

**Psychosocial Determinants of the Acts and Functions of Nonsuicidal Self-Injury**

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## ABSTRACT

Nonsuicidal self-injury (NSSI) is a significant physical and mental health concern in society today. Whilst research efforts have made considerable headway in developing an understanding of NSSI, there is still much we do not understand about this paradoxical phenomenon, particularly regarding its aetiology, the functions it serves, and how these are interrelated. The current study examined the impact of the psychosocial determinants of gender, sexual orientation, self-esteem, coping, attachment, mental illness, trauma and body modifications on NSSI. A sample of 1292 adults, ranging in age from 18 to 76 years (1110 females, 182 males), recruited from 29 different countries, completed an online self-report survey. Of the total sample, 67.9% reported a history of NSSI (801 females, 76 males). Female participants identifying as bisexual or lesbian were 5.95 and 4.80 times, respectively, more likely to self-injure than their heterosexual, gay or bisexual male counterparts. Self-injurers in the present study had more body modifications; lower self-esteem; higher incidences of mental illness; and poorer perceived relationship quality with their fathers, mothers, and peers. They had also experienced more aggregated personal trauma and demonstrated a non-productive coping style, in comparison to non-injurers. Self-injurers who also disclosed a self-reported history of mental illness fared considerably poorer across the range of psychosocial determinants than self-injurers with no history of mental illness. This group also self-injured more frequently, used more methods, endorsed a greater number of functions, and had obtained more medical treatment for their wounds. Whilst each of the psychosocial variables were found to be an individual risk factor for NSSI, the combination of gender, familial and individual history of mental illness, aggregated personal trauma, tattoos, paternal and maternal attachment, low self-esteem and coping strategies, accounted for nearly half of the variance of NSSI in the present study.

## DECLARATION

I, Madeline Wishart, declare that the Doctor of Philosophy thesis entitled 'Psychosocial Determinants of the Acts and Functions of Nonsuicidal Self-Injury' is no more than 100,000 words in length, exclusive of tables, figures, appendices, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except when otherwise indicated, this thesis is my own work.

Signature:



Date: 31/03/2017

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## DEDICATION

*Mankind... have never... understood the power of Love.  
For if they had understood...they would surely have built noble temples and altars,  
and offered solemn sacrifices in his honour*

(Plato, trans. 1989).

Nick, for all the sacrifices you've made,  
your unwavering support, encouragement and unconditional love.

What a rollercoaster we've shared.

Here is my paper temple

I love you

To Zedekiah and Judah,  
find something you are truly passionate about  
have the courage and determination to chase it,  
but remember to live your life whilst in pursuit of it,  
for that's when I had you

To all of those who wrestle with nonsuicidal self-injury,  
the triggers may never cease,  
but may the urge lessen its grip

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## CHAPTER 1

### Introduction and Overview

*The skin erupts in a mouth, tongueless, toothless.*

*A voice drips out, liquid.*

*A voice bubbles out, fluid and scabby.*

*A voice sears itself for a moment, in flesh.*

*This is a voice emerging on the skin, a mouth appearing on the skin.*

*The body which could not be air upon the larynx becomes the stroke of a razor*

*(McLane, 1996, p. 114).*

Nonsuicidal self-injury (NSSI) is an intentional, self-inflicted and non-socially sanctioned behaviour, undertaken without suicidal intent, and resulting in low lethality tissue damage (American Psychiatric Association, 2013; Crawford, Geraghty, Street, & Simonoff, 2003; Favazza, 1996; Nock & Favazza, 2009; Walsh, 2006). It is a paradoxical behaviour; the urge to cut, scratch, rub, or burn the flesh, appears in direct contrast to our innate instincts of self-preservation and survival (Connors, 2000; Favazza & Rosenthal, 1990; Klonsky & Lewis, 2014; Pattison & Kahan, 1983). The creation of a painful physical wound to heal an emotional or psychological one seems blatantly irrational and perturbing (Bresin & Gordon, 2013; Briere & Gil, 1998; Motz & Jones, 2009). Yet, the behaviour has been reported in the clinical literature since 1914 (Emerson) under a variety of terms, such as self-mutilation, self-cutting, self-injurious behaviour (refer to Appendix L for the evolution of the nomenclature for NSSI in the literature).

In both clinical and nonclinical populations, the age of onset has remained stable over time (Favazza, 1996; Pattison & Kahan, 1983; Rosenthal, Rinzler, Wallsh, & Klausner, 1972), typically commencing in adolescence, between the ages of 12 and 16

years (Klonsky, 2009, 2011; Nock & Prinstein, 2004; Whitlock et al., 2011). However, three studies over the past decade have reported a much later onset of the behaviour, with young adults initiating NSSI well into their early twenties (Heath, Toste, Nedecheva, & Charlebois, 2008; Klonsky, 2011; Whitlock et al.). Whilst it is challenging to ascertain conclusive epidemiological data (Swannell, Martin, Page, Hasking, & St John, 2014), estimates indicate that between 5.9% (Briere & Gil, 1998) and 6.97% (Martin, Swannell, Harrison, et al., 2010) of adults in the general population engage in NSSI over their lifetime. However, adolescent rates appear much higher, and considerably more variable, with reported lifetime prevalence ranging from 2.9% (Larsson & Sund, 2008) to 56% (Hilt, Nock, Lloyd-Richardson, & Prinstein, 2008). The prevalence rates in university samples follow a similar pattern, with lifetime prevalence rates ranging from 11.6% (Heath et al.) to 43.6% (Hasking, Momeni, Swannell, & Chia, 2008).

It is apparent that the population who engages in NSSI, has evolved over this time, and it is now found in a much broader nonclinical population (Adler & Adler, 2007; Gratz, Conrad & Roemer, 2002). Heath, Ross, Toste, Charlebois, and Nedecheva (2009) found that 74% of college students in their sample also had a friend who engaged in self-injury. In comparison, Favazza and Conterio (1989) reported in 1989, that only 24% of their sample had a friend who also self-injured. NSSI has traditionally been portrayed as a primarily female phenomenon (Favazza & Conterio, 1988; Graff & Mallin, 1967; Pao, 1969), yet over the past decade epidemiological evidence has been mixed regarding gender prevalence. Recent research indicates that gender differences in the prevalence of NSSI appear largely confined to the period of adolescence (Sornberger, Heath, Toste, & McLouth, 2012; Taliaferro, Muehlenkamp, Borowsky, McMorris, & Kugler, 2012), as the majority of nonclinical college or community based

samples in younger adults and adults have revealed no gender differences in self-injurious behaviours (Andover, Primack, Gibb, & Pepper, 2010; Klonsky, 2011). Is this a result of a proliferation of information and images of self-injury in the media and social media, or could this reflect the depathologization of NSSI from a clinical behaviour, to a more normative one (Adler & Adler, 2007; Heath et al.)? Much of our understanding of the behaviour was largely based on research derived from clinical samples of females with a history of early childhood trauma (Adler & Adler, 2007; Graff & Malin, 1967; Leibenluft, Gardner, & Cowdy, 1987; Tantam & Whittaker, 1992).

Research has found gender differences in the methods employed to self-injure, with females more likely to engage in cutting and scratching, whereas, males are more likely to report using self-battery; burning; or banging, hitting and punching hard surfaces (Sornberger et al., 2012; Whitlock et al., 2011). A recent meta-analysis of the gender differences in NSSI methods indicated that females were more likely to engage in cutting, biting, scratching, pinching, hair pulling, and interference with wound healing than males (Bresin & Schoenleber, 2015). Sornberger et al. hypothesised that it was the sight of blood that typically differentiated the methods utilised between the sexes, with females preferring methods that produced blood; and males adopting methods that did not involve bleeding. This hypothesis has only been explored in one study to date (Glenn & Klonsky, 2010b). Whilst the authors did not find a significant gender difference in the role of seeing blood, their results may have been tempered by a small sample size and limiting the behaviour to cutting. As such, this warrants further investigation.

Self-mutilating behaviour is currently listed as a criterion of borderline personality disorder (BPD) in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5: American Psychiatric Association [APA], 2013). As such, it is not surprising that it has repeatedly been reported to occur comorbidly with NSSI (Glenn & Klonsky, 2010a, 2010b; Nock, 2006). However, NSSI has also been found to occur comorbidly with depressive disorders (Chartrand, Bhaskaran, Sareen, Katz, & Bolton, 2015; In-Albon, Ruf, & Schmid); posttraumatic stress disorder (PTSD: Bentley, Cassiello-Robbins, Vittorio, Sauer-Zavala, & Barlow, 2015; Briere & Gil, 1998; In-Albon, Ruf, & Schmid, 2013); anxiety disorders (Bentley et al., 2015; Glenn & Klonsky, 2013; Gollust, Eisenberg, & Golberstein, 2008); eating disorders (Glenn & Klonsky, 2010a, 2010b; Iannaccone, Cella, Manzi, Visconti, Manzi, & Cotrufo, 2013); and to a lesser degree with dissociative identity disorder (DID: Briere & Gil); and bipolar disorders (Andover & Gibb, 2010; Claes, Houben, Vandereycken, Bijttebier, & Muehlenkamp, 2010). However, research indicates that a significant number of individuals who engage in NSSI, do not have a comorbid history of mental illness, nor have they sought psychological interventions for their self-injurious behaviours (Adler & Adler, 2007; Gratz, Conrad & Roemer, 2002).

Aside from the diagnostic correlates, NSSI has been associated with a range of environmental or psychosocial risk factors, such as childhood sexual, physical or psychological abuse (Briere & Gil, 1998; Klonsky & Moyer, 2008; Martin, Swannell, Harrison, et al., 2010); traumatic life experiences (Layne et al., 2014; McReynolds & Wasserman, 2011); stressors such as familial conflict (Adrian, Zeman, Erdley, Lisa, & Sim, 2011), bullying (Claes, Luyckx, Baetens, Ven, & Witteman, 2015; Garisch & Wilson, 2015) or friendship and romantic difficulties (Adrian et al., 2011; Baetens et al., 2011); concerns about sexual orientation (Muehlenkamp, Hilt, Ehlinger, & McMillan,

2015; Sornberger et al., 2013); and lack of perceived social support (Brausch & Gutierrez, 2010; Muehlenkamp, Claes, Quigley-Prosser, Claes, & Jans, 2013). A number of individual psychological variables have also been associated with NSSI, such as low self-esteem (Claes et al., 2010; Hawton, Rodham, Evans, & Weatherall, 2002); maladaptive coping styles (Andover et al., 2007; Cawood & Huprich, 2011); poor communication and interpersonal skills (Claes et al., 2010; Muehlenkamp et al., 2013; Turner et al., 2012); insecure attachment (Gratz, Conrad, & Roemer, 2002; Grocutt, 2009); and self-criticism (Glassman, Weierich, Hooley, Deliberto, & Nock, 2007; Hooley & St. Germain, 2014). These risk factors and general correlates relate to a broad variety of psychological and behavioural problems, which significantly lessens their predictive strength (Fox, Franklin, Ribeiro, Kleiman, Bentley, & Nock, 2015; Tanner, Hasking, & Martin, 2015). As such, the current study specifically investigates lifetime exposure to traumatic events; paternal, maternal and peer attachment; self-esteem, coping and body modifications.

Research indicates that individuals who are questioning their sexuality or gender; are part of a sexual minority; or are on the trans-spectrum, are more at risk of engaging in NSSI than their heterosexual or cisgender counterparts (Batejan, Jarvi, & Swenson, 2015; Kerr, Santurri, & Peters, 2013; Sornberger, Smith, Toste, & Heath, 2013; Whitlock et al., 2011). However, only a few studies have actually investigated the differences between groups of non-heterosexual individuals, typically comparing non-heterosexuals and heterosexuals as dichotomous categories (Moller, Tait, & Byrne, 2013; Wilcox, Arria, Caldeira, Vincent, Pinchevsky, & O'Grady, 2012). In addition, only one study has explored coping strategies and NSSI in relation to the full spectrum of sexual orientation, and this was in an adolescent sample (Sornberger et al.).

The body modification practices of piercing, tattooing, branding and scarification share considerable commonalities with self-injurious behaviours. They are intentionally acquired, self-effected, non-suicidal in nature, and result in minor tissue damage (Walsh, 2006). Body modifications have also been associated with a history of sexual abuse (Favazza & Conterio, 1989; Martin, Swannell, Harrison, et al., 2010) and are used to cope with stress and trauma (Gratz, 2006; Roberti, Storch, & Bravata, 2004). However, NSSI and body modifications fundamentally differ in their level of social acceptance; and are also distinct in terms of their underlying motivations, their appearance, and the feelings about the ensuing tissue damage (Walsh, 2006). Given the similarities and associations, very few studies have explored the relationship between NSSI and body modifications (Aizenman & Jensen, 2007; Stirn & Hinz, 2008). Of the handful of studies conducted, the findings are conflicting (Claes, Vandereycken, & Vertommen, 2005; Iannaccone, Cella, Manzi, Visconti, Manzi, & Cotrufo, 2013).

NSSI is an overdetermined behaviour, in that it can serve multiple functions for an individual simultaneously (Klonsky & Glenn, 2009; Nock & Prinstein, 2004; Muehlenkamp, Claes, Quigley, Prosser, Claes, & Jans, 2013). However, the scholarship is lacking data on the average number of functions underpinning NSSI in young adult and adult samples to date. The functions of NSSI are often contextually driven and not necessarily stable during the period of engagement in NSSI (Lloyd-Richardson, Nock & Prinstein, 2009). Recent research indicates that NSSI may serve different functions at the onset of the behaviour, and then during its subsequent maintenance (Saraff & Pepper, 2014). The functions can be delineated into two domains: intrapersonal (automatic or self-reinforcing, these functions are used to create a change in the psychophysiological state) and interpersonal (socially reinforced, they are used to modify or regulate one's social environment). Intrapersonal functions are typically more

highly rated than interpersonal functions, with affect regulation as the most commonly endorsed function in the literature (Klonsky, 2009; Swannell, Martin, Scott, Gibbons, & Gifford, 2008).

Over the past century, numerous theories have been put forth towards the development of an aetiological understanding of NSSI. Early theories were psychoanalytically or psychodynamically driven, and centred around the life and death instincts, the aggressive drive, guilt, punishment and sexual impulses (Emerson, 1914; Menninger, 1938; Pao, 1969). These early clinicians introduced the concept of self-mutilation as a function of tension reduction; and identified the association between early childhood trauma (Crabtree, 1967; Grunebaum & Klerman, 1967). Later psychodynamic theorists focused on NSSI as a means of nonverbal communication, particularly with regards to the corporeal expression of trauma (Connors, 1996; McLane, 1996). Emerging from psychoanalytic origins, there is some overlap in attachment theory's conceptualisation of NSSI. Yet the emphasis in attachment theory centres on the reciprocal relationships the individual shares with those in their immediate environment, and insecure attachment bases (Farber, 200; Hallab & Covic, 2010). Behavioural theorists attributed the onset of NSSI predominantly to social learning theory and social modelling, emphasizing the influence of peer and media exposure, and the principles of reinforcement (Nock & Prinstein, 2004; Prinstein, Guerry, Browne, & Rancourt, 2009). The functional approach is grounded heavily in behaviourism, and the reinforcing properties of automatic, social, positive and negative processes (Nock, 2008; Nock & Prinstein, 2004). These theories were all fairly singular in their theoretical approach to understanding NSSI, yet it is largely agreed that NSSI is a multidetermined behaviour. As such, one theory is unlikely to account for this heterogeneous phenomenon.



## 1.1 Rationale for the Current Study

Nonsuicidal self-injury is a concerning behaviour that typically results in physical and psychological harm to those who use it, and is highly confronting and distressing to family, friends, educators and colleagues. A comparison of adult lifetime prevalence rates with those of adolescent and young adult populations, indicates that NSSI is increasing (Martin, Swannell, Harrison, et al., 2010; Nock, 2009; Hasking et al., 2008; Hilt, Cha, et al., 2008). Whilst the behaviour or its consequences result in significant personal costs (permanent physical scars, significant distress, interference with interpersonal relationships, school, university or work), the costs are also systemic, with approximately five to ten million dollars spent *per month* in Australia on hospital admissions for self-harm (Martin, Swannell, Hazell, et al.). The clinical interest in NSSI has dramatically increased over the past decade, and considerable advances have been made towards our understanding of NSSI, yet significant gaps still remain.

Much of our early understanding of self-harm and NSSI was grounded in psychiatric and medical perspectives, based on clinical samples of females with a history of childhood trauma and significant mental health concerns (Adler & Adler, 2007; Gratz, Conrad, & Roemer, 2002), or hospital admission data (Hawton, Fagg & Simkin, 1996; Simpson & Porter, 1981). However, research indicates that NSSI is an inherently private act, typically conducted alone (Laye-Gindhu & Schonert-Reichl, 2005; Whitlock et al., 2011). Individuals who self-injure typically attend to the injuries themselves and rarely seek medical attention for their wounds (Klonsky, 2011; Martin, Swannell, Hazel, et al.), nor consult a mental health practitioner (Martin, Swannell, Hazel, et al.; Whitlock et al.). It is also apparent from community, adolescent and

college samples, that NSSI is now being undertaken in a much broader nonclinical population (Heath, Toste, Nedecheva, & Charlebois, 2008; Whitlock et al.).

Given that the onset typically occurs during the period of adolescence, it is unsurprising that the majority of studies have focused on this period of the lifecycle (Hilt, Cha, et al., 2008; Muehlenkamp & Gutierrez, 2007). Studies on young adults are typically conducted on samples of university students (Hamza, Willoughby, & Good, 2013; Whitlock et al., 2011), yet in Australia only 26% of 18 to 34 year olds attended university in 2011 (Australian Bureau of Statistics, 2013). Clearly, the young people attending higher education facilities are not representative of all young adults and results cannot be generalised to the larger community (Moller, Tait, & Byrne, 2013; Swannell, et al., 2014). Furthermore, recent research indicates that the age of onset is increasing into early adulthood, warranting further investigation into this period (Heath et al., 2008; Klonsky, 2011; Whitlock et al., 2006, 2011).

Recent research of young adults in nonclinical or community based samples has indicated that the gender differences which appear prevalent in adolescent samples, are not found in adult samples (Andover et al., 2010; Gollust et al., 2008; Klonsky, 2011; Moller et al., 2013). Moreover, research is required to investigate if gender differences persist across the breadth of factors associated with the act of NSSI (i.e., frequency, methods, functions, the experience of pain etc.) in this age group. There has also been a large gap in the chronological reporting of these different aspects involved in the act of NSSI, and various behaviours associated with the act of self-injury may have quantifiably changed over time.

Sornberger et al. (2013) and Kerr et al. (2013) found that young adults who were part of a sexual minority were at a higher risk of engaging in NSSI than their

heterosexual counterparts. The methodology has been somewhat flawed to date though, with sexual orientation typically categorised as a heterosexual or non-heterosexual dichotomy; or lesbian and gay participants grouped as one homogenous group (Sornberger et al.). Whereas, there is evidence to suggest that there is a gender interaction with sexual orientation in NSSI (Skegg et al., 2003).

NSSI is often described as a maladaptive coping mechanism, yet few studies have explored the relationship between coping and NSSI (Andover, Pepper, & Gibb, 2007; Andrews, Martin, Hasking, & Page, 2014; Cawood & Huprich, 2011; Sornberger et al., 2013; Tanner et al., 2015). Furthermore, the relationship of coping strategies and the functions that motivate self-injury have not been investigated in literature.

The purpose of the current study is to address these limitations in the extant research on NSSI, by exploring the behaviour in a nonclinical sample of online participants over the age of 18 years.

## **1.2 The Overall Aim**

The overall aim of this research is to develop a broad understanding of NSSI by drawing on the lived experience of individuals engaging in NSSI. More specifically, it endeavours to explore what personal, psychological, social and relationship factors influence NSSI; the manner in which the behaviour is enacted; and the function that NSSI subsequently fulfils.

### 1.3 The Research Questions

The current study aims to answer a number of research questions:

1. Are there any significant gender differences in the experience of NSSI? Namely, the components that characterise the act (e.g., frequency, method, functions etc.), or are associated with it (e.g., sources of exposure to NSSI prior to the act, desire to stop)?
2. Have the inherent factors involved in or associated with the act of NSSI (i.e., age of onset, method, time taken from urge to action, severity, pain, sources of exposure to NSSI prior to engagement) changed over the past decade, since they were last reported in the literature?
3. Is the experience of pain a salient feature in the act of NSSI?
4. What is the function (i.e., affect regulation, self-punishment, marking distress etc.) of NSSI for the individual who self-injures?
5. Is there a relationship between the intrapersonal functions of NSSI and non-productive coping strategies?
6. What are the relationships between personal (sexual orientation, piercing, tattooing and body modifications) and psychological (mental illness, trauma history, attachment, self-esteem and coping styles) factors and engagement in NSSI?

## 1.4 Hypotheses

There are a number of main hypotheses for this study:

1. Individuals who are part of a sexual minority will be more likely to engage in NSSI, and emotion-focused or non-productive coping strategies than their heterosexual counterparts. Furthermore, this relationship will be more pronounced in bisexual participants.
2. It is predicted that individuals with tattoos, piercings and body modifications will be significantly more likely to have engaged in NSSI than those without any body art or modifications.
3. Females will predominantly employ methods of NSSI that result in blood (i.e., cutting and carving), whilst males will utilise methods that do not involve bleeding (i.e., self-battery; punching, hitting or banging a hard surface; burning).
4. Individuals with a history of mental illness will be more likely to have experimented with multiple methods of NSSI than self-injurers who have no history of mental illness.
5. Intrapersonal functions will be more highly endorsed than interpersonal functions.
  - a. NSSI will be engaged in predominantly as a function of affect regulation.
  - b. NSSI enacted in the presence of others is more likely to be associated with interpersonal functions.
6. Intrapersonal functions will be significantly correlated to non-productive coping strategies.
  - a. It is specifically hypothesised that the function of affect regulation will be correlated with the non-productive coping strategy of tension reduction.
  - b. It is further predicted that the function of self-punishment will also be highly correlated with the non-productive coping strategy of self-blame.

7. There will be a significant relationship between self-punishment as a function of NSSI, self-esteem and the experience of pain during NSSI.
8. The length of time taken to contemplate the act of self-injury will be directly related to whether pain is experienced during the act, the severity of NSSI, the desire to stop self-injuring, and the functions NSSI performs.
9. Individuals with a history of trauma, low self-esteem, body modifications, negative coping styles, and insecure mother, father and peer attachment will be more likely to engage in NSSI.

## **1.5 Structure of Thesis**

The introduction provides the reader with a broad overview of the current study. It presents the rationale, the overall aim of the study, and lists the research questions and hypotheses under investigation. The thesis is composed of the following ten chapters:

**Chapter 2** starts by exploring the broad spectrum of behaviours that are encompassed by the umbrella term of self-injurious behaviours. It then addresses the challenges and considerable time taken to agree on a universal term for the behaviour; and the problems this created in developing an understanding of NSSI. The progressions in developing a taxonomy to classify NSSI are discussed, culminating in Favazza's sociocultural classification of NSSI and the proposed criteria for NSSI in the DSM-5. The evolution of NSSI and its depathologization as a behaviour as it has transitioned into nonclinical populations is briefly reviewed. The chapter concludes with a discussion of the functions of NSSI, focusing on the work of Klonsky and colleagues.

**Chapter 3** focuses on providing a thorough differentiation of NSSI from suicide, and highlights the importance in clinically discriminating between these two

distinct behaviours. The behaviours are distinguished fundamentally in terms of intent; but also with regards to lethality; the type and number of methods employed; the resultant degree of tissue damage; the frequency of the behaviour; the level of psychological distress; cognitive constriction; and the psychological aftermath following the act, based on the work of Walsh (2006).

**Chapter 4** presents a comprehensive epidemiological profile of NSSI. It starts by exploring the prevalence of NSSI in Australia. The chapter then addresses the issues inherent in obtaining a true indication of the prevalence of NSSI. The prevalence rates for adolescents, young adults, and then adults, are presented. The chapter concludes with an exploration of the prevalence for the age of onset, the gender effects in prevalence rates, and the impact of sexual orientation on the prevalence of NSSI.

**Chapter 5** reviews the current theoretical models of NSSI, with a focus attachment theory, social and behavioural approaches, the relatively recent biological approaches, a functional perspective, and lastly, presents Nock's (2009, 2010) integrated theoretical model of the development and maintenance of self-injury.

**Chapter 6** examines the diagnoses and psychosocial variables that predispose, precipitate or co-occur with NSSI. It starts by briefly exploring the diagnostic correlates of NSSI, then reviews the relationship of trauma to NSSI in the literature. This chapter also explores the associations between NSSI and self-esteem, coping, body art, and modifications in the extant scholarship.

**Chapter 7** focuses on the act of NSSI, presenting an overview of all aspects surrounding the actual act of NSSI, from the time taken to contemplate acting on the urge to self-injure, through to whether medical treatment has been obtained for wound care. It encompasses the methods, bodily sites and implements used to self-injure. It

also reviews the literature for gender differences in the method employed in the act of NSSI. The number of methods used; the frequency of the behaviour; and the experience of pain are discussed. The relationship between the method used to self-injure and the repeated engagement in NSSI is investigated. This chapter also addresses the setting for the act, including if NSSI is practiced alone or in the presence of others; and the routines and rituals undertaken during the act.

**Chapter 8** details the methods employed in the current study. It includes an overview of the recruitment process, and the general characteristics of the sample. This section also presents the online survey package and the five standardised assessment measures that it comprised, as well as the additional demographic, mental health, and body modification questions. It concludes with a discussion of the procedures undertaken in this study.

**Chapter 9** presents the results from the statistical analyses in the current study, commencing with a description of the processes used in the analysis of the data. This chapter adopts a funnelled approach in the presentation of the results, starting with the descriptive statistics, and then increasing in both complication, and in the number of variables analysed. Whilst adhering to this approach as closely as possible, the results section also approximates the structure of the literature review.

**Chapter 10** provides an interpretation of the results from the current study, and discusses them in relation to the extant literature on NSSI, as presented in chapters two to seven of the literature review. The discussion is formatted to follow the structure of the results section. This section also addresses the strengths and limitations of this study; highlights the clinical implications from the findings in the current research; and presents recommendations for future research, before presenting concluding comments.



## CHAPTER 2

### Nonsuicidal Self-Injury

*I hurt myself today*

*To see if I still feel*

*I focus on the pain*

(“Hurt,” Nine Inch Nails, 1994, track 14)

#### 2.1 The Broad Continuum of Self-Injurious Behaviour

Self-injurious behaviours constitute a broad spectrum of behaviours in which individuals willingly harm themselves by their direct action, inaction or omission (Connors, 2000; Favazza, 1998; Suyemoto, 1998). Yet, self-injury cannot be defined based purely on the behaviour itself (Connors, 1996). Self-injurious behaviours may be inflicted through indirect methods (substance abuse, overeating, and smoking); and by acts of omission (neglecting basic health, hygiene or medical needs). They may be driven by anxiety or nervousness (nail biting, cuticle picking, cheek biting, and picking at scabs or pimples); or by social mechanisms underlying peer group interactions (train surfing, chicken, bloody knuckles, the choking game, inhaling substances, erasing). The behaviours could be based on societal expectations about beauty (waxing, plucking, cosmetic tattooing, dieting, excessive exercising, cosmetic procedures and surgeries); part of a religious ritual (circumcision); or practices that are associated with popular culture and fashion (piercing, tattooing, ear stretching). With contemporary definitions of socially acceptable behaviours shifting regularly, the behaviour needs to be contextualised with regards to current social norms and the method used (Connors, 1996; Gilman, 2013; Walsh, 2006).

Socially sanctioned behaviours aside, self-injurious behaviours still encompass a much wider range of behaviours, than under exploration in the current study. As Favazza (Favazza, 1989, 1996, 1998) clearly demarcated in his *Sociocultural Classification of NSSI* (Table 1), some of these non-socially sanctioned acts are behaviours typically ascribed to specific mental illnesses; and are engaged in for different reasons than NSSI. Stereotypical behaviours (head banging, finger biting, and eyeball pressing) are often enacted repeatedly and rhythmically; and associated with developmental (Stereotypic Movement Disorder) or neuropsychological disorders (Lesch-Nyhan syndrome or Tourette's disorder). Conversely, acts of major NSSI are infrequent and result in severe physical injury (castration, amputation, facial skinning, eye enucleation). They are typically associated with schizophrenia spectrum disorders, transsexualism, acute substance abuse or psychotic episodes 1987 (Favazza, 1989, 1996, 1998; Favazza & Favazza, 1987; Favazza & Rosenthal, 1990, 1993; Simeon & Favazza, 2001).

## **2.2 Nomenclature: The Search for a Universal Term**

Since its introduction by Emerson in 1914 into clinical literature, self-injury has been masked under a guise of lexicology (refer to Appendix L for the evolution of the nomenclature for NSSI in the literature). Whilst the discussion over the search for universally accepted nomenclature was initiated in the early 1980s (Favazza & Rosenthal, 1993; Pattison & Kahan, 1983), it was not until the past decade that a consensus has largely been reached in the scholarship. Until this point, the varied terms were all used in the literature, and often interchangeably to describe behaviours that differed considerably along the spectrum of self-injurious thoughts and behaviours

(SITB). This lack of clarity and consistency in the terminology resulted in considerable confusion, leading to significant conceptual and methodological difficulties; impeding scientific advancement and treatment in this sphere (Connors, 1996; Favazza & Rosenthal, 1993; Kehrberg, 1997; Messer & Fremouw, 2008; Nock & Favazza, 2009; Prinstein, 2008).

It has been widely agreed upon that the term *self-mutilation* has been relegated to refer to behaviours of a more severe and permanent nature than the self-injurious behaviours classified under the domain of NSSI (Nock & Favazza, 2009; Walsh, 2006). Self-mutilative acts also occur with less frequency and repetition, are more bloody in presentation and are typically associated with profound mental illness (refer to Table 1). In addition, the term *self-mutilation* has been associated with negative, pejorative and dramatic connotations (Connors, 1996; Nock & Favazza, 2009; Walsh, 2006). As such, the phrase *Major NSSI* has been deemed preferable by those who engage in the behaviour (Nock & Favazza, 2009). Similarly, both individuals who self-injure and researchers have recently lobbied for the removal of the word *deliberate* preceding self-harm in DSH, as a result of its negative associations (Heath et al., 2008; NICE, 2012; Walsh, 2006).

Until quite recently, the terms *deliberate self-harm*, *self-harm* and *self-injury* were often used synonymously in the clinical literature, to refer to SITB that both included and excluded suicidal intent (Brunner et al., 2013; Nock, 2012). The disparity between these two definitions has been highly problematic and made comparisons across studies challenging (Muehlenkamp et al., 2012). However, the term self-harm (or the largely superseded DSH) is predominantly used now in Europe and the United Kingdom to describe a much broader overarching range of behaviours than NSSI,

irrespective of suicidal intent (Cheung et al., 2013; Heath et al., 2008; Jacobson & Gould, 2007; Muehlenkamp et al., 2012; Plener et al., 2013). To enumerate, *self-harm* includes the behaviours under the realm of NSSI (i.e., cutting, burning, carving, scratching, self-battery etc.) but also incorporates behaviours that involve indirect methods of self-harm and behaviours that are more ambiguous with regard to their intent: such as the ingestion of non-ingestible substances or objects; taking prescribed medications beyond their recommended dosage; ingesting recreational or illicit drugs; and jumping from a height; as delineated in the Child and Adolescent Self-harm in Europe (CASE) Study (De Leo & Heller, 2004; Hawton, Bergen, Kapur, et al., 2012; Hawton, Bergen, Waters, et al., 2012; Madge et al., 2011; Madge et al., 2008). Currently, research into SITB appears to fall into two categories focusing on either self-harm or NSSI. The recent inclusion of NSSI (refer to Table 2) as a separate area of interest in Section III of the DSM-5 (American Psychiatric Association, 2013) may further assist in operationalising the distinction between NSSI and self-harm more clearly, and subsequently facilitate greater comparisons across studies (Nock, 2012).

### **2.3 Classification of Self-Injurious Behaviours**

Favazza (1996, p. 232) pronounced that “the first steps in doing something about a problem are giving it a name and a classification.” The interest in classifying self-injurious behaviour was not a new endeavour, a number of theorists have previously proposed classifications of self-injury, beginning with the early writings of Menninger (1935; 1938) and Dabrowski (1937), who both delineated five quite different categories of self-mutilation. Menninger (1935; 1938) recognised the need to differentiate socially acceptable forms of self-injury from those ascribed to psychological pain, conflict, guilt,

Table 1: *Favazza's Sociocultural Classification of NSSI*

Culturally Sanctioned		Non-Socially Sanctioned		
Any modifications willingly made to the body that are in accordance with social or cultural norms.		Non-socially sanctioned acts of nonsuicidal self-injury which may be ascribed to psychological distress or mental illness.		
Rituals	Practices	Major	Stereotypical	Superficial or Moderate
Rituals remain constant over several generations, reflecting the beliefs and values of the social milieu. They are often imbued with rich symbolism and meaning, i.e., male circumcision performed during the Jewish brit milah; and ceremonial or initiation scarification	Behaviours that are typically trends within a society at a particular time, such as nose, eyebrow and navel piercing; cosmetic surgery; and tattoos	Infrequent acts resulting in severe physical injury. Typically associated with schizophrenia spectrum disorders, transsexualism or acute substance abuse. Examples include: castration, amputation, facial skinning; and eye enucleation	Repetitious acts that often possess a rhythmic quality. Predominantly performed without implements, these behaviours are typically lacking in both symbolism and meaning. Largely restricted to developmental (i.e., Stereotypic Movement Disorder) or neuropsychological disorders (i.e., Lesch-Nyhan syndrome or Tourette's disorder). Acts include head banging; tongue or finger biting; and eyeball pressing	Acts sustaining only minor tissue damage and of a low lethality epitomize this collective group of NSSI
				Compulsive
				Typified by daily acts of a repetitive, ritualistic nature i.e., skin picking; skin scratching; onychophagia; and trichotillomania
				Episodic
				A transient behaviour performed irregularly in an attempt to alleviate psychological distress, e.g., cutting, burning, carving, scratching, carving, self-battery
				Repetitive
				An escalation of episodic NSSI, which occurs when the behaviour is undertaken more frequently, and the act itself becomes addictive. Identification with the behaviour may also occur

*Note.* Favazza (1987, 1996) originally used the term “Deviant” to broadly categorise all non-socially sanctioned self-injury. In 1998, he favoured the term “Pathological,” then in 2006 used the two terms interchangeably. However, the term “Non-Socially Sanctioned” has been employed here as it is less pejorative and more applicable given the current epidemiological data on NSSI.

mental illness, and intellectual disability. Three decades later Pao (1969) distinguished between delicate and course cutters; and then the 1980s brought renewed interest into the phenomenon of self-harm and a number of key researchers in the field developed classification models of self-harm. Pattison and Kahan's (1983) influential paper instigated the discourse, with their differential classification of self-destructive behaviours. It classified behaviours on three levels of lethality (low, medium, and high); a direct or indirect dichotomy; and frequency (single episode or multiple episodes). Most importantly, the authors argued that suicidal thoughts and behaviour and self-injury were clinically distinct behaviours; and they were seminal in advocating for the inclusion of NSSI as a syndrome in the DSM-IV.

The most widely cited and comprehensive model is the Sociocultural Classification of NSSI devised by Favazza and colleagues. The researcher has tabulated the model for clarity and conciseness (Table 1). The self-injurious behaviours focused on in the current study, fall under the domain of moderate/superficial self-injury, in the episodic or repetitive subtypes according to Favazza's framework (Favazza, 1989, 1996, 1998; Favazza & Favazza, 1987; Favazza & Rosenthal, 1990, 1993; Simeon & Favazza, 2001). It encompasses behaviours such as, cutting, carving, severely scratching, burning or rubbing the skin against abrasive surfaces or with erasers; pinching, banging, hitting or punching oneself; interference with wound healing or skin picking; biting; and inserting objects under the skin, such as needles and pins (Favazza & Conterio, 1989; Hamza et al., 2013; Klonsky, 2009, 2011; Martin, Swannell, Hazell, et al., 2010; Muehlenkamp & Gutierrez, 2004). Repetitive and episodic self-injury lack the rhythmicity endemic in the compulsive subtype and typically involve the usage of tools – such as knives, razors, scissors, glass, lighters or matches – to accomplish the act (Favazza, 1996).

Table 2: *DSM-5 Proposed Criteria for Nonsuicidal Self-Injury*

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Nonsuicidal Self-Injury Proposed Criteria

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- A. In the last year, the individual has, on 5 or more days, engaged in intentional self-inflicted damage to the surface of his or her body of a sort likely to induce bleeding, bruising, or pain (e.g., cutting, burning, stabbing, hitting, excessive rubbing), with the expectation that the injury will lead to only minor or moderate physical harm (i.e., there is no suicidal intent).

**Note:** The absence of suicidal intent has either been stated by the individual or can be inferred by the individual's repeated engagement in a behaviour that the individual knows, or has learned, is not likely to result in death.

- B. The individual engages in the self-injurious behaviour with one or more of the following expectations:

1. To obtain relief from a negative feeling or cognitive state.
2. To resolve an interpersonal difficulty.
3. To induce a positive feeling state.

**Note:** The desired relief or response is experienced during or shortly after the self-injury, and the individual may display patterns of behaviour suggesting a dependence on repeatedly engaging in it.

- C. The intentional injury is associated with at least one of the following:

1. Interpersonal difficulties or negative feelings or thoughts, such as depression, anxiety, tension, anger, generalized distress, or self-criticism, occurring in the period immediately prior to the self-injurious act.
2. Prior to engaging in the act, a period of preoccupation with the intended behaviour that is difficult to control.
3. Thinking about self-injury that occurs frequently, even when it is not acted upon.

- D. The behaviour is not socially sanctioned (e.g., body piercing, tattooing, part of a religious or cultural ritual) and is not restricted to picking a scab or nail biting.

- E. The behaviour or its consequences cause clinically significant distress or interference in interpersonal, academic, or other important areas of functioning.

- F. The behaviour does not occur exclusively during psychotic episodes, delirium, substance intoxication, or substance withdrawal. In individuals with a neurodevelopmental disorder, the behaviour is not part of a pattern of repetitive stereotypes. The behaviour is not better explained by another mental disorder or medical condition (e.g., psychotic disorder, autism spectrum disorder, intellectual disability, Lesch-Nyhan Syndrome, stereotyped movement disorder with self-injury, trichotillomania, excoriation disorder).

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*Note.* (American Psychiatric Association, 2013, p. 803).

Research indicates that self-injurious behaviours can primarily be differentiated in terms of the level of tissue damage inflicted or severity (minor, moderate, major or severe); method (i.e., cutting, scratching, burning, carving etc.) and the frequency with which it is engaged in (i.e., occasional or episodic versus repetitive). An adolescent who engages in minor scratching is quite distinct from a middle-aged individual who has engaged in repetitive NSSI for over twenty years, resulting in considerable keloid scarring on their arms, chest and thighs. Therefore, even when refining self-harming behaviours down to NSSI (as opposed to DSH or broader self-injurious behaviours), there appears to exist a behavioural scale that could be graded from minor to severe self-injury (Whitlock et al., 2008). Testing this hypothesis, Whitlock et al. (2008) found three distinct classes of individuals who self-injure, differentiated principally by severity, but also revealing notable qualitative differences between each of the three groups. Other recent studies have also delineated subgroups of self-injurers (Klonsky & Olino; 2008; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007). Distinguishing minor self-injurers from moderate/severe self-injurers, Lloyd-Richardson et al. found that the two groups differed significantly, not only on the behaviours associated with the act of NSSI, but also with regards to psychopathology. Moderate/severe self-injurers were more likely to have a history of psychiatric treatment, hospitalisation, suicide attempts and current suicidal ideation than minor self-injurers. Klonsky and Olino delineated four distinct classes of self-injurers via a latent class analysis. Each of the four groups increased in severity and psychopathology.

As early as 1979, Morgan noted that individuals presenting to hospital for treatment of their self-inflicted wounds appeared qualitatively different from individuals whose NSSI only produces superficial, minor or moderate tissue damage that does not require suturing or specialised medical care. This has significant therapeutic



implications for clinicians and the treatment of this clearly heterogeneous group of individuals (Whitlock et al., 2008). As such, future research into NSSI needs to be sensitive to the different subtypes or gradients of self-injury that occur under the domain of NSSI.

## **2.4 Nonsuicidal Self-Injury Defined**

*Nonsuicidal self-injury (NSSI)* is defined here as an intentional, self-inflicted and non-socially sanctioned act, resulting in low lethality tissue damage, and undertaken in the absence of suicidal intent (American Psychiatric Association, 2013; Crawford, Geraghty, Street, & Simonoff, 2003; Favazza, 1996; Nock & Favazza, 2009; Walsh, 2006). The individual aspects of this definition warrant further explanation. Of fundamental importance is the specification that the act is *nonsuicidal*, that is, the purpose or goal of the behaviour is *not* to end life as it is known (Favazza & Rosenthal, 1990; Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2005).

The act is *intentional* in that the injury is performed deliberately and has not occurred as a result of an accident, indirect means (such as excessive dieting or exercise, substance abuse or smoking) nor by omission (neglecting basic health, hygiene or medical needs) (Connors, 2000; Favazza, 1998; Figueroa, 1988; Gardner, 2001; Motz, 2009; Nock & Favazza, 2009; Turp, 2002; Walsh, 2006). Intent is an important point of distinction between NSSI and suicide attempts and will be addressed in greater detail in Chapter 3. It is *self-inflicted* as the injury is typically enacted directly by the individual (Favazza, 1998). Furthermore, the behaviour is *non-socially sanctioned* as it not considered a practice or ritual (see Table 1 for the distinction between practices and rituals as delineated by Favazza), that is undertaken in accordance with social, cultural

or religious norms (Connors, 2000; Favazza, 1996, 2009; Favazza & Simeon, 1995; Walsh, 2006). Finally, the term *low lethality* is used to emphasise that NSSI does not include acts of major self-injury (Favazza, 1989; Favazza & Conterio, 1988; Favazza & Rosenthal, 1990; Nock & Favazza, 2009; Pattison & Kahan, 1983).

## **2.5 Differentiating Nonsuicidal Self-Injury from its Early Pathological Conceptualisation**

The population who engage in NSSI are now more diverse than the stereotypical “self-harmer,” “cutter” or “self-mutilator” depicted in the early literature, which was typified by female patients diagnosed with BPD, a history of childhood trauma (Graff & Malin, 1967; Leibenluft, Gardner, & Cowdry, 1987; Tantam & Whittaker, 1992).

Whilst a significant number of individuals who self-injure have been diagnosed with a range of psychiatric conditions (i.e., BPD, depressive disorders, anxiety based disorders), since the 1990s a much larger percentage of the population have not experienced any clinical treatment for NSSI, nor for any other psychiatric concerns (Adler & Adler, 2007; Gratz, Conrad & Roemer, 2002).

Whilst the proliferation of information and images in the media, movies and songs have repeatedly been held accountable for the increased prevalence rates of NSSI in young people, it may have actually helped to begin demedicalizing and reducing the stigma around self-injury. Adler and Adler (2007) suggest that part of the destigmatization of NSSI can be attributed to the knowledge that it is used as a mechanism of self-healing, rather than purely a symptom of mental illness. This slight change in the social perceptions of NSSI can have a considerable impact on the lives of those who self-injure, helping to diminish the isolation, shame and guilt associated with

this maladaptive coping mechanism (Adler & Adler). No longer cast as the “gothic,” “emo,” or “cutter;” an awareness of labelling theory, and the conscious avoidance of labelling individuals by their behaviour, further assists in shifting the perceptions towards individuals who engage in NSSI (Gardner, 2001).

## **2.6 The Functions of Nonsuicidal Self-Injury**

When applied to the study of behaviour, the term *function* typically implies an analysis of the antecedents and consequences that initiate and maintain that behaviour, pursuant to learning theory and behaviour therapy. However, the term *function* is used more broadly in the literature on NSSI, and predominantly signifies the self-reported and self-evaluated reasons and motives for engaging in the behaviour; rather than the explicit antecedents and consequences that reinforce it (Klonsky & Lewis, 2014; Lloyd-Richardson, Nock, & Prinstein, 2009; Nock, 2008; Saraff & Pepper, 2014). As such, the term function has been used interchangeably with reasons and motivations by a number of researchers (Lloyd-Richardson et al, 2007; Muehlenkamp, Brausch, Quigley, & Whitlock, 2013; Zetterqvist, Lundh, Dahlström, & Svedin, 2013). As Klonsky (2007) specified in his review of the functions of NSSI, it is challenging to accurately summarise these functions, given that a number of different assessment measures have been used to empirically explore them. There is also considerable conceptual overlap and co-occurrence amongst the functions (refer to Table 3 for a summary of the main functions of NSSI based on Klonsky’s 2007 review). Furthermore, the functions or the reasons why an individual engages in NSSI are not necessarily stable and are often contextually driven (Lloyd-Richardson, Nock, & Prinstein, 2009). Research indicates that NSSI is an overdetermined behaviour, and therefore can serve multiple functions

simultaneously for the individual (Klonsky & Glenn, 2009; Nock & Prinstein, 2004; Muehlenkamp et al., 2013; Nixon et al., 2002). Indeed, a clinical study found that adolescent inpatients endorsed an average of 8.2 reasons for engaging in NSSI (Nixon et al., 2002), whilst adolescents in two nonclinical samples endorsed an average of 4.3 (Zetterqvist et al., 2013) to 4.76 functions (Lloyd-Richardson et al., 2007). To date, the literature is lacking this information in young adult or adult samples.

There is a general consensus that the functions of NSSI largely fall into two broad domains: intrapersonal and interpersonal (Heath, Ross, Toste, Charlebois, & Nedecheva, 2009; Klonsky & Olino, 2008; Muehlenkamp et al., 2013; Nock & Prinstein, 2004, 2009; Saraff & Pepper, 2014). *Intrapersonal functions* are automatically or self-reinforcing and involve the use of NSSI to create a change in the psychophysiological state, such as affect regulation, self-punishment and the generation of feelings (Klonsky & Glenn, 2009; McKenzie & Gross, 2014; Nock & Prinstein, 2004; Zetterqvist et al., 2013). More specifically, individuals who self-injure for intrapersonal reasons might cite the following motivations: “to stop bad feelings”, “to relieve feelings of emptiness or numbness”, “to punish myself” and “to feel something, even if it was pain” (Klonsky & Glenn, 2009; Lewis & Santor, 2008; Lloyd-Richardson et al., 2007; Martin, Cloutier, Levesque, Bureau, Lafontaine, & Nixon, 2013; Muehlenkamp et al., 2013).

In contrast, *interpersonal functions* are socially reinforced, and NSSI is used to regulate or modify the individual’s social environment, with motivations such as, peer bonding, influencing others, and revenge (Klonsky & Glenn, 2009; McKenzie & Gross, 2014; Nock & Prinstein, 2004; Zetterqvist et al., 2013). On NSSI functional assessment scales (Functional Assessment of Self-Mutilation [FASM]; Inventory of Statement

About Self-Injury [ISAS]; Ottawa Self-Injury Inventory [OSI]; Self-Injurious Thoughts and Behaviors Interview [SITBI]), items measuring interpersonal functions typically include items such as “to get back at someone”, “to get out of doing something that I don’t want to do”, “to be part of a group” and “hope others notice something is wrong” (Klonsky & Glenn, 2009; Lewis & Santor, 2008; Lloyd-Richardson et al., 2007; Martin et al., 2013; Muehlenkamp et al., 2013). A significant number of individuals who self-injure have endorsed socially oriented reasons for engaging in NSSI (Klonsky et al., 2011; Zetterqvist et al., 2013). However, these motivations appear more strongly endorsed in adolescent samples (Lloyd-Richardson et al., 2007; Zetterqvist et al., 2013), than in young adults (Klonsky & Glenn, 2009; Martin et al., 2013; Saraff & Pepper, 2014), or adult samples (Kortge et al., 2013). In fact, Lloyd-Richardson et al. (2007) reported that in their nonclinical sample of adolescents, socially reinforced items were endorsed almost equally to intrapersonal (automatic) items. Contrary to this, the majority of research has repeatedly reported that these interpersonal reasons for self-injuring are not often endorsed by participants, and typically form only secondary reasons to intrapersonal motivations (Klonsky, 2009; Nixon et al, 2002).

There is considerable stigma associated with NSSI, based upon the perception that it is an attention seeking behaviour, or a mechanism for manipulating or influencing others (Law, Rostill-Brookes, & Goodman, 2009; Warm, Murray, & Fox, 2002). This appears to be a misnomer, given that intrapersonal functions are more commonly endorsed than interpersonal functions (Klonsky & Glenn, 2009; Kortge et al., 2013; Nock & Prinstein, 2004; Zetterqvist et al., 2013). Glenn and Klonsky (2011) found that lifetime frequency of NSSI was associated with intrapersonal but not interpersonal

Table 3: *Summary of Klonsky's (2007) Functions of Nonsuicidal Self-Injury*

Functions	Description of function
<i>Affect Regulation</i>	To reduce, relieve, cope or ameliorate unwanted affect and tension
<i>Anti-suicide</i>	To interrupt, change or cease suicidal thoughts or impulses
Autonomy	To demonstrate or prove self-sufficiency, control and independence
<i>Feeling Generation</i>	To disrupt or cease feelings of depersonalization, dissociation, numbness or emptiness, and generate a sensation to feel something
Interpersonal boundaries	To demarcate the distinction between the self and the other, individuation and identity assertion
Interpersonal influence	To seek support or care from others; to influence others' behaviours; to avoid a situation; or to gain attention
<i>Marking distress</i>	To express or communicate unbearable or inexpressible distress
Peer bonding	To affiliate, emulate or bond with others
Revenge	To demonstrate anger with someone else; hurt, punish or exact revenge upon them
<i>Pain Displacement</i>	To inflict physical pain to replace emotional pain, or unpleasant memories, a means of distraction, or because it is easier to care for
<i>Self-punishment</i>	To express anger, guilt, disappointment, frustration or disparage oneself by punishing the body
Sensation seeking	To generate a sense of excitement or exhilaration, akin to engaging in thrill seeking behaviours
Toughness	To experiment with, or prove a tolerance to pain

*Note.* Adapted from Klonsky (2007). Intrapersonal functions have been italicised whereas interpersonal functions are not. These functions have been listed alphabetically, and the listed order does not represent the frequency of endorsement in the empirical literature. These functions are not mutually exclusive, and there may be considerable commonality or overlap between them.

functions. In addition, Saraff and Pepper (2014) reported that intrapersonal functions were related to greater psychopathology. A comprehensive review of the literature revealed that the most commonly endorsed functions of NSSI across studies are affect

regulation (Favazza & Conterio, 1989; Klonsky, 2009; Nixon et al, 2002; Swannell, Martin, Scott, Gibbons, & Gifford, 2008); self-punishment (Hamza, Willoughby, & Armiento, 2014; Klonsky, 2009; Laye-Gindhu & Schonert-Reichl, 2005; Turner, Chapman, & Layden, 2012; Swannell et al., 2008); feeling generation, or the minimisation of dissociative symptoms (Briere & Gil, 1998; Klonsky & Glenn, 2009); marking or expressing distress physically (Glenn & Klonsky, 2011; Klonsky & Glenn, 2009; Swannell et al., 2008); and suicide prevention or self-preservation (Briere & Gil, 1998; Glenn & Klonsky, 2011; Klonsky & Glenn, 2009; Swannell et al., 2008).

Affect regulation is overwhelmingly cited as the most common reason for self-injuring, with the aim of alleviating negative or unwanted affect (Klonsky, 2009; Swannell et al., 2008). In adult clinical samples, affect regulation has recurrently been cited as the main reason for engaging in NSSI (Briere & Gil, 1998; Herpertz, 1995; Osuch, Noll, & Putnam, 1999). This finding has largely been replicated in community based samples of adults, with the majority of participants endorsing statements that were related to emotion regulation (Favazza & Conterio, 1989; Klonsky & Glenn, 2009; Kortge, Meade, & Tennant, 2013). Whilst, both clinical (Nock & Prinstein, 2004) and community samples (Laye-Gindhu & Schonert-Reichl, 2005) of adolescents also support an affect regulation function, other functions also share considerable weight for the reasons underpinning NSSI (Lloyd-Richardson et al., 2007; Zetterqvist et al., 2013). Klonsky (2009) argued that the evidence supporting an affect regulation function in NSSI is threefold. Firstly, the majority of participants in the extant research report that they self-injure to reduce negative affect. Secondly, laboratory and self-report studies indicate that negative affect is experienced prior to the act of NSSI and decreases following the self-injury. Finally, laboratory studies that represent self-injury through

algometer pressure devices or cold-pressor tasks, have resulted in reduced negative affect following the experimental condition.

The functions may also differ from the initiation of NSSI to the subsequent maintenance of the behaviour over its course (Lloyd-Richardson, Nock, & Prinstein, 2009; Muehlenkamp, 2005; Muehlenkamp et al., 2013; Saraff & Pepper, 2014). Saraff and Pepper's (2014) study suggests, that whilst interpersonal functions appear to be a factor in the maintenance of self-injurious behaviours, intrapersonal functions demonstrated a more significant role in the repetitive engagement in NSSI. Muehlenkamp et al. (2013) investigated the motives for initiating NSSI, and then the functions that NSSI performed for participants who repeatedly self-injured. Whilst affect regulation was cited as the most common function of NSSI overall, they found that affect regulation functions were endorsed more during the maintenance of NSSI, than for the initiation of the behaviour. Conversely, social motivations received greater endorsement during the initiation of NSSI than during repeated acts of self-injury. However, it should be noted that the authors developed two different lists of motives (18 possible reasons were developed) and functions (26 possible functions were created from extant research and client interviews) for the initiation and maintenance, respectively (Muehlenkamp et al., 2013).

A number of researchers have found gender differences in the self-reported functions for NSSI (Klonsky & Glenn, 2009; Lloyd-Richardson et al., 2007; Zetterqvist et al., 2013). Klonsky and Glenn reported that women endorsed intrapersonal functions for engaging in NSSI more than men, whilst their endorsement of interpersonal functions was comparable. They also ascertained that of the 13 functions on the Inventory of Statements About Self-Injury (ISAS), the only significant gender difference was that men were more likely to engage in NSSI for sensation seeking than



women. However, Zetterqvist et al. found that only six of the 22 different functions assessed by the Functional Assessment of Self-Mutilation (FASM) in their study were endorsed equally by both males and females. Finally, Lloyd-Richardson et al. determined that females were more likely to self-injure as a means of self-punishment, whilst males were more likely to engage in NSSI to make others angry.

An accurate assessment of the functions of NSSI holds important clinical implications. Individual treatment can be targeted to substitute self-injurious behaviours with more adaptive coping strategies and techniques that specifically fulfil the function/s that NSSI performs (Kortge, Meade & Tennant, 2013; Lloyd-Richardson, Nock, & Prinstein, 2004, 2009), providing what Lloyd-Richardson et al. (2009, p. 38) termed a “functionally guided treatment approach”. For example, if an individual self-injures in the hope of decreasing distress then the clinician can focus on exploring a range of alternate affect regulation strategies. Whereas, if NSSI is employed as a means of fitting in or bonding with peers then therapeutic approaches that target interpersonal skill development would be more appropriate (Linehan, 1993; Nock & Prinstein, 2004). Therefore, an assessment of the functions of NSSI is vital to developing an effective and viable treatment plan (Klonsky & Lewis, 2014; Klonsky et al., 2011).

## CHAPTER 3

### **Defining Nonsuicidal Self-Injury: The Importance in Distinguishing it from Suicide**

*When we describe a bit of human behavior as crazy we usually mean to push it aside as something alien to us, as something not germane to the ordinary conduct of life, yet every thoughtful man knows well that aberrant forms of behavior are only exaggerations of trends that lie deep within himself, that in the behavior of the insane he sees written large tendencies that sleep in his own constitution*

(Houston, 1934, p. 122).

A number of theorists have proposed that self-injurious thoughts and behaviours (SITB) can be conceptualised as a continuum of lethality, with suicide positioned as the most severe endpoint of the scale (Connors, 1996; Firestone & Seiden, 1990; Muehlenkamp & Gutierrez, 2007; O'Carroll et al., 1996; Silverman et al., 2007a, 2007b). Whilst NSSI and suicidality may share the same global characteristics or experiential qualities, aside from lethality, they differ fundamentally in their function, method and frequency (Bennun, 1984; Connors, 1996, 2000; Gollust, Eisenberg, & Golberstein, 2008; Hamza, Stewart, & Willoughby, 2012; Hamza & Willoughby, 2014; Walsh, 2006). Suicide is the desire to terminate life as it is known; whereas NSSI could be described as a type of maladaptive psychological “band-aid”, enacted to preserve life - not cease it (Connors, 2000; Shneidman, 1994; Silverman et al., 2007a). In fact, Favazza (1996) contended that NSSI is antithetical to suicide.

There are several key elements that distinguish NSSI from suicidal thoughts and behaviours, and extending on Shneidman's (1994) influential work on suicide, Walsh (2006) has provided the most comprehensive taxonomy differentiating NSSI from

suicidal thoughts and behaviours (see Table 4 for a summary). Operationally, NSSI and suicidal thoughts and behaviours are distinct in terms of intent: the type and number of methods employed; the potential for lethality; the resultant degree of tissue damage; the frequency of the behaviour; the level of psychological distress, cognitive constriction, and hopelessness and helplessness that are present; the fundamental problem underpinning the behaviour; and the psychological aftermath following the act (Shneidman, 1994; Walsh, 2006). Furthermore, NSSI and suicidality (suicidal ideations and suicide attempts) have been found to be empirically distinct, with different prevalence rates, correlates, antecedents and intervention responses (Bakken & Gunter, 2012; Nock & Kessler, 2006; Tuisku et al., 2014; Whitlock et al., 2013). As such, identifying and distinguishing between these two constructs is vital for epidemiology and public health, research and theory, and their effective management and treatment in clinical practice (Franklin et al., 2017; Messer & Fremouw, 2008; Muehlenkamp, 2005).

### **3.1 Intent**

It has long been argued that the primary factor in discriminating NSSI from suicidality and other SITB is *intent* (De Leo, Burgis, Bertolote, Kerkhof, & Bille-Brahe, 2004; Favazza, 1998; Favazza & Rosenthal, 1990; Nock & Kessler, 2006; Silverman et al., 2007a, 2007b; Suyemoto, 1998; Walsh, 2006). A *suicide attempt* (SA) is the intentional engagement in a self-injurious behaviour with at least some *intent* to terminate consciousness (Nock & Favazza, 2009). Intent refers to the goal or purpose of the behaviour (Silverman et al., 2007a; Walsh, 2006). The intent in suicide is to terminate consciousness or life as it is known. The term *consciousness* or *life as it is*

*known* is used here when discussing intent, as research has shown individuals may attempt suicide believing in an afterlife, transformation or rebirth (De Leo et al., 2004; Shneidman, 1994; Silverman et al., 2007a; Stanley, Gameroff, Michalsen, & Mann, 2001). Furthermore, these terms supplant the phrase *to die* as suicide is perceived as a solution and the goal is not necessarily to die, but rather to stop the unendurable psychological pain (Shneidman, 1994). This is not simply semantics, but is important as it operationally allows for the ambiguity that exists in suicidal intent, in the constant struggle between the innate survival instinct and intolerable emotional pain (De Leo et al., 2004; Shneidman, 1994). Silverman et al. (2007a) specified that there are four key assumptions underpinning the presence of suicidal intent: firstly, the desire to terminate life as a conscious experience; secondly, an understanding of the risk that engaging in the behaviour will entail; thirdly, an awareness of the methods that might be employed; and finally, knowledge about how to put these methods into effect. As such, whilst an action is implied in the concept of intent, it is not necessarily enacted (Silverman et al., 2007a).

Conversely, the intent in NSSI is not to terminate consciousness but rather to interrupt it. The goal is to obtain relief from overwhelming or undesirable affect (i.e., distress, numbness, anger, agitation, stress, sadness). It is a maladaptive coping mechanism undertaken as solution to *modify* rather than *terminate* consciousness (De Leo et al., 2004; Shneidman, 1994; Walsh, 2006). In 1938 Menninger articulated this distinction when describing the range of self-injurious behaviours in a male patient “...it demonstrates the entire absence of a real wish to die. Anyone strongly determined to kill himself could have done so with one-hundredth the effort that this boy used ...” (p. 230).

The concept of intent is fraught with complexity in both suicidal thoughts and behaviours and NSSI (Silverman et al., 2007a; Walsh, 2006). It is often difficult to determine the true intent of an individual's behaviour unless they have left a suicide note or explicitly stated "I swallowed those pills in an attempt to kill myself," or in the case of NSSI, "I didn't want to die, I just wanted to feel something." Unfortunately, intent is often not this straightforward nor clearly articulated (Walsh, 2006). Furthermore, the assumption of intent is fundamentally grounded in the premise that it is a dichotomous variable, with the intent to suicide either present or absent (O'Carroll et al., 1996; Prinstein, 2008; Silverman et al., 2007a). However, a number of researchers argue the ambiguity in suicidal intent should be reflected in suicide assessment, requiring more flexibility than the dichotomous *zero intent to die* and *non-zero intent to die* bifurcation (O'Carroll et al., 1996; Prinstein, 2008; Silverman et al., 2007a, 2007b). In an effort to address this, Silverman et al. (2007a) proposes the inclusion of a third category in the nomenclature of suicide and suicidal behaviours: no intent, uncertain intent, and intent.

The definition of NSSI operationally precludes the presence of suicidal intent during the actual act of self-injury. However, it does not exclude suicidal intent occurring concurrently but independently of the act of NSSI during the same period in time that NSSI was assessed (i.e., the last 4 weeks, 12 months), nor occurring at a later stage. The results on the presence of suicidal ideation in individuals who self-injure are mixed in the extant literature, ranging from no suicidal ideation during NSSI (Walsh & Rosen, 1988) to reports of suicidal ideation occurring independent of, preceding or following NSSI (Gollust et al., 2008; Martin, Swannell, Hazell, Harrison, & Taylor, 2010; Muehlenkamp & Gutierrez, 2004; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006; Whitlock et al., 2013). However, extant research indicates that the

majority of individuals who engage in NSSI do not experience suicidal ideation during the same period, with estimates ranging from 51.9% (Martin, Swannell, Hazell, et al., 2010) to 89% (Gollust et al., 2008).

Whilst NSSI needs to be understood as operationally and theoretically distinct from suicidal thoughts and behaviours, and the research reveals that the incidence of one does not preclude the presence of the other, they are not mutually exclusively occurring constructs (Briere & Gil, 1998; Tantam & Husband, 2009). Unfortunately, the absence of suicidal intent does not act as a protective factor against later suicidal ideation nor suicide attempts or death (Nock & Kessler, 2006). Engagement in NSSI has been consistently reported as a predictive or risk factor in subsequent suicide attempts (Klonsky, May, & Glenn, 2013; Tuisku et al., 2014). It is this overlap and co-occurrence between NSSI and suicidal thoughts and behaviour that results in considerable clinical and theoretical confusion (Klonsky et al., 2013; G. Martin, Swannell, Hazell, et al., 2010). Given, these conceptual and operational issues with intent, NSSI must be investigated more thoroughly to distinguish it from suicidal thoughts and behaviours and other SITB, exploring the other points of differentiation.

### **3.2 Further Points of Differentiation Between NSSI and Suicidality**

Aside from intent, there are several other important differences between NSSI and suicidality that must be explored theoretically and in conducting a thorough clinical assessment.

