparisons would be cautioned. If scalar invariance was achieved, the multi-group mean structure was estimated to determine if the latent means of the factors differed between sexes by fixing the latent means in the female group to zero, while allowing the male group latent means to vary.

2.3.4 Latent Class Analysis (LCA) and Latent Profile Analysis (LPA)

LCA and LPA are mixture modeling techniques that attempt to explain observed heterogeneity within a population by finding meaningful groups of persons who respond similarly to one another on sets of variables (Muthén, 2004). LCA is used when variables are categorical-ordinal or dichotomous, whereas LPA techniques are used for continuous variables. Several model-fit parameters are computed which guide the researcher, along with substantive theory, as to the number of meaningful classes or profiles within the population of interest. Nylund, Asparouhov, and Muthén (2007) used simulated data with Monte Carlo techniques to determine which model-fit parameters identified the correct number of classes under different circumstances of population size and data complexity. The model-fit parameters examined were the loglikelihood ratio, AIC, BIC, Sample Size Adjusted BIC, bootstrap likelihood ratio test (BLRT), and the Lo-Mendell-Rubin (LMR) test. Briefly the BLRT and LMR test whether a k class model (i.e., nested model) is a better representation of the heterogeneity in a population compared to a $k - 1$ class. If the

LMR and BLRT are significant it suggests that the researcher should continue analyses and test a $k + 1$ model versus the current k class model. Nylund and colleagues found that the BLRT test was the best model-fit parameter in determining the correct number of classes when used alone, but researchers should continue to rely on multiple model-fit parameters and also refer to substantive theory when deciding on the best model. In line with Nyland and colleagues (2007) preference was given to the BLRT statistic in determining the correct number of classes, but all other reported parameters were considered. In addition, any class or profile that accounted for less than 5% of the population would be rejected.

2.4 Procedure

Participants were presented with a study advertisement on a crowdsourcing website, and were given a general description of the survey. Interested participants agreed to participate in the study for a small compensation that was comparable to previous research conducting self-report studies on crowdsourcing websites. Participants were presented with a letter of information, and provided their consent by continuing the survey. The survey took about 30-40mins to complete for most participants, and following completion participants were presented with a debriefing form that contained further information, as well as links to helpful resources for those struggling with self-destructive behaviours.

Chapter 3

3 Results

3.1 Internal Consistency and Descriptive Statistics of Study Measures and the RRDI

Table 2 reports the internal consistency and descriptive statistics of all study measures excluding the RRDI. All measures had excellent internal consistency (i.e., $\alpha > .75$), and acceptable skewness (i.e., < 2.00) and kurtosis (i.e., < 2.00), except for the CTQ Physical Neglect subscale, which had a slightly lower internal consistency compared to other measures (i.e., $\alpha = .65$).

In Appendix C, the internal consistency and descriptive statistics of the RRDI across all ten measured behaviours are reported. Given the varying sample size and small number of items per scale, the RRDI functions had excellent reliability (i.e., all α's > .75). Mean scores tended to demonstrate that RRDI Peri-Dissociation and Pro-Dissociation were endorsed less often than other recognized functions, but all had mean endorsement rates well-above zero, supporting the validity of this item subset.

3.2 Correlations with Outcome Variables: Trauma History, PTSD, Depression, and Anxiety

Table 2 also reports the correlation between RRDI function subscales and outcome variables of interest. Functions related to NSSI, Alcohol Use, Drug Use, Binge Eating, Purging, and Restricted Eating all had moderate to strong correlations with PTSD, Depression, Anxiety, and Dissociation symptoms. In addition, most function subscales had moderate to strong correlations with the CTQ relating to emotional, physical, and sexual abuse, as well as physical neglect. Correlations between RRDI scales and outcome variables were mostly non-significant when examining sexual, medical, and general risk-taking. Correlations between all functions and the CTQ Emotional Neglect scale were usually non-significant across all measured behaviours.

3.3 Convergent Validity of the RRDI

The Inventory of Statements About Self-Injury (ISAS) was included as a measure of convergent validity for the NSSI subsection of the RRDI. The ISAS includes scales that are similar in content to the RRDI, as well as factor scores for intrapersonal and interpersonal reasons for self-injury. As shown in Table 3, the RRDI Emotion Regulation, Punishment, Anti-Dissociation, Thrill-Seeking, and Challenging subscales were most strongly correlated with their ISAS counterpart of conceptually similar content. In addition, RRDI intrapersonal functions were more strongly correlated with the ISAS Intrapersonal factor score, and the RRDI interpersonal functions were more strongly correlated with the ISAS Interpersonal factor score. Dissociation and Pro-Dissociation scales were more strongly correlated with Interpersonal Functions of the ISAS compared to Intrapersonal.

Table 3 additionally reports the correlation between reasons for NSSI and the frequency of NSSI behaviours. Importantly, peri-dissociative reasons for NSSI were the most robust predictor of past month/current NSSI. Only emotion regulation obtained a correlation strength similar to peri-dissociative reasons in terms of six month and one-year frequency.

Table 4 reports correlations between RRDI function scales and the Dissociative Symptoms Scale (DSS), which was included as a measure for convergent validity with the Dissociation items of the RRDI. Across the four factors of the DSS, the Dissociation and Pro-Dissociation items were the most strongly correlated scales. However, Punishment, Anti-Dissociation, Thrill-Seeking, and Challenging scales evidenced strong correlations with the DSS.

3.4 Exploratory Structural Equation Modeling of Self-Injury Subsection of the RRDI

An initial 7-factor Exploratory Structural Equal Model (ESEM) with target rotation and maximum likelihood estimation was conducted on the 22-items of the RRDI self-injury subsection. Table 5 reports the standardized factor loadings for this model, Table 6 reports the factor correlations, and Table 7 reports relevant fit indices. The model

achieved excellent fit ($\chi^2_{(98)}$ = 218.71, p <.001, χ^2/df = 2.23; RMSEA = .058 [.047, .068]; CFI = .98; TLI = .95; SRMR = .02), and most loadings were > .3 on their respective factor. Although the model achieved good fit, examination of the factor loadings highlighted issues with items that needed to be addressed. In addition, as seen in Table 6, some factor correlations were very high, and likely shared substantial variance with other factors. Each modification made to the model, as well as the impact on model fit is described in Table 7. Although some factor loadings exceeded a value of 1, model modifications were made first, and then factor loadings were examined within the final model.

Item 14, on the Elicit Dissociation scale had a loading < .10, and did not load strongly on any factor in the model; therefore, the first modification made to the model was removal of Item 14. Removal of Item 14 from the measure, resulted in a single-item indicator of Elicit Dissociation, and therefore, Item 11 was moved to the Peri-Dissociation factor where it loaded with moderate strength. The second modification made to the model was combining the factors of Challenging and Thrill-Seeking, given that r > .75. Although this modification degraded model fit, this is expected given that statistics will always favour a greater number of factors. The next two modifications comprised removing Items 5 (i.e., "lost control over my behaviour") and 18 (i.e., to feel more aware of or inside of my body"). Both items only had moderate loadings on their intended factor, and even with target rotation procedures utilized, demonstrated strong cross-loadings with other factors.

Since ESEM cross-loads every item on every factor, no modifications of cross-loading items or correlating residuals were performed. Although the correlation between the Peri-Dissociation and the Externalizing factor was high, combining these factors resulted in a model with poor fit. Therefore, the final accepted model was 5 factors with 3 items removed, and as shown in Table 7 achieved good fit, $\chi^2_{(86)}$ = 246.42, p < .001, χ^2/df = 2.87; RMSEA = .071 [.061, .081]; CFI = .97; TLI = .94; SRMR = .02 (see Table 8 for the standardized factor loadings for the final model, and Table 9 for the final model factor correlations).

3.5 Measurement Model of the RRDI Using Confirmatory Factor Analysis

The first model tested using Confirmatory Factor Analysis (CFA) was the five-factor model from the ESEM procedures. The fit of this model was adequate, $\chi^2_{(142)} = 563.79$, $p < .001$, $\chi^2/df = 3.97$; RMSEA = .09, CFI = .92, TLI = .90, SRMR = .06 (see Table 10 for standardized factor loadings for the 19 items, and Table 11 for the factor intercorrelation matrix). Although the model achieved adequate fit, there was a strong correlation (i.e., $r > .80$) between the Peri-Dissociation Factor and the Externalizing Factor; therefore, these factors were combined and the model was retested. The four-factor model had a substantially lower quality fit compared to the five-factor model, however, all factor correlations were less than .70 suggesting this was the correct number of factors covered by the items. A series of modifications were made to this model to determine if it could achieve adequate fit; these modifications were made in a step-wise fashion and the resulting impact on model fit is reported in Table 12. The final accepted model included four correlated residuals and achieved good fit, although the RMSEA was higher than recommended (i.e., > .05), $\chi^2_{(142)} = 534.35$, $p < .001$, $\chi^2/df = 3.76$; RMSEA = .09, CFI = .92, TLI = .91, SRMR = .05.

3.6 Invariance of the Self-Injury Subsection of the RRDI Across Sexes

3.6.1 Measurement Model in Male and Female Participants

In female participants, the model achieved good fit, similar to that found in the overall measurement model, $\chi^2_{(158)} = 352.17$, $p < .001$, $\chi^2/df = 2.23$; CFI = .921; TLI = .905; RMSEA = .080 [.069, .092]; SRMR = .064. All standardized regression coefficients were strong, and correlations between the four factors were in the moderate range (i.e., .39 - .56). The fit of the model in male participants was also good, $\chi^2_{(142)} = 382.35$, $p < .001$, $\chi^2/df = 2.42$; CFI = .92; TLI = .90; RMSEA = .096 [.085, .108]; SRMR = .04. Importantly, however, in male participants there was a strong correlation between the Dissociative Re-enactment and Anti-Dissociation factors (i.e., $r = .88$); in addition, correlations between the factors was much higher in male versus female participants

overall (i.e., .61 < *r* < .75 for males versus .39 < *r* < .56 for females). However, for the purposes of testing metric and scalar invariance, the four-factor model was retained in both males and females.

3.6.2 Configural Invariance of the RRDI

Configural invariance was tested by unconstraining the item loadings and the intercepts across groups (i.e., male and female), and fixing the latent means at zero. Free intercepts and fixed means of zero essentially indicates lack of a mean structure. The fit of the unconstrained model was good, $\chi^2_{(318)} = 809.25$, $p < .001$, $\chi^2/df = 2.55$; CFI = .919; TLI = .903; RMSEA = .091 [.083, .099]; SRMR = .06. Although model fit was good, deviations in the loadings as well as latent variable correlations and variances were substantial between males and females (see Tables 5 and 6 for unstandardized factor loadings, and standardized factor correlations). Configural invariance was retained as the model fit was still adequate when comparing across groups.

3.6.3 Metric Invariance of the RRDI

To test for metric invariance the factor loadings between groups were restricted, while the intercepts were free to vary. The fit of the stricter model was good, $\chi^2_{(299)} = 783.49$, $p < .001$; CFI = .908; TLI = .895; RMSEA = .093 [.085, .101]; SRMR = .062. A chi-square difference test between the nested (constrained) model versus parent (unconstrained) model was found to be nonsignificant ($\chi^2_{diff\ (19)} = 809.25 – 783.49 = 25.76$, $p > .05$). Therefore, the restricted model was considered statistically similar to the unrestricted model, and metric invariance of the RRDI was obtained.

3.6.4 Scalar Invariance of the RRDI

The final test of invariance for the RRDI was scalar invariance, which restricts both loadings and intercepts. The fit of the stricter model (i.e., scalar model) was good, $\chi^2_{(314)} = 855.64$, $p < .001$, $\chi^2/df = 2.72$; CFI = .897; TLI = .888; RMSEA = .096 [.089, .104]; SRMR = .069. A chi-square difference test between the nested (restricted intercepts) versus parent (restricted loadings) models was significant ($\chi^2_{diff\ (15)} = 855.64 – 783.49 = 72.15$, $p < .05$); in addition, ΔCFI = .008 and ΔRMSEA = .003. Therefore, both

the chi-square difference test and ΔCFI statistic indicated that the less restrictive model was a statistically better model, and scalar invariance was rejected. After inspection of the modification indices, the intercept of Item 1 was found to be unequal across groups. Another test of scalar invariance was conducted, this time relaxing the restriction on the intercept of Item 1. The fit of this model was improved over the previous model $\chi^2_{(277)}$ = 711.57, $p < .001$; CFI = .912; TLI = .903; RMSEA = .092 [.084, .100]; SRMR = .064, and ΔCFI = .005 and ΔRMSEA < .005. Therefore, partial invariance of the RRDI was accepted between sexes.

3.6.5 Comparison of Latent Means Between Males and Females

A mean-structure multi-group analysis was conducted to determine if significant differences in latent means existed across sexes for the four different factors. The latent means of the female group were fixed at zero, while the male group latent means were free to vary. Inspecting the unstandardized latent means, males were found to have a significantly higher latent mean on Dissociative Re-enactment (.48, $p < .001$), and a significantly lower latent mean on Emotion Regulation (-.37, $p < .01$). Tables 13 and 14 report the standardized item loadings, as well as standardized factor correlations in both female and male participants, respectively.

