Childhood Parental Invalidation and Young Adult Non-Suicidal Self-Injury

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Abstract

Non-suicidal self-injury (NSSI) is a prevalent behaviour that serves many functions, but is associated with increased distress, impairment, and risk of death by suicide (Andover, Morris, Wren, & Bruzzese, 2012; Burke, Hamilton, Cohen, Stange, & Alloy, 2016). The overall goal of the current project was to make meaningful theoretical and applied contributions for our current understanding and treatment of NSSI. The present research first investigated potential causal mechanisms by which parental invalidation, a potential familial risk factor for NSSI, may lead to engagement in this maladaptive behaviour. Results of Study 1 supported the existence of two serial mediation mechanisms whereby childhood emotional invalidation by parents leads to increased engagement in NSSI: (a) through increased difficulties in emotion regulation and negative urgency impulsivity, and (b) through increased self-criticism and depressive symptoms. Study 2 aimed to validate the retrospective, self-report measure of parental invalidation used in Study 1 (the Invalidating Childhood Environment Scale) by examining its test-retest reliability, and concurrently gathering retrospective sibling-report data. Results supported the reliability and validity of this measure, and thus its use in the current and future research. The goal of Study 3 was to investigate the effectiveness of two interventions designed to help individuals resist their self-critical thoughts, and thereby interrupt the second NSSI mechanism identified in Study 1. It was hypothesized that these interventions would lead to reduced NSSI engagement and associated depressive symptoms. The interventions were not found to be effective in this case, as individuals in both the control and intervention conditions showed significant reductions in both NSSI engagement and depressive symptoms across the study interval. Theoretical implications, practical applications, limitations, and future directions are discussed.

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List of Abbreviations (Alphabetical)

CESD-R	Centre for Epidemiologic Studies Depression Scale – Revised
CMT	Compassionate Mind Training
DEQ	Depressive Experiences Questionnaire
DERS	Difficulties in Emotion Regulation Scale
DSHI	Deliberate Self-Harm Inventory
DSM	Diagnostic and Statistical Manual of Mental Disorders
ICES	Invalidating Childhood Environment Scale
ITS	Interpersonal Theory of Suicide
NSSI	Non-Suicidal Self-Injury
UPPS	Urgency, Premeditation, Perseverance, and Sensation Seeking Impulsive Behaviour Scale
RRS	Ruminative Responses Scale

Chapter 1: General Introduction to NSSI

Non-suicidal self-injury (NSSI) has been defined as the deliberate, direct destruction of one's own body tissue without conscious suicidal intent and for purposes not socially sanctioned (Gratz, 2001, 2003; Klonsky, 2007). Many different terms have been used to refer to these behaviours, including self-mutilation (Lester, 1972), self-injurious behaviours (Whitlock, Eckenrode, & Silverman, 2006), parasuicide (Klonsky, Fiedler, Turkheimer, & Oltmanns, 2003), deliberate self-harm (Gratz, 2003), and deliberate self-injury (Chiesa, Sharp, & Fonagy, 2011). Throughout this dissertation, I will use the term non-suicidal self-injury (NSSI) to emphasize the distinction between suicide attempts, and the non-suicidal forms of self-injury that this research seeks to examine.

Forms of Self-Injury

NSSI can take many forms. Some of these include cutting, burning, scratching, interfering with wound healing, carving words or pictures into one's skin, banging body parts, and sticking one's self with sharp objects (Klonsky, 2007). The most common form of NSSI has usually been found to be cutting, which 70% of individuals with a history of NSSI endorse as their "preferred method" (Briere & Gil, 1998; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006a). Banging, hitting/punching, burning, and biting, are also commonly-endorsed forms of NSSI. However, in the largest non-clinical sample to date, severe scratching (i.e., to the point that bleeding occurred or marks remained on skin) was the most common form of self-injury (Whitlock et al., 2006)

Importantly, the definition of NSSI includes only behaviours that are engaged in with the deliberate purpose of causing tissue damage. Other behaviours, such as substance abuse, eating

disordered behaviours, and risky sexual behaviours, are typically not considered NSSI because any resulting tissue damage is usually an unintentional side-effect of behaviours pursued for other purposes. Similarly, body modification such as piercings and tattoos are considered socially sanctioned forms of self-expression, and thus do not constitute NSSI. However, the boundaries between NSSI and these other behaviours are nebulous. For some individuals, these behaviours may constitute NSSI if they are pursued for the express purpose of causing tissue damage (Klonsky, 2007).

NSSI Prevalence

Prevalence rates of NSSI vary widely depending on the age and comorbid diagnoses of sample populations. Approximately 4% of adults in the general population report a lifetime history of NSSI (Briere & Gil, 1998; Klonsky, Fiedler, Turkheimer, & Oltmanns, 2003). Endorsement rates rise to 19-25% within adult clinical populations (Briere & Gil, 1998). Recent research suggests that prevalence rates are particularly high in community samples of adolescents and young adults. A recent systematic review of international NSSI prevalence found that an average of 18% of adolescents had engaged in NSSI, with lifetime prevalence rates ranging between 5.5-30.7% (Muehlenkamp, Claes, Havertape, & Plener, 2012). Prevalence rates for adolescent psychiatric inpatients are even higher, ranging from 30-61% (Groschwitz et al., 2015; Wolff et al., 2013). Studies of NSSI prevalence in college students have revealed rates that are similarly alarmingly high, ranging from 15-38% (Gratz, 2001; Gratz, Conrad, & Roemer, 2002). The higher endorsement rates among adolescents and young adults suggest either that the rate of NSSI is increasing, or that there are reporting biases operating in older adult populations, causing them to deny their history of NSSI (Nock, 2009).

Most individuals report that their first episode of NSSI occurred in early adolescence, typically around age 13-15 (Gandhi et al., 2018; Nock et al., 2006a). Onset in early or later adulthood is rarer, but does occur (4.6% age 21-24, 4.4% age 25 or older; Whitlock et al., 2006). There is evidence that suggests that earlier age of onset (particularly before age 12) is associated with increased NSSI frequency, engaging in more forms of NSSI, more NSSI-related hospital visits, and increased suicidal ideation (Ammerman, Jacobucci, Kleiman, Uyeji, & McCloskey, 2018). Importantly, the majority of individuals who have engaged in NSSI do so only once or a few times; a small minority go on to experience chronic difficulties with NSSI (Nock et al., 2006a; Whitlock et al., 2006).

It was traditionally believed that women were more likely to engage in NSSI than men, but it is becoming clear that prevalence rates do not differ significantly between genders (Andover, Primack, Gibb, & Pepper, 2010; Gratz et al., 2002). Although prevalence rates do not differ significantly, NSSI characteristics have been found to vary significantly between genders, with women reporting an earlier age of onset, greater medical injury at most severe episode, and significantly more variance in the number of lifetime episodes of NSSI (Andover et al., 2010; Gandhi et al., 2018). There are also gender differences in forms of NSSI, with women more likely to scratch or cut themselves, and men more likely to burn themselves, hit themselves, punch objects with the intention of harming themselves, or bang body parts against hard objects (Brunner et al., 2014;Whitlock et al., 2006).

Information on cross-cultural prevalence of NSSI is currently quite limited, as the majority of research in the area has been conducted on samples that are primarily Caucasian, and living in Western countries such as Canada, the United States, Australia, and European countries. A recent review of the existing evidence examining prevalence rates of NSSI in non-

Western or ethnic/racial minority populations found that NSSI is increasingly being studied in adolescent populations in China, Hong Kong, and Japan, with prevalence rates similar to those found in Western studies (Gholamrezaei, De Stefano, & Heath, 2017). Research examining prevalence rates of NSSI in ethnic or racial minority populations within Western countries is quite limited, and currently provides inconsistent and highly variable patterns of incidence and prevalence. The current evidence is particularly inconclusive about incidence rates in Asian/Asian-American and Hispanic individuals, but suggests that rates may be lower in African-American and Middle Eastern populations, and higher in Native American populations (Gholamrezaei et al., 2017).

The Functional Model of NSSI

To the naïve observer, it can be perplexing to try to understand why an individual would voluntarily hurt herself. Research examining the functions of NSSI has proliferated within the past decade, and has led to NSSI being gradually re-conceptualized as a harmful behaviour that is maintained because it serves a function, rather than a symptom of a psychiatric disorder (Nock, 2009). Prior to the development of a functional approach to understanding NSSI, researchers took a syndromal approach, which focused on describing the psychosocial constructs associated with NSSI. This research provided a heterogeneous list of psychosocial and diagnostic characteristics associated with increased risk of NSSI, such as childhood abuse, depression, anxiety, loneliness, suicidal ideation, personality disorders, and post-traumatic stress, among many others. Although this research was useful in identifying which individuals were at increased risk of engaging in NSSI, it was less useful in understanding why those individuals self-injured (Nock & Prinstein, 2004).

The functional approach to understanding NSSI has sought to identify the antecedent and consequent processes that produce and maintain self-injurious behaviours. The goal of this research has been to develop a better understanding of the mechanisms perpetuating NSSI in order to inform the development of more effective interventions, which would be specifically designed to target the active mechanisms. In general, the functions of self-injury have been found to fall within two broad domains: intrapersonal functions and interpersonal functions (Klonsky & Glenn, 2009; Klonsky, Glenn, Styer, Olino, & Washburn, 2015; Nock & Prinstein, 2004). Intrapersonal functions, such as affect regulation or the reduction of negative emotion, occur within the self-injuring individual, and are the most commonly endorsed reasons for NSSI (Nock & Prinstein, 2004). Interpersonal functions occur between individuals, for example, an individual may self-injure to elicit help from their significant others, or in an attempt to demonstrate the severity of their emotional pain to those around them (Haines, Williams, Brain, & Wilson, 1995; Nock & Prinstein, 2004).

A particularly influential model in the functional understanding of NSSI was proposed by Nock and Prinstein (2004). Their Four-Function Model of NSSI categorizes the functions of self-injury on two dichotomous factors: (a) positive (i.e., causing the addition of a favourable stimulus) or negative (i.e., causing the removal of an aversive stimulus); and (b) automatic (i.e., intrapersonal) or social (i.e., interpersonal; Power, Smith, & Beaudette, 2016). The resulting model consists of four categories of NSSI function: (1) intrapersonal negative reinforcement (i.e., NSSI reduces or distracts from aversive thoughts/feelings); (2) intrapersonal positive reinforcement (i.e., NSSI generates desired feelings/stimulation); (3) interpersonal positive reinforcement (i.e., NSSI facilitates help-seeking); and (4) interpersonal negative reinforcement (i.e., NSSI facilitates escape from undesired social situations; Nock, 2009; Nock & Prinstein,

2004). This model was originally developed with adolescent psychiatric inpatients with a history of self-injury, but has since been extended to incarcerated female offenders who engaged in NSSI (Power et al., 2016), and women who engaged in binge-eating and purging behaviours (Wedig & Nock, 2010).

NSSI: A Transdiagnostic Behaviour

Concurrent to the shift in understanding NSSI from a functional rather than a syndromal perspective, there has been a shift in viewing NSSI as a transdiagnostic behaviour, rather than a symptom of other psychiatric disorders. In the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000), NSSI appeared only as a symptom of borderline personality disorder (BPD). However, there is a wealth of evidence indicating that NSSI occurs in individuals diagnosed with a myriad of internalizing and externalizing disorders, including post-traumatic stress disorder, generalized anxiety disorder, obsessive-compulsive disorder, major depressive disorder, substance use disorders, eating disorders, and a range of personality disorders (Bentley, Nock, & Barlow, 2014).

In order to address lingering concerns that NSSI is solely a symptom of severe borderline personality disorder, Selby and colleagues (Selby, Bender, Gordon, Nock, & Joiner, 2012) conducted a study in which they compared individuals in four groups: (1) individuals currently engaging in NSSI but without a diagnosis of BPD, (2) individuals with BPD and NSSI, (3) individuals with BPD but without NSSI, and (4) individuals without BPD or NSSI. Importantly, these researchers found that most individuals in the NSSI-only group (N = 65) did not exhibit subthreshold BPD or personality disorder not otherwise specified, which suggests that NSSI cannot simply be characterized as a personality disorder symptom. In addition, the

NSSI-only group showed similar levels of functional impairment as both BPD groups, including high levels of suicidality. This finding, taken together with others (Muehlenkamp, 2005; Zetterqvist, Lundh, Dahlström, & Svedin, 2013), supports the growing understanding of NSSI as a behaviour that is transdiagnostic, highly prevalent, and associated with significant distress and impairment, rather than a specific symptom of one disorder. This burgeoning understanding has led to proposals that NSSI be included in future version of the DSM as a distinct disorder. In the current version of the DSM (5th ed., DSM-5; American Psychiatric Association, 2013), NSSI appears in Section III as a Condition for Further Study: a condition for which the DSM taskforce is encouraging future research. This suggests that NSSI may become a distinct diagnosis in future versions of the DSM. It has been argued that the inclusion of a clearly-defined NSSI category in the DSM would be beneficial in that it would improve communication between professionals and patients, facilitate studies of prevalence rates, foster research to develop our understanding of the development and treatment of NSSI, and overall, improve client care (Plener & Fegert, 2012; Wilkinson & Goodyer, 2011).

NSSI and Suicide

Although NSSI behaviours are distinct from the forms of self-harm characteristic of suicide attempts, individuals with a history of NSSI are statistically more likely to have a concurrent history of suicide attempts (Andover et al., 2010). The association between NSSI and both suicide ideation and suicide attempts is robust (Guan, Fox, & Prinstein, 2012; Joiner, Ribeiro, & Silva, 2012; Muehlenkamp & Gutierrez, 2007; Wolff et al., 2013), and has led to research investigating whether NSSI might be used as a clinical indicator of suicide risk, which is challenging to quantify due to reliance on self-report. A recent study (Burke et al., 2016) found that the presence and number of NSSI scars predicted current suicide ideation and

suicide attempt history, over and above the predictive power of past suicide attempts, even after controlling for current depressive symptoms.

A theory with particular relevance for understanding the link between NSSI and suicide is Thomas Joiner's Interpersonal Theory of Suicide (ITS). According to this theory, in order to die by suicide, an individual must experience not only a desire to die, but also fearlessness of death and increased pain tolerance, which Joiner calls acquired capacity for suicide (Joiner et al., 2012). The idea behind acquired capacity for suicide is that every human being has an innate horror of death, as it is terrifying and painful, and yet some individuals manage to take their own lives. The theory states that these individuals must manage gradually to lose their fear of death by repeated exposure to, and increased tolerance for, painful and provocative stimuli. According to Joiner's theory, NSSI, although non-suicidal in nature, could be related to increased risk of death by suicide by increasing acquired capacity for suicide. Repeatedly, intentionally harming one's self to the point of tissue damage may increase an individual's acquired capability for suicide by desensitizing her to the fear and pain associated with self-inflicted violence (Joiner et al., 2012). Although the link between NSSI and suicide is not directly examined in the research that follows, knowledge of this link highlights the importance of research that seeks to understand the etiology and treatment of NSSI, as individuals who engage in this behaviour experience significant distress and impairment, and are at high risk of ending their own lives (Eisenberg, Gollust, Golberstein, & Hefner, 2007).

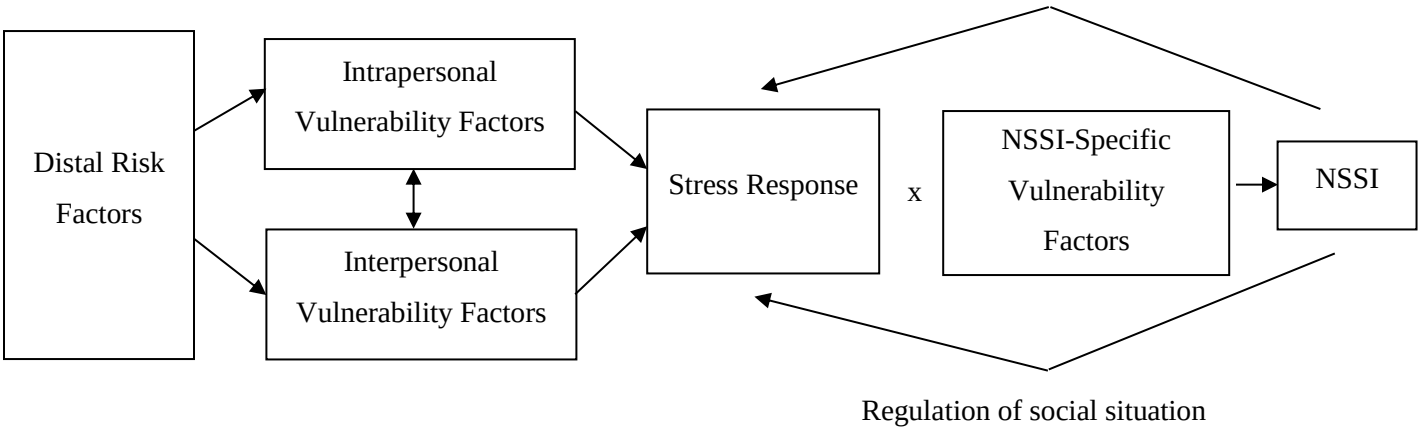
Chapter 2: Theoretical Context

Non-Suicidal Self-Injury (NSSI) is receiving increased empirical and clinical attention, which is warranted given the myriad of troubling and clinically-significant negative consequences of this behaviour, including physical injury, heightened aversive emotions, academic difficulties, and increased risk of death by suicide (Bentley et al., 2014). Despite this increased attention, there is still much that we do not know about NSSI, particularly the underlying mechanisms by which these behaviours develop and are maintained.

Many theoretical models have been proposed to explain the etiology of NSSI. Nock (2009) proposed an integrated theoretical model, which brought together findings from several different areas of NSSI research to explain the development and maintenance of NSSI behaviours. According to this model, distal risk factors, such as childhood abuse, familial criticism, or genetic predisposition for emotional reactivity, interact with intrapersonal (e.g., poor distress tolerance, high aversive emotions/cognitions) and interpersonal (e.g., poor communication skills, poor social problem-solving skills) vulnerability factors to put an individual more at risk of responding to a stressful event in an ineffective manner. These risk factors could predispose an individual to a number of forms of psychopathology (e.g., substance abuse, or eating disorders), so the model also includes NSSI-specific vulnerability factors, such as social learning, which determine which individuals decide to cope with their elevated, dysregulated negative affect through NSSI, rather than through other cognitive or behavioural mechanisms (Nock, 2009; see Figure 1).