### **3.2.1 The Method Employed in the Act of NSSI vs. Suicide**

A notable point of distinction between suicidal thoughts and behaviours and NSSI is the method used to carry out the act, which varies considerably between the two behaviours. Individuals who attempt suicide typically opt for methods of a higher lethality, for instance the most common methods of suicide in Australia in 2015 were ranked as hanging (which includes suffocation and strangulation); poisoning by drugs; other (including fires, motor vehicle accidents or stepping in front of any mode of transport); poisoning by other methods (including alcohol or carbon monoxide); firearms; and falls or jumping from a height (Australian Bureau of Statistics, 2016). Interestingly, the most common method of NSSI – cutting – accounted for only 3% of deaths by suicide in Australia in 2015. As Walsh (2006) highlighted, this is significant as it means that 97% of all individuals who died by suicide in Australia in 2015 died using methods other than contact with a sharp object. Individuals who engage in NSSI typically employ methods with a much lower risk of lethality – such as cutting, scratching, burning, and self-hitting – resulting in wounds which generally do not require medical attention (Bryan & Bryan, 2014; Cawood & Huprich, 2011; Favazza, 1992; Jacobson & Gould, 2007; Klonsky, 2011; Martin, Swannell, Hazell, et al., 2010; Nixon, Cloutier, & Jansson, 2008; Sornberger, Heath, Toste, & McLouth, 2012). Furthermore, the type of cutting that is likely to result in death is severing the carotid artery or jugular veins. It is not cutting the forearms, legs & torso, which are the most common sites for self-injury (Walsh, 2006). Indeed, in a study involving NSSI and DSH admissions to hospital and subsequent death by suicide, Miller et al. (2013) found that 71% of individuals who were initially admitted for cutting, changed to a more lethal method to attempt suicide.

### **3.2.2 The Number of Methods Employed in the Act of NSSI vs. Suicide**

Not only do the *types* of methods differ between NSSI and suicide attempts, but also the *number* of methods used (see Table 4). Individuals who attempt suicide typically use only one method even if they make multiple attempts (Muehlenkamp, 2005). However, those who engage in NSSI often use multiple methods to self-injure; such as cutting and carving, or scratching and burning (Brunner et al., 2013; Bryan & Bryan, 2014; Gollust et al., 2008; Hamza, Willoughby, & Good, 2013; Klonsky, 2011; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; G. Martin, Swannell, Hazell, et al., 2010; Whitlock, Eckenrode, & Silverman, 2006; You, Leung, Fu, & Lai, 2011). Furthermore, acts of NSSI occur with far greater frequency than suicide attempts in individuals. Suicide attempts are typically not made recurrently or with the chronicity in which NSSI typically occurs (Muehlenkamp, 2005; Walsh, 2006).

#### **3.2.2.1 The Psychological Aftermath**

Finally, the psychological aftermath following a suicide attempt is in direct contrast to that experienced after engagement in NSSI. After a suicide attempt, the individual typically feels greater distress and frustration. Conversely, the act of self-injury has an immediate effect, instantly reducing psychological distress or unwanted affect (Stanley et al., 2001; Walsh, 2006). It has been theorised that the immediacy of the effect significantly underpins the addictive quality of NSSI, contributing to the higher frequency of engagement in NSSI than suicide attempts (Nixon et al., 2002; Victor, Glenn, & Klonsky, 2012).



### 3.3 NSSI and Later Suicide Attempts

Recent research indicates that NSSI is a strong predictor of later suicide attempts (Guan, Fox, & Prinstein, 2012; Hamza & Willoughby, 2016; Klonsky et al., 2013; Riberio et al., 2016; Tuisku et al., 2014). In fact, Klonsky et al. (2013) found that NSSI was a greater predictor of attempted suicide than any other psychological risk factors, such as depression, anxiety, impulsivity and BPD. At approximately 26% (Laye-Gindhu & Schonert-Reichl, 2005; Martin, Swannell, Hazell, et al., 2010) the rates of suicide attempts appear significantly higher in individuals who self-injured than individuals who had never self-injured: 4.3% (Laye-Gindhu & Schonert-Reichl, 2005) to 6% (Martin, Swannell, Hazell, et al., 2010). A meta-analysis of 172 longitudinal studies predicting suicide ideation, attempts and death, reported that individuals with a history of NSSI were 4.27 times more likely to attempt suicide (Riberio et al., 2016).

Investigating a community sample of adolescents who self-injured, Muehlenkamp and Gutierrez (2004) found that 5.9% had attempted suicide independently of their NSSI. Examining not only NSSI, but suicidal intent and suicidal attempts, students were classified into three groups based on their survey responses: No history of NSSI, suicidal intent or suicide attempts; engagement in NSSI within the past year excluding any suicidal intent or suicide attempts; and NSSI with suicide attempts. The authors found that a further 3.4% of participants had self-injured and made a suicide attempt within this time frame. In a smaller sample of 2,317 adolescents, aged 13 to 21 years from Hong Kong, Cheung et al. (2013) also categorised students into groups based on the presence of NSSI, suicidal intent and suicide attempts. The authors did not report the NSSI only rate in their paper; however, it can be calculated and 5.18% of their sample engaged in NSSI only in the 12 months preceding their survey; and an additional 8.80% engaged in NSSI with suicidal intent and suicide attempts. Whilst,

Nock et al. (2006) reported that a startling 70% of adolescents who engaged in NSSI in their sample had also made at least one suicide attempt throughout their lifetime.

Despite the range of results, it has been consistently found that when suicide attempts have been made a different method has generally been employed than the individual's preferred method of NSSI, with suicide attempts predominantly made via an overdose (Favazza, 1992; Favazza & Rosenthal, 1993; Muehlenkamp; 2005; Stanley et al., 2001).

Favazza (1992) asserted that a suicide attempt often occurs through the individual's inability to control their self-injurious behaviour any longer. In support of this, recent research in a large community based adolescent sample found that with each additional act of NSSI there was a sevenfold increased risk of future suicide attempts (Guan et al., 2012). A similar result was found in a sample of university students also examined over a two year period, where higher frequency of NSSI (> 20 lifetime acts) was predictive of later suicidal thoughts and behaviours (Whitlock et al., 2013).

Theoretically, Joiner's (2005) interpersonal-psychological theory of suicide has recently been evoked by a number of researchers to explicate the relationship between the frequency of NSSI and future suicide attempts (Guan et al., 2012; Klonsky et al., 2013; Muehlenkamp & Gutierrez, 2007; Nock et al., 2006; Tuisku et al., 2014; Victor & Klonsky, 2014; Willoughby, Heffer, & Hamza, 2015). Joiner (2005) argued that suicide requires both the *desire* to cease consciousness and the acquired *capability* to enact that desire. NSSI proffers a virtually inimitable risk factor for attempting suicide, in that it provides stimuli for both desire and capability, unlike virtually any other risk factor which may provide one or the other. Other psychological risk factors, such as depression, anxiety, BPD and schizophrenia may trigger the *desire* to attempt suicide but they do not provide the *capability* (Joiner, 2002, 2005; Joiner, Brown, & Wingate,

2005). Whereas, drawing upon Beck's (1996) Cognitive Sensitization and Solomon's (1980) Opponent Process Theory, Joiner (2002; 2007) postulated that individuals habitually gain the ability to attempt suicide through their experience in NSSI. Repeated engagement in NSSI confers an understanding of self-injurious methods and how to use them. Furthermore, NSSI habituates individuals to the fear and pain associated with SITB, desensitizing their capability to attempt suicide (Joiner, 2002, 2005; Joiner et al., 2006).

Whilst the majority of individuals who engage in NSSI may not attempt suicide, NSSI is clearly a salient risk factor for suicidal ideation, attempted suicide and suicide. As such, this has direct implications for clinical practice. A comprehensive suicide assessment should be undertaken when NSSI is present, and periodically in the future even if individuals did not present with suicidal ideation in the past. Suicide assessment should also occur after NSSI behaviours have ceased (Nock et al., 2006; Whitlock et al., 2013). Given the prevalence rates of NSSI a focus of future research should be on further distinguishing between NSSI and suicide, particularly as to what places some individuals at risk of suicide over others (Guan et al., 2012).

Table 4: *Differentiating Self-harm from Suicidality*

Feature	NSSI	Suicide
1. Intent	<ul style="list-style-type: none"> <li>▪ To alleviate emotional distress</li> <li>▪ To <i>modify</i> consciousness</li> <li>▪ To harm a part of the body to <i>ease</i> the pain</li> </ul>	<ul style="list-style-type: none"> <li>▪ To die</li> <li>▪ To <i>terminate</i> consciousness</li> <li>▪ To kill oneself to <i>cease</i> the pain</li> </ul>
2. Method and Potential Lethality	<ul style="list-style-type: none"> <li>▪ Methods of low lethality: cutting, carving, scratching, burning</li> </ul>	<ul style="list-style-type: none"> <li>▪ High lethality methods: hanging, poisoning, firearm, fall</li> </ul>
3. Number of Methods Used	<ul style="list-style-type: none"> <li>▪ Usually &gt;1 method over time</li> </ul>	<ul style="list-style-type: none"> <li>▪ Typically 1 method</li> </ul>
4. Level of Physical Damage	<ul style="list-style-type: none"> <li>▪ Minor tissue damage, rarely requiring medical attention</li> </ul>	<ul style="list-style-type: none"> <li>▪ Major tissue damage, broken bones, serious cognitive deficits, death</li> </ul>
5. Frequency / Repetition	<ul style="list-style-type: none"> <li>▪ Frequently multiple acts, becoming a chronic, high-rate pattern</li> </ul>	<ul style="list-style-type: none"> <li>▪ Typically single episode</li> <li>▪ Individuals may make multiple overdose attempts</li> </ul>
6. Degree of Psychological Pain	<ul style="list-style-type: none"> <li>▪ Uncomfortable, irregular</li> </ul>	<ul style="list-style-type: none"> <li>▪ Intolerable, unrelenting</li> </ul>
7. Constriction of Cognition	<ul style="list-style-type: none"> <li>▪ Little or no constriction</li> <li>▪ Potential to comprehend options available</li> <li>▪ Looking for a temporary solution</li> </ul>	<ul style="list-style-type: none"> <li>▪ Extreme constriction → tunnel vision</li> <li>▪ Suicide is the only option</li> <li>▪ Looking for a final solution</li> </ul>
8. Psychological Aftermath	<ul style="list-style-type: none"> <li>▪ <i>Immediate</i> relief → addictive quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ <i>No</i> relief, typically feel worse</li> </ul>

*Note.* The information included in this table is based on the literature reviewed, and incorporates tabulated material from Muehlenkamp (2005), Pattison and Kahan (1983), and Walsh (2006).

## CHAPTER 4

### Non-Suicidal Self-Injury: An Epidemiological Profile

*Does anybody know how I feel?*

*Sometimes I'm numb, sometimes I'm overcome*

*Does anybody care what's going on?*

*Do I have to wear my scars like a badge on my arm*

*For you to see me, I need release*

(“Scream,” ZOEgirl, 2005, track 4)

#### 4.1 An Epidemiological Picture of Self-Harm in Australia

Martin, Swannell, Hazell, et al. (2010) estimated that approximately five to ten million dollars are spent per month in Australia on hospital admissions for self-harm. Results from the National Hospital Morbidity Database (NHMD) revealed that between 2010 and 2011 there were approximately 26,062 hospital admissions for intentional self-harm in Australia (Australian Institute of Health and Welfare: Pointer, 2013). The terms *admissions* and *cases* are used interchangeably throughout this section, as the data refers not to the number of individuals admitted, but rather to the number of hospital admissions, as some people may have had multiple hospital admissions throughout this period. This data is based on the definitions of *intentional self-harm* presented in the ICD-10-AM listed in Chapter XX *External causes of morbidity and mortality* (see Appendix K for the full range X60–X84 as cited in AIHW, 2013). As such, this total admission figure incorporates not only non-suicidal self-injury but a much greater range of self-harming behaviours including suicide, and suicide attempts; 10 different categories of self-poisoning; two categories of self-harm by weapon discharge and one by exposure to explosive material; hanging, strangulation or suffocation; self-harm by smoke, fire or flames; burns due to steam, hot vapours and hot objects; self-harm by a

blunt object; drowning; jumping from a height; lying in front of, or jumping from a moving object; crashing a vehicle; and other specified means or unspecified means. The category most pertinent to this research is self-harm by a sharp object (AIHW, 2013).

In Australia, self-harm by a sharp object accounted for 13% of the public and private hospital admissions for self-injurious behaviour from 2010 to the 30<sup>th</sup> of June 2011, preceded only by self-poisoning (82%). Of the 3,388 cases, there were more females ( $n = 1811$ ) than males ( $n = 1577$ ) who injured themselves with a sharp object during this period. The majority of admissions occurred within the 25 to 44 year age group ( $n = 1588$ ), followed by 15 to 24 years olds ( $n = 1109$ ), 45 to 64 year olds ( $n = 528$ ) and finally those aged 0 to 14 ( $n = 61$ ). There were no hospital admissions for self-harm by a sharp object in individuals over 65 years of age. There has been a substantial increase in self-harm by sharp objects within the 15-24 age group, with the number of admissions almost doubling over the past decade, from 576 admissions in 1999-2000 to 1109 in 2010-2011. Even more concerning, is the considerable rise in admissions for females within this age range, increasing from 274 cases in 1999-2000 to 640 a decade later in 2010-2011 (AIHW, 2013).

In one of the largest studies investigating adult NSSI in the community, the Australian National Epidemiological Study of Self-Injury (ANESSI) randomly surveyed 12,006 Australians (Martin, Swannell, Harrison, et al., 2010). Following Briere and Gil's (1998) national study of adult self-mutilation in the US, this is only the second study of its kind, investigating the prevalence of self-injury in an adult non-clinical nationally representative sample. Adopting a definition of self-injury without suicidal intent, they found that 2.6% of the population over 10 years of age had self-injured in the 12 months prior to the survey, with a lifetime prevalence of 8.1% in 978 participants

(Martin, Swannell, Harrison, et al., 2010). In comparison, Moller, et al. (2013) found that 8.2% of participants (n = 4160) reported they had self-injured *over the past year* in their sample of adults aged between 20 – 24 years and 40 – 44 years, who were randomly drawn from the Australian Capital Territory and surrounding area. Whilst in a community sample of 211 participants (comprised predominantly of university students, aged 18-30 years) recruited from Melbourne, Hasking, Momeni, Swannell, and Chia (2008) found a prevalence rate of 43.6% in the previous 12 months. Martin, Swannell, Hazell, et al. (2010) specified that whilst 12 children in the 10-14 age group (9 males, 3 females) and 2 adults in the 75-84 year old age group (1 male, 1 female) had self-injured in the four weeks preceding the survey, NSSI was most prevalent in females aged 15-19 years (4%) and 20-24 years (3.6%); and in males at 10-14 years (2.3%) and 15-19 years (2.2%), before decreasing with age in both males and females. The higher prevalence rates in the Hasking et al. study could in part be attributed to their recruitment process, which openly detailed the study, potentially contributing to sampling bias.

In 2002, The Australian Institute for Suicide Research and Prevention participated as the only non-European collaborator in the large international Child and Adolescent Self-Harm in Europe (CASE) research project. In Queensland, 3757 students were recruited across years 10 and 11 from 14 government and independent secondary schools (De Leo & Heller, 2004). De Leo and Heller indicated that 6.2% of the students in their study had self-harmed in the past 12 months, whilst 12.4% reported a lifetime history of DSH. This lifetime prevalence rate is slightly higher than the lifetime prevalence rate found by Martin, Swannell, Hazell, et al. (2010).

Both De Leo and Heller (59.2%) and Martin, Swannell, Hazell et al. (40.6%) indicated that cutting was the most common method of self-injury. Martin, Swannell, Hazell, et al. discerned that cutting was very closely followed by scratching (39.8%); deliberately hitting a part of one's body against a hard surface (36.8%); punching, hitting or slapping one's self (33.8%) and then biting and burning (both at 15%). Aside from cutting, De Leo and Heller (2004) reported a greater range of self-harming behaviours that – unless specified by the individual – cannot be easily differentiated from suicidal thoughts and behaviour in terms of intent: overdosing on medication (29.6%); ingesting a recreational or illicit drug with the intention to cause harm (3%); self-battery (2.2%); hanging (1.7%); and sniffing or inhalation (1.7%). Moller, et al. (2013) adopted a similar approach, and exploring self-harm even more broadly they found that self-battery was the most common form of self-harm in their sample (78.8%); followed by denying yourself a necessity (i.e., food) for punishment (23.9%); cutting (12.4%) and then overdose (7.4%).

Dispelling the myth that self-injury is a predominantly female and adolescent phenomenon, Martin, Swannell, Hazell, et al. (2010) found higher prevalence rates of male self-injury than previously reported in the literature. Whilst more females than males engaged in NSSI in the 18-24 year old age group, more males self-injured amongst 25-34 year olds; and there were no significant differences between gender across any of the other age groups (Martin, Swannell, Harrison, et al., 2010). Interestingly, Moller, et al. (2013) also reported more males self-harmed within the 20-24 year old cohort than females. Whilst in their investigation of DSH in adolescence, De Leo and Heller (2004) found that females were more likely to engage in DSH than males. However, the authors noted that 41% of the males in their study (compared to



16% of females) did not write a qualitative description of their DSH and were therefore excluded from the statistical analyses.

Martin, Swannell, Hazell, et al. also demonstrated that NSSI does not always commence and end during adolescence, as often depicted. They found that the average age of onset was 17.15 years, which is considerably older than often reported. In addition, the age of onset ranged from 5 to 63 years of age. Interestingly, six women indicated that their initial act of self-injury occurred between 45 and 54 years of age (Martin, Swannell, Harrison, et al., 2010).

#### **4.2 Prevalence Rates of NSSI: Why the Inconsistencies?**

In the three studies conducted in Australia over the past decade examining prevalence rates of NSSI, the 12 month prevalence of self-injury ranged from 2.6% (Martin, Swannell, Hazell, et al., 2010) to 43.6% (Hasking et al., 2008). This is largely reflective of the global body of data. As such, it is extremely difficult to ascertain whether the range in prevalence rates for NSSI represents unique variations in different populations or is merely an artefact of the many methodological concerns inherent in epidemiological research into NSSI (Brunner et al., 2013; Muehlenkamp, Claes, Havertape, & Plener, 2012; Watanabe et al., 2012). Firstly, as discussed earlier, there is considerable inconsistency in the operational nomenclature across studies (refer to section 2.3: Fox, 2011; Jeffery & Warm, 2002; Latimer et al., 2013; Stanford & Jones, 2010), in particular whether self-injurious behaviours occur with or without suicidal intent, and the distinction between deliberate self-harm and non-suicidal self-injury (Martin, Swannell, Hazell, et al., 2010; Muehlenkamp et al., 2012). Secondly, there has been significant variability between the actual assessment measures used, and also in

the format in which these different inventories, questionnaires, scales and surveys have been presented (Muehlenkamp et al., 2012; Swannell et al., 2014). Thirdly, a number of different time frames have been used in the assessment (i.e., 4 weeks, 6 months, 12 months or lifetime prevalence) making comparisons across studies quite challenging (Jacobson & Gould, 2007; Muehlenkamp et al., 2012). Fourthly, there are numerous issues associated with hospital admissions and separation data, fundamentally in that they are under-representative, non-generalizable, and challenging to differentiate the behaviour from suicide attempts. Finally, the heterogeneity of individuals who self-injure and the different sample characteristics – such as, age, gender, specific populations, and clinical versus non-clinical populations – makes it very difficult to compare epidemiological results across studies.

#### **4.2.1 Assessment Measures: Single Item Questions versus Behaviour Checklists**

Research indicates that the primary variable impacting prevalence rates is not how self-injurious behaviour is operationally defined (i.e., DSH versus NSSI) as previously thought, but extending upon this, how the behaviour is actually assessed (Lloyd-Richardson et al., 2007; Muehlenkamp et al., 2012; Sornberger et al., 2012; Swannell et al., 2014). An analysis of seven different NSSI studies in college samples highlights one of the fundamental problems inherent in NSSI research; five different assessment measures were used to assess NSSI in these seven studies (Cawood & Huprich, 2011; Gratz et al., 2002; Hamza et al., 2013; Hasking et al., 2008; Paivio & McCulloch, 2004; Whitlock et al., 2006, 2011). Gratz et al., and Cawood and Huprich used the Deliberate Self-Harm Inventory (DSHI) developed by Gratz (2001); Hamza et

al. utilised the Inventory of Statements about Self-Injury (ISAS: Klonsky & Olino, 2008); whilst Whitlock et al. (2006), Paivio and McCulloch and Hasking et al. all created new measures to explore the behaviours of NSSI, with Whitlock et al. (2011) refining their earlier Non-Suicidal Self-Injury Assessment Tool with an additional two behaviours.

A concerning assessment bias appears to exist between single item assessment measures and behavioural checklist measures (Heath et al., 2008; Muehlenkamp et al., 2012; Sornberger et al., 2012). Single item assessment measures simply require the participant to provide a yes, no or Likert based response indicating whether they have self-injured within the prescribed time frame (i.e., the past 4 weeks, 12 months, or over your lifetime). For instance, in their large population based study of 61,767 U.S. students Taliaferro, Muehlenkamp, Borowsky, McMorris, and Kugler (2012, p. 206) requested participants to respond “no,” “yes, during the last year,” or “yes, more than a year ago” to the question “Have you ever hurt yourself on purpose [cutting, burns, bruises]?” Similarly, Briere and Gil (1998, p. 611) measured NSSI in their national study by the single question: “intentionally hurting yourself [e.g., by scratching, cutting, or burning] even though you weren’t trying to commit suicide” which was rated on a four-point Likert scale ranging from 0 (never) to 3 (often) during the past six months. In comparison, behavioural checklists require respondents to nominate from a list of behaviours (i.e., cutting, burning, scratching, biting, interference with wound healing, carving, rubbing skin against rough surfaces, inserting sharp objects into the skin, punching self, ingesting dangerous substances etc.) which types of NSSI or DSH they have engaged in within the nominated period; assessing not only the presence of self-injurious behaviours but also the method of NSSI. However, behavioural checklists vary greatly in the number of behaviours presented to participants, ranging from 5 (Brunner

et al., 2013; Hasking et al., 2008; Nixon et al., 2008; Sornberger et al., 2012; You et al., 2011) to 19 behaviours (Whitlock et al., 2011). Assessment measures comprising checklists of behaviours have consistently yielded higher prevalence rates than single item measures (Heath et al., 2008; Lloyd-Richardson et al., 2007; Muehlenkamp et al., 2012; Sornberger et al., 2012; Swannell et al., 2014). This has been attributed to a number of reasons. Firstly, a checklist of behaviours essentially acts as a recognition task, requiring respondents to read through each behaviour, requiring a greater time commitment and consideration of each individual item; as opposed to the single question format which is a free recall task (Swannell et al., 2014). The recognition component may provide a prompt to participants, reminding them of their engagement in one or more of the methods of self-injury that they had undertaken in the past, such as interference with wound healing or skin picking (Heath et al., 2008; Swannell et al., 2014). Secondly, checklists may yield higher prevalence rates as the presentation of a number of behaviours broadens the definition of self-injury, encapsulating the breadth of NSSI (Heath et al., 2008; Lloyd-Richardson et al., 2007; Sornberger et al., 2012). There is some evidence of this in adolescent studies, with several studies employing the Functional Assessment of Self-Mutilation (FASM) or the Ottawa Self-Injury Inventory (OSI), which consist of 11 and 17 behaviours respectively, reporting higher prevalence rates (Hilt, Cha, & Nolen-Hoeksema, 2008; Lloyd-Richardson et al., 2007; Plener et al., 2013; Zetterqvist et al., 2013) than those employing checklists of 5 or 6 behaviours (Martin, Swannell, Hazell, et al., 2010; Nixon et al., 2008; You et al., 2011). However, as Heath et al. (2008) contends, merely listing behaviours does not ensure consistency in the conceptualisation of each behaviour between both the participants and the researchers. Heath et al. (2008) provide the example of “sticking pins into skin” arguing that it could potentially be conceived as a form of self-injury, tattooing, substance

abuse, or more extreme body modifications. At present, it remains unclear whether the single item assessment measures are underestimating the prevalence of NSSI and DSH, or if the behavioural checklists are resulting in an inflation in the rates (Muehlenkamp et al., 2012; Swannell et al., 2014).

#### **4.2.2 Response Rates and Representativeness of the Data**

Response rates are an important estimate of potential nonresponse bias and therefore the representativeness of the data (Williams, Hodgins, & Smith, 2007). As such higher response rates typically result in greater generalization and reliability of the findings of any given study (Swannell et al., 2014; Williams et al., 2007). The response rate could potentially be influenced by whether the true nature of the study is initially disclosed to participants. For instance, advertising a study on NSSI may specifically attract individuals who are currently self-injuring or have a history of self-injury. Interestingly and somewhat contradictingly, the two studies with the lowest prevalence rates (15.3%: Whitlock, et al., 2011; & 17%: Whitlock, et al., 2006) and the two studies with the highest prevalence rates (39.5%: Hamza, et al., 2013; & 41%: Paivio & McCulloch, 2004) all recruited participants under the premise of completing a broader study where the topic of NSSI was not revealed. For example, Whitlock et al. (2011) emailed students an invitation to complete a *Survey of Student Wellbeing*, whilst Paivio and McCulloch telephoned their randomly selected students and asked if they were interested in participating in a study on “childhood experience, feelings, and coping behaviour”. The response rates in these four studies range from 37% (Whitlock et al., 2006), 38.9% (Whitlock et al., 2011) to 100% (Paivio & McCulloch, 2004).

The 100% response rate reported by Paivio and McCulloch (2004) could be attributed to the incentive of a course credit awarded to the students for their participation in the research. Hamza et al. (2013) provided students with the choice of a course credit or monetary compensation (\$10) for their time and effort. Gratz et al. (2002) also offered a research credit to their 133 students for completing their paper survey package. In the United States of America, university students are often required to participate in research as a prerequisite of their undergraduate course exchange for course credit. Swannell et al. (2014) contends that as students typically elect to participate in research that is personally relevant, this offer of a course credit is likely to attract students who either currently self-injure or have a history of NSSI, leading to the potential over-representation and subsequent amplification of prevalence rates in this population.

#### **4.2.3 Prevalence Rates: Inconsistency in Time Frames**

It is also difficult to compare prevalence rates across studies, as researchers have used different time frames to assess the rate of NSSI in their samples (Jacobson & Gould, 2007; Muehlenkamp et al., 2012). Whilst, the majority of studies now investigate lifetime prevalence rates (Briere & Gil, 1998; Gratz et al., 2002; Hamza et al., 2013; Hasking et al., 2008; Klonsky, 2011; Muehlenkamp & Gutierrez, 2007; Nixon et al., 2008; Paivio & McCulloch, 2004; Sornberger et al., 2012), a number of studies have included statistical results of both lifetime prevalence and engagement in NSSI over the past 12 months (Cawood & Huprich, 2011; Hilt, Cha, et al., 2008; Larsson & Sund, 2008; Lloyd-Richardson et al., 2007; Whitlock et al., 2006; Whitlock et al., 2011; Zetterqvist et al., 2013). However, several papers have reported different time frames,

such as 4 weeks (Martin, Swannell, Hazell, et al., 2010), 6 months (Plener et al., 2013), 12 months (Taliaferro et al., 2012) or two years (You et al., 2011), making comparisons challenging at best.

#### **4.2.4 Hospital Data**

Early epidemiological studies relied heavily on hospital admission data, particularly in England (Hawton, Bergen, Mahadevan, Casey, & Simkin, 2012; Hawton, Fagg, & Simkin, 1996; Hawton, Fagg, Simkin, Bale, & Bond, 1997; Hurry, 2000; Simpson & Porter, 1981; Tulloch, Blizzard, Hornsby, & Pinkus, 1994). However, for multiple reasons hospital admission data is not generalizable to the broader community as far as NSSI or DSH is concerned. Whilst popular culture in the form of music, film, television and the written word have generated far greater public awareness about NSSI, fundamentally it remains a highly secretive behaviour. It is typically performed in the privacy of one's own home, often behind locked doors (Madge et al., 2008). Many individuals who self-injure go to great lengths to hide their behaviour from family, friends and colleagues, injuring themselves on parts of their bodies where their wounds may be easily concealed by clothing or accessories (Briere & Gil, 1998; Madge et al., 2008). The act itself may also be considered inherently private by those who self-injure. The six participants in Crouch and Wright's (2004, p. 193) qualitative study of DSH revealed that secrecy was considered one of the key characteristics of a "genuine self-harmer". If unwanted attention is directed to wounds, they are often attributed to accidents or clumsiness by individuals who self-injure (Briere & Gil, 1998). If adolescents inform anyone about their self-injury, research suggests it is most likely to be a peer, rather than a trusted adult, medical or mental health professional (Brunner et

al., 2013; De Leo & Heller, 2004; Evans, Hawton, & Rodham, 2005; Klonsky, 2011; Whitlock et al., 2011). A significant number of individuals who self-injure remain hidden in our community, not disclosing their self-injurious behaviour to anyone. In a large sample of adolescents in England ( $n = 6020$ ), Evans, Hawton and Rodham (2005) reported that 21.1% of the 15-16 year olds in their study had not informed anyone about their NSSI. Similarly, 29% of adolescents in a German research study indicated that no one knew about their NSSI (Plener et al., 2013). Findings from studies on young adults yield comparable results, with 35.2% (2006) and 22.6% (Whitlock et al., 2011) of college students revealing that they had not disclosed their NSSI to anyone. Furthermore, of the individuals that actually do inform a friend or family member about their self-injury, Martin, Swannell, Harrison et al. (2010) found that only 31.6% of them actually asked for help.

In non-clinical populations, the overwhelming majority of acts of NSSI do not result in the level of tissue damage that would require medical attention. Predominantly individuals engaging in NSSI in the community sustain only minor or moderate physical harm (i.e., scratching, bleeding, burning, bruising, and superficial lacerations). As such, only a small percentage of individuals present to accident and emergency departments each year to obtain medical treatment for their self-inflicted injuries (Brunner et al., 2013; Hawton, Bergen, Waters, et al., 2012; Klonsky, 2011; Lloyd-Richardson et al., 2007; Martin, Swannell, Hazell, et al., 2010; Watanabe et al., 2012; Whitlock et al., 2011). In Australia, only 10.3% of adolescents who self-harmed presented to hospitals for treatment, according to De Leo and Heller (2004). Martin, Swannell, Harrison, et al. (2010) found that 16.1% of participants who had self-injured in the four weeks prior to the survey had sought medical treatment for their wounds, however only 2.3% presented to an emergency department and were admitted



overnight. Examining three different epidemiological studies in the U.S. across the lifespan reveals a similar pattern, with 3% of adolescents (Lloyd-Richardson et al., 2007), 5% of college students (Whitlock et al., 2011) and 3.8% of adults (Klonsky, 2011) receiving medical attention for wounds as a result of their NSSI.

Given the small percentage of individuals engaging in NSSI who actually present to hospitals, a case could be made that these individuals are qualitatively different from those in the community who do not require medical treatment for their wounds (Morgan, 1979). Injuries requiring medical attention may also be indicative of a suicide attempt; an escalation of self-injurious behaviour; and/or self-injuring whilst substance affected which can significantly impair judgement regarding the degree of harm inflicted. This would provide yet another reason that hospital derived data cannot be generalised to those who self-injure in the greater community (Morgan, 1979). A further concern with basing community prevalence estimates on hospital admissions and separation data, is that the way the data is classified and recorded, can greatly impact the prevalence rates. Criteria regarding the classification of intentional self-harm during hospital admission procedures may also change over time. Presently, the data does not adequately distinguish between deliberate self-harm with suicidal intent and self-injury without suicidal intent. Currently, all forms of self-harming behaviour, suicide attempts, self-poisoning and NSSI are recorded in hospital data under the very broad heading of “intentional self-harm behaviours” according to the ICD-10-AM (see Appendix K) (Berry & Harrison, 2007; Martin, Swannell, Hazell, et al., 2010). As such, the data needs to be interpreted with considerable caution (Berry & Harrison, 2007).

#### **4.2.5 NSSI: The Challenge of Calculating Prevalence Rates in a Heterogeneous Population**

Different populations, behaviours, age groups, gender and other specific sample characteristics make it challenging to compare prevalence data across studies (Whitlock et al., 2008). However, the high variability in prevalence rates in the vast array of epidemiological studies on NSSI has not only been found between different samples (i.e., clinical versus nonclinical samples; college versus community based samples) but also amongst apparently homogenous samples, such as college populations and high school students (Swannell et al., 2014). Whitlock et al. (2008) believe that this could be attributed in part to considerable heterogeneity in individuals who engage in NSSI, suggesting the existence of subgroups or multiple typologies of self-injury even within the operational definition of NSSI.

This concept of course is not new, with numerous researchers contributing to the classification of self-injurious behaviours, since Menninger (1935; 1938) and Dabrowski (1937) instigated the discourse into the development of this taxonomy (refer to section 2.4). This heterogeneity, not only has a significant impact on the epidemiological data, but also on the therapeutic implications for clinicians (Whitlock et al., 2008).

### **4.3 Prevalence Rates of NSSI**

#### **4.3.1 Prevalence Rates of NSSI in Adolescents**

Given that self-injurious behaviours often begin and end during the tumultuous period of adolescence, the majority of epidemiological studies have focused on these

late childhood and teenage years, particularly utilising surveys on school based samples of adolescents (Bakken & Gunter, 2012; Hilt, Cha, et al., 2008; Larsson & Sund, 2008; Lloyd-Richardson et al., 2007; Muehlenkamp & Gutierrez, 2007; Plener et al., 2013; Plener, Libal, Keller, Fegert, & Muehlenkamp, 2009; Sornberger et al., 2012; You et al., 2011; Zetterqvist et al., 2013). To enable greater comparisons between studies, the prevalence figures cited here are all from studies specifically investigating NSSI (rather than including DSH). The reported lifetime prevalence rates of NSSI in adolescents have ranged considerably, from 2.9% in a sample of 12 to 15 year olds in Norway ( $n = 2,264$ ; Larsson & Sund, 2008), to 56% in a U.S. sample of adolescent females aged 10 to 14 years ( $n = 94$ ; Hilt, Cha, et al., 2008). Similarly, 12 month prevalence rates have varied from a 3.6% in Larsson and Sund's (2008) adolescent study in Norway to 46% in a U.S sample of students in years 9 to 12 (Lloyd-Richardson et al., 2007). The breadth of range in this prevalence data is greater during this period than that of young adults or adulthood.

In a study of 3,060 adolescents, aged 15 to 17 years from randomly selected classes from 17 different educational programs in Sweden, Zetterqvist, et al. found a lifetime prevalence rate of engagement in NSSI of 41.6%. Interestingly, when applying the recent DSM-5 (American Psychiatric Association, 2013) criteria for NSSI to this sample, Zetterqvist, et al. (2013) ascertained that 6.7% of the adolescents met the full criteria for a diagnosis of NSSI (see Table 2 for the DSM-5 criteria for NSSI). Whilst, in a comparison of NSSI in German speaking countries, Plener et al. (2013) calculated a six month prevalence rate of 18.8% in ninth grade adolescents ( $M = 14.99$  years) across Austria, Germany and Switzerland. The largest epidemiological study on NSSI to date was a population based survey of 61,767 students in grades 9 and 12 in the U.S. The

authors found that 3.9% of the sample had solely engaged in NSSI within the past 12 months (Taliaferro, Muehlenkamp, Borowsky, McMorris, & Kugler, 2012).

#### **4.3.2 Prevalence Rates of NSSI in Young Adults**

Just as the majority of epidemiological data from nonclinical populations of adolescents is derived from school based samples, our understanding of the prevalence and profile of young adults' engagement in NSSI is fundamentally drawn from university based samples (Moller et al., 2013; Swannell et al., 2014). In their meta-analysis of the prevalence of NSSI in nonclinical samples, Swannell et al. (2014) ascertained that 87.2% of research conducted into NSSI on young adults were drawn from university populations. However, reported lifetime prevalence rates in university students differ significantly, ranging from 11.68% (Heath et al., 2008) to 43.60% (Hasking et al., 2008). Similarly, prevalence rates of students' engagement in NSSI over the past 12 months have ranged from 6.8% (Whitlock et al., 2011) to 14.6% (Cawood & Huprich, 2011) in university samples.

Whitlock, et al. (2011) conducted a large scale study in 2006-2007 which randomly recruited 11,529 students, under the age of 25 years from eight Midwest and Northeastern universities and colleges in the US. Participants were asked to participate in an online *Survey of Student Wellbeing* which assessed the prevalence of NSSI via the screening question "Have you ever done any of the following with the purpose of intentionally hurting yourself?" followed by a checklist of 19 NSSI behaviours. Participants who indicated that these behaviours were employed with suicidal intent were excluded from the NSSI sample. The authors found that 15.3% of university students had engaged in NSSI during their lifetime and 6.8% had self-injured during the

past year. This is in accordance with their smaller study from the previous year, which found a lifetime prevalence rate of 17% (7.3% in the past year) in a sample of 2,875 students recruited from two Northeastern universities to complete an online survey entitled the *Survey of College Mental Health and Wellbeing*. The survey format was similar to that presented in the larger study (as described above) with the inclusion of 16 self-injurious behaviours (SIB) following the initial screening question on SIB.

Interestingly, a number of other studies have reported significantly higher rates ranging from 34% to 43.60% of NSSI in university students (Cawood & Huprich, 2011; Gratz et al., 2002; Hamza et al., 2013; Hasking et al., 2008; Paivio & McCulloch, 2004). In looking for points of difference to explicate the higher rates of NSSI found in these five studies, they have all substantially smaller sample sizes than the two studies by Whitlock and colleagues (Whitlock et al., 2006; Whitlock et al., 2011), ranging from 100 (Paivio & McCulloch, 2004) to 1,107 undergraduate students in Canada (Hamza et al., 2013), whilst, the two samples from the United States of America respectively comprise 133 (Gratz et al., 2002) and 302 (Cawood & Huprich, 2011) undergraduate psychology students. The Australian sample purports to be a community based sample, however it has been included here as 82.90% of the 211 participants were actually university students recruited from a large university in Melbourne, Australia (Hasking et al., 2008). Perhaps more importantly, the participants in the two studies with the 15.3% (Whitlock et al., 2011) and 17% (Whitlock et al., 2006) lifetime prevalence rates were also randomly selected using a specialised software package by the university registrars. Of the five studies that found the higher lifetime prevalence rates of 34% - 43.60%, only one used random sampling to recruit their participants (Paivio & McCulloch, 2004).

Although the considerably significant differences in prevalence rates are indeed problematic, Swannell et al. (2014) raises a more germane issue with basing our understanding of NSSI in young adults recruited solely from university populations in Western countries. The majority of young people in the UK, US and Australia – where the bulk of extant research has been generated - do not attend university. In 2011, 42% of 18 – 24 year olds were enrolled in colleges and universities in the US (U.S. Department of Education National Center for Education Statistics, 2012). Whilst in England, The Department of Education reported that in the year following completion of their A Levels (the equivalent to the completion of high school or secondary school) 52% of young people attended a higher education institution (Department for Education, 17 July 2012). In Australia, however, the Australian Bureau of Statistics (ABS) reported that only 26% of young adults aged 18 – 34 were enrolled in an educational institution in 2011, and a greater proportion of these students were at the younger end of this age spectrum (Australian Bureau of Statistics, April 2013). Obviously, the young people attending higher education facilities in these countries are not representative of all young people and university findings cannot be generalised to the larger community (Moller et al., 2013). This is clearly evident when comparing the lifetime prevalence rates from university samples, which range from 11.68% (Heath et al., 2008) to 43.60% (Hasking et al., 2008) to community based samples, which are considerably lower at 4% (Briere & Gil, 1998) to 8.1% (Martin, Swannell, Hazell, et al., 2010).

### 4.3.3 Prevalence Rates of NSSI in Adults

Prevalence rates in adult samples have considerably less variability in range than adolescent and young adult samples. In national community samples prevalence rates of adults have ranged from 4% in the past 6 months (Briere & Gil, 1998), 5.9% over the lifetime in the US (Klonsky, 2011), and over the lifetime 6.97% in Australia (Martin, Swannell, Hazell, et al., 2010)<sup>1</sup>. Briere and Gil (1998) were the first to investigate the prevalence of NSSI in the US using a nationally representative randomly selected sample of 927 adults (range = 18 - 90 years;  $M = 46$  years). The largest nationally representative exploration of nonclinical NSSI was undertaken by Martin, Swannell, Hazell, et al. (2010) in Australia. The Australian National Epidemiological Study of Self-Injury (ANESSI) randomly surveyed 12,006 Australians (5943 males and 6063 females ranging in age from 10 to 100 years) over the telephone. In comparison to the 4% prevalence rate in Briere and Gil's study, Martin, Swannell, Hazell, et al. found that 1.8% of participants ( $n = 222$ ) had self-injured in the past 6 months, whilst they reported a lifetime prevalence rate of 8.1% ( $n = 978$ ). Utilizing a similar methodology to Martin, Swannell, Hazell, et al., Klonsky (2011) reported a lifetime prevalence rate of 5.9% ( $n = 26$ ) in a random sample of 439 US participants (range = 19 - 92 years,  $M = 55.5$  years).

In a military sample of 1,986 American Air Force recruits, Klonsky, Oltmanns, and Turkheimer (2003) reported that approximately 4% of participants endorsed a history of NSSI. A more recent online survey revealed a lifetime prevalence rate of 14%

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<sup>1</sup> This was calculated from the data in ANESSI (Martin, Swannell, Harrison, et al., 2010), as the 8.1% lifetime prevalence rate cited, also includes participants aged 10 to 18 years.

in a sample of 335 military personnel and veterans taking college classes, with 3% of participants reporting that they had self-injured in the past 12 months (Bryan & Bryan, 2014). A UK study of 9803 military personnel found a lifetime prevalence rate of 2.3% ( $n = 200$ ) (Hines, Jawahar, Wessely, & Fear, 2013). There were no gender differences found in prevalence rates in the first study (Klonsky et al., 2003), whilst the latter two both found an increased likelihood of female military personnel engaging in NSSI in (Bryan & Bryan, 2014; Hines et al., 2013).

#### **4.3.4 Age of Onset**

In both clinical and nonclinical populations, NSSI typically begins during adolescence, and onset is most oft reported between the ages of 12 and 16 in the literature (Australian Institute of Health and Welfare, 2007; Heath et al., 2008; Klonsky, 2009, 2011; Kumar, Pepe, & Steer, 2004; Muehlenkamp & Gutierrez, 2004, 2007; Nixon et al., 2008; Nixon, Cloutier, & Aggarwal, 2002; Nock & Prinstein, 2004; Whitlock et al., 2006; Whitlock et al., 2011). This remains consistent with earlier epidemiological research into age of onset (Favazza, 1996; Favazza & Conterio, 1988; Favazza & Conterio, 1989; Novotny, 1972; Pattison & Kahan, 1983; Rosenthal et al., 1972), where the first act of self-injury was commonly reported occurring after or coinciding with the commencement of puberty (Burnham, 1969; Crabtree, 1967; Pao, 1969; Siomopoulos, 1974). However, the initial act of NSSI has been reported up to the age of 22 (Whitlock et al., 2011) and 24 (Klonsky, 2007) in the extant literature.

Muehlenkamp and Gutierrez (2004, 2007) indicated that the onset of NSSI started between 13 and 15 years of age. Accordingly, both Nixon et al. (2008) and Whitlock et al. (2011) reported a mean of 15.2 years as the age most participants started



self-injuring. Similarly, Whitlock et al. (2006) found the average age that participants engaged in their first act of NSSI was between the ages of 15 and 16; and Klonsky (2011) determined the mean age of onset was 16.1 years. The Australian Institute of Health and Welfare (2007) reported a mean onset age of 13.9 years based on a sample of 616 adolescents. Whilst a large national community based sample in Australia, found a considerably higher mean age of 17.2 years (Martin, Swannell, Harrison, et al., 2010; Martin, Swannell, Hazell, et al., 2010). Although the onset of NSSI most frequently occurs during the period of adolescence, it can commence at a much earlier age or conversely much later in life, with reported ranges from 5 to 60 years of age (Martin, Swannell, Hazell, et al., 2010), and 9 years to 56 years of age (Gardner & Gardner, 1975). However, these cases typically represent outliers and may be indicative of more serious mental health concerns or significant trauma histories. Martin, Swannell, Hazell, et al. (2010) quantified that only 9 of their participants commenced NSSI before the age of 10, and 8 over the age of 43.

Recent research indicates that a considerable percentage of the population are initiating self-injurious behaviours into early adulthood (Heath et al., 2008; Klonsky, 2011; Whitlock et al., 2011). In a small sample ( $n = 23$ ), Heath et al. (2008) reported that 21.7% of participants commenced NSSI between the ages of 17 and 19 years; and a further 17.3% started over the age of 20 years. This was supported by the findings of Whitlock et al. (2011) that 22.7% of their sample began self-injuring between the ages of 18 and 22 years. Consistent with these university based samples, Klonsky (2011) found that 35% of participants in his randomly selected community sample ( $n = 439$ ) did not start self-injuring until over the age of 18 years. Whilst a limited number of studies have investigated age of offset, the available data reveals that the engagement of self-injurious behaviours often persists into early adulthood. Klonsky (2011) ascertained

that 50% of participants continued to self-injure over the age of 18, with 30% still self-injuring beyond 25 years. Given this recent onset and offset data, early adulthood is a period requiring greater attention in NSSI research.

#### **4.3.5 Gender Effects on Prevalence Rates in NSSI**

Non-suicidal self-injury has traditionally been portrayed as a predominantly female phenomenon. However, the prevalence rates of gender over the past decade have been mixed. Twelve month prevalence rates in females have ranged from 4.4% (Larsson & Sund, 2008) to 32.1% (Sornberger et al., 2012); and in males from 1.1% (Watanabe et al., 2012) to 22.8% (Yates, Tracy, & Luthar, 2008) . Whilst a large number of studies have reported higher prevalence rates in females (Bakken & Gunter, 2012; Brunner et al., 2013; De Leo & Heller, 2004; Larsson & Sund, 2008; Laye-Gindhu & Schonert-Reichl, 2005; Madge et al., 2011; Madge et al., 2008; Martin, Swannell, Hazell, et al., 2010; Nixon et al., 2008; O'Connor, Rasmussen, & Hawton, 2014; Plener et al., 2013; Ross & Heath, 2002; Sornberger et al., 2012; Taliaferro et al., 2012; Watanabe et al., 2012; Yates et al., 2008; You et al., 2011; Zetterqvist et al., 2013), numerous other studies have ascertained that males are equally as likely to self-injure as their female counterparts (Andover et al., 2007; Andover, Primack, Gibb, & Pepper, 2010; Garrison, Addy, McKeown, & Cuffe, 1993; Gollust et al., 2008; Gratz, 2001; Gratz et al., 2002; Heath et al., 2008; Klonsky et al., 2003; Muehlenkamp & Gutierrez, 2004, 2007; Zoroglu et al., 2003). A closer examination of the literature reveals a number of reasons which could quantify the different prevalence rates attributed to gender; and indubitably, the variety of explanations addressed earlier in the chapter underpinning the

breadth of range in the general prevalence rates also apply to the more specific prevalence data of gender effects.

Firstly, the majority of studies reporting a higher incidence of NSSI in females are based solely on adolescent samples (Bakken & Gunter, 2012; Brunner et al., 2013; De Leo & Heller, 2004; Larsson & Sund, 2008; Laye-Gindhu & Schonert-Reichl, 2005; Madge et al., 2011; Madge et al., 2008; Nixon et al., 2008; O'Connor et al., 2014; Plener et al., 2013; Ross & Heath, 2002; Sornberger et al., 2012; Taliaferro et al., 2012; Watanabe et al., 2012; Yates et al., 2008; You et al., 2011; Zetterqvist et al., 2013), except for Martin, Swannell, Hazell, et al.'s study (2010) which was a national population based study investigating NSSI in Australians aged 10 to 100 years old. Whilst Madge et al. (2011) found a significant association between gender and engagement in NSSI, they reported that the strength of this association was weak. Only five of the adolescent studies reviewed, did not find a gender effect on prevalence rates in NSSI (Garrison et al., 1993; Lloyd-Richardson et al., 2007; Muehlenkamp & Gutierrez, 2004, 2007; Zoroglu et al., 2003). Three of these studies explored the relationship between NSSI and suicide attempts, and whilst they found no significant gender differences in engagement of NSSI in their adolescent samples, all three of them indicated that female adolescents were significantly more likely to have made a suicide attempt (Muehlenkamp & Gutierrez, 2004, 2007; Zoroglu et al., 2003). Several inferences could be made here; namely it is highly likely that there is a gender difference found in the prevalence rates of adolescents in NSSI, and perhaps these four studies lacked the statistical power to replicate this broader finding. Alternatively, a number of studies within the larger body of research that found a gender effect in adolescents, may have been examining self-harming behaviours with suicidal intent – such as overdosing, exceeding the prescribed dosage of medication, self-poisoning,

consumption of recreational drugs to self-harm (De Leo & Heller, 2004; Hawton, Bergen, Kapur, et al., 2012; Larsson & Sund, 2008; Madge et al., 2011; Madge et al., 2008; Nixon et al., 2008; O'Connor et al., 2014) – rather than behaviours defined as *non-suicidal* self-injury. Furthermore, a number of studies assessed the incidence of NSSI using a single question (Bakken & Gunter, 2012; Laye-Gindhu & Schonert-Reichl, 2005; Ross & Heath, 2002) such as “Have you intentionally hurt yourself within the past year?” (Watanabe et al., 2012, p. 553). Unlike this general question, some studies provided examples of self-injurious behaviours in their single question measures (Larsson & Sund, 2008; Laye-Gindhu & Schonert-Reichl, 2005; Taliaferro et al., 2012), such as “During the past 12 months, did you do something to purposely hurt yourself without wanting to die, such as cutting, scraping, or burning yourself on purpose?” (Bakken & Gunter, 2012, p. 345). Regardless, single question assessment measures may be interpreted differently by participants and researchers (Heath et al., 2008) and participants may respond in the affirmative thinking of past suicide attempts. A number of researchers have clearly attempted to ameliorate this concern by requiring participants to provide a qualitative description of their most recent act of NSSI (Laye-Gindhu & Schonert-Reichl, 2005; O'Connor et al., 2014; Watanabe et al., 2012).

The overwhelming majority of studies investigating NSSI in nonclinical samples of young adults or adults in college or community based samples reveal no gender differences in the prevalence of self-injurious behaviours (Andover et al., 2007; Andover et al., 2010; Briere & Gil, 1998; Gollust et al., 2008; Gratz, 2001; Gratz et al., 2002; Heath et al., 2008; Klonsky, 2011; Klonsky et al., 2003; Moller et al., 2013). Whitlock et al. (2006) and Whitlock et al. (2011) both reported gender effects on the prevalence of NSSI in their large samples of college students in the U.S. However, the gender association found by Whitlock et al. (2006) was weak and specifically confined

to multiple acts of self-injury. Furthermore, whilst Whitlock et al. (2011) established that females were 1.8 times more likely to have engaged in NSSI over their lifetime than males in their sample, they found no significant differences between males and females in the prevalence for self-injury during the past year. One Australian study reported a higher incidence of males self-injuring than females but this was only within the cohort aged 20-24 years, and fundamentally attributed to the large number of males who reported self-battery within this age group (Moller et al., 2013). This study also categorised self-harm as cutting, banging, overdosing or denying yourself a necessity, the latter two of which, do not meet the current widely accepted definition of NSSI.

The different methods employed by individuals to self-injure may have a significant impact on the gender effects of prevalence rates. Research has shown that males and females traditionally used different methods or types of behaviour to self-injure (Bresin & Schoenleber, 2015). Whitlock et al. (2008) argued that self-injury in males is typically moderate to severe in its application when compared to the self-injurious practices of females. You et al. (2011) postulated that males and females choose methods of self-injury that represent differences in the expression of emotional distress, with females typically turning their overwhelming affect inwards attacking the self by cutting, scratching or pinching; whilst males tend to direct their affect externally by hitting, banging and punching objects around them. Fascinatingly, Sornberger et al. (2012) observed that the method of self-injury in males and females could be delineated by the mere presence or absence of blood. Males usually opted for methods of NSSI that did not cause bleeding, whereas the type of self-injurious behaviours employed by females most often resulted in bleeding (Sornberger et al., 2012). A number of studies have found that cutting (Brunner et al., 2013; Hawton, Bergen, Waters, et al., 2012; Klonsky, 2011; Madge et al., 2008; Sornberger et al., 2012; Whitlock et al., 2006; You

et al., 2011), scratching (Sornberger et al., 2012; Whitlock et al., 2006) and pinching (Whitlock et al., 2006) appear more common in females than males, whereas forms of self-battery (i.e., banging their head or other body parts, punching oneself or another object with the intention of causing self-injury) (Brunner et al., 2013; Gollust et al., 2008; Madge et al., 2008; Moller et al., 2013; You et al., 2011) and burning (Brunner et al., 2013; Sornberger et al., 2012; You et al., 2011) are more regularly used by males. Similarly, studies exploring DSH indicate that females are more likely to overdose or exceed their dosage of prescribed medication than males (Hawton, Bergen, Waters, et al., 2012; Madge et al., 2008; O'Connor et al., 2014). Thus, the behaviours represented in the assessment measures may significantly affect the prevalence rates according to gender (Heath et al., 2008). Should gender differences persist in the methods employed to self-injure, treatment practices need to account for this and be gender sensitive (Whitlock et al., 2008).

The relationship between males and help seeking behaviours for psychological concerns has been well documented (Mackenzie, Reynolds, Cairney, Streiner, & Sareen, 2012; Yousaf, Popat, & Hunter, 2015). Males may be underrepresented in studies on NSSI due to an unwillingness to divulge personal information. In support of this theory, De Leo and Heller (2004) reported that a large number of male adolescents in their study did not complete the required qualitative components of the assessment measure and therefore their data had to be excluded from the final analyses. Sornberger et al. (2012) also pondered whether the gender effect found in their study could be ascribed to the reluctance of adolescent males to disclose their self-injurious behaviours. Heath et al. (2008) posited that perhaps this hypothesis also accounts in part for the greater prevalence of females engaging in NSSI in clinical research, as women are more likely to seek professional help for their distress.

Whilst the gender effect on NSSI during the period of adolescence remains inconclusive, it is clear that approximately equal numbers of males and females engage in NSSI as young adults and in adulthood. The historical representation of NSSI as a predominantly female phenomenon may potentially be attributed, firstly, to the methods assessed in studies. Research that focused primarily on cutting, scratching, carving and pinching is likely to have inadvertently created a gender bias, with more females engaging in these forms of self-injury (Swannell et al., 2014). Secondly, as self-harm is listed as a diagnostic criterion of BPD, many of the early clinical studies on self-harm were conducted on inpatient samples of individuals with BPD in psychiatric facilities (Graff & Malin, 1967; Leibenluft, Gardner, & Cowdry, 1987; Tantam & Whittaker, 1992). Given that BPD is more pervasive in females, the large majority of participants in this early research were indeed female. Through this somewhat entwined relationship in the early emerging research into self-harm, the stereotypical female “self-harmer” or “cutter” was born (Swannell et al., 2014). A myth or stereotype that unfortunately persists today.

#### **4.3.6 The Impact of Sexual Orientation on Prevalence Rates for NSSI**

Research suggests that concerns about sexual orientation may significantly affect prevalence rates for NSSI, with comparative studies indicating that being part of a sexual minority increases the risk of engagement in NSSI or DSH in adolescents (Almeida et al., 2009; Deliberto & Nock, 2008), young adults (Kerr et al., 2013; Serras et al., 2010; Sornberger et al., 2013; Wilcox et al., 2012), and adults (Skegg et al., 2003). More specifically, individuals who are questioning their sexuality; or are attracted to members of the same sex; have had same-sex intimate relationships; or

identify as bisexual, gay, lesbian, or queer; or are on the trans-spectrum (i.e., transgender, gender queer, gender fluid, transsexual), are more likely to have a history of NSSI than their heterosexual and cisgender counterparts. However, few studies on NSSI have explored the differences between groups of non-heterosexual or trans-spectrum individuals, typically focusing on either concerns about sexual orientation (McMahon, Reulbach, Keeley, Perry, & Arensman, 2010; O'Connor, Rasmussen, & Hawton, 2009; O'Connor et al., 2014; Whitlock et al., 2006); or comparing non-heterosexuals with heterosexuals as dichotomous categories (Almeida, Johnson, Corliss, Molnar, & Azrael, 2009; Deliberto & Nock, 2008; Moller et al., 2013; Wilcox et al., 2012). An exploration of the studies that do explore between group differences, reveals mixed results in the prevalence rates across the varying levels of same-sex attraction and trans-spectrum (Gollust et al., 2008; Jones & Hillier, 2013; Kerr et al., 2013; Serras, Saules, Cranford, & Eisenberg, 2010; Skegg, Nada-Raja, Dickson, Paul, & Williams, 2003; Sornberger, Smith, Toste, & Heath, 2013; Walls, Laser, Nickels, & Wisneski, 2010; Whitlock et al., 2011).

Whilst the effect of sexual orientation on the prevalence of NSSI is in no way confined to the period of adolescence, it is particularly evident within this age group. In a Scottish adolescent sample, O'Connor et al. (2009) found that concerns about sexuality was an independent factor for self-harming, yet in a later study in Northern Ireland this finding was confined solely to adolescent males (O'Connor et al., 2014). Prevalence of self-harm and NSSI have been reported to be at least double (Almeida et al., 2009) or triple (32.6% vs. 11.11%, Deliberto & Nock, 2008) the rates of those in nonheterosexual adolescents when compared to their heterosexual peers. This variance was most pronounced in males, with 41.7% of non-heterosexual males reporting a



history of self-harm, in comparison to 3.4% of heterosexual students (Almeida et al., 2009).

McMahon et al. (2010) found that for adolescent males who had been bullied, the highest odds ratio for a lifetime history of DSH was concerns about sexual orientation, however this odds ratio did not register nearly as highly in males who had not been bullied (McMahon et al., 2010). Intuitively, it could be argued that adolescents who are confused about their sexual orientation are more likely to be bullied in the school environment where individuality and uniqueness are undervalued, and the ability to blend in or go with the status quo are socially rewarded. As such, the relationship between bullying and sexual orientation is unfortunately not unexpected. In support of this, Walls et al. (2010) ascertained that adolescents who were bullied at school because of their gender identity or sexual orientation, who were also part of a sexual minority, were significantly more likely to engage in cutting than adolescents who had not been victimised. In an online study of 3,043 same-sex attracted (SSAY) and 91 trans-spectrum youth in Australia, nearly half (46.15%) of the trans-spectrum youth reported self-harming as a result of homophobia or transphobia. A high percentage (30.12%) of cisgender SSAY had also engaged in self-harming behaviours due to exposure to homophobia and cissexism (Jones & Hillier, 2013).

This pattern persists into young adulthood demonstrated by a number of studies on college based samples in the U.S. showing that students who were questioning their sexual orientation (Whitlock et al., 2006), or part of a sexual minority were more at risk of NSSI (Kerr et al., 2013; Serras et al., 2010; Sornberger et al., 2013; Wilcox et al., 2012). In a U.S. college sample non-heterosexual orientation was found to be a predictive factor of engagement in NSSI during the past 12 months and non-

heterosexual orientation was independently associated with a history of NSSI (Wilcox et al., 2012). In accordance with this, bisexual students (Kerr et al., 2013; Moller et al., 2013; Serras et al., 2010), and lesbians (Gollust et al., 2008; Kerr et al., 2013) were 4.7 (Kerr et al.) and 8.14 (Sornberger et al.) times more likely to have engaged in NSSI than heterosexual students.

In New Zealand, Skegg et al. (2003) determined that a history of engaging in self-harm significantly increased incrementally with the degree of same-sex attraction in both men and women. Therefore, men and women who identified as lesbian or gay were more likely to have a history of self-harm than individuals with a heterosexual or bisexual orientation, or degrees of same-sex attraction between these dichotomies. However, males with any inclination of same-sex attraction were at a greater risk of self-harm than women with same-sex attraction (Skegg et al., 2003). In contrast to these findings, Sornberger et al. (2013) ascertained that gay and lesbian students were not significantly more likely to have self-injured than their heterosexual counterparts, unlike students who were bisexual or questioning their sexuality.

## CHAPTER 5

### Theories and Models of Why Individuals Engage in NSSI

*Visualize, if you will, the initial frames of the films used to teach surgery to medical students: a piece of carefully cleansed skin, the location of which is explained in the accompanying technical commentary, the skin surrounded by blue non-reflecting drapes, and the surgeon's gloved hand making a rapid scalpel incision.*

*Then there is a pause, which the viewer experiences as longer than it is, before blood wells up and before the viewer experiences the emotional shift from what seems inanimate surgical anatomy to confrontation with the wound.*

*How can we understand the development of a person who again and again treats her own skin and body in a somewhat similar fashion?*

(Kafka, 1969, p. 207)

Nonsuicidal self-injury is a complex behaviour; contextually embedded, it is heterogeneous in its presentation, and associated with a range of different experiences, stressors, symptoms and diagnoses. This complexity has resulted in considerable challenges to understanding its aetiology, and why individuals would choose to injure themselves over employing another more adaptive and socially acceptable means of coping (Suyemoto, 1998). Numerous theories have been proposed, and a detailed discussion of them all is beyond the scope of this research; as such a few key theories have been focused upon. At present, the scholarship is lacking a definitive and comprehensive theory or model explicating the aetiology, maintenance and cessation of NSSI (Klonsky, Muehlenkamp, Lewis, & Walsh, 2011).

Clinically, the term self-mutilation was originally introduced in 1914 by Emerson in a case study written for the first issue of the *Psychoanalytic Review*.

However, two decades later Menninger (1935) is often credited with initiating the discourse with his article entitled *A Psychoanalytic Study of The Significance of Self-mutilations* followed by his seminal publication, *Man Against Himself* (1938). During the early 20<sup>th</sup> century there were actually several other medical, forensic and clinical papers published on self-mutilation that have rarely been cited in the historical development of this construct, but are contextually important in how self-mutilative behaviour was understood and perceived throughout this period (Ackerman & Chidester, 1936; Dabrowski, 1937; Houston, 1934; Kerr, 1927; Maccormac, 1948; Pessin, 1941).

It was 1960 before self-mutilation again appeared in the psychiatric literature with Offer and Barglow's (1960) paper investigating the first documented epidemic of self-mutilation, which occurred in an adolescent psychiatric hospital. This incited interest in the area and a number of papers were published during this decade (Battle & Pollitt, 1964; Bick, 1968; Burnham, 1969; Crabtree, 1967; Graff, 1967; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Kafka, 1969; Matthews, 1968; Pao, 1969; Phillips & Alkan, 1961a, 1961b; Podvoll, 1969). Two important changes occur in the 1960s. Firstly, whilst still psychoanalytical in orientation, the perspective was broadening to encompass other environmental influences (Shaw, 2002). Secondly, new terms were introduced to describe self-mutilative behaviour: wrist cutter (Graff & Mallin, 1967); wrist slasher (Graff, 1967; Grunebaum & Klerman, 1967); delicate self-cutting (Pao, 1969); and self-injury (Matthews, 1968). Clinical interest and investigations into self-mutilative behaviours waned again during the 1970s, with only a handful of papers published (Friedman, Glasser, Laufer, Laufer, & Wohl, 1972; Gardner & Gardner, 1975; Green, 1978; Morgan, 1979; Morgan et al., 1975; Novotny, 1972; Rosenthal et al., 1972). Importantly though, Morgan et al., coined the phrase "deliberate self-harm"

in 1975 which became the nomenclature *de rigueur* during the 1990s. The 1980s heralded a renewed interest in NSSI, and since then the theoretical focus has shifted considerably from the early psychoanalytic perspectives of Emerson (1914), Menninger (1935, 1938) and Kafka (1969). The literature over the past several decades has witnessed a much broader approach, encompassing attachment (Gratz, 2002; Hilt, Nock et al., 2008), social and behavioural (Muehlenkamp, Hoff, Licht, Azure, & Hasenzahl, 2008), psychobiological (Simeon et al., 1992; Van Moffaert, 1990; Winchel & Stanley, 1991), feminist (Jeffreys, 2000; Shaw, 2002), biological (Claes, Vandereycken, & Vertommen, 2006), and functional (Bentley, Nock, & Barlow, 2014; Nock, 2008) perspectives. This paradigm change is largely responsible for triggering the literary debate over the search for universally accepted nomenclature.