3.7 Latent Profile Analysis of the NSSI subsection of the RRDI

A series of LPAs were conducted on the 19-items of the RRDI self-injury subsection. A one-class model was calculated first to determine if a two-class model improved the loglikelihood, BIC, and AIC values; LPAs were then increased from two to five classes (see Table 15 for model fit statistics. Although most model fit parameters were still improving in the five-class model, one group consisted of 18 individuals and was below 5% of the population; therefore, only models with 2-4 classes were considered. The four-class model was favoured as the loglikelihood, AIC, and BIC values improved over the three-class model, entropy was high (i.e., .93), and the BLRT value was significant, indicating that the four-class model statistically improved model fit over the three-class model. The LMR-LRT value was non-significant which suggests that the

four-class model did not statistically improve model fit over the three-class model. Given that all other model fit indices favoured the four-class model, and Nyland and colleagues (2007) suggest that the BLRT index is a better determinant of the correct number of classes over the LMR-LRT, the four-class model was selected for further analysis.

Figure 2 displays the item means of the RRDI for each of the four classes, and Table 16 reports the results of the comparisons between the classes on the four factors of the RRDI. The first class identified was the largest, accounting for 50.3% of participant

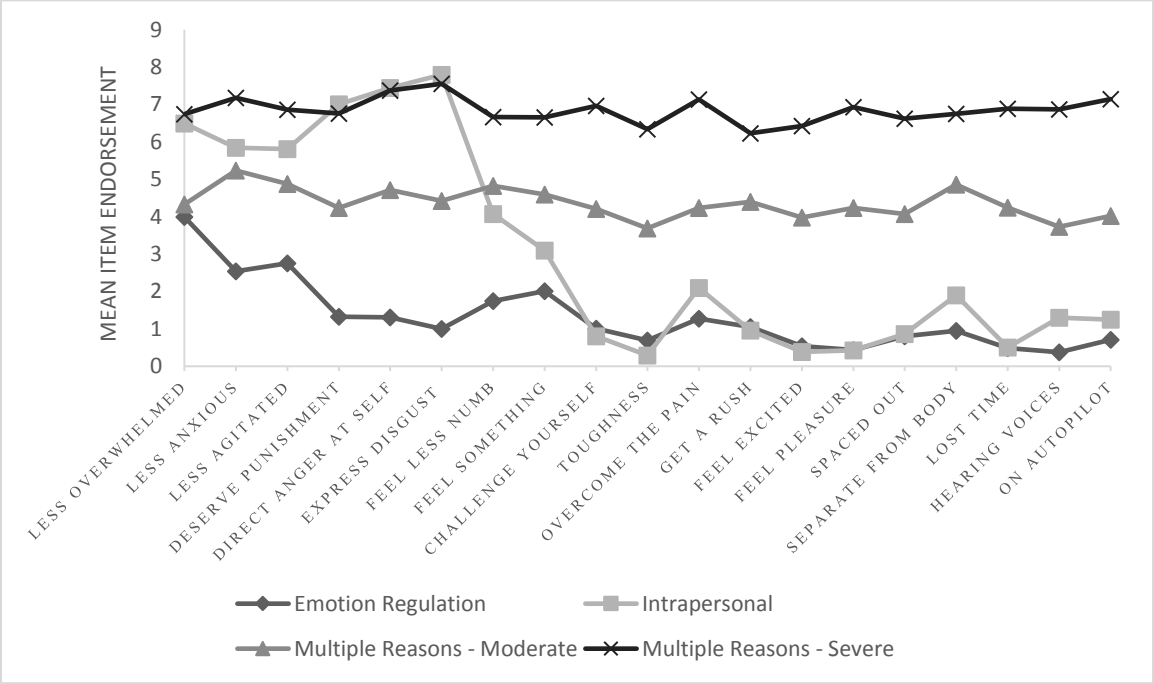

Figure 2: Item Means of the RRDI Self-Injury Subsection for the Four Profile Model. *Note:* For full item wording see Appendix B

responses. Overall the class reported significant emotion regulation reasons for self-injury, particularly using self-injury to "feel less overwhelmed"; however, punishment and anti-dissociation reasons were infrequently endorsed as reasons for self-injury, and dissociative re-enactment reasons were almost never endorsed. Class One was therefore labeled "Emotion Regulation". Class Two accounted for 11.9% of participants, and endorsed significant emotion regulation and punishment reasons for self-injury, they also reported anti-dissociation reasons for self-injury to a moderate extent, but rarely endorsed

dissociative re-enactment reasons for self-injury. Because of the strong endorsement of emotion regulation and punishment reasons for self-injury, and moderate endorsement of anti-dissociation reasons for self-injury, Class Two was labeled “Intrapersonal Reasons”. Class Three accounted for 24.5% of participants, and reported an overall moderate endorsement for all reasons for self-injury; therefore, this class was labeled “Poly-Reasons Moderate”. Finally, Class Four accounted for 14.1% of participants and was characterized by high endorsement of all reasons for self-injury; therefore, Class Four was labeled “Poly-Reasons Severe”.

3.7.1 Profile Comparisons

Multivariate Analyses of Variance (MANOVA) were performed on the outcome variables of interest included in the survey, across the four identified classes of reasons for self-injury. Comparisons were not made for the Life Events Checklist, or the Emotional Neglect Subscale of the CTQ, as these tests did not obtain a significant *F* value. As shown in Table 17 the Emotion Regulation Class endorsed the lowest severity of PTSD, Depression, Anxiety, and Dissociation symptoms, and less severe experiences of childhood abuse compared to all other classes. The Poly-Reasons Moderate and Poly-Reasons Severe classes differed only in terms of their endorsement of dissociation symptoms, with the Poly-Reasons Severe Class endorsing more severe and frequent dissociative symptoms on the DSS referring to Gaps in Awareness and Memory, Somatic Misperceptions, and Reexperiencing. The Poly-Reasons Severe Class did endorse more severe experiences of abuse compared to the Intrapersonal Reasons Class referring to the CTQ scales of Physical and Sexual Abuse and Physical Neglect. Although most differences were non-significant the Poly-Reasons Severe Class consistently endorsed the most difficulty with posttraumatic symptoms compared to all other classes, particularly with intrusion, anhedonia, and anxious arousal symptoms. The Intrapersonal Reasons Class endorsed more psychopathology and childhood trauma compared to the Emotion Regulation Class, but not compared with the two Poly-Reasons Classes.

3.8 Latent Class Analysis of the Ten Self-Destructive Behaviour Categories

A series of Latent Class Analyses (LCA) were performed on the 10 different types of SDB assessed by the RRDI. The total number of classes were increased from starting from 1 until model fit indices were degraded. Table 18 reports the results of LCAs performed on the 10 SDBs of the RRDI. The five-class model was deemed the best fitting model as this model had a better BLRT, LMR, Entropy, and Adjusted BIC compared to the six-class model. When compared to the three- and four-class models, the five-class model was found to have an improved BLRT, LMR, Entropy, Loglikelihood, AIC, and Adjusted BIC. Figure 3 displays the five-class model in terms of probabilities of behaviour endorsement.

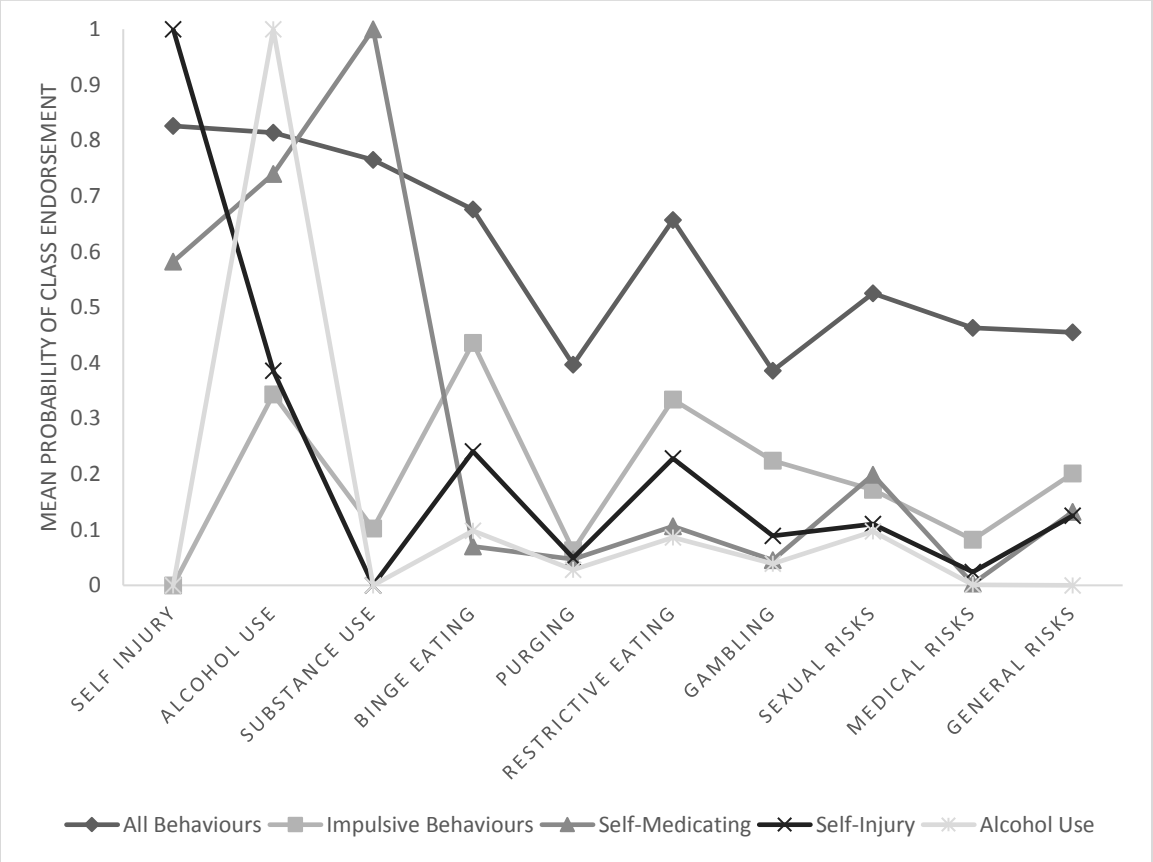

Figure 3: Mean Probability of Lifetime Endorsement of the 10 Destructive Behaviours Across the Five Classes

Class 1 was represented by individuals who had the highest probability of endorsing lifetime engagement in binge eating, purging, restricting eating, gambling, sexual risk-taking, medical risk-taking, and general risk-taking. Individuals in Class 1 also had high probabilities of endorsing self-injury, alcohol use, and substance use, although, other classes did have higher probabilities of endorsing these behaviours. Because of the high probability of endorsing all 10 measured behaviours, Class 1 was labeled an "All Behaviours" class. Class 2 was labeled "Impulsive Behaviours", and was characterized by individuals with a modest probability of endorsing binge eating and restricting eating, as well as gambling, sexual risk-taking, medical risk-taking, and general risk-taking. Class 2 also had the lowest probability of endorsing alcohol use, substance use, and self-injury. The third identified class was labeled "Self-Medicating" given their high probability of endorsing using substances, as well as alcohol use, and self-injury. Except for sexual risk-taking, individuals in the Self-Medicating class had a very low probability of most other behaviours. Class 4 consisted of individuals with the highest probability of endorsing self-injury (i.e., 1.00), and elevated probabilities of endorsing binge eating and restricting eating; however, this group had low endorsement of all other behaviours. Class 4 was labeled "Self-Injury" due to these endorsement probabilities. Finally, Class 5 was labeled "Alcohol Use" given that this class had a 1.00 probability of endorsing alcohol use, but near zero probabilities of endorsing all other behaviours.

3.8.1 Class Comparisons on Past Year Frequency of Behaviours and Outcome Measures

Table 19 displays results of One-Way and MANOVA statistics for comparisons of past year behaviour frequency and outcome variables related to psychopathology and traumatic experiences across the five-classes. One-Way ANOVAs were mostly non-significant when comparing past-year engagement in SDB. The one exception was a significant difference across classes in past-year engagement in general risk taking $F(4, 229) = 6.92$, $p < .05$, with the All Behaviours, Impulsive Behaviours, and Self-Medicating classes endorsing a significantly greater past year engagement in general risk-taking compared to the Alcohol Use Class.

MANOVA comparisons of PCL-5 total scores and subscale scores across classes were found to all be significant ($p < .05$). Specifically, the All Behaviours Class was found to be higher than all other classes in terms of PCL-5 Total Score, as well as PCL-5 subscale scores referring to Avoidance, Negative Alterations, Anhedonia, Externalizing Behaviour, Anxious Arousal, and Dysphoric Arousal. Referring to the PCL-5 Intrusion subscale, the All Behaviours Class was found to be higher than all other classes, excluding the Self Injury Class. The Self-Medicating Class and Self-Injury Class had comparable scores for the PCL-5 Total, as well as all subscales of the PCL-5; therefore, these classes did not differ from each other on any scale, but did score significantly higher on the PCL-5 Total Score and subscale scores compared to Impulsive Behaviours Class and Alcohol Use Class. The Impulsive Behaviours and Alcohol Use Class did not differ from each other on the PCL-5 Total score or any subscale scores, and scored lower across all scales compared to the other three classes.