Figure 1

Nock's Integrated Model of the Development and Maintenance of NSSI (2009)



A variety of constructs have been proposed as the most important distal risk factors, intrapersonal vulnerability factors, and interpersonal vulnerability factors in the development of NSSI, but the mechanisms by which these factors are related are currently unclear. The first goal of the current research (Study 1) was: (a) to identify the distal, intrapersonal, and interpersonal risk factors with the most theoretical and empirical support in the development of NSSI; (b) to use these factors to develop an empirically-supported etiological model of the development of NSSI; and (c) to test the validity of this model in a large empirical sample.

Risk Factors in the Development of NSSI

I. Parental Invalidation.

Parental invalidation has been defined as parental intolerance toward their children's expression of private emotional experience. This invalidation can manifest as parental criticism or lack of parental support when private emotions are expressed, and communicates to the child that such expressions are unwarranted and that emotions should be coped with privately and without parental support (You & Leung, 2012). The construct of parental invalidation has held

an important theoretical role in the clinical understanding of NSSI development since it was originally introduced by Marsha Linehan in her influential first manual of Dialectical Behaviour Therapy (1993). Linehan's biosocial model suggests that experiencing invalidating family environments during childhood interferes with the development of appropriate emotion regulation skills, such as the abilities to correctly label emotions, tolerate negative emotional experiences, and generate effective coping strategies. The resulting deficits in emotion regulation skills are believed to leave individuals at risk of engaging in less optimal coping mechanisms, including NSSI and substance abuse, among others (Martin et al., 2016).

Although parental invalidation has held an important theoretical role in the understanding of NSSI for decades, it is only recently that empirical research has emerged to support the link between parental invalidation and the development of NSSI (Baetens et al., 2015; Buckholdt, Parra, & Jobe-Shields, 2014; Wedig & Nock, 2007; You & Leung, 2012). In a year-long longitudinal study, You and Leung (2012) found that perceived family invalidation and depressive symptoms at Time 1 were significantly related to the occurrence of NSSI a year later. Buckholdt and colleagues (2014) conducted a mediation analysis, which revealed that the significant relationship between perceived parental emotional invalidation and adolescent internalizing and externalizing symptoms was fully mediated by adolescent emotion regulation difficulties. Baetens and colleagues (2015) tested a more complex mediation model, and showed that perceived parental environment (perceived lack of parental emotional support and perceived parental criticism) had a direct effect on adolescent NSSI frequency, as well as indirect effects through adolescent depressive symptoms and self-criticism. These studies have helped elucidate the mechanism by which parental invalidation – a distal risk factor – leads to the development of NSSI through intrapersonal risk factors such as self-criticism and emotion

dysregulation. However, most studies tend to investigate the link between parental invalidation and NSSI through only one or two of the myriad of risk factors that have been hypothesized to be a part of this mechanism. Therefore, a more complete understanding of the mechanisms by which parental invalidation leads to NSSI still needs to be developed.

Parental Invalidation vs. Childhood Maltreatment.

Most research into familial risk factors for the development of NSSI has focused on more "severe" forms of childhood maltreatment, such as physical abuse, sexual abuse, and physical neglect. Although there are many studies linking childhood maltreatment and NSSI, specific findings can be inconsistent, particularly in non-clinical populations (Martin et al., 2016). The evidence is further limited in that most studies examine the relationship between only one or two forms of neglect/abuse and NSSI, and usually do not examine the mediating mechanisms by which childhood maltreatment leads to NSSI (Glassman, Weierich, Hooley, Deliberto, & Nock, 2007). In fact, recent meta-analyses have suggested that the association between childhood sexual abuse and NSSI has been vastly overestimated, as the association becomes non-significant when other risk factors, such as the overall quality of the family environment, are taken into account (Klonsky & Moyer, 2008). This was particularly true in community-based, rather than clinical, populations. A similar lack of association has been found for studies of physical abuse (Whitlock et al., 2006) and physical neglect (Di Pierro, Sarno, Perego, Gallucci, & Madeddu, 2012) within non-clinical high school and college student samples. These findings suggest that other risk factors, particularly interpersonal risk factors that co-occur with childhood maltreatment, such as parental invalidation, may be important predictors of NSSI development (Martin et al., 2016).

II. Emotional Dysregulation.

Emotional dysregulation is a multifaceted construct, which has been defined as: (a) a lack of awareness, understanding, and acceptance of emotions; (d) difficulties controlling behaviours when experiencing emotional distress; (c) lack of access to adaptive strategies for modulating the duration and/or intensity of aversive emotional experiences; and (d) an unwillingness to experience emotional distress as part of pursuing meaningful activities in life (Gratz & Roemer, 2004). In empirical studies, parental invalidation of emotional expression has been found to be related to higher levels of adolescent emotional dysregulation (Buckholdt et al., 2014), and I hypothesize that this relationship is causal. From infancy, parents play a fundamental role in teaching their children about the appropriate expression and regulation of emotions (Kopp, 1989). In a healthy parent-child dyad, this means that the parent teaches the child to identify emotions, and cope with them in healthy ways, such as through soothing behaviours that initially come from the parent and eventually are internalized. In emotionally invalidating relationships, children never learn effective emotional regulation from their caregivers, become emotionally dysregulated, and frequently turn to maladaptive coping strategies to get through the day. Affect regulation is the most commonly reported function of NSSI (Klonsky, 2007). Individuals who engage in NSSI report that intense negative affect tends to precede their episodes of self-injury, that decreased negative affect and relief/tension reduction are present after self-injury, and that they engage in self-injury in order to achieve this decrease in negative affect (Klonsky, 2007).

Nearly all studies of trait-level emotion dysregulation in NSSI have used the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), which measures 6 components of emotional dysregulation: (1) nonacceptance of emotional responses, (2) difficulties engaging

in goal-directed behaviour, (3) impulse control difficulties, (4) lack of emotional awareness, (5) limited access to emotion regulation strategies, and (6) lack of emotional clarity. A recent review of research investigating the role of emotion regulation in NSSI concluded that DERS total scores, which combine all six subscales, reliably differentiate individuals with and without a history of NSSI, and that increased total DERS scores are associated with increased NSSI frequency (Andover & Morris, 2014).

Researchers investigating the links between specific dimensions of emotion dysregulation, as measured by the DERS subscales, have found mixed results. Muehlenkamp and colleagues found that individuals with a history of NSSI reported significantly more emotion regulation difficulties across all the DERS subscales (Muehlenkamp, Kerr, Bradley, & Larsen, 2010). Tatnell and colleagues (2018) found that difficulties engaging in goal-directed behaviour (subscale 2), impulse control difficulties (subscale 3), and limited access to emotion regulation strategies (subscale 5) were all predictive of NSSI. Other researchers have found specific evidence of a link between NSSI and having limited access to emotion regulation strategies (subscale 5; Turner, Chapman, & Layden, 2012) or nonacceptance of emotional experiences (subscale 1; Nock & Mendes, 2008; Slee, Garnefski, Spinhoven, & Arensman, 2008). Overall, the research indicates a diffuse pattern of emotion regulation difficulties in individuals with a history of NSSI, which supports the use of the total DERS score in the model of NSSI development.

III. Impulsivity.

Emotion regulation difficulties are associated with increased impulsivity (Schreiber, Grant, & Odlaug, 2012). This relationship between emotion regulation difficulties and impulsivity is supported by the existence of common neural substrates – particularly the

prefrontal cortex and the amygdala – which play key roles in both emotion regulation and impulsive behaviours (Ochsner & Gross, 2005; Ray & Zald, 2012).

Recent literature suggests that impulsivity can best be defined as a multifaceted construct with five dimensions: (a) negative urgency – the tendency to act impulsively when experiencing negative affect; (b) positive urgency – the tendency to act impulsively when experiencing positive affect; (c) lack of premeditation – failure to reflect on the consequences of the act before engaging in the act; (d) lack of perseverance – an inability to focus or follow through on difficult or boring tasks; and (e) sensation seeking – the tendency to enjoy and pursue activities that are exciting and an openness to trying new experiences (Cyders & Smith, 2007; Evenden, 1999; Whiteside & Lynam, 2001). A recent meta-analysis found that individuals who engage in NSSI self-report greater impulsivity than those individuals who do not, and that this effect is most consistent for negative urgency (Hamza, Willoughby, & Heffer, 2015). Negative urgency seems to be especially important in understanding NSSI because these individuals: (a) are more emotionally dysregulated, and so experience more intense negative emotions, (b) are more likely to commit rash decisions when experiencing these negative emotions, and (c) are thus particularly likely to engage in maladaptive coping behaviours that provide immediate relief from distress, such as NSSI (Cyders & Smith, 2007; Glenn & Klonsky, 2010). I therefore hypothesize that emotional dysregulation will be associated with increased negative urgency impulsivity, and that together, these two constructs will serially mediate the relationship between parental invalidation and NSSI.

IV. Self-Criticism.

A core characteristic of parental invalidation is parental criticism, which has been linked to increased individual self-criticism (Ammerman & Brown, 2016; Baetens et al., 2015).

People with self-critical personalities tend to feel inferior and berate themselves for failing to meet the high standards that they impose on themselves (Katz & Nelson, 2007). Parental verbal abuse, or severe criticism, has been found to be associated with the development of a negative, internalized self-schema, which leads not only to the development of increased self-criticism, but to depressive symptoms, as the individual begins to attribute negative life events to internal, stable, and global factors (Sachs-Ericsson, Verona, Joiner, & Preacher, 2006).

Although the emotion-regulating function of NSSI is generally well-established, some researchers have asked why some individuals choose to engage in NSSI to regulate their emotions, as opposed to other behaviours, such as substance abuse, which could also achieve those ends. These researchers have hypothesized that individuals with a history of severe parental criticism or verbal or emotional abuse may select NSSI because of the directly injurious nature of these behaviours; they have internalized a highly-critical view of themselves, and have learned this pattern of direct "self-abuse" through modelling by primary caregivers. The development of a self-critical cognitive style may lead these individuals to engage in NSSI as an extreme form of self-punishment whenever they disapprove of their own behaviour (Glassman et al., 2007). In support of this theory, self-criticism has been found to mediate the relationship between parental expressed emotion (i.e., the expression of critical/hostile and/or emotionally over-involved attitudes and comments) and NSSI (Ammerman & Brown, 2016) and childhood maltreatment and NSSI (Glassman et al., 2007). I therefore hypothesize the existence of a second mechanism whereby parental invalidation leads to the development of NSSI through increased self-criticism.

V. Depression

There is robust evidence that individuals who engage in NSSI tend to experience greater levels of negative affect, including feelings of sadness and depression, more frequently than individuals who do not engage in NSSI (Briere & Eadie, 2016; Taylor, Peterson, & Fischer, 2012). This finding is consistent with the current understanding of NSSI as serving an emotion-regulation function in individuals experiencing increased negative affect (Briere & Gil, 1998), and is supported by studies that show that heightened negative emotions tend to precede episodes of NSSI (e.g., Muehlenkamp et al., 2009) and are alleviated following NSSI (Nock, 2009).

The undeniable link between self-criticism and depression is well-established (Joeng & Turner, 2015). According to Beck's cognitive theory of depression, self-criticism leads to and supports depression (Beck, 1964). In support of this theory, researchers have found empirical evidence that individuals who are highly self-critical are more likely to develop depression and are at increased risk of depressive relapse (Cantazaro & Wei, 2010; Ehret, Joormann, & Berking, 2015). I therefore hypothesize that there will be a significant relationship between self-criticism and depressive symptoms in the current study.

Baetens and colleagues (2015) found evidence supporting a path model where the significant relationship between perceived parental criticism/lack of parental emotional support and NSSI frequency was fully, serially mediated through self-criticism and depressive symptoms. In this model, the significant relationships between parental criticism and NSSI, and self-criticism and NSSI became non-significant when depressive symptoms were included in the model as a second serial mediator. Xavier and colleagues similarly found that self-criticism and depressive symptoms mediated both the significant relationship between memories of

negative experiences with parents and NSSI (Xavier, Pinto-Gouveia, Cunha, & Carvalho, 2016) and the significant relationship between lifetime history of NSSI and subsequent NSSI (Xavier, Pinto-Gouveia, Cunha, & Dinis, 2017). Based on this empirical evidence, which is grounded in the functional model of NSSI and Nock's Integrated Model of the Development and Maintenance of NSSI, I therefore hypothesize that the relationship between parental invalidation and NSSI will be serially mediated by self-criticism and depressive symptoms.

VI. Rumination.

Research has also indicated that rumination – the tendency to brood and reflect on one's negative affect and behaviour – may be an important intrapersonal factor in the realm of self-injury. Factor analyses have revealed two subtypes of rumination: brooding and reflective rumination. Brooding, which involves dwelling on the reasons for one's negative mood, has been found to be a toxic form of rumination, and is associated with increases in depressive symptoms and suicidal ideation (Miranda & Nolen-Hoeksema, 2007; Pollak et al., 2010; Valderrama, Miranda, & Jeglic, 2016). Reflection involves trying to understand the reasons for one's negative mood, and has been found to be associated with decreases in depressive symptoms (Miranda & Nolen-Hoeksema, 2007; Treynor, Gonzalez, & Nolen-Hoeksema, 2003).

Brooding rumination exacerbates negative emotional states, depressive symptoms, and contributes to impulsive, maladaptive behaviours such as binge eating and drinking (Valderrama et al., 2016). It has also been found to be positively correlated with self-injury for escaping negative emotional states (Miranda & Nolen-Hoeksema, 2007; Selby, Franklin, Carson-Wong, & Rizvi, 2013; Treynor et al., 2003) and with greater severity, recency, and variety of self-injury (Quirk, Wier, Martin, & Christian, 2015). A ruminative response style has

been found to act as both a mediating and moderating variable for NSSI (Xavier, Cunha, & Pinto-Gouveia, 2018). Rumination has been found to moderate the relationship between depressive symptoms and NSSI (Hilt, Cha, & Nolen-Hoeksema, 2008), and the relationship between psychological distress and NSSI in female adolescents (Voon, Hasking, & Martin, 2014). I therefore hypothesize that, in the second causal pathway between parental invalidation and NSSI, brooding rumination will moderate the relationship between depressive symptoms and NSSI, such that individuals higher in brooding rumination will be more likely to engage in NSSI.

The Current Research

The current research aims to make meaningful theoretical and applied contributions for our current understanding of the development and treatment of NSSI. In order to do so, it has three concrete goals: (1) to investigate potential causal mechanisms by which parental invalidation, a potential familial risk factor for NSSI, may lead to engagement in this maladaptive behaviour; (2) to validate retrospective, self-report measures of parental invalidation by concurrently gathering retrospective sibling-report data; and (3) to investigate the effectiveness of an intervention designed to help individuals resist their self-attacks (potentially parental invalidation-based) and reduce the frequency and severity of self-injury.

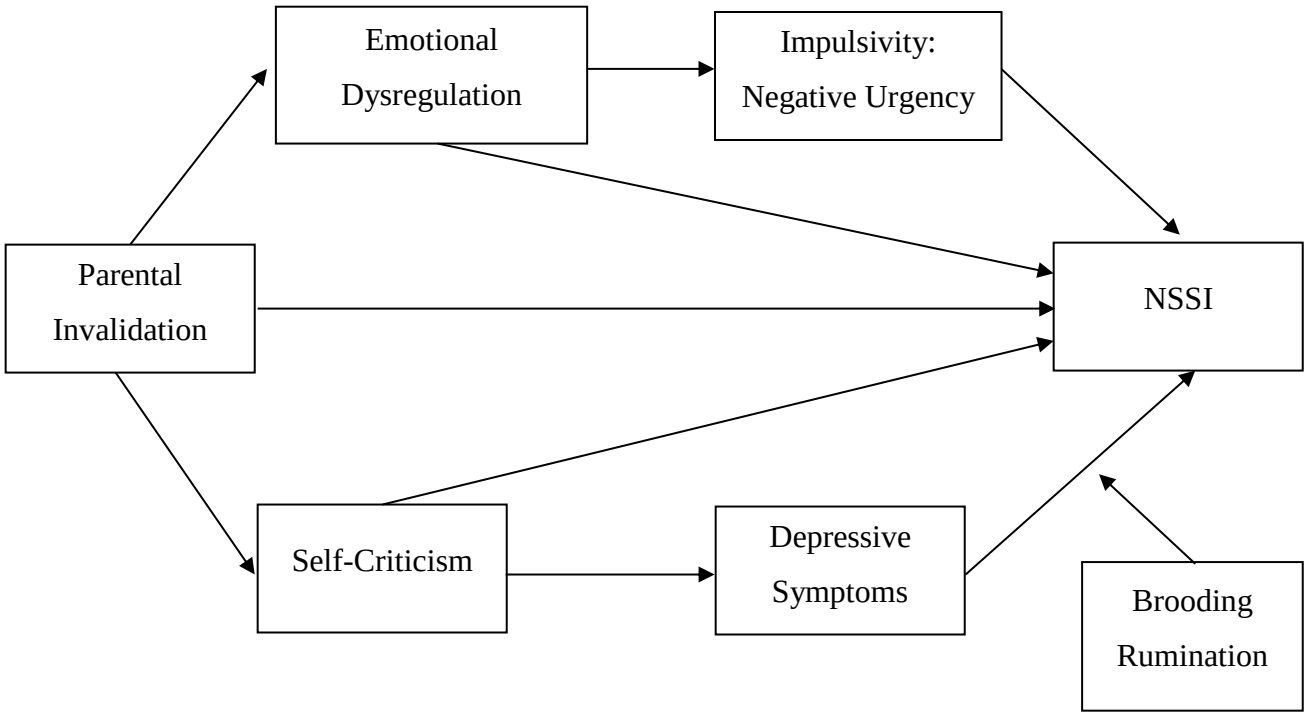
Description of the Three Studies.

First, in Study 1, I investigated two particularly promising pathways that may explain how parental invalidation leads to the development of NSSI (see Figure 2). In the first pathway, I hypothesized that parental invalidation would lead to increased emotional dysregulation, which in turn would lead to increased negative urgency impulsivity, and that these two constructs would serially mediate the relationship between parental invalidation and NSSI. In

the second pathway, I hypothesized that parental invalidation would lead to increased self-criticism and depressive symptoms, which would serially mediate the relationship between parental invalidation and NSSI. I further hypothesized that depressive symptoms would lead to more NSSI in individuals who also had a propensity toward brooding rumination (a moderation effect). These variables were also chosen as mediators because, unlike childhood experiences with parents, which cannot be changed, these intrapersonal characteristics may be more amenable to interventions.