Despite the large body of research that now exists on NSSI, the majority of the theoretical papers have had a singular focus. Yet given the multifaceted heterogeneity of this behaviour; NSSI is now largely agreed to be multidetermined (Figuroa, 1988; Jacobson & Batejan, 2014; Nock & Cha, 2009; Prinstein, Guerry, Browne, & Rancourt, 2009). What they all share, however, is an agreement that NSSI serves one, or even several, particular functions for the individual - whether intrapersonal or interpersonal - and can best be conceptualised as a maladaptive coping mechanism (LeCloux, 2013; Suyemoto, 1998). Within each of the following theoretical paradigms, the mechanisms that provide the impetus and incite the idea to initially injure oneself, may be inherently different from the mechanism that subsequently maintains the behaviour (Muehlenkamp, 2012).

## 5.1 Psychodynamic Approaches

As a function of the times when self-mutilation made its appearance in the clinical literature, the earlier aetiological understandings of NSSI were grounded in psychoanalytic and psychodynamic theories. A number of different themes emerged during this period: the life and death instincts with the aggressive drive; guilt; punishment; sexual impulses; attention; and the relationship to early childhood trauma (Ackerman & Chidester, 1936; Dabrowski, 1937; Emerson, 1914; Menninger, 1935, 1938).

The orthodox psychoanalytic theory of self-mutilation encompassed Freud's central tenets of the dualistic principles of instinctual life, the tripartite structure of the mind, the aggressive drive, and punishment. Self-mutilation was considered a means of satiating the conflict of the superego's desire for punishment, and the powerful inherent influence of the life instincts. In the case of the individual with neurosis, a compromise was made, with the ego conceding to the most minimal form of self-punishment that it could bargain for. As such, the aggressive impulses were directed towards a part of the self, rather than the self as a whole (Ackerman & Chidester, 1936; Burnham, 1969; Crabtree, 1967; Menninger, 1935, 1938; Offer & Barglow, 1960; Pao, 1969). Ergo, Menninger (1935; 1938) used the overarching term *focal* suicide to refer to self-mutilative behaviours. He also contended, that in individuals with psychoses, the bargaining process is forgone, which resulted in major self-mutilative behaviours (Menninger, 1935, 1938). It is important to highlight that in his theory, Menninger was influential in specifying that the intent underlying self-mutilation and suicidal thoughts and behaviour was distinctly disparate.

This introjectively directed aggression was often driven by guilt over unwanted sexual impulses or experiences, which provided the link to early childhood trauma (Ackerman & Chidester, 1936; Emerson, 1914; Pessin, 1941). Podvoll (1969, p. 214) believed that guilt and punishment played a considerable role in individuals who self-mutilated, stating “they are at one and the same time attackers and victims, sinners and penitents.” Emerson (1914) and Pessin (1941) both theorised that the act of cutting was inherently symbolic for the act of masturbation, and that the physical pain associated with childhood sexual trauma created an intimate relationship between sexual stimulation and pain.

This self-directed aggression was not solely driven by guilt, a number of theorists postulated that it was an attack on an internalised other, often the unconsciously introjected maternal object (Farber, 2000; Friedman, Glasser, Laufer, Laufer & Wohl, 1972; Kafka, 1969). By turning the aggression inward on the self as opposed to the other, the desire to harm the mother found expression, whilst retaining the libidinal bond and acting under the restrictions of the superego. In presenting the case of Mary, Kafka (1969) suggested that her blood had become her transitional object, representing the unconsciously internalised mother, which Mary could summon with a razor or a piece of broken glass whenever the need to be comforted arose. In accordance with Winnicott’s (1951/1958) delineation of the transitional object as a “not-me” possession, Kafka (1969) extrapolated that Mary appeared to treat her skin as an inanimate object. This apparent detachedness facilitated and exacerbated Mary’s self-injury (Kafka, 1969). For patients in psychiatric care, the act of self-injury facilitated mother-infant like dyadic relationships with the female psychiatric staff, providing much craved attention and physical touch (Farber, 2000).

The theme of self-mutilating to gain the attention of others was introduced early in the psychoanalytic literature, and persists to the present day. Houston (1934) contended that the young woman he was treating, self-injured in order to obtain sympathy from her family after falling out of their favour. Similarly, in detailing the case of a 12 year old girl, Ackerman and Chidester (1936, p. 717) stated that she “utilized her injuries as a means of securing attention,” and note that when those around her were directed not to make a fuss of her injuries, she then verbally complained of the pain to draw their attention to her self-inflicted injuries. Two of Dabrowski’s (1937) categories of self-mutilation (*self-mutilation in states of neuropathic dramatization and hysteria; and self-mutilation in relation to a feeling of inferiority, guilt or the need to be in the spotlight*) feature an element of harming oneself to obtain the attention, affection or sympathy of another; or to acquire a desired result. Grunebaum and Klerman (1967) postulated that sympathy may not always be the desired secondary gain. In their study of self-injurers in a psychiatric facility, self-injuring was engaged in with greater frequency to compete with peers for the coveted status of “the chief cutter.”

The concept of tension reduction or impulse discharge, was also introduced during this period. From very early on in the literature, it was identified as one of the primary functions of self-mutilative behaviours (Crabtree, 1967; Goldwyn et al., 1967; Grunebaum & Klerman, 1967; Podvoll, 1969). Grunebaum and Klerman (1967) were one of the first theorists to describe the tension that mounts prior to the act of cutting, the affect involved (anxiety, anger, sexual tension), and the escalating urge to cut, which was followed by a pervasive sense of calmness.

Later psychodynamically oriented research focused on the connection between trauma and NSSI as a means of communicating that which could not be verbally



expressed. For the physically or psychologically abused, vocalisation is typically expressly forbidden and an alternative form of communication is sought (McLane, 1996). Just as the memories of the trauma are stored in nonverbal terms, such as sensations or visual images, they may be enacted as such, manifesting in corporeal expression (Connors, 1996). In a manner reminiscent of how the self-injurer uses the skin, Anzieu (1985/1989, p. 105) described the Skin Ego, as “the original parchment which preserves...the erased, scratched-out, written-over first outlines of an original pre-verbal writing made up of traces upon the skin.” Self-injury is essentially a regression back to an infantile state, where the skin was the primary channel for preverbal communication. Affect is expressed corporeally instead of experienced mentally – as in childhood – for the ego cannot defend against the painfully debilitating emotions and feelings experienced by the individual who self-injures (Farber, 2000; McLane, 1996). The repetitive re-enactments of psychosomatic expression fortify the infantile pathways of affective expression and self-injury becomes the primary mechanism of dealing with negative affect (Farber, 2000). The skin becomes a mnemonic tool, recording prior memories or trauma (Gardner, 2001). The body can be likened to a physiological photo album or diary, each scar representing that which cannot be uttered, a permanent record of trauma, suffering and healing carved indelibly into the skin (Farber, 2000; Gardner, 2001). Analogous to the individual that procures a tattoo to commemorate an event or a specific period in their lives, the scars tell an inherently personal story (Sweetman, 2000). NSSI is an attempt to communicate something, be it psychological or physical trauma, inner turmoil, a mood disturbance or intolerable emotional pain (McLane, 1996). The intended recipient may be an external other, a part of the self or the self as a whole integrated being (Connors, 1996; McLane, 1996).

Emerson (1914), who initiated the discourse on self-mutilation over a century ago, recognised that one theory could not be accountable for his patient's self-mutilative behaviour, and he concluded that the aetiology of her behaviour was multiplicitous. Whilst there is little empirical support for psychoanalytic or psychodynamic theories, they established that self-injury was distinct from suicidal thoughts and behaviour, and that NSSI was likely to be aetiologically multidetermined. Unfortunately, this distinction became somewhat blurred in the later literature when suicidal intent was not clearly excluded; and a multidetermined approach of any factors, was not empirically investigated until several decades later.

## **5.2 Attachment**

*“The relationship between an individual's self-harm and their attachment system is inextricably linked”*

Grocutt (2009, p. 97)

Emerging from psychoanalysis, object relations theory, developmental psychology and ethology (particularly Lorenz's 1935 study of imprinting in geese; and Harlow and Zimmermann's 1958 pioneering work on the effects of maternal deprivation in rhesus monkeys) attachment theory espouses a systemic approach, conceptualising the individual in a series of reciprocal relationships throughout the life cycle, but founded upon the first relationship between an infant and their primary caregiver. Central to Bowlby's attachment theory is that this initial relationship is internalized as a cognitive representation or working model of the self and other,

forming the archetype upon which future relationships are based (Bowlby, 1998, 2012). Through the *strange situation* study, Ainsworth and Bell (1970) identified three patterns of attachment in infant-mother dyads, which later research indicated, largely persisted through adolescence and adulthood (Hazan & Shaver, 1987). Securely attached infants of a “good-enough caregiver” (Winnicott, 1965) develop a working model that others are helpful, supportive and can be trusted; and that they in turn are worthy of receiving this care and support (Ainsworth, 1989; Bowlby, 1998, 2012). Paramount to the current study, it is through this secure attachment that the child also learns to organise and regulate their affect and experiences, learning to cope effectively with negative emotions and employ adaptive affect-regulation techniques (i.e., seek social support, or use cognitive or behavioural coping strategies).

According to the attachment paradigm, early childhood traumas involving neglect, sexual abuse, violence, separation or loss often cause interruptions to interactions with caregivers, significantly altering the developing working models about self, others and the individual’s perceptions about their worthiness to receive care and security (Grocutt, 2009; Simpson & Porter, 1981; Van der Kolk, Perry, & Herman, 1991). As such, children whose early attachments are characterised by these traumas or inconsistency, indifference, rejection, inattentiveness or dismissiveness may develop insecure attachment patterns which Ainsworth and Bell (1970) asserted, manifested either as anxious-ambivalent, or avoidant. Main and Solomon (1986) later proposed the addition of a disorganized/disoriented attachment pattern to Ainsworth and Bell’s original categorisation. These insecure attachment patterns are not necessarily features of daily interpersonal interactions but are expressed in response to the need for comfort or a sense of security when under stress or emotionally overwhelmed (Brumariu, Obsuth, & Lyons-Ruth, 2013).

Insecure attachment styles have been associated with a number of other psychological variables, diagnoses, behaviours and adjustment (Brumariu et al., 2013; Cooper et al., 1998). The relationship between trauma and insecure attachments has been well documented (Bowlby, 1998, 2012; Low, Jones, MacLeod, Power, & Duggan, 2000; Van der Kolk et al., 1991). A strong link between low self-esteem and insecure attachment has also been repeatedly recorded in the literature (Armsden & Greenberg, 1987; Barnum & Perrone-McGovern, 2017). Greater levels of insecure attachment have been recorded in adolescents who met the criteria for anxiety disorders (Brumariu et al., 2013), and children with diagnoses of depression (Armsden, McCauley, Greenberg, Burke, & Mitchell, 1990). Individuals with insecure attachment styles have demonstrated a range of maladaptive affect-regulation techniques, such as alcohol or substance abuse (Caspers, Cadoret, Langbehn, Yucuis, & Troutman, 2005; Stein, Milburn, Zane, & Rotheram-Borus, 2009), risk taking behaviours (Cooper et al., 1998), and promiscuous sexual behaviours (Dempster, Rogers, Pope, Snow, & Stoltz, 2015).

Given the relationships between attachment, self-esteem, trauma, and the use of other maladaptive coping strategies or affect regulation techniques, a relationship with self-injurious behaviours is highly probable. However, the influence of the perceived quality of parental attachment on the engagement of NSSI or DSH in nonclinical populations has been underexplored to date (Gratz et al., 2002; Hallab & Covic, 2010; Heath, Toste, Nedecheva, & Charlebois, 2008; Hilt, Nock et al., 2008; Kimball & Diddams, 2007) with much of the earlier research undertaken in clinical samples (Bezirgianian, Cohen, & Brook, 1993; Carroll, Schaffer, Spensley, & Abramowitz, 1980; Marchetto, 2006; Simpson & Porter, 1981; Van der Kolk, Perry, & Herman, 1991). Several studies have found that individuals who self-injure have less secure attachments with their parents than those who did not engage in NSSI (Hallab & Covic,

2010; Hilt, Nock et al., 2008; Kimball & Diddams, 2007; Martin et al., 2011).

Inimically, Heath et al., (2008) found no differences on their measure of attachment between college students who engaged in NSSI and students who had no history of NSSI, yet this could be largely ascribed to the small sample size ( $n = 23$ ).

Interestingly, there appears to be some significant gender differences between parent attachment patterns and gender. Gratz et al. (2002) reported a positive association between insecure attachment to fathers and DSH in females, but not in males. Whilst two other studies (Hallab & Covic, 2010; Hilt, Nock et al., 2008) revealed that the influence of parental attachment on self-injury was not equal, with paternal attachment showing greater significance in the maintenance of NSSI, than maternal attachment across experimental conditions. Research in other related areas, has indicated that the impact of the perceived quality of the paternal relationship is not peculiar to NSSI. Demidenko, Manion, and Lee (2015) found that adolescent girls with a diagnosis of depression had poorer perceived attachment to fathers, than nondepressed participants. Whilst in a study on suicide attempts, of the three relationship domains, paternal attachment was the only significant predictor of suicide attempts (Sheftall, Mathias, Furr, & Dougherty, 2013). This highlights the differing impact each individual parent can have on NSSI (Hallab & Covic, 2010; Hilt, Nock et al., 2008). Finally, employing path analysis Hallab and Covic (2010) revealed that the pathway between attachment and DSH was not a direct one, and was mediated by stress, with father attachment showing the strongest impact on DSH.

Whilst the influence of parental attachment has a long history in the clinical literature, the role of extrafamilial attachments is still a relatively new area of research (Armsden & Greenberg, 1987; Laible, 2007). During childhood and adolescence, as

children spend more time at school in the company of their peers, they increasingly rely on their peers as a source of support and security, in the absence of physical parental proximity (Allen, Uchino, & Hafen, 2015; Hazen & Shaver, 1994; Laible; Nickerson & Nagle, 2005). Providing that the peer proves a secure and stable base over recurrent times of need, the security of this attachment relationship is internalized (Hazen & Shaver). These peer attachments do not replace the parents as attachment figures (Hazen & Shaver; Laible; Nickerson & Nagle, 2005). In fact, research indicates the role of parental attachment persists through this period, and continues to predict psychological wellbeing into young adulthood (Allen et al.; Armsden & Greenberg; Laible; Nickerson & Nagle). According to Hazen and Shaver's model, parents are relegated a step down in the attachment hierarchy, until they are supplanted by a romantic partner as the primary attachment figure in adulthood.

Peer relationships have a significant influence on our social, behavioural and emotional functioning (Armsden & Greenberg; Hallab & Covic, 2010; Laible; Nickerson & Nagle). In fact, Laible (2007) found that peer attachment had a stronger direct relationship with all facets of social and emotional development than parent attachment in a sample of late adolescents and young adults. However, only Hallab and Covic (2010) have explicitly investigated the relationship between peer attachment and NSSI. The erudition on self-injurious behaviours has explored factors closely related to peer attachment, such as perceived social support (Andrews et al., 2014; Muehlenkamp et al., 2013; Rotolone, & Martin, 2012; Tatnell et al., 2014); and the quality of peer communication (Hilt, Cha, & Nolen-Hoeksema, 2008), further highlighting the influence of peers on NSSI. Indeed, Rotolone, and Martin (2012) reported that low social support was the strongest predictor of engagement in NSSI. Comparably, Claes et al. (2010) found that adolescents who engaged in NSSI had less positive relationships

with same-sex peers than their counterparts who did not self-injure. However, it could not be ascertained whether the perceived negative relationships existed prior, or subsequent to the initiation of their NSSI; and no measure of attachment was incorporated into their study.

As early as 1967, Grunebaum and Klerman identified the difficulty individuals who self-injure have with trusting others, asserting “while superficially these young women may appear socially adept, they are markedly impaired in their ability to trust and share with their peers...”(p. 533). In support of this, Hilt, Cha, & Nolen-Hoeksema (2008) discovered that poor quality peer communication predicted engagement in NSSI for social reinforcement when subjected to high levels of peer victimization. Furthermore, they reported that the combined interaction of peer communication and peer victimization predicted both social positive and negative reinforcement, implicating the engagement of NSSI in multiple and complex interpersonal functions. The relationship between peer attachment and NSSI warrants further exploration to ascertain what effects it has on the initiation, maintenance and cessation of self-injurious behaviours.

### **5.3 Social and Behavioural Approaches**

*The opposite of courage in our society is not cowardice, it is conformity*

Rollo May

From a behavioural perspective, NSSI is initiated and subsequently maintained through principles associated with Bandura’s (1977) social learning theory (Nock & Prinstein, 2004; Suyemoto, 1998). Behavioural theorists contend that the idea or

impetus to first self-injure is predominantly derived through one of three processes. Firstly, during the early developmental years a connection may be made between injury and an increased level of care, perceived love and attention. For instance, when a child falls over and scrapes their knee, a parent may lavish them with love and attention whilst carefully attending to their wound. An individual may later injure themselves attempting to re-create this desired feeling of being nurtured and attended to (Jacobson & Batejan, 2014). Secondly, the behaviour may have initially been learnt via social modelling in early childhood through repeated physical abuse. In these circumstances the child witnesses and experiences an adult (or adults) in their lives discharging their negative affect by physically attacking another individual. Experiencing an overwhelming and unwanted affective state at a later time; the child or adolescent attempts to regulate this affect by physically attacking their own body, through NSSI (Muehlenkamp, 2012). Behavioural proponents extrapolate that evidence supporting this theory can be found in the relationship between early childhood trauma and NSSI that is frequently reported in the literature. Finally, advocates of social learning theory also argue that the idea to initially injure oneself through NSSI may also be learnt through the influence of peer and media exposure (Prinstein, Guerry, Browne & Rancourt, 2009).

Following the principles of social modelling, researchers have suggested that some individuals might start self-injuring because friends or peers that they perceive as “cool,” or attribute a higher status too, are engaging in NSSI (Claes, Houben, Vandereycken, Bijttebier, & Muehlenkamp, 2010; Muehlenkamp, Hoff, Licht, Azure, & Hasenzahl, 2008; Prinstein, et al., 2009, 2010). This has been well documented across a range of other health risk behaviours, such as alcohol consumption (Osgood et al., 2013; Schwinn & Schinke, 2014), substance use (Helms et al., 2014), and sexual behaviours



(Lyons, Manning, Longmore, & Giordano, 2015; Ragsdale et al., 2014). Research has repeatedly found that adolescents who self-injured knew more peers who also engaged in NSSI, than adolescents who did not self-injure (Claes et al., 2010; Muehlenkamp et al., 2008; Prinstein et al., 2009). Whilst this may support the hypothesis that increased exposure to NSSI heightens the risk of subsequent initiation of NSSI; it is also conceivable that once an adolescent starts self-injuring they may gravitate towards other peers who also self-injure (Claes et al., 2010; Prinstein et al., 2009). This process, entitled the *selection to similarity* has been well documented since Cohen's (1977) and Kandel's (1978) influential studies on peer influence (Osgood et al., 2013; Prinstein et al., 2009). Therefore, to more accurately examine the dose-response relationship, other studies have specifically investigated where the idea to self-injure originated from. Deliberto and Nock (2008) reported that 38.3% of adolescents in their study indicated that their initial idea to self-injure originated from their peers, which was greater than any other area of origin. Similarly, Heath et al. (2009) and Nixon et al. (2008) reported that 22% and 29% of students respectively, first thought of self-injuring because they knew someone else who engaged in the behaviour.

Prinstein et al. (2009) suggest socialization effects may further account for maintaining and increasing self-injurious behaviour, with adolescents in particular, assuming the behaviours and attitudes of their peer group over time. This emulative behaviour may then be reinforced by the peer group. Peers may also directly or indirectly (i.e., "Amy must be having a really hard time, have you seen how many new wounds she has?") compare the number and severity of their self-injurious wounds, which can lead to contagions in educational or psychiatric settings (Simpson, 1980; Walsh, 2006). This contagion effect was first recorded in 1960, when Offer and Barglow (1960) reported that 12 patients (aged between 14 to 22 years of age) engaged

in approximately 90 episodes of self-injury over a period of nine months in a Psychiatric hospital. Walsh and Rosen (1985) found a contagion effect in a psychiatric facility with adolescents apparently triggering each other, creating a clustering of self-injurious acts. This contagion effect in treatment facilities has since been reported by several researchers (Nock & Prinstein, 2005; Rosen & Walsh, 1989; Taiminen, Kallio-Soukainen, Nokso-Koivisto, Kaljonen, & Helenius, 1998). Interestingly, two qualitative studies revealed a competitive social influence on NSSI. Grunebaum and Klerman (1967) reported that a group of female patients competed with each other for the title of “chief cutter”, with the patient possessing the most stitches attaining the title. Whilst Crouch and Wright (2004) discovered that adolescents were in competition to be considered a “genuine self-harmer” (i.e., intrapersonal motivations) as opposed to someone who harms themselves for attention (i.e., interpersonal reasons).

Whilst a number of studies have reported the influence of peers on the engagement of NSSI, the underlying social mechanisms have rarely been explored. The influence of peers could be attributed to a range of different behavioural or social factors, such as behavioural reinforcement, a desire for social status, or conformity to “fit in” with the perceived “cool kids” (Prinstein et al., 2010). Furthermore, whilst peer influence may contribute to the initiation of NSSI, research indicates that a significant percentage of individuals who self-injure believe the behaviour originated from within, and not from any external influences (Deliberto & Nock, 2008; Nixon et al., 2008). Nixon et al. (2008) found that 73.4% of youths in their study indicated that the initial idea to self-injure was their own.

The media has repeatedly been held accountable for the increase in NSSI and DSH over the past two decades, particularly since the release of films such as *Girl*,

Interrupted (1999), Secretary (2002) and Thirteen (2003). Self-injury.net listed approximately 55 movies, 36 TV shows, and 231 songs that depict,<sup>2</sup> describe or refer to self-injury in some form. A simple Google search, reveals numerous websites with lists of up to 26 celebrities, that have publicly disclosed a history of NSSI ([www.ranker.com/list/celebrities-who-self-harm/celebrity-lists](http://www.ranker.com/list/celebrities-who-self-harm/celebrity-lists)). Aside from these traditional media forums, NSSI has a strong visible presence in the social media on Facebook, Instagram, Tumblr, Pinterest and in numerous chat rooms, blogs and forums (Lewis & Seko, 2016). A simple search of the term self-injury listed 989,000 videos on You Tube, and 13,900,000 results on Google (on the 28<sup>th</sup> February 2017). Deliberto and Nock (2008), and Nixon et al. (2008) found that 13.3% and 15.1% of adolescents respectively, indicated that the idea to self-injure originated from something they had seen or heard in the media. Whilst, 21.6% of students in Health et al.'s (2009) study, cited the media as the source of their idea to self-injure.

The media and social learning theory have been paired in the past to explain the increase in self-injurious behaviour at the extreme end of the spectrum – specifically in the instances of multiple or cluster suicides. Often referred to as The Werther Effect, a term coined by sociologist David Phillips in 1974, after Goethe's (1774/2012) loosely autobiographical character in his novel *The Sorrows of Young Werther*. The Werther Effect proposes that suicidal ideation and behaviours typically increase following the influence of suggestion, particularly in reference to publicity. The strict laws governing the media coverage of suicides that were only lifted in Australia in 2011 (Australian

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<sup>2</sup> Information current on 7<sup>th</sup> May 2013. The website has since been closed as the administrator has retired

Press Council, 2011), were instituted principally due to the findings of this suggestion-imitation effect. Namely, that imitative suicides increase in direct proportion to the amount of publicity attributed to a suicide in the media (Hittner, 2005; Niederkrotenthaler et al., 2012; Phillips, 1974; Phillips & Carstensen, 1986; Stack, 2014). These findings have had support in cases of celebrity suicides, ranging from Marilyn Monroe (Phillips, 1974), a young female singer in Taiwan (Chen et al., 2012), a male pop star/actor in Hong Kong (Yip et al., 2006), to a soccer goal keeper in Germany (Hegerl, Koburger, Rummel-Kluge, Gravert, Walden, & Mergl, 2013; Ladwig, Kunrath, Lukaschek, & Baumert, 2012). In each case, an increase in suicides followed each death. However, more recent research indicates that The Werther Effect may be limited to publicity surrounding celebrities, and results surrounding non-celebrities may have been inflated in earlier studies due to methodological issues. As such, support for this theory remains largely unsubstantiated and warrants further investigation (Hittner, 2005; Scherr & Reinemann, 2011).

Exponents of behavioural theory contend, that aside from providing the foundation upon which the behaviour is originally learnt, social learning theory also illustrates how NSSI is repeated or maintained. Essentially, learning theory proposes that repeated engagement in any given behaviour is maintained via positive reinforcement (i.e., the addition of a valued consequence following the behaviour) and negative reinforcement (i.e., the behaviour is followed by the removal of an aversive or unpleasant stimulus). More specifically, when applied to NSSI, the sensation of the blade cutting the skin can provide an immediate awakening from feelings of numbness or depersonalization, positively reinforcing the act of self-injury. Similarly, the behaviour may be negatively reinforced when self-injury is employed to interrupt or terminate an unwanted affective or cognitive state (Lloyd-Richardson et al., 2008).

### 5.3.1 A Functional Approach

Numerous theorists have explored the functions or motivations for NSSI (refer to section 2.6), yet few have adopted a functional aetiological approach to understanding NSSI (Klonsky, 2007; Lloyd-Richardson et al., 2007; Muehlenkamp et al., 2013; Zetterqvist et al., 2013). Nock and his colleagues (Bentley, Nock & Barlow, 2014; Nock, 2008; Nock & Prinstein, 2004) delineated a four-factor function model (FFM) that attributes the aetiology of NSSI to the reinforcing properties of four distinct functions (illustrated in Figure 1). The four reinforcement processes occur across two dichotomous dimensions. In the first dichotomy, behaviour is either positively or negatively reinforced; whilst the second dichotomy NSSI is a function of either automatic (intrapersonal) or social (interpersonal) reinforcers. *Automatic* or *intrapersonal* NSSI behaviours result in the alteration of an internal or physiological state. Whereas, the *social* reinforcement *dichotomy* hypothesizes that NSSI is engaged in repeatedly due to its interpersonal effectiveness as a means of nonverbal communication with others (Bentley et al., 2014; Nock & Prinstein, 2004; Nock, 2008).

*Automatic-positive reinforcement* involves the generation of a positive affective state, thoughts or stimulation, such as creating a feeling of calmness; and releasing tension. Whereas in *automatic-negative reinforcement*, NSSI is used to reduce or cease unwanted affect or cognitions, such as to terminate feelings of dissociation or numbness; or to stop distressing thoughts. *Social-positive reinforcement* involves the presentation of a positive interpersonal consequence following the act of self-injury, such as conveying to others the level of one's emotional pain; gaining sympathy from a friend or family member; or the perception of feeling cared for during medical attendance to wounds. Conversely, *social-negative reinforcement* represents the use of

NSSI to avoid unpleasant interpersonal situations, such as going to school; or terminating conflict (Bentley et al., 2014; Nock & Prinstein, 2004; Nock, 2008).

Nock and Prinstein (2004) reported that statements on the automatic reinforcement scales were endorsed by 24% - 53% of participants, while 6% - 24% endorsed social reinforcement statements. Research indicates that whilst interpersonal functions certainly influence the maintenance of self-injurious behaviours, they do not appear to be as significant as intrapersonal functions in perpetuating the behaviour over time (Muehlenkamp et al., 2013; Nock & Prinstein, 2004, 2005). Bentley et al. (2014) conceded that this model may not account for the broad range of factors that influence the development and maintenance of NSSI, but it provides an empirically driven start to understanding this phenomenon.

	Positive Reinforcement (PR)	Negative Reinforcement (NR)
Automatic (A)	<p><b>APR</b></p> <p>Increase or generate desired affect or cognition</p>	<p><b>ANR</b></p> <p>Decrease or eliminate aversive affect or cognition</p>
Social (S)	<p><b>SPR</b></p> <p>Increase or generate desired social outcome</p>	<p><b>SNR</b></p> <p>Decrease or eliminate aversive social situation</p>

Figure 1: *Four-Function Model (FFM)*.

(Figure combining the work of Bentley, Nock, & Barlow, 2014; & Nock, 2008)

### 5.3.2 Opponent Process Theory

Another theory of NSSI currently being explored is Opponent Process Theory. Joiner (2005) initially incorporated Solomon's (1980) Opponent Process Theory in his interpersonal-psychological theory of suicide. Nock, Joiner, Gordon, Lloyd-Richardson, and Prinstein (2006), then hypothesised that Opponent Process Theory may explain the relationship between the frequency of engagement in NSSI and future suicide attempts, which other researchers have also since suggested (Guan et al., 2012; Klonsky et al., 2013; Muehlenkamp & Gutierrez, 2007; Tuisku et al., 2014; Victor & Klonsky, 2014).

Solomon (1980, p. 698) contended that many acquired behaviours occur due to an "affective control system with a negative feedback loop," or an opponent process. Essentially, when a state of equilibrium is interrupted by a stimulus or behaviour (i.e., primary response), a secondary reaction or opponent process is triggered. When the stimulus or behaviour is stopped, the individual is returned to a state of equilibrium (Solomon, 1980). In the case of NSSI, the stimulus is the act of self-injury – the cutting, burning or carving – and the opponent process is the feeling of relief experienced following the act. This opponent process is strengthened through repeated acts of self-injury over time. Solomon theorised, that over time the aversion to the stimulus would gradually decline; and withdrawal symptoms would emerge and subsequently intensify. For NSSI, advocates of Opponent Process Theory suggest that this would lead to a gradual desensitization to pain (Guan et al., 2012; Klonsky et al., 2013; Muehlenkamp & Gutierrez, 2007; Tuisku et al., 2014; Victor & Klonsky, 2014).

Opponent Process Theory is appealing in that it does not pathologize NSSI, but recognises it as a reinforced acquired behaviour. It also offers an explanation for the addictive quality of NSSI (Solomon, 1980). However, empirical evidence supporting an

Opponent Process Theory for NSSI has yielded a number of inconsistencies at this early stage. Self-injurers have been found to have a higher tolerance to pain than non-injurers (Hamza et al., 2014; Glenn et al., 2014; McCoy et al., 2010). In contrast to Opponent Process Theory, Gordon et al. (2010) also reported that more physical pain was actually associated with a higher frequency of engagement in NSSI. Furthermore, Hamza and Willoughby (2013) and Nock et al. (2006) found that greater pain thresholds and tolerances were not associated with more frequent NSSI, nor longer engagement in NSSI. Unexpectedly, the relationship between pain and relief, has also not been found to increase proportionately (Franklin et al., 2010; 2013). Furthermore, in juxtaposition to the habituation hypothesis in Opponent Process Theory, Nock et al. (2006) found that there was a positive relationship between the experience of pain and the frequency, and number of methods used in NSSI.

Hamza et al. (2014) found that individuals who self-injured as a function of self-punishment demonstrated an increased tolerance to pain. As such, they argued that repeated engagement in NSSI alone does not result in a greater tolerance to pain, as suggested by Opponent Process Theory. Hooley and St. Germain (2014) found that self-criticism influenced the willingness to endure pain in NSSI. These results further highlight the multifaceted nature of NSSI, and the importance that function plays in NSSI.

Solomon contended that research into naloxone, demonstrated that it could be effectively used to reduce acquired behaviours, such as NSSI. There has only been partial success reported in the use of opioid antagonists (naltrexone hydrochloride and naloxone) to reduce self-injurious behaviours in clinical samples (see section 3.5.3.1 The Endogenous Opioid System). Whilst, Solomon was theorising about the Opponent



Process Theory broadly and not specifically in relation to NSSI, he believed that naloxone could only be effective in highly habituated individuals. Given this, the use of opioid antagonists are only likely to be efficacious in clinical samples of self-injurers with a long history of the behaviour. To segue into the biological approaches to NSSI, future research into opioid antagonists could perhaps incorporate an investigation into Opponent Process Theory.

## **5.4 Biological Approaches**

Research into the biological aetiology NSSI is still in its infancy. However, a number of biological factors have been implicated in the development and maintenance of NSSI. Whilst the majority of the research investigating the biological aspects of NSSI has been undertaken on clinical samples, specifically females diagnosed with BPD, a number of avenues warrant further investigation (Jacobson & Batejan, 2014). The heterogeneous nature of NSSI points to multiple aetiologies and it is more likely that any biological systems at play, operate in concert rather than as a sole pathophysiological determinant (Grossman & Siever, 2001; Sandman & Kemp, 2011).

### **5.4.1 The Endogenous Opioid System (EOS)**

The endogenous opioid system (EOS) has been implicated in the pathogenesis and maintenance of NSSI, largely due to its role in the mechanisms of pain analgesia; reinforcement and reward; the modulation of affect and stress responses; and also addiction (Ribeiro, Kennedy, Smith, Stohler, & Zubieta, 2005; Sandman & Kemp, 2011; Sher & Stanley, 2008). Endogenous opioids and their receptors are opiate-like

substances that are naturally produced and reside in the central and peripheral nervous systems (Kirtley, O'Carroll, & O'Connor, 2015; Koneru, Satyanarayana, & Rizwan, 2009; Ribeiro et al., 2005). Since the mid-1970s four primary classes of opioid peptides have been identified: endorphins, enkephalins, dynorphins, and endomorphins. Each of these opioid peptides ligand to three distinct classes of G-protein receptors: labelled mu ( $\mu$ ), delta ( $\delta$ ) and kappa ( $\kappa$ ) (Benarroch, 2012; Bloom & Holly, 2011; Ribeiro et al., 2005). The complex opioid signaling pathways and their associated receptors proliferate many areas of the brain, and the central and peripheral nervous systems (Koneru et al., 2009). Their physiological effects are dependent upon which receptor is activated by which peptide (Osuch & Payne, 2008).

Stress, pain, exercise and sexual activity all stimulate the release of endorphins, which produce analgesic and euphoric effects whilst simultaneously decreasing the level of anxiety experienced in the body (Koneru et al., 2009). Alternatively, whilst still heavily involved in pain regulation, dynorphins function quite differently and can generate depersonalization, derealisation, and dysphoria (Bandelow, Schmahl, Falkai, & Wedekind, 2010; Koneru et al., 2009). Research indicates that physical pain and emotional distress are modulated by similar regions in the brain and there is considerable overlap amongst these two processes (Bresin & Gordon, 2013). Given the known relationship between the EOS in the regulation of pain and affect, the application to NSSI appears somewhat intuitive and parsimonious (Bresin & Gordon, 2013; Ribeiro et al., 2005).

Evidence supporting the potential role of the EOS in NSSI has been derived from four main sources: the pain hypothesis, the addiction hypothesis, trials of

psychopharmacological opioid antagonists, and lower levels of endogenous opioids in the plasma and cerebrospinal fluid of self-injurers.

#### **5.4.1.1 The Pain Hypothesis**

Primarily, numerous reports of pain analgesia during the act of NSSI implicates the EOS (refer to section 7.7.4 for further discussion on pain analgesia in NSSI: Bohus et al., 2000; Claes, Vandereycken, & Vertommen, 2006; Franklin, Hessel, & Prinstein, 2011; Glenn, Michel, Frankin, Hooley & Nock, 2014; Hooley et al., 2010). Often referred to as *the pain hypothesis* in the literature, the theory underpinning this hypothesis suggests that individuals who self-injure possess a diminished sensitivity to pain, either due to greater levels of endogenous opioids, and/or hypersensitive opioid receptors (Bandelow et al., 2010; Bloom & Holly, 2011; Grossman & Siever, 2001; Sandman & Kemp, 2011). The act of self-injury is then employed as a method of stimulation to interrupt and stop dissociation, or feelings of numbness and depersonalisation, which may have been triggered by interpersonal or environmental stressors (Grossman & Siever, 2001; Sandman & Hetrick, 1995).

#### **5.4.1.2 The Addiction Hypothesis**

Secondly, reports of the addictive properties that NSSI wields, adds further support that the EOS proffers some significance in the maintenance of self-injurious behaviours (Grossman & Siever, 2001; Nixon, Cloutier, & Aggarwal, 2002; Plener et al., 2013; Sandman & Kemp, 2011). The *addiction hypothesis* is based on addiction studies and postulates that the EOS has been chronically overstimulated by repeated

self-injurious behaviour in an attempt to alleviate negative affect. Consequently, the individual develops a tolerance to the heightened opiate tone, through this habitual overstimulation of endogenous opioids. They then periodically suffer from a withdrawal response. This stimulates a desire for further endogenous reward, which they have learnt via repetition to activate through the physical act of self-injury (Grossman & Siever, 2001; Osuch & Payne, 2008; Sandman & Kemp, 2011). According to Grossman and Siever (2001), additional support for the addiction hypothesis is found in reports that individuals who engage in repetitive NSSI experience strong urges to self-injure; they demonstrate a need to increase the severity of their NSSI; and they have great difficulty terminating their NSSI. Bandelow et al. (2010) contended that as endorphins are only released when actual tissue damage occurs, cutting is a far more effective method of obtaining a biochemical reward, than self-injurious methods that do not penetrate or damage the skin (pinching, banging or hitting oneself & interference with wound healing). This may accentuate why cutting has consistently been reported as the most common method of NSSI (Cawood & Huprich, 2011; Heath et al., 2008; Klonsky, 2007, 2011; Martin, Swannell, Hazell, et al., 2010; Nixon et al., 2008). Furthermore, Bandelow et al. suggested that this could also explain why replacing cutting with non-injurious alternatives that do not result in bleeding (e.g., holding ice cubes against the skin or snapping elastic bands around the wrist), fail to have the same therapeutic effect as self-injurious behaviours that enact tissue damage.

#### **5.4.1.2.1 Psychopharmacological Trials of Opioid Antagonists**

The *partial* success of psychopharmacological trials of opioid antagonists (i.e., naltrexone hydrochloride and naloxone) to reduce self-injurious behaviours in

developmental disorders (Barrett, Feinstein, & Hole, 1989; Sandman & Kemp, 2011; Sandman, Touchette, Lenjavi, Marion, & Chicz-DeMet, 2003) and in individuals diagnosed with BPD (McGee, 1997; Roth, Ostroff, & Hoffman, 1996; Sonne, Rubey, Brady, Malcolm, & Morris, 1996) adds further support to the addiction hypothesis, and an opioid release during NSSI. Naltrexone is an oral medication originally administered to block physical dependence in substance abusers (Walsh, 2006). Naltrexone is thought to be effective in reducing self-injurious behaviour as it attenuates the endogenous reinforcement experienced after the act of NSSI, and the behaviour decreases as it is no longer biochemically rewarding (Bandelow et al., 2010; Bresin & Gordon, 2013). However, empirical results on the use of opioid antagonists have been mixed to date in studies of individuals with developmental disorders, and clinical samples. Therefore, they are yet to warrant application in nonclinical trials (Bandelow et al., 2010; Bloom & Holly, 2011; Plener & Libal, 2014; Sandman & Kemp, 2011; Symons, Thompson, & Rodriguez, 2004).

#### **5.4.1.3 Lower Levels of Endogenous Opioids**

Finally, several studies have found altered levels of endogenous opioids in the plasma (Coid, Allolio, & Rees, 1983) or cerebral spinal fluid (CSF: Stanley, Sher, Wilson, Ekman, Huang, & Mann, 2010) of individuals who engage in NSSI, when compared to non-injurers in clinical and developmental disorders. However, it is not known whether the lower levels of  $\beta$ -endorphin and met-enkephalin that Stanley et al. (2010) found in a sample of psychiatric patients diagnosed with BPD, would also be found in nonclinical samples of individuals who self-injure. Furthermore, there appears to be a discrepancy between the levels of endogenous opioids obtained via plasma using

venipuncture (Coid et al., 1983; Weizman et al., 1988), or CSF using a lumbar puncture (Stanley et al., 2010), significantly confounding cross study comparisons. There is some evidence to indicate that plasma sampling provides a more dynamic measure of endogenous opioids than CSF, which appears to reflect a more stable or baseline measure of endogenous opioids (Kirtley et al., 2015).

Despite the identified relationship between pain and the EOS, this is a relatively new avenue for exploration in NSSI and only a few studies have been undertaken to date (Stanley et al., 2010). As such, there are a number of significant limitations with the extant research, aside from those already addressed. All of these studies are based on clinical samples, predominantly in individuals diagnosed with BPD (Coid et al., 1983; Stanley et al., 2010); or in individuals with developmental disorders (Weizman, Gil-Ad, Dick, Tyano, Szekely, & Laron, 1988). The sample sizes in these studies are also small, further limiting generalization (Coid et al., 1983; Stanley et al., 2010), and there are considerable differences in their methodology. Whilst converging avenues of evidence point to the involvement of the EOS, future studies need to investigate the role that EOS plays in the neurobiological aetiology of NSSI (Sher & Stanley, 2009).

#### **5.4.2 The Monoamine System**

The neurotransmitters serotonin, dopamine and noradrenaline, which are collectively known as the monoamine system, have also been implicated in the biological aetiology of NSSI (Bloom & Holly, 2011). However, the monoamine system has been subjected to even less empirical testing than the EOS (Stanley et al., 2010).

#### 5.4.2.1 The Serotonergic System

Research has implicated reduced serotonergic (5-hydroxytryptamine: 5-HT) neurotransmission or tone in impulsive behaviour (Walderhaug, Herman, Magnusson, Morgan, & Landrø, 2010); aggression (Coccaro, 1992); suicidality (Mann, Stanley, McBride, & McEwen, 1986; Stanley, Virgilio, & Gershon, 1982); Obsessive Compulsive Disorder (OCD: Hollander, Fay, Cohen, Campeas, Gorman, & Liebowitz, 1988); and Prader-Willi Syndrome (PWS: Akefeldt, Ekman, Gillberg, & Månsson, 1998; Gunay-Aygun, Schwartz, Heeger, O'Riordan, & Cassidy, 2001) of which self-injurious behaviour - particularly skin picking - is a clinical feature. However, mixed results have been found regarding the dysregulation of serotonergic function in individuals who engage in NSSI in clinical samples. Whilst serotonergic dysfunction was reported in a sample of individuals who engage in NSSI with eating disorders (Steiger, Koerner, Engelberg, Israël, Ying Kin, & Young, 2001) and in a sample of parasuicidal adolescent females (Crowell, Beauchaine, McCauley, Smith, Stevens, & Sylvers, 2005), studies on samples with personality disorders (Stanley et al., 2010) and BPD (Gardner, Lucas, & Cowdry, 1990) found no differences in the monoamine metabolite levels between those who engaged in NSSI and control groups.

In a seminal study, exploring a genetic vulnerability-stress model, Hankin, Barrocas, Young, Haberstick, and Smolen (2015) recently found that children and adolescents who engaged in NSSI were more likely to have one short allele of 5-*HTTLPR* and have experienced significant interpersonal stress. The Transporter-Linked Polymorphic Region (5-*HTTLPR*) is a repeat polymorphism region with both long and short alleles in the gene (*SLC6A4*) that codes for the serotonin transporter. The short allele has been associated with reduced serotonin transporter expression and function

(Goldman, Glei, Lin, & Weinstein, 2010; Hankin et al., 2015). However, earlier genetic studies examining the short allele of 5-*HTTLPR* failed to find an association to NSSI in a clinical sample of women with BPD (Maurex, Zaboli, Öhman, Åsberg, & Leopardi, 2010).

A review of the considerable body of empirical data into psychopharmacological treatments for NSSI based on the serotonergic system indicates that selective serotonin reuptake inhibitors (SSRIs) are not recommended as a first-line psychopharmacological treatment for NSSI. There are concerns that NSSI or suicidality may arise as potentially adverse side effects from SSRIs in adolescent populations. However, results from the Treatment of SSRI-Resistant Depression in Adolescents (TORDIA: Brent et al., 2009) and Adolescent Depression Antidepressant and Psychotherapy Trial (ADAPT: Wilkinson, Kelvin, Roberts, Dubicka, & Goodyer, 2011) have not contraindicated NSSI as a common side effect (Plener & Libel, 2014). However, this does not lend a great deal of support for the role of the serotonergic system in the development of NSSI (Bloom & Holly, 2011).

#### **5.4.2.2 The Dopaminergic System**

Self-injurious behaviours are listed as clinical features in the genetic condition Lesch-Nyhan syndrome (APA, 2013), which has been linked to dopaminergic dysfunction (Göttle et al., 2014). This, in combination with results from animal studies (Breese, Criswell, & Mueller, 1990; Goldstein, Kuga, Kusano, Meller, Dancis, & Schwarcz, 1986; Okamura, Murakami, Yokoyama, Nakamura, & Ibata, 1997) has led to a number of researchers postulating that the dopaminergic system may be a contributing factor in the biological aetiology of NSSI (Winchel & Stanley, 1991). However, Stanley



et al. (2010), and Gardner, Lucas, and Cowdry (1990) found no differences in dopamine levels between those who engaged in NSSI and control groups, in samples of individuals with personality disorders and BPD. As such, there is little empirical evidence supporting a predominantly dopaminergic driven hypothesis in the pathophysiology of NSSI (Groschwitz & Plener, 2012; Sher & Stanley, 2009; Winchel & Stanley, 1991).

## **5.5 An Integrated Approach**

Expanding substantially on his four-function model (FFM: described in section 5.3.1), Nock (2009) developed one of the first integrated aetiological models of NSSI. Grounded in the principles of behavioural theory, it is a functional model that incorporates the considerable breadth of the previous research into the demonstrated correlates, predictors and risk factors for NSSI (Nock, 2010). Based on the extant literature, the model makes three propositions towards the initiation and maintenance of NSSI (Nock, 2009; 2010). Firstly, integrating the FFM into the model, NSSI is repeatedly engaged in because the act is either positively or negatively reinforced through automatic (intrapersonal) and social (interpersonal) consequences which immediately follow the act of self-injury (Nock & Prinstein, 2004). Secondly, a number of environmental, genetic and neurobiological distal risk factors produce a predisposition for these intrapersonal and interpersonal vulnerability factors. Thirdly, several self-injury specific vulnerability factors increase the risk of specifically engaging in NSSI, rather than the adoption of another maladaptive coping mechanism. These three propositions will now briefly be addressed in turn (Nock, 2009; 2010).

The integrated theoretical model of the development and maintenance of self-injury, suggests that certain individuals may have intrapersonal and/or interpersonal vulnerability factors that inhibit their ability to adaptively manage perceived stressors. These vulnerability factors are more proximal risk factors. The intrapersonal risk factors include high aversive emotions and cognitions, and poor distress tolerance. The interpersonal vulnerability factors are poor communication skills and poor social problem-solving (Nock, 2009, 2010). These intrapersonal and interpersonal vulnerabilities directly correspond to the functions that individuals use their NSSI for (Nock, 2010). For instance, Nock (2010) theorised that individuals who self-injure primarily as a means of affect regulation, have a predisposition or a vulnerability to affective hyperarousal and poor ability to tolerate distress, when faced with any form of stress. As such, these individuals are at a heightened risk of adopting a maladaptive behaviour like NSSI, in an attempt to regulate affect, cognitions, or their social environment. When exposed to a stressor, a stress response is triggered (Nock, 2009, 2010). In individuals with intrapersonal vulnerabilities they either become overaroused, in the form of intolerable distress or overwhelming negative affect; or they respond by being underaroused, which presents as numbness or dissociation. When triggered by an environmental stressor, individuals with interpersonal vulnerabilities may feel that are unable to meet the social demands that they believe are required of them. Nock (2009, 2010) contends that this hypothesis supports the numerous associations found in the literature between NSSI and other maladaptive behaviours, such as eating disorders and substance usage.

Nock (2009, 2010) proposed that these intrapersonal and interpersonal vulnerabilities develop as a result of the environmental, genetic and neurobiological distal risk factors that an individual is exposed to. These distal risk factors include a

genetic predisposition for high emotional and cognitive reactivity; childhood abuse and maltreatment; and family hostility and criticism. The distal factors are not specific risk factors for NSSI, and like the intrapersonal and interpersonal vulnerability factors, they also provide an elevated risk of engagement in other maladaptive behaviours undertaken for the same function/s as NSSI (Nock, 2009, 2010). They are also associated with a range of psychiatric disorders, and Nock (2009) suggested that the relationship between NSSI and particular diagnostic correlates may be due to the fact that they share the same aetiological pathways.

These distal risk factors and intrapersonal and interpersonal vulnerability factors still do not explain why an individual initially chooses to self-injure over a different maladaptive behaviour, such as substance use. Again, drawing on the extensive body of extant research and many of the aetiological theories addressed earlier in this chapter, Nock identified six theories of NSSI, that he argued are NSSI-specific vulnerability factors: social learning hypothesis (discussed in section 5.3), self-punishment hypothesis, social signalling hypothesis, pragmatic hypothesis, pain analgesia/opiate hypothesis (discussed in section 5.4.1), and the implicit identification hypothesis. Nock (2009) contended that the six NSSI-specific vulnerability factors or processes, all have preliminary empirical evidence in the role of NSSI, that warrants their individual inclusion in this integrative model. The social learning hypothesis, and pain analgesia/opiate hypothesis have been discussed in detail earlier in the chapter, in sections 5.3 and 5.4.1, respectively. The remaining four processes will be outlined here.

The *self-punishment hypothesis* suggests that NSSI is a form of self-directed abuse fuelled by self-depreciation, self-hatred and self-criticism (Nock, 2009, 2010). In its presentation style, it is reminiscent of the early psychoanalytic theory of

intropunitively directed aggression. However, a behavioural approach dictates that this style may be learned through repeated familial criticism or abuse. Herein also lies the link to early childhood trauma that has been repeatedly reported in the literature on NSSI (Nock, 2009). Self-punishment is one of the most commonly endorsed functions for NSSI, and there is considerable evidence supporting its role in NSSI (Hamza et al., 2014; Klonsky, 2009; Swannell et al., 2008). Recent research has linked the role of pain analgesia, self-criticism and self-punishment together (Hooley et al., 2010; St Germain & Hooley, 2012), with individuals who are highly self-critical, believing they are more deserving of enduring pain, as it is consistent with their self-view. This adds further support to the unique and combined roles of pain analgesia, self-criticism and self-punishment in Nock's integrated model.

The *social signalling hypothesis* proposes that individuals use NSSI as a mechanism for interpersonal communication. NSSI is chosen over talking, yelling, crying or writing, as these traditional communication channels have failed to produce the desired response in the past (Nock, 2009, 2010). The investment in the cutting, carving or burning of the skin, demonstrates or signals, the seriousness of the message that the self-injurer is attempting to convey to others. Nock (2010) acknowledges that studies into the signalling function of NSSI are scarce. However, he argues that there is support for this theory in the qualitative descriptions given by self-injurers in the clinical literature, that articulate their struggle with verbalising their overwhelming affect or psychological pain. This mechanism of using the body to communicate, is eloquently captured by McLane (1996) in the opening quote for chapter one. Psychodynamically, this would also point to another link with early childhood trauma (as discussed in section 5.1), and the nonverbal retention of trauma memories seeking manifestation through physical expression (Connors, 1996; McLane, 1996).

The *pragmatic hypothesis* attributes the behaviour to its immediate effectiveness and availability. The act can be undertaken at anytime and anywhere, with no cost, and little preparation (Nock, 2010; Walsh, and Rosen, 1988). Any number of household items can be employed as an implement with which to injure oneself (Walsh & Rosen, 1988). As Nock (2010) highlighted, this hypothesis is particularly pertinent to adolescents. Many adolescents have yet to develop the coping skills required to manage the stressors they encounter, nor have they finely tuned their interpersonal skills to effectively communicate their concerns with their peers. Furthermore, they may not have reliable access to other methods of maladaptive coping, such as alcohol and drugs, used by adults (Nock, 2010). Finally, and incorporating the social learning hypothesis, they have a greater exposure to NSSI through their peers and online social presence (Prinstein et al., 2009).

The *implicit identification hypothesis* underpins how NSSI is maintained, rather than initiated. It suggests that individuals start to identify themselves by their behaviour, identifying themselves as a “cutter,” “burner” or “self-injurer”. As such, when overwhelmed by affect or exposed to a stressor, they automatically choose the behaviour they implicitly identify with, rather than other behaviours that may also serve that function (Nock, 2009, 2010). Little research has investigated this hypothesis to date. However, Nock and Banaji (2007) found that individuals with a recent history of NSSI had stronger implicit identification and more favourable implicit attitudes towards NSSI, than their matched controls.

Nock’s (2009) integrated theoretical model demonstrates a comprehensive understanding of the extant knowledge acquired on NSSI by incorporating a considerable number of risk factors that have been identified to date. It also clearly

illustrates the multidetermined nature of this phenomenon; and that both distal and proximal factors, may result in general or specific vulnerabilities towards the initiation and maintenance of NSSI. Further research is needed to understand how these vulnerabilities and risk factors contribute to NSSI, and the interrelationships that may mediate them. Furthermore, several of the NSSI-specific vulnerability factors are relatively new theories and warrant further investigation.

## CHAPTER 6

### Predisposing, Precipitating and Associated Factors

*Between myself and myself.  
I scratch like a cat.*

*The blood that runs is dark fruit—  
An effect, a cosmetic.*

*You smile.  
No, it is not fatal.*

(Plath, 1962)

The existing body of research into NSSI has investigated a wide range of environmental and psychological influences on non-suicidal self-injury (Chartrand, Bhaskaran, Sareen, Katz, & Bolton, 2015; Taliaferro & Muehlenkamp, 2015). This research is vital to elucidate which diagnoses and variables predispose, precipitate or co-occur with NSSI; and further in delineating the risk factors from those that may act in a protective capacity (Garisch & Wilson, 2015). Self-mutilating behaviour is currently listed as a criterion of borderline personality disorder (BPD) in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5: American Psychiatric Association [APA], 2013). As such, the moderate to high rates of comorbidity between NSSI and BPD are not surprising (Andover, Pepper, Ryabchenko, Orrico, & Gibb, 2005; Glenn & Klonsky, 2010a, 2010b; In-Albon, Ruf, & Schmid, 2013; Nock et al., 2006). However, NSSI also shares diagnostic correlates with a number of other disorders. It has commonly been reported to occur comorbidly with major depressive disorder (MDD: Chartrand, Bhaskaran, Sareen, Katz, & Bolton, 2015; Hintikka, Tolmunen, Rissanen, Honkalampi, Kylmä, & Laukkanen, 2009; In-Albon et al., 2013); posttraumatic stress disorder (PTSD: Briere & Gil, 1998; In-Albon et al., 2013); anxiety disorders

(Chartrand et al., 2015; Glenn & Klonsky, 2013), particularly social phobia (Chartrand, Sareen, Toews, & Bolton, 2012; In-Albon et al., 2013) and generalized anxiety disorder (Chartrand et al., 2012; Gollust et al., 2008); and eating disorders, primarily bulimia nervosa (Glenn & Klonsky, 2010a, 2010b, 2013; Iannaccone, Cella, Manzi, Visconti, Manzi, & Cotrufo, 2013). To a lesser degree, there has also been reported comorbidity in the literature with dissociative identity disorder (DID; Briere & Gil, 1998); bipolar disorders (Andover & Gibb, 2010; Claes et al., 2010); externalizing disorders (Nock et al., 2006) and substance abuse (Garisch & Wilson, 2015; Moller et al., 2013). The empirical evidence indicates that NSSI occurs across a diverse range of diagnostic contexts, supporting the recent inclusion of NSSI as a separate area of interest in Section III of the DSM-5 (APA, 2013: refer to Table 2), rather than solely as a criterion of BPD (Bentley et al., 2015).

Aside from the diagnostic correlates, NSSI has been associated with environmental or psychosocial risk factors such as childhood sexual, physical or psychological abuse (Briere & Gil, 1998; Gratz, 2006; Martin et al., 2010; Shapiro, 1987; Simpson & Porter, 1981); traumatic life experiences (Layne et al., 2014; McReynolds & Wasserman, 2011); stressors such as familial conflict (Adrian, Zeman, Erdley, Lisa, & Sim, 2011), bullying (Claes, Luyckx, Baetens, Ven, & Witteman, 2015; Garisch & Wilson, 2015) or friendship and romantic difficulties (Adrian et al., 2011; Baetens et al., 2011); concerns about sexual orientation (Almeida et al., 2009; Muehlenkamp, Hilt, Ehlinger, & McMillan, 2015; Sornberger et al., 2013); and lack of perceived social support (Brausch & Gutierrez, 2010; Muehlenkamp et al., 2013). A number of individual psychological variables have also been associated with NSSI, such as low self-esteem (Claes et al., 2010; Hawton, Rodham, Evans, & Weatherall, 2002); maladaptive coping styles (Andover et al., 2007; Cawood & Huprich, 2011); poor



communication and interpersonal skills (Claes et al., 2010; Muehlenkamp et al., 2013; Turner et al, 2012); insecure attachment (Gratz, Conrad, & Roemer, 2002; Grocutt, 2009); and self-criticism (Glassman, Weierich, Hooley, Deliberto, & Nock, 2007; Hooley & St. Germain, 2014). All of these risk factors and general correlates relate to a broad variety of psychological and behavioural problems, which significantly lessens their predictive strength (Tanner, Hasking, & Martin, 2015). As such, the current study specifically investigates lifetime exposure to traumatic events; parent and peer attachment; self-esteem, coping and body modifications.

## **6.1 Trauma History and Exposure to Stressful Life Events**

The relationship between trauma and NSSI has a long history in the erudition of SITB (Briere & Gil, 1998; Connors, 1996; Shapiro, 1987; Simpson & Porter, 1981; Van der Kolk, Perry, & Herman, 1991). The scholarship has traditionally focused on childhood sexual abuse as a precursor to self-harm or NSSI. Yet, studies exploring the relationship between childhood sexual abuse and NSSI have reported conflicting results (Ford & Gomez, 2015; Klonsky & Moyer, 2008). The literature has also largely overlooked the breadth of trauma, neglecting to investigate other traumatic or highly stressful events that may contribute to the initiation of self-injurious behaviours (Franzke, Wabnitz, & Catani, 2015; Gratz et al., 2002; Kaess, et al., 2013; Thomas, Lund, & Bradley, 2015). As such, researchers have begun to explore the impact other types of trauma have upon the commencement and maintenance of self-injurious behaviours (Nada-Raja & Skegg, 2011). Traumatic events occurring during the formative years of childhood have also held the focus of researchers. However, the commencement of self-injurious behaviours could potentially be triggered by traumatic

events occurring exclusively in adulthood (Marchetto, 2006). Finally, recent research suggests that it is an individual's accumulative trauma history – rather than one single incident – that has greater strength in predicting a history of NSSI (Thomas, Lund & Bradley, 2015; Zetterqvist, Lundh, & Svedin, 2013).

Early research and theory into self-harm focused heavily on the role of childhood sexual abuse in the development of subsequent self-injury, with the majority reporting a strong association between the two (Briere & Gil, 1998; Kaess et al., 2013; Shapiro, 1987; Simpson & Porter, 1981; Van der Kolk, Perry, & Herman, 1991; Zlotnick, et al., 1996). However, a number of more recent studies have produced contradictory findings, reporting no direct associations between childhood sexual abuse and NSSI across clinical (Brodsky, Cloitre, & Dulit, 1995; Weismore & Esposito-Smythers, 2010), adolescent (Weismore & Esposito-Smythers, 2010), college (Heath, et al., 2008) and adult samples (Nada-Raja & Skegg, 2011). The authors of two recent meta-analyses have argued that whilst a relationship may exist between childhood sexual abuse and NSSI, it is not necessarily a proximal one; and the impact of childhood sexual abuse may in fact be mediated by other psychological, biological, familial or social risk factors; rather than being a direct causal factor (Klonsky & Moyer, 2008; Maniglio, 2011). In fact, in their meta-analysis of 45 different samples Klonsky and Moyer (2008) ascertained that all of the studies which controlled for psychological risk factors reported only weak or statistically insignificant direct associations between childhood sexual abuse and NSSI. Furthermore, they estimated that childhood sexual abuse accounts for less than five percent of the total variance in the aetiology of NSSI. In support of this, a longitudinal study by Nada-Raja and Skegg (2011) determined that whilst childhood sexual abuse significantly contributed to subsequent engagement in NSSI, the pathway was not a direct one. Klonsky and Moyer (2008) and Smith, Kouros

and Meuret (2014) proposed that the association between childhood sexual abuse and NSSI may be an artefact of correlating to the same biopsychosocial risk factors, rather than a proximal aetiological pathway.

In support of this hypothesis, a number of recent studies have investigated the mediating effects a range of psychological, familial and social variables have on NSSI through childhood traumatic experiences (Bolen, Winter, & Hodges, 2013; Franzke et al., 2015; Gratz et al. 2002; Martin, Bergen, Richardson, Roeger, & Allison, 2004; Smith, Kouros & Meuret, 2014). Martin et al. (2004) reported that when controlling for depressive symptomatology, family functioning and hopelessness, the relationship between childhood sexual abuse and self-injury retained statistical significance for males but not females. In complete contrast, Gratz et al. (2002) found no relationship between childhood sexual abuse and self-harm in men when controlling for insecure attachment, emotional neglect, childhood separation, physical abuse and dissociation, yet a weak statistical significance remained for female participants. However, the findings of Gratz et al. must be tempered by the small sample size of men who disclosed a history of childhood sexual abuse in their study.

It is plausible that the association between childhood sexual abuse and NSSI may have inadvertently been exaggerated in much of the early literature due to their shared relationships with dissociation, particularly as the scholarship was initially founded upon clinical studies of patients diagnosed with BDP (Smith et al., 2014). In support of this, Franzke et al., (2015) found that dissociative symptoms had a significant direct effect on NSSI, and they also mediated the relationship between childhood maltreatment (emotional abuse, physical abuse, sexual abuse, physical neglect, & emotional neglect) and NSSI. This result was replicated by the findings of Bolen et al.

(2013), who reported that individuals with a history of childhood sexual abuse who had more severe dissociative symptoms, had a greater probability of self-injuring. Similarly, Smith et al. postulated that the relationship between trauma and NSSI might derive, not from the actual traumatic event itself, but rather from the symptoms associated with the trauma. The authors qualify that approximately 80% of the general population experience a traumatic event at some point in their lives, yet only a small percentage of people subsequently experience ongoing or clinically significant trauma symptomatology. Given these inconclusive findings, theories conceptualising NSSI as manifesting principally in response to childhood sexual abuse need to be re-examined, as it now appears unlikely that childhood sexual abuse is the primary underlying factor driving the commencement and maintenance of self-injurious behaviour (Franzke, Wabnitz, & Catani, 2015; Klonsky & Moyer, 2008).