MANOVA comparisons were found to be significant for both the PHQ-Anxiety and PHQ-Depression scales. Post-hoc multiple-groups comparisons demonstrated that the All Behaviours Class scored significantly higher than all other classes on the PHQ-Depression scale, and all classes, excepting the Self-Medicating Class, on the PHQ-Anxiety scale. The other consistent finding was that the Alcohol Use Class scored significantly lower than all other classes on the PHQ-Depression and PHQ-Anxiety scale. MANOVA results for Dissociation symptoms referring to the PCL-5 Dissociation scale and the DSS subscales can also be seen in Table 19. Across all scales, the All Behaviours Class was found to score higher consistently; however, significant differences only emerged for the DSS scales referring to Derealization, Gaps in Awareness and Memory, and Reexperiencing. Significant differences between other classes was rare.

MANOVA was also performed on the CTQ subscales, however, for this measure, only comparisons for the CTQ-Emotional, Physical, and Sexual Abuse scales were significant. The All Behaviours Class reported higher severity of childhood Emotional Abuse compared to all other classes, higher severity of childhood Physical Abuse compared to the Alcohol Use Class, and higher severity of childhood Sexual Abuse compared to the Self-Medicating and Alcohol Use Classes. Multiple-Group Comparisons

referring to the other classes were generally non-significant. A One-Way ANOVA across the five-classes was also performed on the ACE Total Score. Again, the All Behaviours Class reported higher severity of childhood adversity compared to all other classes. The Self-Medicating Class reported a higher severity of childhood adversity compared to the Impulsive Behaviours Class and Alcohol Use Class, and the Self-Injury Class reported a higher severity of childhood adversity compared to the Alcohol Use Class.

Finally, a Univariate ANOVA was performed on the total score of the Life Events Checklist, and was found to be significant. The Self-Injury Class was found to have the highest endorsement of lifetime trauma compared to all other classes. The All Behaviours Class and Self-Medicating Class was found to have higher endorsement of lifetime trauma compared to the Alcohol Use and Impulsive Behaviours Class

Chapter 4

4 Discussion

The current research evaluated the factor structure and validity of the *Reasons for Reckless and Self-Destructive Behaviours Inventory* (RRDI), which was initially developed as a brief assessment tool of reasons for SDB related to PTSD. Specifically, we evaluated the internal consistency and construct validity of several reasons of SDB across 10 well-recognized SDB including NSSI, alcohol abuse, substance abuse, binge eating, purging, restricted eating, gambling, sexual risk-taking, medical risk-taking, and general risk-taking. The RRDI also expanded the construct of dissociation in SDB as experiences of feeling in a trance or spaced out, time loss or time feeling different, hearing internal voices, loss of volitional control, feeling on "auto-pilot", and trying to feel numb or out of your body, were all assessed alongside previously measured functions of emotion-regulation, self-punishment, anti-dissociation, sensation-seeking, and toughness. The potential utility of dissociative reasons for SDB were evaluated using bivariate correlations, confirmatory factor analysis (CFA), and latent profile analysis (LPA). Finally, we also conducted a latent class analysis (LCA) of the 10 SDB to demonstrate the importance of assessing multiple SDB as opposed to only a single behaviour type.

4.1 Psychometric Evaluation of the RRDI

We found good initial psychometric validity for the RRDI across several different behaviour categories. Specifically, across all scales, coefficient alpha was excellent, given the small number of items per scale and the varying sample size across each behaviour category. In addition, no major deviations in kurtosis or skewness indices were found, demonstrating the normality of the RRDI scales even within a non-clinical sample. Psychometric validity was also established via mean endorsement ratings of reasons for SDB. Specifically, across behaviour types, regulating emotions was frequently endorsed as an important reason for SDB. This finding is in congruence with most existing research suggesting that SDB is often engaged in to regulate dysphoric affective states (e.g., Klonsky, 2007), and that emotion dysregulation is an important mechanism

between negative life events and SDB (Burns, Fischer, Jackson, & Harding, 2012; Hund & Espelage, 2006). In addition, reasons were differentially endorsed across behaviours in an expected fashion. Sensation/thrill seeking was more frequently endorsed as an important reason for drinking alcohol, using substances, or engaging in risky sexual behaviour, compared to behaviours such as NSSI or purging. In contrast, self-punishment and anti-dissociation motivations were endorsed as a more important reason for NSSI, purging, and restricted eating.

Most notably, we found consistent mean ratings for items that have not been previously recognized in measurement instruments for SDB, specifically peri-dissociation (i.e., dissociative experiences during SDB) and pro-dissociation items (i.e., SDB eliciting dissociative experiences). Consistent with previous work examining dissociative versus non-dissociative distress, peri-and pro-dissociation items (e.g., detachment, loss of time) were always less frequently endorsed compared to items assessing non-dissociative distress states (e.g., anxiety, tension; Brown & Frewen, 2017; Frewen, Brown, & Lanius, 2017).

Elevations in mean ratings for peri- and pro-dissociation were found in individuals who endorsed binge eating and gambling behaviour. The notion that dissociative states are prominent in binge eating episodes is not new, as some authors suggest that dissociation is a fundamental aspect to the binge episode (Heatherton & Baumeister, 1991; Miller, McClusky-Fawcett, & Irving, 1993; Swirsky & Mitchell, 1996). For example, Heatherton and Baumeister (1991) describe binge eating episodes as a method of escape from self-awareness, in which the individual constricts their focus on an immediate and concrete stimulus (i.e., food) to block out painful states of aversive self-awareness (e.g., feelings of inadequacy, dysphoric states) and disconnect from higher level thoughts (e.g., personal values, future goals). The escape state described by Heatherton and Baumeister is highly related to a compartmentalization function of dissociation. Likewise, dissociative experiences are found to be elevated in some pathological gamblers. For example, Ledgerwood and Petry (2006a) identified a "dissociation" factor in their principal components analysis of the *Gambling Experience Measure,* and in addition, found that about one-third of a sample of treatment-seeking

gamblers endorsed high levels of PTSD experiences as well as elevations in dissociative symptoms (Ledgerwood & Petry, 2006b).

Peri- and pro-dissociation items were also found to have correlations with childhood traumatic experiences of abuse and neglect in the expected small to moderate range ($.25 < r < .50$). This is consistent with previous research examining the trauma-model of dissociation (Dalenburg et al., 2012, 2014), and previous research examining the association between experiences of abuse and neglect and various self-destructive behaviours (e.g., Klonsky & Moyer, 2008). Finally, convergent validity of the dissociation items was found by examining intercorrelations between reasons for NSSI and the Dissociative Symptoms Scale (DSS). Specifically, across all DSS subscales peri- and pro-dissociation were found to have the strongest correlation. It should be noted that self-punishment self-challenge, and sensation-seeking motivations were also strongly correlated with DSS subscales. One potential explanation for this is that the DSS was developed to be normally distributed in the general population; therefore, examining correlations within a self-injuring subset of the general populations may have lead to higher correlations than would be found with a measure of pathological dissociation, such as the *Dissociative Experiences Scale* (Bernstein & Putnam, 1986).

4.2 Factor Structure and Sex Invariance of the NSSI Subsection of the RRDI

The current study also examined a measurement model of the NSSI subsection RRDI, a new measure of reasons for engaging in SDB that also takes into account the different ways that dissociative experiences relate to SDB. Specifically, the factor structure of the self-injury component of the instrument was examined in a general population sample of individuals who endorsed engaging in self-injury at least once in their life.

A four-factor model was found to best fit the data: 1) Dissociative Re-enactment (consisted of thrill seeking, self-challenge, elicit dissociation, and antecedent dissociative states), 2) Emotion Regulation, 3) Self-Punishment, and 4) Anti-Dissociation. Two items were found to cross-load stronger on an unspecified factor than their intended factor, and were subsequently removed from the item set, resulting in an item pool of 20-items.

Furthermore, three pairs of items were specified to have correlated residuals to decrease the RMSEA and SRMR values, improve model fit, and because from an empirical standpoint the error terms of the items were likely to overlap given they are on the same factor and had similar content description. The correlations between the latent variables were strong, suggesting that the model is not completely orthogonal; however, correlations did not exceed .7, which indicates distinctiveness of the latent variable variance coverage.

The hypothesis that a seven-factor model would best fit the data was not confirmed in the present study. The inclusion of more than four factors resulted in very high correlations between certain latent variables, in one case as high as .92. Dissociative states preceding and during self-injurious acts were found to be highly related to endorsement of engaging in self-injury for thrill-seeking or self-challenging purposes. Since the inclusion of the dissociative item set is novel to the current research project, there is limited empirical support for this finding, and this result will need to be corroborated by further research.

The current research found that a four-factor model of the RRDI was adequate in both male and female participants in terms of fit statistics and factor loadings. Greater differentiation of the factors was found in female versus male participants, suggesting greater uniqueness in reasons for self-injury in female participants versus males. The correlations between the different reasons were much stronger in males, and often exceeded .6, which suggests that men may more often have multiple reasons for engaging in a particular form of self-injury, whereas women may be more likely to engage in self-injury for one particular reason. Examination of the mean structures highlighted that women compared to men were more likely to endorse emotion regulation as the reason for engaging in self-injury; whereas men were more likely to endorse dissociative re-enactment (i.e., thrill seeking, challenging, and dissociative reasons) as the reason for

self-injury. No sex differences were found between men and women on anti-dissociation or self-punishment.

The current research also found support for partial measurement invariance of the RRDI (Byrne, Shavelson, & Muthén, 1989; Kline, 2016). Specifically, configural and metric invariance procedures were satisfied; however, at the level of scalar invariance, the assumption of equivalent intercepts across groups was not satisfied. Such results suggest that scores on the RRDI for men compared to women have a degree of a differential additive response style, such that there are systematic influences unrelated to the factors that influence responses to an indicator in a specific population. Examination of the modification indices indicated that item one was the largest contributor to the lack of adequate fit in the model (i.e., "When you injure yourself intentionally, how often is it...to feel less emotionally overwhelmed?"), after relaxing the constraint on this item, scalar invariance of the four-factor model was obtained. Given the well replicated finding that women have higher emotional intensity, awareness, and expressiveness compared to men (Gratz & Roemer, 2004; Grossman & Wood, 1993; Kring & Gordon, 1988), this item may be picking up on a fundamental difference in why men and women engage in NSSI. Future research may consider using more specific affective items to examine emotion regulation reasons for self-injury, such as anger, or shame, rather than a general overall emotional distress item. Therefore, the finding that women endorsed significantly greater emotion regulation reasons for self-injury compared to men should be interpreted with caution.

Given the modest sample size for men and women (i.e., < 200) the findings of the current study are encouraging for future research with the RRDI, in terms of cross-sex comparisons of subscale scores, as well as the relationship between subscale scores and outcome variables. It will be important for future research to determine invariance of the measure between groups that endorse recent self-injury (i.e., in the past three months) versus groups of individuals that have engaged in self-injury only historically (i.e., > 1 year ago). The current sample was primarily comprised of individuals that are not actively self-injuring, or engage in self-injury a few times per year, this may have an impact on the structure of the RRDI. It is reasonable to hypothesize that individuals who

are actively self-injuring endorse a greater variety of reasons and a greater importance of the reason for the self-injury.

4.3 Latent Profile Analysis

Our LPA identified four qualitatively different profiles of individuals based on the 19-reasons for NSSI. Consistent with previous research, emotion regulation reasons were identified as the most important reason for performing NSSI (Klonsky, 2007; Klonsky & Glenn, 2009; Nock & Prinstein, 2004). The largest class endorsed only emotion regulation reasons as important for their self-injury behaviours, and represented over 60% of self-injurers in the current study. We also identified three classes that endorsed multiple reasons for their NSSI behaviour. One class only endorsed the intrapersonal reasons for self-injury included in our measure, these individuals endorsed that using NSSI as a method of emotion regulation and self-punishment was very important to them, and to a slightly lesser degree anti-dissociative reasons for NSSI.

Important to the aims of the current study, the LPA also identified two classes that endorsed dissociative reasons as important for their self-injury, one endorsing moderate importance and another endorsing high importance. Crucially, these two profiles did have distinct characteristics compared to the profiles without dissociative reasons for NSSI. The two dissociative reasons profiles endorsed both intrapersonal and interpersonal reasons for NSSI to a similar degree. In addition, they reported a greater number of methods used to perform NSSI, and endorsed more significant experiences of physical and sexual abuse and physical neglect. A greater number of NSSI methods has been reported by several studies as a significant predictor of making a suicide attempt (Anestis, Khazam, & Law, 2015; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). This may be due to the individual being more “comfortable” with the concept of damaging their body (Anestis et al., 2015). Clinically, these two groups had very high rates of PTSD, D-PTSD, depression, and anxiety. In combination with their greater history of traumatic experiences and greater variety of NSSI methods, both of these groups may be particularly difficult to treat with treatment as usual plans. Treatment programs applying *Dialectical Behaviour Therapy*, allowing for skill-building and

internal resource development, may be beneficial to these individuals, compared to other treatment plans.