Figure 2

Graphical Representation of the Proposed Model



Because data collection in Study 1 was exclusively self-report, in Study 2 my goal was to validate this commonly-used but potentially problematic methodology. I did this in two ways. First, to establish that the self-report measures used in Study 1 were capturing individuals' stable and meaningful perceptions of their childhood experiences with their parents, rather than

temporarily biased reports due to fluctuating emotional states, I examined the test-retest reliability of the measure of perceived parental invalidation over a six-week period. Second, I examined the concordance in perceptions of childhood parental invalidation in sibling dyads, who were born within three years and raised by the same two parents.

Third, in Study 3, I examined the effectiveness of a self-help intervention designed to help self-injuring individuals resist their self-critical self-attacks, and thereby reduce the frequency and severity of their NSSI. This intervention was based on Study 1 findings, which demonstrated that self-criticism mediated the relationship between parental invalidation and NSSI.

Chapter 3: Path Analysis Model of NSSI Development (Study 1)

The goal of Study 1 was to investigate two potential causal mechanisms by which the experience of childhood parental invalidation may put individuals at increased risk of engaging in Non-Suicidal Self-Injury (NSSI). Previous research has established relationships between individual risk factors and NSSI. However, our understanding of the development of NSSI is currently incomplete, in that we have limited knowledge of how these risk factors may interact. The current study aimed to extend previous findings by testing a more complete model of NSSI development. In testing this model, this study aimed not only to enhance our understanding of the mechanisms which lead to the development of NSSI, but to identify intrapersonal risk factors that may be amenable to intervention.

To meet this goal, the first objective of Study 1 was to replicate previous findings linking maternal and paternal childhood emotional invalidation to increased likelihood of engaging in NSSI later in life:

> *Hypothesis 1:* Individuals with a history of maternal or paternal parental invalidation will be significantly more likely to report a history of NSSI.

The second objective was to examine whether the significant relationship between childhood parental invalidation and increased risk of NSSI was mediated by either of two proposed serial mediation pathways, which were proposed based on theoretical and empirical evidence, as outlined in Chapter 2:

> *Hypothesis 2:* Difficulties in emotion regulation, and negative urgency impulsivity, will serially mediate the relationship between parental invalidation and NSSI (first pathway).

Hypothesis 3: Self-criticism and depressive symptoms will serially mediate the relationship between parental invalidation and NSSI (second pathway).

Hypothesis 4: Brooding rumination will moderate the mediated pathway between depression and NSSI (in the second pathway), such that this pathway will be more likely to lead to NSSI in individuals high in brooding rumination.

Method

Participants and Procedure

Participants were adult women (N = 404) residing in the United States, recruited online through a crowd-sourcing website, Amazon's Mechanical Turk. The study was posted to the website, and Mechanical Turk users were provided with the following description of the study: "Answer questions about your early experiences with your parents, your current emotions, and any past or current self-injury (no history of self-injury required to participate)." Mechanical Turk users who were interested in the study, and met demographic requirements, could then begin the survey. Participants were required to be female, current residents of the United States, and between the ages of 18 and 25 years, inclusive. The original sample had 411 participants, however, 7 participants were removed for not meeting study requirements (i.e., 3 participants were older than 25, 1 self-reported his sex as "male," and 3 reported their sex as "other"). Once these participants were removed, the mean age of the sample was 22.37 years (SD = 1.48).

Interested participants followed a link on the Mechanical Turk website, which redirected them to complete the survey online, through Survey Monkey (www.surveymonkey.com). The survey began with a letter of informed consent. Individuals who agreed to participate completed the study questionnaires in sequential order as outlined below. Upon completion of

the survey, participants were given a code to enter in Mechanical Turk to receive payment for their participation. Study 1 took approximately 30 minutes to complete, and participants were compensated $3 USD for their time.

Materials

I. Invalidating Childhood Environment Scale.

The Invalidating Childhood Environment Scale (ICES; Mountford, Corstorphine, Tomlinson, & Waller, 2007) consists of two scales, measuring perceived maternal and paternal invalidation during childhood (up to 18 years), as well as the individual's overall perception of their childhood environment. Maternal and paternal childhood invalidation are rated separately. Each subscale consists of 14 items, such as, "If I was upset, my mother/father said things like: 'I'll give you something to really cry about!'" Items are rated on a 5-point scale according to how closely they reflect the experience of the participant up to 18 years (1 = *Never*, 2 = *Rarely*, 3 = *Some of the time*, 4 = *Most of the time*, 5 = *All of the time*). In a validation study (Mountford et al., 2007), the ICES scores showed good internal consistency in a clinical group of women (paternal $\alpha = .80$; maternal $\alpha = .77$) and more modest internal consistency in a non-clinical group of women (paternal $\alpha = .59$; maternal $\alpha = .66$). The internal consistency of the scale scores in the current study was very high, paternal Cronbach's $\alpha = .92$ and maternal Cronbach's $\alpha = .92$.

II. Difficulties in Emotion Regulation Scale.

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item scale consisting of seven subscales (nonacceptance of emotional responses, difficulties engaging in goal-directed behaviour, impulse control difficulties, lack of emotional awareness,

limited access to emotion regulation strategies, and lack of emotional clarity). Participants rate items such as "I experience my emotions as overwhelming and out of control" on a 5-point scale, indicating how much they apply to the participant (1 = *Almost Never/0-10%*, 2 = *Sometimes/11-35%*, 3 = *About Half the Time/36-65%*, 4 = *Most of the Time/66-90%*, 5 = *Almost Always/91-100%*). Overall, the DERS scores have very high internal consistency, with a Cronbach's α of .93. Each of the individual subscales' scores also have adequate internal consistency, with an alpha value above .80 (Gratz & Roemer, 2004). Internal consistency scale scores in the current study were once again very high, with Cronbach's α = .93 for the nonacceptance subscale, .90 for the goal-directed behaviour subscale, .90 for the impulse control subscale, .87 for the emotional awareness subscale, .92 for the emotion regulation strategies subscale, .88 for the emotional clarity subscale, and .96 for the overall DERS total score.

III. Urgency, Premeditation, Perseverance, and Sensation Seeking Impulsive Behaviour Scale.

The Urgency, Premeditation, Perseverance, and Sensation Seeking Impulsive Behaviour Scale (UPPS; Whiteside & Lynam, 2001) was developed by conducting an exploratory principal components analysis on four NEO-PI-R representations of impulsivity and seventeen pre-existing impulsivity scales, which revealed a four-factor solution, corresponding to the four subscales of (Lack of) Premeditation, Negative Urgency, Sensation Seeking, and (Lack of) Perseverance. The overall scale consists of 34 items, such as "I often get involved in things I later wish I could get out of," which are rated on a 4-point scale as they apply to participants (1 = *Almost Never*, 2 = *Sometimes*, 3 = *Often*, 4 = *Almost Always*). The internal consistency coefficients for scores on the four subscales in the scale development study were .91 for (a

Lack of) Premeditation, .86 for Negative Urgency, .90 for Sensation Seeking, and .82 for (a Lack of) Perseverance. These coefficients were consistent with those found in the current study, which were .88 for (a Lack of) Premeditation, .90 for Urgency, .84 for Sensation Seeking, and .88 for (a Lack of) Perseverance.

IV. Self-Criticism Subscale of the Depressive Experiences Scale.

The Depressive Experiences Questionnaire (DEQ; Santor, Zuroff, & Fielding, 1997) is a 66-item questionnaire, rated on a 7-point Likert scale, which assesses the orthogonal personality dimensions of Dependency and Self-Criticism. For this series of studies, only the Self-Criticism subscale was used, which includes items such as "If I fail to live up to expectations, I feel unworthy," which are rated on a 7-point scale (1 = *Strongly Disagree*, 4 = *Neutral/Undecided*, 7 = *Strongly Agree*). The DEQ has been found to have high test-retest reliability, at one hour, 2-day, and 7-day intervals (Zuroff, Colussy, & Wielgus, 1983) as well as good convergent and discriminant validity (Blaney & Kutcher, 1991). In the current study, the Self-Criticism subscale scores had a coefficient alpha of .80, which was consistent with the internal reliability of .76 for the sample of undergraduate women in the original scale development article. This study used the revised McGill scoring of the DEQ Self-Criticism subscale, because it was found to have superior convergent and divergent validity (Santor et al., 1997).

V. Centre for Epidemiologic Studies Depression Scale – Revised.

The Centre for Epidemiologic Studies Depression Scale – Revised (CESD-R; Van Dam & Earleywine, 2011) is a recently revised version of a popular assessment tool that has wide applicability to the general population. It was revised to reflect modern diagnostic criteria and

improve its psychometric properties. The CESD-R consists of 20 items, such as "I lost interest in my usual activities," which are rated on a 5-point scale (0 = *Not at all OR less than 1 day last week*, 1 = *1-2 days last week*, 2 = *3-4 days last week*, 3 = *5-7 days last week*, 4 = *Nearly every day for 2 weeks*). Scale items load on a single factor with two main symptom clusters: negative mood and functional impairment. The CESD-R has exhibited good psychometric properties including high scale score internal consistency (α = .93), strong factor loadings, and good convergent and discriminant validity (Van Dam & Earleywine, 2011). Consistent with prior research, the scale showed good internal reliability in the current study, Cronbach's α = .95.

VI. Rumination Responses Scale.

The Ruminative Responses Scale (RRS; Treynor et al., 2003) was designed to yield a measure of rumination unconfounded with depression content. It consists of 10-items, such as "Go someplace alone to think about your feelings," which participants rate on a 4-point scale, indicating how frequently they generally engage in each behaviour (1 = *Almost Never*, 2 = *Sometimes*, 3 = *Often*, 4 = *Almost Always*). Scale items load on two factors: Reflection, which is neutrally valenced, and Brooding, which is negatively valenced. At its inception, the RRS was found to have good psychometric properties, with a Cronbach's alpha of .72 for the Reflection subscale scores, and .77 for the Brooding subscale scores (Treynor et al., 2003). Subscale scores in the current study also showed good internal consistency, Cronbach's α = .82 for Reflection and Cronbach's α = .84 for Brooding.

VII. Deliberate Self-Harm Inventory.

The Deliberate Self-Harm Inventory (DSHI; Gratz, 2001) consists of 17 behaviourally-based self-report items designed to assess self-harm, defined as the deliberate, direct destruction or alteration of body tissue without conscious suicidal intent, but resulting in injury severe enough for tissue damage (e.g., scarring) to occur. Each item asks whether the individual has engaged in a different type of self-harming behavior, to which participants respond "yes" or "no." A sample item is: "Have you ever intentionally (i.e., on purpose) cut your wrist, arms, or other area(s) of your body (without intending to kill yourself)?" Other methods include burning, banging your head, sticking sharp objects into your skin, and scratching to the point of bleeding or scarring. A total number of methods score was calculated by summing the number of "yes" responses, with higher totals reflecting a greater severity of deliberate self-harm behavior. The DSHI scores have shown good internal consistency and validity, both in prior research (i.e., Gratz, 2001; Cronbach's $\alpha = .82$) and in the current study, Cronbach's $\alpha = .65$.

VIII. Demographics.

Following the other questionnaires, participants were also asked to indicate their age, sex, and current country of residence.

Results

Descriptive Statistics

I calculated the means and standard deviations for each subscale and compared them to the original scale development articles (see Table 1). Scale means were not reported in the original scale development article for the UPPS, so the scale means reported in this table are from a later article by the scale development authors (Whiteside & Lynam, 2003).

Mean scores for most of the scales were significantly above those reported in the community samples examined in the initial scale development articles. This was particularly true for the measures of parental invalidation, emotional dysregulation, and depression. For the parental invalidation measure, the scale means were more similar to the clinical group in the original scale development study than the non-clinical group. This pattern of results suggests that there have may be a self-selection effect operating during study recruitment. The study advertisement in Mechanical Turk stated: "Answer questions about your early experiences with your parents, your current emotions, and any past or current self-injury (no history of self-injury required to participate)." Although we clarified that a history of self-injury was not required to participate, it seems that individuals with a history of self-injury or difficult early experiences with their parents may have been more likely to choose to participate in this study.

I also examined the correlations between the subscale scores to look for evidence of multicollinearity (i.e., $r > 0.90$; Pallant, 2005). Pearson correlations were calculated and did not reveal evidence of significant multicollinearity (see Table 2). As expected, all the subscale scores were significantly, positively correlated.

NSSI Prevalence

Of the 404 women who met study requirements, 232 (57.4%) reported that they had engaged in at least one form of intentional, non-suicidal self-injury (NSSI) in their lifetime. This prevalence rate is significantly above what has previously been reported in a general community sample and supports the hypothesis that there may be a self-selection bias occurring, in which individuals with a history of NSSI are more likely to decide to participate in research investigating this topic. Of those individuals who reported a lifetime history of NSSI, the majority reported that they had engaged in one (22.5%) or two (15.1%) forms of self-

injury, although there were individuals who reported engaging in up to 10 forms of self-injury (see Table 3). The most commonly-reported forms of NSSI were cutting (36.1%) and severe scratching (23.3%), which were both reported significantly more frequently than in the original DSHI scale development article (see Table 4). However, these prevalence rates are not inconsistent with what has been reported elsewhere, particularly the high prevalence of severe self-scratching (Briere & Gil, 1998; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006; Whitlock et al., 2006).

Table 1

Descriptive Statistics of Study 1 Variables (N = 404)

Scale	**Current Study *M (SD)***	**Development Study *M (SD)***	**Development Study Sample**
1. Maternal ICES	32.50 (12.01)	Clinical: 31.68 (7.22) Non-clinical: 28.24 (4.96)	Clinical: 73 eating-disordered women Non-clinical: 62 women without eating disorders
2. Paternal ICES	32.13 (12.29)	Clinical: 34.70 (8.88) Non-clinical: 27.81 (4.31)	
3. DERS Total	99.69 (28.21)	77.99 (20.72)	260 women in an undergraduate psychology course
4. UPPS Urgency	29.38 (7.88)	32.81 (not reported)	18 women in a control condition; non-clinical
5. DEQ Self-Criticism	119.53 (18.22)	127.62 (20.25)	81 undergraduate women
6. CESDR	22.61 (15.23)	16.4 (13.5)	243 undergraduate psychology students, 62% female
7. RRS Brooding	11.67 (4.32)	9.66 (3.09)	605 community women

Table 2

Correlations of Study 1 Variables (N = 404)

	1.	2.	3.	4.	5.	6.	7.
1. ICES Maternal							
2. ICES Paternal	.36***						
3. DERS Total	.40***	.41***					
4. Negative Urgency	.29***	.30***	.65***				
5. DEQ Self-Criticism	.35***	.36***	.65***	.49***			
6. CESD-R Depression	.35***	.34***	.67***	.47***	.58***		
7. Brooding Rumination	.31***	.28***	.58***	.42***	.57***	.68***	
8. DSHI	.25***	.25***	.41***	.38***	.32***	.45***	.36***

* Significant at the $p < .05$ level

** Significant at the $p < .01$ level

*** Significant at the $p < .001$ level

Note. Correlations of .1, .3, and .5 represent small, medium, and large effect sizes, respectively.

Table 3

Frequency of Non-Suicidal Self-Injury (N = 404)

Number of Forms of NSSI Endorsed	Frequency	Percent
0	172	42.6
1	91	22.5
2	61	15.1
3	33	8.2
4	21	5.2
5	15	3.7
6	5	1.2
7	3	0.7
8	2	0.5
9	0	0
10	1	0.2

Table 4

Frequency of Forms of Non-Suicidal Self-Injury

Self-Injurious Behaviour	Current Study (*N* = 404)		DSHI Development Study (*N* = 102)	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Cutting	146	36.1	14	14
Severe scratching	94	23.3	12	12
Carving words into skin	39	9.7	12	12
Sticking pins, needles, stables into skin	39	9.7	12	12
Other forms of self-harm	36	8.9	6	6
Banging head	33	8.2	12	12
Interference with wound healing	31	7.7	8	8
Punching self	30	7.4	10	10
Biting	27	6.7	6	6
Carving pictures into skin	25	6.2	4	4
Burning with lighter or match	22	5.4	4	4
Burning with cigarette	18	4.5	4	4
Using bleach or oven clean to scrub skin	3	0.7	0	0
Rubbing sandpaper on skin	2	0.5	1	1
Rubbing glass into skin	2	0.5	2	2
Breaking bones	1	0.2	0	0
Dripping acid on skin	0	0	0	0

Mediation Analysis

To examine the two proposed serial mediations between parental invalidation and NSSI, I conducted two path analyses: one with maternal invalidation as the antecedent variable, and one with paternal invalidation as the antecedent variable. These analyses had to be conducted separately for each parent, as the ICES gives measures of maternal and paternal invalidation separately and does not yield a measure of combined parental invalidation. It is important to note that my goal in these analyses was to evaluate the validity of the proposed mediations, rather than to evaluate the goodness of model fit; these analyses are thus best characterized as a type of path analysis, rather than a latent variable structural equation modelling approach.

Both maternal and paternal invalidation were significantly correlated with the total DSHI score (see Table 2; maternal $r = .25$, $p < .001$; paternal $r = .25$, $p < .001$). To investigate whether the relationships between maternal and paternal invalidation and NSSI were significantly mediated by (a) difficulties in emotion regulation and negative urgency impulsivity (pathway 1), and (b) self-criticism and depressive symptoms, which was further moderated by brooding rumination (pathway 2), I conducted two mediation analyses using the PROCESS Macro in SPSS (version 3) by Andrew Hayes (Hayes, 2017). Due to the complexity of the proposed model, I constructed a custom model in SPSS syntax. Bootstrapping with 10,000 samples was used to test all indirect effects, due to evidence that the sampling distribution of the indirect effect tends to be non-normal (Hayes, 2017).