The literature exploring the relationship between childhood sexual abuse and self-harm or NSSI, has yet to explore the breadth of other traumatic events that individuals have been exposed to; and the impact that these may have on the development and maintenance of self-injurious behaviours. The American Psychiatric Association (2013) lists a number of events that may result in trauma symptomatology if experienced directly or witnessed in person – such as, natural or human-made disasters; severe accidents; exposure to war as a combatant or civilian; and threatened or actual physical and sexual assault – yet very few of these have been explored in relation to NSSI. Two seminal contributors to the field, theoretically explored the interaction of multiple risk factors on the development of self-injurious behaviours. Linehan (1983) addressed the interplay of childhood sexual abuse and an invalidating family environment; whilst Van der Kolk (1996) argued that childhood trauma, neglect and attachment influenced the initiation of NSSI. More recently, several studies have

empirically analysed various aspects of trauma and their relationship with NSSI. Nada-Raja and Skegg (2011) reported that assault victimization (including threatened, attempted or actual sexual and physical assault) and PTSD were directly linked to NSSI in adult women. Gratz et al. (2002) reported that amongst male college students, childhood separation was the most significant predictor of self-harm, accounting for 12% of the variance. Finally, Kaess et al. (2013) found significant associations between maternal and paternal antipathy, maternal neglect, paternal physical abuse and sexual abuse, with NSSI.

Intuitively, it could be hypothesised that there is a direct relationship between the number of traumatic events experienced across the lifetime and the subsequent engagement in NSSI. However, very few studies have explored the impact of cumulative trauma in adolescents on NSSI (Franzke et al., 2015; Martin, Bureau, Cloutier, & Lafontaine, 2011; Zetterqvist, Lundh, & Svedin, 2013), and even less have looked at the impact of composite trauma, or aggregated trauma, that has occurred across the lifespan, on NSSI (Thomas, Lund & Bradley, 2015). Only one study to date has explored traumatic events that occurred in adulthood (Marchetto, 2006) and interestingly, the author discovered that 55% of participants who cut themselves, disclosed that their traumatic experiences only occurred in adulthood. In support of the accumulative trauma hypothesis, Zetterqvist, Lundh, and Svedin (2013) discovered that adolescents who self-injured disclosed more adversities and trauma symptoms than those who did not self-injure. Similarly, Martin et al. (2011) found that individuals who engaged in NSSI had a greater severity of sexual abuse, and were more likely to have also been physically abused than those who did not self-injure. Whilst in a clinical sample of adult females, Franzke et al. (2015) determined that patients who self-injured reported significantly more types of childhood maltreatment than those who did not

self-injure. Germane to the current study, Thomas et al. (2015) found that no single trauma event was predictive of NSSI, but rather the individual's aggregated exposure to traumatic events that predicted a history of NSSI. In addition, Zetterqvist et al. ascertained that adolescents who engaged in more frequent NSSI had experienced greater adversities and more trauma symptoms than individuals who engaged in less frequent self-injury. The authors contend that this adds credence to the conceptualisation of NSSI as a mechanism for coping with stress and overwhelming affect. This recent research also highlights the need to examine multiple domains of trauma in NSSI research (Thomas et al., 2015; Zetterqvist et al., 2013 ).

## **6.2 Self-Esteem**

There is a large body of empirical data indicating that low self-esteem is significantly associated with NSSI (Garisch & Wilson, 2015; Iannaccone et al., 2013; Rotolone & Martin, 2012; Tatnell, Kelada, Hasking, & Martin, 2013). Rosenberg, Schooler, Schoenbach, & Rosenberg (1995, p. 141) defined self-esteem as “the individual's positive or negative attitude toward the self as a totality”. Self-esteem forms the fundamental underpinnings of the subjective experience, greatly influencing the affective component of one's quality of life (James, 1890/1950; Rosenberg et al., 1995). Given that NSSI is predominantly conceptualised as an affect regulation strategy, the association between this behaviour and attitude is hardly surprising. Moreover, this relationship appears consistent from the period of adolescence (Cawood & Huprich, 2011; Claes et al., 2010; Garisch & Wilson, 2015) into young adulthood (Armiento, Hamza, & Willoughby, 2014; Iannaccone et al., 2013; Rotolone & Martin, 2012). Rotolone and Martin (2012) found that self-esteem significantly predicted NSSI. In fact,

they ascertained that the odds of self-injuring increased by a factor of 1.87 for every single unit decrease in self-esteem. Interestingly, Iannacone et al. (2013) found that individuals who self-injured, or those who self-injured and had piercings and/or tattoos had lower self-esteem than those with only piercings and/or tattoos.

The lower rates of self-esteem reported in individuals who engage in NSSI are also consistent with the self-punishing function of self-injury (Garisch & Wilson, 2015; Tanner et al., 2015). In that the act of self-injury is performed as a means of directing hate or aggression against the corporeal self. Self-esteem may also decrease further following the commencement of NSSI due to the negative stigma, guilt and shame associated with the behaviour. Every act of self-injury may further fuel these negative feelings and cognitions, reinforcing a negative self-concept and reducing the individuals' ability to cope and draw on other resources to manage their affect or stress, perpetuating the cycle of NSSI (Armiento et al., 2014; Garisch & Wilson, 2015). The association between heightened levels of self-criticism (Fennig et al., 2008; Glassman, Weierich, Hooley, Deliberto, & Nock, 2007; Hooley & St. Germain, 2014), and rumination (Hilt, Cha, & Nolen-Hoeksema, 2008; Hoff & Muehlenkamp, 2009; Tanner et al., 2015) in the literature on NSSI add support to this theory (Claes et al., 2010). Armiento et al. (2014) also reported that individuals with low self-esteem who self-injured were less likely to disclose their behaviour, than those with higher levels of self-esteem. The authors suggested that this could also be attributed to the negative consequences (i.e., guilt, social avoidance and negative self-concept) associated with concealing their stigmatized behaviour from family, friends and professional sources of support.

### 6.3 Coping

Nonsuicidal self-injury is often described as a dysfunctional or maladaptive coping mechanism (Andrews et al., 2014; Nock, 2010; Sornberger et al, 2013). Yet interestingly, empirical research explicitly exploring the relationship between coping and NSSI is still considerably lacking (Andover, Pepper, & Gibb, 2007; Andrews et al., 2014; Cawood & Huprich, 2011; Sornberger et al, 2013; Tanner et al., 2015). Coping has a long history in psychology, from its earliest hierarchical conceptualisation by Freud as an ego-defense mechanism that focused on coping as a trait or style; to its current understanding fostered by the research of Lazarus and Folkman (1987), indicating that coping is a dynamic process that changes over time in response to the situational context (Frydenberg, 2008; 2014; Lazarus, 1993). Lazarus (1993, p. 237) defined coping as “ongoing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person.” Termed the transactional theory of coping, it emphasises the ongoing and fluid relationship an individual shares with their environment, and it conceptualises coping as a transaction between the two. As such, the process involves the individual making a series of largely automatic or unconscious appraisals. Firstly, an appraisal of the situation to ascertain whether it is one of stress, harm, loss or challenge (the primary appraisal). This is followed by an inventory of the resources available to cope (the secondary appraisal), and finally an evaluation of the coping strategy employed after the event (the tertiary appraisal) (Frydenberg, 2008; 2014; Lazarus, 1987; 1993).

Lazarus (1993) specified that this theory of coping is an inclusive process, and is not restricted to purely adaptive, nor successful and stable coping strategies. That is, it includes any attempts or strategies undertaken to cope with a given stressor, regardless



of whether the strategy is successful or not; adaptive or nonadaptive; consolidated; or fluid and unstable. When an individual employs a similar strategy for coping with stressors recurrently over time, this is considered a stable way of coping. Similarly, when a coping process is applied repeatedly to different situations, it is termed consolidated coping. This stable and consolidated coping process is referred to as a particular coping style (Frydenberg, 2008). The transactional theory of coping identifies two global styles of coping: problem focused and emotion-focused (Lazarus, 1993), whilst other researchers have categorised coping strategies based on whether they represent functional or dysfunctional styles (Frydenberg, 2008; 2014). Functional, productive or problem-focused coping styles involve direct attempts to address the situation (i.e., problem solving, seek social support or professional help); whereas emotion-focused, maladaptive or dysfunctional strategies employ non-productive, avoidant or harmful methods, such as self-blame, tension reduction, keep to self, ignoring the problem, worrying, and engaging in NSSI (Frydenberg, 2008; 2014). The terms productive and non-productive, or emotion-focused and problem-focused are preferred here, as they are less pejorative and have less negative connotations than the terms dysfunctional and functional. Frydenberg (2008) contends that emotion-focused and problem-focused styles do not necessarily translate to good or bad styles, as coping strategies are fundamentally contextually driven.

As a behaviour that is primarily enacted in response to a trigger or stressor, it is not unexpected that self-injurious behaviours have been highly correlated with emotion-focused coping styles in a number of studies (Cawood & Huprich, 2011; Evans et al., 2005; Portzky, De Wilde, & van Heeringen, 2008; Williams & Hasking, 2010). More specifically, avoidant coping strategies (i.e., alcohol or substance usage, staying in one's room) were found to be directly related to NSSI by Andover et al. (2007), Evans et al.

(2005), and Williams and Hasking (2010). Extending upon this, Hasking et al. (2008) discovered that increases in the severity of NSSI paralleled increases in the use of avoidant coping strategies. Conversely, several studies have reported an inverse relationship between problem-focused coping styles and NSSI (Andover et al., 2007; Cawood & Huprich, 2011; Evans et al., 2005; Guerreiro, Figueira, Cruz, & Sampaio, 2015). Furthermore, self-injurers have been found less likely to employ strategies that involve eliciting support from others (Guerreiro, et al., 2015; Wester & Trepal, 2010).

Guerreiro et al. (2015) ascertained that of the 16 coping strategies on the Adolescent Coping Scale, the strongest predictors of lifetime engagement in NSSI were tension reduction and self-blame. This is consistent with the widely supported findings that NSSI is predominantly engaged in as a means of affect regulation (Favazza & Conterio, 1989; Klonsky, 2009; Nixon et al, 2002; Swannell, Martin, Scott, Gibbons, & Gifford, 2008). In fact, Guerreiro et al. (2015) reported that the use of tension reduction as a coping style approximately tripled the risk of engagement in NSSI. Interestingly, Guerreiro et al. (2015) also found that self-blame was a strong predictor of NSSI which is also intuitively reasonable, given that self-punishment is frequently cited as a function of NSSI (Hamza, Willoughby, & Armiento, 2014; Klonsky, 2009; Laye-Gindhu & Schonert-Reichl, 2005; Turner, Chapman, & Layden, 2012; Swannell et al., 2008). Finally, Rotolone and Martin (2012) discovered that low social support was the strongest predictor of NSSI, with an individual 3.51 times more likely to self-injure with each one unit decrease in social support. In accordance with this finding, Wichstrøm (2009) identified satisfaction with social support as a protective factor against future engagement in self-injury. Despite critically reviewing a decade of the literature on the association between DSH and coping in adolescents, Guerreiro et al. (2013) concluded

that the question as to whether self-injury represents a coping strategy still remains unanswered.

#### **6.4 Body Art and Modifications**

*The finest clothing made is a person's own skin, but, of course, society demands something more than this*

Mark Twain

There has been a considerable shift in the public perception of body modifications (BM) since the 1980s, with piercings and tattoos gaining acceptance as normative behaviour (Bui, 2010; Tiggemann & Golder, 2006; Walsh, 2006). Body modifications encompass behaviours such as tattooing and piercing, but also the more esoteric practices of branding and scarification, in which designs are respectively burnt or cut directly into the skin (Favazza, 1996). The pain associated with these procedures is likely to prevent them from attaining the popularity and prevalence of piercing and tattooing. However, as different piercings (i.e., navel, nose, tongue, eyebrow, ear gauges) become more common and more complex, other forms of BM, such as scarification and branding, have increased in the desire to express individuality and uniqueness (Favazza, 1996). The most common piercings aside from the ear lobes, are the range of cartilaginous ear piercings (i.e., conch, helix, rook, tragus etc.), nostril, navel, eyebrow, lip and tongue piercings (Armstrong, Roberts, Owen, & Koch, 2004; Claes, Vandereycken, & Vertommen, 2005; Tiggemann & Hopkins, 2011).

The question has been raised as to whether these body modifications constitute a form of self-injury. These modifications certainly share many commonalities with NSSI: they are intentionally acquired, self-effected, non-suicidal in nature, and result in only minor tissue damage (Walsh, 2006). As with NSSI, tattoos are also largely positioned in areas of the body that can be concealed to facilitate social integration (Stirn, Oddo, Peregrinova, Philipp, & Hinz, 2011). Both NSSI and BM also share an association with a history of sexual abuse (Favazza & Conterio, 1989; Liu & Lester, 2012; Martin et al., 2010; Romans, Martin, Morris, & Harrison, 1998); display signs of addictive properties (Sandman & Kemp, 2011; Stirn et al, 2011; Vail, 1999); and use the behaviours to cope with psychosocial stressors or traumatic events (Gratz, 2006; Roberti, Storch, & Bravata, 2004). However, BMs (particularly piercing and tattoos) and NSSI differ significantly in public perception and social acceptability; the motivations underpinning them; and the appearance and feelings about the resultant tissue damage (Walsh, 2006). The tissue damage in BMs are undertaken to aesthetically enhance the body; and/or to commemorate an event, person or something of significance; unlike the scars resulting from NSSI which are not aesthetically pleasing and are typically hidden with clothing or accessories (Claes et al., 2005; Iannaccone et al, 2013; Walsh, 2006).

Research indicates that the motivations underlying the acquisition of BMs also typically differentiates them from NSSI (Aizenman & Jensen, 2007). The main reasons in the literature endorsed by both men and women for acquiring a tattoo are “to celebrate an occasion/person”, “to express myself”, “because they look good” and “to be unique” (Swami, 2011; Tiggemann & Golder, 2006; Tiggemann & Hopkins, 2011). Whilst tattooing and piercing are often explored together, empirical evidence suggests that they might serve different functions, which preclude combining them in a generic

body modification category (Liu & Lester, 2012). Piercings lack the commemorative, celebratory and symbolic motivations underlying the acquisition of tattoos, yet share the functions that serve as expressions of individuality and aesthetics (Armstrong et al., 2004; Claes et al., 2005; Tiggemann & Hopkins, 2011). The differences in functions between tattoos and piercings (and possibly branding and scarification as there are no studies to date that incorporate these BM practices) could be a consequence of their procedure and permanence. The acquisition of a tattoo requires a greater commitment in time than a piercing. Furthermore, whilst laser techniques enable the removal of tattoos, this procedure is painful, time consuming and expensive when compared to the instant removal of a piercing (Sweetman, 1999; Wohlrab, Stahl, & Kappeler, 2007).

Stirn et al. (2011) contended that the number of BMs reported by individual participants in their sample ranged from one to eighty, indicating considerable heterogeneity amongst this population. As such, the authors categorised the participants according to their degree of BM: those with less than 10 BMs were labelled “low users” and participants with more than 10 BMs were designated “high users”. The main difference between the two groups was the level of addiction experienced, which was significantly greater in the high users. This is analogous to individuals who engage in high frequency NSSI, and the reported urge they feel to repeat the behaviour (Grossman & Siever, 2001).

Only a handful of studies have explored NSSI in concert with BM (Aizenman & Jensen, 2007; Stirn & Hinz, 2008). Two of the studies conducted in samples of females with eating disorders found conflicting results, with Iannaccone et al. (2013) reporting no correlation between piercing and NSSI, but a correlation between tattooing and burning. Whilst Claes et al. (2005) found a negative correlation between piercing and

tattooing with NSSI. This inverse relationship may be explicated by the findings of Stirn and Hinz (2008), who reported that a significant number of participants who self-injured stopped engaging in NSSI once they started piercing. Comparing the motivations underlying BM to those of NSSI, Aizenman and Jensen (2007) found that college students who self-injured reported affect regulation and a need to gain control significantly more than those who pierced or tattooed. Conversely, students who had piercings and tattoos reported aesthetic, creative or individuation motivations.

## CHAPTER 7

### The Act of Nonsuicidal Self-Injury (NSSI)

*The razor's cut is not deep, nevertheless  
the blood rushes out happily in the warm  
water as if kin to it, the same  
tender substance.*

*Rising  
a new person*

(Oates, 1970, p. 36)

The act of NSSI is not only unique to each individual who engages in it, but sometimes the act differs in one or more qualities each time the individual self-injures. The act of NSSI can vary from the methods utilised to self-injure; the frequency in which it is enacted; the bodily site selected; and the implements employed to exact the injury. The length of time taken from the first urge, to the eventual act; the setting and rituals associated with the act; the severity of the wounds and whether medical attention is required and/or sought following the behaviour, all interact to make NSSI a multifaceted and heterogeneous behaviour (Madge et al., 2008; Prinstein, 2008). The act is remarkable in its accessibility, NSSI can be undertaken at anytime and anywhere, with no cost and little preparation. Aside from the obvious and most used implements (i.e., razor blades, knives, and other cutting tools) any number of household items can be employed as an implement with which to harm oneself (Walsh & Rosen, 1988).

## 7.1 The Methods, Physical Sites and Implements of NSSI

The most oft reported methods of NSSI include cutting; carving; severely scratching; burning; or rubbing the skin against abrasive surfaces or with erasers; pinching, banging, hitting or punching oneself; interference with wound healing or skin picking; biting; and inserting objects under the skin, such as needles and pins (Briere & Gil, 1998; Favazza & Conterio, 1989; Hamza et al., 2013; Klonsky, 2009, 2011; Lloyd-Richardson et al., 2007; Martin, Swannell, Hazell, et al., 2010; Muehlenkamp & Gutierrez, 2004; Plener et al., 2013; Sornberger et al., 2012; Zetterqvist et al., 2013). The literature consistently demonstrates that cutting is the most prevalent modus operandi for NSSI (Bryan & Bryan, 2014; Cawood & Huprich, 2011; De Leo & Heller, 2004; Heath et al., 2008; Klonsky, 2007, 2011; Nixon et al., 2008). Estimates indicate that cutting is the main method of NSSI for approximately 35% (Klonsky, 2011) to 65% (Heath et al., 2008) of individuals who self-injure (Briere & Gil, 1998; De Leo et al., 2004; Favazza & Conterio, 1989; Madge et al., 2008; Martin, Swannell, Hazell, et al., 2010; Muehlenkamp & Gutierrez, 2004; Whitlock et al., 2006; Whitlock et al., 2011), with higher rates in the military (78.7%: Bryan & Bryan, 2014), and psychiatric populations (>80%: Herpertz, 1995). This is followed by severely scratching or scraping the skin (17% - 57%: Briere & Gil, 1998; Cawood & Huprich, 2011; Favazza & Conterio, 1988; Favazza & Conterio, 1989; Gollust et al., 2008; Heath et al., 2008; Herpertz, 1995; Martin, Swannell, Hazell, et al., 2010; Muehlenkamp & Gutierrez, 2004; Whitlock et al., 2011); burning (22% - 35%: Briere & Gil, 1998; Favazza & Conterio, 1988; Favazza & Conterio, 1989; Heath et al., 2008; Herpertz, 1995; Klonsky, 2011; Muehlenkamp & Gutierrez, 2004); banging, hitting or punching oneself (12% - 44%: Briere & Gil, 1998; Favazza & Conterio, 1989; Gollust et al., 2008; Hamza et al., 2013; Heath et al., 2008; Herpertz, 1995; Klonsky, 2011; Martin, Swannell, Hazell, et



al., 2010; Muehlenkamp & Gutierrez, 2004; Whitlock et al., 2011); or hitting, punching or banging a hard surface or object (20% - 43%: Briere & Gil, 1998; Gollust et al., 2008; Martin, Swannell, Hazell, et al., 2010; Muehlenkamp & Gutierrez, 2004; Whitlock et al., 2011); biting (17% - 37%: Briere & Gil, 1998; Gollust et al., 2008; Klonsky, 2011; Whitlock et al., 2011); interference with wound healing (15% - 37%: Favazza & Conterio, 1988; Favazza & Conterio, 1989; Gollust et al., 2008; Herpertz, 1995; Klonsky, 2011) and needle sticking (16%: Gratz, Conrad, & Roemer, 2002).

### **7.1.1 Site of NSSI**

Hasking, Momeni, Swannell, and Chia (2008) revealed that the method used to self-injure may have considerable bearing on the bodily location in which the injury is inflicted. The lower arm (63.5%) and thighs (40.4%) were found to be the most prevalent sites for cutting; the lower arm (63.8%), hands (34.5%), wrists (34.5%), and thighs (33.3%) were frequented for scratching; and the lower and upper arms were both equally wounded (66.7%) via burning. Whilst wound interference was the most dispersed in its wound applications, with the hands (46.2%), lower arm (34.6%), lower leg (30.8%), thighs (30.8%), and wrists (30.8%) all injured. These physical sites of injury have changed to some extent since self-mutilation was first explored in the clinical literature, when the face (Battle & Pollitt, 1964; Crabtree, 1967; Goldwyn, Cahill, & Grunebaum, 1967; Grunebaum & Klerman, 1967; Matthews, 1968; Phillips & Alkan, 1961a, 1961b; Podvoll, 1969) and wrists (Goldwyn et al., 1967; Graff, 1967; Graff & Mallin, 1967; Grunebaum & Klerman, 1967) were nominated as the most common sites. The wrists are still a popular site for self-injury, but as individuals who self-injure have become more savvy at keeping their self-injurious behaviours hidden,

self-inflicted injuries have also moved to locations that are more discrete and can be easily hidden with clothing or jewellery. For instance, Whitlock et al. (2011) found that aside from the arms (48%), wrists (33%) and hands (32%), participants also wounded their thighs (22%), stomachs (14%), calves and ankles (13%). Similarly, in a study of only self-cutting, Laukkanen, Rissanen, Tolmunen, Kylmä, and Hintikka (2013) reported that other than the arms, the thighs (13%), shins (15%), ankles (13%), abdomen (8%), or sides of the body (6%), were also cut by the 440 adolescents in their study. Finally – and perhaps as a gender effect of different methods of NSSI – it appears that males and females favour different sites for their self-injury, with females dominantly wounding their arms and thighs, whilst males preferred to injure their hands, chest, genitals or face (Sornberger et al., 2012; Whitlock et al., 2006; Whitlock et al., 2011). However, the relationship of gender with the location and methods of NSSI has been underexplored in the literature to date, and is an area for further consideration.

### **7.1.2 Gender Differences in the Method of NSSI**

Recent research indicates that there may be significant gender differences in the methods utilised to self-injure. Females appear more likely to engage in self-injurious behaviours such as cutting and scratching; whereas males typically employ self-battery; banging, hitting, or punching a hard surface; or burning (Brunner et al., 2013; Gollust et al., 2008; Sornberger et al., 2012; Whitlock et al., 2006; Whitlock et al., 2011; You et al., 2011). Sornberger et al. (2012) postulated that the presence of blood is what appears to differ in the modus operandi between the sexes, with females opting for methods that produce blood, whilst males typically use methods that do not involve bleeding.

Interestingly, Favazza and Conterio (1989) found that for 47% of participants the sight

of their blood was comforting, whilst Glenn and Klonsky (2010b) reported that seeing blood was an important facet of NSSI for 51.9% of their participants ( $n = 64$ ). They did not find any gender differences in the importance of seeing blood. However, the results may have been tempered by the small sample size and the restriction to participants who utilised cutting. The role of blood in NSSI and its relationship to differences in the methods of NSSI is an avenue requiring further exploration.

### **7.1.3 The Number of Methods Used to Self-Injure**

Individuals often employ more than one method to self-injure, with estimates ranging from 30.7% to 66.7% of individuals using only one method of NSSI (Hamza et al., 2013; Hasking et al., 2008; Klonsky, 2011; Martin, Swannell, Hazell, et al., 2010; Muehlenkamp & Gutierrez, 2004). Conversely, 34.8% (Gollust et al., 2008) to 70% (Whitlock et al., 2006) of individuals in the literature endorsed using two or more methods to self-injure (Anestis, Khazem, & Law, 2015; Bryan & Bryan, 2014; Hamza et al., 2013; Klonsky, 2011; Lloyd-Richardson et al., 2007; Martin, Swannell, Hazell, et al., 2010; You et al., 2011). Jacobson & Gould (2007) theorised that the number of different methods used to self-injure was largely determined on where the sample was derived from, with individuals from clinical samples reportedly utilising a greater variety of methods than those from community based samples. Aside from Bryan and Bryan's (2014) military sample, the studies referenced above all drew their samples from nonclinical populations. Perhaps, more accurately a direct relationship exists between the number of methods employed and the level of overall impairment, with a greater number of methods engaged in, reflecting a greater level of impairment (Jacobson & Gould, 2007). In support of this Victor, Styer, and Washburn (2015)

recently suggested that the number of methods employed in NSSI combined with a higher frequency of engagement in the behaviour may be associated with a heightened risk of suicidal behaviour.

#### **7.1.4 Implements Employed in NSSI**

Early clinical research indicated that the implements used to inflict injuries were predominantly razor blades (Goldwyn et al., 1967; Kafka, 1969; Matthews, 1968), broken glass (Goldwyn et al., 1967; Podvoll, 1969), smashed light bulbs (Kafka, 1969), scissors, knives (Phillips & Alkan, 1961a), cigarettes, pins (Crabtree, 1967; Matthews, 1968; Phillips & Alkan, 1961b), nails (Phillips & Alkan, 1961b), needles (Phillips & Alkan, 1961b), and a buzz saw (Goldwyn et al., 1967). Recent research investigating the tools of self-injury has been scarce. Murray, Warm, and Fox (2005) showed that little has changed over the past several decades, with the most common implements used to self-injure listed as razors (89%), knives (79%), lighters (38%), broken glass (34%), and matches (31%). However, 35% of participants indicated that they employed other implements to self-injure (i.e., sewing needles and sandpaper). Anecdotal evidence indicates that individuals who self-injure may have become more creative in their use of the implements, using items such as torn soft drink cans, paper clips, and hair straighteners to injure their bodies.

#### **7.2 Repetition or Frequency of Engagement in NSSI**

The Proposed Criteria for NSSI in the DSM-5 (Table 2) specifies that the behaviour is repetitive in nature, requiring five acts to have occurred within the past

year to fulfil this diagnosis (APA, 2013). The literature consistently demonstrates that NSSI is a predominantly repetitive behaviour (Favazza & Conterio, 1989; Heath et al., 2008; Lloyd-Richardson et al., 2007; Madge et al., 2008; Muehlenkamp & Gutierrez, 2007; Whitlock et al., 2006; Whitlock et al., 2011). Studies on both adolescent (Hasking, Andrews, & Martin, 2013; Laye-Gindhu & Schonert-Reichl, 2005; Nixon et al., 2008; Zetterqvist et al., 2013), and college based samples (Hamza & Willoughby, 2014; Heath et al., 2008; Whitlock et al., 2006; Whitlock et al., 2011) indicate that the majority (approximately 70% to 80%) of adolescents and young adults engage in multiple acts of NSSI. Lloyd-Richardson et al. (2007) reported that adolescents engaged in an average of 12.87 acts of NSSI, whilst 41% of the adolescents in the Zetterqvist et al. (2013) study indicated that they self-injured 11 or more times. Similar results have been found in college samples, with Hamza and Willoughby (2014) ascertaining that 24% of college students self-injured 5 – 10 times, 33% engaged in 11 – 50 acts of NSSI, 7.1% self-injured 51 – 100 times, and 14.2% reported over 100 incidents of NSSI.

### **7.2.1 The Relationship Between Method and Repeated Engagement in NSSI**

The likelihood of repeated engagement in NSSI has been associated with the number and different types of methods, and the reasons for self-injuring by Madge et al. (2008). Repeated experience with NSSI was reported by 59% of adolescents who solely used cutting as their modus operandi (Madge et al., 2008). Similarly Miller et al. (2013), found that of those admitted to hospital for NSSI or DSH, individuals who employed cutting were more likely to be readmitted in the future than those who used other methods of DSH. Madge et al. (2008) and Whitlock et al. (2011) both reported that 63% of their respective samples who engaged in repeated NSSI used multiple methods to

self-injure. Whilst it is reasonably intuitive to hypothesise that with repeated engagement in NSSI the number of methods employed to self-injure may increase, this is an aspect of NSSI practice that has been underexplored in the literature to date.

### **7.2.2 The Experience of Pain**

*“...every pain contains in itself the possibility of a pleasurable sensation”*

(Freud, 1910, p. 22)

The degree of pain experienced during self-injury has long been of interest to researchers. This is an artefact of the early clinical studies using samples of patients diagnosed with BPD. As these studies found that individuals who self-injured in a dissociative state typically experienced little or no pain during the act of NSSI (Bohus et al., 2000; Kemperman, Russ, Clark, Kakuma, Zanine, & Harrison, 1997; Russ, Clark, Cross, Kemperman, Kakuma, & Harrison, 1996; Russ, Campbell, Kakuma, Harrison, & Zanine, 1999). The past two decades have produced a marked increase of NSSI research in nonclinical samples, with studies revealing that between 13.1% (Plener et al., 2013) and 29% (Favazza & Conterio, 1989) of individuals experienced no pain during the act of NSSI (Murray, Warm & Fox, 2005; Polk & Liss, 2009). Whilst, 11.5% (Plener et al., 2013) to 43% (Murray et al., 2005) of individuals indicated, that they often or always felt pain during acts of NSSI. Lloyd-Richardson et al. (2007) confirmed, that adolescents who engaged in moderate or severe NSSI were more likely to experience pain during their self-injury, than those who engaged in minor NSSI. Exploring the actual level of pain experienced, estimates have varied from 3.2% (Polk & Liss, 2009),

8% (Hilt, Nock, Lloyd-Richardson, & Prinstein, 2008), and 10% (Favazza & Conterio, 1989) of participants disclosing they experienced great pain when self-injuring.

Whilst Emerson (1914, p. 51) originally contended “the pain element in itself may be regarded as almost negligible” in self-mutilation, contemporary research indicates that pain may actually serve multiple functions in NSSI. Furthermore, it appears that the sensation of pain is a salient feature of NSSI to many individuals who engage in this behaviour (Nock & Prinstein, 2004). It can transform emotional pain into something physical and tangible (Polk & Liss, 2009), or offer a distraction from intolerable affect (Winchel & Stanley, 1991). The pain may also act as an immediate reminder to the individual who feels numb, that they are alive and can feel something, even if it is simply the sensation of pain (Nock & Prinstein, 2004; Polk, 2009). Similarly, pain may act as a catalyst to either induce one into - or bring someone out of - a dissociative state (Brown, Comtois, & Linehan, 2002). Regardless of the function that pain performs in NSSI, the experience of pain appears to have a different meaning for those who self-injure, as they willingly endure exposure to painful stimuli (Hooley et al., 2010).

Individuals who self-injure have predominantly demonstrated higher pain analgesia than non-self-injurers, across both adult and adolescent samples (Franklin, Hessel, & Prinstein, 2011; Glenn, Michel, Frankin, Hooley & Nock, 2014; Hooley et al., 2010; Koenig, Thayer, & Kaess, 2016). More specifically, self-injurers generally exhibit higher pain thresholds (how long it takes until a stimulus registers as painful) and pain tolerances (how long a painful stimulus is endured before it is terminated) (Franklin, Hessel, & Prinstein, 2011; Hamza, Willoughby, & Armiento, 2014; Hooley et al., 2010; Koenig et al., 2016). Interestingly, Joiner’s (2005) theory of interpersonal-

psychology has been proposed to explicate the differences in pain analgesia between those who self-injure and those who do not. In particular, that individuals who self-injure have a decreased aversion to pain, and are less intimidated by the thought of anticipated pain. Secondly, that repetitive acts of NSSI result in a habituation effect, increasing one's pain threshold and tolerance levels (Hooley, 2010; Nock, 2010). However, a number of recent studies have not supported this hypothesis, finding that self-injurers were *not* more likely to engage in provocative and painful events (PPEs: e.g., getting a tattoo, contact sports) than non-self-injurers (Franklin et al., 2011; Hamza, Willoughby, & Armiento, 2014). In addition, the habituation hypothesis has found mixed support, with research indicating that the frequency of NSSI is not related to the experience of pain (Franklin et al., 2010; Franklin et al., 2013). Finally, Joiner (2005) originally proposed his theory of interpersonal-psychology to explicate the relationship between NSSI and subsequent SAs, not the relationship between pain and NSSI, to which it has recently been applied.

Recent research has found a relationship between self-criticism, NSSI and pain analgesia (Glenn et al., 2014). Based on this, several studies have suggested that individuals who are highly self-critical are more willing, or believe they are more deserving of enduring pain, as it is consistent with their self-view (Hooley, 2010). More specifically, that self-critical individuals employ NSSI as a mechanism for self-punishment or the reduction of guilt (Hooley et al., 2010; St Germain & Hooley, 2012).

Several important limitations exist in these recent studies on pain and NSSI, including small sample sizes in each of the experimental groups (Franklin et al., 2010; Glenn et al., 2010; Hamza, Willoughby & Armiento, 2014; Hooley et al., 2010; Hooley & St Germain, 2015). Fundamentally, we cannot be sure that the measures of pain



assessment (i.e., algometer pressure devices or cold-pressor tasks) adequately replicate the pain sensation of NSSI, created by the participant's chosen method of self-injuring (Glenn et al., 2014; Hamza, Willoughby & Armiento, 2014). Aside from Hamza, Willoughby and Armiento (2014), the majority of these studies also did not include a manipulation to alter the affect of participants, which typically occurs preceding an act of NSSI (Glenn et al., 2014; Hooley & St Germain, 2015; McCoy, Fremouw, & McNeil, 2010). As such Glenn et al. (2014) contests that results may be reflecting trait - as opposed to state - differences in pain analgesia. This is a developing area of research in NSSI warranting further exploration, and longitudinal studies could aid in clarifying questions of causality. Despite the increased research into the experience of pain and NSSI, it remains unclear why those who engage in NSSI demonstrate greater pain analgesia than controls (Glenn et al., 2014).

### **7.3 The Setting for The Act**

#### **7.3.1 Alone or in the Presence of Others**

To date, little research has explored the current status of whether individuals typically self-injure alone or in the presence of others. According to Laye-Gindhu and Schonert-Reichl (2005), all female adolescents and the majority of male adolescents (71%) in their study self-injured in private, whilst 21% of males self-injured with peers, and 7% of males engaged in self-injury both alone and with others. Similarly, in a college sample Whitlock et al. (2011) found that females were more likely to self-injure alone, whilst males were more likely to report sometimes engaging in NSSI in the presence of others; injuring another person; or allowing someone else to injure them.

As NSSI is not always *inflicted* by the individual themselves, but occasionally engaged in with a proxy (Favazza & Conterio, 1989; Walsh, 2006; Whitlock et al., 2011), Walsh (2006) and Crawford et al. (2003) proposed supplanting the ubiquitously used term *self-inflicted*, for the terms *self-effected* and *self-initiated*, when operationally defining NSSI. However, this scenario is relatively rare, and occurs most often during the period of adolescence, where individuals may engage in NSSI simultaneously, or may alternate between harming each other (Farber, 2000; Offer & Barglow, 1960; Walsh, 2006). Further anecdotal evidence of this phenomenon can be found in NSSI forums, where individuals openly discuss practices around NSSI. However, there has not been any empirical research conducted to date exploring whether the functions underlying NSSI by proxy, are in fact analogous to those who enact the tissue damage directly themselves.

Similarly, there has not been any empirically driven comparisons between the functions underpinning the engagement of NSSI alone, to NSSI undertaken in the presence of others. Whilst the contagion effect has received some attention in regards to self-injurious behaviours, references to NSSI actually performed together in peer groups (i.e., as in an initiation rite; as a test of will; or as a feat of strength in adolescent dare games, such as bloody knuckles, erasing and the choking game) in the literature are scarce (Laye-Gindhu & Schonert-Reichl, 2005; Lena & Bijoor, 1990; Schwartz, Cohen, Hoffmann, & Meeks, 1989; Walsh, 2006). Laye-Gindhu and Schonert-Reichl (2005) did not specify the type of NSSI, nor the context in which it was conducted in the 21% of male adolescents who self-injured in the presence of others. Lena and Bijoor (1990) provided the only account of NSSI in a dare game, which described a game of chicken involving wrist cutting amongst a 13 year female and her friends. Yet online media sources (“Choking ‘game’”, 2017; Wheatstone, 2016), search engines, and YouTube

indicate that games involving self-injurious behaviours are been played with some regularity, predominantly amongst adolescents and college students. Intuitively, it would appear that the mechanisms underlying these types of peer group behaviours are distinct from the intrapersonal functions underpinning NSSI. However, it is likely they share interpersonal functions.

### **7.3.2 Routines and Rituals Associated with NSSI**

The routines and rituals around the practice of NSSI have been discussed in theoretical (Gardner, 2001; Martin, 2012; McShane, 2012), treatment (Connors, 2000; Walsh, 2006), and self-help books (Alderman, 1997; Sutton, 1999), biographies and novels about the topic (Strong, 1998), and in the social media and self-injury websites (e.g., <https://self-injury.net>, <http://sirius-project.org>). However, the scholarship has yet to empirically investigate the rituals and routines that are undertaken in the practice of NSSI. A number of clinicians and counsellors have recorded accounts of routines, ritualised or almost ceremonial behaviour around the practice of repetitive NSSI, such as Gardner's (2001, p. 29) account of the ritualistic practices of Mary:

Mary kept her razors in a special wooden box, wrapped in a piece of velvet cloth. The box was kept under her bed...Before cutting herself Mary laid out her razors on the cloth... She would sometimes play certain music... After the cutting Mary followed a routine with cleaning up the blood and tending to the cuts, before putting on plasters, covering up her arms again, and cleaning and hiding the

razor back in its special place. She said that just opening the box made her feel calmer

In her self-help book, entitled *Healing the hurt within*, Sutton (1999) stated that 32% of the 37 individuals who were surveyed about their self-injury, reported that their NSSI was *always* ritualistic, whilst an equal number reported that it was *always* spontaneous. Whereas, Favazza and Conterio (1989) found that 44% of the women in their study adhered to a regular routine when self-injuring. Further research is needed to understand the significance of ritual in NSSI, and the number of individuals who have established rituals and practices associated with their self-injury.

### **7.3.3 Time From Urge to Action**

Most individuals who engage in repeated NSSI experience a preoccupation or urge to self-injure (APA, 2013; Favazza & Conterio, 1989; Favazza & Rosenthal, 1993; Pattison & Kahan, 1983). Klonsky and Olinio (2008) used the term latency, to delineate this period between the initial urge to injure and action. Favazza and Conterio (1989) and Klonsky (2011) reported that in approximately 69% - 77% of individuals, this latency period was 15 minutes or less. However, Zetterqvist et al. (2013) recently found a more conservative estimate, with 39.9% of adolescents engaging in NSSI after only thinking about the behaviour for a few minutes.

Research indicates that a relationship may exist between the level of self-injurious behaviour and the time from urge to action, with moderate and severe self-injurers taking more time to contemplate their behaviour before acting (Klonsky & Olinio, 2008; Lloyd-Richardson et al., 2007; Whitlock, Muehlenkamp, & Eckenrode, 2008). Nock and Prinstein (2005) also found a relationship between pain and the time

from urge to action, with higher perceived pain during self-injury associated with more time spent contemplating the behaviour before actually engaging in it. Intuitively this follows, as the wounds inflicted by individuals engaged in moderate to severe NSSI typically result in a greater degree of tissue damage, which are more likely to involve more pain than wounds inflicted by superficial NSSI (Lloyd-Richardson, 2007). A direct relationship has also been found between the number of acts of self-injury undertaken by one's friends and the time from urge to action (Nock & Prinstein, 2005). Interestingly, the scholarship on NSSI has yet to investigate if there is any association between the urge to self-injure and different methods of NSSI (Washburn, Juzwin, Styer, & Aldridge, 2010).

#### **7.3.4 Severity and Medical Treatments for Wounds Related to NSSI**

The methods and applications of NSSI in nonclinical populations predominantly result in only minor or moderate tissue damage. These injuries are typically treated at home - if at all - and generally do not require medical attention (Brunner et al., 2013; Klonsky, 2011; Martin, Swannell, Hazell, et al., 2010; Whitlock et al., 2011). Hasking et al. (2013) established that 45.9% of acts of NSSI were "not at all serious" and a further 49.1% of episodes did not necessitate first aid, with medical attention required for only 4.5% of acts of NSSI. Similarly, Whitlock et al. (2011) reported that 5% of college students in their sample obtained medical treatment for their self-inflicted injuries. However, 21% of participants disclosed that they had injured themselves more severely than they had expected (Whitlock et al., 2011). Greater severity of NSSI and the need to obtain medical treatment for self-inflicted injuries has been to be associated with greater psychopathology in the literature (Hasking et al, 2008; Klonsky & Olino, 2008). Furthermore, Andrews, Martin, Hasking, and Page (2013) reported that the

continuation or maintenance of self-injurious behaviours in adolescents, was associated with seeking first aid for wound management, and engaging in four or more acts of NSSI.

## CHAPTER 8

### Method

This chapter details the methods employed in the current study. It includes an overview of the general characteristics of the sample, the online survey package, the procedures undertaken, and concludes with a description of the recruitment processes.

#### 8.1 Participants

In total, 1624 individuals started the online survey. Due to incomplete or invalid responses, 319 cases were excluded from the sample. A further 13 participants were omitted from the analyses as they were under 18 years of age and, therefore, did not meet the age inclusion criteria. Participants data were retained if they completed up to and including the question pertaining to their history or current engagement in NSSI. Whilst the final sample consisted of 1292 adults, not all participants completed the survey package in its entirety.

Participants ranged in age from 18 to 76 years, with a mean age of 26.82 ( $SD = 12.57$ ) and a median of 24.00 years. Of the total sample, 85.9% were female ( $n = 1110$ ) and 14.1% were male ( $n = 182$ ). The majority of the sample disclosed that they had self-injured at some point in their lives ( $n = 877, 67.9%$ ), with 32.1% participants ( $n = 415$ ) reporting no history of NSSI. Of those that indicated that they had engaged in NSSI, 801 were female and 76 were male, which was 72.2% and 41.8% of the sample per gender, respectively.

Participants were recruited from 29 different countries, with the majority from Australia (57.1%), United States (25.5%), and the United Kingdom (11.5%). Whilst this

was intended to be a nonclinical sample, 42.3% of the total sample reported a current diagnosis or a history of mental illness ( $n = 547$ ). The majority of participants were heterosexual ( $n = 984$ , 76.2%), 168 bisexual (13%), 65 lesbian (5%), 55 asexual (4.3%), and 20 were gay (1.5%).

The highest level of education attained by participants varied from primary school (1.2%), secondary school (40.6%), technical and further education (14.1%), an undergraduate degree (29.6%) to post-graduate studies (14.6%). Most of the sample (60.2%) were currently undertaking some form of study. Employment status ranged from full time work (27.5%), part time (25.6%), casual employment (13.6%), volunteer work (5.5%), home duties (7.2%) and unemployed (20.6%). Approximately one third of the entire sample lived at home with their parents (34.7%); whilst 21.8% lived with their partner, husband or wife; 14.5% lived with housemates; 11.9% lived alone; 9.2% lived with their partner and children; 3.7% lived with only their children; 1.5% lived with their siblings; 1.3% lived with their partner, children and others; .6% lived in an assisted living situation; and .5% lived in a correctional facility.

## **8.2 Materials**

The survey was distributed using the Qualtrics internet system. It consisted of five previously published psychological assessment measures. In addition, the researcher developed a demographic questionnaire and a series of supplementary questions related to the variables of interest (see Appendix H for all additional survey questions developed by the researcher). These were used to explore nonsuicidal self-injury, self-esteem, accumulative trauma history, attachment, coping and a range of demographic and personal variables.



## **8.2.1 Demographics and Background Information**

The researchers developed a series of questions to collect demographic data from participants. Participants were asked to provide information about their date of birth, gender, country of permanent residence, sexual orientation, level of education, whether they were currently studying, employment status, current living arrangements and history of mental illness (Please refer to Appendix H for the complete list of these questions).

### **8.2.1.1 History of Mental Illness**

As the aim of the current study was to recruit a nonclinical sample of individuals both with and without a history of NSSI, a history of mental illness was assessed through six questions developed by the researcher (please refer to Appendix H for the complete list of questions). These questions were embedded within the Stressful Life Events Screening Questionnaire (SLESQ) and were worded and formatted as closely as possible to the original items of this scale. Participants were initially asked “*Have you ever been diagnosed with a mental illness?*” If they responded affirmatively, they were asked three follow up questions: “*Please list the diagnosis and the approximate age you were first diagnosed*” (participants could list multiple diagnoses); “*Have you ever been hospitalised for a mental illness?*” and “*How many times have you been diagnosed for a mental health issue?*” If they responded that they had no prior history of mental illness, skip logic was used to automatically direct the participant to the next question: “*Please list any medications you are currently taking;*” and “*Please list any medications you have been prescribed in the past for mental health reasons.*” This series of questions concluded with the following two questions asking about their family history of mental

illness: *“Has anyone in your family ever been diagnosed with a mental illness?”*

*“Please list their relationship to you and the mental illness they were diagnosed with.”*

The researcher analysed each participant’s set of responses to the mental health questions. These were subsequently recoded and reported diagnoses were classified into ten categories for the purposes of statistical analyses (see Appendix M for an outline of the classification process employed).

### **8.2.1.2 Piercings, Tattoos and Body Modifications**

The researchers developed six questions enquiring about the presence, number and location of piercings and tattoos. Participants were then asked if they had any other body modifications aside from the piercings and tattoos; and if they had undergone any cosmetic procedures or surgeries (i.e., collagen, Botox, rhinoplasty). Participants who responded “yes,” were asked to provide a description of their respective body modification; or cosmetic surgery or procedure.

Individual qualitative responses were analysed for both body modifications and cosmetic procedures to ensure that all modifications and procedures were consistent with the definitions in the current study. Seven responses for body modifications were recoded, as the underlying motivations in their acquisition were deemed medical in nature (i.e., artificial eye due to an accident, breast augmentations or reductions). Similarly, 12 cosmetic surgeries or procedures were also recoded as the procedures were typically undertaken for medical or corrective reasons, rather than purely cosmetic (i.e., appendectomy, orthodontic braces, wisdom teeth extraction, and reconstructive surgery).

## 8.2.2 Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale (RSE: Rosenberg, 1965) is a frequently employed, easy to administer, self-report measure of global self-esteem (Appendix D). Its simplicity, brevity and face validity have contributed to its application in a wide variety of settings and translation into over thirty languages (Alessandri, Vecchione, Eisenberg, & Laguna, 2015; Bagley, Bolitho, & Bertrand, 1997; Gana, Saada, Bailly, Joulain, Hervé, & Alaphilippe, 2013; Sinclair, Blais, Gansler, Sandberg, Bistis, & LoCicero, 2010).

The 10-item scale was originally developed to explicitly assess the unidimensional component of global self-esteem in adolescents. Each item was scored on a 4-point rating scale, ranging from 4 (strongly agree) to 1 (strongly disagree). To control for response-set bias, five items are positively framed (e.g., “I feel that I have a number of good qualities”) and five are phrased in the negative (e.g., “I certainly feel useless at times”). Negatively phrased questions are reverse scored, then summated with the positive items to provide a single score of global self-esteem, ranging from 10 to 40. As such, higher scores reflect higher self-esteem. Total mean scores reported have ranged from 31.36 ( $SD = 5.13$ ) in a sample of 12-19 year olds (Bagley et al., 1997); and 32.62 ( $SD = 5.80$ ) in an adult sample (Sinclair et al., 2010).

In accordance with its widespread usage, the RSE has been subjected to considerable psychometric testing (Alessandri et al., 2015; Blascovich & Tomaka, 1991; Fleming & Courtney, 1984; Gana et al., 2013; Gray-Little et al., 1997; Hoge & McCarthy, 1984; Savin-Williams & Jacquish, 1981; Sinclair et al., 2010). The RSE has demonstrated strong internal consistency from .88 (Fleming & Courtney, 1984) to .91 (Sinclair et al., 2010). The current study found strong internal consistency on the RSE

with Cronbach's alpha of .94. Fleming and Courtney (1984) reported a robust test-retest reliability over 1-week of  $r = .82$ , and in a longitudinal study Gana et al. (2013) reported test-retest reliabilities of .83 both at two years, and again at four years. Evidence has also been collected in support of convergent and discriminant validity. Moderate negative correlations have been reported between the RSE and constructs typically associated with low self-esteem. For instance, a relationship ranging from  $r = -.64$  (Fleming & Courtney, 1984) and  $r = -.47$  (Sinclair et al., 2010) has been found with anxiety. Correlations with depression have ranged from  $r = -.62$  (Sinclair et al., 2010) to  $r = -.54$  (Fleming & Courtney, 1984).

### **8.2.3 Inventory of Statements about Self-Injury**

The Inventory of Statements about Self-Injury (ISAS) is a comprehensive self-report measure of non-suicidal self-injury (Appendix E). It comprises two distinct sections: Section I. Behaviours assesses the act of NSSI; whilst Section II. Functions measures the functions of behaviour (Klonsky & Olino, 2008; Klonsky & Glenn, 2009). The ISAS has been employed to assess nonsuicidal self-injurious behaviours across a broad range of different populations, from high school students (Bildik, Somer, Kabukçu Başay, Başay, & Özbaran, 2013; Oktan, 2014, 2015), college students (Batejan, Swenson, Jarvi, & Muehlenkamp, 2015; Glenn, Blumenthal, Klonsky, & Hajcak, 2011; Glenn & Klonsky, 2010a, 2010b; Hamza & Willoughby, 2014; Klonsky & Olino, 2008), to clinical samples (Klonsky, Glenn, Styer, Olino, & Washburn, 2015; Sadeh et al., 2014), young women in residential care (Lindholm, Bjärehed, & Lundh, 2011) and transgender adults (Dickey, Reisner, & Juntunen, 2015). A number of studies have been undertaken to explicitly investigate the psychometric properties of the ISAS

(Glenn & Klonsky, 2011; Klonsky & Glenn, 2009; Klonsky & Olino, 2008; Kortge, Meade, & Tennant, 2013; Latimer, Meade, & Tennant, 2013). Finally, it has also been translated and found psychometrically sound in Turkish (Bildik et al., 2013; Oktan, 2014, 2015) and Swedish samples (Lindholm et al., 2011).

### **8.2.3.1 Inventory of Statements about Self-Injury: Section I. Behaviours**

The first section of the ISAS measures the lifetime frequency of the following types of 12 self-injurious behaviours: cutting, biting, burning, carving, pinching, pulling hair, severe scratching, banging or hitting self, interfering with wound healing, rubbing skin against rough surfaces, sticking self with needles and swallowing dangerous substances. The questionnaire specifies that behaviours should only be endorsed if they have been undertaken intentionally and without suicidal intent. In the paper version, participants are asked to estimate the number of times they have engaged in each of the 12 behaviours over their lifetime. As the current study was presented in an online format, a sliding scale was incorporated into the questionnaire design and participants moved the scale from 0 to 100 to indicate their lifetime frequency of each behaviour. Participants also have the option of listing any other self-injurious behaviours that they have engaged in, under the item “other”. If at least one of these 12 behaviours is endorsed, participants are asked to complete a further five questions in this section eliciting additional descriptive and situational information about the act of NSSI (age of onset; most recent NSSI; physical pain associated with NSSI; whether the behaviour occurs alone or in the presence of others; duration of the urge to self-injure prior to engagement; and desire to stop). The latter four questions are presented in a multiple-choice format (Klonsky & Olino, 2008; Klonsky & Glenn, 2009).

The psychometric properties of the 12 behaviours of the ISAS were initially evaluated in a sample of 761 college students. With Cronbach's alpha of .84, the self-injurious behaviours demonstrated good internal consistency (Klonsky & Olino, 2008). Test-retest reliability assessed at four weeks ( $n = 59$ ) was strong at .85, whilst the median test-retest reliability at 12 months ( $n = 51$ ) was not as robust with a median of .68 (Glenn & Klonsky, 2011).

The construct validity for this section of the ISAS was evaluated utilising the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD: Zanarini et al., 2003) and the Youth Risk Behaviours Survey (YRBS: Kann, 2001). Stronger correlations ( $\alpha = .001$ ) were found between the suicide/self-harm item ( $r = .45$ ) of the MSI-BPD than with any of the other items of the MSI-BPD scale (median  $r = .21$ ). Whilst moderate correlations were found between the MSI-BPD (omitting the self-harm/suicide item;  $r = .37$ ); the suicidal ideation ( $r = .38$ ) and the attempted suicide ( $r = .28$ ) items of the YRBS, supporting the construct validity of this section of the ISAS (Klonsky & Olino, 2008).

### **8.2.3.2 Inventory of Statements about Self-Injury: Section II. Functions**

Section two consists of 39 reasons (items) for engaging in NSSI, which form the 13 function scales: affect regulation; anti-dissociation; anti-suicide; autonomy; interpersonal boundaries; interpersonal influence; marking distress; peer bonding; revenge; self-care; self-punishment; sensation seeking; and toughness. Each of the 13 scales comprises three items, which are rated on a three point Likert scale, ranging from 0 = *not relevant* to 2 = *very relevant*. Each item starts with the statement "When I self-harm, I am..." (e.g., "calming myself down"; "punishing myself"; "fitting in with

others”). Scores for each of the 13 functions range from 0 to 6, with higher scores representing the more frequent occurrence of NSSI to manage that particular function (Glenn & Klonsky, 2011; Klonsky & Glenn, 2009; Klonsky & Olino, 2008). Mean total scores for the ISAS have ranged from 14.3 ( $SD = 13.3$ ; Klonsky & Glenn, 2008) to 26.24 ( $SD = 9.90$ ; Kortge et al., 2013). There are two optional open-ended questions at the end of the inventory that invite participants to list any other statements they believe are more reflective of their experience; or that they believe should be added to the list (Klonsky & Olino, 2008; Klonsky & Glenn, 2009).

Test-retest reliabilities of the 13 function scales over 12 months were all positive and significant, with a median of .59 (Glenn & Klonsky, 2011). Internal consistency has not been calculated for the overall ISAS functions scale to date in English. However, in its Turkish translation, Bildik et al. (2013) reported high internal consistency at .93 for the complete ISAS functions scale.

Klonsky and Glenn (2009) advocated a two-factor structural model with an interpersonal and intrapersonal dichotomy. Initially, the two factors were calculated by summing each of the function scales and dividing each total by the number of subscales that comprised it; eight for the interpersonal scale (autonomy, interpersonal boundaries, interpersonal influence, peer-bonding, revenge, self-care, sensation seeking, and toughness) and five for the intrapersonal scale (affect regulation, anti-dissociation, anti-suicide, marking distress, and self-punishment). Coefficient alphas of .87 and .80, respectively were found.

Klonsky, Glenn, Styer, Olino, and Washburn (2015) recently revised the computation of these factors, recommending the summation of all the individual items, rather than the function scale scores, to form the intrapersonal and interpersonal or

Social factors. Scores on the intrapersonal scale range from 0 to 26, whilst the interpersonal scale ranges from 0 to 36. This method of calculation yielded stronger internal consistencies with coefficient alphas of .89 for the social interpersonal factor and .88 for the intrapersonal factor (Klonsky et al., 2015). Replicating this calculation in larger samples, Kortge et al. (2013) and Batejan et al. (2015) reported internal consistencies of .87 and .86 for the interpersonal factor; and .77 and .81 for the intrapersonal factor, respectively. In the current study, the 39 items of the ISAS demonstrated excellent internal consistency ( $\alpha = .90$ ), whilst the Cronbach's alphas for the 15 Intrapersonal and 24 Interpersonal factors were strong at .95 and .87, respectively (see Appendix N). Test-retest correlations of .82 for the interpersonal factor and .60 for the intrapersonal factor have been reported across a 12 month period in a small sample of university students (Glenn & Klonsky, 2011).

The ISAS function scales have demonstrated sound construct validity with higher scores on interpersonal or intrapersonal functions correlated with higher scores on clinical measures, including the Depression Anxiety Stress Scales (DASS-21), The McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD), and the Youth Risk Behaviours Survey (YRBS) (Klonsky & Glenn, 2009; Kortge, et al., 2013).

The researchers developed a number of additional questions which were incorporated into this online survey block. Participants were then asked "*Have you EVER intentionally (i.e., on purpose) and without suicidal intent (i.e., not for suicidal reasons) harmed yourself?*" Participants who indicated they had never engaged in NSSI entered a skip logic and were not required to respond to any further questions about NSSI, including the ISAS. Embedded within or following the ISAS were a range of questions designed by the researcher to gain a more comprehensive understanding of



NSSI (e.g., frequency, severity, sources of potential exposure to NSSI, routines or rituals, the number of people known who self-injure prior to onset: see Appendix H for the complete list of questions developed by the researcher on NSSI).

#### **8.2.4 Stressful Life Events Screening Questionnaire**

The Stressful Life Events Screening Questionnaire (SLESQ: Goodman, Corcoran, Turner, Yuan & Green, 1998) is a 13 item self-report measure of lifetime exposure to DSM-IV PTSD criterion A traumatic events (Appendix F). Participants are asked to respond either yes or no to whether they have experienced each of the 13 traumatic events (e.g., life threatening illness, childhood sexual abuse, physical assault, being threatened with a weapon). If the participant responds affirmatively then they are asked for more detailed information about that particular trauma, for example: the age at which the trauma occurred; a brief description of the trauma; the type of force used; the nature of the threat; injuries sustained; relationship (if any) to perpetrator; frequency, duration and repetition of the trauma; and perception of threat to self. If they did not endorse a traumatic event, skip logic was used in the Qualtrics online survey to automatically direct the participant to the next question.

The SLESQ assesses the presence or absence of lifetime exposure to stressful events, however it does not rate them. To ensure nominated events fulfilled the criteria of the SLESQ, as the authors (1998) recommended each participant's quantitative and then qualitative responses were reviewed to ensure their nominated events were life-threatening, involved a significant level of violence and/or assault to bodily integrity, and either occurred directly to the participants or a person very close to them. The authors cite the example that they excluded pneumonia from life-threatening illness as it

is typically not considered life-threatening but included cancer given its pervasive acknowledgement as life-threatening.

Items on the SLESQ are worded to discourage multiple reporting of the same event across items, for instance questions that may address similar trauma experiences (i.e., forced sexual intercourse and attempted sexual assault) start with the phrase “*other than the experiences described in the last question...*”. To check for multiple reporting errors, the last question on the SLESQ specifically asks participants to stipulate if they have reported the same incident under more than one item in the questionnaire. If participants indicated that they had reported one incident under two separate headings, their responses were reviewed and if the two event responses clearly referred to the same trauma, they were recoded into one category, as recommended by Green et al. (2000). However, there is a final item on the SLESQ which enables respondents to list repeated episodes of any traumas that they have experienced, such as a second physical assault (Goodman et al., 1998; Green et al., 2000).

A total SLESQ score is calculated by summing the number of stressful life events participants had experienced throughout their lifetime. Finally, following established practice in the literature (Elhai, Miller, Ford, Biehn, Palmieri, & Frueh, 2012; Elhai, Patrick, Anderson, Simons, & Frueh, 2006; Elhai & Simons, 2007), lifetime frequency estimates were calculated to create two subcategories within the SLESQ, for Violent Crime Victimization (SLESQ items 3, 5, 6, 7, 8, 9, & 10) and Noncrime Traumatic Events (SLESQ items 1, 2, 4, 11, 12 & 13) by summing SLESQ counts for items in each category.

In the original study assessing the psychometric properties of the SLESQ, 202 male and female college students completed the self-report questionnaire (Goodman et

al., 1998). 140 students from this sample returned 2 weeks later to complete *either* the questionnaire or a one-on-one clinical interview. With an overall correlation of .89, the SLESQ appears to have good test-retest reliability for the number of traumatic events reported over a two-week test-retest interval ( $n = 66$ ). This is consistent with the test-retest reliabilities of the Traumatic Events Questionnaire (TEQ; .91; Lauterbach & Vrana, 1996) and the Traumatic Stress Schedule (TSS; .88; Norris & Perilla, 1996). Test-retest reliability for individual trauma events ranged from .31 (attempted sexual assault) to 1.00 (robbery/mugging), with a median kappa of .73 (Goodman et al., 1998).

Allen, Madan & Fowler (2015) reasoned that as the scale of measurement for the 13 items of the SLESQ are dichotomous, traditional approaches to assessing the internal consistency, such as Cronbach's alpha, are inappropriate. In accordance with contemporary psychometric theory (Gadermann, Guhn, & Zumbo, 2012) they utilised ordinal alpha to ascertain that the SLESQ had good internal consistency (ordinal alpha = .87).

Convergent reliability was assessed via the administration of clinical interviews two weeks after the initial administration of the SLESQ ( $n = 74$ ). The interview schedule was based upon four existing interview schedules: the DSM-IV field trials trauma history interview; the Conflict Tactics Scale (Strauss, 1989); the high magnitude stressors portion of the PSEI (Resnick, Falsetti, Kilpatrick & Freedy, 1996); and Russell's (1986) semi-structured sexual abuse interview. The correlation between the total number of events reported initially and at the interview was .77; and kappas for individual events ranged from .26 (witness death/assault) to .90 (life threatening illness) with a median kappa of .64 (Goodman et al., 1998).

In an assessment of the concurrent validity of the SLESQ, a comparison of prevalence rates with two other larger trauma studies (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Norris, 1992) that selected participants via probability sampling was conducted. Comparisons between trauma prevalence rates in the three studies were slightly confounded by differing definitions or thresholds of particular trauma events or the wording of items. However, with the exception of three trauma events (traumatic bereavement, witnessing death and robbery) prevalence rates were largely consistent with Kessler et al. (1995) and Norris (1992).

### **8.2.5 Inventory of Parent and Peer Attachment**

In accordance with Bowlby's theory of attachment, the IPPA assesses individuals' perceptions of the positive and negative affective and cognitive aspects of their relationships with their mother, father (or caregivers), and close friends (Appendix G). In particular, it examines the degree with which these figures provide a source of psychological security. Each domain (mother, father, and peer) measures three dimensions of attachment: trust, communication, and alienation (Armsden & Greenberg, 1987; Armsden, McCauley, Greenberg, & Burke, 1990). The trust subscale assesses the perceived degree of mutual respect and understanding in the relationship. Whilst the communication subscale explores the quality, openness, and reciprocity of interpersonal communication; and finally, the alienation subscale evaluates the feeling of anger, detachment and insecurity (Armsden & Greenberg, 1987; Armsden et al., 1990; Gullone & Robinson, 2005).

The 75 item self-report questionnaire is scored on a 5 point Likert scale, ranging from 1 = "almost never or never true" to 5 = "almost always or always true". The

current study utilised the revised version of the IPPA as recommended in the assessment material by the authors (Greenberg & Armsden, 2009). The revised version evaluates mother and father attachment separately, whereas the original version published in 1987 (Armsden & Greenberg) assessed parent attachment as a single domain with 28 items; and peer attachment with 25 items. The revised questionnaire is composed of three 25 item scales: Mother Attachment (e.g., “I wish I had a different mother”), Father Attachment (e.g., “My father accepts me as I am”) and Peer Attachment (e.g., “I feel alone or apart when I am with my friends”). The items can also be summated to provide a score on the three subscales – Trust (10 items); Communication (mothers/fathers 9 items; peers 8 items); and Alienation (negatively coded; mothers/fathers 6 items; peers 7 items) - for each parent and peers (Armsden & Greenberg, 1987; Armsden, McCauley, Greenberg, & Burke, 1990).

Armsden and Greenberg (1987) initially developed the Inventory of Parent and Peer Attachment (IPPA) to measure attachment in older adolescents, aged 16 to 20. However, the IPPA has been employed to assess attachment in children and younger adolescents (Gullone & Robinson, 2005), college students (Viana & Rabian, 2008) and adults (Curzik & Salkicevic, 2016). The IPPA has also been translated and employed to measure attachment in Chinese (Zhang, Zhang, Zhang, Wang, & Hung, 2011), Colombian (Pardo, Pineda, Carrillo, & Castro, 2006), Greek (Charalampous et al., 2016), Italian (Guarnieri, Ponti, & Tani, 2010; Pace, San Martini, & Zavattini, 2011), and Spanish (Gallarín & Alonso-Arbiol, 2013), samples.