4.4 Dissociation and Non-Suicidal Self-Injury

The current research adds to the growing body of evidence suggesting that dissociative experiences have a nuanced role in NSSI behaviour (e.g., Briere & Eadie, 2016; Forrest et al., 2015; Muelhenkamp et al., 2011). Specifically, both ESEM and CFA analyses supported that dissociative experiences during NSSI covaried with endorsement of sensation-seeking and self-challenge reasons for NSSI. To our knowledge this is a novel empirical finding, but does line up with previous theory and research in other areas. For example, one hypothesis may be that individuals who engage in NSSI "to get a rush or excited" or "to prove that I can take it" have alterations in pain sensitivity networks such that they can tolerate, and in effect, experience less physiological sensations of pain, compared to individuals who do not endorse these reasons for NSSI. Dissociative states may be one explanation for this alteration in pain perception, as previous research has demonstrated correlations between experiences of dissociation and subjective analgesia (Ludäscher et al., 2007). Ludäscher and colleagues (2010) exposed women with BPD with or without PTSD to a pain tolerance paradigm after listening to either a subjective emotionally neutral script or a dissociation inducing script (i.e., either an interpersonal conflict situation or a traumatic experience). Results demonstrated that in both groups, subjects reported a greater pain threshold following the dissociation inducing script compared to the neutral script, and fMRI results supported a negative correlation between symptoms of dissociation and activation of brain regions associated with pain processing. However, studies by Glenn and associates (2014) and Hooley, Ho, Slater, and Locksin (2010) have found that only a self-critical cognitive style, not dissociation, predicts pain threshold and pain endurance. One possible explanation for these disparate findings is that the Glenn et al. and Hooley et al. studies used community samples of participants, whereas Ludascher et al. (2010) used an outpatient clinical sample. Future research

utilizing similar methods in both community and clinical samples would provide stronger evidence to the role of dissociation and pain in NSSI.

Another hypothesis for the degree of association between dissociative experiences and challenge or thrill-seeking reasons for NSSI is that dissociation is a facilitator for approach motivations of NSSI, and re-enactment of previous traumatic experiences. For example, in Connors (1996) theoretical paper, re-enactment of previous traumatic experiences was proposed as one of four primary functions of NSSI in trauma survivors. Specifically, Connors noted that NSSI can be used as an attempt to gain mastery or control over a previously unmanageable situation, and that the individual may hold beliefs that this time "I will be able to control what happens", or "this time I will be in charge of the pain and decide when it's too much" (p. 202). The results of the current study demonstrate that such beliefs regarding NSSI may be facilitated by prominent dissociative experiences that provide affective blunting for approaching painful stimuli, allow for a constriction of conscious focus on the NSSI act, such that normal signals for terminating the behaviour are not acknowledged, or lead to a loss of volitional control and automatize behaviour. In support of a traumatic re-enactment hypothesis, the two profiles associated with dissociative symptoms in the current study endorsed more severe experiences of childhood trauma, particularly physical neglect and physical and sexual abuse, compared to the two profiles with no dissociative experiences. Although this is a largely theoretical position, many scholars have noted the strong association between dissociation during NSSI and traumatic re-enactment (Connors, 1996; van der Kolk, 1989), and across SDB, such as disordered eating (Farber, 1997; Farber, 2008), risky sexual behaviour (Gold & Seifer, 2002), and general risk-taking or reckless behaviour (Levy, 2000).

4.5 Latent Class Analysis of Destructive Behaviours

Finally, we conducted a LCA on participants' lifetime endorsement of engagement in the 10 destructive behaviours assessed by the RRDI. The LCA identified five qualitatively distinct classes, three of which engaged in multiple behaviours and two that primarily engaged in one behaviour. The first class we identified was a small cohort that had high mean probabilities of endorsing all ten behaviours. Consistent with previous

findings, this class of individuals seemed to be at the greatest risk for current psychopathology including PTSD, depression, anxiety, and dissociation. Contrary to expectations, however, although these individuals reported greater childhood adversity, they did not report higher rates of childhood trauma compared to other classes. The only exception was that these individuals reported very high rates of emotional abuse compared to others.

The Impulsive Behaviours class did endorse multiple behaviour types, but overall had a low current symptom load compared to the All Behaviours, Self-Medicating, and Self-Injury classes. Given that the LCA was examining binary lifetime endorsement of behaviours, one hypothesis may be that this class represents a group of individuals who engaged in risky and potentially destructive behaviours in adolescence and young adulthood, but when approaching middle adulthood engagement in these behaviours desisted. This prediction is congruent with developmental models of antisocial and risk-taking behaviour in adolescence (Steinberg, 2007, 2008).

Finally, we did identify a class of individuals who endorsed lifetime engagement in NSSI but, with the exception of a moderate probability of alcohol use endorsement, did not engage in any other risk behaviours. Furthermore, these individuals endorsed comparable levels of current psychopathology and childhood trauma compared to a class which engaged in self-injury, alcohol use, and substance use, and endorsed the highest number of lifetime traumatic experiences. This finding has relevance to the current debate regarding whether NSSI should be recognized as a separate disorder within the DSM-5. In particular, the consistent finding that NSSI is related to a highly self-critical cognitive style and risk of making a future suicide attempt, in conjunction with the current findings of elevated PTSD, depression, and anxiety in these individuals suggests that NSSI may need to be treated as unique compared to other destructive behaviours.

4.6 Implications

SDB negatively impacts not only the individual, but also the larger social microsystems (e.g., families, peer groups) and macrosystems (e.g., school, workplace, mental health system) in which they are embedded. Motivational or functional models

examining *why* individuals engage in these behaviours may be a particularly fruitful avenue of research in terms of the treatment, and ultimately, prevention of the negative effects caused by these behaviours. The results of this project have demonstrated that to fully describe motivational/functional models of SDB, dissociative reasons need to be incorporated, as a substantial proportion of individuals endorse these reasons as moderately or highly important to their behaviour. Indeed, in this study we demonstrated that individuals who endorsed dissociative reasons for NSSI endorsed relatively equal importance of intrapersonal and interpersonal reasons for NSSI, endorsed more methods of NSSI used in their life, and endorsed a greater severity of childhood abusive experiences. Furthermore, after suicide ideation, the most robust predictor of making a suicide attempt is a history of NSSI (Klonsky et al., 2013). The current research found that dissociative reasons for NSSI were more strongly related to past month frequency of NSSI compared to all other reasons, furthermore, only emotion regulation reasons were as strongly associated with NSSI frequency over the past six months and year.

Motivational models of SDB may be particularly important for community mental health care. If certain motivations or reasons for a SDB can predict risk for future injury, need for hospitalization, or risk for suicide, to a comparable level as a diagnosis of major depressive disorder or PTSD, then community services can save time and resources, and make more informed decisions regarding care and future steps. Indeed, most persons first point of contact with the mental health system is their family doctor or a community professional, who may not be qualified to make a psychological diagnosis, or due to case overload, do not have time to run full diagnostic interviews on all persons presenting with SDB. Although the data in the current research cannot prove that dissociative reasons are a critical risk factor for behaviours such as severe injury or suicide, inclusion of formal measurement of dissociative reasons in future research may demonstrate further importance of these motivations.

4.7 Limitations and Future Research

The results of the current research project need to be examined considering several limitations. First, the current research utilized an online convenience sample that overall had a relatively low endorsement of NSSI and other SDB over the previous year.

Future research utilizing an online survey approach should oversample for individuals who have engaged in one or more behaviours within the previous six months, as these individuals could more accurately assess their motivations for SDB. In addition, future research should utilize clinical populations receiving inpatient or outpatient treatment for SDB such as eating disorders or substance abuse to determine if the current results extend beyond the general population.

Second, although the goal of the research was to assess dissociative reasons for SDB that occur throughout a self-destructive episode (for the current study, specifically in NSSI), the RRDI did not contain follow-up items to determine whether the individual experienced dissociation before, during, and/or after the episode. A critic could suggest that the peri-dissociation items were still "anti-dissociative" in function, and that the individual was engaging in NSSI to disrupt or terminate more severe dissociative experiences such as voice hearing or gaps in time or awareness. An argument against this assertion is that we identified a profile of individuals who endorsed significant anti-dissociation reasons for NSSI, but near zero levels of peri-dissociation items. Future research would be able to elucidate these competing arguments by including questions after responding to the item such as "did you have this experience before injuring yourself? During? After?".

Another limitation of the current study was the use of a single method to assess reasons for SDB, namely self-report. Future research would benefit from using multi-method designs such as ecological momentary assessment using written or electronic diaries (Shiffman, Stone, & Hufford, 2008), and experimental designs utilizing pain tolerance tasks (e.g., Hooley, Ho, Slater, Lockshin, 2010) to more deeply understand dissociative experiences during self-injury and other SDB.

Although we employed CFA techniques, following model specification several modifications were made. The gold-standard approach would have been to conduct a CFA on a separate sample of individuals and rigorously test our identified model from ESEM. The modifications made to the model were done to ensure that only unique factors would be included in the final model. Future research will want to test the

structure of RRDI motivations in a separate sample of individuals to buttress support for the final factor structure.

A final limitation to discuss is the use of a lifetime endorsement variable in the LCA. The classes identified may be muddied by unspecified time periods of performing these behaviours, as well as how chronically the behaviours were engaged in at different time-points. Although the identified classes make empirical sense in light of previous research findings, these results will need to be corroborated by future studies which examine specific time periods, with clear markers as to behaviour frequency.

One area of future research that deserves special consideration is extending motivational models of SDB to the domains of suicide ideation and suicide. Indeed, most recognized functions of NSSI or other SDB could be extrapolated to reasons for making a suicide attempt (e.g., stop unwanted or painful emotions, prove I can take it, punish myself). Furthermore, an area of future research that should be explored is whether certain reasons for SDB are incrementally predictive of thoughts, or attempting suicide, over and above the frequency that the individual engages in the behaviour. Furthermore, there is some evidence to suggest that dissociative experiences are potentially important in thinking about and making a suicide attempt. For example, Baumeister (1991) and Schneidmann (1993) describe how individuals at risk for suicide often have a narrowing or constriction of consciousness (i.e., compartmentalization of experience), such that their focus is not on the past or future, but simply one moment in time. In addition, recent laboratory studies have demonstrated that individuals with deficits in recognizing and labeling their internal states or have greater feelings of detachment score higher on measures of suicide risk compared to individuals who do not endorse these deficits (Forrest et al., 2015).

4.8 Conclusion

The central question in research focusing on SDB is how can these behaviours be terminated, and how can they be prevented. Understanding why an individual engages in SDB is the cornerstone to being able to answer these questions. Motivational models can inform etiology, prognosis, treatment needs and plans, as well as ways to prevent

individuals from engaging in these behaviours in the first place. Within the current research we developed a measurement instrument that identified several reasons that are important to performing destructive behaviours, and further identified the role of dissociation in SDB, particularly NSSI. Given that dissociative reasons were found to be strong predictors of current NSSI, and were consistently related to previous traumatic experiences and psychopathology, these reasons should be incorporated into future models of NSSI and other destructive behaviours.

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Table 1: Demographic Information of Full Sample (N = 1056)

	N(%) or *M*(*SD*)		N(%) or *M*(*SD*)
Sex		Marital Status	
Male	538 (50.9)	Single	495 (46.9)
Female	513 (48.6)	Married	460 (43.6)
Other	2 (.2)	Common-law	46 (4.4)
Choose Not to Say	3 (.3)	Divorced	37 (3.5)
		Other	13 (1.2)
Age	33.31 (10.09)	Choose Not to Say	1 (.1)
Ethnicity		Employment	
Caucasian	547 (51.8)	Full or Part-Time	680 (77.7)
African American	198 (18.8)	Student	87 (8.2)
Latino	93 (8.8)	Unemployed	95 (9.0)
East Asian/Asian American	81 (7.7)	Not Able to Work	28 (2.7)
Native American	41 (3.9)	Other	19 (1.8)
Other	57 (5.4)	Choose Not to Say	7 (.7)
Choose Not to Say	19 (1.8)		
		Psychiatric Diagnosis	
Education		Current	190 (18.0)
Some Post-Secondary	917 (86.8)	Past	136 (12.9)
Completed Highschool	125 (11.8)	Never	687 (65.1)
No Highschool	6 (.6)	Choose Not to Say	43 (4.0)
Other	5 (.5)		
Choose Not to Say	3 (.3)		

Notes. Categories not adding to 100% due to rounding.