Since 0 is outside of the range of the brooding rumination scale (range: 5 – 20), brooding rumination was mean-centered prior to all analyses to make the regression coefficient between depressive symptoms and NSSI interpretable; this coefficient estimates the change in NSSI for a change of 1 unit on the CESD-R, for individuals with a score of 0 on the proposed moderator of

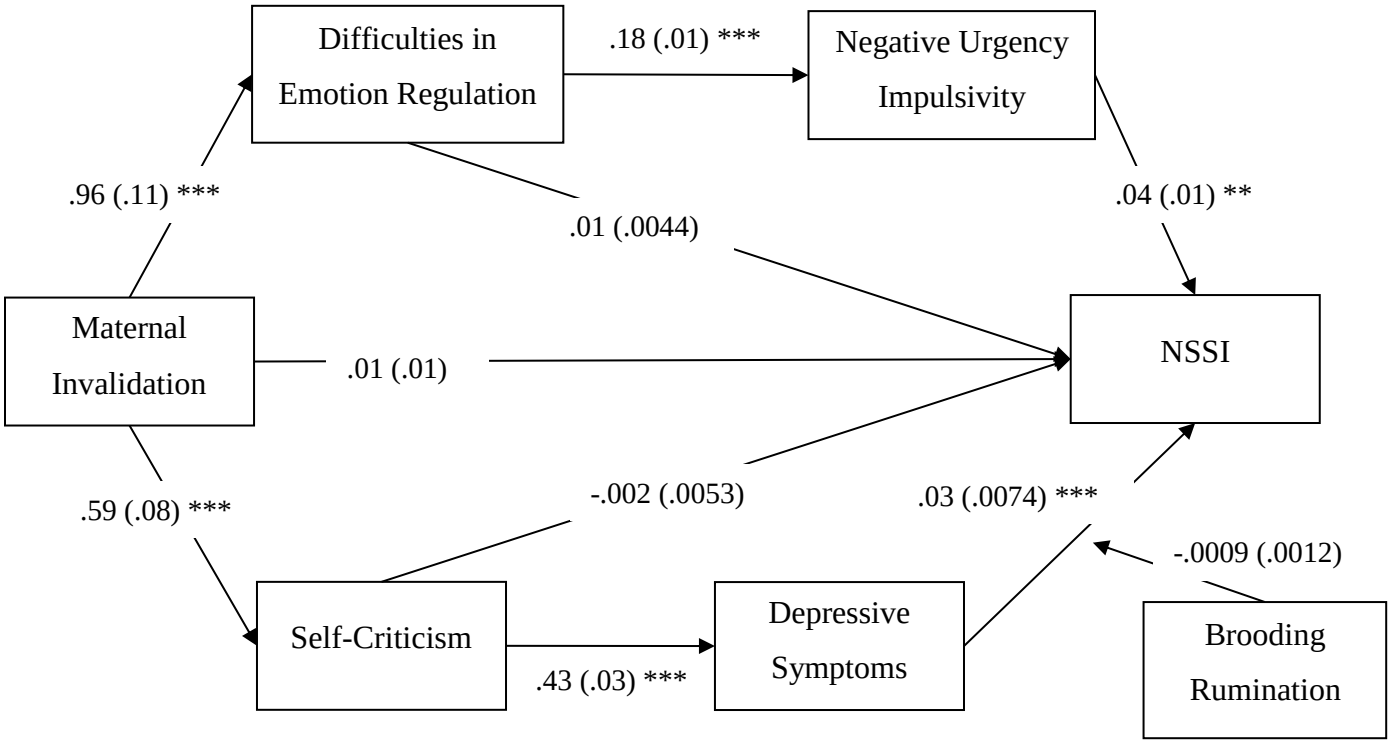
brooding rumination. Mean-centering the brooding rumination variable thus made this regression coefficient interpretable, as it then indicates the change in NSSI for a change of 1 unit on the CESD-R, for individuals with an average score on brooding rumination.

Mediation Analyses for Maternal Invalidation.

First, I examined the model for maternal invalidation. For this model, neither of the bootstrapped 95% confidence intervals for the serial indirect effects contained zero, indicating that both (a) difficulties in emotion regulation and negative urgency impulsivity, and (b) self-criticism and depressive symptoms, significantly, serially mediated the relationship between maternal invalidation and NSSI (see Figure 3).

Figure 3

Path Analysis for Maternal Invalidation (Standard Errors are Parenthesized)



R^2 = .25*
* Significant at the p <.05 level
** Significant at the p < .01 level
*** Significant at the p < .001 level

The proposed moderator effect of brooding rumination on the relationship between depressive symptoms and NSSI, in the second pathway, was found to be non-significant, as there was no interaction between depressive symptoms and brooding rumination in predicting NSSI, t (397) = -0.77, p = .44, 95% CI [-.0032, .0014]. Conditional process analyses, using bootstrapping, revealed that the indirect effect through the second pathway was significant at all levels of brooding rumination (i.e., none of the 95% confidence intervals included 0).

Mediation Analyses for Paternal Invalidation.

Next, I examined the model for paternal invalidation. Similarly, for this model, neither of the bootstrapped 95% confidence intervals for the serial indirect effects contained zero, indicating that both (a) difficulties in emotion regulation and negative urgency impulsivity, and (b) self-criticism and depressive symptoms, also significantly, serially mediated the relationship between paternal invalidation and NSSI (see Figure 4).

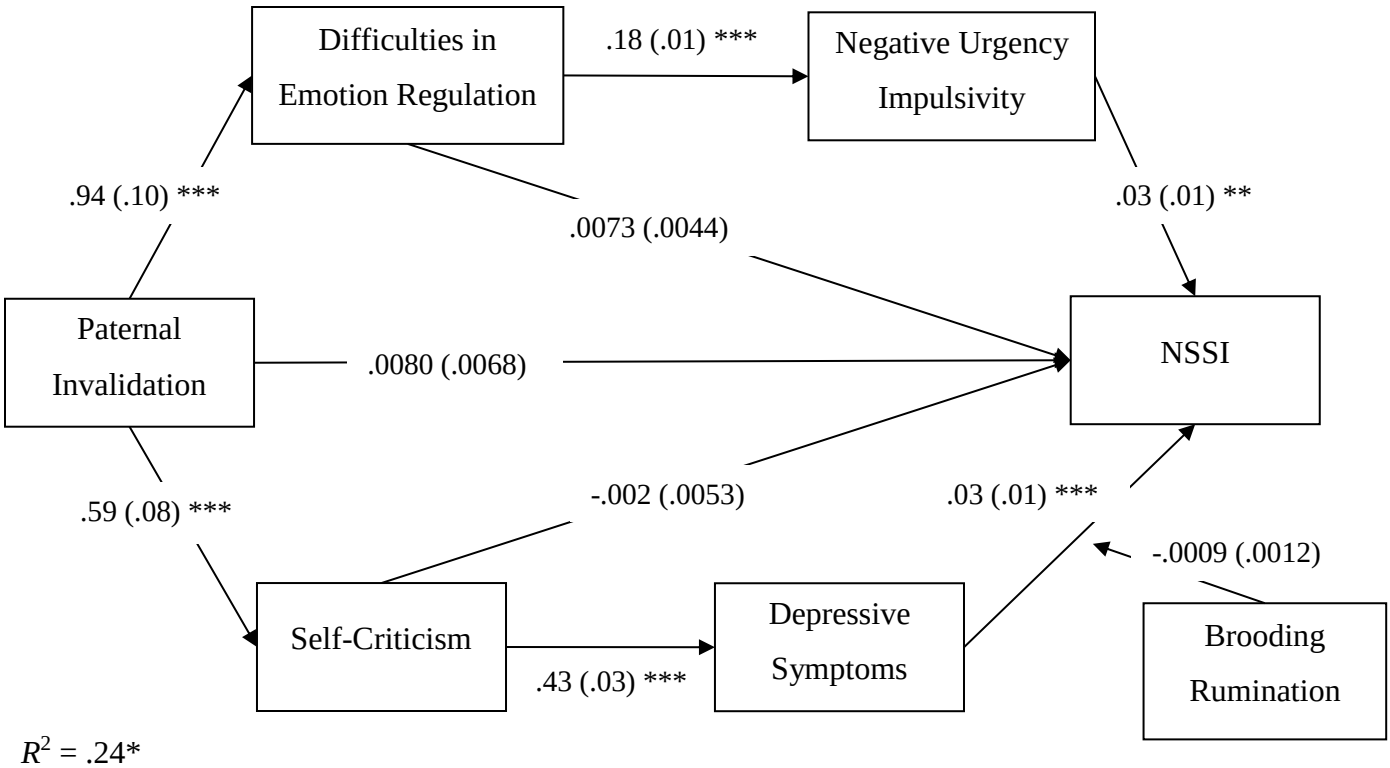
The proposed moderator effect of brooding rumination on the relationship between depressive symptoms and NSSI, in the second pathway, was again found to be non-significant, as there was no interaction between depressive symptoms and brooding rumination in predicting NSSI, t (397) = -0.77, p = .44, 95% CI [-.0032, .0014]. Consistent with the results for maternal invalidation, conditional process analyses, using bootstrapping, revealed that the indirect effect through the second pathway was significant at all levels of brooding rumination (i.e., none of the 95% confidence intervals included 0).

Alternative Models.

In order to test the specificity of my proposed model, I also conducted mediation analyses for two alternative models: (a) a model in which the DSHI and CESD-R were reversed, and (b) a model in which the DSHI and total DERS were reversed. These models were arbitrarily chosen

Figure 4

Path Analysis for Paternal Invalidation (Standard Errors are Parenthesized)



R^2 = .24*

* Significant at the $p < .05$ level

** Significant at the $p < .01$ level

*** Significant at the $p < .001$ level

because I considered them to be theoretically implausible. I thus expected to find no evidence of serial mediation for either model. Each model was tested twice, once using maternal invalidation as the antecedent variable and once with paternal invalidation as the antecedent variable.

Alternative Model 1.

For the first model, using maternal invalidation as the antecedent variable, the bootstrapped 95% confidence interval for the indirect effect of the first pathway contained zero, indicating that emotion regulation difficulties and negative urgency impulsivity did not significantly, serially mediate the relationship between maternal invalidation and depression. However, the 95% confidence interval for indirect effect of the second pathway did not contain zero, supporting

serial mediation between maternal invalidation and depression by self-criticism and self-injury. The proposed moderating effect of brooding rumination was non-significant.

Similarly, for the first alternative model but using paternal invalidation as the antecedent variable, the indirect effect for the first pathway was non-significant, indicating that emotion regulation difficulties and negative urgency impulsivity did not significantly, serially mediate the relationship between paternal invalidation and depressive symptoms. Again, the 95% confidence interval for the indirect effect for the second pathway did not contain zero, supporting serial mediation between paternal invalidation and depression by self-criticism and self-injury. The proposed moderating effect of brooding rumination was again non-significant.

Alternative Model 2.

For the second alternative model, with maternal invalidation as the antecedent variable, neither of the 95% confidence intervals for the indirect effects included zero, indicating that the relationship between maternal invalidation and difficulties in emotion regulation was significantly, serially mediated by both (a) non-suicidal self-injury and negative urgency impulsivity, and (b) self-criticism and depressive symptoms. The proposed moderation by brooding rumination was non-significant.

For the second alternative model, with paternal invalidation as the antecedent variable, both indirect effects were again found to be significant, indicating that the relationship between paternal invalidation and difficulties in emotion regulation was significantly, serially mediated by (a) non-suicidal self-injury and negative urgency impulsivity, and (b) self-criticism and depressive symptoms. Once again, the proposed moderation by brooding rumination was non-significant.

Discussion

The results of Study 1 support my first hypothesis, as they show that a history of childhood parental emotional invalidation is associated with an increased risk of engaging in NSSI. This finding adds to the body of other recent empirical research that supports the existence of this long-theorized relationship, which has played an important role in the clinical treatment of NSSI for over two decades (Baetens et al., 2015; Buckholdt et al., 2014; Lynch, Trost, Salsman, & Linehan, 2007; Wedig & Nock, 2007; You & Leung, 2012). It also supports emerging evidence that suggests that interpersonal relationship factors such as emotional invalidation may play a critically important role in the development of NSSI, and may even be part of the mechanism by which more "severe" forms of childhood maltreatment, such as physical or sexual abuse, lead to later coping through NSSI (Di Pierro et al., 2012; Glassman et al., 2007; Klonksy & Moyer, 2008; Martin et al., 2016).

My second hypothesis was also supported, as the significant relationship between childhood emotional invalidation and engaging in NSSI was significantly, serially mediated by increased difficulties in emotion regulation, and negative urgency impulsivity. This finding is important, because it supports the potential existence of a causal mechanism where NSSI develops in individuals whose parents do not teach them to effectively accept, label, and regulate their emotions through adaptive strategies in childhood. Instead, individuals with emotionally invalidating parents learn that they should suppress or eliminate their emotions. This intolerance for negative emotional experiences in individuals who also never learned effective emotion regulation strategies, makes it more likely for these individuals to engage in maladaptive coping strategies such as NSSI to deal with the negative affective experiences that they find so aversive (Klonsky, 2007).

The results of the current study also support my third hypothesis, which postulated that the association between childhood emotional invalidation and NSSI engagement would be serially mediated by increases in self-criticism and depressive symptoms. This finding supports the hypothesis that individuals with highly critical parents tend to internalize these self-critical views, and berate themselves for failing to meet their self-imposed high standards (Katz & Nelson, 2007). The development of such a negative cognitive style puts these individuals at increased risk of developing depressive symptoms, as they develop a negative view of themselves, the future, and the world (Beck, 1964; Cantazaro & Wei, 2010; Ehret et al., 2015; Joeng & Turner, 2015). These individuals are thus at increased risk of engaging in NSSI in order to deal with their overwhelming negative emotions because they have internalized a pattern of self-abuse through modelling by their parents (Glassman et al., 2007).

It was surprising that my fourth hypothesis, that brooding rumination would moderate the mediation relationship between depressive symptoms and NSSI, was not supported. Instead, study results showed that self-criticism and depressive symptoms significantly, serially mediated the relationships between both maternal and paternal invalidation and NSSI at all reported levels of brooding rumination, whereas I had hypothesized that this would only be the case for individuals reporting high levels of brooding rumination. This result suggests that brooding rumination may be better understood as a mediator of the relationship between depressive symptoms and NSSI, consistent with previous findings showing that brooding rumination mediated the relationship between daily peer hassles and engaging in NSSI (Xavier et al., 2018).

Practical Applications

The finding of two serially mediated pathways between childhood parental invalidation and NSSI engagement has important implications not only for theories of NSSI etiology, but also

for NSSI treatment. Much NSSI research has focused on identifying environmental factors that increase the risk that an individual will engage in NSSI, but there is nothing that can be done to change negative childhood experiences once they have occurred. However, identifying the mechanisms that are put in place by these early experiences and then come to operate independently, provides hope for NSSI treatment, because once these intrapersonal factors have been identified, they can be the target of new interventions. Evidence from Study 1 suggests that emotion regulation difficulties, negative urgency impulsivity, self-critical tendencies, and depressive symptoms play an important role in NSSI engagement. This finding also suggests that an intervention that targeted one of these intrapersonal factors might disrupt the mechanism of NSSI engagement, and lead to decreased NSSI frequency or severity. For instance, teaching an individual some emotion regulation strategies that do not have the negative side effects of NSSI, may make her less likely to turn to NSSI for its emotion-regulating properties. The aim of Study 3 in the current dissertation is to test such an intervention: it is a self-help intervention study in which individuals learn strategies to decrease their self-critical tendencies, which I hypothesize will lead to (a) decreased depressive symptoms, and (b) decreased NSSI frequency.

Limitations

The conclusions that can be drawn from the current study are limited by the fact that the majority of the indirect pathways in the alternative models were also found to be significant. This means that although I found support for my hypothesized model of causal mechanisms between childhood parental invalidation and engaging in NSSI, these alternative mechanisms cannot be ruled out.

Any conclusions about the existence of causal mechanisms are also limited by the cross-sectional design of the current study. The results should be interpreted with caution, as the use of

a longitudinal design would improve our ability to draw conclusions about causal relationships between constructs. Additionally, the study relied entirely upon self-report measures, which have been shown to be susceptible to bias due to impression management or to response styles such as acquiescent responding (Paulhus & Vazire, 2007). However, the use of self-report was also essential in the current study, as I needed to access information about internal, emotional experiences, which are not always externally observable.

Finally, there are also concerns about the extent to which the Mechanical Turk (MTurk) sample is representative of the general population. Investigations into the nature of MTurk samples have found that MTurk respondents do not differ from population-based samples, and that they reliably replicate established decision-making biases, which supports the generalizability of data gathered using this platform (Goodman, Cryder, & Cheema, 2013; Levay, Freese, & Druckman, 2016). However, descriptive statistics from the current study revealed differences between this sample and prior research in the area. Specifically, mean ratings of parental invalidation, difficulties in emotion regulation, depression, rumination, and NSSI prevalence were higher than those previously reported in non-clinical samples, and were more consistent with a clinical sample (Gratz, 2001; Gratz & Roemer, 2004; Mountford et al., 2007; Van Dam & Earleywine, 2011). This pattern of results led to the hypothesis that there may have been a self-selection bias operating in the current sample, such that individuals with a history of NSSI, and thus higher levels of these related constructs, were more likely to choose to complete the study. However, this explanation is not entirely satisfactory, as scale means for self-criticism and impulsivity were not found to be elevated, as would be expected if self-selection was operating.

Conclusions

In conclusion, the results of Study 1 have important theoretical and practical implications for our understanding of how NSSI develops, and how this pattern of behaviour, once established, may be treated by targeting the active mechanisms that keep it in place. Specifically, Study 1 supported the existence of two serial, mediation mechanisms whereby childhood emotional invalidation by parents leads to increased engagement in NSSI: (a) through increased difficulties in emotion regulation and negative urgency impulsivity, and (b) through increased self-criticism and depressive symptoms. Interventions that target any of these intrapersonal factors may disrupt the mechanism, and lead to decreased NSSI engagement.

Chapter 4: Validation of Self-Report Measures (Study 2)

Self-report methodology is widely used in psychology research and is a valuable tool that allows researchers to measure constructs that are not always externally observable, such as individuals' thoughts and feelings. However, the validity of self-report data is viewed with skepticism by many researchers, due to concerns that it can be distorted through biases such as socially-desirable, or acquiescent responding (Paulhus & Vazire, 2007). The validity of adults' retrospective reports of their own adverse childhood experiences has been viewed with even more doubt, due to early, influential studies (e.g., Yarrow, Campbell, & Burton, 1970) suggesting that these retrospective reports are inaccurate. There is particular concern that individuals who are currently experiencing significant psychopathology, such as depressed mood, may over-report adverse childhood experiences due to the global, negative cognitive biases that are characteristic of these states (Brewin, Andrews, & Gotlib, 1993).

Studies examining the reliability and validity of retrospective self-reports of adverse childhood experiences have had mixed results (Pinto, Correia, & Maia, 2014). Despite early skepticism, more recent studies have come to more optimistic conclusions. Hardt and Rutter (2004) conducted a meta-analysis of 20 years of studies examining the validity of retrospective self-report data, through comparison with contemporary official records, contemporary parental report, and retrospective corroboration by siblings. They concluded that although there is evidence of a significant false negative rate, false positives are relatively rare, and that the degree of bias observed in this methodology is not sufficient to invalidate its use (Hardt & Rutter, 2004). They also found that negative reporting biases resulting from depressed mood are usually relatively minor (e.g., Brewin et al., 1993; Sheridan, Brown, Moy, & Harris, 2013). Similarly, there is mounting evidence to suggest that the test-retest reliability of retrospective reports of

childhood maltreatment is good, or even excellent (Pinto et al., 2014), and remains stable even after significant reduction of psychiatric symptomatology through a completed course of psychotherapy (Paivio, 2001).