Ten items on both the mother and father attachment subscales and eight items on the peer attachment subscale are negatively worded and are reverse-scored. The scores on each subscale are then added to form a total scale score, which ranges from 25 to

125, with higher scores reflecting more secure attachment and low scores denoting insecure attachment (Armsden & Greenberg, 1987; Armsden, McCauley, Greenberg, & Burke, 1990). Mean and standard deviation scores reported in the original study are not relevant to the current study as the revised version has been adopted here. To date, the only standardised descriptive scores published with the revised IPPA scoring are on the Alienation subscale, with means ranging from 13.55 (SD = 5.61; Viana & Rabian, 2008) to 15.28 (SD = 4.95; Curzik & Salkicevic, 2016) on the Mother scale; 14.37 (SD = 5.72; Viana & Rabian, 2008) to 15.75 (SD = 5.23; Curzik & Salkicevic, 2016) on the Father scale; and 16.82 (SD = 4.62; Viana & Rabian, 2008) to 18.22 (SD = 4.24; Curzik & Salkicevic, 2016) on the Peer scale.

Psychometric testing has demonstrated that the IPPA is both a reliable and valid measure of attachment. In a small sample ( $N = 27$ ) of college students test-retest reliabilities over a period of three weeks were .93 for parent attachment and .86 for peer attachment (Armsden & Greenberg, 1987). Armsden and Greenberg (1987) reported Cronbach's alphas of .87 for mother attachment, .89 for father attachment and .92 for peer attachment. In a much larger sample of adolescents, Hilt, Nock, Lloyd-Richardson and Prinstein (2008) found high internal consistency for mother and father attachment at both the initial testing ( $n = 637$ ) and on re-testing 11 months later ( $n = 508$ ), with all reported alphas  $> .94$ . With regards to the three subscales, internal consistency was only evaluated for combined parent attachment in the original study. However, Cronbach alphas for the three peer scales were .91 for Trust; .87 for Communication; and .72 for Alienation (Armsden & Greenberg, 1987). In the current study, the Cronbach alpha coefficient were calculated for the three relationship domains: mother (.97); father (.96); peer (.95); and then for each of the three subscales (Trust, Communication, and Alienation) under each of these domains. Cronbach alpha coefficients indicated good

internal consistency on all three of the Trust and Communication subscales with all alphas  $> .92$ . Internal consistency was not as sound on the three Alienation subscales, with Cronbach's alpha ranging from  $.76$  on the peer domain to  $.83$  on both the mother and father domains.

In support of the construct validity of the IPPA, parental attachment scores have been found to correlate with family self-concept scores from the Tennessee Self Concept Scale (TSCS) and the cohesion and expressiveness scales on the Family Environment Scale (FES). Furthermore, peer attachment scores were found to be significantly correlated to social self-concept as measured by the TSCS (Armsden & Greenberg, 1987).

### **8.2.6 Coping Scale for Adults**

The current study employed the long version of the Coping Scale for Adults (CSA: Fryderberg & Lewis, 1997), which is a 74 item self-report inventory comprising 73 structured items. The final question is open-ended and asks participants to list any other behaviours they use to cope with problems or concerns in their lives. Seventy of the items measure 18 empirically and conceptually distinct coping strategies: seek social support, focus on solving the problem, work hard, worry, improve relationships, wishful thinking, tension reduction, social action, ignore the problem, self-blame, keep to self, seek spiritual support, focus on the positive, seek professional help, seek relaxing diversions, physical recreation, protect self, and humour. The other 3 items comprise a "Not Coping" subscale, which identifies the presence of psychosomatic concerns (i.e., "I suffer from headaches or stomach aches") and an inability to cope (i.e., "I get stressed out and despair") (Fryderberg & Lewis, 1997, 2000).

Participants rated each item on a 5-point Likert scale, ranging from 1 = “doesn’t apply or don’t do it” to 5 = “used a great deal”. Raw scores on the coping strategies range from 4 to 35. However, the scoring sheet requires the adjustment of raw scores for the number of items per subscale, which is calculated by multiplying the total score for each of the 19 coping strategies (including Not Coping). Adjusted scores for the coping strategies range from 20 to 105, with higher scores indicating a greater utilisation of that particular coping strategy. The authors have only reported the means and standard deviations for the raw scores which range from Seek Spiritual Support ( $M = 7.42$ ,  $SD = 4.49$ ) to Work Hard and Achieve ( $M = 19.29$ ,  $SD = 3.09$ ) (Fryderberg & Lewis, 1997, 2000).

Utilising a sample of 371 Australian adults, Fryderberg and Lewis (1997) found the CSA demonstrated reasonable internal consistency, with Cronbach’s alpha coefficients ranging from .69 to .92. In the current study, Cronbach’s alpha was acceptable for the majority of coping strategies, ranging from .73 (Relax) to .96 (Seek Professional Help), indicating moderate to good internal reliability. However, Cronbach’s alpha was low for Tension Reduction (.62), Protect Self (.62), and Wishful Thinking (.67), signifying poor internal consistency.

According to Fryderberg and Lewis (1997), test-retest reliability was high for the majority of the subscales (ranging from  $r = .75$  to  $r = .97$ ), except for Work Hard ( $r = .23$ ), Focus on Solving the Problem ( $r = .56$ ) and Social Action ( $r = .56$ ) which had low and moderate retest reliability, respectively. In a small sample ( $n = 25$ ) test-retest reliability was also calculated for the 73 structured items of the CSA 10-14 days after the initial administration. Ten of the items did not attain statistically significant correlations. However, the authors reported that these items still satisfied the criteria for



response stability as all ten items were endorsed by more than 88 percent of respondents on both test administrations (Fryderberg & Lewis, 1997, 2000).

### **8.3 Procedure**

Ethics approval was obtained by the Victoria University Human Research Ethics Committee (Appendix A). The online survey was designed in Qualtrics, a web-based survey tool, hosted through the secure Victoria University server. The researcher took advantage of the large variety of question format and design options available in Qualtrics when designing the survey: employing multiple choice questions, sliding scales, matrix tables, text or essay entry for qualitative responses, dropdown lists, and accessing the global question library for date of birth and country of permanent residence. For each question, a decision was made as to whether a forced response was required; and whether single or multiple responses were enabled. Skip logic was utilised to customise the survey pathway of participants so they were not required to answer irrelevant questions based on their previous responses. The Qualtrics platform also allowed the researcher to set up the scoring structure for each quantitative question in the survey. Qualtrics supports ethical research data collection by using secure, encrypted storage under US-EU Safe Harbor Principles.

The data collection occurred over a 12-month period, with the online survey system allowing each participant to complete the survey only once. However, participants had the option of saving their responses and returning to the survey within seven days. After this time, partial responses were closed and recorded. The data was downloaded directly from Qualtrics into SPSS.

The introductory page of the survey package provided potential participants with the information (Appendix B) necessary to giving their informed consent. Given the sensitive nature of many of the questions in the survey, participants were provided with the contact number of a Psychologist at Victoria University. The number for a 24-hour National Helpline for Australian residents was also listed on the information page, whilst a link was provided for International participants to access a Helpline in their country (Appendix B). This link was also provided in the footer for the entirety of the survey and in the end of survey message along with the contact details of the researcher's supervisors. Participants were clearly advised that their participation was completely voluntary and should they become uncomfortable or distressed they were free to withdraw from the study at any time. Participants were then directed to the Participant Consent Form, which required them to click on the button stating "I Consent" to participate in the study, before being directed to the survey (Appendix C).

Participants were not offered any compensation for participation in the study. However, upon completion of the survey, all participants had the choice of entering the draw to win one of 50 online iTunes vouchers valued at AUD\$20 each. To ensure participant anonymity, the 599 participants who choose to enter the draw, were redirected to a separate survey to enter their email address. Email addresses could not be linked to the survey results, and were only used for the purposes of the prize draw. After the closure of the online survey, a random number generator was used to select the 50 participants who received the iTunes voucher, and they were sent an iTunes gift code via email.

### 8.3.1 Recruitment

Participants were recruited via convenience sampling through a range of different sources. The researcher created a character to promote the research (Appendix I2), which was used in all the social media advertising and on promotional postcards (Appendix I3). An online research presence was established and maintained at least weekly through each of the following avenues on social media: Facebook (Appendix J1), Twitter (Appendix J2), Pinterest (Appendix J3), and Instagram (Appendix J4), with the express purpose of recruiting potential participants. The researcher also posted advertisements for the study on a number of Facebook groups (Sirius Project, Stop Self-Injury, Understanding Self-Harm, Self-Harm Awareness, Victoria University Group etc.).

A brief description and direct URL link for the study was advertised on 15 different websites, such as the Victoria University Noticeboard, Psychological Research on the Net, Beyond Blue, Depression Net (or dNet), The Australian Psychological Society (APS), Gay & Lesbian Health Victoria, Self-Injury.Net. The study was also advertised repeatedly in several electronic newsletters: namely Safe in Oz, APS Matters through the APS, and ProPsych. In addition, the researcher paid to promote the research through three avenues with the Anxiety Disorders Association of Victoria (ADAVIC): their online website, their e-newsletter and the promotional postcards (Appendix I3) were distributed by the organisation at their weekly support groups.

The study was also promoted through traditional media avenues. Firstly, the researcher was interviewed about the study in a radio interview on Triple R during the Detour Program in a segment entitled “I Wanna Be A Doctor”. The researcher was also interviewed by two local papers regarding the research (Appendices I5 & I6).

Furthermore, the researcher wrote an article on NSSI for a paper in rural Victoria, which also advertised the study (Appendix I4).

Finally, convenience sampling was also employed to recruit participants via professional networks, word of mouth and at four workshops or presentations on NSSI presented by the researcher. A link to the study was provided in the presentation material at each of these and promotional postcards were also disseminated. Regardless of the source of recruitment, all participants accessed the study via a single link to the online survey.

## CHAPTER 9

### Results

Prior to commencing the analysis, considerable time was taken preparing the data by defining variables and assigning missing values. The data set was then screened for errors, invalid responses and the accuracy of the scoring transferred from Qualtrics; and any errors were rectified. The visual binning procedure in SPSS was utilised to group the number of piercings and tattoos in three approximately equal categories: none, minimal and extensive. Subscale and total scale scores were calculated for each of the assessment measures and for the additional variables created for the current study.

Given that not all participants completed the survey package in its entirety, the violations of assumptions were assessed on a test-by-test basis for each of the analyses undertaken. The internal consistency was calculated for the total scale score of the RSE; and the total scale and subscale scores for the ISAS, IPPA, CSA in this research sample using Cronbach's alpha in SPSS. As recommended by Pallant (2013), the lifetime prevalence of mental illness,<sup>3</sup> and trauma in non-injurers were compared against the national averages in Australia using a series of chi-square goodness of fit analyses.<sup>4</sup>

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<sup>3</sup> National averages on Mental Health were obtained from the 2014-2015 National Health Survey in Australia (ABS, 2015)

<sup>4</sup> National averages on trauma were obtained from the Australian Bureau of Statistics 2012 Personal Safety Survey (PSS) (ABS, 2012).

A funnelled approach was taken in the analysis of the data, starting with descriptive statistics, and increasing both in complication and in the number of variables analysed, culminating in the binomial logistic regression. Adhering to this approach as closely as possible, the results section was primarily organised to follow the approximate structure of the literature review.

The preliminary analyses involved running a range of descriptive statistics on the data. Following this, a range of chi-square tests for independence were run to explore the relationship between any categorical variables of interest. To compensate for the potential over estimate of the chi-square value when variables had only two categories in each variable, *Yates' Correction for Continuity* was reported. Similarly, when variables had more than two categories, *Cramer's V* was reported as the measure of effect size, rather than the phi coefficient to account for the degrees of freedom. Five independent samples t-tests were conducted and two paired-samples t-tests were performed. For each of the t-tests, eta squared was calculated as a measure of effect size, using the formula given in Pallant (2013).

A succession of Pearson product-moment correlation coefficients were conducted to investigate a number of hypotheses; and two Spearman rank order correlations were used to explore relationships when the data was ordinal or ranked, as recommended by Pallant (2013).

Prior to the interpretation of all the one-way between-groups analysis of variance (ANOVA), *Levene's F test* was examined. Where the assumption of homogeneity of variance was not met, the *Welch F-ratio* was reported as it is a more robust test than the F ratio, per Field (2013) and Pallant (2013). As recommended by Field (2013) and Tabachnick and Fidell (2013), when multiple comparisons were made,

a Bonferroni adjusted alpha level was calculated to minimise the effects of a type 1 error. The effect size was calculated using omega squared, as advised by Field (2013), as eta squared is slightly biased given that it is calculated from the sample's sums of squares, and not adjusted for the estimation of effect size in the population. Four one-way between-groups multivariate analysis of variances were run in the current study. Firstly, to investigate both gender differences across the 13 individual functions of the ISAS, and secondly to investigate a history of mental illness across the 13 individual functions of the ISAS. A third MANOVA was conducted to examine the differences between sexual orientation and coping strategies. The fourth MANOVA was run to explore an incident of violent crime across the mother, father and peer attachment scales. In each of the MANOVAs, *Box's test* revealed that the assumption of homogeneity of variance-covariance matrices was not met. However, *Box's test* is widely acknowledged as being too conservative in the large sample sizes, as in the current study (Field, 2013; Tabachnick & Fidell, 2013). *Pillai's Trace* was reported instead of the *F* statistic, as it offers a more robust statistic when violations of assumptions occur and unequally sized matrices are present (Field, 2013; Pallant, 2013; Tabachnick & Fidell, 2013).

In the direct discriminant analysis, *Box's M* again indicated that the assumption of equality of covariance matrices was violated, even though the log determinants were quite similar. Given the large sample size, this is not considered serious violation (Tabachnick & Fidel, 2013). The final analyses employed logistic regressions. A multinomial logistic regression was chosen to assess the impact of several factors on the time taken from urge to engagement in NSSI. This analysis was chosen over a discriminant function analyses due to the unequal group sizes in the dependent variable. Lastly, as NSSI was a categorical variable a binary logistic regression was performed to

assess the impact of a range of factors on the likelihood that respondents would report they had engaged in NSSI.

## 9.1 Prevalence of NSSI

The majority of the sample reported a lifetime history of NSSI ( $n = 877$ , 67.9%). The lifetime rate of NSSI was 72.2% of females ( $n = 801$ ), compared to 41.8% of males ( $n = 76$ ). A Chi-square test for independence (with Yates Continuity Correction) indicated that this difference between gender and engagement in NSSI was significant,  $\chi^2_{(1)} = 64.91$ ,  $p < .001$ ,  $\phi = -.23$ . However, the unequal gender representation in the current study should be highlighted with a disproportionate number of females ( $n = 1110$ ) than males ( $n = 182$ ). The average age of participants with a history of NSSI was 24.68 ( $SD = 11.09$ ), whilst the average age of non-self-injurers was significantly higher ( $M = 31.33$ ,  $SD = 14.22$ ;  $t(1290) = -8.39$ ,  $p < .001$ , two tailed). The magnitude of the differences between the means (mean difference = -6.65, 95% CI: -8.20 to -5.09) was moderate, with an eta squared of .05.

### 9.1.1 Sexual Orientation

At 70.4% and 88.4% of the total sample respectively, the majority of both self-injurers ( $n = 617$ ) and non-injurers ( $n = 367$ ) were heterosexual. Employing a Chi-square test for independence, a significant difference was found between sexual orientation and engagement in NSSI,  $\chi^2_{(4)} = 62.54$ ,  $p < .001$ , *Cramer's V* = .22 (Table 5). Whilst, the number of gay males in each group was similar (self-injurers  $n = 11$ ; non-injurers  $n = 9$ ), there was considerable variation between the numbers of lesbian,



bisexual and asexual participants across the NSSI and non-injuring groups. Of note, the percentage of bisexual females who self-injured ( $n = 134$ , 10.37%) was significantly higher compared to the number of bisexual females who had never engaged in NSSI ( $n = 11$ , 0.85%,  $\chi^2_{(1)} = 32.90$ ,  $p = <.001$ ,  $\Phi = -.18$ ). This result was not replicated in male bisexuals who self-injured. As such, females who identified as bisexual were 5.95 times more likely to have self-injured than their heterosexual counterparts. Finally, lesbians were 4.80 times more likely to have a lifetime history of NSSI than female heterosexuals.

### 9.1.2 Mental Illness

The current study was undertaken with the intention of recruiting a nonclinical sample, however, 42.3% of the total sample ( $n = 547$ ) reported a history of mental illness (see Appendix M for an outline of the classification process in the current study). A Chi-square goodness of fit test indicated there was no statistical difference in the percentage of mental illness disclosed by *non-injurers* in the current sample (15.9%), when compared with the 17.5% reported in the data from the 2014 – 2015 National Health Survey in Australia (ABS, 2015),  $\chi^2(1, n = 415) = .733$ ,  $p = .39$ . Chi-square goodness of fit analyses were also performed to compare the percentages of non-injurers across specific diagnoses with those listed in the 2014 – 2015 National Health Survey in Australia. However, not all diagnoses nominated by participants in the present study were canvassed in the National Health Survey.

A Chi-square test for independence indicated a significant difference in mental health history between self-injurers and non-self-injurers, with 54.8% of self-injurers ( $n = 481$ ) disclosing a history of mental illness; compared to the 15.9% of non-injurers ( $n = 66$ )

$\chi^2_{(2)} = 256.45, p = < .001$ . A Cramer's V of .45 indicates a large effect size. For self-injurers, the odds of reporting a mental illness was 6.42 times the odds of non-injurers. Table 5 delineates the number of participants by self-reported diagnoses, for both the group who currently or previously engaged in self-injury (NSSI) and the group who had never self-injured (No NSSI). A series of Chi-square tests for independence revealed a significant difference between self-injurers and non-injurers across all self-reported mental illnesses.

Amongst both self-injurers and non-injurers, depression was the most commonly reported mental illness with 49.6% ( $n = 399$ ) and 12.3% ( $n = 51$ ) reporting a depressive disorder respectively. These included major depressive disorder (MDD), persistent depressive disorder (dysthymia), substance-induced depressive disorder, major depressive episode and any of the above with peripartum onset (postnatal depression). The percentage of depressive disorders in non-injurers was higher than that reported in the 2014 – 2015 National Health Survey in Australia (ABS, 2015),  $\chi^2 (1, n = 415) = 5.879, p = .01$ . In the current study, the odds of reporting a depressive disorder was 5.96 times more likely for self-injurers than non-injurers.

Anxiety disorders were the second most prevalent mental illness, reported by 22.9% of self-injurers ( $n = 184$ ) and 6.3% of non-injurers ( $n = 26$ ). Anxiety disorders reported in the current study included social anxiety disorder (social phobia), panic disorder, agoraphobia, generalized anxiety disorder (GAD), and substance/medication-induced anxiety disorder. A comparison with the findings of the 2014 – 2015 National Health Survey in Australia (ABS, 2015),  $\chi^2 (1, n = 415) = 3.790, p = .05$ , indicate that the percentage of anxiety disorders reported by non-injurers was significantly higher than the national proportion (note that the percentages of 1.2% for OCD and 1% for

Table 5: *Characteristics of Nonsuicidal Self-Injuring and Non-Injuring Groups*

	NSSI ( <i>n</i> = 877)	No NSSI ( <i>n</i> = 415)	Chi-square	<i>p</i>	ES
<b>Characteristics:</b>					
<b>Gender: <i>n</i> (%)</b>					
Male	76 (8.7%)	106 (25.5%)	$\chi^2 (1, n = 1292) = 64.91$	<.001	$\Phi = -.23$
Female	801 (91.3%)	309 (74.5%)			
<b>Sexual Orientation: <i>n</i></b>					
Heterosexual	617	367	$\chi^2 (1, n = 1292) = 49.73$	<.001	$\Phi = .20$
Gay	11	9	$\chi^2 (1, n = 1292) = 1.00$	.316	$\Phi = .03$
Lesbian	59	6	$\chi^2 (1, n = 1292) = 15.36$	<.001	$\Phi = -.11$
Bisexual	148	20	$\chi^2 (1, n = 1292) = 35.14$	<.001	$\Phi = -.17$
Asexual	42	13	$\chi^2 (1, n = 1292) = 1.51$	.219	$\Phi = -.04$
<b>Mental Illness: <i>n</i></b>					
ADD/ADHD	19	2	$\chi^2 (1, n = 1219) = 4.66$	.017	$\Phi = -.07$
Anxiety	184	26	$\chi^2 (1, n = 1219) = 51.87$	<.001	$\Phi = -.21$
Bipolar	81	2	$\chi^2 (1, n = 1219) = 38.20$	<.001	$\Phi = -.18$
BPD	94	0	$\chi^2 (1, n = 1219) = 50.94$	<.001	$\Phi = -.21$
Depression	399	51	$\chi^2 (1, n = 1219) = 162.26$	<.001	$\Phi = -.37$
DID	16	0	$\chi^2 (1, n = 1219) = 6.90$	.009	$\Phi = -.08$
Eating Disorders	60	3	$\chi^2 (1, n = 1219) = 24.01$	<.001	$\Phi = -.14$
OCD	31	2	$\chi^2 (1, n = 1219) = 10.58$	<.001	$\Phi = -.10$
PTSD	81	5	$\chi^2 (1, n = 1219) = 31.50$	<.001	$\Phi = -.16$
Other	42	5	$\chi^2 (1, n = 1219) = 10.87$	.001	$\Phi = -.10$
Family History of Mental Illness	463	166	$\chi^2 (1, n = 1214) = 33.14$	<.001	$\Phi = .17$

*Note:* ES = Effect Size. Where the  $\Phi$  value is designated, Yates' Correction for Continuity has been reported instead of the Pearson Chi-Square value as recommended by Pallant (2013) for a 2 by 2 table. Participants could nominate multiple diagnoses for mental illness therefore percentages do not total 100%.

PTSD were subtracted from the total percentage of anxiety disorders reported as these were analysed individually). The odds ratio indicates, that self-injurers in the present study were 3.97 times to have a history of anxiety disorders than non-injurers.

Of the self-injurers, 11.7% ( $n = 94$ ) reported a diagnosis of borderline personality disorder (BPD). With none of the participants from the non-injuring group disclosing a diagnosis of BPD, a Chi-square test for independence (with Yates Continuity Correction) indicated a significant association between a diagnosis of BPD and NSSI,  $\chi^2_{(1)} = 50.94$ ,  $p < .001$ ,  $phi = -.21$ . Other personality disorders reported by participants and included under the category of “Other” included antisocial personality disorder, avoidant personality disorder, dependent personality disorder, schizoid personality disorder and unspecified personality disorder (see Appendix M for frequencies).

Eighty-one self-injurers (10.1%) reported a diagnosis of bipolar disorders (bipolar I disorder and bipolar II disorder), compared to only two non-injurers (0.5%). As such, the odds of having a history of bipolar disorders was 21.01 more likely in self-injurers than non-injurers. A history of posttraumatic stress disorder (PTSD:  $n = 81$ ) was disclosed by 10.1% of self-injurers and only 1.2% of non-injurers ( $n = 5$ ), which for non-injurers is not statistically different from the 2014 – 2015 National Health Survey in Australia,  $\chi^2 (1, n = 415) = .176$ ,  $p = .67$  (ABS, 2015). However, the odds ratio indicates, that self-injurers were 8.34 times more likely to have a history of PTSD than non-injurers.

There was no significant difference between the percentage of non-injurers reporting a diagnosis of obsessive-compulsive disorder (OCD: 0.5%,  $n = 2$ ) in the current study compared with the 2014 – 2015 National Health Survey in Australia,  $\chi^2 (1,$

$n = 415$ ) = .1.805,  $p = .179$  (ABS, 2015). However, self-injurers were 7.57 times more likely to report a diagnosis of OCD than non-injurers, based on the odds ratio. The percentage of self-injurers with eating disorders (i.e., anorexia nervosa, bulimia nervosa and unspecified eating disorder) was 7.5% ( $n = 60$ ) and 0.7% in non-injurers ( $n = 3$ ). The odds ratio suggested that self-injurers are 10.08 times more likely to have had an eating disorder than non-injurers. Other diagnoses reported by self-injurers included attention-deficit / hyperactivity disorder (ADHD:  $n = 19$ ); and dissociative identity disorder (DID:  $n = 16$ ).

Of the self-injurers, 57.8% ( $n = 463$ ) reported a family history of mental illness, compared to 42.2% ( $n = 338$ ) of non-injurers. A Chi-square test for independence (with Yates Continuity Correction) indicated a significant association between a family history of mental illness and NSSI,  $\chi^2_{(1)} = 33.14$ ,  $p < .001$ ,  $\phi = .17$ .

## **9.2 Piercings, Tattoos and Body Modifications**

### **9.2.1 Piercings**

More than three quarters of the sample had at least one piercing ( $n = 953$ ; 73.8%), whilst 339 participants reporting no piercings (26.2%). The majority of females ( $n = 915$ , 82.4%) had at least one piercing, whilst 20.9% ( $n = 38$ ) of males reported a piercing. The number of piercings ranged from one (11.1%) to 27 piercings (.1%); and of those with piercings, individuals had a mean number of 3.69 piercings ( $SD = 3.18$ ). The ear was the most frequently pierced site on the body; predominantly the lobe (71.1%), followed by other parts of the ear, such as the helix, anti-helix (rook), tragus, conch or daigus (19.3%). Participants also had their navel (15.9%), nose (13.7%),

tongue (6.6%), lip (5.3%), nipples (3.2%), eyebrows (2.3%), and genitals (1.7%) pierced; with a further 3.9% of participants disclosing they had other parts of their bodies pierced (i.e., nape, wrist, chest).

The visual binning procedure in SPSS was utilised to group the number of piercings into three approximately equal categories. The resulting categorical variable encompassed three levels of piercings: none, minimal (1-3 piercings) and extensive (4 or more piercings). A Chi-square test for independence indicated a significant association between the number of piercings and engagement in NSSI,  $\chi^2(2) = 55.99, p = < .001$ . A *Cramer's V* = .21 indicated a medium effect size (Figure 2).

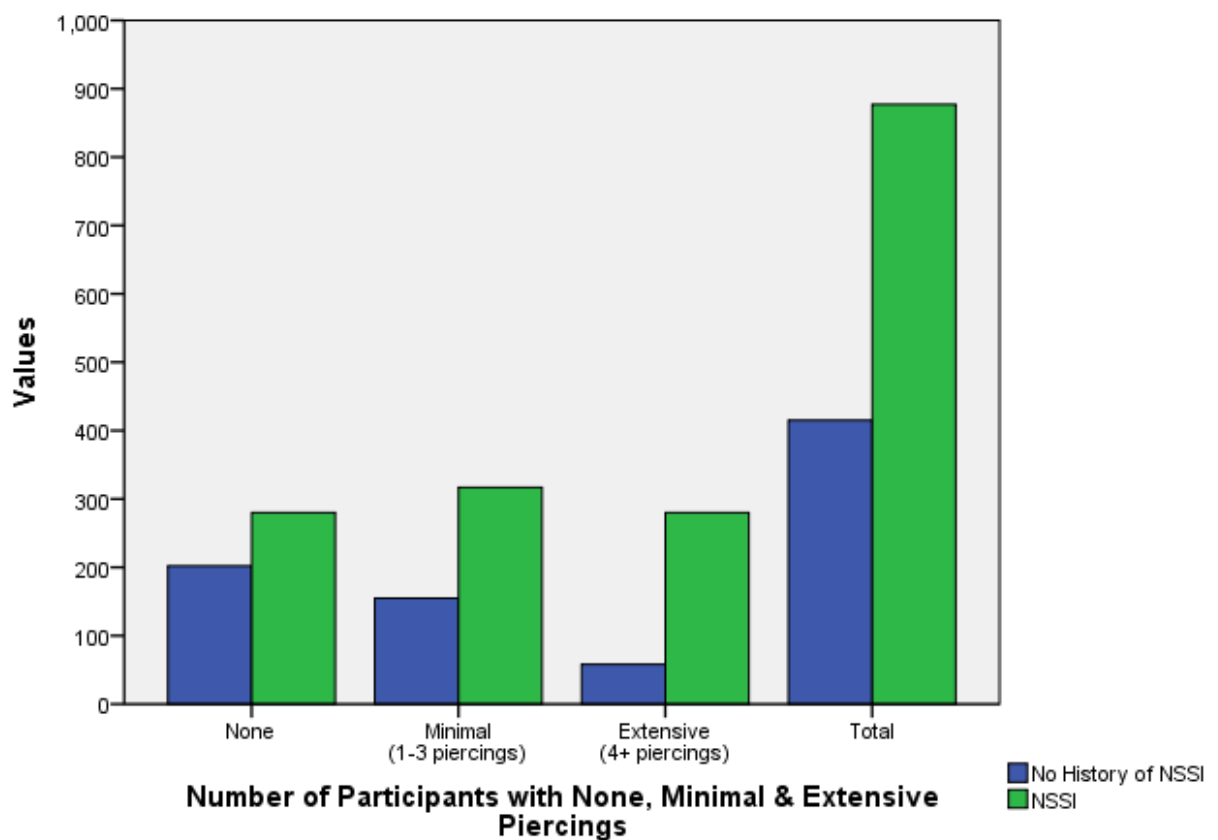


Figure 2: *The Number of Participants With Piercings in Self-Injurers and Non-Injurers.*

### 9.2.2 Tattoos

Tattooing was less common than piercing in the current study, with 410 participants (31.7%) reporting they had a tattoo, and 882 participants (68.3%) had no tattoos. Of those who reported the presence of at least one tattoo, 369 were female (33.2% of females) and 41 were male (22.5% of males). Analogous to the quantity of piercings, the number of tattoos procured by participants, ranged from 1 (14.4%) to 30 (.1%). Individuals with tattoos, had a mean number of 2.98 tattoos ( $SD = 3.48$ ).

The visual binning procedure in SPSS was again used to organise the number of tattoos reported by participants into three categories: none, minimal (1 tattoo) and extensive (2 or more tattoos). A significant association was found between the number of tattoos and engaging in NSSI, utilising a Chi-square test for independence,  $\chi^2_{(2)} = 40.99$ ,  $p = < .001$ , *Cramer's V* = .18 (Figure 3).

### 9.2.3 Body Modifications and Cosmetic Surgery

Thirty-one participants disclosed that they had other body modifications aside from their piercings or tattoos (2.4%), such as brandings, scarification, and stretched ear lobes. Three of these participants were male (1.6% of males) and 28 were female (2.5% of females). Thirty of the participants who reported a body modification had a history of NSSI, or currently self-injured. Whilst only one of the participants who had a body modification disclosed that they had never engaged in NSSI. A Chi-square test for independence (with Yates Continuity Correction) indicated a significant association between body modifications and engagement in NSSI,  $\chi^2_{(1)} = 10.84$ ,  $p = < .001$ , *phi* = .10.

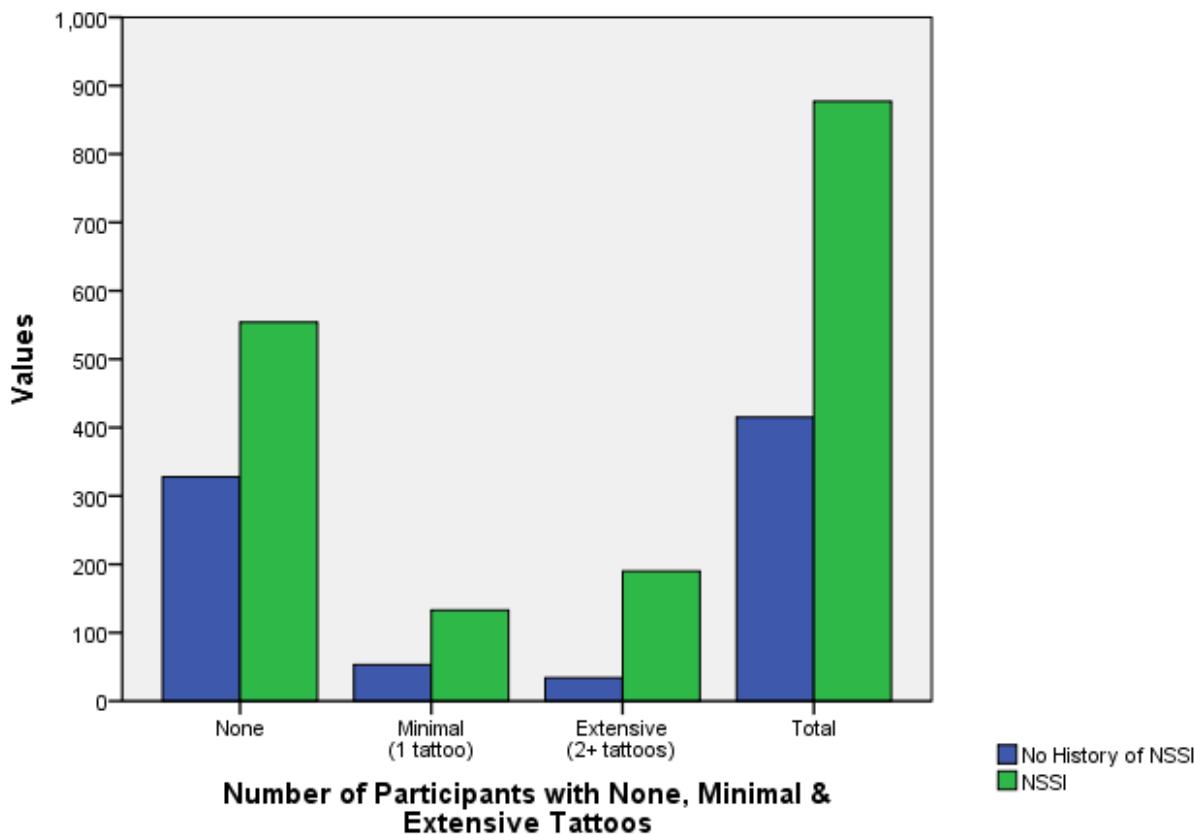


Figure 3: *The Number of Participants With Tattoos in Self-Injurers and Non-Injurers*

A further 34 participants (2.6%) reported that they had cosmetic procedures or surgeries, such as rhinoplasty, Botox, breast augmentation or reduction, and eye lifts. The majority of participants who disclosed a cosmetic procedure were female ( $n = 49$ , 4.4% of females), with only four males (2.2% of males) reporting a cosmetic surgery. A comparison of the frequencies of participants who engaged in NSSI with those who had no history of NSSI, revealed that 29 self-injurers disclosed they had undergone cosmetic surgery. Whilst 24 non-injurers stated they had undertaken some form of cosmetic surgery. A Chi-square test for independence (with Yates Continuity Correction) was performed to determine if this association was significant. There was a significant



relationship between cosmetic surgery and engagement in NSSI,  $\chi^2_{(1)} = 3.78, p = .052$ . However, a  $\phi = .06$  indicated a very small effect size.

### 9.3 Nonsuicidal Self-Injury

#### 9.3.1 Onset of NSSI

The age of onset for NSSI ranged from 2 to 59 years of age,<sup>5</sup> with an average age of 15.47 years ( $SD = 5.39$ ). In an attempt to ascertain where the idea to self-injure originated from, participants were asked if they knew anyone who self-injured prior to their initial engagement in the behaviour. Only 26.9% of self-injurers reported knowing someone who self-injured before they first engaged in NSSI, whilst 16.4% of participants indicated that they were *not sure* if they knew anyone who self-injured prior to the onset of NSSI. Of the participants who knew someone who self-injured, 12.4% only knew one person ( $n = 109$ ), 6% knew two people ( $n = 53$ ), 2.4% knew 3 people ( $n = 21$ ), 2.6% knew 4 people ( $n = 23$ ) and 2.7% knew 5 people or more ( $n = 24$ ) before they started engaging in self-injury themselves.

Participants were also asked to nominate the multiple mediums in which they had seen or heard about NSSI prior to commencing the behaviour themselves (Table 6). Interestingly, 38.4% of participants who self-injured had not previously seen, heard or

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<sup>5</sup> Eighty-six participants reported onset under the age of 10 years. Close scrutiny of the data indicated that these cases were more consistent with the clinical data on NSSI, with all cases disclosing either early childhood trauma and/or a history of mental illness.

read about NSSI in social or traditional media prior to engaging in self-injurious behaviours themselves ( $n = 337$ ). The most common source of exposure to NSSI prior to the commencement of self-injurious behaviours was through watching movies (27.7%,  $n = 243$ ); knowing family or friends who self-injured (26.9%,  $n = 236$ ); reading about it in a book (22%,  $n = 193$ ); watching television (20.8%,  $n = 182$ ); hearing about NSSI in the lyrics of a song (20.3%,  $n = 178$ ) or seeing it on a web site (15.4%,  $n = 135$ ). Other avenues of exposure included television current affairs, news or information programs (13.9%,  $n = 122$ ); newspapers (10%,  $n = 88$ ); social networking sites (9.9%,  $n = 87$ ); poetry (9.8%); music videos (7.5%,  $n = 66$ ), chat rooms (3.3%,  $n = 29$ ) and comics (1%,  $n = 9$ ). The mean number of sources of potential exposure to NSSI was 2.14 ( $SD = 2.53$ ). A series of Chi-square tests for independence (with Yates Continuity Correction) were performed to investigate whether there were any significant gender effects on the various mediums that exposed participants to NSSI, prior to the commencement of their self-injurious behaviours. A significant difference was found with only two of the fourteen sources of exposure. Within their respective genders, a higher percentage of males (14.5%,  $n = 11$ ) than females (6.9%,  $n = 55$ ) reported seeing NSSI in music videos ( $\chi^2_{(1)} = 4.73$ ,  $p = .03$ ,  $phi = .08$ ). Similarly, 5.3% of males ( $n = 4$ ) and 0.6% of females ( $n = 5$ ) indicated they had read about NSSI in comics prior to their onset of NSSI ( $\chi^2_{(1)} = 10.49$ ,  $p = .001$ ,  $phi = .13$ ).

Table 6: Sources of Potential Exposure to NSSI by Gender

Source of exposure:	Total ( <i>n</i> = 877)		Males ( <i>n</i> = 76)		Females ( <i>n</i> = 801)		$\chi^2$	<i>p</i>	$\Phi$
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%			
No prior exposure	337	38.4	27	35.5	310	38.7	.17	.67	-.02
Movies	243	27.7	20	26.3	223	27.8	.02	.88	-.01
TV Shows	182	20.8	14	18.4	168	21.0	.14	.70	-.02
Television Journalism	122	13.9	14	18.4	108	13.5	1.03	.31	.04
Music Videos	66	7.5	11	14.5	55	6.9	4.73	.03	.08
Songs	178	20.3	19	25.0	159	19.9	.84	.36	.04
Books	193	22.0	13	17.1	180	22.5	.87	.35	-.04
Newspapers	88	10.0	9	11.8	79	9.9	.12	.73	.02
Comics	9	1.0	4	5.3	5	.06	10.49	.001	.13
Poetry	86	9.8	9	11.8	77	9.6	.18	.67	.02
Web Sites	135	15.4	14	18.4	121	15.1	.36	.55	.03
Social Networking Sites	87	9.9	6	7.9	81	10.1	.17	.68	-.02
Chat Rooms	29	3.3	1	1.3	28	3.5	.46	.49	-.03
Friend/s or Family who self-injure	236	26.9	21	29.2	215	27.8	.19	.91	.01
Other	159	18.1	15	19.7	144	18.0	.05	.82	.01

*Note:* Total % = percentage of self-injurers. Males and females % = percentage of self-injurers by gender. Participants could nominate multiple sources of exposure to NSSI.

### 9.3.2 Frequency and Recency of Engagement in NSSI

Overall, the frequency with which the self-injurers in the current study engaged in NSSI ranged from 6.5% ( $n = 56$ ) self-injuring only once a year or less, to 7.9% ( $n = 68$ ) self-injuring several times per day. The majority of participants acted on their urges to self-injure 2 to 3 times per week (16.0%); 2 to 3 times a month (15.3%); or several times a year (19.1%). Males predominantly self-injured several times a year (30.1%,  $n = 22$ ), whilst the range of spread in which females engaged in NSSI was greater, with 18.1% ( $n = 143$ ) self-injuring several times a year, 16.7% ( $n = 132$ ) self-injuring 2 to 3 times per week, and 15.5% ( $n = 123$ ) self-injuring 2 to 3 times a month (Table 7). A Chi-square test for independence indicated no significant difference between the frequency in which males and females engage in NSSI,  $\chi^2_{(10)} = 15.06$ ,  $p = .13$ ,  $\phi = .13$ . Asked when their most recent act of NSSI occurred, 9.6% of all self-injurers ( $n = 83$ ) reported that they had self-injured on the day of the survey, and 22.2% had self-injured within the past week ( $n = 192$ ). Whereas, a considerable proportion of the sample of self-injurers had not engaged in NSSI for 8 months or more (34.8%,  $n = 301$ ). Almost half of the males (46.5%,  $n = 34$ ) and half of the females (50.1%,  $n = 397$ ) who self-injured, had engaged in NSSI within the month prior to completing the questionnaire. Conversely, 25.3% of males ( $n = 23$ ) and 23.1% ( $n = 186$ ) of females had not self-injured for two years or more.

Table 7: *Frequency and Recency of Nonsuicidal Self-Injury*

Characteristics:	Total		Males		Females	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Frequency of NSSI						
Several times a day	68	7.9	8	11.0	60	7.6
Daily	76	8.8	8	11.0	68	8.6
4 – 6 times a week	108	12.4	8	11.0	100	12.6
2 – 3 times a week	138	16.0	6	8.2	132	16.7
Once a week	64	7.4	3	4.1	61	7.7
2-3 times a month	132	15.3	9	12.3	123	15.5
Once a month	45	5.2	0	0.0	45	5.7
Several times a year	165	19.1	22	30.1	143	18.1
Once a year or less	56	6.5	6	8.2	50	6.3
Never	12	1.4	3	4.1	9	1.1
Most recent NSSI						
Today	83	9.6	10	13.7	73	9.2
Yesterday	72	8.3	7	9.6	65	8.2
2 – 7 days ago	120	13.9	5	6.8	115	14.5
8 – 14 days ago	59	6.8	5	6.8	54	6.8
15 – 30 days ago	97	11.2	7	9.6	90	11.4
2 – 4 months ago	83	9.6	1	1.4	82	10.4
5 – 7 months ago	49	5.7	3	4.1	46	5.8
8 months – 1 years ago	92	10.6	12	16.4	80	10.1
2 – 5 years ago	135	15.6	14	19.2	121	15.3
6- 10 years ago	43	5.0	5	0.6	38	4.4
> 10 years ago	31	3.6	4	5.5	27	3.4

*Note.* Total % = percentage of self-injurers by frequency and most recent NSSI. Males and females % = percentage of male and female self-injurers by frequency and most recent NSSI.

### 9.3.3 Methods of NSSI

To facilitate cross study comparisons for the methods of NSSI, participant responses for the number of times they had engaged in a particular method of NSSI, were collapsed into five categories: 0 times, 1 or 2 times, 3 – 10 times, 11 – 50 times, and 51 – 100 times (refer to Hamza & Willoughby, 2014; Heath et al., 2008; Klonsky & Olino, 2008 for similar categorizations). Frequencies for the 12 methods of NSSI are presented in Table 8. Among the participants who reported engaging in NSSI at some point over their lifetime, the most common methods were cutting ( $n = 780$ , 88.2%), banging or hitting oneself ( $n = 581$ , 65.8%), interference with wound healing ( $n = 577$ , 64.8%), severe scratching ( $n = 481$ , 54.0%), burning ( $n = 412$ , 46.4%), biting ( $n = 387$ , 43.4%), pinching ( $n = 387$ , 43.4%), pulling hair ( $n = 347$ , 38.8%), carving ( $n = 268$ , 30.0%), rubbing skin against a rough surface ( $n = 244$ , 27.3%), sticking oneself with needles ( $n = 235$ , 26.3%), and swallowing dangerous chemicals or substances ( $n = 186$ , 20.8%). Twenty percent of participants ( $n = 180$ ) reported that they used *other* methods to self-injure, such as crushing toes, bruising, self-choking or auto asphyxiation, pricking skin, punching hard objects, and scalding. The majority of participants used more than one method to self-injure (63.4% of self-injurers), with a mean of 3.92 methods ( $SD = 3.66$ ).

An independent samples t-test was conducted to compare the number of methods utilised to self-injure in those who had been diagnosed with a mental illness and those who had no history of mental illness. A significant difference was found between the number of methods used to self-injure by participants who had a history of mental illness ( $M = 5.46$ ,  $SD = 3.45$ ) and those without a history of mental illness ( $M = 2.51$ ,  $SD = 3.31$ ;  $t(1217) = 15.18$ ,  $p < .001$ , two-tailed). The magnitude of the

differences in the means (mean difference = 2.95, 95% *CI*: 2.57 to 3.33) indicates a large effect size (eta squared 0.16).

A one-way between-groups multivariate analysis of variance was performed to investigate gender differences across the 13 methods of NSSI. However, the overall test indicated there was no significant difference between males and females on the combined methods of NSSI,  $F(13, 863) = 1.67, p = .062$ ; *Pillai's Trace* = .02; partial eta squared ( $\eta_p^2$ ) = .02.

#### **9.3.4 Alone**

The large majority of self-injurers engaged in self-injury in private (83%,  $n = 705$ ); whilst 16.1% ( $n = 137$ ) sometimes self-injured in the presence of others; and 0.8% ( $n = 7$ ) never self-injured alone (Table 9). A significant association was found between gender and engaging in NSSI alone, utilising a Chi-square test for independence,  $\chi^2_{(2)} = 7.21, p = .03$ , with more females self-injuring alone ( $n = 652, 83.9%$ ) than males ( $n = 53, 73.6%$ ). However, a *phi* of .09 indicates that the effect size is small.

The relationship between the intrapersonal and interpersonal functions of NSSI and self-injuring alone was examined using the Pearson product-moment correlation coefficient. A very weak correlation was found between intrapersonal functions of NSSI and self-injuring alone,  $r = .13, n = 849, p < .001$ , two-tailed. This indicates that the endorsement of intrapersonal reasons for NSSI is associated with engaging in self-injury alone. There was no significant association between interpersonal functions and self-injuring in private.

Table 8: *Lifetime Usage of NSSI Methods*

Methods of NSSI	Number (%) (n = 877)				
	0 times	1 or 2 times	3 – 10 times	11 – 50 times	51 – 100 times
Cutting	97 (11.1%)	28 (3.2%)	104 (11.8%)	248 (28.0%)	400 (45.2%)
Biting	490 (55.9%)	32 (3.7%)	134 (15.3%)	154 (17.0%)	67 (7.4%)
Burning	465 (53.0%)	62 (7.1%)	156 (17.9%)	147 (16.4%)	47 (5.0%)
Carving	609 (69.4%)	39 (4.5%)	102 (11.7%)	84 (9.2%)	43 (4.6%)
Pinching	490 (55.9%)	18 (2.0%)	103 (11.7%)	154 (17.2%)	112 (12.5%)
Pulling hair	530 (60.4%)	30 (3.5%)	100 (11.4%)	108 (11.7%)	109 (12.2%)
Severe scratching	396 (45.2%)	32 (3.7%)	133 (15.1%)	179 (20.0%)	137 (15.2%)
Banging or hitting self	296 (33.8%)	25 (2.8%)	159 (18.2%)	251 (28.6%)	146 (16.2%)
Interfere with wounds	300 (34.2%)	17 (1.9%)	87 (9.9%)	184 (20.5%)	289 (32.5%)
Rub skin	633 (72.2%)	26 (3.0%)	77 (8.8%)	88 (9.8%)	53 (5.7%)
Stick self with needles	642 (73.2%)	27 (3.1%)	81 (9.3%)	79 (8.7%)	48 (5.2%)
Swallow chemicals	691 (78.8%)	35 (4.0%)	70 (8.0%)	52 (5.6%)	29 (3.2%)
Other	697 (79.5%)	6 (0.6%)	51 (5.9%)	67 (7.3%)	56 (6.2%)

*Note:* NSSI = nonsuicidal self-injury

a. Participants could select multiple behaviours.

### 9.3.5 Time from Urge to Action

The majority of participants who self-injured, did so within less than one hour of their initial urge to self-injure (57.1%,  $n = 485$ ). Whilst 21.2% ( $n = 180$ ) typically acted on their urge between 1 and 3 hours; 12.3% ( $n = 105$ ) waited 3 to 24 hours; and 9.3% ( $n$



= 79) acted on their urge to self-injure more than one day later (Table 9). A Chi-square test for independence revealed no significant gender differences in the latency period from urge to action,  $\chi^2_{(5)} = 4.85, p = .43$ .

### 9.3.6 Pain

Of all the self-injurers in the sample, 39.2% ( $n = 333$ ) reported experiencing pain when they engaged in NSSI; whilst 50.8% ( $n = 431$ ) sometimes felt pain; and 10% of self-injurers never experienced pain during the act of NSSI (Table 9). The majority of males (47.2%,  $n = 34$ ) and 38.5% of females indicated that they felt pain when self-injuring. A Chi-square test for independence indicated no significant association between gender and the experience of pain during NSSI,  $\chi^2_{(2)} = 2.21, p = .33, phi = .05$ .

A Spearman Rank Order Correlation was conducted to investigate the relationship between pain and the frequency of NSSI. A strong positive significant correlation was found between the two variables,  $r = .63, p < .01$ , two tailed. A Chi-square test for independence revealed there was no significant association between the experience of pain during the act of NSSI and a history of mental illness,  $\chi^2_{(2)} = 5.73, p = .06, Cramer's V = .08$ . However, a Chi-square test for independence between a diagnosis of BPD and pain was significant ( $\chi^2_{(2)} = 11.03, p = .004, Cramer's V = .12$ ). Of the 94 participants who disclosed a diagnosis of BPD, only 4 participants reported that they felt no pain during self-injury (4.3%), 62 participants sometimes felt pain (66.0%), whilst 28 participants stated they experienced pain whilst self-injuring (29.8%).

Table 9: *The Act of Nonsuicidal Self-Injury*

Characteristics:	Total		Males		Females	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Time from urge to action</b>						
> 1 hour	485	57.1	49	68.1	436	56.1
1 – 3 hours	180	21.2	12	16.7	168	21.6
3 – 5 hours	46	5.4	4	5.6	42	5.4
6 – 11 hours	30	3.5	1	1.4	29	3.7
12 – 24 hours	29	3.4	1	1.4	28	3.6
> 1 day	79	9.3	5	6.9	74	9.5
<b>Pain when self-injuring</b>						
Yes	333	39.2	34	47.2	299	38.5
Sometimes	431	50.8	31	43.1	400	51.5
No	85	10.0	7	9.7	78	10.0
<b>Alone when self-injuring</b>						
Yes	705	83.0	53	73.6	652	83.9
Sometimes	137	16.1	17	23.6	120	15.4
No	7	0.8	2	2.8	5	0.6
<b>Professional medical attention for wounds (Severity)</b>						
No	555	65.4	47	65.3	508	65.4
Yes, once	94	11.1	8	11.1	86	11.1
Yes, 2 – 4 times	102	12.0	11	15.3	91	11.7
Yes, 5 – 7 times	29	3.4	2	2.8	27	3.5
Yes, 8 – 10 times	11	1.3	1	1.4	10	1.3
Yes, > 10 times	58	6.8	3	4.2	55	7.1
<b>Desire to stop self-injuring</b>						
Yes	604	72.6	42	59.2	562	73.9
No	228	27.4	29	40.8	199	26.1

*Note.* Total % = percentage of self-injurers. Males and females % = percentage of self-injurers by gender.

### 9.3.7 Medical Attention or Severity of Wounds

Table 9 details numbers and percentages of self-injurers who have required professional medical attention for their wounds. Overall 65.4% ( $n = 555$ ) have never sought medical treatment, whilst 11.1% ( $n = 94$ ) have once; 12% ( $n = 102$ ) have on 2 to 4 occasions; and 4.5% ( $n = 40$ ) have between 5 and 10 times; and 6.8% of self-injurers ( $n = 58$ ) required medical attention for their wounds on more than 10 occasions. A Chi-square test for independence indicated no significant association between gender and seeking medical treatment for NSSI,  $\chi^2_{(5)} = 1.61$ ,  $p = .90$ ,  $\phi = .04$ .

Another Chi-square test for independence was run to investigate whether there was any association between a history of mental illness and obtaining medical assistance for NSSI. The analyses revealed that self-injurers with a history of mental illness were significantly more likely to have sought medical treatment for their wounds,  $\chi^2_{(5)} = 71.67$ ,  $p < .001$ . Following Pallant's (2013) recommendation for calculating the effect size criteria in larger tables, *Cramer's V* = .29, indicating a large effect size for this analyses. Figure 4 shows the differences between self-injurers with and without a history of mental illness across the levels of medical attention sought for NSSI.

The relationship between severity, pain and the time taken from urge to action was explored using Spearman Rank Order Correlations. There were strong positive significant relationships found between all three variables. Experiencing pain during the act of NSSI, and the time taken from urge to action were both strongly correlated to the severity with which one self-injured at  $r = .66$ ,  $p < .01$ , two tailed. The relationship between severity and urge to action yielded a correlation of  $r = .75$ ,  $p < .01$ .

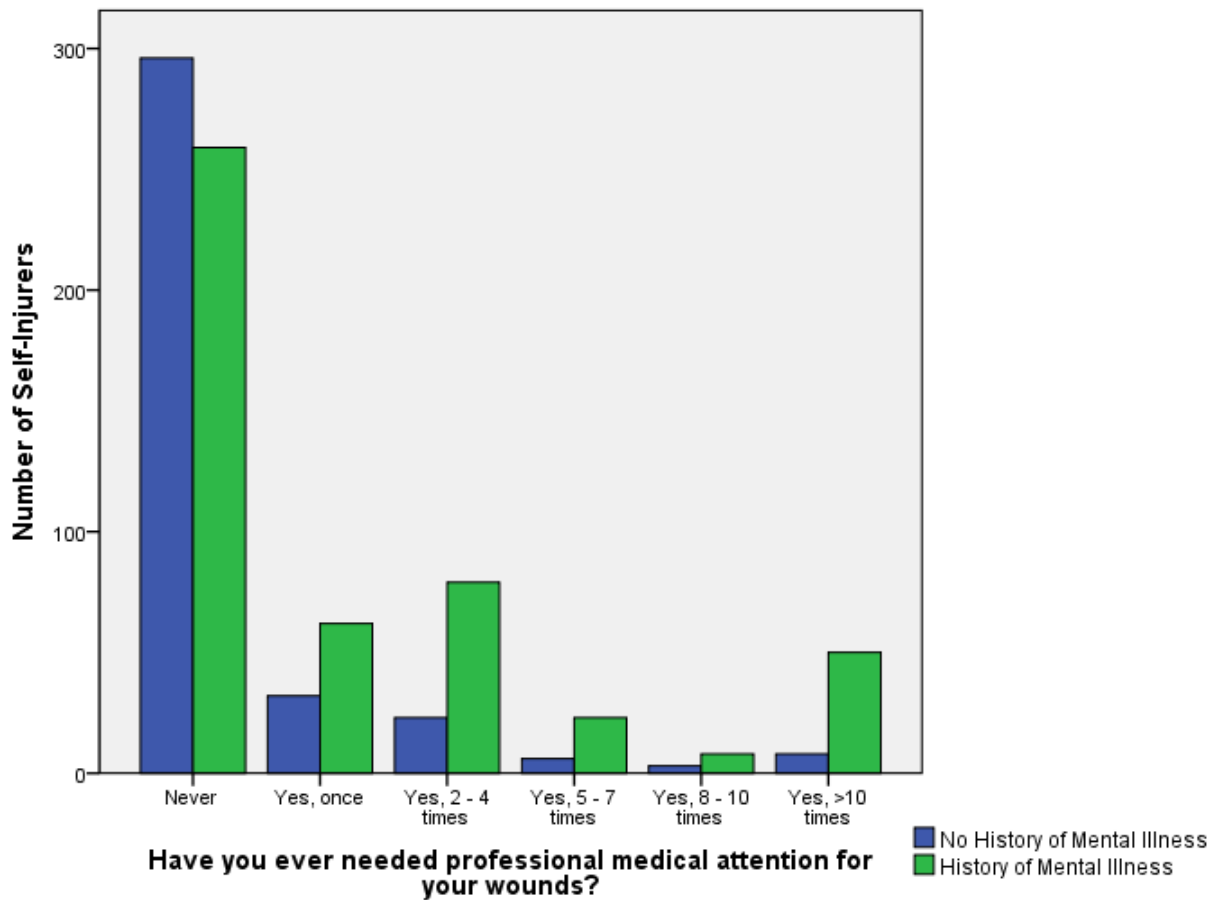


Figure 4: Medical Treatment Sought for NSSI in Self-Injurers With and Without a History of Mental Illness

### 9.3.8 Desire to Stop

The majority of self-injurers in the current study wanted to stop self-injuring (72.6%,  $n = 604$ ), whilst 27.4% ( $n = 228$ ) did not wish to stop (Table 9). Interestingly, there was a significant difference between males (59.2%,  $n = 42$ ) and females (73.9%,  $n = 562$ ) in their desire to stop self-injuring, as indicated by a Chi-square test for independence (with Yates Continuity Correction),  $\chi^2_{(1)} = 6.33$ ,  $p = .01$ ,  $\phi = -.09$ .

#### 9.4 The Functions of NSSI

The mean total score on the ISAS in the current study was 21.15 ( $SD = 11.55$ ), which is within the range of previously reported results (Klonsky & Glenn, 2009; Kortge et al., 2013). Self-injurers endorsed an average of 6.48 ( $SD = 3.06$ ) functions. An independent samples t-test was conducted to compare the number of functions endorsed in those who had been diagnosed with a mental illness and those who had no history of mental illness. A significant difference was found between the number of functions underpinning NSSI by participants who had a history of mental illness ( $M = 7.16$ ,  $SD = 2.29$ ) and those without a history of mental illness ( $M = 5.66$ ,  $SD = 3.61$ ;  $t(875) = -7.18$ ,  $p < .001$ , two-tailed). The magnitude of the differences in the means (mean difference = -1.51, 95%  $CI$ : -1.92 to -1.09) indicates a medium effect size (eta squared 0.06). A second independent samples t-test was run to ascertain if there were any gender differences in the number of functions endorsed. The analysis revealed that there was no significant difference between the number of functions endorsed by males ( $M = 6.28$ ,  $SD = 3.27$ ) and females ( $M = 6.50$ ,  $SD = 3.04$ ;  $t(875) = -.61$ ,  $p = .54$ , two-tailed).

A paired-samples t-test was conducted to assess the within-sample difference in self-injurers between the two ISAS factors (interpersonal and intrapersonal). Intrapersonal functions ( $M = 15.15$ ,  $SD = 7.58$ ) were endorsed significantly more than interpersonal functions ( $M = 6.01$ ,  $SD = 5.80$ ),  $t(876) = -38.76$ ,  $p < .001$  (two tailed). The mean difference in scores was -9.14 with a 95% confidence interval ranging from -9.60 to -8.68. The eta squared statistic (.63) indicated a large effect size. As shown in Table 10, of the 13 individual functions, affect regulation ( $M = 4.36$ ,  $SD = 1.96$ ) was the

most highly endorsed, followed by self-punishment ( $M = 3.55$ ,  $SD = 2.22$ ), anti-dissociation ( $M = 2.67$ ,  $SD = 2.16$ ), marking distress ( $M = 2.36$ ,  $SD = 1.99$ ) and anti-suicide ( $M = 2.20$ ,  $SD = 2.13$ ). The least endorsed functions were peer bonding ( $M = 0.11$ ,  $SD = 0.51$ ), revenge ( $M = 0.45$ ,  $SD = 1.05$ ) and autonomy ( $M = 0.59$ ,  $SD = 1.08$ ).

Table 10: Comparison of The Functions of NSSI by Gender

Function	Male ( $n = 76$ )		Female ( $n = 801$ )		$F(1, 875)$	$p$	$\eta_p^2$
	$M$	$SD$	$M$	$SD$			
Intrapersonal	12.01	7.52	15.44	7.52	14.45	< .001	
Affect regulation	3.51	2.09	4.44	1.93	15.82	< .001	.018
Anti-dissociation	2.20	2.03	2.72	2.17	4.02	.045	.005
Anti-suicide	1.87	2.05	2.23	2.13	2.06	.152	.002
Marking distress	1.58	1.72	2.43	1.99	12.96	< .001	.015
Self-punishment	2.86	2.31	3.62	2.21	8.23	.004	.009
Interpersonal	6.21	5.33	5.99	5.84	.10	.75	
Autonomy	0.66	1.24	0.63	1.29	.023	.878	< .001
Interpersonal boundaries	0.82	1.31	0.88	1.41	.16	.69	.000
Interpersonal influence	0.63	1.27	0.89	1.31	2.74	.098	.003
Peer-bonding	0.34	0.82	0.09	0.46	18.07	< .001	.020
Revenge	0.57	1.21	0.43	1.03	1.09	.296	< .001
Self-care	0.95	1.24	1.48	1.71	7.09	.008	.008
Sensation seeking	1.04	1.33	0.55	1.04	14.44	< .001	.016
Toughness	1.21	1.48	1.02	1.48	1.11	.292	.001

Note.  $\eta_p^2$  = partial eta squared. As multiple analyses were run the Bonferroni adjusted alpha level of .004 was employed to reduce the chance of a Type 1 error.  $n = 877$ .

The next set of analyses examined whether males and females engaged in NSSI for different reasons. Exploring the two factors of the ISAS (intrapersonal and interpersonal: Table 10) utilising a one-way between-groups analysis of variance, females endorsed intrapersonal functions ( $M = 15.44$ ,  $SD = 7.52$ ) more strongly than males ( $M = 12.01$ ,  $SD = 7.52$ ;  $F(1, 875) = 14.45$ ,  $p < .001$ ). Despite reaching statistical significance, the actual difference in mean scores between males and females was quite small (eta squared = .02). In comparison to the intrapersonal factor, males ( $M = 6.21$ ,  $SD = 5.33$ ) and females ( $M = 5.99$ ,  $SD = 5.84$ ;  $F(1, 875) = .10$ ,  $p = .747$ ) did not differ significantly in their endorsement of interpersonal functions.

A one-way between-groups multivariate analysis of variance was then performed to investigate gender differences across the 13 individual functions of the ISAS. Whilst *Box's test* revealed that the assumption of homogeneity of variance-covariance matrices was not met in this analysis, both Field (2013) and Tabachnick and Fidell (2013) contend that *Box's test* is too conservative in large sample sizes. As such, *Pillai's Trace* has been reported, for it provides a more robust statistic when violations of assumptions occur and unequally sized matrices are present (Field, 2013; Pallant, 2013; Tabachnick & Fidell, 2013). *Levene's F test* demonstrated that the assumption of homogeneity of variance was not met for self-care, sensation seeking, peer bonding and marking distress. Given this violation, a Bonferroni adjusted alpha level of .004 was set (Field, 2013; Pallant, 2013; Tabachnick & Fidell, 2013).

There was a statistically significant difference between males and females on the combined functions,  $F(13, 863) = 4.53$ ,  $p < .001$ ; *Pillai's Trace* = .06; partial eta squared ( $\eta_p^2$ ) = .06. When the results for the 13 functions were considered separately, using a Bonferroni adjusted alpha level of .004, gender differences were found in only

five of the 13 ISAS functions. An inspection of the mean scores indicated that females endorsed affect regulation ( $F(1, 875) = 15.82, p < .001, \eta_p^2 = .018$ ); marking distress ( $F(1, 875) = 12.96, p < .001, \eta_p^2 = .015$ ); self-punishment ( $F(1, 875) = 8.23, p = .004, \eta_p^2 = .009$ ); peer bonding ( $F(1, 875) = 18.07, p < .001, \eta_p^2 = .020$ ); and sensation seeking ( $F(1, 875) = 14.44, p < .001, \eta_p^2 = .016$ ) more strongly than males (Table 10).