Table 2: Additional Study Measures: Descriptive Statistics and Inter-Correlation Matrix (N = 1056)

Measure	M (SD	SU	KU	α	1	2	3	4	5	6	7	8	9	10	11	12	13
1. PCL-Total	17.07 (18.09)	1.08	.29	.97	-	.55*	.56*	.64*	.55*	.54*	.53*	.37*	.05	.54*	.54*	.41*	.31*
2. PHQ-ANX	1.75 (1.70)	.94	.18	.84			.70*	.32*	.36*	.19*	.27*	.06	-.01	.28*	.17*	.35*	.20*
3. PHQ-DEP	1.64 (1.72)	1.03	.33	.84				.33*	.37*	.23*	.28*	.19*	.06	.24*	.14*	.36*	.14*
4. DSS-Total	6.93 (3.63)	1.58	2.27	.98					.52*	.61*	.58*	.44*	.02	.27*	.35*	.24*	.06
5. CTQ-EA	10.58 (5.62)	.78	-.47	.90						.71*	.55*	.43*	.25*	.28*	.26*	.56*	.13*
6. CTQ-PA	9.05 (5.10)	1.08	-.05	.89							.63*	.56*	.12*	.29*	.39*	.46*	.12*
7. CTQ-SA	8.28 (5.37)	1.49	1.05	.95								.45*	.01	.34*	.42*	.31*	.13*
8. CTQ-PN	10.22 (4.27)	.28	-.86	.65									.52*	.18*	.26*	.32*	.06
9. CTQ-EN	13.24 (5.80)	.31	-.71	.87										-.02	-.08	.22*	-.16*
10. ISAS-IAP	3.38 (2.31)	.12	-.98	.96											.89*	.26*	.57*
11. ISAS-INT	2.69 (2.08)	.26	-.83	.98												.21*	.57*
12. ACE	2.46 (2.49)	1.02	.40	.79													.20*
13. LEC	6.39 (4.97)	.61	-.84	.89													-

Notes. * = $p < .001$, SU = Skew Index, KU = Kurtosis, PCL = PTSD Checklist, PHQ = Patient Health Questionnaire, ANX = Anxiety, DEP = Depression, DSS = Dissociative Symptoms Scale, CTQ = Childhood Trauma Questionnaire, EA = Emotional Abuse, PA = Physical Abuse, SA = Sexual Abuse, PN = Physical Neglect, EN = Emotional Neglect, ISAS = Inventory of Statements About Self-Injury, IAP = Intrapersonal, INT = Interpersonal, ACE = Adverse Childhood Experiences Scale, LEC = Life Events Checklist

Table 3: Convergent Validity of the Self-Injury Subsection of the RRDI

Scale (# of items)	*M* (SD)	α	Past Month NSSI [a]	Past 6 Months NSSI [a]	Past Year NSSI [a]	ISAS-AR	ISAS-P	ISAS-AD	ISAS-SS	ISAS-T	ISAS-IAP	ISAS-INT
Emotion Regulation (3)	4.43 (2.91)	.83	.12*	.19**	.21**	**.41****	.21**	.24**	.02	.004	.32**	.08
Punishment (3)	3.65 (3.01)	.89	.11*	.12*	.14*	.12*	**.48****	.23**	.14*	.15*	.35**	.20**
Anti-Dissociation (3)	3.07 (2.73)	.84	.12*	.08	.11*	.05	.11	**.40****	.14*	.12*	.23**	.16**
Thrill-Seeking (3)	2.30 (2.65)	.91	.19**	.06	.10	-.07	.07	.18**	**.37****	.25**	.12*	.29**
Challenging (3)	2.53 (2.58)	.85	.15*	.06	.08	-.06	.12*	.24**	.35**	**.40****	.18**	.35**
Peri-Dissociation (5)	2.56 (2.48)	.89	.24**	.19**	.19**	-.02	.18**	.25**	.23**	.17**	.22**	.28**
Pro-Dissociation (2)	2.43 (2.75)	.82	.14*	.04	.05	-.05	.10	.23**	.28**	.23**	.17**	.29**

Notes. ** = $p < .001$, * = $p < .01$. [a] = Kendall-tau correlation used as frequency was an ordinal variable. Bolded values represent correlation between conceptually similar scales of the RRDI and ISAS. ISAS = Inventory of Statements About Self-Injury, AR = Affect Regulation, P = Punishment, AD = Anti-Dissociation, SS = Sensation Seeking, T = Toughness, IAP = Intrapersonal Reasons, INT = Interpersonal Reasons

Table 4: Convergent Validity of the Dissociation Items of the Self-Injury Subsection of the RRDI

RRDI Scale (# of items)	*M* (SD)	α	DSS-D	DSS-G	DSS-SM	DSS-R
Emotion Regulation (3)	4.43 (2.91)	.83	.24*	.32*	.25*	.33*
Punishment (3)	3.65 (3.01)	.89	.41*	.44*	.40*	.45*
Anti-Dissociation (3)	3.07 (2.73)	.84	.48*	.46*	.46*	.47*
Thrill-Seeking (3)	2.30 (2.65)	.91	.50*	.43*	.48*	.48*
Challenging (3)	2.53 (2.58)	.85	.49*	.42*	.48*	.49*
Dissociation (5)	2.56 (2.48)	.89	.65*	.61*	.62*	.63*
Pro-Dissociation (2)	2.43 (2.75)	.82	.57*	.53*	.57*	.58*

Notes. DSS = Dissociative Symptoms Scale, D = Depersonalization/Derealization, G = Gaps in Awareness and Memory, SM = Somatic Misperceptions, R = Reexperiencing.

Table 5: ESEM Standardized Factor Loadings for Original 7-Factor Model of the RRDI Self-Injury Subsection

RRDI Scale/Item	Emotion Regulation		Punishment		Thrill Seeking		Challenging		Anti-Dissociation		Pro-Dissociation		Peri-Dissociation	
	Loading	SE	Loading	SE	Loading	SE	Loading	SE	Loading	SE	Loading	SE	Loading	SE
Emotion Regulation														
Less Overwhelmed	.642	.05	.028	.05	-.189	.07	-.008	.08	.096	.06	.006	.05	-.028	.07
Less Anxious	.718	.05	-.013	.04	-.025	.07	-.017	.08	.059	.05	-.008	.05	.157	.06
Less Agitated	.959	.05	-.023	.03	.065	.04	.007	.06	-.090	.04	-.032	.05	-.066	.05
Punishment														
Deserve Punishment	-.007	.04	.726	.05	-.060	.06	.088	.09	.023	.06	.026	.06	.014	.06
Direct Anger At Self	.093	.04	.699	.05	-.002	.05	.013	.06	-.008	.05	.093	.06	.062	.07
Express Disgust	-.041	.03	1.019	.07	.065	.04	-.060	.06	.003	.05	-.100	.07	-.030	.05
Thrill-Seeking														
Get A Rush	.016	.05	.032	.04	.594	.09	.013	.07	.137	.05	.242	.04	.037	.08
Feel Excited	.048	.03	.003	.03	.712	.07	.174	.07	.030	.05	.009	.05	.033	.05
Feel Pleasure	.063	.03	.098	.03	.754	.07	.043	.06	.041	.04	-.073	.09	.061	.05
Self-Challenge														
Challenge Yourself	-.075	.06	.044	.05	.046	.12	.716	.26	.023	.05	.087	.07	.052	.12
Toughness	.033	.02	-.023	.04	-.008	.09	1.057	.23	-.061	.04	-.167	.04	-.067	.06

Overcome the Pain	.060	.04	.020	.05	-.019	.05	.480	.17	.147	.08	.316	.17	.096	.08
Anti-Dissociation														
Feel Something	-.003	.03	-.040	.03	.007	.05	-.019	.05	.960	.11	.042	.08	-.055	.06
Feel Less Numb	.099	.03	.065	.04	-.009	.05	-.007	.06	.773	.08	.031	.05	-.029	.06
Feel More Aware	-.030	.05	.048	.04	.126	.10	.174	.07	.332	.08	-.190	.09	.289	.09
Pro-Dissociation														
Feel More Numb	.123	.05	.070	.05	.267	.10	.193	.09	.135	.07	.255	.13	.085	.08
Feel Separate From Body	-.035	.04	.119	.04	.389	.06	.113	.09	.160	.07	.061	.13	.227	.07
Peri-Dissociation														
Lost Control	.145	.05	.284	.06	-.119	.08	.042	.08	-.037	.09	.189	.09	.387	.12
Spaced Out	.030	.04	-.055	.04	.053	.05	-.107	.07	.019	.06	-.028	.05	.908	.09
Lost Time	-.005	.04	-.060	.04	.039	.05	.040	.05	-.150	.04	.087	.05	.963	.07
Hearing Voices	-.006	.04	.099	.04	.039	.06	.061	.07	.083	.05	-.052	.06	.634	.07
On Autopilot	.019	.03	-.007	.04	-.084	.05	.075	.07	.167	.04	-.098	.05	.778	.07

Table 6: ESEM 7 Factor Correlation Matrix of the RRDI

RRDI Factor	ER	P	T	AD	C	Pro-D	PD
ER	-	.51	.24	.49	.28	.26	.46
P			.36	.46	.53	.25	.59
T				.53	.76	.12	.66
AD					.55	.30	.64
C						.12	.78
Pro-D							.12
PD							-

Notes. ER = Emotion Regulation, P = Punishment, T = Thrill Seeking, AD = Anti-Dissociation, C = Challenging, Pro-D = Pro-Dissociation, PD = Peri-Dissociation

Table 7: ESEM Model Fit Parameters

Model	$\chi^2_{(df)}$	BIC	RMSEA [95% CI]	CFI	TLI	SRMR
7-Factor Model	218.71 (98), $p < .001$	35224.60	.058 [.047, .068]	.980	.952	.015
6-Factor Model Item 14 Removed	250.36 (99), $p < .001$	33798.00	.064 [.054, .074]	.973	.942	.019
5-Factor Challenging and Thrill-Seeking Combined	335.24 (115), $p < .001$	33788.18	.072 [.063, .081]	.960	.927	.022
5-Factor Item 18 Removed	297.93 (100), $p < .001$	32274.43	.073 [.063, .083]	.962	.928	.021
5-Factor Item 5 Removed	246.42 (86), $p < .001$	30345.35	.071 [.061, .081]	.969	.937	.019

Notes. BIC = Bayesian Information Criterion, RMSEA = Root Mean Square Error of Approximation, CFI = Comparative Fit Index, TLI = Tucker Lewis Index, SRMR = Standardized Root Mean Square Residual.

Table 8: ESEM Final Model

RRDI Scale/Item	Emotion Regulation		Punishment		Anti-Dissociation		Externalizing		Peri-Dissociation	
	Loading	SE	Loading	SE	Loading	SE	Loading	SE	Loading	SE
Emotion Regulation										
Less Overwhelmed	.637	.050	.072	.048	.078	.048	-.237	.058	.021	.062
Less Anxious	.726	.045	.018	.039	.037	.039	-.043	.048	.158	.049
Less Agitated	.933	.047	-.018	.033	-.103	.033	.148	.036	-.050	.041
Punishment										
Deserve Punishment	-.016	.038	.782	.042	.019	.040	-.008	.050	.010	.052
Direct Anger At Self	.106	.038	.749	.042	.020	.037	.015	.048	-.009	.050
Express Disgust	-.026	.030	.980	.040	-.050	.030	.004	.038	-.034	.040
Anti-Dissociation										
Feel Something	-.028	.031	-.029	.027	.886	.063	.052	.040	.059	.039
Feel Less Numb	.087	.036	.081	.033	.704	.055	.013	.043	.075	.044
Externalizing										
Challenge Yourself	-.128	.044	.133	.047	.014	.046	.566	.061	.205	.062
Toughness	-.090	.038	.077	.040	-.137	.039	.640	.053	.288	.053
Overcome the Pain	.043	.049	.114	.052	.222	.052	.356	.068	.159	.068
Get A Rush	.050	.041	.000	.044	.201	.043	.727	.056	-.111	.056
Feel Excited	.053	.028	-.057	.032	-.137	.039	.640	.053	-.039	.044
Feel Pleasure	.069	.032	.027	.036	-.025	.035	.841	.045	.019	.048
Peri-Dissociation										
Spaced Out	.072	.035	-.047	.036	.030	.039	.018	.051	.815	.056
Lost Time	.048	.033	-.018	.034	-.085	.036	.139	.047	.807	.055
Hearing Voices	.043	.049	.114	.052	.114	.052	.222	.052	.643	.059
On Autopilot	.010	.039	.117	.041	.057	.041	.086	.053	.835	.053
Feel More Numb	.137	.048	.105	.050	.200	.051	.456	.058	.039	.069

Table 9: ESEM Final Model Factor Correlations

RRDI Factor	ER	P	AD	E	PD
ER	-	.50*	.49*	.32*	.41*
P			.43*	.52*	.58*
AD				.50*	.48*
E					.75*
PD					-

Notes. * = $p < .05$. ER = Emotion Regulation, P = Punishment, AD = Anti-Dissociation, E = Externalizing, PD = Peri-Dissociation

Table 10: Standardized Factor Loadings of Five-Factor CFA Model

Item	Emotion Regulation		Punishment		Anti-Dissociation		Externalizing		Peri-Dissociation	
	Loading	SE	Loading	SE	Loading	SE	Loading	SE	Loading	SE
Less Overwhelmed	.63	.04								
Less Anxious	.86	.02								
Less Agitated	.85	.03								
Deserve Punishment			.79	.02						
Direct Anger At Self			.84	.02						
Express Disgust			.90	.02						
Feel Something					.85	.03				
Feel Less Numb					.90	.02				
Get A Rush							.76	.03		
Feel Excited							.89	.01		
Feel Pleasure							.87	.02		
Challenge Yourself							.79	.02		
Toughness							.82	.02		
Overcome the Pain							.70	.03		
Feel More Numb									.69	.03
Spaced Out									.84	.02
Lost Time									.87	.02
Hearing Voices									.82	.02
On Autopilot									.88	.02

Notes. All factor loadings were significant at $p < .05$. SE = Standard Error.