Because data for Study 1 were collected exclusively using retrospective self-report measures, the goal of Study 2 was to validate this commonly used but potentially problematic methodology. This was done in two ways. First, in order to establish that I was measuring individuals' stable and meaningful perceptions of their early childhood experiences with their parents, and not temporary perceptions due to fluctuating emotional states, I examined the test-retest reliability of the Invalidating Childhood Environment Scale (ICES) over a six-week period:

> *Hypothesis 1:* Individuals' ratings of both maternal and paternal childhood emotional invalidation at Time 1 and Time 2 (six weeks later) will be strongly correlated, operationalized as at least a large effect size ($r > .50$, Cohen, 1992; i.e., the measure will show good test-retest reliability).

The six-week retest time interval was carefully chosen to be long enough to avoid memory effects, and to allow for state changes in participant mood (Leue & Lange, 2011; McCrae, Kurtz, Yamagata, & Terracciano, 2011; Polit, 2014; Watson, 2004).

Second, I sought to establish the validity of individuals' self-reported childhood experiences of parental invalidation through sibling corroboration. Accordingly, to participate in Study 2, individuals were required to have an older sibling who was raised by the same two parents, and was no more than 3 years older, to ensure that they were raised in the same familial environment. Importantly, both members of each sibling pair reported on the experience of one

sibling, due to mounting evidence that siblings may have a different experience of their parents (Bifulco, Brown, Lillie, & Jarvis, 1997; Wright & Zakriski, 2003).

Hypothesis 2: Individuals' ratings of maternal and paternal childhood emotional invalidation will be strongly correlated with their siblings' ratings of their experiences, operationalized as at least a medium effect size ($r > .30$; Cohen, 1992).

Method

Participants

Eighty-six women were recruited from the Queen's University PSYC100 and 200-level pools to participate in the six-week retest portion of Study 2 (age range: 17 – 21 years, M = 18.17, SD = 0.59). These participants were required to be between 16 and 25 years of age, and to have a sibling who was raised by the same two heterosexual parents, and older than her, but not by more than three years. Siblings could be male or female, but were required to be older to avoid issues of consent with minors.

Sixty-five siblings also participated in the sibling-report portion of Study 2. The siblings of all retest participants were invited to participate, but 21 did not. Two sibling pairs were 4 years apart in age, and so were excluded, resulting in a final sample of 63 sibling pairs. One sibling was younger than his PSYC100 sister, but fell within the 3-year window, and so was still included. The mean age of Queen's University participants who completed the sibling-report portion of Study 2 was 18.19 years (SD = 0.59; age range 17 – 21). The mean sibling age was 20.27 years (SD = 1.00; age range 16 – 24). The average difference in sibling age was 2.14 years (SD = .64; range 0 – 3 years). Of the 63 siblings, 33 were men (52.38%) and 30 were women (47.62%).

Procedure

During the PSYC100 prescreen in Fall 2016, and the PSYC100 and PSYC200-level prescreens in Fall 2017, participants completed a modified version of the Invalidating Childhood Environment Scale (ICES; see Appendix A). The ICES was modified to be more inclusive for students who were raised by two mothers or two fathers. Prescreen participants also completed a question asking whether they had an older sibling who was no more than three years older than them, and was raised by the same two parents. Psychology students who met these requirements, as well as the age and gender requirements, and agreed to be contacted, were then emailed 6 weeks following completion of prescreen and asked whether they would like to participate in this study (see recruitment email, Appendix B). Eligible individuals were emailed links to two Survey Monkey questionnaires: one link directed them to a survey for them to complete, and the other was to be sent to their older sibling, so that the sibling could complete the ICES with modified instructions. In order to link sibling pairs, both siblings were provided with a matching sibling code, which they were asked to enter when they began the surveys. The questionnaires began with informed consent, and ended with a complete debriefing as to the nature of the study, including information on where to seek support if they desired. Participation took approximately 20 minutes, and participants were compensated either 0.5 psychology pool credits, or $10 (sent through PayPal or cash in the mail, according to participant preference).

Importantly, older siblings were not asked to complete the ICES based on their own childhood experience, but rather to report on their younger sister's experience as they saw it (see Appendix C). The reason for this distinction was that there is mounting evidence that siblings may have a different experience of their parents because their distinctive personality traits and behaviours evoke different responses (Wright & Zakriski, 2003). Thus, to validate the subjective

report of one sibling, both members of the sibling pair reported on their parents' parenting practices toward that sibling.

Measures

Each member of each sibling pair completed the Invalidating Childhood Environment Scale (ICES; see Study 1 Materials above). Queen's psychology students completed the ICES with slightly modified instructions at both time points (see Appendix A). Their older siblings completed the ICES with modified instructions, which directed them to answer the items based on their younger sister's experience with their parents, as they saw it (see Appendix C).

Results

Descriptive Statistics

I began by calculating means and standard deviations for each ICES subscale, for each sample, at each time point. Scale means were slightly below those reported in the non-clinical sample of the original scale development article, but were within one standard deviation (see Table 5; Mountford et al., 2007).

Test-Retest Reliability Analyses

In order to examine the stability of undergraduates' retrospective self-report of maternal and paternal parental invalidation during childhood, I computed Pearson's correlation coefficients between their Time 1 (prescreen) and Time 2 (six weeks later) ratings (see Table 6). Correlation results indicated that there was a significant positive correlation between Time 1 and Time 2 ratings of maternal invalidation, r (86) = .78, $p < .001$. There was also a significant positive correlation between Time 1 and Time 2 ratings of paternal invalidation, r (86) = .80, $p < .001$.

Validity Analyses: Sibling Corroboration

Next, I computed Pearson correlations to examine the concordance between undergraduate students' ratings of their maternal and paternal childhood invalidation, and ratings of the same constructs by their siblings. Results indicated that there was a significant positive correlation between self-ratings and sibling-ratings of maternal invalidation, both for the Time 1, r (63) = .40, p = .001, and Time 2, r (63) = .58, p < .001, data. For paternal invalidation, there was also a positive correlation between self-ratings and sibling-ratings. Whereas the correlation between the Time 2 and sibling data was significant and substantial, r (63) = .47, p < .001, the correlation between Time 1 and sibling data was significant but small, r (63) = .26, p = .04.

Table 5

Descriptive Statistics and Correlations for Study 2 Variables

	M (SD)	Cronbach's α	1.	2.	3.	4.	5.
1. Maternal Time 1	23.30 (7.81) *n* = 86	.86 *n* = 86					
2. Paternal Time 1	23.36 (8.73) *n* = 86	.90 *n* = 86	.61*** *n* = 86				
3. Maternal Time 2	22.93 (7.36) *n* = 86	.86 *n* = 86	.78*** *n* = 86	.52*** *n* = 86			
4. Paternal Time 2	24.01 (8.25) *n* = 86	.88 *n* = 86	.54*** *n* = 86	.80*** *n* = 86	.68*** *n* = 86		
5. Sibling Maternal	25.06 (7.00) *n* = 65	.83 *n* = 65	.40** *n* = 63	.18 *n* = 63	.58*** *n* = 63	.39** *n* = 63	
6. Sibling Paternal	25.20 (7.59) *n* = 65	.85 *n* = 65	.03 *n* = 63	.26* *n* = 63	.15 *n* = 63	.47*** *n* = 63	.52*** *n* = 65

* Significant at the $p < .05$ level

** Significant at the $p < .01$ level

***Significant at the $p < .001$ level

Note. Correlations of .1, .3, and .5 represent small, medium, and large effect sizes, respectively.

Discussion

The results of Study 2 provide support for the reliability and validity of the Invalidating Childhood Environment Scale (ICES) as a retrospective, self-report measure of parental emotional invalidation during childhood. The results supported my first hypothesis, as individuals' ratings of both maternal and paternal childhood emotional invalidation were highly, significantly correlated across the six-week retest interval. This finding is meaningful as it addresses the concern that young adult report of childhood experiences with parents might be affected by transient mood states (Brewin et al., 1993). Because affective states are relatively unstable over time (Leue & Lange, 2011), this high level of concordance between Time 1 and Time 2 ratings indicates that the ICES is measuring individuals' stable and meaningful perceptions of their early childhood experiences with their parents, and not temporary perceptions due to fluctuating emotional states.

Study 2 results also supported my second hypothesis, as individuals' ratings of maternal and paternal childhood emotional invalidation were corroborated by their siblings' ratings of the same constructs. Sibling-report has been widely used to verify reports of retrospective data, and has generally shown good agreement (e.g., Amodeo & Griffin, 2009; Bifulco et al., 1997). Consistent with past research, siblings in the current study showed significant levels of agreement in their report of childhood parental invalidation, with correlation effect sizes in the medium to large range (i.e., r = .26 - .58).

Sibling corroboration was slightly higher for ratings of maternal versus paternal childhood parental invalidation. I initially made no hypotheses about differences in sibling agreement between parents, because there has been very little past research on sibling agreement about adverse childhood experiences with parents, and existing evidence is inconsistent. One

study about sibling report of parental alcoholism found that same-sex sibling pairs had higher levels of agreement about the drinking behaviours of their opposite-sex parent (e.g., brothers agreed on mothers and sisters agreed on fathers; Rhea, Nagoshi, & Wilson, 1993). Another study, with only sister pairs, found higher levels of agreement about maternal than paternal alcoholism (Amodeo & Griffin, 2009) A study of parental physical abuse found that sisters agreed more on paternal than maternal abuse (Bifulco et al., 1997). This study contributes to a growing body of literature in this area.

Limitations

Some study limitations should be considered. First, only sibling pairs who were within three years in age and were raised by the same two heterosexual parents were included. Caution should be exercised in generalizing these findings to the children of same-sex couples, children raised in blended families, or children who are more than three years apart in age. Although there is no reason to believe that findings would be different for children of same-sex couples, one can theorize that concordance rates would decrease in siblings who experienced less shared familial environment during childhood. This might include children born several years apart, or step-siblings with different custody arrangements.

Conclusions

The results of Study 2 support the use of the ICES as a reliable and valid indicator of individuals' childhood experiences with parental emotional invalidation. Numerous researchers have raised concerns that retrospective self-report measures like the ICES may be unreliable due to response biases, such as socially-desirable responding, acquiescent responding, fluctuating mood states, or psychopathology (e.g., Brewin et al., 1993; Yarrow et al., 1970). However, this study is consistent with more recent evidence that supports the validity of retrospective self-

reports of adverse childhood experiences, because these reports were found to be: (a) consistent over time, and (b) corroborated by siblings who grew up in the same familial environment.

Chapter 5: Self-Help Intervention to Resist Self-Attacks (Study 3)

Currently, an individual seeking psychological treatment for non-suicidal self-injury (NSSI) is most likely to receive dialectical behaviour therapy (DBT) or a psychodynamic treatment, often transference-based or mentalization-based psychotherapy. There is evidence that DBT reduces rates of self-injury (Koons et al., 2001; Linehan et al., 2002; Van Den Bosch, Koeter, Stijnen, Verheul, & Van Den Brink, 2005; van Goethem, Mulders, de Jong, Arntz, & Egger, 2015). However, although the efficacy of DBT has been established, its effectiveness in standard clinical settings remains under-researched: few well-conducted empirical studies exist that include randomized controlled trials, likely because of ethical and legal risks (Feigenbaum et al., 2012; Kliem, Kröger, & Kosfelder, 2010; Muehlenkamp, 2006). A recent meta-analysis reviewing randomized controlled trials of DBT efficacy could find only five studies in a systematic literature search (Panos, Jackson, Hasan, & Panos, 2014). The evidence that exists is mixed as to whether DBT reduces the frequency and severity of NSSI as well as the associated risk and distress more than treatment as usual (TAU; Feigenbaum et al., 2012; McMain, Links, Gnam, Guimond, & Cardish, 2009; Panos et al., 2014).

There is a similar lack of empirical evidence supporting the use of psychodynamic treatments for non-suicidal self-injury, only the lack is more severe. There has been progress, as there are some randomized, controlled trials of long-term psychodynamic treatments for NSSI (e.g., Levy, Yeomans, & Diamond, 2007) but numerous challenges remain. These include small sample sizes and a lack of appropriate control groups (Oldham, 2007). There is also a tendency for articles published in this field to be purely theoretical, or to provide information about treatment efficacy only in the form of case studies (e.g., Rivera & Darke, 2012). This state of affairs led two researchers in the field to beg their peers to engage in empirical evaluation of

treatment outcomes, in order for "psychoanalytic treatment to survive in the era of evidence-based medicine" (Blatt & Shahar, 2004, p. 393).

Not only is there a lack of empirical evidence supporting the current standard treatments for self-injury, but these treatments are very difficult to access, as they can only be provided by highly trained practitioners, are frequently only available in urban centres, and can be prohibitively expensive (Guerdjikova, Gwizdowski, McElroy, McCullumsmith, & Suppes, 2014). The process of accessing treatment often involves long wait times for individuals in intense distress. For these reasons, the purpose of the current study was to examine the validity of a self-directed, short-term intervention in reducing the frequency and severity of self-injury.

The results of Study 1 supported my hypothesis that one potential mechanism by which parental invalidation may lead to self-injury is through internalized self-criticism and increased depressive symptoms. Therefore, a goal of the current study is to examine whether two interventions designed to help individuals deal with their self-criticism would interrupt this mechanism and reduce both depressive symptoms and the frequency and severity of self-injury.

High self-critics have been found to be more likely to accept their self-critical thoughts, feel weak and beaten down, display shame and sadness in response to their critical self-attacks, and be more prone to depression and depressive relapse (Whelton & Greenberg, 2005). In 2009, Kelly, Zuroff, and Shapiro, found that a two-week intervention designed to teach individuals to resist their self-critical self-attacks was effective in reducing depression, shame, and self-criticism in highly self-critical individuals. I hypothesize that this same intervention will also be effective in reducing self-injury, as it will interrupt the second mechanism, from parental invalidation through self-criticism and depressive symptoms to NSSI engagement, that was supported in Study 1.

Kelly and colleagues (Kelly, Zuroff, & Shapira, 2009) also examined a second intervention, which was designed to help participants develop their self-soothing skills, particularly in the face of their self-critical thoughts. Although Kelly and colleagues found that this intervention condition was not effective in reducing depressive symptoms, it did reduce shame in their sample of distressed acne sufferers. Deficits in self-soothing have long been hypothesized to play a causal role in the development and maintenance of NSSI (Linehan, 1993). According to this hypothesis, individuals with emotionally invalidating caregivers do not have the supportive, soothing caregiver experiences required to develop and internalize adaptive self-soothing behaviours. Without more adaptive self-soothing skills, they then tend to turn to maladaptive coping strategies, such as NSSI, in order to deal with negative emotions. This hypothesis is supported by the consistent report, by individuals who self-injure, that they experience intense negative thoughts and feelings prior to self-injuring, and that they engage in self-injury in order to soothe themselves and reduce these negative feelings (Gallegos & Hillbrand, 2016; Nock, 2010). I therefore also hypothesize that the self-soothing intervention condition will result in a reduction of NSSI behaviours.

Hypothesis 1: Participants in both the attack-resisting and the self-soothing treatment conditions will report significantly fewer episodes of NSSI during the two-week treatment period than in the two weeks prior.

I further hypothesize that, consistent with the findings of Kelly and colleagues (2009), participation in the attack-resisting treatment condition will result in decreased depressive symptoms. Additionally, given the pivotal role of self-soothing deficits in individuals who

engage in NSSI, I expect that the self-soothing intervention will also result in decreased depressive symptoms in this population.

Hypothesis 2: Participants in both the attack-resisting and self-soothing treatment conditions will show significant reductions in depressive symptoms following the two-week intervention.

Both interventions in the current study are designed to help individuals develop skills to deal with their critical self-thoughts more effectively. Given the causal relationship between increased self-criticism, depressive symptoms, and engaging in NSSI that was demonstrated in Study 1, I expect that these interventions will be particularly effective at reducing depressive symptoms and NSSI behaviours in highly self-critical individuals.

Hypothesis 3: Decreases in depressive symptoms and NSSI frequency will be particularly pronounced in highly self-critical individuals.

Method

Participants

Students taking first- or second-year psychology courses at Queen's University were invited to participate in the PSYC100 prescreen in the fall of 2016, the PSYC100 and PSYC200-level prescreen in the fall of 2017, and the PSYC200-level prescreen in the winter of 2018. Willing participants completed the Deliberate Self-Harm Inventory (DSHI) with modified instructions, asking whether they had engaged in any form of Non-Suicidal Self-Injury (NSSI) in the previous *two-weeks*, rather than at any point in their life, as in the original questionnaire

instructions (see Appendix D). The purpose of this modification was to identify individuals who were actively engaging in NSSI, in order to invite them to participate in Study 3.

All women, aged 17 – 25 years, who indicated in the prescreen that they had engaged in at least one form of NSSI in the previous two weeks, and had given consent to be contacted, were emailed an invitation to participate in Study 3 (see Appendix E). Seventy-three participants completed the first laboratory session, with an average age of 18.92 years (*SD* = 1.42; age range 17 – 24 years). Five participants dropped out before completing the second study session, leaving a final sample of 68 participants with a mean age of 18.93 years (*SD* = 1.35; age range 17 – 24). Because of attrition, the final sample was slightly uneven across conditions, with 24 participants in the control condition, 23 in the soothing condition, and 21 in the attack-resisting condition.

Measures

Regardless of the condition to which they were assigned, all Study 3 participants completed the same battery of computerized questionnaires during both their first and second laboratory sessions: the Self-Criticism Subscale of the Depressive Experiences Questionnaire (DEQ), the Centre for Epidemiologic Studies Depression Scale - Revised (CESD-R), and the Deliberate Self-Harm Inventory (DSHI; please see Chapter 3 for a description of each scale). Throughout Study 3, the DSHI instructions were modified to ask participants whether, and how frequently, they had engaged in self-injurious behaviours in the past *two-weeks*, rather than at any time in the past, as in the original instructions (see Appendix D).

Consistent with previous research, the Self-Criticism Subscale of the DEQ and the CESD-R showed high internal consistency (see Table 6). The internal consistency of the DSHI was lower than has previously been reported for this measure (e.g., $\alpha = .82$, Gratz, 2001).