The latter two statistical analyses were then repeated to investigate whether there was a functional difference in self-injurers who had a history of mental illness compared to self-injurers who did not report a mental illness. First, a one-way between-groups analysis of variance was conducted on the two factors of the ISAS (intrapersonal and interpersonal: Table 11) to compare the two groups of self-injurers. An examination of the *Levene's F test* revealed that the assumption of homogeneity of variance was not met for the intrapersonal factor, and therefore *Welch's F* was reported as it is a more robust test than the F ratio (Field, 2013; Pallant, 2013). The ANOVA demonstrated that self-injurers with a history of mental illness endorsed intrapersonal functions ( $M = 17.70, SD = 5.92$ ) more strongly than self-injurers who had no prior history of mental illness ( $M = 12.04, SD = 8.19; Welch's F(1, 875) = 132.16, p < .001$ ). Self-injurers with a history of mental illness also endorsed interpersonal functions for self-injuring more highly ( $M = 6.53, SD = 5.59$ ) than self-injurers with no history of mental illness ( $M = 5.37, SD = 5.98; F(1, 875) = 8.68, p = .003$ ).

Following the ANOVA, a one-way between-groups multivariate analysis of variance was run to compare a history of mental illness across the 13 individual functions of the ISAS. *Box's test* indicated that the assumption of homogeneity of variance-covariance matrices was not met in this analysis. However, *Box's test* is generally considered too conservative in large sample sizes (Field, 2013; Tabachnick &



Fidell, 2013). As a more robust statistic when violations of assumptions occur and unequally sized matrices are present, *Pillai's Trace* was reported (Field, 2013; Pallant, 2013; Tabachnick & Fidell, 2013).

Table 11: *Comparison of The Functions of NSSI in Self-Injurers With and Without a History of Mental Illness*

Function	History of Mental Illness ( <i>n</i> = 481)		No Mental Illness ( <i>n</i> = 396)		<i>F</i> (1, 875)	<i>p</i>	$\eta_p^2$
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Intrapersonal	17.70	5.92	12.04	8.19	132.16	< .001	
Affect regulation	4.91	1.39	3.70	2.32	91.45	< .001	.095
Anti-dissociation	3.08	2.09	2.17	2.15	39.90	< .001	.044
Anti-suicide	2.80	2.14	1.48	1.87	91.32	< .001	.094
Marking distress	2.71	1.94	1.93	1.97	34.48	< .001	.038
Self-punishment	4.21	1.89	2.76	2.34	102.85	< .001	.105
Interpersonal	6.53	5.59	5.37	5.98	8.68	.003	
Autonomy	.67	1.29	.60	1.28	.62	.431	.001
Interpersonal boundaries	.91	1.43	.83	1.37	.73	.393	.001
Interpersonal influence	1.04	1.36	.66	1.21	18.45	< .001	.021
Peer-bonding	.08	.42	.14	.59	3.09	.079	.004
Revenge	.41	.98	.49	1.12	1.28	.258	.001
Self-care	1.70	1.76	1.11	1.51	27.83	< .001	.031
Sensation seeking	.60	1.11	.58	1.04	.091	.763	.000
Toughness	1.11	1.54	.95	1.39	2.56	.110	.003

*Note.*  $\eta_p^2$  = partial eta squared. As multiple analyses were run the Bonferroni adjusted alpha level of .004 was employed to reduce the chance of a Type 1 error. *n* = 877.

There was a statistically significant difference between self-injurers with and without a history of mental illness on the combined functions,  $F(13, 863) = 15.09, p > .001$ ; *Pillai's Trace* = .86; partial eta squared ( $\eta_p^2$ ) = .86. When the results for the 13 functions were considered separately, using a Bonferroni adjusted alpha level of .004, significant group differences were found in seven of the 13 ISAS functions. The two groups differed across all of the intrapersonal functions, but on only two of the interpersonal functions.

An inspection of the mean scores indicated that self-injurers with a history of mental illness endorsed the following functions more strongly than self-injurers with no prior history of mental illness: affect regulation ( $F(1, 875) = 91.45, p < .001, \eta_p^2 = .095$ ); anti-dissociation ( $F(1, 875) = 39.90, p < .001, \eta_p^2 = .044$ ); anti-suicide ( $F(1, 875) = 91.32, p < .001, \eta_p^2 = .094$ ); marking distress ( $F(1, 875) = 34.48, p < .001, \eta_p^2 = .038$ ); self-punishment ( $F(1, 875) = 102.85, p < .001, \eta_p^2 = .105$ ); interpersonal influence ( $F(1, 875) = 18.45, p < .001, \eta_p^2 = .021$ ); and self-care ( $F(1, 875) = 27.83, p < .001, \eta_p^2 = .031$ ) (Table 11).

Finally, Pearson's Product-Moment Correlation Coefficient was used to explore the relationships between the experience of pain during the act of NSSI and the functions of self-injury. Table 12 illustrates that a significant positive correlation was found between pain and all 13 functions of NSSI, across both the intrapersonal and the interpersonal factors. However, the correlations between pain and the intrapersonal functions were stronger overall, than the relationship of pain to the interpersonal functions. The strongest relationships in these correlational analyses were the relationships between pain and affect regulation ( $r = .62, p < .01$ ); and between pain and self-punishment ( $r = .57, p < .01$ ).

Table 12: *Pearson Product-Moment Correlations Between Pain and The Functions of NSSI*

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Pain	-													
Intrapersonal														
2. Affect regulation	.62**	-												
3. Anti-dissociation	.43**	.68**	-											
4. Anti-suicide	.39**	.60**	.55**	-										
5. Marking distress	.45**	.65**	.58**	.48**	-									
6. Self-punishment	.57**	.76**	.62**	.60**	.66**	-								
Interpersonal														
7. Autonomy	.19**	.32**	.27**	.28**	.36**	.33**	-							
8. Interpersonal boundaries	.26**	.39**	.34**	.32**	.46**	.41**	.52**	-						
9. Interpersonal influence	.29**	.36**	.28**	.30**	.60**	.38**	.21**	.30**	-					
10. Peer-bonding	.08**	.06*	.08**	.09**	.12**	.07**	.19**	.18**	.27**	-				
11. Revenge	.19**	.22**	.17**	.18**	.38**	.27**	.25**	.40**	.47**	.24**	-			
12. Self-care	.32**	.53**	.50**	.45**	.52**	.49**	.30**	.36**	.34**	.16**	.20**	-		
13. Sensation seeking	.31**	.30**	.28**	.23**	.32**	.26**	.29**	.34**	.27**	.30**	.30**	.24**	-	
14. Toughness	.36**	.40**	.35**	.32**	.48**	.40**	.50**	.39**	.30**	.22**	.25**	.32**	.56**	-

Note. \*  $p < .05$ , \*\*  $p < .01$  (2-tailed).

## 9.5 Coping

The descriptive statistics for the 19 coping strategies are displayed in Table 13 for both self-injurers and non-injurers. Amongst the group of self-injurers, the five most commonly endorsed coping strategies were self-blame ( $M = 66.15$ ,  $SD = 35.08$ ), keep to self ( $M = 62.63$ ,  $SD = 33.53$ ), worry ( $M = 61.67$ ,  $SD = 32.47$ ), work hard ( $M = 60.25$ ,  $SD = 34.03$ ) and not cope ( $M = 60.09$ ,  $SD = 33.02$ ). Whilst in the group with no history of NSSI, work hard ( $M = 72.14$ ,  $SD = 29.65$ ), focus on solving the problem ( $M = 68.41$ ,  $SD = 26.95$ ), seek relaxing diversions ( $M = 67.95$ ,  $SD = 26.42$ ), seek social support ( $M = 63.76$ ,  $SD = 27.15$ ) and focus on the positive ( $M = 60.84$ ,  $SD = 25.29$ ) were the five most commonly endorsed of the 19 coping strategies.

Table P5 in Appendix P presents the results of the Pearson product-moment correlations between NSSI and the 19 coping strategies. All 19 coping strategies were significantly correlated to NSSI. However, the strength of the correlations only ranged from very weak (wishful thinking  $r = -.06$ ,  $p < .05$ ) to weak (focus on the positive  $r = .35$ ,  $p < .01$ ). Non-productive or emotion-focused coping strategies were positively correlated to NSSI (worry, tension reduction, ignore the problem, self-blame, keep to self, seek professional help, and not cope), whilst productive or problem-focused coping strategies shared a negative relationship to NSSI (social support, problem solving, work hard, improve relationships, wishful thinking, social action, spiritual support, focus on the positive, seek relaxation, physical recreation, protect self, and humour).

A one-way between-groups analysis of variance was conducted to explore the difference in coping strategies used by those with and without a history of NSSI. The *Levene's F test* revealed that the assumption of homogeneity of variance was not met for 14 of the 19 coping strategies; therefore, the *Welch F-ratio* is reported for all coping

strategies (Table 13). In an effort to reduce the effects of a type 1 error, due to the multiple comparisons made for the 19 coping strategies, a Bonferroni adjusted alpha level of .003 was employed, as recommended by Field (2013) and Tabachnick and Fidell (2013). Even with alpha at the adjusted level of  $p < .003$  level, there were statistically significant differences between self-injurers and non-injurers across all coping strategies (Table 13) except wishful thinking: *Welch's F* (1, 1290) = 5.37,  $p = .021$ . Despite attaining statistical significance, the effect size (calculated using omega squared as advised by Field, 2013) was small for the majority of coping strategies, ranging from  $\omega^2 = .009$  (seeking professional help) to  $\omega^2 = .05$  (focus on solving the problem, seeking relaxing diversions, and improve relationships). However, a medium effect size was found for seeking social support ( $\omega^2 = .07$ ), focus on the positive ( $\omega^2 = .12$ ), and physical recreation ( $\omega^2 = .06$ ).

Given the significant difference in the engagement of NSSI by sexual orientation, descriptive statistics were calculated to ascertain if there were any differences between groups on the 19 coping strategies of the CSA. The means and standard deviations for heterosexual, bisexual, lesbian, gay and asexual participants are presented in a table O1 in Appendix O. Subsequently, a one-way between-groups multivariate analysis of variance (MANOVA) was performed to investigate the differences in coping strategies across sexual orientation. The dependent variables were the 19 coping strategies and the independent variable was sexual orientation. The *Levene's F test* demonstrated that the assumption of homogeneity of variance was met for all, but three (Seek spiritual support, Seek professional help, & Physical recreation) of the 19 coping strategies.

As recommended in the literature, *Pillai's Trace* has been reported here as it offers a more robust statistic when there are violations of assumptions and unequally sized matrices (Field, 2013; Pallant, 2013; Tabachnick & Fidell, 2013). Furthermore, to account for this and to reduce the effects of a type 1 error due to the multiple comparisons made for the nineteen coping scales, a Bonferroni adjusted alpha level of .003 was employed as indicated in the literature (Field, 2013; Tabachnick & Fidell, 2013). There was a statistically significant difference between sexual orientation on the combined coping strategies,  $F(19, 1269) = 2.89, p = < .001; Pillai's Trace = .17; \eta_p^2 = .04$ .

With alpha set at the Bonferroni adjusted alpha level of .003, when the results for the dependent variables were considered separately, significant differences were found for sexual orientation on five of the coping strategies (tension reduction, self-blame, focus on the positive, physical recreation, and not cope). Post-hoc comparisons were conducted to explore the univariate main effects. As recommended by Field (2013), Hochberg's GT2 was used due to the unequal sample sizes.

Table 13: A Comparison of Non-Suicidal Self-Injuring and Non-Injuring Groups Across Coping Strategies

Coping strategies	NSSI ( <i>n</i> = 877)		No NSSI ( <i>n</i> = 415)		Welch's <i>F</i> (1, 1290)	<i>p</i>	$\omega^2$
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Seek social support	47.60	27.79	63.76	27.15	96.66	< .001	.07
Focus on solving the problem	53.94	29.19	68.41	26.95	77.03	< .001	.05
Work hard	60.25	34.03	72.14	29.65	41.10	< .001	.03
Worry	61.67	32.47	55.20	24.80	15.58	< .001	.01
Improve relationships	37.39	24.24	49.25	24.30	67.24	< .001	.05
Wishful thinking	48.34	28.20	51.84	23.90	5.37	.021	.003
Tension reduction	49.06	27.43	41.30	20.62	31.97	< .001	.02
Social action	26.75	17.70	32.34	18.12	27.19	< .001	.02
Ignore the problem	57.29	32.06	47.18	23.87	40.13	< .001	.02
Self-blame	66.15	35.08	51.66	25.68	70.17	< .001	.04
Keep to self	62.63	33.53	49.41	24.32	64.60	< .001	.04
Seek spiritual support	31.59	26.82	36.43	27.40	8.91	.003	.006
Focus on the positive	41.03	24.55	60.84	25.29	176.26	< .001	.12
Seek professional help	45.78	31.50	39.54	24.77	14.89	< .001	.009
Seek relaxing diversions	53.52	28.16	67.95	26.42	80.58	< .001	.05
Physical recreation	39.13	26.43	53.93	27.57	83.22	< .001	.06
Protect self	43.68	24.18	52.88	22.40	45.14	< .001	.03
Humour	46.07	29.73	55.38	27.34	30.82	< .001	.02
Not cope	60.09	33.02	46.82	24.98	64.12	< .001	.04

*Note.*  $\omega^2$  = omega squared. As multiple analyses were run the Bonferroni adjusted alpha level of .003 was utilised to reduce the chance of a Type 1 error.

There was a statistically significant main effect for tension reduction  $F(4, 1287) = 4.64, p = .001; \eta_p^2 = .01$ . Post-hoc comparisons using Hochberg's GT2 indicated that the mean score on tension reduction for bisexuals ( $M = 53.96, SD = 27.05$ ) was significantly different from heterosexuals ( $M = 45.36, SD = 25.19$ ). There was a significant main effect for physical recreation  $F(4, 1287) = 4.19, p = .002; \eta_p^2 = .01$ ; with a significant difference between the means of bisexuals ( $M = 37.54, SD = 24.42$ ) and heterosexuals ( $M = 45.53, SD = 28.22$ ). A similar result was found for Not cope  $F(4, 1287) = 4.93, p = .001; \eta_p^2 = .02$ ; with a significant difference between the means of bisexuals ( $M = 65.21, SD = 30.89$ ) and heterosexuals ( $M = 51.36, SD = 31.09$ ). For self-blame  $F(4, 1287) = 4.55, p = .001; \eta_p^2 = .01$ ; Hochberg's GT2 showed that there were significant differences in the means between lesbians ( $M = 71.77, SD = 33.90$ ) and bisexuals ( $M = 68.60, SD = 33.82$ ) with heterosexuals ( $M = 59.83, SD = 32.61$ ). This was also found for focusing on the positive  $F(4, 1287) = 5.10, p < .001; \eta_p^2 = .02$ ; with significant differences in the means between both lesbians ( $M = 38.62, SD = 22.26$ ) and bisexuals ( $M = 41.99, SD = 25.28$ ) with heterosexuals ( $M = 49.3, SD = 26.62$ ).

The relationship between non-productive coping strategies (worry, tension reduction, ignore the problem, self-blame, keep to self and not coping) and the intrapersonal functions of NSSI (affect regulation, anti-dissociation, anti-suicide, marking distress, self-punishment) was examined using the Pearson product-moment correlation coefficient. As shown in Table 14, a significant positive relationship was found between all the variables. The moderate positive correlation between self-blame and self-punishment was the strongest correlation in this analyses,  $r = .50, p < .01$ , two tailed. Moderate correlations were found between affect regulation and all non-productive coping strategies, except for the weak correlation with tension reduction ( $r = .38, p < .01$ ).



Table 14: *Pearson Product-Moment Correlations Between ISAS Intrapersonal Functions and Non-Productive Coping Strategies*

Scale	1	2	3	4	5	6	7	8	9	10
ISAS Intrapersonal Functions										
1. Affect Regulation										
2. Anti-dissociation	.45**									
3. Anti-Suicide	.39**	.37**								
4. Marking Distress	.40**	.38**	.28**							
5. Self-punishment	.51**	.39**	.41**	.47**						
Non-productive Coping Strategies										
6. Worry	.43**	.25**	.25**	.31**	.39**					
7. Tension reduction	.38**	.28**	.24**	.26**	.34**	.79**				
8. Ignore problem	.43**	.30**	.26**	.27**	.36**	.76**	.71**			
9. Self-blame	.46**	.29**	.31**	.30**	.50**	.86**	.78**	.79**		
10. Keep to self	.43**	.28**	.25**	.24**	.35**	.78**	.70**	.82**	.85**	
11. Not cope	.44**	.31**	.32**	.29**	.39**	.82**	.74**	.72**	.81**	.73**

Note. \*\*  $p < .01$  (2-tailed).

## 9.6 Self-Esteem

The overall mean score for self-esteem in this sample was 24.47 ( $SD = 7.44$ ). A two-tailed independent samples t-test was performed to determine whether there was a difference in self-esteem between males and females. In the current study males ( $M = 27.61$ ,  $SD = 6.92$ ) had higher self-esteem than females ( $M = 23.95$ ,  $SD = 7.40$ );  $t(1290) = 6.24$ ,  $p = .11$ , two-tailed). However, the magnitude of the differences in the means (mean difference = 3.66, 95%  $CI$ : 2.51 to 4.81) was small (eta squared = .029).

A second two-tailed independent samples t-test was executed to ascertain if there was a significant difference in the mean scores between individuals with a history

of NSSI and those who have never engaged in self-injury. The results of Levene's test indicated that the homogeneity of variances assumption is tenable, although barely at .051. Non-self-injurers had significantly higher self-esteem ( $M = 30.77$ ,  $SD = 5.66$ ) than self-injurers ( $M = 21.48$ ,  $SD = 6.23$ );  $t(1290) = -25.75$ ,  $p < .001$ , two-tailed). Furthermore, the magnitude of the differences between self-injurers and non-self-injurers (mean difference =  $-9.29$ , 95%  $CI$ :  $-9.99$  to  $-8.58$ ) was very large (eta squared = .339).

A third two-tailed independent samples t-test was conducted to compare the mean self-esteem scores in self-injurers with and without a history of mental illness. The results of Levene's test revealed that equal variances were not assumed. There was a significant difference between the group means. Self-injurers without a history of mental illness had significantly higher self-esteem ( $M = 23.10$ ,  $SD = 6.45$ ) than self-injurers who disclosed a history of mental illness ( $M = 20.15$ ,  $SD = 5.71$ );  $t(875) = 7.11$ ,  $p < .001$ , two-tailed). There was a small effect size (mean difference =  $2.96$ , 95%  $CI$ :  $2.14$  to  $3.77$ , eta squared = .05).

A Pearson's Product-Moment Correlation Coefficient was run, to examine the relationship between self-punishment, pain, NSSI and self-esteem. As indicated in Table 15, the relationships between all four variables were significant, at the alpha level of .01. A significant moderate relationship was found between pain and self-punishment. Self-punishment had strong relationships to NSSI and self-esteem, although its relationship to self-esteem was inverse. Self-esteem had an inverse relationship, of moderate strength with pain. Finally NSSI had a strong positive relationship to pain, and an inverse relationship with self-esteem.

Table 15: *Pearson Product-Moment Correlations Between Self-Punishment as a Function of NSSI, Pain and Self-Esteem*

Scale	1	2	3	4
1. Self-Punishment	-			
2. Pain	.57**	-		
3. Self-Esteem	-.60**	-.46**	-	
4. NSSI	.67**	.76**	-.58**	-

Note. \*\*  $p < .01$  (2-tailed).

## 9.7 Trauma

In the current sample 73.7% of all participants reported at least one traumatic event (range 0 – 11), with an average of 2.02 traumatic events over their lifetime ( $SD = 1.20$ ). Of the entire sample, 389 participants disclosed that at least one of the traumatic or adverse events that they had been exposed to occurred to them when they were over the age of 18 years. Furthermore, 30.56% of self-injurers ( $n = 268$ ) and 18.79% of non-injurers ( $n = 78$ ) reported that they had experienced an incident of violent crime victimization or personal trauma since the age of 18 years. The most commonly endorsed traumas were sexual abuse ( $n = 342, 26.5%$ ); other sexual assault ( $n = 278, 21.5%$ ); child physical abuse ( $n = 257, 19.9%$ ) and adult physical abuse ( $n = 257, 19.9%$ ). Whilst the least frequently endorsed lifetime traumas were other traumas involving serious injury or threat to life ( $n = 30, 2.3%$ ); force or weapon used in robbery ( $n = 67, 5.2%$ ); and life threatening illness ( $n = 76, 5.9%$ ).

An independent samples t-test was conducted to determine if there was a significant difference in the aggregated trauma history between self-injurers and non-injurers. The results of Levene's test indicated that the homogeneity of variances was not met, therefore equal variances cannot be assumed. Self-injurers had experienced significantly more trauma events over their lifetime ( $M = 2.30$ ,  $SD = 2.09$ ) than non-injurers ( $M = 1.44$ ,  $SD = 1.64$ );  $t(1290) = -8.05$ ,  $p < .001$ , two-tailed). Furthermore, the magnitude of the differences between self-injurers and non-injurers (mean difference =  $-.86$ , 95%  $CI$ :  $-1.07$  to  $-.65$ ) was moderate (eta squared =  $.05$ ).

Two further independent samples t-tests were run to determine if there were significant differences self-injurers and non-injurers in violent crime victimization and then in noncrime traumatic events. The results of Levene's test indicated that the homogeneity of variances was not met for violent crime victimization but it was tenable for noncrime traumatic events. Self-injurers experienced significantly more violent crime victimization events over their lifetime ( $M = 1.41$ ,  $SD = 1.47$ ) than non-injurers ( $M = .61$ ,  $SD = .97$ );  $t(1290) = -11.65$ ,  $p < .001$ , two-tailed). The magnitude of the differences between self-injurers and non-injurers across lifetime prevalence of violent crime victimization (mean difference =  $-.80$ , 95%  $CI$ :  $-.94$  to  $-.67$ ) was moderately strong (eta squared =  $.09$ ). However, there was no significant difference between self-injurers ( $M = .60$ ,  $SD = .83$ ) and non-injurers ( $M = .58$ ,  $SD = .85$ ) in the aggregated noncrime traumatic events,  $t(1290) = -.43$ ,  $p = .670$ , two-tailed).

Across the whole sample, participants reported more violent crime victimisation events ( $n = 719$ , 55.65%) than noncrime traumatic events ( $n = 538$ , 41.64%). Considering, the results in the current study examined violent crime (and other traumas) across the lifespan, this is comparable to the results in the ABS 2012 Personal Safety

Table 16: *Frequency of Lifetime Trauma Events Among Participants*

Type of trauma	Total sample ( <i>N</i> = 1292)		NSSI ( <i>n</i> = 877)		No NSSI ( <i>n</i> = 415)	
	Male ( <i>n</i> = 182)	Female ( <i>n</i> = 1110)	Male ( <i>n</i> = 76)	Female ( <i>n</i> = 801)	Male ( <i>n</i> = 106)	Female ( <i>n</i> = 309)
Violent Crime Victimisation	160	1327	101	1134	59	193
Force/weapon used in robbery	29	38	17	30	12	8
Sexual assault	17	325	12	285	5	40
Attempted sexual assault	7	194	6	172	1	22
Other sexual assault	18	260	13	220	5	40
Child physical abuse	30	227	17	190	13	37
Adult physical assault	43	214	27	179	16	35
Threatened with a weapon	16	69	9	58	7	11
Noncrime Traumatic Events	130	639	55	473	75	166
Life threatening illness	19	57	8	40	11	17
Life threatening accident	20	95	10	62	10	33
Family/close friend died from accident, homicide, or suicide	43	198	17	144	26	54
Witnessed trauma to another individual	26	157	10	123	16	34
Other trauma involving serious injury or threat to life	8	22	3	18	5	4
Other situation that was frightening or horrifying	14	110	7	86	7	24

*Note.* Participants could endorse multiple traumatic events.

Survey (PSS) which reported that 44.8% of participants had experienced some form of violence since the age of 15. Whilst the PSS did not survey the Australian population across the breadth of trauma assessed by the SLESQ, it did explore experiences of sexual and physical assault that had occurred since the age of 15 years. To compare the *non-injurers* in the current sample to a representative Australian sample, a series of chi-square goodness of fit tests were run utilising the results of the ABS 2012 PSS (ABS, 2012). No statistical differences were found between male (4.7%,  $\chi^2(1, n = 106) = .14, p = .71$ ) and female *non-injurers* (12.9%,  $\chi^2(1, n = 309) = 3.60, p = .06$ ) on sexual assault history when compared to the 4.0% of males and 17.1% of females who had been sexually assaulted according to the ABS 2012 PSS. However, significant differences were found in the prevalence of physical abuse, with lower rates reported in the current study amongst both male (15.09%,  $\chi^2(1, n = 106) = 26.03, p < .001$ ) and female *non-injurers* (11.33%,  $\chi^2(1, n = 309) = 48.19, p < .001$ ), in comparison to the 39.3% of males and 29.3% of females who reported at least one incident of physical assault since the age of 15 in the ABS 2012 PSS (ABS, 2012).

A one-way between-groups analysis of variance was performed to examine gender differences between the different types of trauma (Table 16). The *Levene's F test* revealed that the assumption of homogeneity of variance was not met for all but one (Witnessed trauma to another individual) of the different types of trauma, therefore, the *Welch F-ratio* is reported (Field, 2013). With the aim of minimising the effects of a type 1 error due to the multiple comparisons made for the 13 types of trauma, a Bonferroni adjusted alpha level of .004 was employed, as recommended by Field (2013) and Tabachnick and Fidell (2013). With alpha at the  $p < .004$  level, there was statistically significant difference, with a greater number of females than males experiencing a robbery (*Welch's F* (1, 1290) = 20.33,  $p < .001, \omega^2 = .04$ ); sexual assault (*Welch's F*

(1, 1290) = 60.73,  $p < .001$ ,  $\omega^2 = .02$ ); attempted sexual assault (*Welch's F* (1, 1290) = 55.57,  $p < .001$ ,  $\omega^2 = .02$ ); and other sexual assault (*Welch's F* (1, 1290) = 28.00,  $p < .001$ ,  $\omega^2 = .01$ ). The effect size was calculated using omega squared as advised by Field (2013); and despite attaining statistical significance the effect was small.

Two independent samples t-tests were run to explore if there were significant differences participants with and without a history of mental illness in violent crime victimization and then in noncrime traumatic events across the whole sample. Levene's test indicated that the homogeneity of variances was not met, and therefore equal variances cannot be assumed. Individuals with a history of mental illness experienced significantly more violent crime victimization events over their lifetime ( $M = 1.70$ ,  $SD = 1.53$ ) than participants with no existing or prior mental illness ( $M = .75$ ,  $SD = 1.09$ );  $t(1290) = -12.36$ ,  $p < .001$ , two-tailed). The magnitude of the differences between the two groups across lifetime prevalence of violent crime victimization (mean difference =  $-.95$ , 95% *CI*:  $-1.10$  to  $-.80$ ) was moderately strong (eta squared =  $.10$ ). There was also a significant difference between participants with a history of mental illness ( $M = .76$ ,  $SD = .92$ ) and participants with no history of mental illness ( $M = .47$ ,  $SD = .75$ ) in noncrime traumatic events,  $t(1290) = -5.96$ ,  $p < .001$ , two-tailed). The magnitude of the differences in the means (mean difference =  $-.29$ , 95% *CI*:  $-.38$  to  $-.19$ ) was small (eta squared =  $.03$ ).

A summary independent samples t-test was conducted to investigate whether there was a significant difference in the exposure to violent crime victimization of self-injurers with a history of mental illness in comparison to non-injurers with a history of mental illness. The Hartley test of equal variance indicated that the assumption of homogeneity of variance was not met in this analysis. Self-injurers with a history of

mental illness ( $M = 1.77, SD = 1.56$ ) experienced significantly more acts of personal violent crime, than non-injurers with an existing or prior mental illness ( $M = 1.15, SD = 1.24$ );  $t(547) = 3.68, p < .001$ , two-tailed). The magnitude of the differences between the two groups across lifetime prevalence of violent crime victimization (mean difference = .62, 95% *CI*: .28 to .95) was small (eta squared = .02).

To explore whether there were any differences in the reported trauma history of self-injurers with a history of mental illness compared to self-injurers without a history of mental illness, two final independent samples t-tests were conducted. Equal variances could not be assumed, as Levene's test indicated that the homogeneity of variances was not met. There was a significant difference in trauma history between the two groups of self-injurers for both violent crime victimization and noncrime traumatic events. Self-injurers with a history of mental illness experienced significantly more violent crime victimization events over their lifetime ( $M = 1.77, SD = 1.55$ ) than self-injurers with no existing or prior mental illness ( $M = .96, SD = 1.21$ );  $t(877) = -8.64, p < .001$ , two-tailed). The magnitude of the differences between the two groups across lifetime prevalence of violent crime victimization (mean difference = -.81, 95% *CI*: -.99 to -.62) was moderate (eta squared = .07). Similarly, self-injurers with a history of mental illness reported more aggregated noncrime traumatic events ( $M = .73, SD = .92$ ) and self-injurers with no history of mental illness ( $M = .45, SD = .69$ ) in,  $t(877) = -5.03, p < .001$ , two-tailed). The magnitude of the differences in the means (mean difference = -.27, 95% *CI*: -.38 to -.17) was small (eta squared = .03).



## 9.8 Attachment

The mean total scores on the three relationship domains were: mothers ( $M = 80.57$ ,  $SD = 24.76$ ); fathers ( $M = 74.89$ ,  $SD = 24.91$ ); and peers ( $M = 92.42$ ,  $SD = 19.35$ ). The means and standard deviations were calculated for total attachment, trust, communication and alienation for each of these three relationship domains for self-injurers and non-injurers to allow for comparisons across groups (Table 17). Pearson Product-Moment correlations were then run between NSSI and the nine attachment subscales of the IPPA. All correlations were significant, but only weak to medium in strength. The strongest correlations to NSSI on each of the three relationship domains was with alienation (Refer to Appendix P, Table P4).

A series of independent samples t-tests were run to examine whether there were any significant differences in attachment between males and females in the current sample. Whilst a significant difference was found in the total attachment scores to Mothers between males ( $M = 87.61$ ,  $SD = 22.95$ ) and females ( $M = 79.43$ ,  $SD = 24.86$ ;  $t(1171) = 3.94$ ,  $p < .001$ , two-tailed), the magnitude of the differences in the means (mean difference = 8.18, 95% *CI*: 4.11 to 12.26) was small (eta squared = .02). The findings were similar in the total attachment score to Fathers between males ( $M = 83.46$ ,  $SD = 22.39$ ) and females ( $M = 73.53$ ,  $SD = 25.03$ ;  $t(1162) = 5.13$ ,  $p < .001$ , two-tailed). The magnitude of the differences in the means (mean difference = 9.94, 95% *CI*: 6.12 to 13.76) was again small (eta squared = .03). However, there was no significant difference found between males ( $M = 93.21$ ,  $SD = 17.12$ ) and females ( $M = 92.29$ ,  $SD = 19.69$ ) in the total attachment score to peers ( $t(1152) = .61$ ,  $p = .541$ , two-tailed).

A paired-samples t-test was conducted to assess the within-sample difference in self-injurers between perceived mother and father attachment. Self-injurers rated their

perceived total attachment to their mothers significantly more highly ( $M = 73.85$ ,  $SD = 23.30$ ) than the perceived total attachment to their fathers ( $M = 68.42$ ,  $SD = 23.16$ ),  $t(772) = -5.86$ ,  $p < .001$  (two tailed). The mean difference in scores was  $-5.42$  with a 95% confidence interval ranging from  $-7.24$  to  $-3.61$ . The eta squared statistic of  $.02$  indicated a small effect size.

Table 17: Means and Standard Deviations for the Perceived Relationship Quality with Mothers, Fathers and Peers in Self-Injurers and Non-Injurers

Attachment Scale	NSSI		No NSSI	
	<i>M</i>	( <i>SD</i> )	<i>M</i>	( <i>SD</i> )
Mothers	(n = 778)		(n = 395)	
Total Attachment	73.91	(23.27)	93.67	(22.27)
Trust	32.47	(10.95)	40.12	(9.30)
Communication	24.20	(8.96)	31.47	(9.03)
Alienation	18.76	(5.35)	13.92	(5.52)
Fathers	(n = 772)		(n = 392)	
Total Attachment	68.42	(23.16)	87.63	(23.30)
Trust	30.32	(11.37)	37.78	(10.24)
Communication	21.17	(8.42)	28.06	(9.61)
Alienation	19.07	(5.91)	14.21	(5.70)
Peers	(n = 765)		(n = 389)	
Total Attachment	87.89	(19.38)	101.33	(15.93)
Trust	37.92	(9.12)	42.86	(7.22)
Communication	28.23	(7.71)	32.40	(6.19)
Alienation	20.27	(5.21)	15.92	(4.59)

A Pearson's Product-Moment Correlation Coefficient was conducted to explore the relationship between self-esteem, trauma and the total attachment scores across the three relationship domains. As indicated in Table 18, the relationships between self-esteem and total mother, father and peer attachment were significant, with moderate correlations between each, at the alpha level of .01. The relationship between violent crime victimisation and attachment across the three relationship domains were also significant, although inversely related to attachment and ranging in strength from weak to moderate. Finally, noncrime traumatic events only shared a weak significant association to mother and father attachment, not peer attachment, in the current study.

Table 18: *Pearson Product-Moment Correlations Between Self-Esteem and the Mother, Father and Peers Total Attachment Scores*

Scale	1	2	3	4	5	6
1. Self-Esteem	-					
2. Mother Total Attachment	.46**	-				
3. Father Total Attachment	.41**	.50**	-			
4. Peer Total Attachment	.45**	.31**	.29**	-		
5. Violent Crime Victimization	-.26**	-.36**	-.33**	-.19**	-	
6. Noncrime Traumatic Events	-.04	-.10**	-.12**	-.03	.36**	-

Note. \*\*  $p < .01$  (2-tailed).

A one-way between-groups multivariate analysis of variance was run to compare participants who had experienced an incident of violent crime to those who had not, across the three relationship domains of the IPPA. *Box's test* indicated that the assumption of homogeneity of variance-covariance matrices was not met in this analysis. However, as previously stated, it is largely agreed that *Box's test* is too conservative in large sample sizes (Field, 2013; Tabachnick & Fidell, 2013). *Pillai's Trace* was reported as it provides a more robust statistic when violations of assumptions occur and unequally sized matrices are present (Field, 2013; Pallant, 2013; Tabachnick & Fidell, 2013). An examination of *Levene's F test* demonstrated that the assumption of homogeneity of variance was met for each of the relationship domains. There was a statistically significant difference between participants with and without a history of violent crime on the combined attachment domains,  $F(3, 1150) = 48.20, p < .001$ ; *Pillai's Trace* = .11; partial eta squared ( $\eta_p^2$ ) = .11. When the results for total mother, father and peer attachment were considered separately, significant group differences were found for each of the relationship domains.

An inspection of the mean scores indicated that participants with a history of violent crime had perceived lower attachment to mothers ( $M = 74.67, SD = .91$ ) than participants without a history of violent crime ( $M = 89.06, SD = 1.09$ ), ( $F(1, 1152) = 102.36, p < .001, \eta_p^2 = .08$ ). Participants with a history of violent crime also had perceived lower attachment to fathers ( $M = 68.81, SD = .92$ ) than participants without a history of violent crime ( $M = 83.64, SD = 1.09$ ), ( $F(1, 1152) = 108.04, p < .001, \eta_p^2 = .09$ ). This pattern persisted with peer attachment, and participants with a violent trauma history had perceived lower attachment to peers ( $M = 90.59, SD = .74$ ) than participants without a history of violent crime ( $M = 95.04, SD = .88$ ), ( $F(1, 1152) = 14.96, p < .001, \eta_p^2 = .01$ ).

A direct discriminant analysis was conducted to predict whether attachment influenced engagement in NSSI. Predictors were the three subscales for attachment (Trust, Communication and Alienation) across all three of the relationship domains (Mother, Father and Peer Attachment). While the log determinants were quite similar, Box's M indicated that the assumption of equality of covariance matrices was violated. However, Tabachnick & Fidel (2013) contend that given the large sample size, this is not considered serious. The discriminant function revealed a significant association between all predictors and NSSI, accounting for 25.40% of the variance. Closer examination of the structure matrix of correlations between predictors and the discriminant function revealed that the best predictors of engagement in NSSI are Mother Alienation (.72), Peer Alienation (.70), Father Alienation (.68), Mother Communication (-.65), and Father Communication (-.63). The cross validated classification showed that overall 75.6% of cases were correctly classified. The histogram demonstrated the distribution of discriminant scores for self-injurers and non-injurers (Figure 5).

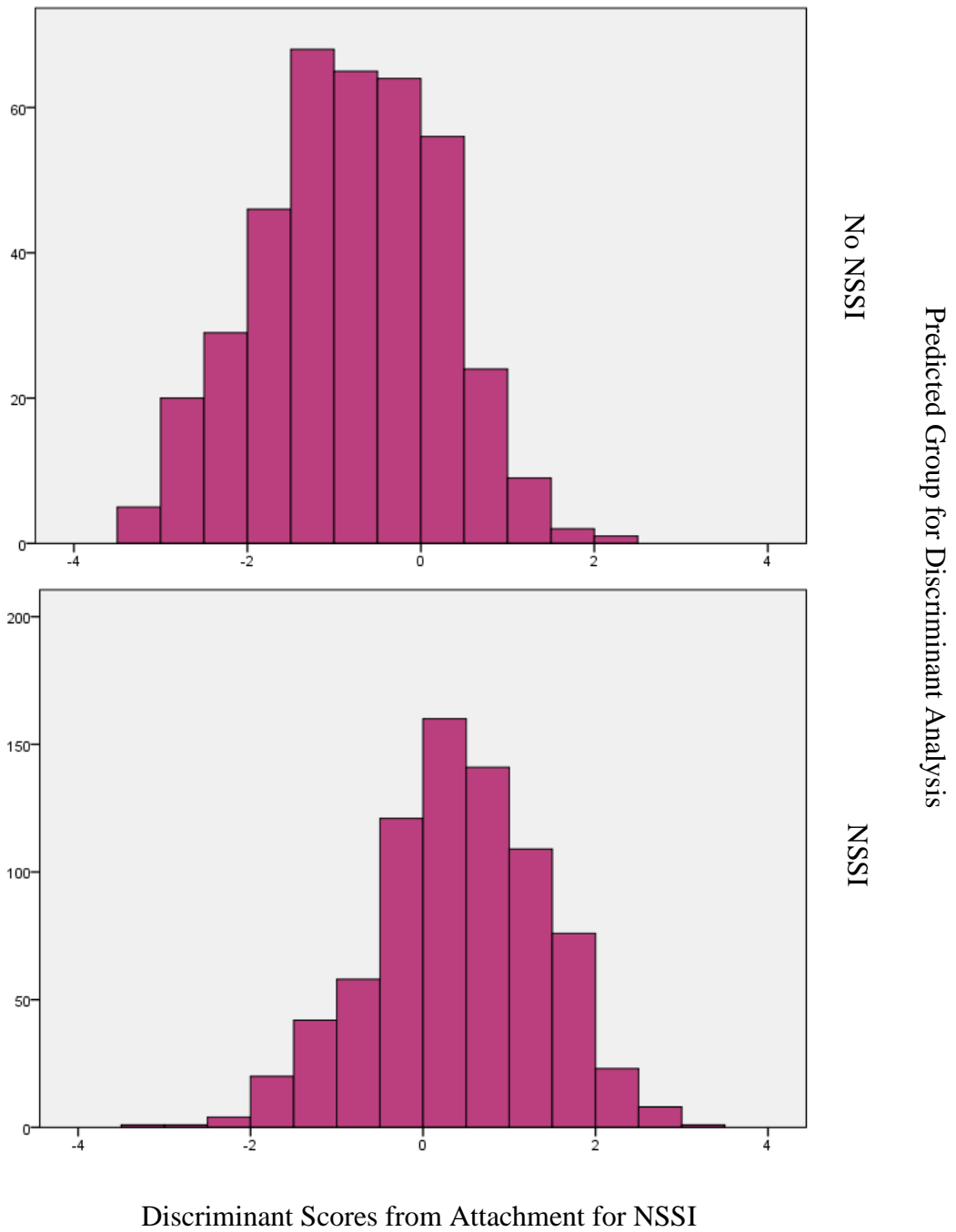


Figure 5: *Histograms Showing the Distribution of Discriminant Scores for Self-Injurers and Non-Injurers*

## 9.9 Factors Impacting How Long it Takes to Act on the Urge to Self-Injure

A multinomial logistic regression was conducted to assess the impact of several factors on the time taken from urge to engagement in NSSI (Appendix Q). As recommended by Tabachnick and Fidell (2013), this method of analyses was selected over a discriminant function analyses given the unequal group sizes of the six categories in the dependent variable. The model comprised six independent variables: frequency, severity, pain, intrapersonal functions, interpersonal functions, and desire to stop. The full model containing all six predictors was significant,  $\chi^2(30, n = 832) = 64.71, p < .001$ . Whilst this indicates that the model could reliably differentiate between the time it took participants to act on their urge to self-injure, the overall model only explained 7.5% (Cox and Snell R square) of the variance in time from urge to action; and correctly classified 57.1% of cases. As shown in Appendix Q, only three of the independent variables made a unique statistically significant contribution to the model (frequency, severity, and intrapersonal functions). Furthermore, the predictors did not remain stable for each of the latency periods. For self-injurers who waited less than an hour to enact their urge, frequency, severity and intrapersonal functions were all significant predictive factors, with respective odds ratios of 1.20, .84, and 1.06. In the one to three hour latency period, only frequency and intrapersonal functions were predictive, with odds ratios of 1.26 and 1.10. Whilst in both the three to six, and six to twelve hour latency periods the only predictive factor was intrapersonal functions, with respective odds ratios of 1.08 and 1.15. None of the variables were predictive of the time taken from urge to action in the twelve to 24 hour latency period.

## 9.10 NSSI: A Multidetermined Behaviour

In order to establish multiple risk factors and their contributions to NSSI, a series of correlational analyses were run to ascertain which variables would be included in the regression analyses. These variables were originally selected based upon the literature review, and the earlier analyses conducted. The results of these correlational analyses are presented in Appendix P, in Tables P1 through to Table P7. The literature has indicated that NSSI is a multidetermined behaviour, and as such any variables with even a small significant correlation (greater than .20) were included in the initial regression analysis.

As NSSI is a categorical variable, a binary logistic regression was performed to assess the impact of a number of factors on the likelihood that respondents would report they had engaged in NSSI (Appendix R). The initial model contained 29 predictor variables: gender; sexual orientation (heterosexual, lesbian and bisexual); piercings; tattoos; the number of diagnosed mental illnesses; family history of mental illness; experiencing a violent crime; self-esteem; attachment (trust communication and alienation subscales for fathers, mothers and peers); coping strategies (social support, problem focus, improve relationships, tension reduction, self-blame, keep to self, focus on the positive, relaxation, physical recreation, and not cope). The full model containing all 29 predictors was statistically significant,  $\chi^2 (29, n = 1292) = 746.92, p = < .001$ . This indicates that the model was able to reliably differentiate between participants who did and did not report a history of NSSI. The model as a whole explained 47.7% of the variance in NSSI (Cox and Snell R square); and correctly classified 86.6% of cases. Of the 29 independent variables, only 15 (gender; tattoos; the number of diagnoses for mental illness; family history of mental illness; experiencing a



violent crime; self-esteem; peer communication; father trust and communication; mother communication; social support; problem focus; tension reduction; self-blame; focus on the positive) made a unique statistically significant contribution to the model. Whereas, sexual orientation; the number of piercings; peer trust and alienation; father alienation; mother trust and alienation; improve relationships; keep to self; relaxation; physical recreation; and not cope did not make an individual statistically significant contribution to the model.

With the aim of presenting the most parsimonious model, all the nonsignificant variables were removed from the analysis, and another binary logistic regression was run. The results are presented in Table 19. The final model contained 15 predictor variables: gender; the number of tattoos; the number of diagnoses for a mental illness; having a family member diagnosed with a mental illness; self-esteem; experiencing a violent crime; attachment: father trust; father, mother and peer communication; coping strategies: social support; problem focus; tension reduction; keep to self; and focus on the positive. The full model containing all 15 predictors was statistically significant,  $\chi^2(15, n = 1153) = 722.65, p = < .001$ . This indicates that the model was able to reliably differentiate between participants who did and did not report a history of NSSI. Overall, the model explained 46.6% of the variance in NSSI (Cox and Snell R square); and correctly classified 86.6% of cases. As demonstrated in Table 19, 13 of the 15 independent variables made a unique statistically significant contribution to the model, except for peer communication and self-blame which did not.

The strongest predictor of engagement in NSSI was gender, with an odds ratio of 2.38. As such, the odds of engaging in NSSI are 2.38 times more likely for females than males, when controlling for all other factors in the model. The next greatest

predictors of engagement in NSSI were related to mental illness. With an odds ratio of 1.84, individuals who disclosed a family history of mental illness were more likely to have engaged in NSSI. The number of comorbid diagnoses for mental illness was the third highest predictor of NSSI, indicating that individuals who have more than one mental health diagnosis were 1.61 times more likely to engage in NSSI than those without a mental health diagnosis. A history of violent crime victimisation (force or weapon used in a robbery; sexual assault; attempted sexual assault; other sexual assault; child or adult physical abuse; and being threatened with a weapon); and the number of tattoos acquired, were the fourth and fifth highest predictors of NSSI, with respective odds ratios of 1.37 and 1.36.

Table 19: *Binary Logistic Regression Analysis Predicting Nonsuicidal Self-Injury*

Variable	<i>B</i>	<i>S.E.</i>	Wald	<i>p</i>	OR	95% CI for OR	
						Lower	Upper
Gender	.87	.25	11.62	.001	2.38	1.44	3.91
Number of Tattoos	.30	.07	18.66	< .001	1.35	1.18	1.55
Number of Mental Health Diagnoses	.47	.11	17.27	< .001	1.61	1.28	2.01
Family History of Mental Illness	.61	.19	10.22	.001	1.84	1.27	2.69
Self-esteem (RSE)	-.19	.02	72.02	< .001	.83	.79	.86
Violent Crime Victimization (SLESQ)	.31	.09	12.60	< .001	1.37	1.15	1.63
<b>IPPA</b>							
Father Trust	.06	.02	14.22	< .001	1.06	1.03	1.09
Father Communication	-.07	.02	15.08	< .001	.93	.89	.96
Mother Communication	-.03	.01	8.74	.003	.96	.94	.99
Peer Communication	-.01	.02	.75	.386	.99	.95	1.02
<b>CSA</b>							
Social Support	-.02	.01	7.73	.005	.98	.97	.99
Problem Focus	.03	.01	14.35	< .001	1.03	1.01	1.04
Tension Reduction	.02	.01	15.43	< .001	1.02	1.01	1.04
Self-blame	-.01	.01	2.48	.11	.99	.98	1.00
Focus on the Positive	-.03	.01	26.48	< .001	.97	.95	.98

*Note.* CI = confidence interval. OR = odds ratio. RSE = Rosenberg Self-esteem Scale; SLESQ = Stressful Life Events Screening Questionnaire; IPPA = Inventory of Parent & Peer Attachment; CSA = Coping Scale for Adults.

## CHAPTER 10

### Discussion

This study has found several novel results which provide important contributions to the extant NSSI scholarship, and have implications for the prevention, assessment, treatment and education of NSSI. Firstly, whilst studies have been undertaken exploring the functions of NSSI in adult samples using the ISAS, the average number of functions endorsed has not been reported on to date. Secondly, this study was instrumental in exploring the experience of pain with the full range of functions from the ISAS on NSSI, as previous studies have only focused on one particular function (i.e., self-punishment). Similarly, it is unique in its investigation of the relationship between self-esteem, self-punishment, pain and NSSI. This study was also the first to differentiate the effects of gender from sexual orientation on coping strategies and NSSI, finding that females identifying as lesbian are at a significantly greater level of risk for NSSI than gay males. Another novel result was that the second strongest predictor of engagement in NSSI was having an immediate family member with a history of mental illness. Finally, the most important unique finding was the result of the logistic regression, which accounted for a large 46.6% of the variance in NSSI. This combination of variables had not been explored together in a predictive model of NSSI.

The high percentage of participants who disclosed a self-reported history of mental illness in the current study was unexpected. Utilising this data, self-injurers with and without a history of mental illness were compared to explore whether they differed in regard to the act of NSSI, the functions that motivate the behaviour, and psychosocial determinants that potentially initiate and maintain it. In the following section the

relationship and impact of individual psychosocial risk factors are presented, before discussing the combined effect of these variables on NSSI.

## **10.1 Rates of NSSI**

The current study did not aim to recruit a representative sample; and with 67.9% of participants reporting a lifetime history of NSSI, the rates were significantly higher than those reported in the literature in young adult (Heath et al., 2008; Hasking et al., 2008; Moller et al., 2013; Swannell et al., 2014; Whitlock et al., 2011) and adult samples (Briere & Gil, 1998; Bryan & Bryan, 2014; Klonsky et al., 2003; Martin, Swannell, Hazell, et al., 2010), which ranged from 11.68% to 43.60%; and 5.9% to 8.1%, respectively. It is likely that this is predominantly a function of the recruitment process and self-selection bias, with participants electing to participate in a study that had personal relevance to them. This research project was openly transparent, advertised as a study exploring NSSI. It was promoted in the social media to appeal to individuals who currently self-injure or had a history of NSSI. Given this, the rates from the current study cannot be generalized to the broader community.

### **10.1.1 Gender Effects on NSSI**

The scholarship on NSSI over the past decade has shown a considerable shift in gender engagement of NSSI. Numerous studies in nonclinical samples of young adults or adults have revealed no difference in the gender engagement of NSSI (Andover et al., 2007; Andover et al., 2010; Briere & Gil, 1998; Gollust et al., 2008; Gratz, 2001; Gratz et al., 2002; Heath et al., 2008; Klonsky, 2011; Klonsky et al., 2003; Moller et al., 2013). Contrary to this, in the current study females were significantly more likely to

have engaged in NSSI than men. Seventy-two percent of females reported a lifetime history of NSSI, compared to only 41% of males. In accordance with the findings of Whitlock et al. (2011), who also reported that females were significantly more likely to self-injure than males, the effect size for the gender difference was small. The findings in the current study regarding gender need to be tempered; firstly, by the purposive sampling technique employed; and secondly, by the skewed gender distribution (1110 females and 182 males). Finally, the gender effects may be reflective of this particular semi-clinical sample and the associated diagnoses, rather than predominantly attributed to gender. Further studies in nonclinical, and particularly community based samples, are needed to investigate if the numbers of young adult and adult males who self-injure are increasing.

### **10.1.2 Sexual Orientation**

The majority of both self-injurers and non-injurers in the current sample identified their sexual orientation as heterosexual. Consistent with previous research, a significant relationship was found between sexual orientation and NSSI (Kerr et al., 2013; Serras et al., 2010; Skegg, 2003; Sornberger et al., 2013; Wilcox et al., 2012). In particular, significantly more individuals identifying as heterosexual, lesbian and bisexual engaged in NSSI than those identifying as gay or asexual. Lesbians and bisexual females were 4.80 and 5.95 times, respectively more likely to engage in NSSI than heterosexuals. This supports the findings of Kerr et al. (2013) and Sornberger et al. (2013), who reported significantly higher incidences of NSSI in bisexuals and lesbians when compared to heterosexual participants.

In the current study, males identifying as bisexual did not have significantly greater odds of engaging in NSSI. This is in direct contrast to the results of O'Connor et al. (2014) and Almedida et al. (2009) whose studies indicated that the effect of sexual orientation were confined solely or predominantly to males in their respective adolescent samples. This highlights the importance of distinguishing gender from sexual orientation and not examining them together as studies have primarily done in the past (i.e., categorising lesbian and gay as one homogeneous group: Serras et al., 2010; Sornberger et al. 2013). Otherwise, it cannot be unequivocally determined whether these effects can be attributed to sexual orientation or gender identity; being part of a sexual minority; or perhaps even other psychological, social or biological factors associated with being part of a sexual minority (Deliberto & Nock, 2008; Whitlock et al., 2011).

These varying results along the spectrum of same-sex attraction indicates that further research needs to focus on not categorising individuals who are non-heterosexually orientated as one homogenous group, as there are clear differences within the spectrum of sexual orientation and gender identity. The current study lacked the option for participants to self-identify as questioning, and recent research indicates that individuals who identify as questioning are at a comparable risk of engaging in NSSI as individuals who identify as bisexual (Sornberger et al., 2013). As such, this is an important dimension of sexual orientation that should be incorporated into future studies. Furthermore, this study focused on sexual orientation, and only included the traditional dichotomy for gender. Given the significant differences in gender on the influence of sexual orientation on the prevalence rates of NSSI; and recognising gender as a much more fluid construct, future research should adopt an approach to gender measurement that is a non-binary and more inclusive of gender diverse people.

### **10.1.2.1 Sexual Orientation and Coping**

Only one other study to date has examined the use of coping strategies and NSSI across the spectrum of sexual orientation (Sornberger et al., 2013). However, the authors grouped lesbian and gay participants together in their study, and the findings of the current study suggest that females identifying as lesbian are at a significantly greater level of risk for NSSI than gay males. Exploring a greater range of coping strategies, using the Coping Scale for Adults (CSA), the multivariate test demonstrated a significant difference between sexual orientation and coping overall. An examination of the univariate tests indicated that significant differences were found for sexual orientation on five of the nineteen coping strategies: tension reduction, self-blame, focus on the positive, physical recreation, and not cope. These results are particularly interesting considering NSSI, and the functions NSSI reportedly serves for many individuals. NSSI is primarily enacted as a means of affect regulation or tension reduction (Klonsky, 2009; Swannell et al., 2008), and indeed in the current study it was the most highly endorsed function for NSSI. Similarly, self-punishment was the second highest endorsed function in the current study, and is also frequently cited in the literature as one of the main functions underpinning NSSI (Hamza, et al., 2014; Klonsky, 2009; Swannell et al., 2008). Post-hoc analyses revealed that bisexual participants endorsed their usage of tension regulation and self-blame strategies significantly more highly than heterosexual participants. Given that bisexual participants were at the highest risk of engaging in NSSI in the present study, the greater utilisation of tension reduction and self-blame as coping mechanisms in comparison to the other groups is not surprising.

Whilst participants identifying as bisexual, scored higher on the emotion-focused or non-productive coping strategies of tension reduction and self-blame, they



scored lower on the problem-focused or productive coping strategies of focusing on the positive and physical recreation. They also scored higher on the not coping subscale, which is indicative of psychosomatic concerns and an inability to cope. Whereas participants identifying as lesbian, scored significantly higher than heterosexual participants on self-blame, and significantly lower on focusing on the positive. There were no significant differences across coping strategies for participants who identified themselves as male or asexual from the heterosexual participants. These findings suggest that individuals who identify as bisexual, and to a lesser degree as lesbian, use more emotion-focused coping strategies and less problem-focused coping strategies than heterosexual participants. Sornberger et al. (2013) found that individuals in their study who identified as bisexual or questioning also endorsed a greater use of maladaptive coping strategies, yet only differed on one adaptive coping strategy, which was reading.

Why is it that individuals identifying as bisexual and lesbian are at a greater risk of adopting emotion-focused or non-productive coping mechanisms, such as tension reduction, self-blame and NSSI? Researchers, such as Sornberger et al. (2013) and Kerr et al. (2013) have suggested that it could entail being a part of a minority, and being subjected to the associated stigma and stress. Yet, it is interesting that participants identifying as gay and asexual did not engage in statistically higher levels of NSSI or other non-productive coping mechanisms. Part of this could be attributed to the additional discrimination, stigma and oppression of biphobia, or antibisexual prejudice (MacLeod, Bauer, Robinson, MacKay, & Ross, 2015; Obradors-Campos, 2011; Todd, Oravec, & Vejar, 2016). This discrimination is derived from several negative stereotypes and misnomers associated with bisexuality, and unfortunately it comes from individuals identifying as heterosexual, lesbian or gay. Bisexuals have been incorrectly

perceived as indecisive, confused or unstable in their sexuality; less committed to relationships; promiscuous; and untrustworthy (Kerr et al., 2013; Todd, Oravec, & Vejar, 2016). The fact that bisexual males did not engage in statistically higher rates of NSSI needs to be tempered by the smaller sample of males identifying as bisexual ( $n = 23$ ), when compared to the larger number of females who identified as bisexual ( $n = 145$ ).

These findings indicate that further research needs to be directed towards different coping strategies, stress, self-esteem, and mental health in across the spectrum of same-sex attraction, but particularly focused on individuals identifying as bisexual. Moreover, community efforts need to be directed towards destigmatizing bisexuality and demystifying the misnomers and myths associated with it.

### **10.1.3 Mental Illness**

Self-injurers were expected to have higher rates of mental illness than non-injurers. However, the prevalence of self-reported mental illness in the current sample of self-injurers was significantly higher than expected at 54.8%. The odds of self-injurers reporting a mental illness were 6.42 times the odds of non-injurers, with a higher prevalence across all self-reported diagnoses. Self-injurers with a history of mental illness engaged in NSSI more frequently and for more reasons, they used more methods to self-injure, and they had obtained more medical treatment for their wounds, than self-injurers with no prior history of mental illness. This group of self-injurers also reported lower self-esteem, and a greater aggregated history of both violent crime victimisation and noncrime traumatic events, than both self-injurers without a history of mental illness, and non-injurers. From these results, it could be hypothesised that self-

injurers with a history of mental illness may form a distinct subgroup of self-injurers. However, the delineation between these two groups cannot be unequivocally attributed to mental illness, as the research methodology employed in the current study does not allow for interpretations of causality.

Other delineations of subgroups of self-injurers, such as Favazza's (1987, 1996) *sociocultural classification of NSSI* (Table 1) have typically used severity and frequency to distinguish between the groups. In 1969, Pao distinguished between delicate and course cutters. More recent studies have supported this delineation, with a number of researchers identifying subclasses of self-injurers in the broader heterogeneous population (Lloyd-Richardson et al., 2007; Klonsky & Olino, 2008; Whitlock et al., 2008). Lloyd-Richardson et al. differentiated between minor self-injurers and moderate/severe self-injurers. They found that moderate/severe self-injurers used more methods and self-injured with greater frequency than minor self-injurers, they were more likely to feel pain, and to consume alcohol or drugs during the act of NSSI, and they were more likely to have received medical treatment for their wounds. They were also more likely to have a history of psychiatric treatment, hospitalisation, suicide attempts and current suicidal ideation. Through a latent class analysis, Klonsky and Olino identified four distinct classes of self-injurers, each increasing in severity and psychopathology. The fourth group was characterised by a later age of onset, more time taken to contemplate the act of NSSI; more pain experienced during NSSI; and a higher, and multiple endorsement of intrapersonal or automatic functions. This group was also more likely to have greater depressive, anxious and BPD symptomatology; have made a suicide attempt; and sought medical attention for their injuries related to NSSI or a suicide attempt. Whitlock et al. (2008) also used latent class analysis to extract three subgroups of self-injurers based on severity. As in Klonsky and Olino's study,

psychopathology increased incrementally with severity in each of the three subgroups. The high severity group identified by Whitlock et al., were more likely to have undergone counselling, had greater suicidality; disordered eating; and histories of emotional, sexual and physical abuse, than the groups of superficial and moderate self-injurers. The results of these studies illustrate the heterogeneity of the self-injurers, both in their presentation of the behaviour, and in regards to the associated psychopathology and other risk factors. Practitioners need to be mindful of this considerable heterogeneity in their assessment and treatment of NSSI.

In accordance with the extant literature, the most commonly reported diagnoses amongst self-injurers were depressive disorders (Chartrand et al., 2015; Hintikka et al., 2009; In-Albon et al., 2013); anxiety disorders (Chartrand et al.; Glenn & Klonsky, 2013; Gollust et al., 2008); BPD (Andover et al., 2005; Glenn & Klonsky, 2010a, 2010b; In-Albon et al., 2013; Nock et al., 2006); bipolar disorders (Andover & Gibb, 2010; Claes et al., 2010); PTSD (Briere & Gil, 1998; In-Albon et al.); eating disorders (Glenn & Klonsky, 2010a, 2010b, 2013; Iannaccone et al., 2013); OCD (included under anxiety disorders in Glenn & Klonsky, 2013); ADD/ADHD (Martin, Swannell, Harrison, et al., 2010) and DID (Briere & Gil); in that order. Obsessive compulsive disorder was analysed separately rather than under the broader umbrella of anxiety given the significant number of self-injurers who nominated it as a diagnosis. Self-injurers were 7.57 times more likely to disclose a diagnosis of OCD than non-injurers. The literature to date has explored anxiety disorders as one homogeneous group, as with depressive disorders. Given the high prevalence of mental illness, a future avenue for research could be a more focused investigation to the psychiatric disorders comorbidly occurring with NSSI.

There was a higher prevalence of familial mental illness amongst self-injurers in this study. In fact, in the regression analysis, having at least one family member with a mental illness, was the second strongest predictor of a history of NSSI. Again, as the current study was cross-sectional in design, inferences of causation cannot be made. A family history of mental illness could potentially be conceptualised under the category of distal risk factors, as a genetic predisposition, in Nock's (2009, 2010) integrated theoretical model. There was a significant relationship found between a familial history of mental illness and aggregated personal trauma in the present study. Given this association to trauma, it is plausible that a relationship also exists between a family history of mental illness and the other two distal risk factors proposed by Nock: a genetic predisposition for high emotional/cognitive reactivity and familial hostility/criticism. From the current study, it cannot be determined whether it is a genetic predisposition to mental illness that creates particular vulnerabilities to NSSI, or whether there are other factors associated with a familial history of mental illness that result in a heightened propensity to self-injure. For instance, research has demonstrated that there are numerous effects of living with a family member who has mental health issues, such as poorer physical health, lack of family support, financial stress, disrupted schedules, stigma, blame, and discrimination (Chang et al., 2016; Corrigan & Miller, 2004). Therefore, the discriminative value of familial mental illness could indirectly be an artefact of one of these factors, or a combination of several factors associated to having a family member with a mental illness, including a genetic link. Numerous studies have explored the relationship or predictive value of different mental illnesses on NSSI, but few have explored the impact of familial mental illness and what the nature of its relationship is to self-injury.

## 10.2 Piercings, Tattoos and Body Modifications

Very few studies have examined the relationship between piercings, tattoos, body modifications and NSSI (Aizenman & Jensen, 2007; Claes et al., 2005; Iannaccone et al. 2013; Stirn & Hinz, 2008). Piercings were prevalent in the current sample, with participants overall reporting an average of 3.69 piercings. Whilst tattoos were less common, the range of both piercings and tattoos acquired were similar at 1 to 27; and 1-30, respectively. Given this breadth in the range, participants were categorised into groups of none; minimal; and extensive for both piercing and tattoos. A significant association was found between both piercing and tattooing with the engagement of NSSI. Participants with extensive piercings (4 or more piercings) were 3.48 times more likely to have a history of NSSI than individuals with no piercings or minimal piercings (1-3 piercings). Similarly, participants who had extensive tattoos (2 or more tattoos) were 3.31 times more likely to have engaged in NSSI than individuals with no tattoos. Body modifications such as brandings, scarification, and stretched ear lobes were only reported by 31 participants. Based upon the odds ratio, this suggests that individuals with body modifications, other than piercings and tattoos, are 14.66 times more likely to report a history of NSSI.