Table 11: Factor Correlations for Initial Five-Factor CFA Model

RRDI Factor	ER	P	AD	E	PD
ER	-	.54*	.57*	.42*	.54*
P			.50*	.56*	.62*
AD				.61*	.65*
E					.85*
PD					-

Notes. * = $p < .05$. ER = Emotion Regulation, P = Punishment, AD = Anti-Dissociation, E = Externalizing, PD = Peri-Dissociation

Table 12: Tested Models and Associated Fit Indices of the RRDI using CFA

Model	$\chi^2_{(df)}$	BIC	RMSEA [CI]	CFI	TLI	SRMR
1. 5 Factor	563.79 (142), $p < .001$	30510.49	.089 [.082 - .097]	.92	.90	.058
2. 4 Factor	761.87 (146), $p < .001$	30684.89	.106 [.099 - .114]	.88	.86	.059
3. 4 Factor – Correlated Residual #3 and #10	725.00 (145), $p < .001$	30653.94	.104 [.096 - .111]	.88	.86	.058
4. 4 Factor – Correlated Residual #6 and #13	659.78 (144), $p < .001$	30594.64	.098 [.091 - .106]	.90	.88	.056
5. 4 Factor – Correlated Residual #12 and #22	622.31 (143), $p < .001$	30563.09	.095 [.087 - .103]	.91	.89	.055
6. 4 Factor – Correlated Residual #12 and #19	534.34 (142), $p < .001$	30481.04	.086 [.078 - .094]	.92	.91	.053

Notes. BIC = Bayesian Information Criterion, RMSEA = Root Mean Square Error of Approximation, CI = Confidence Interval, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, SRMR = Standard Root Mean Square Residual.

Table 13: Standardized Factor Loadings (Standard Error) of the RRDI in Female Participants

Item	Emotion Regulation	Self-Punishment	Anti-Dissociation	Dissociative Reenactment
Less Overwhelmed	**.58 (.06)**			
Less Anxious	**.86 (.04)**			
Less Agitated	**.84 (.04)**			
Deserve Punishment		**.82 (.03)**		
Direct Anger At Self		**.87 (.03)**		
Express Disgust		**.88 (.03)**		
Feel Something			**.84 (.04)**	
Feel Less Numb			**.90 (.04)**	
Get A Rush				**.74 (.04)**
Feel Excited				**.80 (.03)**
Feel Pleasure				**.73 (.04)**
Challenge Yourself				**.76 (.04)**
Toughness				**.78 (.04)**
Overcome the Pain				**.72 (.04)**
Feel More Numb				**.60 (.05)**
Spaced Out				**.70 (.04)**
Lost Time				**.69 (.04)**
Hearing Voices				**.70 (.04)**
On Autopilot				**.66 (.05)**

Note. Items 5 and 18 not presented as they were removed from the final model. All bolded estimates are significant at $p < .001$. Standardized loadings are reported. $r_{\text{EREGxPUNISH}} = .53$, $r_{\text{EREGxANTI-DISS}} = .46$, $r_{\text{EREGxDISSREENACT}} = .42$, $r_{\text{PUNISHxANTI-DISS}} = .43$, $r_{\text{PUNISHxDISS-REENACT}} = .54$, $r_{\text{ANTI-DISSxDISSREENACT}} = .58$.

Table 14: Final Model Factor Structure and Loadings (Standard Error) of the RRDI in Males

Item	Emotion Regulation	Self-Punishment	Anti-Dissociation	Dissociative Reenactment
Less Overwhelmed	**.68 (.05)**			
Less Anxious	**.84 (.03)**			
Less Agitated	**.87 (.03)**			
Deserve Punishment		**.76 (.04)**		
Direct Anger At Self		**.80 (.03)**		
Express Disgust		**.92 (.02)**		
Feel Something			**.87 (.03)**	
Feel Less Numb			**.89 (.03)**	
Get A Rush				**.72 (.04)**
Feel Excited				**.80 (.03)**
Feel Pleasure				**.88 (.02)**
Challenge Yourself				**.68 (.04)**
Toughness				**.73 (.04)**
Overcome the Pain				**.78 (.03)**
Lost Control				**.88 (.02)**
Spaced Out				**.88 (.02)**
Lost Time				**.86 (.02)**
Hearing Voices				**.91 (.02)**
Feel More Numb				**.87 (.02)**

Note. Items 5 and 18 not presented as they were removed from the final model. All bolded estimates are significant at $p < .001$. Standardized coefficients presented. $r_{\text{EREGxPUNISH}} = .62$, $r_{\text{EREGxANTI-DISS}} = .73$, $r_{\text{EREGxDISSREENACT}} = .75$, $r_{\text{PUNISHxANTI-DISS}} = .61$, $r_{\text{PUNISHxDISS-REENACT}} = .75$, $r_{\text{ANTI-DISSxDISSREENACT}} = .88$

Table 15: Fit and Classification Indices for a Latent Profile Analysis of the 19-items of the RRDI.

Number of Profiles	Loglikelihood	AIC	Adj. BIC	LMR p-value	BLRT p-value	Entropy	Class Sizes
1	-15954.10	31984.20	32011.53				
2	-14672.67	29371.34	29413.05	2630.54 *P* < .0001	< .0001	.952	244, 118
3	-14371.66	28899.32	28955.41	494.28 *P* < .05	< .0001	.905	170, 92, 100
4	-14162.12	28520.23	28590.71	415.56 *P* = .3300	< .0001	.930	182, 43, 87, 50
5	-14022.87	28281.74	28366.60	276.15 *P* = .5380	< .0001	.937	177, 40, 73, 18, 54

Note. AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, LMR-LRT = Lo-Mendell-Rubin Likelihood Ratio Test, BLRT = Bootstrap Likelihood Ratio Test.

Table 16: Comparison of RRDI and ISAS Factor Scores Across the Four Classes

Measure	**Class 1**: Emotion Regulation (*N* = 182)	**Class 2**: Intrapersonal Reasons (*N* = 43)	**Class 3**: PolyReasons-Moderate (*N* = 87)	**Class 4**: Poly-Reasons – Severe (*N* = 50)	*F* statistic	η^2
RRDI						
Emotion Regulation	3.16 (2.81) [2, 3, 4]	6.00 (3.09) [1]	5.04 (2.07) [1, 4]	6.85 (1.56) [1, 3]	30.39, $p <$ .001	.23
Punishment	1.17 (1.37) [2, 3, 4]	7.32 (1.74) [1, 3]	4.57 (1.61) [1, 2, 4]	7.25 (1.37) [1, 3]	309.00, $p <$ .001	.75
Anti-Dissociation	1.86 (2.63) [2, 3, 4]	3.56 (3.36) [1, 4]	4.83 (2.18) [1, 4]	6.95 (1.19) [1, 2, 3]	53.51, $p <$ .001	.35
Dissociative Reenactment	.74 (.75) [3, 4]	.91 (.86) [3, 4]	4.20 (.98) [1, 2, 4]	6.75 (1.04) [1, 2, 3]	664.85, $p <$ .001	.87
ISAS						
Intrapersonal	3.63 (1.81) [2, 3, 4]	5.58 (1.57) [1]	4.62 (2.21) [1]	4.99 (2.06) [1]	14.56, $p <$ .001	.12
Interpersonal	2.75 (1.66) [3, 4]	3.13 (1.53)	3.95 (2.11) [1]	4.21 (2.16) [1]	11.75, $p <$ .001	.10
# of NSSI methods used (Range 0-12)	4.92 (3.54)[3, 4]	6.07 (2.48)[3, 4]	8.51 (3.73)[1, 2]	8.60 (4.19)[1, 2]	26.81, $p <$ .001	.18
% Experiencing Pain during NSSI	80.2% (N = 146)	83.7% (N = 36)	86.0% (N = 75)	78.0% (N = 39)		

Notes. Superscript numbers indicate which Class mean values are significantly different from one another. RRDI = Reasons for Reckless and Destructive Behaviours Inventory, ISAS = Inventory of Statements About Self-Injury, NSSI = Non-suicidal Self-Injury.

Table 17: Differences Between Latent Profiles on Outcome Measures

Measure/Scale	**Class 1**: Emotion Regulation (*N* = 182)	**Class 2**: Intrapersonal Reasons (*N* = 43)	**Class 3**: PolyReasons-Moderate (*N* = 87)	**Class 4**: Poly-Reasons – Severe (*N* = 50)	*F* statistic	η^2
PCL-5						
Total	16.31 (16.55) [2, 3, 4]	32.00 (20.58) [1]	34.11 (18.28) [1]	38.66 (19.22) [1]	26.11	.22
Dissociation	4.05 (7.09) [3, 4]	6.38 (9.60) [3, 4]	12.52 (9.75) [1, 2]	14.86 (9.77) [1, 2]	25.29	.22
DSS						
Total	5.28 (2.27) [2, 3, 4]	7.46 (3.62) [1, 3, 4]	9.37 (3.75) [1, 2, 4]	11.49 (4.55) [1, 2, 3]	50.48	.30
CTQ						
Emotional Abuse	10.33 (5.49) [2, 3, 4]	14.60 (5.63) [1]	13.76 (5.52) [1]	15.50 (5.89) [1]	14.68	.13
Physical Abuse	8.34 (4.53) [2, 3, 4]	9.37 (5.27) [1, 4]	11.82 (5.99) [1]	14.21 (6.71) [1, 2]	16.40	.14
Sexual Abuse	7.09 (4.31) [2, 3, 4]	9.09 (6.99) [1, 4]	12.00 (6.67) [1]	12.82 (6.67) [1, 2]	19.12	.16
Physical Neglect	10.32 (2.82) [2, 3, 4]	10.86 (3.56) [1, 4]	12.68 (3.86) [1]	13.87 (5.43) [1, 2]	14.43	.13
Emotional Neglect	12.72 (5.59)	14.63 (5.56)	13.22 (4.88)	12.24 (6.03)	1.45, *ns*	.01
PHQ						
Anxiety	1.93 (1.71) [2, 3, 4]	3.10 (2.01) [1]	2.55 (1.77) [1]	2.79 (1.70) [1]	7.24	.06
Depression	1.78 (1.77) [2, 3, 4]	3.02 (1.99) [1]	2.48 (1.65) [1]	2.79 (1.76) [1]	8.92	.07
Life Events Total	9.63 (4.94)	9.00 (4.69)	8.49 (4.44)	9.08 (4.46)	1.19, *ns*	.01
ACE Total	2.70 (2.28) [2, 3, 4]	4.00 (3.02) [1]	3.99 (2.83) [1]	4.63 (2.84) [1]	10.39	.08

Notes. ACE = Adverse Childhood Experiences, CTQ = Childhood Trauma Questionnaire, DSS = Dissociative Symptoms Scale, , PCL = PTSD Checklist for DSM-5, PHQ = Patient Health Questionnaire. *F* value significant at $p < .001$ unless otherwise stated. Superscript numbers indicate which Class mean values are significantly different from one another.

Table 18: Fit and Classification Indices for a LCA of 10 Types of Self-Destructive Behaviour

Number of Classes	Loglikelihood	AIC	Adj. BIC	LMR LRT p-value	BLRT p-value	Entropy	Class Sizes
1	-3845.27	7710.27	7725.40				
2	-3743.54	7529.09	7560.27	200.72 *P* < .001	< .0001	.878	56, 725
3	-3699.57	7463.15	7510.67	86.75 *P* = .0013	< .0001	.577	64, 358, 359
4	-3671.81	7429.62	7493.48	54.78 *P* = .05	< .0001	.660	69, 158, 227, 327
5	-3652.28	7412.55	7492.75	38.55 *P* < .001	< .0001	.856	63, 184, 184, 205, 145
6	-3636.61	7403.21	7499.74	31.018 *P* = .0073	= .05	.778	173, 134, 135, 72, 191, 76
7	-3623.77	7399.54	7512.41	26.358 *P* = .1544	= .2174	.820	75, 103, 90, 172, 133, 134

Notes. AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, LMR LRT = Lo-Mendell-Rubin Likelihood Ratio Test; BLRT = Bootstrap Likelihood Ratio Test.