Participants in the intervention conditions also completed an intervention compliance measure during the second laboratory session, which is described below.

Procedure

Time 1 Laboratory Session.

The interventions implemented in Study 3 were based on those developed by Kelly, Zuroff, and Shapira (2009). All participants in Study 3 came into the lab for their first study session and were randomly assigned to one of three conditions: a control condition, a self-soothing condition, or an attack-resisting intervention condition designed to help highly self-critical individuals resist their self-attacks.

During informed consent, participants who were assigned to one of the treatment conditions were informed that as well as completing two laboratory sessions, two weeks apart, they had been assigned to a condition that involved completing daily visualization exercises. This information was consistent with the recruitment email (see Appendix E), which stated that some participants would be randomly selected to complete a two-week self-help intervention, and also consistent with the study procedure outlined by Kelly, Zuroff, and Shapira (2009). Participants randomly assigned to the control condition were given the opportunity to complete a self-help condition after completing their second laboratory session, but no participants chose this option.

Following completion of the computerized questionnaires, participants in the control condition received their compensation and left the laboratory. Those in one of the two treatment conditions remained seated in front of the computer, and the experimenter told them that a PowerPoint slideshow would take them through the instructions for their two-week self-help intervention. She also familiarized the participants with the paper materials they would need to complete the exercises, and then went to sit in a separate cubicle within the same room.

Both of the intervention slideshows followed the same format, and were identical to the slideshows used by Kelly and colleagues (Kelly et al., 2009) except that all references to acne-related distress were changed to self-injury-related distress. The slides began by guiding participants through a brief visualization exercise, similar to the type of imagery the interventions would require. Next, participants completed a brief paper assessment form of their distress related to their NSSI, in order to orient participants to the difficulties the intervention was intended to target (see Appendix F). Third, the PowerPoint slideshow presented a brief rationale for the specific intervention. Fourth, the slides described the exercises participants would be asked to do each day for the two-week interval, and finally, the slideshow guided participants through practicing these exercises in the lab. The first laboratory session lasted approximately 30 minutes for participants in the control condition, and 60 minutes for participants in one of the treatment conditions. All participants were compensated $10 or 1.0 psychology course credits for the first laboratory session.

Time 1: Self-Soothing Condition.

After completing the assessment form measuring NSSI-related distress (see Appendix F), the slideshow presented participants with a description of self-criticism as a form of self-to-self relating. This description was based in Gilbert's conceptualization of self-criticism, developed in his compassionate mind training (CMT; Gilbert, 2005, 2007), and was identical to the description used by Kelly and colleagues (2009). In order to facilitate participants' understanding of self-to-self relating, the slideshow personified each component of the intrapersonal relationship, as is done in some forms of therapy, such as the Gestalt two-chair technique:

> There is an inner-critic inside each of us that can say mean and negative things about ourselves in a hostile way. This inner-critic – both what s/he says *and* how s/he says it – attacks what we might call our "inner-target."

Our inner-target typically surrenders to these attacks, increasing our feelings of distress. We call this type of internal dialogue *bullying*.

Just as we have an inner-critic that has the ability to attack our "inner-target" in a harsh way (e.g., "You are disgusting!"), we also have an "inner-soother" (a compassionate part within us) that has the ability to soothe our inner-target by saying accepting things in a warm and compassionate way (e.g., "It's OK to feel distressed").

The exercise we would like you to perform over the next two weeks will involve you practicing a more compassionate way of relating to yourself. It is called *compassionate self-soothing*.

It is thought that relating to yourself in a more compassionate way activates parts of the brain associated with calmness and well-being, and de-activates parts of the brain associated with anxiety, stress, and depression. We will therefore be providing you with self-soothing exercises to facilitate this.

Following this explanation, participants were asked to imagine their "compassionate inner-soother" as a real person with physical characteristics such as size, vocal tone, etc. After imagining this person for 30 seconds, they were asked to complete the "Building an Inner-Soother Image" worksheet. This sheet asked them to imagine a wise, empathic, warm, and non-judgmental inner-soother, and to describe their physical and behavioral attributes, such as visual characteristics, vocal tone, and way of relating to their inner-target (see Appendix G).

Next, participants wrote a letter to themselves from the perspective of the compassionate inner soother that they had just imagined. Participants were told that their letter should include the following aspects of compassion, enumerated by Gilbert (2005): (1) compassion towards yourself; (2) empathy toward your own distress; (3) sympathy for your own distress; (4) reminders to yourself of how you are like others; (5) acceptance of your appearance and distress; (5) forgiveness for things you criticize yourself for; (6) feelings of warmth for the self; (7)

openness to getting help and helping yourself feel better; and (8) awareness of your suffering and openness to grow. A sample letter was provided (see Appendix H), and participants were asked to take 5-7 minutes to write their own letter.

Once they had thoroughly developed their image of a compassionate inner soother, participants moved on to the instructions for the two-week intervention. Participants were asked to write five statements to themselves from their compassionate inner-soother. They were reminded of the 8 characteristics of compassion listed above and told that their self-statements should reflect as many of these as possible. They were also provided with ten sample statements, which were slightly modified versions of those developed by Kelly and colleagues, based on Gilbert and Iron's (2004) description of how to facilitate more compassionate self-relating in highly self-critical individuals (see Appendix I). Statements were only modified from those developed by Kelly and colleagues to eliminate references to acne-related distress. Participants wrote out their five self-statements on a sheet of paper for the experimenter to keep, and also wrote each statement on a separate cue card to take home and use during the two-week intervention.

Finally, participants were given detailed instructions about the exercises they were to engage in during the following two weeks, before the second laboratory session. They were asked to engage in the following two-step exercise three times a day, ideally in the morning, at lunch, and in the evening. The first step was to spend one minute visualizing the image of their compassionate inner soother that they had developed during the laboratory session, particularly its distinctive features such as appearance and vocal qualities. The second step was to spend up to four minutes reading their five self-statements repeatedly, while imagining that they were being read to them by their compassionate inner soother. After reading the instructions,

participants were asked to go through this exercise in the lab in order to become familiar with the task. All participants were emailed a copy of the treatment instructions immediately upon completion of the first laboratory session (see Appendix J).

Time 1: Attack-Resisting Condition.

The procedure for the attack-resisting intervention condition was identical to that of the inner-soother condition, except that instead of learning about an inner-critic, an inner-target, and an inner-soother, participants learned about an inner-critic, an inner-target, and a challenging inner-target. Following the assessment portion of the session, the slideshow explained self-criticism as a form of hostile self-to-self relating. As in the self-soothing condition, the slideshow began by explaining the rationale for how learning to resist one's self-attacks could lower distress. Each component of the intrapersonal relationship was again personified to facilitate this explanation:

> There is an inner-critic inside of each of us that can say mean and negative things about ourselves in a hostile way. This inner-critic – both what s/he says and how s/he says it – attacks what we might call our "inner-target." We call this type of internal dialogue *bullying*.
>
> When we feel distressed, it is usually because our inner-target accepts and submits to the attacks of our inner-critic. In other words, we tend to feel most upset and inferior when we relate to our inner-critic's harsh attacks as a "*submitting inner-target*."
>
> For instance, our inner-critic might say with hostility, "Nobody wants to see your face." Our *submitting inner-target*, out of habit and/or anxiety, might then accept the put-down without saying anything in defense, surrendering to this harsh attack.
>
> When our submitting inner-target responds to the inner-critic in this victimized way, we experience distress. Although we often unintentionally submit to our inner-critic, we are able to practice and strengthen different, more adaptive ways of reacting to it. Specifically, our inner-target can become a "*challenging inner-target.*"

> Our *challenging inner-target* can fight back against our inner-critic by presenting him/her with arguments against his/her attacks in a way that is brave, strong, and resilient (e.g., "You are wrong, and don't have the right to treat me that way!")
>
> It is thought that fighting back at your inner-critic can help you counter the harshness and irrationality of his/her attacks. More regular challenging of these attacks is thought to de-activate brain activity associated with submissive and avoidant behavior, shame, and depression. We will therefore be providing you with *challenging inner-target* exercises to facilitate this.

After reading this explanation, participants were asked to imagine their confident, resistant, and resilient "challenging inner-target" as a real person with physical characteristics such as size, vocal tone, and facial expressions. This image was to be someone who stands up for themselves in the face of attacks, mistreatment, or injustice. First, participants were asked to spend 30 seconds imagining this challenging inner-target. They then completed a form asking them to describe their image in detail (see Appendix K).

Next, participants wrote a letter from their resilient, challenging inner-target to their personified inner-critic. They were provided with a sample letter (see Appendix L) and instructed that their letter should reflect as many of the following characteristics as possible: (1) the view that you are strong and ''unbeatable''; (2) the belief that your inner-critic is unnecessarily or excessively harsh and abusive; (3) confidence in who you are and what you look like, even in the face of attacks from your inner-critic; (4) the courage to fight back when your inner-critic tries to make you feel small and weak; (5) logic and rationality that counter the mean and unproven statements your inner-critic makes; (6) resilience and conviction when dealing with criticisms from your inner-critic and others; and (7) intolerance of mean and unjust treatment. Participants were asked to take 5-7 minutes to write this letter.

When their letter was completed, participants were asked to write five statements from their challenging inner-target, directed at resisting their inner critic. Ten sample statements were provided (see Appendix M). Participants wrote their statements on a piece of paper to leave with the experimenter, and also separately on five cue cards, to take home with them. The rest of the session was identical to the self-soothing condition: participants read instructions for the two-week exercise, practiced the exercise in lab, and were e-mailed a copy of the instructions before leaving (see Appendix N).

Time 2 Laboratory Session.

During the second laboratory session, participants in the control condition completed the same battery of questionnaires as during the first laboratory session (i.e., the Self-Criticism Subscale of the Depressive Experiences Questionnaire, the Centre for Epidemiologic Studies Depression Scale - Revised, and the Deliberate Self-Harm Inventory with instructions modified to ask only about the last two weeks). They were then informed that they could now choose to participate in one of the active intervention conditions, which would involve completing daily visualization exercises and coming in for another laboratory session in two weeks. No participants chose this option, so instead they were debriefed, compensated with either $10 or 1.0 psychology course credits, thanked for their time, and dismissed. The second session took approximately 30 minutes for control participants.

For participants in the intervention conditions, the second laboratory session consisted of two parts. First, they viewed another PowerPoint slideshow. This slideshow was a subset of the slides that were presented during the first laboratory session: it included only the instructions for writing a letter from the challenging inner-target to the inner-critic (attack-resisting condition), or from the compassionate inner-soother to the inner-target (self-soothing condition). After taking 5-7 minutes to write this letter, participants in the intervention conditions also completed an

intervention compliance measure, which asked them to rate: (1) the degree to which they successfully completed the self-help intervention three times a day, on 7-point Likert scale from *1 = Never Completed* to *7 = Always Completed*; (2) the vividness of the inner image they visualized during the two-week intervention, on a 7-point Likert scale from *1 = Not at all Vivid* to *7 = Very Vivid*; (3) how emotionally compelling they found the self-statements that they read to themselves during the intervention, on a 7-point Likert scale from *1 = Not at all Compelling* to *7 = Very Compelling*; (4) the number of times a day they completed the visualization exercises; and (5) the number of times a week they completed the visualization exercises (see Appendix O). Finally, intervention condition participants completed the battery of questionnaires (i.e., the Self-Criticism Subscale of the DEQ, the CESD-R, and the modified DSHI). They were then debriefed, compensated $10 or 1.0 psychology course credits, thanked for their time, and dismissed. The second laboratory session took approximately 60 minutes for participants in the intervention conditions.

Results

Descriptive Statistics

I began by computing means and standard deviations for each subscale, separately for each condition and time point (see Table 6). One-way ANOVAs revealed no between-condition differences at Time 1 for any of the study variables (i.e., self-criticism, depression, or NSSI). Means on the CESD-R and DEQ Self-Criticism subscale were slightly higher than those reported on the original scale development measure (see Table 1), which was expected as the scales were originally developed with a general undergraduate sample, whereas this sample was selected because of current engagement in NSSI.

Table 6

Means and Standard Deviations of Variables by Condition at Time 1 and Time 2

	Mean (Standard Deviation)	
	Time 1	Time 2
CESD-R Depression	Cronbach's α = .94	Cronbach's α = .93
Self-Soothing	32.58 (13.58)	24.87 (15.01)
Attack-Resisting	30.92 (15.97)	26.57 (14.75)
Control	27.56 (16.38)	26.50 (13.14)
DSHI NSSI	Cronbach's α = .57	Cronbach's α = .51
Self-Soothing	2.56 (2.48)	1.00 (1.48)
Attack-Resisting	2.50 (1.67)	0.67 (0.80)
Control	1.71 (1.12)	0.54 (0.93)
DEQ Self-Criticism	Cronbach's α = .80	Cronbach's α = .76
Self-Soothing	132.38 (20.49)	131.25 (18.24)
Attack-Resisting	132.04 (16.72)	128.90 (12.64)
Control	132.28 (19.01)	128.74 (20.73)

Note. Sample sizes were $n = 23$ in the self-soothing condition, $n = 21$ in the attack-resisting condition, and $n = 24$ in the control condition.

Table 7

Correlations of Study 3 Variables

	1.	2.	3.	4.	5.
1. Time 1 CESD-R					
2. Time 1 Self-Criticism	.60***				
3. Time 1 NSSI	.23	.22			
4. Time 2 CESD-R	.68***	.37**	.24		
5. Time 2 Self-Criticism	.55***	.74***	.26*	.54***	
6. Time 2 NSSI	.28*	.17	.46***	.25*	.09

* Significant at the $p < .05$ level

** Significant at the $p < .01$ level

*** Significant at the $p < .001$ level

Note. Correlations of .1, .3, and .5 represent small, medium, and large effect sizes, respectively.

Table 8

Means and Standard Deviations of Compliance by Condition

Condition	Mean (Standard Deviation)	Range	*t*
Daily Compliance			
Self-Soothing	4.24 (1.43)	1 – 7	.75
Attack-Resisting	3.90 (1.55)	0 – 7	
Imagery Vividness			
Self-Soothing	5.13 (1.54)	2 – 7	2.42*
Attack-Resisting	3.85 (1.92)	0 – 7	
Emotional Strength of Self-Talk			
Self-Soothing	5.02 (1.37)	2 – 7	.14
Attack-Resisting	4.95 (1.90)	0 – 7	
Times a Day			
Self-Soothing	1.80 (0.76)	0.5 – 3.50	.56
Attack-Resisting	1.68 (0.75)	0 – 3	
Times a Week			
Self-Soothing	9.13 (5.51)	1.5 – 21	1.89
Attack-Resisting	6.39 (3.34)	0 – 14	

*Significant at the $p < .05$ level

Note. *N*s were 23 and 20 in the soothing and attack-resisting conditions, respectively.

I examined the correlations between the three measures at the two different time points (see Table 7). As expected, there were significant correlations between self-criticism and depression subscale scores, at both time points. There were fewer significant correlations for the measure of NSSI: Time 1 NSSI was only significantly correlated with Time 2 NSSI and Time 2 self-criticism, and Time 2 NSSI correlated significantly with Time 1 NSSI and Time 1 and Time 2 depression. Based on the model developed in Study 1, I expected NSSI to correlate significantly with both self-criticism and depression, at both time points.

Compliance Measure

Next, I examined means and standard deviations for the five compliance measures, between treatment groups (see Table 8). Compliance ratings were quite good, and were equal to, or higher than, those reported by Kelly and colleagues (2009). Thus, any differences in treatment outcomes between the current study and that of Kelly et al. could not be attributed to differences in intervention compliance. Independent-samples *t*-tests of the differences between the two intervention conditions on each measure were non-significant for four of the five compliance measures: only imagery vividness showed a significant difference, such that vividness was higher in the attack-resisting than the soothing condition, $t\ (41) = 2.42$, $p = .02$.

Hypothesis Testing

In order to test my first two hypotheses, that the intervention conditions would result in (1) decreased NSSI frequency, and (2) decreased depressive symptoms, I conducted a repeated measures ANOVA for each of the two dependent variables: NSSI frequency and depression. Each ANOVA included one between-subjects factor with three levels (Condition: control, self-soothing, attack-resisting), and one within-subjects factor with two levels (Time: Time 1, Time 2). Based on my hypotheses, I expected to find significant Condition x Time interactions, such

that NSSI frequency and depressive symptoms would be lower at Time 2 for participants in the two intervention conditions.

NSSI Frequency.

Condition had no effect on NSSI, F (2, 65) = 1.16, p = .32, but Time did, F (1, 65) = 28.02, p < .001, revealing that the two-week time period led to reduced engagement in NSSI. There was also no significant interaction between Condition and Time, F (2, 65) = 0.74, p = .48. These results indicate that contrary to my first hypothesis, NSSI frequency did not vary as a result of treatment condition. Instead, the two-week time period led to reduced NSSI frequency regardless of condition.

Depressive Symptoms.

Condition had no effect on depression, F (2, 65) = 0.07, p = .94, but Time did, F (1, 65) = 8.92, p = .004, revealing that the two-week time period led to reduced depression across conditions. There was also no significant interaction between Condition and Time, F (2, 65) = 1.21, p = .31. These results indicate that contrary to my second hypothesis, depressive symptoms did not vary as a result of treatment condition. Instead, the two-week time period led to reduced depression regardless of condition.

Self-Criticism.

To test my third hypothesis, that self-criticism would moderate the impact of treatment condition on the two dependent variables at Time 2, I used multiple regression analyses. For each analysis, I entered condition, Time 1 self-criticism, and the interaction between these two variables as the predictor variables. The outcome variable was the Time 2 value of the dependent variable of interest, and the Time 1 value of this dependent variable served as a covariate. Based on my third hypothesis, I again expected to find a significant interaction, this time between

Condition and Time 1 self-criticism, such that individuals with higher self-criticism at Time 1 would show greater improvements on the dependent variables in the treatment conditions.

Contrary to my third hypothesis, a multiple regression with NSSI frequency as the outcome variable revealed that the only significant predictor of Time 2 NSSI engagement was Time 1 NSSI engagement, $\beta = .44$, $t\ (62) = 3.86$, $p < .001$. Neither the condition, $\beta = -.68$, $t\ (62) = -0.78$, $p = .44$, nor Time 1 self-criticism, $\beta = -.12$, $t\ (62) = -0.41$, $p = .68$, were significant predictors, nor was the interaction between Condition and Time 1 self-criticism, $\beta = .70$, $t\ (62) = 0.78$, $p = .44$.