Whilst the results indicate a higher incidence of body modification behaviours in self-injurers, one must be cautious in making interpretations and not infer causality. The current study did not ascertain whether the various body modifications precipitated or followed the onset or the offset of NSSI. Whereas, Stirn and Hinz (2008) reported that a significant number of participants who engaged in self-cutting, stopped their NSSI once they started procuring body modifications. The authors contended that the acquisition of body piercing supplanted the need to cut. In further support of this, they discovered that those who self-injured had more piercings than those who did not self-injure; and that

these piercings were typically not performed by professionals. To enable an understanding of the temporal relationships between piercing, tattooing, body modifications and NSSI, future studies should investigate whether the body art and modifications were acquired prior to, concurrently, or post engagement in NSSI.

### **10.3 NSSI**

#### **10.3.1 Onset of NSSI**

The average age of onset was 15.47 years, which is in accordance with the literature in both clinical and nonclinical samples (Australian Institute of Health and Welfare, 2007; Heath et al., 2008; Klonsky, 2009, 2011; Muehlenkamp & Gutierrez, 2004, 2007; Nixon et al., 2008; Nock & Prinstein, 2004; Whitlock et al., 2011), and remains largely unchanged since NSSI was initially introduced as self-mutilation and later DSH (Emerson, 1914; Favazza, 1996; Favazza & Conterio, 1988, 1989; Novotny, 1972; Pattison & Kahan, 1983; Rosenthal et al., 1972). There was a significant difference in the ages of those who engaged in self-injury (24.68 years) and those who had no history of NSSI (31.33 years). The age of onset ranged from 2 to 59 years, which is consistent with the findings of Martin, Swannell, Hazell, et al. (2010) and the earlier research of Gardner and Gardner (1975). Analogous to Martin, Swannell, Hazell, et al., only six participants commenced self-injuring over the age of forty years. However, a much greater number of participants ( $n = 86$ ) initiated NSSI before the age of 10 years than typically reported in the literature. It was anticipated that the cases at either end of the age range would represent outliers, and would have experienced significant traumas or mental health concerns. Of these 86 participants, the large majority had either been diagnosed with at least one mental illness; had a family history of mental illness; or had

experienced significant trauma in their lives (i.e., sexual abuse or physical abuse). Only one participant did not report any of these precursors to the early onset of NSSI, whilst the remaining 10 participants declined to answer the mental health and trauma questions.

The current study did not undertake a thorough investigation into the social or interpersonal mechanisms of NSSI. However, from the results obtained, there was only minor evidence found in support of the social learning hypothesis. Only 26.9% of self-injurers reported that they knew someone who self-injured prior to their own initial engagement in the behaviour. Whilst the current study did not ask participants if this is where the idea to self-injure originated from, the results are comparable to previous studies which found that 22% (Heath et al., 2009) and 29% (Nixon et al., 2008) of participants, initially started self-injuring because they knew someone else who engaged in the behaviour. These findings do not support the influence of peer exposure as a mechanism for the initiation of NSSI. With the aim of gaining a better aetiological understanding of NSSI from a social modelling perspective, future research should ascertain how many people self-injurers knew both prior to the initial act of their self-injury, and then post onset. This would provide a means of testing whether the social effect is related to social modelling, rather than just an artefact of selection to similarity, where the individual is drawn towards other peers who also self-injure (Cohen, 1977; Kandel, 1978; Osgood et al., 2013; Prinstein et al., 2009).

Prior to the onset of NSSI, 61.6% of self-injurers in this study had been exposed to an average of 2.14 potential sources of self-injury through traditional and social media sources. The most common sources of exposure were movies, books, television programs, and songs, but less than a third of self-injurers endorsed exposure to each of



these media. The low numbers of self-injurers who endorsed seeing, reading or hearing about NSSI on a website (15.4%), through social networking sites (9.9%), and in chat rooms (3.3%) were noteworthy, given that these forums are often blamed in the media for reported increases in the prevalence rates of NSSI (Prinstein et al., 2009). These results are consistent with previous studies, citing that 13.3% (Deliberto & Nock, 2008), 15.1% (Nixon et al., 2008) and 21.6% (Heath et al., 2009) of self-injurers reported that the idea to self-injure originated from something they had seen or heard in the media. These figures are not strong enough to support the influence of the media in the initiation of NSSI for the majority of self-injurers. This is not to say that the exposure to content involving NSSI, does not play a role in maintaining the behaviour over time.

### **10.3.2 Methods of NSSI**

In accordance with previous research, cutting was the most common method of self-injury in the current study. However, with 88.2% of self-injurers reporting at least one act of cutting in their lifetime history of NSSI, this prevalence rate is considerably higher than that reported in the literature (35%: Klonsky, 2011 to 65%: Heath et al., 2008). It is more consistent with the rates found in psychiatric (>80%: Herpertz, 1995) and military samples (78.7%: Bryan & Bryan, 2014). This appears to be a pattern in the present study with higher engagement reported across all methods of NSSI than those previously reported in the literature. The only exception was severe scratching at 54.0%, which whilst at the upper end (51%: Whitlock et al., 2011; 56.5%: Heath et al., 2008; 57%: Briere & Gil, 1998), remained within the range of percentages reported in the extant literature (18.4%: Gollust et al., 2008 to 57%: Briere & Gil, 1998). The higher frequencies reported across the methods of NSSI could largely be attributed to the fact

that over half of the self-injurers in the current study disclosed a history of mental illness.

The majority of participants (63.4%) used multiple methods to self-injure ( $M = 3.92$ ,  $SD = 3.66$ ), with a very similar finding to Bryan and Bryan (66%: 2014) and Whitlock et al. (70%: 2006). Jacobson and Gould (2007) postulated that the number of methods employed could be related to where the sample was drawn from, with clinically derived samples equating to multiple methods. However, all of the studies reviewed (Bryan & Bryan; Hamza et al., 2013; Klonsky, 2011; Lloyd-Richardson et al., 2007; Martin, Swannell, Hazell, et al., 2010; Whitlock et al.; You et al., 2011) were based on nonclinical samples (with the exception of the military sample in Bryan & Bryan). The hypothesis that a direct relationship existed between the number of methods employed and the level of overall impairment was significant, as self-injurers with a history of mental illness reported utilizing a greater number of methods to self-injure than participants who had no history of mental illness.

Contrary to expectations, this study found no significant gender differences in the methods used to self-injure. This contrasts with a considerable body of the research that has found that males are more likely to engage in self-injurious behaviours such as self-battery; banging, hitting, or punching a hard surface; or burning. Whereas, females have predominantly been reported to engage in cutting, scratching and carving (Bresin & Schoenleber, 2015; Brunner et al., 2013; Gollust et al., 2008; Sornberger et al., 2012; Whitlock et al., 2006; Whitlock et al., 2011; You et al., 2011). This had lead several researchers to speculate on the role and import of the sight blood in NSSI for females (Favazza & Conterio, 1989; Glenn and Klonsky, 2010b; Sornberger et al., 2012). However, there is no empirical evidence to support this to date (Glenn & Klonsky). The

absence of gender effects in the methods used to self-injure may be attributed to the substantially smaller number of males in the current sample.

### **10.3.3 Alone**

The overwhelming majority of participants always self-injured alone, yet 137 self-injurers sometimes engaged in the behaviour in the presence of others, and 7 participants specified that they never self-injured alone. Females were more likely to self-injure alone, than males in the present study. The effect size for this gender difference was small, but should also be tempered by the large gender distribution discrepancy in the sample. These findings are consistent with the limited extant research on whether individuals typically self-injure alone or in the presence of others (Glenn & Klonsky, 2009; Laye-Gindhu & Schonert-Reichl, 2005; Whitlock et al., 2011).

In accordance with the findings of Klonsky and Glenn (2009), self-injuring alone was correlated to the intrapersonal functions of NSSI. This suggests that self-injurers who engage in NSSI for intrapersonal reasons are more likely to self-injure alone. Contrary to the expected, the opposite relationship was not significant, and self-injuring in the presence of others was not correlated to interpersonal functions of NSSI. Glenn and Klonsky (2009) explored the relationship of self-injuring alone, intrapersonal functions and suicidality. They found that individuals who only ever self-injured alone were more at risk of suicidality. More specifically, self-injuring alone was associated with history of suicidal ideation, suicidal plans, and suicide attempts. Intrapersonal functions only partially explained the relationship between self-injuring alone and suicidality, whilst the association between the latter two variables retained its significance even when accounting for known risk factors for suicide. The authors

suggest that these findings can be directly applied to suicide risk assessment in a clinical setting. Given the challenge of assessing suicide risk in self-injurers, and the conferred risk of suicidal thoughts and behaviour associated with NSSI (Guan et al., 2012; Klonsky et al., 2013; Tuisku et al., 2014), clinicians should ascertain whether NSSI is always undertaken alone (Glenn & Klonsky, 2009). However, caution needs to be taken in providing mental health practitioners with this information. In the current study, 705 participants self-injured alone, whilst only 144 participants self-injured with others (either sometimes or always), yet research indicates that approximately 26% of self-injurers attempt suicide (Laye-Gindhu & Schonert-Reichl, 2005; Martin, Swannell, Hazell, et al., 2010).

It would be interesting to investigate whether the experience of NSSI differed in any way for the 144 participants in the current study who sometimes or always self-injured in the presence of others. This research did not investigate whether any of these participants had ever engaged in self-injury by proxy, that is, injuring another person, or allowing another person to injure them (Favazza & Conterio, 1989; Walsh, 2006; Whitlock et al., 2011). This has yet to be empirically investigated in the literature on NSSI. An exploration of NSSI by proxy, should also focus on whether the functions underlying NSSI by proxy, are in fact analogous to those who enact the tissue damage directly themselves.

#### **10.3.4 Time From Urge to Action**

In the current study, 57.1% of participants had a latency period of less than one hour before self-injuring, whilst 21.2% acted on the initial urge 1 to 3 hours later, and 5.4% waited 3 to 5 hours. Another 6.9% of self-injurers waited between 6 and 24 hours

before engaging in NSSI, and for 9.3% of participants the latency from urge to action was greater than 24 hours. The fact that 78.3% of self-injurers action their urge to harm themselves within three hours, indicates that the behaviour is largely enacted impulsively (Nock & Prinstein, 2005). There were no significant differences between males and females and the time they took to act on their initial urge to self-injure. These findings are consistent with the extant research on the time taken to contemplate NSSI (Favazza & Conterio, 1989; Klonsky, 2011; Nock & Prinstein, 2005; Zetterqvist et al., 2013).

Research has indicated that the time taken from urge to action has been related to several other NSSI contextual variables. Firstly, it has been directly related to the level of self-injury, with individuals who engaged in moderate to severe NSSI exhibiting a greater period of latency than injurers engaging in minor NSSI (Klonsky & Olino, 2008; Lloyd-Richardson et al., 2007; Whitlock, Muehlenkamp, & Eckenrode, 2008). Secondly, and somewhat intuitively, the latency period from urge to action was associated to the level of pain experienced by self-injurers, with higher perceived pain also associated with a greater latency period (Nock & Prinstein, 2005). In the current study, the time taken to contemplate NSSI was strongly correlated to severity and pain. This indicates that the more severely one injures themselves and the more pain they experience, the longer they will take to contemplate engaging in NSSI. These contextual variables (frequency, severity, and pain), were incorporated with the desire to stop self-injuring and the two functional factors – intrapersonal and interpersonal – in an attempt to ascertain what factors influenced the time taken to contemplate self-injuring. Whilst the model containing all six variables was significant, it only accounted for 7.5% of the variance in the time taken from urge to action. Furthermore, the only variables that made a statistically significant contribution to the model were frequency, severity, and

intrapersonal functions. Interestingly, the predictors also varied for each of the latency periods. Frequency of NSSI, intrapersonal functions and severity (inversely), were all significant predictive factors for acting on the urge to self-injure in less than one hour (in order of their predictive strength). In the one to three hour latency period, only frequency and intrapersonal functions were predictive factors. Whilst in both the three to six hour, and six to twelve hour latency periods intrapersonal functions was the only significant predictor of the time taken to contemplate NSSI. In the twelve to 24 hour latency period there were no predictive factors.

To date, only a handful of studies have investigated the predictive or associated factors of the time self-injurers take to contemplate their act (Klonsky & Olino, 2008; Lloyd-Richardson et al., 2007; Nock & Prinstein, 2005; Whitlock, Muehlenkamp, & Eckenrode, 2008). Research has also typically focused on using the time taken from urge to action, as one of several contextual variables (i.e., severity, frequency, method) with which to categorise self-injurers into different subgroups (Klonsky & Olino, 2008; et al., 2008; Zetterqvist et al., 2013). These findings suggest that in the majority of self-injurers the behaviour is largely an impulsive one. However, as proposed by Klonsky and Olino (2005), the predictive value of intrapersonal functions, suggests that NSSI has become a stable and perhaps consolidated coping mechanism for regulating the affective and cognitive states in individuals who take longer to contemplate their self-injurious behaviour. As these three factors contributed to so little of overall variance in the time taken to contemplate NSSI, future research should investigate what other factors influence this thought process. It would also be valuable to ascertain if these variables change over the course of the behaviour.

### **10.3.5 Medical Attention or Severity of Wounds**

In the current study 34.6% of self-injurers had sought medical attention for their wounds as a result of NSSI, on at least one occasion. This percentage is considerably higher than the findings reported in the limited recent literature on seeking treatment for wound care (Hasking et al., 2013; Whitlock et al., 2006; 2011). Hasking et al. found that only 4.5% of self-injurious acts in an adolescent sample required medical treatment, whilst Whitlock et al. (2011) reported that in a college sample, 5% of students had obtained medical treatment for their self-inflicted injuries. Consistent with the results of Whitlock et al., there were no gender differences for seeking medical attention for NSSI related injuries.

The higher rate of medical treatment sought in this study, may be reflective of this particular semi-clinical sample. In fact, significantly more self-injurers with a history of mental illness obtained medical treatment for their self-inflicted injuries, than self-injurers without a history of mental illness. Furthermore, there was a large effect size between the two groups. These findings suggest that seeking medical treatment for NSSI, and subsequently severity, are more likely to be associated with a mental illness. As with a greater number of methods employed to self-injure, and a higher frequency of the behaviour, the repeated need to obtain medical treatment for self-inflicted injuries appears to be associated with greater psychopathology (Hasking et al, 2008; Klonsky & Olino, 2008). This is evidenced in studies that have categorised self-injurers into different subgroups based on the level of their behaviour on several contextual variables (i.e., severity, frequency, method, time taken from urge to action) of NSSI (Hasking et al, 2008; Klonsky & Olino, 2008; Lloyd-Richardson et al., 2007; Whitlock et al., 2008). In exploring the predictive factors on the maintenance or offset of NSSI, Andrews et al.,

(2013) found that adolescents who required first aid for their wounds and engaged in four or more acts of NSSI were at a greater risk of the continual use of NSSI.

This information is particularly helpful to mental health professionals in assessing NSSI, and should be incorporated into existing assessment tools, as it is in the ISAS. Whilst the question asked in the current study (“Have you ever needed professional medical attention for your wounds?”) provided a measure of severity, it would also be beneficial to ascertain if self-injurers had “ever intentionally hurt [themselves] more severely than expected?” as Whitlock et al. asked in their large 2006 and 2011 studies. This would provide mental health practitioners with a sound base from which to discuss wound assessment, wound care, and potentially harm minimisation strategies with their clients.

### **10.3.6 Desire to Stop**

There are little means of comparison for the current results on the desire to stop self-injuring, as only one study to date has reported their findings from the ISAS on this aspect of NSSI (Lindholm et al., 2011). The majority of self-injurers reported that they did want to stop self-injuring, with only 27.4% of self-injurers disclosing they did not want to stop. This is similar to the 66.7% of young women who reported wanting to stop engaging in NSSI, in a Swedish sample (Lindholm et al). There was a significant gender difference in the current study with 73.9% of females, and only 59.2% of males disclosing they wanted to stop self-injuring. Somewhat intuitively, Hamza and Willoughby (2014) found that self-injurers who had not self-injured for one year (desisters) or two years (recovered injurers) were more likely to want to stop self-injuring than persistent self-injurers, who had been engaging in the behaviour for at



least two years. This provides a very strong case for early intervention programs and treatments. Drawing inferences from the present findings on the time taken to contemplate NSSI and coping, by this arbitrary two year mark, evidence suggests, that NSSI may have become a stable and perhaps consolidated coping mechanism for regulating affective and cognitive states. At this point the behavior is likely to be considerably more difficult to terminate or even reduce.

#### **10.4 The Functions of NSSI**

This is the first study to report the average number of functions endorsed for NSSI in an adult sample. Previous figures have been based on adolescent samples, and ranged from 4.3 (Zetterqvist et al., 2013) to 4.7 functions in nonclinical samples (Lloyd-Richardson et al., 2007). Self-injurers in the current study endorsed an average of 6.48 functions for engaging in NSSI. The increase in the endorsement of functions from those reported during the period of adolescence, to those found in adulthood in the current study, could potentially be attributed to the consolidation of NSSI as a stable coping mechanism over time. However, the nature of the research methodology employed in this study, prohibits the exploration of temporal relationships.

Nevertheless, these findings further support the premise that NSSI is an overdetermined behaviour, concurrently serving multiple functions for those who engage in this behaviour (Klonsky & Glenn, 2009; Nock & Prinstein, 2004; Muehlenkamp et al., 2013; Nixon et al, 2002).

There was a significant difference in the number of functions endorsed by those who disclosed a history of mental illness and those who reported no prior or existing mental health diagnoses. Self-injurers without a history of mental illness reported an

average of 5.66 ( $SD = 3.61$ ) functions, whilst those with a history of mental illness reported an average of 7.16 ( $SD = 2.29$ ) functions of NSSI. This follows the pattern in adolescent samples, as Nixon et al (2002) reported that self-injurers in a clinical sample endorsed an average of 8.2 functions. The results also suggest, that the more functions that NSSI is enacted to meet, the more likely the presence of an underlying or comorbid mental illness. This has significant clinical implications, as the endorsement of a higher number of functions may be a potential indication to mental health practitioners that the client should be assessed for underlying and potentially undiagnosed psychopathology. It would be helpful to investigate this further, to develop normative figures across different populations and age groups, in both nonclinical and clinical groups. In the therapeutic setting, this would be pertinent data to include in a standardised NSSI assessment measure, such as the ISAS. This would provide mental health practitioners – such as school, university and community counsellors – with a helpful means of comparison with which to assess the level of NSSI in their clients.

Consistent with previous research, intrapersonal functions were endorsed significantly more than interpersonal functions in the current sample (Klonsky & Glenn, 2009; Kortege et al., 2013; Nock & Prinstein, 2004; Zetterqvist et al., 2013). The most common functions, in order of endorsement were – affect regulation, self-punishment, anti-dissociation, marking distress, and anti-suicide. Whilst the functions that were least endorsed by self-injurers, were autonomy, sensation seeking, revenge, and peer bonding (in order from the highest to lowest endorsement). These results are comparable to the findings of previous functional research in NSSI (Hamza et al., 2014; Glenn & Klonsky, 2011; Klonsky, 2009; Klonsky & Glenn, 2009; Swannell, et al., 2008; Turner et al., 2012). Despite the fact that interpersonal functions, such as revenge, interpersonal influence, peer bonding, and sensation seeking are endorsed significantly less than

intrapersonal reasons (Klonsky & Glenn, 2009; Kortge et al., 2013; Nock & Prinstein, 2004; Zetterqvist et al., 2013), the public persona of NSSI as an attention seeking, manipulative behaviour still persists (Law, Rostill-Brookes, & Goodman, 2009; Warm, Murray, & Fox, 2002). It is important that findings such as this, which emphasise the intrapersonal reasons individuals self-injure, are disseminated in public forums to help correct the misnomers about NSSI.

There was a significant gender difference found in functional endorsement, with females endorsing intrapersonal functions more than males. However, males and females did not significantly differ in their endorsement of interpersonal functions. These findings replicated those of Klonsky and Glenn (2009). However, Klonsky and Glenn only found one functional difference between men and woman, with men more likely to self-injure as a means of sensation seeking than women. Conversely, the current study found that women were more likely than men to engage in sensation seeking. Furthermore, women were also significantly more likely to self-injure as a means of affect regulation, marking distress, self-punishment, and peer bonding. Lloyd-Richardson et al (2007) also reported that females were also more likely to engage in self-punishment than males. These differing results indicate that future studies should investigate the effects of gender for the individual functions of NSSI, and not just the two factors, across differing age groups and populations.

Saraff and Pepper (2014) recently reported that intrapersonal functions were related to greater psychopathology, whilst Klonsky and Glenn (2009) found that higher scores on both intrapersonal and interpersonal factors were related to higher scores on clinical assessment measures. Whilst a number of studies have investigated the relationship of various clinical correlates to the intrapersonal and interpersonal domains,

no studies to date have explored whether the endorsement of the 13 functions on the ISAS differs in self-injurers with and without a history of mental illness (Klonsky & Glenn, 2009; Klonsky & Olino, 2008). Given that over half of the current sample of self-injurers disclosed an existing or prior history of mental illness, this group of self-injurers was compared with self-injurers who did not report a history of mental illness, across the intrapersonal and interpersonal factors, and then over the 13 functions of NSSI. Consistent with the results of Klonsky and Glenn (2009), the two groups of self-injurers differed significantly on both the intrapersonal and interpersonal factors, with self-injurers who disclosed a history of mental illness, scoring higher across both factors. An examination of the univariate tests of the 13 functions, revealed that self-injurers with a history of mental illness endorsed each of the intrapersonal functions more strongly than self-injurers with no prior history of mental illness. However, on the interpersonal domain, the two groups only differed significantly on interpersonal influence and self-care.

Individuals who self-injure appear to have more difficulty regulating their affect, and to a lesser degree, their social environments. There is research to indicate that the functions underpinning the initiation of NSSI and the maintenance of the behaviour over its course may differ (Lloyd-Richardson, Nock, & Prinstein, 2009; Muehlenkamp, 2005; Muehlenkamp et al., 2013; Saraff & Pepper, 2014). As such, longitudinal research is needed to explore if the functions of NSSI differ over time, particularly in moderate to severe self-injurers who may engage in the behaviour over several years or more. Furthermore, longitudinal research could investigate the functions of NSSI in relation to coping, to ascertain whether incremental increases in functional endorsement over time, equate to the consolidation and stabilisation of NSSI as a coping mechanism.

## 10.5 Coping

In further support of the conceptualisation of NSSI as a maladaptive coping mechanism, self-injurers and non-injurers significantly differed in their endorsement of all 19 coping strategies. Individuals with a history of NSSI scored higher on all non-productive coping strategies (ignore the problem, keep to self, self-blame, tension reduction and not cope); and lower across all productive coping strategies, except for seeking professional help. Self-injurers endorsed seeking professional help more than non-injurers. Amongst the group of self-injurers, the five most commonly endorsed coping strategies were largely non-productive coping strategies: self-blame, keep to self, worry, and not cope. This pattern of adopting non-productive or avoidant strategies to manage stressors, suggests that the self-injurious group have a largely non-productive or emotion-focused coping style (Frydenberg, 2008). Interestingly, self-injurers and non-injurers both endorsed the productive coping strategy working hard amongst their top five coping strategies. Self-injurers and non-injurers also scored seeking spiritual support and social action as the least utilised coping strategies. However, these are the only similarities, as the most highly rated coping strategies (focus on solving the problem, seek relaxing diversions, seek social support and focus on the positive), of the non-injurers, were reflective of a productive or problem-focused coping style.

The findings that self-injurers were primarily non-productive or emotion-focused in their coping style is consistent with previous research (Cawood & Huprich, 2011; Guerreiro et al., 2015; Portzky et al., 2008; Williams & Hasking, 2010). Strategies that involved consulting significant others, namely, improve relationships, and social support were used substantially less in the self-injurious group, which is largely consistent with previous research (Guerreiro et al., 2015; Westal & Trepal,

2010). These were also inversely related to NSSI, conferring some protective capacity for the engagement in self-injurious behaviour. In contrast to previous results, self-injurers in the current study were more likely to seek professional help than non-injurers. This could be attributed firstly, to the different age groups in the samples. Secondly, the results for seeking professional help in the current study may have been significantly inflated, as over half of the self-injurers disclosed a history of mental illness. These findings indicate that individuals who self-injure have less adaptive coping skills, are less able to problem solve, and less able to manage and express their emotions, than individuals who do not self-injure.

Surprisingly, tension reduction was not as highly endorsed by self-injurers as expected in the current study. The literature consistently indicates that NSSI is primarily enacted as a means of affect regulation or tension reduction (Klonsky, 2009; Kortge et al., 2013; Nock & Prinstein, 2004; Swannell et al., 2008), and indeed, in the current study affect regulation was the most highly endorsed function for NSSI. At the outset of the research, it was hypothesised that these two variables would be highly correlated. However, only a weak correlation was found between the coping strategy of tension reduction and the NSSI affect regulation function. In fact, the five other non-productive coping strategies (worry, ignore the problem, self-blame, keep to self and not cope) were all more highly correlated to the function of affect regulation than tension reduction. This finding is in direct contrast to the findings of Guerreiro et al. (2015) who reported, that of the 16 coping strategies on the Adolescent Coping Scale, the strongest predictors of a lifetime prevalence of NSSI were tension reduction and self-blame.

### **10.5.1 Self-blame and the self-punishment hypothesis**

As expected, there was a significant positive relationship between the non-productive coping strategy self-blame and the function of self-punishment in the current study. The role of self-punishment in the onset and maintenance of self-injurious behaviours has been well documented in the literature (Hamza et al., 2014; Klonsky, 2009; Turner et al., 2012; Swannell et al., 2008). The relationship between these two variables provides support for the self-punishment hypothesis, which theorises that NSSI is a mechanism for intropunitively directed self-depreciation, negative self-worth, or the belief that one deserves to be punished (Nock, 2009, 2010). Several sources of further support for the self-punishment hypothesis can be garnered from the current study. Firstly, the significantly lower self-esteem in self-injurers suggests that this group have a more negative global attitude of themselves, which is consistent with the self-depreciative and self-loathing aspect of the self-punishment hypothesis. Secondly, there was a strong inverse relationship found between self-punishment and self-esteem, indicating as one's self-esteem decreased, the use of NSSI for purposes of self-punishment increased. Thirdly, there was a moderate positive correlation between self-punishment and pain. Recent research linking pain, self-punishment and self-criticism, suggested that highly self-critical individuals who self-injure as a mechanism of self-punishment, believe that they are more deserving of experiencing pain, as it is consistent with their perception that they need to be punished (Hooley et al., 2010; St Germain & Hooley, 2012). Whilst the present study did not investigate self-criticism, the moderate inverse association found between self-esteem and pain indicates that the lower one's self-esteem is, the more pain that is endured. In the individual who employs NSSI as a means of self-punishment, the results would suggest that pain is an important feature of the act (Nock & Prinstein, 2004).

## 10.6 The Experience of Pain

Only 10% of self-injurers reported that they never felt pain during the act of NSSI, with 39.2% of self-injurers always experiencing pain during their self-injury, and 50.8% sometimes experiencing pain. Plener et al. (2013) reported very similar results in their adolescent study. Taken at face value, this would appear in contradiction to the pain hypothesis, which postulates that individuals who self-injure have a heightened sense of pain analgesia, resulting from a constitutional abnormality in the EOS (Bandelow et al., 2010; Bloom & Holly, 2011; Grossman & Siever, 2001; Sandman & Kemp, 2011). Advocates of the pain hypothesis contend that NSSI is used to disrupt and stop feelings of depersonalisation, dissociation or numbness (Grossman & Siever, 2001; Nock & Prinstein, 2004; Sandman & Hetrick, 1995). The act of self-injury induces a state of stress-induced analgesia, causing a release of the  $\beta$ -Endorphin, which in turn produces euphoric and analgesic effects (Bandelow et al.; Bloom & Holly). It is similar to the endorphins that are released during childbirth, except in self-injury the process is consciously undertaken to create a change in the affective state (Bandelow et al.).

In the current study, a strong significant correlation was found between pain and the affect regulation function, indicating that the utilization of NSSI as a method of affect regulation is associated with the sensation of pain during the act of NSSI. In a recent laboratory study investigating pain offset relief, Franklin et al. (2013) provided new evidence towards the positive reinforcement function of NSSI. They found that pain offset not only reduced negative affect but also stimulated positive affect, supporting both the negative and positive reinforcement properties of NSSI. This also provides further evidence towards the theorized roles of both the EOS in NSSI, and the automatic positive reinforcement function of the Four-Function Model (and its inclusion



in Nock's integrated theoretical model). If it is the act of self-injury that causes a shift in the affective state, it stands to reason that the initial pain component of the act is the actual catalyst or the primary mechanism for the affective change, whether it is inducing positive affect or diminishing negative affect (Brown et al., 2002; Franklin et al., 2013). The pain hypothesis proposes that two biological mechanisms occur during the act of NSSI. Firstly, some form of pain analgesia occurs; and secondly, a feeling of calmness or euphoria is induced. Whilst the aspect of pain analgesia was not supported in the current study, there is considerable evidence for the affect regulation component.

Whilst the experience of pain was most strongly associated with affect regulation and self-punishment, it was also significantly and positively related to the remaining 13 functions of NSSI. Of the intrapersonal and interpersonal factors, it was most strongly associated to the intrapersonal functions of NSSI. This was one of the first studies to explore the experience of pain with the range of functions on NSSI, as previous studies have only focused on one particular function, such as self-punishment (Hooley et al., 2010; St Germain & Hooley, 2012). This study only investigated the presence of pain during NSSI. Given the moderate to strong correlations between intrapersonal functions of NSSI and pain, it would be pertinent to ascertain in future studies, whether the experience of pain is an important facet of the act of NSSI for self-injurers. This could have significant implications for developing future interventions for this phenomenon.

Many of the reports of individuals not experiencing pain during the act of self-injuring, were from early clinical studies on NSSI (Bohus et al., 2000; Kemperman et al., 1997; Russ et al., 1996; Russ et al., 1999). Whilst this study aimed to recruit a nonclinical sample, a significant proportion of self-injurers disclosed a history of mental

illness. Therefore, a comparison of the experience of pain in self-injurers with and without a mental illness was performed. Contrary to expectations, there was no significant difference in the experience of pain between those with or without a history of mental illness.

In discussing the EOS and its role specifically in BPD, Bandelow et al. (2010) suggested that individuals with BPD may have a complex dysfunction of the EOS. As such, they contended that this could explain why individuals with BPD largely did not experience pain when they engaged in NSSI, but why other individuals did feel pain when they cut themselves. However, the findings of the current study were in direct contrast to this. Of the 94 individuals who disclosed a diagnosis of BPD, all engaged in NSSI. Interestingly, there was a significant difference between the experience of pain during the act of NSSI in self-injurers with and without a diagnosis of BPD, but in the present study a diagnosis of BPD was associated with experiencing pain more often during NSSI. Only 4.3% of self-injurers with BPD reported feeling no pain when they injured, compared to 11% of self-injurers who did not have BPD. The results regarding mental illness and pain in the current study need to be interpreted cautiously. The history of mental illness was obtained via self-reporting methodology, and despite all efforts to collaborate the information, there was no means of verifying the information.

In accordance with the findings of Gordon et al. (2010) and Nock et al. (2006), the current study found a strong positive relationship between the experience of pain and the frequency of engagement. Pain was also highly correlated to the severity of NSSI, suggesting that greater pain is experienced with more severe acts of self-injury, which is hardly surprising. These findings suggest that with a greater engagement in

NSSI comes more severe wounds, which result in more pain. However, the experience of pain may not increase at the same incremental rate as increases in wound severity.

Given the relationship of pain to the frequency of engagement in NSSI, severity, the time taken to contemplate self-injuring, the functions of NSSI, and self-esteem, the experience of pain appears to be a salient feature of the experience of self-injury, and one that is still quite poorly understood. In trying to map the aetiology of NSSI, and particularly the role of biological systems such as the EOS, a comprehensive understanding of the many aspects of pain, and how they relate to the act of NSSI is crucial. Future studies should not only explore whether pain is experienced during NSSI – as in the current study – but also rate the level of pain experienced during the act; and whether physically experiencing pain is an important feature of the act of self-injury. Furthermore, to truly enable comparisons with non-injurious control groups, some measure of pain tolerance and threshold should be incorporated into the study design. However, the assessment of these different facets of pain are particularly challenging to empirically assess, because the full experience of NSSI cannot be ethically or morally replicated in a laboratory setting.

## **10.7 Self-Esteem**

Across the whole sample, there was a significant gender difference, with males demonstrating significantly higher self-esteem than females; an effect which is consistent with self-esteem research. In fact, in a large study spanning 48 countries, Bleidorn, et al. (2016) found that males had significantly higher self-esteem scores than females across all nations. This gender effect also remained consistent from the ages of 16 to 45 years.

As expected, self-injurers had significantly lower self-esteem than non-injurers in the present study, with a large percentage of the variance (33.9%) in self-esteem explained by a history of self-injurious behaviour. This is congruent with the considerable body of empirical data exploring the relationship between self-esteem and NSSI to date (Cawood & Huprich, 2011; Garisch & Wilson, 2015; Iannaccone et al., 2013; Rotolone & Martin, 2012; Tatnell, Kelada, Hasking, & Martin, 2013). In exploring a range of predictive and protective factors for NSSI, Rotolone and Martin found that even when all the other significant variables were accounted for, self-injurers still had lower self-esteem than non-injurers. In the current sample, self-injurers who disclosed a history of mental illness had also had significantly lower self-esteem than self-injurers who had no prior or existing mental health conditions. This subgroup of self-injurers who self-reported a history of mental illness had the lowest self-esteem in the entire sample.

Recent research has found that low self-esteem has been associated with higher levels of rumination (Hilt, Cha, & Nolen-Hoeksema, 2008; Hoff & Muehlenkamp, 2009; Tanner et al., 2015) and self-criticism (Fennig et al., 2008; Glassman, Weierich, Hooley, Deliberto, & Nock, 2007; Hooley & St. Germain, 2014) in self-injurers. Lower self-esteem, combined with the proclivity to engage in negative self-critical rumination are consistent with the self-punishing function of NSSI, in that negative cognitions, anger and self-blame are directed inwards (Garisch & Wilson, 2015; Tanner et al., 2015). NSSI confers a unique ability to enact a form of self-punishment (Tanner et al., 2015).

The role of self-punishment has been repeatedly supported in the literature, second only to the function of affect regulation (Hamza et al., 2014; Klonsky, 2009;

Laye-Gindhu & Schonert-Reichl, 2005; Turner et al., 2012; Swannell et al., 2008).

However, this is the first study to date, to explore the relationship between self-esteem, self-punishment, pain and NSSI. As expected, there were moderate to strong relationships found between all four variables. Self-esteem shared an inverse relationship with both self-punishment and pain, indicating that as self-esteem increases the need for self-punishment and pain decreases. This further highlights the role of pain in the act of NSSI, and its potential importance to the self-injurer in cementing the feeling of self-punishment.

Longitudinal research and comparison studies of current self-injurers with past self-injurers, have found that self-esteem may decrease even further over the course of the behaviour (Garisch & Wilson; Rotolone & Martin). The internalisation of the negative stigma associated with NSSI, and the guilt, shame and secrecy, are likely to exacerbate negative self-critical rumination, resulting in a further decrease in self-esteem. Indeed, each act of NSSI may further fuel this negative and self-depreciating cycle, reducing both the ability to cope with daily stressors and the ability to consider other more adaptive coping strategies (Armiento et al., 2014; Garisch & Wilson).

Self-esteem has been demonstrated to increase naturally from the middle of adolescence to adulthood (Bleidom et al., 2016), which is one of several reasons adolescents are likely to be more susceptible to the onset of NSSI. Given its role in the onset and maintenance of NSSI, prevention and early intervention programs should target self-esteem in adolescents (Garisch & Wilson; Rotolone & Martin; Tanner et al.), fostering secure and positive global self-schemata.

## 10.8 Trauma

As anticipated self-injurers disclosed a greater aggregated exposure to traumatic events over the lifetime than non-injurers. Only one other study to date has explored the accumulative effects of trauma across the lifespan (Thomas et al., 2015). The actual difference in the reported mean number of events between the two groups may appear very small, as the average aggregated lifetime trauma in self-injurers was 2.48 events, and in non-injurers it was 1.44 events. However, Zetterqvist et al. (2013) argued that researchers need to be mindful that whilst these numbers appear low in the sphere of psychometrics, they are measuring serious traumatic events, such as sexual and physical abuse, homicide, life threatening illness and exposure to war. Therefore, even one incident is likely to have profound clinical implications on individuals.

The current study explored the aggregated or accumulative trauma that has occurred over the lifespan, as suggested by recent trauma research (Franzke et al., 2015; Martin et al., 2011; Thomas et al., 2015; Zetterqvist et al., 2013). The majority of participants across the entire sample reported exposure to at least one adverse or traumatic event in their lives, which is in line with trauma prevalence in general populations (Smith et al., 2014). Following established practice in the literature on the SLESQ (Elhai, Miller, Ford, Biehn, Palmieri, & Frueh, 2012; Elhai, Patrick, Anderson, Simons, & Frueh, 2006; Elhai & Simons, 2007), lifetime frequency estimates were subsequently calculated to create two subcategories within the SLESQ, violent crime victimisation and noncrime traumatic events. Violent crime victimisation encompasses acts of violence that are perpetrated directly against an individual, they are personal or relational in nature, and typically involve a physical violation, including attempted and actual physical or sexual abuse and assault, robbing or mugging with physical violence

or being threatened with a weapon. Whereas, noncrime traumatic events involve more general events or acts of trauma, such as a life threatening accident or illness, the sudden loss of a loved one, witnessing a trauma, being in other life threatening events such as war. Self-injurers disclosed a history of significantly more violent crime victimisations than non-injurers. There was no difference between self-injurers and non-injurers in their lifetime exposure to noncrime traumatic events. Several interpretations can be made from these findings. Firstly, there is support for the accumulative trauma hypothesis, as self-injurers reported more incidents of trauma than non-injurers. However, the results suggest that it is the accumulative effects of personal trauma or violent crime victimisation that play a role in the onset and/or maintenance of NSSI, rather than the complete breadth of traumatic events. Given these findings, the subcategory of violent crime victimisation was used for all further analyses. This is in line with trauma research, which indicates that personal traumas have a significantly more profound impact on overall functioning than impersonal or noncrime traumatic events, such as a car accident or witnessing a crime (Connors, 1996).

Results from the overall sample showed that the majority of participants reported exposure to at least one adverse or traumatic event in their lives. Violent crime victimisation events were more common than noncrime traumatic events in all participants in the study. A gender comparison across the exposure to traumatic events indicated that more females experienced a robbery, sexual assault, attempted sexual assault, and other forms of sexual assault or abuse than males. However, any gender effects in the current study need to be interpreted cautiously due to the large gender imbalance in the sample distribution. Statistical comparisons of non-injurers experiences of sexual and physical assault to the results from the Australian Bureau of Statistics 2012 Personal Safety Survey (PSS) revealed that there was no statistical

difference in the prevalence of sexual assault in male or female non-injurers in the current sample. However, lower rates of physical abuse were found in the current sample for both male and female non-injurers, than indicated by national survey data. These comparative results against an Australian representative sample are important, as they indicate the experiences of trauma reported in this study are generalizable to the broader population.

In the current study, 30.56% of self-injurers and 18.79% of non-injurers had experienced an incident of violent crime victimization over the age of 18 years. In the only other study to date, which has reported experiences of trauma that occurred in adulthood, Marchetto (2006) found that 55% of self-injurers had experienced a trauma as an adult. This higher percentage in Marchetto's study could be attributed to a number of factors. Firstly, noncrime traumatic events were included in this percentage; secondly, the sample was drawn from an accident and emergency ward; and finally, the sample all used cutting as their method of self-injury. No inferences can be drawn regarding causality of NSSI and the age of onset from the adult experiences of trauma in this study. However, this is an aspect of trauma and NSSI that could warrant further investigation. Given that recent research has indicated that the age of onset is increasing well into adulthood in college populations (Heath et al., 2008; Klonsky, 2011; Whitlock et al., 2011), and approximately one in five college women experience a sexual assault (Fisher, Cullen & Turner, 2010), future studies could be directed to ascertain whether a causal link exists.

A further interesting but unsurprising finding of this study was the incidence of trauma in participants with a self-reported history of mental illness. Individuals with a current diagnosis or a history of mental illness experienced significantly more violent



crime victimisation events and more noncrime traumatic events than individuals with no prior history of mental illness. Whilst the group that experienced the most personal trauma in the current study, were self-injurers with a history of mental illness. As more than half of the self-injurers in the present study reported a current or prior history of mental illness, this result was largely to be expected. The relationship between trauma and a range of mental illness diagnoses that have been comorbidly found to precipitate or co-occur with NSSI, has long been documented (Chartrand et al., 2015; Martin, Swannell, Hazell, et al., 2010). The early clinical literature focused predominantly on the dissociative symptoms of BPD, and PTSD, in response to early childhood sexual abuse (Briere & Gil, 1998; Van Der Kolk et al., 1991). However, the range of diagnoses reported in this study were significantly greater, which is consistent with contemporary research (Chartrand et al.; Claes et al., 2010; Glenn & Klonsky, 2013; Martin, Swannell, Hazell, et al.). In the only other study of accumulative trauma across the lifespan, Thomas et al., (2015) found that aggregated trauma history, a self-reported diagnosis of mental illness and female gender were all predictive of NSSI.

The results suggest that a history of sexual abuse or some form of sexual assault, experienced as either a child or adult, clearly has a role in the onset or maintenance of NSSI. However, the impact of trauma was more powerful when traumas of a sexual nature were incorporated with other forms of personal violent crimes, such as child and adult physical abuse or assault, domestic violence, and being robbed or mugged with a weapon or physical force. In exploring the range of personal and psychological variables that contributed to the onset and maintenance of NSSI, a history of violent crime victimisation was a significant predictor of self-injurious behaviour, yet other variables had greater predictive value. It is therefore likely, as suggested by a number of recent theorists (Klonsky & Moyer, 2008; Maniglio, 2011; Nock, 2009, 2010), that a

history of aggregated trauma, is a distal risk factor, rather than a proximal one, which has considerable overlap and interaction effects with a number of other social, psychological, biological and personal risk factors that precede and occur concurrently with NSSI. The relationship of trauma and NSSI appears to be complex, and regardless of whether trauma is a distal or proximal aetiological risk factor for NSSI, clinicians should be alert to investigate for the presence of one where the other is indicated. Finally, an assessment of aggregated personal trauma should be undertaken by clinicians in conjunction with a NSSI assessment, rather than focusing on sexual trauma or traumas experienced as a child (Maniglio; Thomas et al.).

## **10.9 Attachment**

As the largest study of self-injurers to date to explore attachment across the three separate relationship domains, the current study had a number of significant findings. Primarily, self-injurers in the current study reported poorer perceived relationship quality across relationships to mothers, fathers, and peers, than non-injurers. Self-injurers also rated their perceived relationship quality to their mothers more highly than to their fathers. In addition, there was a gender difference for the overall sample, with males demonstrating a more secure attachment style to both mothers and fathers, than females across trust, communication and alienation. Mother, father, and peer attachment were also significantly associated with self-esteem and a history of trauma. Finally, there were no gender differences in regards to peer attachment.

The results of this study provide further support for the significant role of attachment relationships in the development of NSSI. Self-injurers reported lower perceived trust, poorer quality of communication, and greater alienation with both their

mothers and fathers, than non-injurers. This is in line with prior research exploring attachment to parents in self-injurers, in both nonclinical (Hallab & Covic, 2010; Hilt, Nock et al., 2008; Kimball & Diddams, 2007; Martin et al., 2011) and clinical studies (Bezirgianian, Cohen, & Brook, 1993; Carroll, Schaffer, Spensley, & Abramowitz, 1980; Marchetto, 2006; Simpson & Porter, 1981; Van der Kolk, Perry, & Herman, 1991); and adolescent (Hilt, Nock et al.) and young adult samples (Gratz, 2002; Hallab & Covic; Hamza & Willoughby, 2014; Kimball & Diddams; Martin et al., 2011).

Self-injurers in the current study also rated their perceived relationship to their fathers more poorly than their relationship to their mothers. The paternal relationships of self-injurers were characterised by distrust, ineffectual communication and feelings of alienation. This is congruent with the few studies on NSSI that have explored maternal and paternal attachment separately (Gratz, 2002; Hallab & Covic, 2010; Hilt, Nock, et al., 2008). Gratz et al. reported that insecure paternal attachment was second only to dissociation in predicting NSSI in a sample of college students. In a longitudinal study of NSSI in adolescents, Hilt, Nock et al. found that self-injurers perceived relationships to their mothers appeared relatively stable over time, whilst ratings of their paternal relationships were considerably more variable. In their Attachment-Stress model, Hallab and Covic, reported that mediated by stress, father attachment had the strongest impact on DSH of the three relationship domains. However, these three studies all had fairly small samples of self-injurers. As such, the current study is the largest to date on NSSI to illustrate the specific role of paternal attachment on the NSSI. It is important to note that the influence of the perceived quality of the paternal relationship is not unique to NSSI. Perceived paternal attachment has been found as a significant predictive variable in suicide attempts (Sheftall et al., 2013) and depression in adolescents (Demidenko et al., 2015).

As anticipated, there was a significant gender difference in the current study. More specifically, males had more secure attachment to both mothers and fathers than females across all three subscales. Therefore, females across the whole sample had significantly less mutual respect and understanding with their parents, poorer interpersonal communication with their parents; and a higher degree of insecurity and detachment from them. From a research perspective, these gender differences, combined with the differences in maternal and paternal attachment, emphasise the need to explore parental relationships separately rather than as a single variable. Clinically, these results imply that some form of family therapy may be beneficial in the treatment of NSSI in adolescents; and in young adults both maternal and paternal relationships should be explored therapeutically.

The relationship between trauma history and attachment are intrinsically entwined in the early aetiological understandings of NSSI (Connors, 1996; Grocutt, 2009; Simpson & Porter, 1981; Van Der Kolk et al., 1991). Therefore, as anticipated, participants in the current study with at least one incident of violent crime in their past had significantly lower perceived attachment across all three relationship domains. These findings are congruent with attachment theory, which suggests that early childhood trauma in the form of neglect, sexual or physical abuse, and violence, negatively impacts on the relationships with primary caregivers (Bowlby, 1998, 2012; Low, Jones, MacLeod, Power, & Duggan, 2000; Van der Kolk et al., 1991). This in turn, interferes with the developing working model of self, others and the world, altering the individual's attachment style. These working models serve to interpret, regulate and predict thoughts, feelings and behaviour in the individuals interactions with others, and their environment. Through the experience of trauma, distrust, detachment, insecurity, anger, and secrecy develop, and the individual's perceptions of their

worthiness to be loved and nurtured are tainted, which all contribute in an insecure attachment style (Grocutt, 2009; Simpson & Porter, 1981; Van Der Kolk et al., 1991). In the seminal study by Van Der Kolk and colleagues (1991), they found that whilst the history of trauma was a powerful predictor of the onset of NSSI, it was the insecure attachment style that maintained the behaviour. This corresponds with recent research on the functions of NSSI, which found that the onset of NSSI was associated with interpersonal functions, whilst the intrapersonal functions were largely responsible for the maintenance of the behaviour (Saraff & Pepper, 2014).

As the concept of self is developed in a relational context, feelings of alienation, distrust and ineffective interpersonal communication are likely to negatively impact one's self-esteem. The present study found a significant relationship between self-esteem and mother, father and peer attachment in the present study, as expected. This is consistent with the extant literature showing that low self-esteem is associated with insecure parent attachment (Armsden & Greenberg, 1987; Tatnell et al., 2013). The correlational analyses supported the association between attachment, trauma and self-esteem, which has been previously reported in the literature (Barnum & Perrone-McGovern, 2017).

The importance of the attachment to one's parents has a long erudition in psychology, but it is only more recently that the role of extrafamilial relationships have gained the attention of researchers (Armsden & Greenberg, 1987). In accordance with attachment theory on the role of peer relationships in adulthood, participants in this study rated their perceived quality of attachment to peers more highly, than to mothers or fathers (Armsden & Greenberg, 1987; Hazen & Shaver, 1994; Laible, 2007). However, unlike attachment to parents, there were no gender differences between males and females in the present study in their perceived attachment to peers. This stronger

perceived quality of attachment to peers appears consistent from adolescence to young adulthood. Initially driven in childhood and adolescence by the physical distance from parents, adolescents must find an alternate source of attachment security in times of distress or discomfort at school. Peers provide a proximal source of support (Hallab & Covic, 2010; Hazen & Shaver; Hilt, Cha, et al., 2008; Laible, 2007). As individuals also strive for greater autonomy into early adulthood, the reliance on peers as a source of support and security is increased (Hazen & Shaver; Laible).

As with parental attachment, self-injurers in this study, reported lower perceived trust, poorer quality of communication, and greater alienation with their peers, than non-injurers. Hallab and Covic (2010) is the only other study to date that has compared total peer attachment in both self-injurers and non-injurers, and the two groups did not differ in their perceived quality of peer relationships. However, this could be attributed in part to the small sample sizes of each group in their study. The results from the current study indicated that self-injurers were significantly less likely to seek social support as a coping strategy than non-injurers. This is unsurprising when self-injurers reported greater distrust, and feelings of disrespect, anger, insecurity and detachment from their peers. The likelihood of self-injurers then reaching out to communicate with their peers in times of distress, is further decreased by the reported poor quality of communication with their peers, and lower self-esteem. In this study, the perceived quality of peer attachment was more strongly associated with self-esteem than paternal attachment, and almost as strong as maternal attachment. When exploring the impact of attachment on NSSI across the three relationship domains and subscales, peer alienation made a significant contribution to the variance in the behaviour when compared with non-injurers. However, the regression analysis incorporating the fuller range of psychological and personal variables under investigation in the present study revealed

that none of the peer attachment subscales nor the summed total peer attachment measure, significantly contributed to the prediction of self-injurious behaviour. Given the highly multidetermined nature of NSSI, it is possible that peer attachment may still play a role in the development and/or maintenance of NSSI in interaction with other variables, such as rumination (Hilt, Cha, & Nolen-Hoeksema, 2008; Hoff & Muehlenkamp, 2009; Tanner et al., 2015) and self-criticism (Fennig et al., 2008; Glassman, Weierich, Hooley, Deliberto, & Nock, 2007; Hooley & St. Germain, 2014), which were not explored here but have been linked to NSSI in other recent studies.

Of considerable interest, were the differing results for the nine attachment subscales from the direct discriminant analysis and the binary logistic regression in predicting NSSI. The discriminant function revealed a significant association between all nine predictors (trust, communication, and alienation across the mother, father and peer domains) and NSSI, and accounted for 25.40% of the variance in NSSI. Examining the structure matrix of correlations between the predictors and the discriminant function demonstrated that the best predictors of engagement in NSSI were mother, peer and father alienation; then mother and father communication, respectively. However, when the other personal and psychological variables were evaluated in the binary logistic regression to investigate a more multidetermined approach to NSSI, the predictive value of the attachment subscales changed considerably. The only significant predictors from the attachment subscales were father trust, followed by mother and father communication. This change in the attachment predictor variables highlights the complex interactions that combine to initiate and maintain the behaviour, and provides further support for the multidetermined nature of NSSI,

## **10.10 NSSI: A Multidetermined Behaviour**

The findings from the current study provide support for the role of gender, mental illness, trauma, attachment, self-esteem, coping, and the procurement of tattoos, in the onset and maintenance of self-injurious behaviours. More specifically, the combination of the following psychosocial variables accounted for 46.6% of the variance in NSSI: being female; having an immediate family member diagnosed with a mental illness; having a current or prior history of mental illness; aggregated personal trauma history; low self-esteem; the number of acquired tattoos; paternal trust; paternal, maternal and peer communication; seeking social support, focusing on the problem, tension reduction, self-blame, and focusing on the positive. It is important to highlight that nine of these variables were characteristics of the two larger constructs of attachment and coping. Father, mother and peer communication, together with father trust, measured different aspects of attachment. Similarly, seeking social support, focusing on the problem, tension reduction, self-blame, and focusing on the positive, all assessed distinct coping strategies.

The strongest predictor of this model was gender, which is interesting in light of recent nonclinical studies that have reported no gender differences in the prevalence rates of NSSI in adult samples (Andover et al., 2010; Gollust et al., 2008; Gratz et al., 2002; Heath et al., 2008; Klonsky, 2011; Moller et al., 2013). However, Hoff and Muehlenkamp (2009) also found that gender was a significant predictor of NSSI, with females significantly more likely to engage in self-injurious behaviour. In the current sample, the results regarding the effects of gender need to be tempered by the highly skewed gender distribution. Further studies are warranted in both nonclinical and clinical samples, to ascertain if significant gender differences do exist for the risk of



engaging in NSSI, and the different facets involved in the act of NSSI, the functions that the behaviour serves, and the associated risk factors.

An interesting finding of the present study was that the second strongest predictor of engagement in NSSI was having an immediate family member with a history of mental illness. This is a risk factor that has received little attention in recent aetiological models of NSSI. In consideration of Nock's integrated theoretical model, a familial history of mental illness could conceptually be conceived as an additional distal risk factor. A significant relationship was found in this study, between a family history of mental illness and aggregated personal trauma. Given this relationship, it is plausible that an association also exists between a family history of mental illness and the other two distal risk factors proposed by Nock: a genetic predisposition for high emotional/cognitive reactivity and familial hostility/criticism. However, caution must be taken in interpreting these results, for the cross-sectional research design of this study precludes any inferences of causality. Furthermore, the impact of one's familial mental health history may not be the result of a genetic disposition to self-injury, mental illness, or any other number of factors; but rather, a relationship to other risk factors that increase the probability of engaging in NSSI. Research has indicated that living with a mentally ill family member can have a considerable impact on range of psychosocial and environmental variables, such as, physical health, family support, financial stress, disrupted schedules, stigma, blame, and discrimination (Chang et al., 2016; Corrigan & Miller, 2004). As such, it could be one of these variables, or the interaction of any number of related variables, and a genetic predisposition, that increases the risk of engaging in NSSI. Regardless, a familial history of mental illness is a risk factor requiring further research to explore how it contributes to NSSI. This investigation

would lend itself to longitudinal research to examine the impact over time. It would also benefit from corroborative material, such as the verification of mental health histories.

The current model accounted for a considerable 46.6% of the variance in NSSI. This is slightly higher than the 40.1% of the variance reported by Hoff and Muehlenkamp (2009) that accounted for NSSI in their study with the predictor variables of depression, anxiety, rumination and perfectionism. Whilst the psychosocial variables in the studies of Rotolone and Martin (2012), and Gratz et al. (2002), accounted for considerably less of the overall variance at 21.8% and 29%, respectively. In each of the studies a number of variables contributed to the overall model, but only self-esteem and low social support made a unique contribution to Rotolone and Martin's model; whilst in the study of Gratz et al. sexual abuse, paternal insecure attachment, maternal and paternal emotional neglect, and social desirability all uniquely contributed to the model.

Contrary to expected, a number of hypothesised risk factors for NSSI did not significantly contribute to the initial or final model. In the efforts of developing an aetiological understanding of NSSI, a discussion of these is important, for the testing of different models in future studies. Female participants in the present study who identified as bisexual or lesbian were 5.95 and 4.80 times respectively more likely to engage in NSSI than their heterosexual counterparts. Despite these significant odds, identifying as bisexual and lesbian had no unique discriminating ability in predicting NSSI, when combined with the other variables. However, being female was the strongest predictor of NSSI in the model. It is plausible that as the effects of sexual orientation were specific to female participants identifying as lesbian or bisexual, that some of this variability was assumed under gender. Given the greater level of risk, not

only of NSSI, but of the associated risk factors and diagnostic correlates, the impact of the spectrum of sexual orientation by gender should be explored in future studies.

The number of piercings acquired by participants did not predict engagement in self-injurious behaviour, whilst interestingly, the number of accumulated tattoos held discriminative ability. This provides further evidence that these two forms of body modification should be explored individually, rather than combined as a generic body modification category (Liu & Lester, 2012). There has been very little research on the relationship of piercing, tattoos and body modifications to NSSI (Aizenman & Jensen, 2007; Claes et al., 2005; Iannaccone et al. 2013; Stirn & Hinz, 2008). Perhaps the difference in the predictive value of these two variables lies in part to the similarity of the procedure and permanence of acquiring a tattoo as opposed to a piercing; and partly to the relationship to other variables in the current study. Firstly, the acquisition of a tattoo is more painful than that of piercing, and like the wounds of self-injury, tattoos are often positioned on areas of the body that can be concealed to facilitate assimilation into society (Stirn et al., 2011). As with the resultant scarring from the wounds of self-injury, tattoos are also permanent, unlike a piercing which can be removed at will (Sweetman, 1999; Wohlrab et al., 2007). Alternatively, it is possible that the predictive value of tattooing is an artefact of the association that it shares with trauma or coping. Tattooing has been found to be associated with a history of sexual abuse (Favazza & Conterio, 1989; Liu & Lester, 2012; Romans et al., 1998); and has reportedly been employed as a means of coping with psychosocial stressors or traumatic events much in the same way as NSSI (Gratz, 2006; Roberti et al., 2004). Nevertheless, the discriminative value that the quantity of tattoos contributed to predicting NSSI, warrants its inclusion in future exploratory models.

Finally, an examination of the coping strategies that failed to demonstrate a unique contribution to the regression model yielded some surprises with self-blame, keep to self, and not cope, which all lacked individual discriminative abilities. Correlational analysis revealed a strong relationship between self-blame and self-punishment in the present study, and self-punishment was endorsed as the second highest function motivating the engagement of NSSI. As such, it was anticipated that self-blame would significantly contribute to a predictive model of self-injury. Unexpectedly, the direct correlation between self-blame and NSSI was only weak. Perhaps the relationship between self-blame and NSSI, was mediated by other factors not explored in the current study, such as rumination or self-criticism, which have been the focus of recent studies. It is also plausible that self-blame shares some of the variance with self-esteem, as self-punishment and self-esteem were highly and inversely correlated in this study.

The large number of risk factors identified in the current study, and reported in the literature on NSSI, further illustrates the multidetermined nature of NSSI. As over half the variance in NSSI remains unaccounted for, both in this study and in the extant literature, this also signifies that we are still a considerable way from an accurate aetiological understanding of NSSI. Future studies need to continue to explore the range of risk factors that may contribute to the onset and maintenance of NSSI. Particularly, investigating the various interrelationships and pathways amongst these risk factors, and determining whether they provide a distal or proximal risk for the engagement in self-injurious behaviours.

### 10.11 Strengths and Limitations of The Current Study

A considerable strength of the current study was the large sample size. This is one of the largest online samples of adult self-injurers to date. This provided adequate power for data analysis to examine group differences not only by NSSI, but also by gender, history of mental illness, and sexual orientation. The unexpected high percentage of participants with a self-reported prior or current mental health diagnosis, provided valuable additional data and points of comparison, that were not anticipated during the initial study design. The thesis benefited considerably from all of these group comparisons, and the non-injurers in the sample provided a baseline point of comparison in the analyses.

The large sample size also yielded the potential for greater generalisation of the results. Participants were recruited from 29 different countries, and ranged in age from 17 to 76 years. They came from varied socioeconomic backgrounds with different levels of education and sexual orientation. To ascertain generalisability of the results in this study, mental health and trauma prevalence results in non-injurers were statistically compared against national data from the Australian Bureau of Statistics. The results indicated that the sexual abuse history of *non-injurers* was comparable to the national average, whilst lower rates of physical abuse were reported by non-injurers in the current sample. The prevalence of mental illness amongst non-injurers was also within the national normative range. Given that the sample of *non-injurers* in the current study were within the national normative ranges, despite the use of convenience sampling in

the recruitment of participants, the current sample of *self-injurers* may still be representative of the broader community of individuals who engage in NSSI.

The considerable breadth of the NSSI measure, including the additional questions added by the researcher, enabled a comprehensive profile of the acts and nature of NSSI in this study. A similar approach was taken in obtaining the trauma history of participants, covering aggregated trauma, rather than focusing on early childhood trauma, or solely on sexual and physical abuse, as studies on NSSI have predominantly done in the past. Only one other study to date has explored the impact of aggregated trauma on NSSI in an adult sample of self-injurers. Furthermore, this study was original in investigating the specific differences between violent crime victimisation or relational trauma, and noncrime traumatic events, and their impact on NSSI. In addition to the detailed snapshot of NSSI, the present study provided a more focused investigation of several variables, that to date, have only been examined more broadly in their relationship to NSSI. For instance, whilst the association of parental attachment has been explored in the literature, this study was the first to assess the perceived relationship quality of self-injurers to mothers, fathers, and peers separately. Similarly, whilst a number of studies have investigated sexual orientation, very few have looked at the spectrum of sexual orientation rather than just comparing the dichotomy of heterosexual and non-heterosexual participants. This study also investigated the impact of a number of variables on NSSI that have been under explored in the literature to date, such as piercing, tattooing, and body modifications. Also despite its frequent description as a maladaptive coping mechanism, the relationship between coping and NSSI has rarely been examined in the literature, particularly in adult samples. Finally, to the researcher's knowledge, this is the first study to

investigate the connections between each of these psychosocial variables in an adult sample of self-injurers and non-injurers.

The anonymous online format may have encouraged respondents to answer sensitive questions about their self-injurious behaviours, mental health history and trauma histories more openly than in a face to face, or paper and pencil setting. Hopefully this minimised the potential for social desirability response bias, which may have been of particular concern with the ISAS, if participants endorsed intrapersonal functions more highly than interpersonal functions, which are generally perceived with greater negativity and social stigma. In future studies, the risk of social desirability bias could be reduced even further by incorporating a social desirability scale, such as the Marlowe-Crowne Social Desirability Scale (MCSDS) into the survey package.

Whilst the results of the current study make a valuable contribution to the existing scholarship on NSSI, there are limitations which need to be addressed. Firstly, the potential for response bias may have been introduced during the recruitment phase of the study, as the purpose of the study was openly advertised. This may have attracted participants with a history of NSSI, or those with an invested interest in the behaviour. Females were considerably overrepresented within our sample which may bias the findings, particularly in the gender comparisons, as such caution should be interpreted in generalising the results to all male self-injurers. However, this appears to be a consistent issue with NSSI research (Cawood & Huprich, 2011; Heath et al., 2008).

The survey package relied solely upon self-report measures for each of the variables under investigation. The use of this single-informant methodology means that the occurrence of these phenomena cannot be verified. However, in nonclinical adult samples it would be challenging to obtain corroborating data via multi-method

assessment (e.g., observation, daily diarising, interviews) and multiple-informants (through parents, peers, or medical professionals), as it would require additional consent and considerably more time and resources. This type of methodology also does not lend itself to an online format. Whilst self-report methodology is commonly employed in psychological research, the shame, secrecy and guilt associated with NSSI and a history of trauma, may also inflate the occurrence of a type II error through false negatives and the underreporting of experiences. Furthermore, participants were asked to recall their self-injurious behaviour over their lifetime. This retrospective methodology has the potential for recall errors. Hamza and Willoughby (2014) suggested that this potential limitation could be rectified by employing ecological moments sampling in future studies, with daily diary entries, logs or thoughts, feelings and behaviour records. These could be developed in an online program to enable the automatic retention of electronic data.