Table 19: Differences Between Latent Classes on Outcome Measures

Measure	Class 1: All Behaviours (N = 63)	Class 2: Impulsive Behaviours (N = 184)	Class 3: Self-Medicating (N = 184)	Class 4: Self-Injury (N = 205)	Class 5: Alcohol Use (N = 145)	*F* statistic	η^2
Behaviours- Past Year Frequency							
Self-Injury	2.27 (1.92)	N/A	1.75 (1.78)	1.80 (1.63)	N/A	1.92, *ns*	.01
Alcohol Use	2.38 (1.73)	2.21 (1.07)	2.21 (1.46)	2.16 (1.46)	1.87 (1.26)	1.42, *ns*	.02
Drug Use	2.12 (1.90)	2.23 (2.20)	2.34 (2.18)	N/A	N/A	.24, *ns*	.00
Binge Eating	2.93 (1.53)	2.52 (1.41)	3.31 (1.50)	3.10 (1.52)	2.42 (1.08)	2.12, *ns*	.04
Purging	2.15 (2.30)	1.40 (1.24)	1.70 (1.06)	1.44 (1.13)	2.00 (1.73)	.56, *ns*	.04
Restricted Eating	3.26 (2.19)	2.40 (1.6)	3.33 (1.88)	2.40 (1.71)	3.09 (1.76)	2.28, *ns*	.05
Gambling	2.78 (1.84)	2.56 (1.77)	3.29 (1.11)	2.56 (1.92)	1.33 (1.21)	1.12, *ns*	.04
Sexual Risks	1.76 (1.81)	1.73 (2.05)	1.30 (1.31)	1.88 (1.68)	1.18 (1.08)	.75, *ns*	.02
Medical Risks	2.53 (2.02)	2.00 (1.29)	N/A	1.60 (1.82)	N/A	.91, *ns*	.03
General Risks	1.55 (1.46) [5]	1.01 (1.32) [5]	.88 (1.19)	1.28 (1.49) [5]	.13 (.47) [1, 2, 4]	6.92, $p <$ .05	.11
PCL-5							
Total	32.79 (19.66) [2, 3, 4, 5]	12.05 (13.81) [1, 3, 4]	19.91 (19.33) [1, 2, 5]	21.03 (19.49) [1, 2, 5]	10.66 (13.86) [1,3, 4]	18.12, $p <$ .001	.11
Dissociation	9.13 (8.90) [2, 5]	3.34 (6.17) [1, 4]	5.43 (8.56)	6.70 (9.33) [2]	3.78 (7.35) [1]	6.47, $p <$ .001	.04
CTQ							
Emotional Abuse	14.48 (5.44) [2, 3, 4, 5]	10.55 (5.36) [1, 5]	11.23 (5.97) [1, 5]	11.60 (5.81) [1, 5]	8.14 (4.00) [1, 2, 3, 4]	13.07, $p <$ .001	.08
Physical Abuse	10.82 (6.19) [5]	9.04 (4.67)	9.34 (5.15)	9.56 (5.47)	7.87 (4.13) [1]	3.37, $p <$ .05	.02

Sexual Abuse	10.74 (6.60) [4, 5]	8.59 (5.26)	8.79 (6.20)	8.25 (5.24) [1]	7.02 (4.02) [1]	4.25, $p <$ .01	.03
Physical Neglect	11.64 (3.75)	10.66 (3.24)	11.30 (3.81)	11.15 (3.64)	10.61 (3.45)	1.37, *ns*	.01
Emotional Neglect	13.64 (5.29)	13.50 (5.56)	12.72 (5.65)	12.96 (5.41)	12.26 (5.70)	1.01, *ns*	.01
PHQ							
Anxiety	2.97 (1.89) [2, 4, 5]	1.75 (1.59) [1, 3, 5]	2.45 (1.91) [2, 4, 5]	1.84 (1.59) [1, 4, 5]	1.21 (1.32) [1, 2, 3, 4]	17.75, $p <$ .001	.09
Depression	3.11 (2.07) [2, 3, 4, 5]	1.69 (1.65) [1, 5]	2.04 (1.88) [1, 5]	1.82 (1.62) [1, 5]	1.06 (1.39) [1, 2, 3, 4]	17.14, $p <$ .001	.08
DSS-Total	8.94 (3.58) [2, 3, 4, 5]	6.98 (3.62) [1]	7.04 (3.57) [1]	7.04 (3.57)[1]	6.16 (3.26) [1]	6.44, $p <$ .001	.03
Life Events Total	7.48 (3.41) [2, 4, 5]	4.72 (3.43) [1, 3, 4]	8.16 (4.69) [2, 4, 5]	9.57 (5.17) [1, 2, 3, 5]	4.65 (4.36) [1, 3, 4]	43.37, *p*, < .001	.18
ACE Total	4.63 (2.68) [2, 3, 4, 5]	2.32 (2.26)[1, 3]	3.21 (2.69) [1, 2, 5]	2.77 (2.40) [1, 5]	1.65 (1.87) [1, 3, 4]	20.74, $p <$ .001	.10

Notes. ACE = Adverse Childhood Experiences, CTQ = Childhood Trauma Questionnaire, DSS = Dissociative Symptoms Scale, PCL = PTSD Checklist for DSM-5, PHQ = Patient Health Questionnaire. Superscript numbers indicate which Class mean values are significantly different from one another.

Appendix A: Glossary of Commonly Used Terms (Alphabetical Order).

Acronym		Definition	Acronym		Definition
ACE	=	Adverse Childhood Experiences	ISAS	=	Inventory of Statements About Self-Injury
AIC	=	Akaike Information Criterion	LCA	=	Latent Class Analysis
BIC	=	Bayesian Information Criterion	LEC	=	Life Events Checklist
BLRT	=	Bootstrap Likelihood Ratio Test	LMR	=	Lo-Mendell Rubin
BPD	=	Borderline Personality Disorder	LPA	=	Latent Profile Analysis
CFA	=	Confirmatory Factor Analysis	NSSI	=	Non-suicidal Self-Injury
CFI	=	Comparative Fit Index	PCL	=	PTSD Checklist
CI	=	Confidence Interval	PHQ	=	Patient Health Questionnaire
CTQ	=	Childhood Trauma Questionnaire	PTSD	=	Posttraumatic Stress Disorder
			RMSEA	=	Root Mean Square Error of Approximation
DD	=	Dissociative Disorder			
DSS	=	Dissociative Symptoms Scale	RRDI	=	Reasons for Reckless and Destructive Behaviours Inventory
D-PTSD	=	Dissociative Subtype of PTSD	SDB	=	Self-Destructive Behaviours
ESEM	=	Exploratory Structural Equation Modeling	SE	=	Standard Error
IAV	=	Intrapersonal Avoidance Function	SRMR	=	Standardized Root Mean Residual
IAP	=	Intrapersonal Approach Function	TLI	=	Tucker-Lewis Index

Appendix B: Reasons for Reckless and Destructive Behaviours Inventory

This appendix includes the instructions and definitions for all assessed behaviours. The frequency items and items assessing reasons are the same across all behaviours, and in the interest of space are displayed only for self-injury.

Instructions

The following survey asks about reasons why people engage in 11 different types of behaviours. The first page of each section will ask you to indicate approximately how often you engaged in each behaviour in the past month, in the past 6 months, and then in your lifetime overall. The second page of each section will list some reasons for these behaviours. Please indicate how much you think each is a reason for why you engage in each behaviour, by choosing a score from 0 to 10. A score ***of 0*** means that this is ***NEVER*** a reason you engage in the behaviour, while ***a score of 10*** means that this is ***ALWAYS*** a reason you engage in the behaviour. You can choose any number from 0 to 10 for each reason.

Your responses will remain anonymous, so please be as open with us as possible. If you are bothered by any of the questions you can choose to skip the question(s), or discontinue the survey.

Self-Injury

The next questions ask about reasons why people harm or injure themselves intentionally. Self-injury is defined as:

> The direct and deliberate destruction of your body tissue without an intent to commit suicide. Examples include: cutting, pinching, biting, burning, scratching, scraping, or putting needles in your skin.

Q1. Approximately how many times have you injured yourself intentionally in the past month?

1. Not At All
2. Once
3. Two or Three Time
4. About Once Per Week
5. About Two or Three Times Per Week
6. About Once Daily or Almost Daily
7. Multiple Times Daily Or Almost Daily
8. Daily or Almost Daily for Most of the Day

Q2. During the most stressful period in the past 6 months, approximately how many times have you injured yourself intentionally?

1. Not At All
2. Once
3. Two or Three Times
4. About Once Per Week
5. About Two or Three Times Per Week
6. About Once Daily or Almost Daily
7. Multiple Times Daily or Almost Daily
8. Daily or Almost Daily for Most of the Day

Q3. During the most stressful period in the past year, approximately how many times have you injured yourself intentionally?

1. Not At All
2. Once
3. Two or Three Times
4. About Once Per Week
5. About Two or Three Times Per Week
6. About Once Daily or Almost Daily
7. Multiple Times Daily Or Almost Daily
8. Daily or Almost Daily for Most of the Day

Q4. When you injure yourself intentionally, how often is it...

Question	Never 0	1	2	3	4	5	6	7	8	9	Always 10
"…to feel less emotionally overwhelmed?"											
"…because you felt that you deserved to be punished?"											
"…to get a rush or sense of exhilaration?"											
"…to feel '*something*' rather than '*nothing*'?"											
"…because you lost control of your behaviour?"											
"…to challenge yourself or to prove you could take it?"											
"…to feel <u>less</u> numb or distant from your feelings?"											
"…to feel less anxious or tense?"											
"…to direct anger at yourself											
"…to feel excitement or to get a thrill											
"…to feel <u>more</u> detached or numb from your feelings?"											
"…because you were in a trance, or spaced out?"											
"…to show that you are tough, strong, or brave?"											
"…to feel <u>more</u> separate from, or outside your body?"											
"…to feel less agitated or distressed?"											
"…to express disappointment or disgust with yourself?"											
"…to feel pleasure or get a high?"											
"…to feel <u>more</u> aware of or inside your body?"											
"…because you lost awareness of your behaviour or sense of time?"											
"…to overcome, withstand, or bear the pain?"											
"…to obey or quiet a commanding voice inside your head?"											
"…because you felt like you were on auto-pilot, or an outside observer of your behaviour?"											

Alcohol Use

The next questions ask about alcohol consumption

For Men: The consumption of 5 or more alcoholic drinks on the same day.

For Women: The consumption of 4 or more alcoholic drinks on the same day.

Substance Use

The next questions ask about the **use of any drug, other than alcohol, for a non-medical or prescribed reason**. This may include Cannabis, Non-Medical Use of Prescription Drugs, or using prescription medication at higher than recommended doses, Ecstasy (MDMA), Cocaine, Amphetamine or other stimulants, Inhalants, Sedatives or Sleeping Pills, Hallucinogens, or Opioids.

Gambling

The next questions ask about problem gambling, *which is defined as:*

Engaging in gambling which causes problems in another area of your life such as work, or with family, or in your general health/well-being including financial well-being.

Binge Eating

The next questions about binge eating or lack of control over eating.

Binge eating or uncontrolled eating is defined as:

In a short amount of time, eating much more food than most people would in similar situations and feeling that you are not able to stop eating.

Purging

The next questions ask about purging behaviours to control your weight or body shape.

Purging is defined as:

Making yourself sick (vomiting) to control your body weight and/or shape; or, use of laxatives, diet pills or diuretics (water pills) or exercising more than three hours in one day to control body weight and/or shape.

Restricted Eating

The next questions ask about whether you restrict your eating.

Restricted Eating is defined as:

Not eating or limiting the amount of food you due to a fear of gaining weight.

Sexual Risk-Taking

The next questions ask about taking risks related to sexual behaviour. *Sexual Risk-taking is defined as:*

Sexual activity that puts you at risk for physical or emotional harm, such as: not using safe-sex practices, unsafe sexual relationships with multiple casual partners, having sex with someone you barely knew, or trading sex for something such as money or drugs.

Medical Risk-Taking

The next questions ask you about medical risk-taking.

Medical Risk-taking is defined as:

> Not taking necessary prescribed medication or purposely not engaging in suggested healthy behaviors like exercise, for example, in order to cause physical discomfort or pain, or to purposely be physically unhealthy, maintain an illness, or feel ill or sick.

Other Risk-Taking

The next questions ask about other kinds of risk-taking, that is, other than sexual and medical risk taking.

Risk-taking is defined as:

Acting in a way that puts you or someone else in a dangerous situation that is likely to cause harm either to yourself or another person. Examples include driving recklessly, picking fights, intentionally damaging property, or shoplifting.