Similarly, a multiple regression analysis with depressive symptoms as the outcome variable revealed that the only significant predictor of Time 2 depressive symptoms was Time 1 depressive symptoms, $\beta = .70$, $t\ (62) = 6.12$, $p < .001$. Neither the condition, $\beta = .38$, $t\ (62) = 0.52$, $p = .60$, nor Time 1 self-criticism, $\beta = .10$, $t\ (62) = 0.37$, $p = .71$, were significant predictors, nor was the interaction between Condition and Time 1 self-criticism, $\beta = -.45$, $t\ (62) = -0.61$, $p = .55$.

Discussion

The primary goal of Study 3 was to examine the efficacy of two self-directed, short-term interventions in reducing NSSI engagement and depressive symptoms. Based on the model of NSSI development that was supported in Study 1, I expected that these interventions, which taught participants more adaptive strategies to deal with their self-critical thoughts, would interrupt the mechanism whereby internalized self-criticism leads to engagement in NSSI through increased depressive symptoms.

Contrary to my first two hypotheses, individuals in the two intervention conditions did not show decreased NSSI engagement or depressive symptoms relative to those in the control

condition. Instead, statistical analyses revealed a significant decrease in both these outcome variables regardless of treatment condition. There are many possible explanations for this phenomenon. First, it is possible that this study merely captured regression to the mean. Participants were selected because they had engaged in at least one form of NSSI in the previous two weeks, rather than because they were experiencing long-standing difficulties with NSSI. It is thus possible that these participants were recruited due to chance fluctuations, and would naturally have experienced decreased NSSI engagement and depressive symptoms regardless of study participation.

Although this possibility is disheartening in light of this study's goal of developing an effective self-directed intervention for NSSI, it is actually a powerful and hopeful possibility, as it suggests that NSSI behaviours and the associated distress can spontaneously remit. Studies of the prevalence and course of NSSI have reliably found that prevalence rates are consistently higher in adolescents than adults (Nock, 2010). Thus, although prevalence rates of NSSI in adolescent and young adult samples are alarmingly high (e.g., 15-38%; Gratz, 2001; Gratz et al., 2002), the majority of individuals who engage in this behaviour do develop alternative coping strategies that enable them to stop self-injuring. It is possible that the current study would have had different results if I had recruited individuals with more entrenched difficulties with NSSI. These individuals may have benefitted more from the self-soothing and attack-resisting interventions, and the treatments may thus have led to the expected decreases in NSSI engagement and depressive symptoms.

Another possible explanation for the observed decreases in depressive symptoms and NSSI engagement across conditions may be the effect of disclosure. Recent research indicates that very few individuals who engage in NSSI disclose their self-injury to anyone. As many as

30-57% of self-injurers have never disclosed their self-injury (Armienta, Hamza, & Willoughby, 2014; Rosenrot & Lewis, 2018), and the majority of individuals who have disclosed have only done so once or twice (Heath, Ross, Toste, Charlebois, & Nedecheva, 2009). Those who do disclose are much more likely to do so to a close friend, romantic partner, or family member, than a mental health professional (Armienta et al., 2014; Whitlock, 2006). Lack of NSSI disclosure is important because it creates a barrier for accessing treatment and support from family and friends (Rosenrot & Lewis, 2018). A recent study investigating barriers to, and experiences of, NSSI disclosure found that shame around the behaviour was a core factor preventing individuals from disclosing (Rosenrot & Lewis, 2018). As with many stigmatized behaviours, continued concealment of NSSI has been found to lead to increased feelings of distress, guilt, anxiety, isolation, rejection, and more negative views of the self (Cepeda-Benito & Short, 1998; Pachankis, 2007). Conversely, disclosures can lead to greater self-acceptance when they are met with warm, understanding, and accepting responses (Pachankis, 2007; Rosenrot & Lewis, 2018). It is quite possible that for many participants, Study 3 was the first time that they interacted with another person who knew about their self-injury – in fact, a couple of the participants spontaneously disclosed to the experimenter that they had never told anyone about their self-injury, during the study debriefing session. Although participants did not explicitly discuss their NSSI with the experimenter, it is possible that the experience of disclosing their NSSI as part of an experiment designed to improve understanding and inform treatment for these behaviours may have had a therapeutic effect on all study participants, even those in the control condition. This hypothesis is speculative, as research into the experience of NSSI disclosure is in its infancy. However, the results of Study 3 suggest that more research into the impact of NSSI disclosure is warranted and may have promising results.

My third hypothesis, that the intervention conditions would be particularly effective in reducing NSSI engagement and depressive symptoms in individuals who were high in self-criticism, was also not supported. This was primarily because there was no difference in the outcome variables between treatment conditions. This result was surprising, in light of the findings by Kelly, Zuroff, and Shapira (2009) that the attack-resisting intervention was particularly effective in reducing depressive symptoms in highly self-critical, distressed acne sufferers. Self-criticism has been conceptualized using a state-trait model, with meaningful variation both within persons (state) and between persons (trait; Zuroff, Sadikaj, Kelly, & Leybman, 2016). Individuals' levels of self-criticism, as measured by the DEQ, have been found to decrease with effective depression treatment (Chui, Zilcha-Mano, Dinger, Barrett, & Barber, 2016). In the current study, the intervention conditions were supposed to give participants more adaptive strategies to deal with their self-criticism, rather than to decrease their self-critical tendencies. The focus of the analyses was thus on the hypothesized downstream effects of improved coping skills, which were decreased depressive symptoms and decreased NSSI engagement. The lack of a significant interaction effect between Time 1 self-criticism and condition in the current study suggests that the intervention was no more effective in helping highly self-critical individuals than it was for less self-critical individuals. Instead, all participants exhibited significant decreases in NSSI engagement and depressive symptoms, regardless of treatment condition or Time 1 self-criticism.

Limitations

First, Time 1 NSSI was not significantly correlated with Time 1 depression or self-criticism. Time 2 NSSI was also not correlated with Time 2 self-criticism. This finding runs contrary to a large body of research showing positive correlations between NSSI, self-criticism,

and depression, including the results of Study 1 (e.g., Ammerman & Brown, 2016; Briere & Eadie, 2016; Glassman et al., 2007; Taylor et al., 2012). It is unclear why these variables were uncorrelated. One explanation may be the method of recruitment: participants were selected for participation when they endorsed having engaged in at least one form of NSSI within the previous two weeks. Although this methodology was intended to recruit participants who were currently actively engaging in NSSI and thus were likely to benefit from the interventions, it is also possible that this inclusion criteria capitalized on chance variations in this behaviour, rather than selecting participants with longstanding NSSI difficulties and associated distress.

The young adult, undergraduate sample was selected for this study due to evidence that NSSI prevalence rates in this population are alarmingly high (e.g., Gratz, 2001; Gratz & Roemer, 2004). However, the lack of significant correlations between NSSI, self-criticism, and depression observed in this study suggests that although study participants had recently engaged in NSSI, they were not experiencing the depressive symptoms and high self-criticism that are typically associated with chronic, pathological self-injury. The study sample thus appears to have been a limitation, as a clinical sample may have provided a truer representation of the phenomenon that I was attempting to study and modify.

It is also important to explore the possibility that the lack of significant interaction between condition and time in the Study 3 analyses was attributable to a lack of statistical power. To this end, I conducted a power analysis for the mixed-model ANOVAs using GPower, prior to completing data collection for Study 3. In GPower, I specified that I expected a medium effect size, $f = 0.25$ (Cohen, 1992), as this was the minimum effect that I considered to be clinically meaningful. GPower results showed that in order to obtain a power of 0.8, the sample size required was only 44 participants. With a medium effect size, the final sample size of 68 in

Study 3 yielded power over 0.95. Additionally, the current study's sample size is comparable to that of Kelly and colleagues (2009), who had 25 participants in each of the three conditions. It is therefore highly unlikely that the lack of significant interaction effect in the current study was due to a lack of statistical power.

Conclusions

Although the results of the current study did not support my hypotheses, they still have interesting implications and provide a meaningful extension to our current understanding of NSSI. Since my hypotheses were not supported, explaining the data requires developing new hypotheses, which can only be evaluated through future research. The significant decrease in depressive symptoms and NSSI engagement over time could be evidence of the healing effects of NSSI disclosure, the existence of a population of young adults who experiment with self-injury but then turn to alternative coping strategies, or statistical regression to the mean.

Chapter 6: General Discussion

More than three decades have now passed since Marsha Linehan first proposed that emotional invalidation by primary caregivers in childhood could play a critical role in the later development of maladaptive coping strategies such as NSSI (1993). The current research makes a meaningful theoretical contribution for our current understanding of NSSI development and has important applications as it reveals risks factors that can be targets for intervention.

First, the results of Study 1 supported the existence of two causal mechanisms whereby childhood emotional invalidation by parents puts individuals at increased risk of engaging in NSSI. Study results first supported the link between a history of parental invalidation and an increased risk of NSSI engagement. They also supported the existence of two serial, theoretically grounded mediation mechanisms whereby childhood emotional invalidation by parents leads to increased engagement in NSSI: (a) through increased difficulties in emotion regulation and negative urgency impulsivity, and (2) through increased self-criticism and depressive symptoms.

Second, Study 2 provided evidence for the validity and reliability of a retrospective, self-report measure of childhood parental invalidation. Since the measure of childhood parental invalidation used in Study 1 – the Invalidating Childhood Environment Scale (ICES) – relied on retrospective self-report, the goal of Study 2 was to validate this commonly used but potentially problematic methodology. Study 2 results demonstrated that individuals' ratings of both maternal and paternal childhood emotional invalidation were highly, significantly correlated across the six-week retest interval. They were also corroborated by their siblings' ratings of the same constructs, with a moderate effect size. These findings support the use of the ICES as a reliable and valid indicator of individuals' childhood experiences with parental emotional invalidation,

and are consistent with other recent evidence that supports the validity of retrospective self-reports of adverse childhood experiences (e.g., Hardt & Rutter, 2004; Pinto et al., 2014).

After supporting my hypothesized causal mechanisms in Study 1, and validating my retrospective, self-report measure in Study 2, my goal in Study 3 was to further support my causal model by evaluating the efficacy of two interventions designed to interrupt one of the causal mechanisms, and thereby reduce NSSI engagement. However, Study 3 results did not support the efficacy of the interventions in decreasing NSSI and associated depressive symptoms, as participants in both the control and intervention conditions showed significant decreases in both these outcome measures over the study interval. Although these results were disappointing, as they provided no additional support for my model, I believe that they can be explained by either an overarching therapeutic effect of disclosure, or sampling difficulties. Participants were selected for this study because they reported engaging in at least one form of NSSI in the previous two weeks; it is possible that this sampling strategy capitalized on chance variations and selected participants who would naturally have engaged in less NSSI and been less depressed as time progressed. This hypothesis was supported by the non-significant correlations between NSSI, self-criticism, and depression at Time 1, and NSSI and self-criticism at Time 2. This pattern of correlations, which runs contrary to a large body of research finding that these constructs are highly correlated, suggests that the Study 3 sample individuals may have been experimenting with NSSI, but were not experiencing the depressive symptoms and debilitating self-criticism that are characteristic of clinical NSSI samples.

Although my Study 3 hypotheses were not supported, Study 3 results suggest interesting new avenues of future research into: (a) the therapeutic effect of NSSI disclosure; (b) the existence of a population of young adults who experiment with NSSI, but ultimately develop

more adaptive coping mechanisms, and (c) whether the study interventions would have been more effective for a clinical population, with more entrenched difficulties with NSSI.

Practical Applications

Study 1 and Study 2 results have important practical implications. The identification of mechanisms linking childhood parental invalidation and NSSI, in Study 1, identifies important factors that could be the target of interventions, which would aim to disrupt the active mechanism and decrease NSSI engagement. Although childhood parental invalidation cannot be changed once it has occurred, the resulting difficulties with emotion regulation, negative urgency impulsivity, self-criticism, and depressive symptoms may all be amenable to intervention. Improvements in these areas could help individuals develop more adaptive strategies to deal with their negative thoughts and feelings, so that they would not need to rely on NSSI to feel better.

Study 2 supported the use of the ICES as a reliable and valid indicator of individuals' childhood experiences with parental emotional invalidation. This result has important implications in light of the widespread skepticism about the validity of retrospective self-report measures, particularly of adverse childhood experiences. It suggests that concerns that these measures are unreliable due to response biases, fluctuating mood states, or psychopathology are unfounded, and that these measures may be used both in research and clinical work to obtain an accurate picture of individuals' childhood experiences.

Limitations and Future Directions

This research is not without its limitations. First, in Study 1, the majority of the indirect pathways for the alternative models were also found to be significant. This means that although the hypothesized models were supported, these alternative mechanisms cannot currently be ruled out.

The cross-sectional, correlational design of Study 1 also limits my ability to draw conclusions about the existence of causal mechanisms and assess the temporal ordering of variables (Mathieu & Taylor, 2006). Study 2 demonstrated the reliability and validity of the retrospective, self-report measure of childhood parental invalidation. I am therefore confident in concluding that the first variable in the model – parental invalidation – occurred chronologically before the other variables, which is a necessary condition for causation. However, statements about causality between the other variables must be tempered by the lack of longitudinal design. Future studies should examine the mediation models outlined here using longitudinal and/or experimental designs.

There may also be concerns about the extent to which the Mechanical Turk sample in Study 1 is representative of the general population. However, investigations into the nature of Mechanical Turk samples have found that respondents do not differ from population-based samples, which supports the generalizability of data from this platform (Goodman et al., 2013; Levay et al., 2016).

As described above, the Study 3 data did not show the expected positive correlations between NSSI, self-criticism, and depression at Time 1, or NSSI and self-criticism at Time 2. This pattern of correlations may explain the lack of significant intervention effects, as it suggests that the Study 3 sample may have consisted of individuals who were experimenting with NSSI as a coping strategy, but ultimately were not experiencing the typically associated distress and were able to engage in more adaptive coping strategies moving forward. The young adult, undergraduate sample in Study 3 was selected because of evidence of alarmingly high NSSI prevalence rates in this population. However, the unexpected pattern of correlations, and lack of significant intervention effect, suggest the importance of future research examining the

mechanisms responsible for the development and maintenance of NSSI in clinical populations. It also opens up an interesting line of inquiry into the characteristics of individuals who experiment with NSSI but do not develop a chronic problem, particularly as compared to those that do. Research in this area could help identify important resiliency factors, which could inform future interventions.

Conclusions

NSSI is a prevalent behaviour that serves many functions, particularly affect regulation or the reduction of negative emotion (Nock & Prinstein, 2004). Although NSSI is a coping behaviour, it is associated with increased distress, impairment, and risk of death by suicide (Andover et al., 2012; Burke et al., 2016). Despite having received increased empirical and clinical attention, there is still much that we do not know about NSSI, particularly the underlying mechanisms by which these behaviours develop and are maintained. The current research provided support for a theoretically-based etiological model of the development of NSSI. In so doing, it significantly contributed to our current understanding of NSSI development and identified important risk factors that should be targeted by future interventions aiming to decrease NSSI engagement and the associated negative consequences. This research also validated the use of a retrospective, self-report measure of childhood parental invalidation. Although this researcher's attempt at implementing an intervention to interrupt one of the NSSI mechanisms was unsuccessful, this work still provides an excellent starting point for future academics and clinicians who aim to achieve this important goal.

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Appendix A: Invalidating Childhood Environment Scale (ICES) Modified for PSYC100 & PSYC200 Prescreen

The following questions address your experiences of how your parents responded to your emotions when you were young. For each item, please click the rating from 1 to 5 that most closely reflects your experience up to the age of 18 years.

1	2	3	4	5
Never	Rarely	Some of the time	Most of the time	All of the time

Because your parents may have been very different, please rate them separately. Please rate your experience with your MOTHER now. **If you were raised by two mothers or two fathers, then please choose one of your parents and rate him/her now.**

[14 ICES items inserted here]

Now, please rate your FATHER. **If you were raised by two mothers or two fathers, please rate your second mother or father now.**

[14 ICES items inserted here]

Please choose the option that applies to you:

1. **I rated two mothers**
2. **I rated two fathers**
3. **I rated one mother and one father**

Finally, we would like to know how you saw your whole family when you were younger. Please read the following descriptions and rate how closely each one matches your experience of growing up in your family (up to 18 years).

Rating scale:

1. Not like my family
2. A little bit like my family
3. Like my family some of the time
4. Like my family most of the time
5. Like my family all of the time

[4 ICES items inserted here]

Appendix B: Study 2 Recruitment Email

Dear [STUDENT NAME],

We are inviting you to participate in a psychology research study being conducted by Christine Lambert, a doctoral student in clinical psychology at Queen's University in Kingston, Ontario. You have been chosen for participation because you indicated, in the PSYC100/200 prescreen, that you have an older sibling no more than 3 years older than you.

The purpose of this study is to investigate how similarly individuals and their siblings remember their early experiences with their parents.

If you and your sibling choose to participate, you will both be asked to complete an online questionnaire that will take approximately 10 minutes to complete. Your sibling will be compensated $10. You will be compensated either $10 or half a PSYC100/200 subject pool credit – your choice. All of your responses will be completely confidential – you and your sibling will never see each other's answers.

If you are interested in participating, please visit:
http://www.surveymonkey.com/r/PSYC100_2017 and enter the SIBLING CODE ###

Please provide your sibling with the following link:
https://www.surveymonkey.com/r/SIBLING_2017 **and the following SIBLING CODE: ###**

PLEASE NOTE: You and your sibling should use different links to complete the study, but the same 3-digit code.

If you have any questions or concerns, please contact the experimenter at c.lambert@queensu.ca

Thank you for your time,

Christine Lambert

Appendix C: Invalidating Childhood Environment Scale (ICES) Modified for Study 2 Siblings

The following questions address your experiences of how your parents responded to your emotions when you were young.

Please do not base your ratings on how your parents responded to your emotions, but instead on how they responded to the emotions of your younger sister, who sent you this survey.

For each item, please click the rating from 1 to 5 that most closely reflects your experience up to the age of 18 years.

1	2	3	4	5
Never	Rarely	Some of the time	Most of the time	All of the time

Because your parents may have been very different, please rate them separately. Please rate your experience with your MOTHER now.

[14 ICES items inserted here]

Now, please rate your FATHER.

[14 ICES items inserted here]

Finally, we would like to know how you saw your whole family when you were younger. Please read the following descriptions and rate how closely each one matches your experience of growing up in your family (up to 18 years).