Appendix C: RRDI Descriptive Statistics and Correlations with Outcome Measures

RRDI Scale	*M*	SD	SU	KU	α	Correlations with Outcome Variables of Interest										
						PCL-Total	PCL-Diss	PHQ-Anx	PHQ-Dep	CTQ-EA	CTQ-PA	CTQ-SA	CTQ-PN	CTQ-EN	ACE-Total	LEC-Total
Self-Injury (*N* = 368)																
Emotion Regulation	4.43	2.91	.18	-.90	.83	.33*	.18*	.38*	.26*	.30*	.12	.22*	.05	.05	.21*	-.05
Punishment	3.65	3.01	.39	-.96	.89	.43*	.35*	.21*	.29*	.30*	.24*	.29*	.26*	.06	.21*	-.07
Anti-Dissociation	3.07	2.73	.51	-.83	.84	.44*	.43*	.25*	.24*	.28*	.26*	.30*	.25*	.05	.23*	-.20*
Thrill-Seeking	2.30	2.65	.93	-.28	.91	.34*	.43*	.11	.13	.23*	.38*	.38*	.30*	-.05	.20*	-.12
Challenging	2.53	2.58	.75	-.45	.85	.38*	.44*	.07	.14	.23*	.38*	.39*	.37*	-.01	.27*	-.14
Peri-Dissociation	2.56	2.48	.80	-.45	.89	.48*	.55*	.24*	.25*	.29*	.40*	.39*	.39*	-.01	.27*	-.14
Pro-Dissociation	2.43	2.75	.81	-.57	.82	.46*	.48*	.14	.17*	.29*	.39*	.43*	.35*	-.01	.22*	-.17*
Alcohol Use (*N* = 440)																
Emotion Regulation	4.02	2.77	.24	-.89	.84	.44*	.32*	.39*	.35*	.26*	.26*	.34*	.20*	.07	.24*	.10
Punishment	1.61	2.41	1.42	.12	.95	.50*	.67*	.15*	.21*	.32*	.56*	.52*	.49*	.01	.22*	.04
Anti-Dissociation	2.50	2.56	.83	-.27	.83	.43*	.51*	.11	.19*	.28*	.46*	.40*	.38*	.03	.20*	.06
Thrill-Seeking	3.88	2.70	.30	-.86	.83	.29*	.26*	.17*	.18*	.21*	.25*	.26*	.14	-.05	.18*	.11
Challenging	2.25	2.48	.97	-.08	.85	.45*	.56*	.12	.23*	.29*	.50*	.40*	.45*	.06	.23*	.04

Peri-Dissociation	1.89	2.59	1.23	.50	.94	.50*	.67*	.15	.22*	.31*	.56*	.51*	.50*	-.01	.22*	.04
Pro-Dissociation	2.68	2.75	.75	-.55	.77	.54*	.62*	.29*	.34*	.32*	.46*	.44*	.44*	.05	.28*	.06
Drug Use (*N* = 240)																
Emotion Regulation	4.37	3.10	.22	-1.03	.88	.36*	.19	.38*	.38*	.17	.17	.21*	.14	.05	.22*	.06
Punishment	1.53	2.47	1.50	1.06	.97	.36*	.61*	.16	.16	.32*	.50*	.49*	.40*	-.13	.18	.00
Anti-Dissociation	2.67	2.64	.70	-.60	.82	.37*	.46*	.17	.21*	.25*	.37*	.36*	.28*	-.06	.17	-.02
Thrill-Seeking	4.63	2.90	.11	-1.02	.82	.23*	.16	.20*	.13	.02	.07	.23*	.04	-.11	.12	.13
Challenging	2.19	2.50	1.01	.07	.81	.38*	.54*	.19	.21*	.29*	.46*	.46*	.38*	-.12	.21*	-.04
Peri-Dissociation	1.95	2.60	1.12	.17	.95	.37*	.57*	.15	.19	.33*	.48*	.46*	.40*	-.08	.20*	-.02
Pro-Dissociation	2.90	2.89	.65	-.67	.76	.39*	.41*	.22*	.28*	.31*	.37*	.32*	.32*	.07	.23*	-.06
Gambling (*N* = 30)																
Emotion Regulation	4.43	2.62	-.02	-.68	.86	.40*	.39*	.19	.16	.21	.29	.20	-.08	-.23	.22	.18
Punishment	3.11	2.60	.25	-.97	.90	.41*	.55*	.05	.08	.20	.42*	.33*	.15	-.04	.18	.06
Anti-Dissociation	3.65	2.53	.08	-.93	.79	.37*	.49*	.05	.04	.13	.32*	.27*	.15	-.20	.13	.05
Thrill-Seeking	5.24	2.58	-.02	.48	.79	.13	.04	.13	.05	.04	-.12	.07	-.42	-.32*	.01	.21
Challenging	3.57	2.67	.09	-1.04	.83	.42*	.56*	.01	.05	.22	.38*	.29	.01	-.12	.23	.15
Peri-Dissociation	3.72	2.39	.24	-.67	.86	.52*	.58*	.15	.18	.26	.43*	.38*	-.08	-.12	.23	.15
Pro-Dissociation	3.30	2.67	.34	-.85	.87	.46*	.59*	.09	.13	.31	.43*	.39*	.27	-.08	.23	.11

Binge Eating (*N* = 198)															
Emotion Regulation	4.51	2.86	.14	-.95	.86	.21	.11	.09	.19	.21	.12	.20	.08	-.07	.19	.10
Punishment	2.46	2.69	1.00	.01	.90	.28*	.39*	.17	.15	.03	.31*	.31*	.23	-.24	.11	-.05
Anti-Dissociation	2.60	2.58	.72	-.51	.84	.18	.32*	.07	.01	.06	.27*	.27*	.25*	-.16	.08	-.04
Thrill-Seeking	3.02	2.64	.67	-.42	.83	.25*	.32*	.15	.08	.14	.25*	.27*	.22	-.12	.19	.03
Challenging	2.39	2.57	.84	-.34	.86	.15	.37*	.05	.00	.07	.36*	.24	.30*	-.17	.08	-.08
Peri-Dissociation	3.27	2.40	.56	-.52	.85	.36*	.41*	.17	.17	.13	.24	.33*	.24*	-.16	.12	.03
Pro-Dissociation	2.49	2.79	.83	-.48	.79	.15	.35*	.07	.04	.07	.31*	.33*	.22	-.16	.12	.03
Purging (*N* = 57)															
Emotion Regulation	3.71	2.84	.45	-.76	.86	.21	.11	.09	.19	.21	.12	.20	.46*	-.07	.19	.10
Punishment	3.86	2.85	.05	-1.31	.81	.28*	.39*	.17	.15	.03	.31*	.31*	.25	-.24	.11	-.05
Anti-Dissociation	2.59	2.81	.80	-.64	.94	.18	.34*	.07	.01	.06	.27*	.27*	.40	-.16	.08	-.04
Thrill-Seeking	2.69	2.93	.63	-1.06	.94	.25*	.32*	.15	.08	.14	.25*	.27*	.31	-.12	.20	.03
Challenging	2.77	2.78	.59	-.97	.91	.16	.37*	.05	.00	.07	.36*	.24	.29	-.17	.08	-.08
Peri-Dissociation	3.14	2.83	.47	-.96	.92	.16	.37*	.05	.00	.07	.36*	.24	.46*	-.17	.08	-.09
Pro-Dissociation	2.53	2.91	.80	-.53	.89	.15	.35*	.07	.04	.07	.31*	.27*	.45*	-.22	.09	-.11
Restricted Eating (*N* = 148)															
Emotion Regulation	2.53	2.57	.87	.10	.83	.45*	.44*	.32*	.29*	.25*	.36*	.31*	.39*	.16	.26*	.00

Punishment	2.86	2.71	.64	-.55	.85	.48*	.49*	.37*	.30*	.27*	.32*	.20	.40*	.21	.25*	-.03
Anti-Dissociation	2.15	2.62	1.06	.01	.90	.42*	.54*	.17	.18	.18	.36*	.34*	.39*	.11	.21	-.08
Thrill-Seeking	1.76	2.44	1.39	1.15	.94	.45*	.60*	.24	.16	.22	.39*	.33*	.45*	.21	.21	-.01
Challenging	3.19	2.62	.50	-.59	.77	.36*	.35*	.27*	.24	.15	.21	.14	.30*	.12	.13	-.02
Peri-Dissociation	2.23	2.62	1.18	.51	.92	.47*	.59*	.28*	.25*	.20	.32*	.25*	.46*	.18	.21	.01
Pro-Dissociation	1.95	2.65	1.29	.75	.95	.47*	.57*	.26*	.20	.18	.38*	.28*	.47*	.17	.19	-.06
Sexual Risk-Taking (N = 120)																
Emotion Regulation	3.07	2.72	.55	-.71	.78	.33*	.33*	.02	.04	.14	.21	.10	.21	.04	.12	.09
Punishment	2.06	2.78	1.22	.41	.95	.42*	.57*	.18	.21	.22	.32*	.44*	.32*	.06	.18	.00
Anti-Dissociation	2.93	2.62	.59	-.74	.78	.25	.37*	-.01	.03	.21	.27*	.15	.19	.08	.04	-.11
Thrill-Seeking	5.14	2.97	-.03	-.87	.81	.00	-.01	-.08	-.08	-.14	-.16	-.17	-.18	-.05	-.11	.08
Challenging	2.20	2.63	1.06	.31	.88	.29*	.53*	-.08	-.09	.13	.41*	.24	.27*	.04	.08	-.10
Peri-Dissociation	2.65	2.53	.85	-.18	.87	.24	.45*	.05	-.03	.15	.22	.19	.16	-.04	.11	-.01
Pro-Dissociation	2.27	2.79	1.01	-.07	.85	.32*	.50*	.02	.05	.23	.36*	.19	.30*	.09	.17	-.03
Medical Risk-Taking (N = 57)																
Emotion Regulation	3.89	2.63	.22	-.30	.90	.36	.24	-.08	.23	.08	.14	.04	-.07	-.12	-.02	.17
Punishment	3.17	2.99	.62	-.57	.95	.33	.51*	.10	.03	.24	.28	.40	.29	-.27	-.07	-.06
Anti-Dissociation	3.55	2.62	.29	-.27	.81	.21	.34	-.13	-.11	.04	.22	.27	.28	-.14	-.02	.05

Thrill-Seeking	3.38	2.79	.44	-.55	.90	.26	.37	-.13	-.11	.04	.22	.27	.29	-.14	-.02	.05
Challenging	3.81	2.91	.52	-.43	.94	.04	.16	-.14	-.23	.15	.48*	.06	.26	-.06	-.08	-.13
Peri-Dissociation	3.54	2.84	.32	-.66	.95	.33	.52*	.05	.02	.16	.17	.26	.24	-.22	-.15	-.05
Pro-Dissociation	3.10	2.84	.63	-.25	.94	.18	.45	-.11	-.11	-.02	.27	.32	.25	-.26	-.19	-.04
<u>General Risk-Taking</u> (N = 116)																
Emotion Regulation	3.30	2.90	.66	-.47	.85	.19	.21	.11	.20	.14	.02	.07	.01	.02	.13	-.04
Punishment	2.32	2.76	1.08	.33	.92	.14	.27	.05	.04	.12	.09	.16	.12	.02	.08	-.06
Anti-Dissociation	2.64	2.71	.88	-.03	.86	.13	.27	.06	.00	.12	.13	.10	.16	.08	.06	-.07
Thrill-Seeking	4.34	2.99	.13	-1.02	.86	.10	.13	.14	.18	.14	.02	.12	.17	.20	.09	-.01
Challenging	3.43	2.82	.53	-.45	.79	.00	.14	.01	-.09	.06	.06	.01	.10	.10	.05	-.02
Peri-Dissociation	2.63	2.59	1.11	.72	.90	.09	.30	.06	.08	.09	.05	.11	.13	.07	.10	-.13
Pro-Dissociation	2.38	2.77	1.00	.12	.83	.10	.33*	.04	.07	.06	.14	.14	.20	.05	.08	-.12

Notes. * = $p < .004$ (Bonferroni corrected for 11 computed correlations; .05/11 = .0045). RRDI = Reasons for Reckless and Destructive Behaviours Inventory, PCL = Posttraumatic Stress Disorder Checklist, Diss = Dissociation, PHQ = Patient Health Questionnaire, Anx = Anxiety, Dep = Depression, CTQ = Childhood Trauma Questionnaire, EA = Emotional Abuse, PA = Physical Abuse, SA = Sexual Abuse, PN = Physical Neglect, EN = Emotional Neglect, ACE = Adverse Childhood Experiences Scale, LEC = Life Events Checklist

Appendix D: Sampling Strategy

In the current research, samples were obtained from Crowdflower and Mechanical Turk, two well-utilized crowdsourcing platforms for conducting academic research, particularly in an online survey format. Interested participants clicked on an advertisement that briefly described the study as examining engagement in behaviours that are potentially harmful to yourself and how these behaviours relate to previous life experiences and personality characteristics. Participants were asked to only participate if they have engaged in one of the 12 behaviours from the ISAS intentionally in the past year. This strategy resulted in 1056 participants being recruited, with 368 endorsing engaging in self-injury. Crowdsourcing samples are better representatives of general population in comparison to student samples. However, in contrast to the general population, crowdsourcing platforms tend to have samples with lower average age, higher rates of unemployment, higher likelihood of being a student, higher overall education, and overall higher on internalizing psychopathology measures such as mood and anxiety symptoms (Arditte, Cek, Shaw, & Timpano, 2016; Casler, Bickel, & Hackett, 2013).

Curriculum Vitae

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