Rating scale:

1. Not like my family
2. A little bit like my family
3. Like my family some of the time
4. Like my family most of the time
5. Like my family all of the time

[4 ICES items inserted here]

Appendix D: Deliberate Self-Harm Inventory (DSHI) Modified for PSYC100 & PSYC200 Prescreen

This questionnaire asks about a number of different things that people sometimes do to hurt themselves. Please be sure to read each question carefully and respond honestly. Often, people who do these kinds of things to themselves keep it a secret, for a variety of reasons. However, honest responses to these questions will provide us with greater understanding and knowledge about these behaviors and the best way to help people. Please answer yes to a question only if you did the behavior intentionally, or on purpose, to hurt yourself. Do not respond yes if you did something accidentally (e.g., you tripped and banged you head on accident). Also, please be assured that your responses are completely confidential.

In the past <u>two weeks</u>, have you intentionally (i.e., on purpose) …

[17 DSHI items inserted here]

Appendix E: Study 3 Recruitment Email

Dear [STUDENT NAME],

You are being contacted because based on your responses to the PSYC100/PSYC200-level prescreen, you are eligible to participate in a study being run in the Personality Assessment Lab in the psychology department here at Queen's University. The study consists of two laboratory sessions, two weeks apart, where you will be asked to complete a series of self-report questionnaires. Some participants will also be randomly selected to complete a two-week self-help intervention, designed to help them respond to their negative self-thoughts. All participants will be compensated either one PSYC100 credit or $10 for each laboratory session (your choice).

If you are interested in participating in this study, please respond to this email listing the days and times that you are typically available during the week.

Thank you so much,

Christine Lambert, M.Sc.

Appendix F: Assessment Form

This assessment form has two parts; the first is on this sheet and the second on the following sheet. Please fill out this sheet first, and then the second sheet immediately after

PART 1. What beliefs and thoughts do you have when reflecting on your self-injury?
What goes through your mind? What are you thinking about others, and their thoughts about you? What are you thinking about yourself, and your future?

(a) What do I think others think and believe about me? (e.g., people think I'm crazy)

_____

_____

_____

_____

(b) What do I think and believe about myself? (e.g., I think I'm weaker than other people)

_____

_____

_____

_____

(c) In thinking about my inner-critic (the part of me that says negative things about myself), what qualities come to mind? (e.g., harsh, dominant, bully-like)

_____

_____

_____

_____

PART 2. What feelings do you have when reflecting on your self-injury?

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. **Indicate to what extent you feel this way right now** having just reflected on your self-injury and identified the critical thoughts you have about yourself. Use the following scale to record your answers:

	1 Very slightly or not at all	2 A little	3 Moderately	4 Quite a bit	5 Extremely
1. Angry	1	2	3	4	5
2. Guilty	1	2	3	4	5
3. Proud	1	2	3	4	5
4. Hostile	1	2	3	4	5
5. Ashamed	1	2	3	4	5
6. Strong	1	2	3	4	5
7. Irritable	1	2	3	4	5
8. Blameworthy	1	2	3	4	5
9. Confident	1	2	3	4	5
10. Scornful	1	2	3	4	5
11. Angry at self	1	2	3	4	5
12. At east	1	2	3	4	5
13. Bold	1	2	3	4	5
14. Disgusted	1	2	3	4	5
15. Disgusted with self	1	2	3	4	5
16. Daring	1	2	3	4	5
17. Calm	1	2	3	4	5
18. Loathing	1	2	3	4	5
19. Dissatisfied with self	1	2	3	4	5
20. Fearless	1	2	3	4	5
21. Relaxed	1	2	3	4	5

Appendix G: Building an Inner-Soother Image

This is to help you build up a compassionate image of an inner-soother. As we do this we can practice giving it certain qualities. These will include:

Wisdom, Empathy, Warmth, and Non-Judgement

In each box, think of the above. Try to make the image fit your **ideal** of care and compassion – what you imagine an ideal inner-soother would be like.

How would you like your ideal inner-soother image to look – visual qualities?	
How would you like your ideal inner-soother image to sound (e.g., voice tone)?	
What other sensory qualities can you give it?	
How would you like your ideal inner-soother to treat and behave towards you?	
How would you like to treat and behave towards your ideal inner-soother?	

Appendix H: Compassionate Inner-Soother Letter Example

Dear ____,

I recognize that you are very upset right now, and it is okay to feel that way. I understand why you feel distressed and I would feel the same way if I were in your position. Please do not blame yourself for the things that are upsetting you. We all have strengths and weaknesses; feeling distressed and wanting to self-injure do not make you flawed. Remember that good, worthwhile people will accept you for you, and focus on who you really are and all your positive qualities. I care about you and will always be kind and compassionate to you, regardless of what mistakes you may feel you make. Please try to accept yourself as you are and to remind yourself that you deserve to be loved as much as everyone else. It is okay, though, to feel upset and hopeless at times; all people do at certain times in their lives. It is okay to *not* be perfect, physically or emotionally. What would you say to a friend in your position? You would probably empathize with their suffering, and let them know that you care about them, love them, and want to be around them no matter what.

Warmly, _____

Appendix I: Sample Compassionate Inner-Soother Self-Statements

1. I feel angry/upset/sad right now and it is okay to feel this way; many people in my position would feel upset.
2. I know that I am a good person worthy of love.
3. It is okay to talk to people about what I'm going through; it might even be helpful.
4. I am not to blame for the way that I feel.
5. Nobody is perfect. I will love and accept myself regardless of my strengths and weaknesses.
6. I want to be gentle and nice to myself, just as I would be to others.
7. The people I want to be close to love me no matter what.
8. I would be accepting of a friend in my position. I want to be this way to myself too.
9. I criticize myself for lots of things, but I would like to forgive and accept myself more.
10. I want to help myself feel better.

Appendix J: Inner-Soother Two-Week Exercise – Take Home Instructions

For the next two weeks, *three times EACH DAY:*

Step 1: Spend *one minute* visualizing the image of the compassionate inner soother that you imagined during the lab exercise.

- Remember your image's distinctive qualities (e.g., voice, appearance, emotional quality, if it resembled someone/something)
- Breathe naturally and close your eyes

Step 2: After completing Step 1, for the following 3-4 minutes:

1. Take out Card 1.
2. Breathe naturally and close your eyes.
3. Spend 15 seconds focusing on the image of your inner soother. Visualize how this part of you would say the card's statement to your inner target.
4. Open your eyes and *slowly* read the statement in this way (out loud if possible).
5. Please re-read the statement a second time with even more emotion and warmth.
6. Put Card 1 away and repeat this with Cards 2, 3, 4, & 5.

Please complete Step 1 and Step 2 above at the following three times *each day:*

1. In the morning before leaving the house
2. At lunch time
3. At night before bed

You may find it helpful to set an alarm on your phone or other device to remind yourself to complete the exercises.

If you have any questions or concerns, please contact the experimenter at c.lambert@queensu.ca

Appendix K: Building a Challenging Inner-Target Image

This is to help you build an unbeatable image of a challenging inner target (who stands up to an inner-critic). As we do this we can practice giving it certain qualities. These will include:

Strength, Logic, Perseverance, & Self-Confidence

In each box, think of the above. Try to make the image fit your **ideal** of strength and resilience – what you imagine an ideal challenging inner-target would be like.

How would you like the image of this strong, challenging inner-target to look – visual qualities?	
How would you like your ideal challenging inner-target to sound (e.g., voice tone)?	
What other sensory qualities can you give it?	
How would you like your ideal challenging inner-target to treat and behave towards your inner-critic?	
How would you like to treat and behave towards your ideal challenging inner-target?	

Appendix L: Challenging Inner-Target Letter Example

To _____,

I've been letting you attack me for some time now, and I'm not going to let you continue to put me down in the way that you do. You make me feel horrible and say things that are probably not even true. I'm going to stop believing what you say, because I can be logical and see the lies in what you say to me. Just because I'm not perfect, it doesn't mean that I'm worthless or that people won't like me. I have no reason to believe these things so stop telling me them over and over. I am confident that I'm a valuable person who has a lot of worth. I will not let you beat me down and make me miserable. From now on, I'm going to stand up for myself when you say negative things to me. I'm smart enough to see that you have no evidence for most of what you say to me and I'm not going to believe it. I also don't deserve to be treated in the harsh way you treat me, and I am strong enough to stop you. You are making me feel back, and I won't let you do this to my anymore.

From, _____

Appendix M: Sample Challenging Inner-Target Self-Statements

1. I have inner strength to fight my distress and your role in creating it.
2. It's not true that people will reject me just because I'm not perfect.
3. I'm not letting you attack me and make me feel inferior to other people.
4. You have no right to make me isolate myself and feel depressed.
5. I am not ashamed of who I am.
6. I will prove to you that I *can* function effectively and successfully in society despite my struggles.
7. You criticize me too much for everything; I am not going to take it anymore.
8. What you say about me is mean and makes me feel miserable. Stop it.
9. I refuse to let you "beat me up" about my feelings or emotions.
10. I will challenge any negative things you claim people think about me.

Appendix N: Challenging Inner-Target Two-Week Exercise – Take Home Instructions

For the next two weeks, *three times EACH DAY:*

Step 1: Spend *one minute* visualizing the image of the resilient challenging inner target that you imagined during the lab exercise.

- Remember your image's distinctive qualities (e.g., voice, appearance, emotional quality, if it resembled someone/something)
- Breathe naturally and close your eyes

Step 2: After completing Step 1, for the following 3-4 minutes:

1. Take out Card 1.
2. Breathe naturally and close your eyes.
3. Spend 15 seconds focusing on the image of your challenging inner target. Visualize how this part of you would say the card's statement to your inner critic.
4. Open your eyes and *slowly* read the statement in this way (out loud if possible).
5. Please re-read the statement a second time with even more confidence and strength.
6. Put Card 1 away and repeat this with Cards 2, 3, 4, & 5.

Please complete Step 1 and Step 2 above at the following three times *each day:*

1. In the morning before leaving the house
2. At lunch time
3. At night before bed

You may find it helpful to set an alarm on your phone or other device to remind yourself to complete the exercises.

If you have any questions or concerns, please contact the experimenter at c.lambert@queensu.ca

Appendix O: Intervention Check-In/Compliance Measure

Please rate the degree to which you successfully completed the self-help intervention three times a day:

Never Completed						**Always Completed**
1	**2**	**3**	**4**	**5**	**6**	**7**

Please rate the vividness of the inner image you visualized during the two-week intervention:

Not at all Vivid						**Very Vivid**
1	**2**	**3**	**4**	**5**	**6**	**7**

Please rate how emotionally compelling you found the self-statements that you read to yourself during the intervention:

Not at all Compelling						**Very Compelling**
1	**2**	**3**	**4**	**5**	**6**	**7**

Please indicate how frequently you engaged in the intervention visualization exercises (please be honest – this is to let us know how useful the intervention was):

Number of times a day: _____

Number of times a week: _____

Please add any comments you may have about the intervention or your experience:

_____

_____

_____

_____

_____

Appendix P: Research Ethics Board Approval

Queen's University

September 08, 2016

Ms. Christine Lambert
Ph.D. Candidate
Department of Psychology
Queen's University
Humphrey Hall, Room 329
Queen's University
Kingston, ON, K7L 3N6

GREB Ref #: GPSYC-769-16; TRAQ # 6019070
Title: "GPSYC-769-16 The relationship between familial environment and the development of non-suicidal self-injury"

Dear Ms. Lambert:

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled **"GPSYC-769-16 The relationship between familial environment and the development of non-suicidal self-injury"** for ethical compliance with the Tri-Council Guidelines (TCPS 2 (2014)) and Queen's ethics policies. In accordance with the Tri-Council Guidelines (Article 6.14) and Standard Operating Procedures (405.001), your project has been cleared for one year. You are reminded of your obligation to submit an annual renewal form prior to the annual renewal due date (access this form at http://www.queensu.ca/traq/signon.html/; click on "Events"; under "Create New Event" click on "General Research Ethics Board Annual Renewal/Closure Form for Cleared Studies"). Please note that when your research project is completed, you need to submit an Annual Renewal/Closure Form in Romeo/traq indicating that the project is 'completed' so that the file can be closed. This should be submitted at the time of completion; there is no need to wait until the annual renewal due date.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one year period (access this form at http://www.queensu.ca/traq/signon.html/; click on "Events"; under "Create New Event" click on "General Research Ethics Board Adverse Event Form"). An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example, you must report changes to the level of risk, applicant characteristics, and implementation of new procedures. To submit an amendment form, access the application by at http://www.queensu.ca/traq/signon.html; click on "Events"; under "Create New Event" click on "General Research Ethics Board Request for the Amendment of Approved Studies". Once submitted, these changes will automatically be sent to the Ethics Coordinator, Ms. Gail Irving, at the Office of Research Services for further review and clearance by the GREB or GREB Chair.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Sincerely,

John D. Freeman

John Freeman, Ph.D.
Chair
General Research Ethics Board

c: Dr. Ronald Holden, Supervisor
Dr. Li-Jun Ji, Chair, Unit REB
Ms. Cheryl Hamilton, Dept. Admin.

August 15, 2017

Ms. Christine Lambert
Ph.D. Candidate
Department of Psychology
Queen's University
Humphrey Hall, Room 329
Kingston, ON K7L 3N6

Dear Ms. Lambert:

GREB TRAQ #: 6019070
Title: "GPSYC-769-16 The relationship between familial environment and the development of non-suicidal self-injury"

The General Research Ethics Board (GREB) has reviewed and cleared your request for renewal of ethics clearance for the above-named study. This renewal is valid for one year from September 8, 2017. Prior to the next renewal date you will be sent a reminder memo and the link to ROMEO to renew for another year. You are reminded of your obligation to submit an Annual Renewal/Closure Form prior to the annual renewal due date (access this form at http://www.queensu.ca/traq/signon.html/; click on "Events"; under "Create New Event" click on "General Research Ethics Board Annual Renewal/Closure Form for Cleared Studies"). Please note that when your research project is completed, you need to submit an Annual Renewal/Completed Form in Romeo/traq indicating that the project is 'completed' so that the file can be closed. This should be submitted at the time of completion; there is no need to wait until the annual renewal due date.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one year period. An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours. To submit an adverse event report, access the application at http://www.queensu.ca/traq/signon.html/; click on "Events"; under "Create New Event" click on "General Research Ethics Board Adverse Event Form".

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example, you must report changes in study procedures or implementation of new aspects into the study procedures. Your request for protocol changes will be forwarded to the appropriate GREB reviewers and/or the GREB Chair. To submit an amendment form, access the application at http://www.queensu.ca/traq/signon.html; click on "Events"; under "Create New Event" click on "General Research Ethics Board Request for the Amendment of Approved Studies".

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

Joan Stevenson, Ph.D.
Interim Chair, General Research Ethics Board

c.: Dr. Ronald Holden, Supervisor
Dr. Leandre Fabrigar, Chair, Unit REB

July 18, 2017

Ms. Christine Lambert
Ph.D. Candidate
Department of Psychology
Queen's University
Humphrey Hall, Room 329
Kingston, ON, K7L 3N6

Dear Ms. Lambert:

RE: Amendment for your study entitled: **GPSYC-769-16 The relationship between familial environment and the development of non-suicidal self-injury**; TRAQ # **6019070**

Thank you for submitting your amendment requesting the following changes:

1) To recruit participants for Study 2 from the new Psychology Department 200-level Subject Pool;

2) To add the Invalidating Childhood Environment Scale to the 200-level prescreen. Participants who complete this measure and indicate that they are willing to be contacted to participate in future studies, and also indicate that they have a sibling no more than three years older than them, will be contacted and invited to participate in Study 2.

By this letter, you have ethics approval for these changes.

Good luck with your research.

Sincerely,

Joan Stevenson, Ph. D.
Interim Chair
General Research Ethics Board

c.: Dr. Ronald Holden, Supervisor

April 27, 2017

Miss Christine Lambert
Ph.D. Candidate
Department of Psychology
Queen's University
Humphrey Hall, Room 329
Kingston, ON K7L 3N6

GREB Ref #: GPSYC-803-17; TRAQ # 6020639
Title: "GPSYC-803-17 Self-Soothing and Attack-Resisting Intervention"

Dear Miss Lambert:

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled **"GPSYC-803-17 Self-Soothing and Attack-Resisting Intervention"** for ethical compliance with the Tri-Council Guidelines (TCPS 2 (2014)) and Queen's ethics policies. In accordance with the Tri-Council Guidelines (Article 6.14) and Standard Operating Procedures (405.001), your project has been cleared for one year. You are reminded of your obligation to submit an annual renewal form prior to the annual renewal due date (access this form at http://www.queensu.ca/traq/signon.html/; click on "Events"; under "Create New Event" click on "General Research Ethics Board Annual Renewal/Closure Form for Cleared Studies"). Please note that when your research project is completed, you need to submit an Annual Renewal/Closure Form in Romeo/traq indicating that the project is 'completed' so that the file can be closed. This should be submitted at the time of completion; there is no need to wait until the annual renewal due date.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one year period (access this form at http://www.queensu.ca/traq/signon.html/; click on "Events"; under "Create New Event" click on "General Research Ethics Board Adverse Event Form"). An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example, you must report changes to the level of risk, applicant characteristics, and implementation of new procedures. To submit an amendment form, access the application by at http://www.queensu.ca/traq/signon.html; click on "Events"; under "Create New Event" click on "General Research Ethics Board Request for the Amendment of Approved Studies". Once submitted, these changes will automatically be sent to the Ethics Coordinator, Ms. Gail Irving, at the Office of Research Services for further review and clearance by the GREB or GREB Chair.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Sincerely,

John D. Freeman

John Freeman, Ph.D.
Chair
General Research Ethics Board

c: Dr. Ronald Holden, Supervisor
Dr. Leandre Fabrigar, Chair, Unit REB

July 18, 2017

Miss Christine Lambert
Ph.D. Candidate
Department of Psychology
Queen's University
329 Humphrey Hall
Kingston, ON K7L 3N6

Dear Miss Lambert:

RE: Amendment for your study entitled: **GPSYC-803-17 Self-Soothing and Attack-Resisting Intervention;**
TRAQ # **6020639**

Thank you for submitting your amendment requesting the following changes:

1) To recruit participants from the Psychology Department 200-level Subject Pool;

2) To add the Invalidating Childhood Environment Scale and the Deliberate Self-Harm Inventory to the 200-level prescreen. Participants who score in the top 15-20% on their scores on the Invalidating Childhood Environment Scale, and indicate on the Deliberate Self-Harm Inventory that they engaged in at least one form of self-harm in the two weeks prior to completing the scale, will be invited to participate in this study.

By this letter, you have ethics approval for these changes.

Good luck with your research.

Sincerely,

Joan Stevenson, Ph. D.
Interim Chair
General Research Ethics Board

c.: Dr. Ronald Holden, Supervisor