The current study could have been further strengthened by the use of a standardised measure of mental health, or even a dropdown list format for Mental Health diagnoses, rather than the open qualitative response format used. This would have ensured diagnoses were within the DSM 5 criteria, as a number of participants listed physical ailments (e.g., migraines and headaches) rather than psychological ones. This format would have also resulted in substantial time savings, as considerable recoding was required in this study, to ensure consistency and accuracy across the terminology (e.g., for depression, participants listed numerous different entries, including spelling errors, the use of abbreviations and listing specific depressive disorders). Furthermore, this methodology relied on the self-reporting of mental health history. Whilst every effort was made to collaborate these results, with current and past



medications prescribed, and the family history of mental health, there was no way to truly verify results.

A limitation of this study, and of the majority of studies on NSSI, was the cross-sectional research methodology. This methodology precludes any interpretations regarding causal relationships from the results. To improve the reliability of results, and enable the analyses of temporal relationships, future studies should aim to collect data over multiple points in time. Finally, this study by no means claims to offer an inclusive undertaking of all of the risk factors associated with NSSI. Indeed, the percentage of variance in NSSI accounted for by the regression model indicates there are other important variables not examined here, which are likely to significantly influence the onset and/or maintenance of NSSI. Nevertheless, the findings indicate several fundamental psychosocial factors that practitioners could use to discriminate individuals at greater risk for future engagement in NSSI.

## **10.12 Clinical Implications**

The results of this study have implications for the education, prevention, assessment, and treatment of NSSI. Interpersonal functions were endorsed significantly less than intrapersonal functions in the present study, which is consistent with the extant functional research (Klonsky & Glenn, 2009; Kortge et al., 2013; Nock & Prinstein, 2004; Zetterqvist et al., 2013). In fact, revenge and interpersonal influence were amongst the least endorsed reasons for self-injuring. However, NSSI is still often portrayed as an attention seeking and manipulative behaviour (Law, Rostill-Brookes, & Goodman, 2009; Warm, Murray, & Fox, 2002). This myth or misnomer furthers the secrecy and shame associated with NSSI, perpetuating a repetitive cycle in the

behaviour (Grocutt, 2009; Simpson & Porter, 1981; Van Der Kolk et al., 1991). It is important that findings such as this, emphasising the intrapersonal reasons individuals self-injure, are disseminated to help re-educate the public about the nature of NSSI. This is particularly relevant in educational settings, such as high schools and universities, where individuals are at an age when NSSI is most likely to be initiated. The findings indicated that self-injurers felt greater alienation from both parents and peers, greater distrust and had interpersonal poorer communication than non-injurers. When this insecure attachment style is combined with significantly more experiences of relational or personal trauma, lower self-esteem, and the reduced propensity to seek social support as a means of coping with stress or overwhelming thoughts or feelings, developing healthy attachments is challenging. Therefore, the responses of educators and peers to the disclosure of the NSSI, have the potential to minimise or exacerbate the behaviour.

Given that the onset of NSSI occurs predominantly during adolescence, future research efforts should be directed towards developing prevention and early intervention programs that target this period. Schools provide a unique forum for reaching the majority of school aged adolescents en masse. The results highlight the multidetermined nature of NSSI and the number of proximal and distant risk factors and diagnostic correlates. As such, a curriculum based program would not necessarily need to target NSSI per se, but could be implemented as an approach to adolescent psychological health and wellbeing. Ideally, the program would be psychoeducational and skills based. It could incorporate units directed towards adaptive coping skills training, mindfulness and relaxation techniques, stress inoculation training, problem solving techniques, peer mediation and conflict resolution skills, effective interpersonal communication, healthy emotional expression, cognitive restructuring for self-

depreciating and self-critical thinking, and a unit aimed at increasing self-esteem and self-worth (Hasking et al., 2015; Wester & Trepal, 2010).

The findings of the current study indicated that individuals identifying as bisexual and lesbian are more at risk than their heterosexual peers of engaging in self-injurious behaviours. Other research suggested that individuals who are still questioning their sexuality are at even greater risk of NSSI (Kerr et al., 2013; Sornberger et al., 2013; Whitlock et al., 2011). Practitioners need to be aware of the higher prevalence of NSSI in this population and should enquire about the presence of NSSI in clients who identify as bisexual or lesbian, with a compassionate, interested and non-judgemental stance. It would also be beneficial to disseminate psychoeducational material on NSSI to lesbian, gay, bisexual, transgender, and queer/questioning communities, both as online resource materials and brochures in community centres, schools, universities, hospitals and doctors' offices. This could provide information, resources, sources of support, help reduce the stigma and dispel myths about NSSI and bisexuality, whilst promoting an awareness of the risk in this particular population.

The current study further emphasizes the heterogeneity and breadth of NSSI, and the range of psychosocial factors that predispose, precipitate or co-occur with this phenomenon. This directs the need to tailor treatment plans to the individual. The first step in creating an effective individualised intervention needs to involve a comprehensive and standardised assessment of NSSI (Klonsky & Lewis, 2014; Klonsky et al., 2011). One of the areas for future research and is to be discussed in the following section, is the need to develop a best-practice assessment process. In the meantime, there are a number of NSSI assessment measures that clinicians can utilise in the therapeutic setting, such as the Inventory of Statement About Self-Injury (ISAS), the Functional Assessment of Self-Mutilation (FASM), the Ottawa Self-Injury Inventory

(OSI) and the Self-Injurious Thoughts and Behaviors Interview (SITBI). As a multifaceted behaviour, an accurate assessment of NSSI should focus not just on the behavioural presentation of NSSI, but the motivations or functions that drive it, the immediate antecedents and consequences that serve to maintain the behaviour. It also needs to encompass an assessment of the proximal and distal factors that may have contributed to the onset of the behaviour in the individual, for unless treated, these could result in relapses over time. These distal and proximal factors include an assessment of any existing, prior or emerging mental health concerns, the trauma history, and the quality of perceived relationships to mothers, fathers, or primary caregivers, and peers. Practitioners need to be informed and mindful of the fact during this assessment phase that NSSI comorbidly occurs across a range of mental health diagnoses, as illustrated in this study, and is not solely associated with BPD and PTSD as often portrayed. A full suicide risk assessment needs to be conducted at the initial time of assessment and regularly, given the relationship of later suicide attempts to NSSI (Guan et al., 2012; Klonsky et al., 2013; Martin, Swannell, Hazell et al., 2010; Tuisku et al., 2014).

Existing measures such as the ISAS provide practitioners with an assessment of the behaviours, patterns, and functions associated with the act of NSSI. These all provide important information necessary to the development of an individualised treatment plan to reduce or cease NSSI. The behavioural assessment should address: the methods used and the frequency of NSSI, the location on the body of NSSI, the implements used, any rituals adhered to when self-injuring, the age of onset and when the most recent episode occurred, the experience of pain, whether self-injury is undertaken alone or in the presence of others, and if the client wants and is ready to stop self-injuring. Assessment should also include a measure of the latency period involved

from the initial urge until self-injury is enacted. The range of these assessment questions not only provide a detailed picture of the individual's behaviour but they provide a start to the therapeutic discourse and treatment. For instance, questions around the methods, frequency, and severity can evolve into a discussion on wound assessment, wound care, and potentially harm minimisation strategies with their clients. Whilst eliciting information about the experience of pain during the act and its import to the client and perhaps their need to self-punish as a function of NSSI, can evolve into an exploration of early and immediate substitutes for self-injury, that may involve as aspect of pain (i.e., snapping an elastic band around one's wrist, plunging one's hand into ice cold water). The assessment process should guide the intervention.

The current study found further support for NSSI as an overdetermined behaviour, with self-injurers endorsing an average of six and a half different reasons for engaging in NSSI, such as affect regulation, self-punishment, anti-dissociation or feeling generation, marking distress and anti-suicide. The functions or reasons for self-injuring are not necessarily stable and are often contextually driven (Lloyd-Richardson et al., 2009). Therefore, it is important that practitioners complete a comprehensive functional assessment of NSSI with their clients. Again, there are existing measures that can be easily administered and scored to provide practitioners with a functional understanding of their client's behaviour, such as the ISAS or FASM. To decrease or ameliorate NSSI, it is essential to have an accurate understanding of what function self-injury performs for the client (e.g., self-punishment, affect regulation, marking distress etc.).

Lloyd-Richardson et al. (2009, p. 38) suggested that practitioners adopt a "functionally guided treatment approach" in working therapeutically with individuals who self-injure. Following the functional assessment protocol, individual treatment can

be targeted to substitute self-injurious behaviours with more adaptive coping strategies and techniques that specifically fulfil the functions that NSSI performs (Kortge et al. 2013; Linehan, 1993; Lloyd-Richardson et al., 2004, 2009; Nock & Prinstein, 2004). For instance, if an individual self-injures to generate feelings and stop feeling numb or depersonalised, then the clinician can focus on strategies to create bodily awareness or a physical sensation (i.e., body scan meditation), and grounding and reorienting strategies (i.e., relaxation strategies, breathing retraining, focusing on the immediate surrounding environment). Whereas, if NSSI is employed as a means of self-punishment then therapeutic approaches that focus on increasing the client's self-esteem and self-worth, whilst diminishing their self-criticism and rumination would be more appropriate. Research also suggests that individuals are also likely to self-injure for different reasons over the course of the behaviour, from its initial onset (Lloyd-Richardson et al. 2009; Muehlenkamp, 2005; Muehlenkamp et al., 2013; Saraff & Pepper, 2014). Therefore, the functional assessment should be an ongoing process, with the practitioner repeating the assessment periodically and readjusting the treatment plan accordingly.

The majority of self-injurers reported little contemplation before acting on their urge to self-injure. The brevity of this latency period, or the lack thereof, and the results on coping in this study and the extant literature, suggests that NSSI may have become a stable and consolidated coping mechanism for these participants, which they automatically enact, in response to any stressful or overwhelming situation, thoughts or feelings. At this point the behavior is likely to be considerably more difficult to terminate or even reduce. Furthermore, the desire to stop self-injuring seems to have inverse relationship to the length of time the behaviour is engaged in (Hamza & Willoughby, 2014). Thus, mental health practitioners need to help train their clients in applying new and more adaptive coping strategies across a variety of situations, and in

response to different affective and cognitive states (Kimball & Diddams, 2007). The use of role playing and psychodrama could be beneficial in facilitating the generalisation of these strategies in the therapeutic setting; whilst keeping a thoughts, feelings and coping strategies journal or log could assist with the generalisation in situ.

The current study further emphasized the heterogeneity and breadth of NSSI, and the range of psychosocial factors that predispose, precipitate or co-occur with this phenomenon. This multidetermined and multifaceted nature of NSSI further dictates the need to tailor treatment plans to the individual, even beyond the functional approach. There are clearly a number of factors that appear to be universal to the experience of NSSI, which could form the base of an empirically derived treatment program. The current research suggests that this foundation intervention program should incorporate skills training to target self-esteem, coping, and affect regulation. The intervention should ideally involve additional units that may be targeted directly to the individual, following their functional assessment, such as interpersonal skills training, and anger management skills. As Tatnell et al. (2013) highlighted, psychosocial or environmental factors may be explored therapeutically, but a number of these, such as sexual abuse or witnessing traumatic events may not be amenable to change. Whereas, individual psychological variables such as self-esteem, coping skills and affect regulation, have strong empirical associations to NSSI, and are behaviours that are easily targetable in a therapeutic setting. The clinical implications of this, suggest that developing an understanding of the relationship between self-esteem and other psychosocial and individual variables may help plan more empirically informed and effective preventative, intervention and treatment programs.

The poorer perceived interpersonal communication, lack of mutual respect, and greater insecurity and detachment felt by self-injurers towards their parents in this

study, illustrated the importance of the attachment relationship well into adulthood. The level of perceived insecure attachment was particularly pronounced in the paternal relationship. Clinically, these results infer that a family therapy component may be beneficial in the treatment of NSSI, particularly for adolescents. Furthermore, the findings emphasise the role of the father in attachment, and the need to explore maternal and paternal relationships separately, even in adults.

Until recently there were no empirically supported treatments or interventions specifically to treat NSSI, and evidence-based practices from Dialectical Behaviour Therapy (DBT) and CBT were primarily employed by practitioners (Andover, Schatten, Morris, Holman, & Miller, 2017; Franklin et al., 2013; Nock, 2010; Trepal et al., 2015). Two new interventions, Emotion Regulation Individual Therapy for Adolescents (ERITA: Bjureberg et al., 2017) and Treatment for Self-Injurious Behaviours (T-SIB: Andover et al., 2017) have recently reported favourable results in specifically targeting NSSI in both participants with and without a history of BPD. However, given the recency of these interventions further empirical evidence is needed to support their efficacy. Whilst ERITA (Bjureberg et al., 2017) is based upon emotion regulation group therapy (ERGT) developed by Gratz and colleagues (Gratz, Bardeen, Levy, Dixon-Gordon, & Tull, 2015; Gratz & Gunderson, 2006; Gratz & Tull, 2011), to date, ERGT has only been assessed in samples with a diagnosis of BPD.

### **10.13 Future Directions**

The extant literature on NSSI has made considerable headway in developing an understanding of NSSI. Research over the past several decades has elucidated its heterogeneous presentation, the fundamental functions it performs, the methods that are



employed to enact the behaviour, its multidetermined nature, and a number of psychological, social, behavioural and biological risk factors have been identified. However, there is still much we do not understand about the paradoxical phenomenon of NSSI, particularly regarding its aetiology, the mechanisms that underpin it, how these are interrelated, and how NSSI can be empirically prevented and treated.

Now that we have a documented taxonomy for NSSI with the proposed criterion in the DSM-5, one of the next steps should be in deciding on a best-practice assessment process. The establishment of a best-practice assessment measure would considerably aide consistency across studies, decrease the potential for artificially inflated prevalence estimates, and help prevent pathologizing those who have only occasionally self-injured. It would also contribute to the validity and reliability of assessment measures used in this field. In establishing a best-practice assessment measure, work needs to be collaboratively undertaken to develop or refine existing measures. Firstly, the assessment measure needs to clearly distinguish NSSI from suicidal thoughts and behaviours. Secondly, the assessment needs to incorporate or refine the measures of offset and duration for NSSI, rather than focusing on the frequency of particular methods of NSSI. Whilst it is helpful to ascertain how many times an individual has engaged in a method of NSSI, this does not indicate how long they have been self-injuring. For instance, two individual participants may state that they have each cut themselves 25 times, but one participant may have cut themselves 25 times in the past two months, whereas another participant may have cut themselves 25 times over the past year. To gain a better understanding of the course of NSSI, it would also be beneficial to know if there had been periods of relapse, or engagement of a higher frequency than at other times.

Epidemiological studies of NSSI have traditionally employed a cross-sectional research design and whilst this data has furthered our understanding of the behaviour considerably, it does not provide an accurate picture of the trajectories of NSSI. Longitudinal studies are required to map the behaviour over its course. This research methodology would enable an exploration of the causal directions and temporal relationships of the many risk factors that have been identified for NSSI; and whether they present a distal or proximal risk to the behaviour. Longitudinal research should also investigate the offset of the behaviour, as data related to the offset of NSSI is considerably lacking (Mummé, Mildred, & Knight, 2017; Whitlock, Prussien, & Pietrusza, 2015). A more comprehensive understanding of why individuals stop self-injuring would greatly aid in the development of empirically derived prevention and intervention strategies or programs. Pertinent data should include a broad investigation of the factors influencing the offset. Did the intensity or the power of the triggers diminish? Was the exposure to the triggers lessened? Did the cognitions or affect about the behaviour change? Was any particular resource, service, treatment or person helpful in stopping self-injuring?

In the current study 16.5% of participants commenced self-injuring at 18 years or older, and higher rates of later onset were reported by Klonsky (2011), and Whitlock (2011). Furthermore, 30.56% of self-injurers disclosed that they had experienced a violent personal trauma as an adult. These figures have considerable clinical and social implications, and potential prevention strategies need to be targeted towards young adults, particularly at universities where approximately one in five college women experience a sexual assault (Fisher, Cullen & Turner, 2010). Similarly, mental health practitioners need to be aware of the later onset when conducting risk assessments in

young adults, and not operating under the assumption that this is a peculiarly adolescent phenomenon.

The majority of self-injurers in the present study used more than one method to self-injure, and the most common methods were cutting, banging or hitting oneself, and interfering with wound healing. These results remain fairly consistent across the literature (Heath et al., 2008; Klonsky, 2011; Martin, Swannell, Hazell et al., 2010; Whitlock et al., 2006). However, no research to date has explored why an individual chooses one method of NSSI over another, nor explored their choices regarding the locations they choose to inflict their injuries upon. These are questions that could help to create a more fuller understanding of NSSI.

Research into self-injurious behaviours that occur in groups (e.g., train surfing, chicken, bloody knuckles, the choking game, inhaling substances, erasing), or by proxy is scarce. Yet media sources (“Choking ‘game’”, 2017; Wheatstone, 2016), Google and YouTube searches indicate that these “games” are been played with some regularity, predominantly amongst adolescents and college students. Theoretically, little is really known about these behaviours. Intuitively, it is likely that the social mechanisms underlying these types of peer group behaviours are distinct from the intrapersonal functions underpinning NSSI. However, it is plausible that they share interpersonal motivations or functions. As such, a comparative investigation into the functions of NSSI, dare games, and self-injury by proxy, could further elucidate the mechanisms underlying the interpersonal functions of NSSI, and the social dynamics involved.

As it has largely been agreed that NSSI is a multidetermined behaviour, future research needs to be directed towards developing and testing more complex models, such as Nock’s (2009) integrated theoretical model of the development and maintenance

of self-injury. A greater understanding is needed of the distal and proximal, general and specific risk factors that potentially contribute to the initiation and maintenance of NSSI. Specifically ascertaining the pathways or interrelationships amongst them. It is vital that we gain an empirically derived aetiological understanding of NSSI. Effective interventions cannot be designed when we still do not fully understand what initially drives an individual to pick up an implement and cut their own skin, instead of choosing another less invasive coping mechanism.

#### **10.14 Conclusion**

This study provides an original contribution to the extant literature on NSSI, offering evidence for the combined roles of gender, familial and individual history of mental illness, aggregated personal trauma, tattoos, paternal and maternal attachment, self-esteem, sexual orientation, and coping strategies, on the engagement in NSSI. Whilst each of these psychosocial variables was found to be an individual risk factor for NSSI, the combination of these specific variables accounted for nearly half of the variance in self-injury. In addition, the research extends the existing body of literature, by providing an updated and comprehensive profile of the behaviours and factors associated with the act of NSSI. In the functional analysis of NSSI, the current study also found further support for the fundamental role of intrapersonal functions in the onset and maintenance of the behaviour (Klonsky, 2009; Nixon et al., 2002).

This study indicated that participants identifying as heterosexual, lesbian and bisexual engaged in NSSI significantly more than those identifying as gay or asexual. In particular, lesbians and bisexual females were 4.80 and 5.95 times, respectively, more likely to self-injure than heterosexuals, consistent with the findings of Kerr et al. (2013)

and Sornberger et al. (2013). The present study was also the first to investigate coping strategies and NSSI across the full spectrum of sexual orientation. Bisexual participants, and lesbians to a lesser degree, demonstrated more emotion-focused coping strategies and less problem-focused coping strategies than their heterosexual counterparts. This tendency to employ non-productive and maladaptive coping strategies, indicates this group is at a heightened risk for NSSI. Researchers have attributed the greater use of maladaptive coping mechanisms in bisexual, lesbian, gay and questioning individuals, to the stigma and stress associated with being part of a sexual minority (Kerr; Sornberger). However, interestingly, in the current study, there were no significant differences found in the coping strategies or self-injurious behaviour of gay or asexual participants compared to heterosexual ones. Macleod et al. (2015) and Obradors-Campos (2011) suggested that individuals identifying as bisexual are often subjected to the unique stressors of biphobia, a form of antibisexual discrimination, that comes from not only heterosexuals, but also individuals identifying as gay, lesbian, asexual and questioning. From a research perspective, these results illustrate the importance of exploring NSSI across the spectrum of sexual orientation, rather than categorising it as a heterosexual and non-heterosexual dichotomy. Clinically, these findings suggest that practitioners should empathetically enquire about the presence of NSSI in clients who identify as bisexual or lesbian, given the higher risk of the behaviour within these populations.

Self-injurers in the present study had significantly lower self-esteem and had experienced more personal trauma over their lifetime, than noninjurers. Participants with a history of NSSI also demonstrated a pattern of adopting non-productive or avoidant strategies to manage stressors, suggesting that this group have a largely non-

productive or emotion-focused coping style. This is consistent with the conceptualisation of NSSI as a maladaptive coping mechanism.

Support was found for the overdetermined nature of NSSI, as self-injury was enacted to serve an average of 6.48 functions in the current sample. In line with previous research, intrapersonal functions were more highly endorsed (Klonsky & Glenn, 2009; Kortge et al., 2013; Nock & Prinstein, 2004; Zetterqvist et al., 2013), particularly the mechanisms of affect regulation (Klonsky, 2009; Nixon et al., 2002; Swannell et al., 2008) and self-punishment (Hamza et al., 2014; Klonsky, 2009; Laye-Gindhu et al., 2005). This indicated that individuals who self-injure have more difficulty regulating their feelings, and to a lesser degree, their social environments.

The findings of the current study offered several sources of support for the self-punishment hypothesis, conceptualising NSSI as a mechanism for intropunitively directed self-depreciation (Nock, 2009, 2010; Tanner et al., 2015). The significantly lower self-esteem found in self-injurers, substantiated by a very large effect size, indicated that this group held negative self-views consistent with the self-depreciative aspect of the self-punishment hypothesis. The strong inverse relationships found between self-esteem with both self-punishment and pain signified that as self-esteem decreased, the use of NSSI for self-punishment, and the sensation of pain increased. Drawing inferences from these results and the extant literature base, it would appear that the experience of pain is an important aspect of the act of NSSI for individuals who self-injure as a function of self-punishment (Nock & Prinstein, 2004). Moreover, the experience of pain appeared to be a salient feature of the complete experience of NSSI. It was also associated with the frequency of engagement in NSSI, severity, the time taken to contemplate self-injuring, and all 13 functions of NSSI. However, it was most

highly correlated with the intrapersonal reasons for self-injuring. Despite, the implied significance of pain to the act of NSSI, it remains an area that has been under investigated and is poorly understood.

This was the largest study of NSSI, to date, to investigate attachment across the three separate relationship domains. Significant differences were found in the attachment to fathers, mothers and peers, by gender, a history of NSSI, and an aggregated history of personal trauma, offering considerable further support for an aetiological role of attachment in NSSI. Male participants demonstrated a more secure attachment style than females to both parents across trust, communication and alienation. Whereas, there were no gender differences in the attachment to peers. Self-injurers reported poorer perceived relationship quality across their relationships to mothers, fathers, and peers, than non-injurers. Paternal relationships were rated the most poorly by self-injurers, and were characterised by distrust, ineffectual communication and feelings of alienation. Consistent with attachment and trauma theory, self-injurers with a history of personal trauma, had lower self-esteem and showed poorer attachment across all three relationship domains (Connors, 1996; Grocutt, 2009; Simpson & Porter, 1981; Van Der Kolk et al., 1991).

The combined findings of this study provide evidence in support of Nock's (2009, 2010) integrated theoretical model of NSSI. Whilst the cross-sectional methodology of the current study precludes any interpretations of causation or temporal relationships, a number of psychosocial determinants were identified, providing both an individual and combined risk of engagement in NSSI. The number of psychosocial determinants found to contribute to NSSI in this study necessitate an integrated or multidetermined aetiological model such as Nock's. Nock postulated that high aversive

emotions, high aversive cognitions, and poor distress tolerance formed intrapersonal vulnerability factors for NSSI. The higher levels of depressive and anxious symptomatology reported by self-injurers in the present study lend a measure of support to this hypothesis. Furthermore, Nock's model proposed that these intrapersonal vulnerabilities developed via the interaction of distal risk factors, such as a genetic predisposition for high emotional and cognitive reactivity, childhood abuse or maltreatment, and familial hostility and criticism. The statistically higher prevalence of aggregated personal trauma found in this study, adds further credence to the model.

The role of a familial history of mental illness in this study warrants its further investigation as a determinant of NSSI. Research is also required to ascertain if the effect is related to the genetic risk it confers, or other related variables attributed to living with a family member who has been diagnosed with a mental illness. Hypothetically, it would fit conceptually as a distal risk factor in Nock's model as a potential genetic risk factor.

The present study set out to explore NSSI in a nonclinical sample, but unexpectedly over half of the self-injurers self-reported a diagnosis of mental illness. In fact, the odds of being diagnosed with a mental illness was 6.42 times more likely in the current sample of self-injurers than in non-injurers. In accordance with the affect regulation function of NSSI, depressive and anxiety based disorders were the most common diagnoses for mental illness. Self-injurers with a history of mental illness fared considerably poorer than self-injurers with no current or prior diagnose of mental illness, across the range of psychosocial determinants under investigation in the present study. Self-injurers with a mental illness engaged in NSSI more frequently and used more methods to self-injure; their self-injurious behaviour served a greater number of



functions; and they had obtained medical treatment for their wounds on more occasions. They also had lower self-esteem and a greater aggregated trauma history across both violent crime victimisation and noncrime traumatic events.

These findings would suggest that the existence of subgroups within this population is highly probable. Given the heterogeneous presentation of NSSI, its multidetermined aetiology, and overdetermined functions, this is not surprising. Moreover, delineations of the behaviour have been made based on the degree of severity and the frequency of engagement since Pao's (1967) categorisation of delicate and course cutters, and the seminal sociocultural classification of Favazza (1987, 1996). This is in line with more recent research using statistical methods to identify distinct subgroups of self-injurers within the population (Lloyd-Richardson et al., 2007; Klonsky & Olino, 2008; Whitlock et al., 2008). The implications of this are largely twofold. Firstly, and importantly, these results illustrate that self-injury in adults is not always associated with mental illness. Practitioners need to be mindful that not all clients presenting with NSSI necessarily have comorbid psychopathology. Secondly, these findings imply that there is a contingent of self-injurers who have significant psychopathology (Klonsky & Olino, 2008). Yet even within this group there is considerable variability. Some clients may present with depression, and others with PTSD or attachment based disorders. Clinically, this indicates that a comprehensive assessment needs to be undertaken when clients present with NSSI. This is important, to ascertain not only the severity and frequency of the behaviour, but clearly if there is any underlying, emerging or comorbid psychopathology. These findings also highlight the need for practitioners to account for individual variability in NSSI, and in developing tailored client-central treatment plans.

In the therapeutic and educational setting, practitioners and educational planners need to be mindful of not only the risk factors for NSSI, but equally, of factors that may act in a protective capacity against the initiation and maintenance of self-injury. Whilst a number of these protective factors may not be amenable to therapeutic change, individual psychosocial factors such as self-esteem, coping skills and improving interpersonal relationships, are easily targetable in both a therapeutic or educational context (Tatnell et al., 2013). Furthermore, the current study indicated that perceived supportive relationships with parents, particularly to fathers, may act as a protective factor against the development of self-injurious behaviour. This has considerable clinical implications, as practitioners can work to reinforce and improve the quality of communication, trust, and connectedness to family, and engage fathers in this treatment process (Hoff & Muehlenkamp, 2009; Taliaferro et al., 2012). Finally given the strong relationship of self-esteem to NSSI and other psychosocial determinants in this study, treatment focusing on increasing self-esteem may aid in reducing and ameliorating NSSI (Rotolone & Martin, 2009).

In 1914 Emerson (p. 42) posed the two fundamental questions, “*Why did she cut herself?*” and “*How could she be helped?*” Questions that a century later, still plague mental health and medical professionals, researchers, educators, and those who work in any capacity with individuals engaging in self-injurious behaviours. Nonsuicidal self-injury (NSSI) is a significant physical and mental health concern in society today, particularly in the education, medical and mental health sectors. Whilst research efforts have made considerable headway in developing an understanding of NSSI, there is still much we do not understand about the paradoxical phenomenon of NSSI, particularly regarding its aetiology, the mechanisms that underpin it, how these are interrelated, and how NSSI can be empirically prevented and treated. Given the findings of the current

study and the contributions the psychosocial variables under investigation made to the engagement in NSSI, future research should endeavour to design and test more complex aetiological models of NSSI. In particular, research exploring the temporal relationships between gender, familial and individual history of mental illness, aggregated personal trauma, self-esteem, paternal and maternal attachment, coping and tattoos, appears warranted.

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## APPENDICES

## Appendix A

# MEMO

TO A/Prof Adrian Fisher  
Dr Karen Hallam  
Social Sciences and Psychology  
Victoria University

DATE 18/8/2011

FROM Dr Anthony Watt  
Acting Chair  
Victoria University Human Research Ethics Committee

SUBJECT Ethics Application – HRETH 11/141

Dear Adrian,

Thank you for resubmitting this application for ethical approval of the project entitled:

**HRETH 11/141**    The body as a voice: a biopsychosocial understanding of deliberate self-harm    (HREC 11/93)

The proposed research project has been accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)' by the Acting Chair of the Victoria University Human Research Ethics Committee. Approval has been granted from 18<sup>th</sup> August 2011 to 24<sup>th</sup> August 2012.

Continued approval of this research project by the Victoria University Human Research Ethics Committee (VUHREC) is conditional upon the provision of a report within 12 months of the above approval date or upon the completion of the project (if earlier). A report proforma may be downloaded from the VUHREC web site at: <http://research.vu.edu.au/hrec.php>.

Please note that the Human Research Ethics Committee must be informed of the following: any changes to the approved research protocol, project timelines, any serious events or adverse and/or unforeseen events that may affect continued ethical acceptability of the project. In these unlikely events, researchers must immediately cease all data collection until the Committee has approved the changes. Researchers are also reminded of the need to notify the approving HREC of changes to personnel in research projects via a request for a minor amendment.

On behalf of the Committee, I wish you all the best for the conduct of the project.

Kind regards,

  
Dr Anthony Watt  
Acting Chair  
Victoria University Human Research Ethics Committee



also reminded of the need to notify the approving HREC of changes to personnel in research projects via a request for a minor amendment.

On behalf of the Committee, I wish you all the best for the conduct of the project.

Kind regards,

A/Professor Bill Eckersley

Acting Chair

Victoria University Human Research Ethics Committee

## Appendix B

### Plain language statement

#### **The Body as a Voice: A Biopsychosocial Understanding of Self-Harm**

##### **Principal Investigators**

Associate Professor Adrian Fisher PhD

Dr. Karen T. Hallam PhD

##### **Student Investigator**

Madeline Wishart

Doctor of Philosophy (Psychology) candidate at Victoria University

Email: madeline.wishart@live.vu.edu.au

##### **Project Aim**

Thank you for your interest in our research. You are invited to participate in an online research study being conducted by Victoria University. The present study aims to generate an understanding of self-harm within a subclinical population. Specifically, this study aims to explore what personal, psychological, social and relationship factors influence the commencement of self-harming behaviours.

This study is being conducted by Madeline Wishart for her Doctor of Philosophy (PhD) at Victoria University. The study is supervised by Associate Professor Adrian Fisher and Dr. Karen Hallam in the School of Social Sciences and Psychology at Victoria University in Melbourne, Australia.

*Please ensure you read this information statement carefully before deciding whether you would like to complete the survey.*

##### **If I agree to participate, what will I be required to do?**

We are inviting anyone over 18 years of age to take part in the study. This study will recruit 3 groups, those who self-harm, those who do not self-harm, and those who treat those who self-harm. The questions are written in English so you must have an understanding of the English language. If you decide to proceed, firstly you will be asked a series of demographic questions; followed a range of personal, psychological, social and relationship questions based on factors that may contribute to an individual engaging in self-harm. Participation should take about 25 minutes to one hour of your time, and you may amend or complete your survey at any time, for up to seven days from when you initially started the survey. There are no right or wrong answers and we only ask you to answer each question honestly. You are under no obligation to complete the questions and may change your mind if you wish to do so at any time.

##### **Are there any risks associated with participation?**

It is not anticipated that your involvement in this study will pose a risk. However, answering questions regarding sensitive issues such as self-harm, stressful life experiences, substance use, experiences and quality of close relationships, may cause discomfort or distress in some individuals. If this research raises issues which you would like to discuss with a professional, Australian participants can contact [REDACTED]

██████████ from Victoria University during business hours on ██████████ or Lifeline on 13 11 14, 24 hours a day.

International participants can contact Lifeline International; this service provides free international 24-hour telephone counselling. Details of how to contact this service in your home country can be found on their website: <http://www.lifeline.org.au/About-Lifeline/Lifeline-International/Looking-for-Help/Looking-for-Help>. If you have been self-harming we strongly encourage you to seek professional help regarding this issue.

### **What are the benefits associated with participation?**

Whilst there are no direct benefits to you, through your participation you may learn more about yourself. You may also learn about your relationships with family and friends in ways that you may not have thought about before. Finally, you will have an opportunity to contribute to psychological research by participating in this study. It is hoped that through your participation, researchers will learn more about the complex nature of self-harm and what initially draws individuals to engage in it, rather than using another coping mechanism.

### **Compensation**

On completion of the survey, you will have the choice of entering the draw to win one of 50 online iTunes vouchers valued at AUD\$20 each. If you choose to enter the draw, you will be redirected to a separate survey and asked to enter your email address. Your email address can *NOT* be linked to your survey results in any way, and will only be used for the purposes of the prize draw. The prize draw will occur once the data collection phase of this research has been completed. All participants who have elected to enter the prize draw will be assigned a number and a random number generator will be used to select the 50 participants who will receive an AUD\$20 online iTunes voucher. All participants who have entered the draw will be contacted via their nominated email address and informed whether they have won or not.

### **Data security, privacy and confidentiality**

This study is purely for research and all information will be treated as confidential and kept secure at all times. Your survey responses will be completely anonymous and you will not be asked to provide your name, or any identifying information at any point in the survey. The anonymous web-based survey responses will be stored on secure, password-protected servers and in a locked filing cabinet located in room 3N34 of the St Albans campus at Victoria University for 5 years. Email addresses provided as a contact for the prize draw will not be linked to your data, you will automatically be redirected to a different survey page to enter your email address, and this cannot be linked to your survey data. The group findings from this study will be presented in the student investigator's thesis, and may be presented at conferences or published in academic journals. Individual participants will not be identified at any stage of the project.

### **Voluntary Nature of the Study**

Participation in this research is entirely voluntary, and you may withdraw from the study at any time, for any reason, without penalty. You may withdraw by exiting the survey window on your web browser. Even if you complete part of the survey and then choose to withdraw from the study, your answers will be discarded before the data is analysed.



### Contact Information

Thank you for considering this research. If you have any queries about this research project, do not understand some of the content of this information sheet, or wish to request study results after the conclusion of this project please feel free to contact the senior investigators.

Associate Professor Adrian Fisher PhD  
Head  
School of Social Sciences & Psychology

Footscray Park Campus  
Victoria University  
PO Box 14428  
Melbourne VIC 8001  
Australia

Phone: [REDACTED]  
Fax: [REDACTED]  
Email: [Adrian.Fisher@vu.edu.au](mailto:Adrian.Fisher@vu.edu.au)

Dr Karen T. Hallam  
Lecturer  
School of Social Sciences &  
Psychology  
St Albans Campus  
Victoria University  
PO Box 14428  
Melbourne VIC 8001  
Australia  
Phone: [REDACTED]  
Email: [Karen.Hallam@vu.edu.au](mailto:Karen.Hallam@vu.edu.au)

If you have any queries or complaints about the way you have been treated, you may contact:

The Secretary  
University Human Research Ethics Committee  
Victoria University of Technology  
PO Box 14428 MCMC  
Melbourne, Australia 8001  
Phone: [REDACTED]  
Email: [researchethics@vu.edu.au](mailto:researchethics@vu.edu.au)

## Appendix C

### Online Consent Form For Participants Involved In Research

#### CERTIFICATION BY PARTICIPANT

I have read the Participant Information Statement outlining this research project and understand that I will be requested to complete a survey on this website.

*I understand that:*

- My participation is completely voluntary
- I am free to withdraw from the project at any time
- All information collected from me will remain anonymous and will be treated as highly confidential
- I certify that I am at least 18 years old

If you have read and understood the Participant Information Statement and Consent Form, please click on the '*I Consent*' button below to indicate your consent to participate in this study. If you do **NOT** wish to participate in this study, please click on '*I Do NOT Consent*' button and close your browser.

I Consent

I Do NOT Consent

## Appendix D

### Rosenberg Self-Esteem Scale (RSE)

Below is a list of statements dealing with your general feelings about yourself.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. On the whole, I am satisfied with myself	1	2	3	4
2. At times, I think I am no good at all	1	2	3	4
3. I feel that I have a number of good qualities	1	2	3	4
4. I am able to do things as well as most other people	1	2	3	4
5. I feel I do not have much to be proud of	1	2	3	4
6. I certainly feel useless at times	1	2	3	4
7. I feel that I'm a person of worth, at least on an equal plane with others	1	2	3	4
8. I wish I could have more respect for myself	1	2	3	4
9. All in all, I am inclined to feel that I am a failure	1	2	3	4
10. I take a positive attitude toward myself	1	2	3	4

## Appendix E

### Inventory of Statements About Self-Injury (ISAS)

This questionnaire asks about a variety of self-harm behaviours. Please only endorse a behaviour if you have done it intentionally (i.e., on purpose) and without suicidal intent (i.e., not for suicidal reasons).

Please estimate the number of times in your life you have intentionally (i.e., on purpose) performed each type of non-suicidal self-harm (e.g., 0, 10, 100).

	0	10	20	30	40	50	60	70	80	90	100
Cutting											
Biting											
Burning											
Carving											
Pinching											
Pulling Hair											
Severe Scratching											
Banging or Hitting Self											
Interfering w/ Wound Healing (e.g., picking scabs)											
Rubbing Skin Against Rough Surface											
Sticking Self w/ Needles											
Swallowing Dangerous Substances											
Other											

*Note.* question was formatted as a sliding scale from 0 – 100

If you feel that you have/had a main form of self-harm, please click on the behaviour(s) that you consider to be your main form of self-harm.

- Cutting
- Biting
- Burning
- Carving
- Pinching
- Pulling Hair
- Severe Scratching
- Banging or Hitting Self
- Interfering w/ Wound Healing (e.g., picking scabs)
- Rubbing Skin Against Rough Surface
- Sticking Self w/ Needles
- Swallowing Dangerous Substances
- Other \_\_\_\_\_

At what age did you first deliberately harm yourself? \_\_\_\_\_

How long ago did you most recently deliberately harm yourself?

- Today
- Yesterday
- 2 - 7 days ago
- 8 - 14 days ago
- 15 - 30 days ago
- 2 - 4 months ago
- 5 - 7 months ago
- 8 months - 1 year ago
- 2 - 5 years ago
- 6 - 10 years ago
- >10 years ago

Do/did you experience physical pain during self-harm?

- Yes
- Sometimes
- No

When you self-harm, are/were you alone?

- Yes
- Sometimes
- No

Typically, how much time elapses from the time you have the urge to self-harm until you act on the urge?

- < 1 hour
- 1 - 3 hours
- 3 - 6 hours
- 6 - 12 hours
- 12 - 24 hours
- > 1 day

Do/did you want to stop self-harming?

- Yes
- No

This inventory was written to help us better understand the experience of non-suicidal self-harm. Below is a list of statements that may or may not be relevant to your experience of self-harm. Please identify the statements that are most relevant for you.

*“When I self-harm, I am ...”*

	Not Relevant	Somewhat Relevant	Very Relevant
calming myself down	0	1	2
creating a boundary between myself and others	0	1	2
punishing myself	0	1	2
giving myself a way to care for myself (by attending to the wound)	0	1	2
causing pain so I will stop feeling numb	0	1	2
avoiding the impulse to attempt suicide	0	1	2
doing something to generate excitement or exhilaration	0	1	2
bonding with peers	0	1	2
letting others know the extent of my emotional pain	0	1	2
seeing if I can stand the pain	0	1	2
creating a physical sign that I feel awful	0	1	2
getting back at someone	0	1	2
ensuring that I am self-sufficient	0	1	2
releasing emotional pressure that has built up inside of me	0	1	2
demonstrating that I am separate from other people	0	1	2
expressing anger towards myself for being worthless or stupid	0	1	2
creating a physical injury that is easier to care for than my emotional distress	0	1	2
trying to feel something (as opposed to nothing) even if it is physical pain	0	1	2

	Not Relevant	Somewhat Relevant	Very Relevant
responding to suicidal thoughts without actually attempting suicide	0	1	2
entertaining myself or others by doing something extreme	0	1	2
fitting in with others	0	1	2
seeking care or help from others	0	1	2
demonstrating I am tough or strong	0	1	2
proving to myself that my emotional pain is real	0	1	2
getting revenge against others	0	1	2
demonstrating that I do not need to rely on others for help	0	1	2
reducing anxiety, frustration, anger, or other overwhelming emotions	0	1	2
establishing a barrier between myself and others	0	1	2
reacting to feeling unhappy with myself or disgusted with myself	0	1	2
allowing myself to focus on treating the injury, which can be gratifying or satisfying	0	1	2
making sure I am still alive when I don't feel real	0	1	2
putting a stop to suicidal thoughts	0	1	2
pushing my limits in a manner akin to skydiving or other extreme activities	0	1	2
creating a sign of friendship or kinship with friends or loved ones	0	1	2
keeping a loved one from leaving or abandoning me	0	1	2
proving I can take the physical pain	0	1	2
signifying the emotional distress I'm experiencing	0	1	2
trying to hurt someone close to me	0	1	2
establishing that I am autonomous/independent	0	1	2



OPTIONAL

In the space below, please list any statements that you feel would be more accurate for you than the ones listed above.

*"When I self-harm, I am..."*

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---

---

OPTIONAL

In the space below, please list any statements you feel should be added to the above list, even if they do not necessarily apply to you.

*"When I self-harm, I am..."*

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## Appendix F

### Stressful Life Events Screening Questionnaire (SLESQ)

The items listed below refer to events that may have taken place at any point in your entire life, including early childhood. If an event or ongoing situation occurred more than once, you will be asked to indicate this at the end of this questionnaire.

#### Have you ever had a life-threatening illness?

- Yes
- No

At what age did you have a life threatening illness?

Duration of the illness (in months/years)

Please describe specific illness

#### Were you ever in a life-threatening accident?

- Yes
- No

At what age were you in a life-threatening accident?

Please describe the accident

Did anyone die in the accident?

- Yes
- No

Who? (relationship to you)

- |   |   |
|---|---|
| <input type="checkbox"/> Mother                         | <input type="checkbox"/> Husband / Wife |
| <input type="checkbox"/> Father                         | <input type="checkbox"/> Partner        |
| <input type="checkbox"/> Sibling                        | <input type="checkbox"/> Friend         |
| <input type="checkbox"/> Grandparent                    | <input type="checkbox"/> Stranger       |
| <input type="checkbox"/> Relative (Aunt, Uncle, Cousin) | <input type="checkbox"/> Other _____    |

What physical injuries did you receive in the accident?

Were you hospitalised overnight?

- Yes
- No

**Was physical force or a weapon ever used against you in a robbery or mugging?**

- Yes
- No

At what age was physical force or a weapon used against you in a robbery or mugging?

How many perpetrators?

Please describe physical force (e.g., restrained, shoved) or weapon used against you

Did anyone die?

- Yes
- No

Who?

- |   |   |
|---|---|
| <input type="checkbox"/> Mother                         | <input type="checkbox"/> Husband / Wife |
| <input type="checkbox"/> Father                         | <input type="checkbox"/> Partner        |
| <input type="checkbox"/> Sibling                        | <input type="checkbox"/> Friend         |
| <input type="checkbox"/> Grandparent                    | <input type="checkbox"/> Stranger       |
| <input type="checkbox"/> Relative (Aunt, Uncle, Cousin) | <input type="checkbox"/> Other _____    |

What injuries did you receive?

Was your life in danger?

- Yes
- Maybe
- No

**Has an immediate family member, romantic partner or very close friend died as a result of an accident, homicide, or suicide?**

- Yes
- No

How old were you?

How did this person die?

Relationship to person lost?

- |   |   |
|---|---|
| <input type="checkbox"/> Mother                         | <input type="checkbox"/> Husband / Wife |
| <input type="checkbox"/> Father                         | <input type="checkbox"/> Partner        |
| <input type="checkbox"/> Sibling                        | <input type="checkbox"/> Friend         |
| <input type="checkbox"/> Grandparent                    | <input type="checkbox"/> Stranger       |
| <input type="checkbox"/> Relative (Aunt, Uncle, Cousin) | <input type="checkbox"/> Other _____    |

In the year before this person died, how often did you see/have contact with him/her?

**When you were a child or more recently, did anyone (parent, other family member, romantic partner, stranger or someone else) ever succeed in physically forcing you to have intercourse, or oral or anal sex against your wishes or when you were in some way helpless?**

- Yes
- No

At what age?

How many times?

- |                                |                                       |
|--------------------------------|---------------------------------------|
| <input type="checkbox"/> 1     | <input type="checkbox"/> 5 - 10       |
| <input type="checkbox"/> 2 - 4 | <input type="checkbox"/> more than 10 |

If repeated, over what period?

- |   |   |
|---|---|
| <input type="checkbox"/> 6 months or less   | <input type="checkbox"/> more than 2 years, but less than 5 years |
| <input type="checkbox"/> 7 months - 2 years | <input type="checkbox"/> 5 years or more                          |

Who did this?

- |   |   |
|---|---|
| <input type="checkbox"/> Mother                         | <input type="checkbox"/> Husband / Wife |
| <input type="checkbox"/> Father                         | <input type="checkbox"/> Partner        |
| <input type="checkbox"/> Sibling                        | <input type="checkbox"/> Friend         |
| <input type="checkbox"/> Grandparent                    | <input type="checkbox"/> Stranger       |
| <input type="checkbox"/> Relative (Aunt, Uncle, Cousin) | <input type="checkbox"/> Other _____    |

Has anyone else ever done this to you?

- Yes  
 No

**Other than experiences described in the last question, has anyone ever used physical force or threat to TRY to make you have intercourse, oral or anal sex, against your wishes or when you were in some way helpless?**

- Yes  
 No

At what age?

How many times?

- |                                |                                       |
|--------------------------------|---------------------------------------|
| <input type="checkbox"/> 1     | <input type="checkbox"/> 5 - 10       |
| <input type="checkbox"/> 2 - 4 | <input type="checkbox"/> more than 10 |

If repeated, over what period?

- |   |   |
|---|---|
| <input type="checkbox"/> 6 months or less   | <input type="checkbox"/> more than 2 years, but less than 5 years |
| <input type="checkbox"/> 7 months - 2 years | <input type="checkbox"/> 5 years or more                          |

Who did this?

- |   |   |
|---|---|
| <input type="checkbox"/> Mother                         | <input type="checkbox"/> Husband / Wife |
| <input type="checkbox"/> Father                         | <input type="checkbox"/> Partner        |
| <input type="checkbox"/> Sibling                        | <input type="checkbox"/> Friend         |
| <input type="checkbox"/> Grandparent                    | <input type="checkbox"/> Stranger       |
| <input type="checkbox"/> Relative (Aunt, Uncle, Cousin) | <input type="checkbox"/> Other _____    |

Has anyone else ever done this to you?

- Yes  
 No

**Other than experiences mentioned in the previous two questions, has anyone ever actually touched private parts of your body or made you touch theirs against your wishes, or when you were in some way helpless?**

Yes

No

At what age?

How many times?

1

5 - 10

2 - 4

more than 10

If repeated, over what period?

6 months or less

more than 2 years, but less than 5 years

7 months - 2 years

5 years or more

Who did this?

Mother

Husband / Wife

Father

Partner

Sibling

Friend

Grandparent

Stranger

Relative (Aunt, Uncle, Cousin)

Other \_\_\_\_\_

What age was this person?

Has anyone else ever done this to you?

Yes

No

**When you were a child, did a parent, caregiver or other person ever slap you repeatedly, beat or otherwise attack or harm you?**

Yes

No

At what age

How many times?

1

5 - 10

2 - 4

more than 10

If repeated, over what period?

- |   |   |
|---|---|
| <input type="checkbox"/> 6 months or less   | <input type="checkbox"/> more than 2 years, but less than 5 years |
| <input type="checkbox"/> 7 months - 2 years | <input type="checkbox"/> 5 years or more                          |

Please describe force used against you (e.g., fist, belt)

Were you ever injured?

- Yes  
 No

Please describe the injuries you sustained

Who (relationship to you)?

- |   |   |
|---|---|
| <input type="checkbox"/> Mother                         | <input type="checkbox"/> Husband / Wife |
| <input type="checkbox"/> Father                         | <input type="checkbox"/> Partner        |
| <input type="checkbox"/> Sibling                        | <input type="checkbox"/> Friend         |
| <input type="checkbox"/> Grandparent                    | <input type="checkbox"/> Stranger       |
| <input type="checkbox"/> Relative (Aunt, Uncle, Cousin) | <input type="checkbox"/> Other _____    |

Has anyone else ever done this to you?

- Yes  
 No

**Other than the experiences mentioned in the last question, have you ever been kicked, beaten, slapped around or otherwise physically harmed by a romantic partner, date, sibling, family member, stranger or someone else?**

- Yes  
 No

At what age?

How many times?

- |                                |                                       |
|--------------------------------|---------------------------------------|
| <input type="checkbox"/> 1     | <input type="checkbox"/> 5 - 10       |
| <input type="checkbox"/> 2 - 4 | <input type="checkbox"/> more than 10 |

If repeated, over what period?

- |   |   |
|---|---|
| <input type="checkbox"/> 6 months or less   | <input type="checkbox"/> more than 2 years, but less than 5 years |
| <input type="checkbox"/> 7 months - 2 years | <input type="checkbox"/> 5 years or more                          |

Please describe force used against you (e.g., fist, belt)

Were you ever injured?

- Yes
- No

Please describe the injuries you sustained

Who (relationship to you)?

- |   |   |
|---|---|
| <input type="checkbox"/> Mother                         | <input type="checkbox"/> Husband / Wife |
| <input type="checkbox"/> Father                         | <input type="checkbox"/> Partner        |
| <input type="checkbox"/> Sibling                        | <input type="checkbox"/> Friend         |
| <input type="checkbox"/> Grandparent                    | <input type="checkbox"/> Stranger       |
| <input type="checkbox"/> Relative (Aunt, Uncle, Cousin) | <input type="checkbox"/> Other _____    |

If sibling, what age was he/she?

Has anyone else ever done this to you?

- Yes
- No

**Other than the experiences already covered, has anyone ever threatened you with a weapon like a knife or gun?**

- Yes
- No

At what age?

How many times?

- |                                |                                       |
|--------------------------------|---------------------------------------|
| <input type="checkbox"/> 1     | <input type="checkbox"/> 5 - 10       |
| <input type="checkbox"/> 2 - 4 | <input type="checkbox"/> more than 10 |

If repeated, over what period?

- 6 months or less
- 7 months - 2 years
- more than 2 years, but less than 5 years
- 5 years or more



Please describe the nature of the threat

Who (relationship to you)?

**Have you ever been present when another person was killed, seriously injured, or sexually or physically assaulted?**

- Yes
- No

At what age?

Please describe what you witnessed

Was your own life in danger?

- Yes
- Maybe
- No

**Have you ever been in any other situation where you were seriously injured or your life was in danger (e.g., involved in military combat or living in a war zone)?**

- Yes
- No

At what age?

Please describe any other situation where you were seriously injured or your life was in danger

**Have you ever been in any other situation that was extremely frightening or horrifying that has not been covered above?**

- Yes
- No

At what age?

Please describe any other situation that was extremely frightening or horrifying that has not been covered above

**If any of the events (or ongoing situations) already described happened to you more than once, (e.g., two robberies, two different people committing the same act), please select these events in the box below**

**As you filled out this questionnaire, did you report the same incident, or ongoing situation, under more than one item?**

- Yes, Please indicate which questions refer to the same incident
- No

## Appendix G

### Inventory of Parent and Peer Attachment (IPPA)

Some of the following statements asks about your feelings about your **mother** or the person who has acted as your mother. If you have more than one person acting as your mother (e.g. a natural mother and a step-mother) answer the questions for the one you feel has most influenced you.

*Please read each statement and click on the ONE that tells how true the statement is for you now.*

	Almost Never or Never True	Not Very Often True	Some- times True	Often True	Almost Always or Always True
1. My mother respects my feelings.	1	2	3	4	5
2. I feel my mother does a good job as my mother.	1	2	3	4	5
3. I wish I had a different mother.	1	2	3	4	5
4. My mother accepts me as I am.	1	2	3	4	5
5. I like to get my mother's point of view on things I'm concerned about.	1	2	3	4	5
6. I feel it's no use letting my show around my mother.	1	2	3	4	5
7. My mother can tell when I'm upset about something.	1	2	3	4	5
8. Talking over my problems with my mother makes me feel ashamed or foolish	1	2	3	4	5
9. My mother expects too much from me.	1	2	3	4	5
10. I get upset easily around my mother.	1	2	3	4	5
11. I get upset a lot more than my mother knows about.	1	2	3	4	5
12. When we discuss things, my mother cares about my point of view.	1	2	3	4	5
13. My mother trusts my judgment.	1	2	3	4	5
14. My mother has her own problems, so I don't bother her with mine.	1	2	3	4	5

	Almost Never or Never True	Not Very Often True	Some- times True	Often True	Almost Always or Always True
15. My mother helps me to understand myself better.	1	2	3	4	5
16. I tell my mother about my problems and troubles.	1	2	3	4	5
17. I feel angry with my mother.	1	2	3	4	5
18. I don't get much attention from my mother.	1	2	3	4	5
19. My mother helps me to talk about my difficulties.	1	2	3	4	5
20. My mother understands me.	1	2	3	4	5
21. When I am angry about something, my mother tries to be understanding.	1	2	3	4	5
22. I trust my mother.	1	2	3	4	5
23. My mother doesn't understand what I'm going through these days.	1	2	3	4	5
24. I can count on my mother when I need to get something off my chest.	1	2	3	4	5
25. If my mother knows something is bothering me, she asks me about it.	1	2	3	4	5

This part asks about your feelings about your **father**, or the man who has acted as your father. If you have more than one person acting as your father (e.g. natural and step-father) answer the question for the one you feel has most influenced you.

*Please read each statement and click on the ONE that tells how true the statement is for you now.*

	Almost Never or Never True	Not Very Often True	Some- times True	Often True	Almost Always or Always True
1. My father respects my feelings.	1	2	3	4	5
2. I feel my father does a good job as my father.	1	2	3	4	5
3. I wish I had a different father.	1	2	3	4	5
4. My father accepts me as I am.	1	2	3	4	5

	Almost Never or Never True	Not Very Often True	Some- times True	Often True	Almost Always or Always True
5. I like to get my father's point of view on things I'm concerned about.	1	2	3	4	5
6. I feel it's no use letting my show around my father.	1	2	3	4	5
7. My father can tell when I'm upset about something.	1	2	3	4	5
8. Talking over my problems with my father makes me feel ashamed or foolish	1	2	3	4	5
9. My father expects too much from me.	1	2	3	4	5
10. I get upset easily around my father.	1	2	3	4	5
11. I get upset a lot more than my father knows about.	1	2	3	4	5
12. When we discuss things, my father cares about my point of view.	1	2	3	4	5
13. My father trusts my judgment.	1	2	3	4	5
14. My father has his own problems, so I don't bother him with mine.	1	2	3	4	5
15. My father helps me to understand myself better.	1	2	3	4	5
16. I tell my father about my problems and troubles.	1	2	3	4	5
17. I feel angry with my father.	1	2	3	4	5
18. I don't get much attention from my father.	1	2	3	4	5
19. My father helps me to talk about my difficulties.	1	2	3	4	5
20. My father understands me.	1	2	3	4	5
21. When I am angry about something, my father tries to be understanding.	1	2	3	4	5
22. I trust my father.	1	2	3	4	5
23. My father doesn't understand what I'm going through these days.	1	2	3	4	5
24. I can count on my father when I need to get something off my chest.	1	2	3	4	5
25. If my father knows something is bothering me, he asks me about it.	1	2	3	4	5

This part asks about your feelings about your relationships with your **close friends**.

*Please read each statement and click on the ONE that tells how true the statement is for you now.*

	Almost Never or Never True	Not Very Often True	Some- times True	Often True	Almost Always or Always True
1. I like to get my friend's point of view on things I'm concerned about.	1	2	3	4	5
2. My friends can tell when I'm upset about something.	1	2	3	4	5
3. When we discuss things, my friends care about my point of view.	1	2	3	4	5
4. Talking over my problems with friends makes me feel ashamed or foolish.	1	2	3	4	5
5. I wish I had different friends.	1	2	3	4	5
6. My friends understand me.	1	2	3	4	5
7. My friends encourage me to talk about my difficulties	1	2	3	4	5
8. My friends accept me as I am.	1	2	3	4	5
9. I feel the need to be in touch with my friends more often.	1	2	3	4	5
10. My friends don't understand what I'm going through these days.	1	2	3	4	5
11. I feel alone or apart when I am with my friends.	1	2	3	4	5
12. My friends listen to what I have to say.	1	2	3	4	5
13. I feel my friends are good friends.	1	2	3	4	5
14. My friends are fairly easy to talk to.	1	2	3	4	5
15. When I am angry about something, my friends try to be understanding.	1	2	3	4	5
16. My friends help me to understand myself better.	1	2	3	4	5
17. My friends care about how I am feeling.	1	2	3	4	5
18. I feel angry with my friends.	1	2	3	4	5
19. I can count on my friends when I need to get something off my chest.	1	2	3	4	5
20. I trust my friends.	1	2	3	4	5

	Almost Never or Never True	Not Very Often True	Some- times True	Often True	Almost Always or Always True
21. My friends respect my feelings.	1	2	3	4	5
22. I get upset a lot more than my friends know about.	1	2	3	4	5
23. It seems as if my friends are irritated with me for no reason.	1	2	3	4	5
24. I can tell my friends about my problems and troubles.	1	2	3	4	5
25. If my friends know something is bothering me, they ask me about it.	1	2	3	4	5

## Appendix H

### Additional Survey Questions Developed by The Researcher

The researcher developed a considerable number of additional questions to complement the battery of assessment measures (RSE, ISAS, SLESQ, IPPA & CSA) employed in the current study. These questions were derived from the comprehensive review of the literature and were created to extend upon the standardised measures used to address the research questions in the present study. The questions have been listed under the section they were incorporated within. Where questions were placed within an existing assessment measure, the researcher attempted to mimic the language and formatting of the extant measure as closely as possible. Questions were both quantitative and qualitative in design. The Qualtrics interface provided a platform for a variety of question formats, those adopted in the current study were multiple choice with a single answer response (e.g., Gender: male or female); multiple choice with a multiple answer response (e.g., “Where are your piercings: ear lobe, ear other..., nose, navel etc.”); dropdown lists (e.g., Country of birth); slider (e.g. the frequency of NSSI behaviours); matrix table (e.g. ISAS function scale); single line text entry (e.g., Ethnicity); multi line text entry (e.g., “Please describe any cosmetic procedures or surgeries”); and essay text box (e.g., “Please list any medications you are currently taking”). If the respondent answered negatively to a core question (e.g., “Do you have any piercings?”) skip logic was employed to automatically direct the participant to next core question (i.e., “Do you have any tattoos?”). As such all the linked questions (e.g., “How many piercings do you have?” “Where are your piercings?”) associated with that particular core question are skipped.



## Demographics

The Demographics Section lead the online survey package and was comprised of questions composed entirely by the researcher.

1. Gender

- Male
- Female

2. Date of Birth

3. Country of residence

4. Do you live (please tick all the boxes that apply to your current living situation)?

- alone
- with partner
- with parent(s)
- with siblings
- with children
- with housemates
- in a correctional facility
- in assisted living

5. What is the highest level of education you have completed?

- Primary / Elementary School
- Secondary / High School
- TAFE / Technical College
- Tertiary / University / College Degree
- Post Graduate Studies

6. Which of the following best describes your current employment status?

- Unemployed
- Full time
- Part time
- Casual
- Volunteer
- Home duties

7. Are you currently studying?
- Yes
  - No
8. Which of the following best describes you?
- Heterosexual
  - Gay
  - Lesbian
  - Bisexual
  - Asexual

### **Inventory of Statements about Self-Injury (ISAS)**

*The following questions are presented as the introduction to the ISAS:*

1. Do you have any piercings?
- Yes
  - No
- a) How many piercings do you have?
- b) Where are your piercings?
- Ear lobe
  - Ear other: helix, anti-helix (rook), tragus, conch, daigus etc.
  - Nose
  - Navel
  - Tongue
  - Eyebrow
  - Lip
  - Nipple
  - Genitals
  - Other: \_\_\_\_\_
2. Do you have any tattoos?
- Yes
  - No
- a.) How many tattoos do you have?
- b.) Where are your tattoos?

3. Do you have any other body modifications aside from the piercings and tattoos listed in the previous questions?

- Yes
- No

a.) Please describe any other body modifications

4. Have you had any cosmetic procedures or surgeries (i.e., collagen, botox, rhinoplasty)?

- Yes
- No

a.) Please describe

5. Have you EVER intentionally (i.e., on purpose) and without suicidal intent (i.e., not for suicidal reasons) harmed yourself?

- Yes
- No

*The following questions were embedded within the ISAS:*

1. How often do/did you self-harm?

- Never
- Once a Year or Less
- Several Times a Year
- Once a Month
- 2-3 Times a Month
- Once a Week
- 2-3 Times a Week
- 4-6 Times a Week
- Daily
- Several Times a Day

2. Have you ever needed professional medical attention for your wounds?

- Never
- Once a Year or Less
- Several Times a Year
- Once a Month
- 2-3 Times a Month
- Once a Week
- 2-3 Times a Week
- 4-6 Times a Week
- Daily
- Several Times a Day

3. Thinking back to before you started self-harming, had you seen, read or heard about people deliberately self-harming in:

- Movies
- TV Shows
- Television Journalism (e.g. News, Current Affairs, Entertainment)
- Music Videos
- Songs
- Books
- Newspapers
- Comics
- Poetry
- Web Sites
- Social Networking Sites (e.g. Facebook, My Space etc.)
- Chat Rooms
- Other \_\_\_\_\_

4. Do/did you have any routines, patterns or rituals associated with self-harming?

- Yes
- Maybe
- No

a.) Please describe these routines, patterns or rituals that are associated with your self-harming.

5. Before you started self-harming, did you know anyone else who engaged in self-harming behaviours?

- Yes
- Maybe
- No

a.) How many people do you know who self-harm?

### **Stressful Life Events Screening Questionnaire (SLESQ)**

1. Have you ever been diagnosed with a mental illness?

- Yes
- No

b.) At what age?

- c.) Please list the diagnosis [diagnoses] and the approximate date you were first diagnosed?
2. Have you ever been hospitalised for a mental health issue?
- Yes
  - No
- b.) How many times have you been hospitalised for a mental health issue?
3. Please list any medications you are currently taking.
4. Please list any medications you have been prescribed in the past for mental health reasons.
5. Has anyone in your family ever been diagnosed with a mental illness?
- Yes
  - No
- b.) Please list their relationship to you and the mental illness they were diagnosed with.
6. Has an immediate family member, romantic partner or very close friend attempted suicide?
- Yes
  - No
- b.) How old were you?
- c.) Who? (relationship to you)
- Mother
  - Father
  - Sibling
  - Grandparent
  - Relative (Aunt, Uncle, Cousin)
  - Husband / Wife
  - Partner
  - Friend
  - Stranger
  - Other \_\_\_\_\_

## **Appendix I**

Recruitment material

22 September 2011

Dear Karen,

Welcome to APS Matters, your fortnightly alert to the latest news and information from the APS.

Please note that any queries or comments relating to information in this edition of APS Matters should be directed to the APS Member Assistance Centre at [memberassistance@psychology.org.au](mailto:memberassistance@psychology.org.au). Please do not reply to this email as it is an unattended mailbox.

## 6. Research opportunities

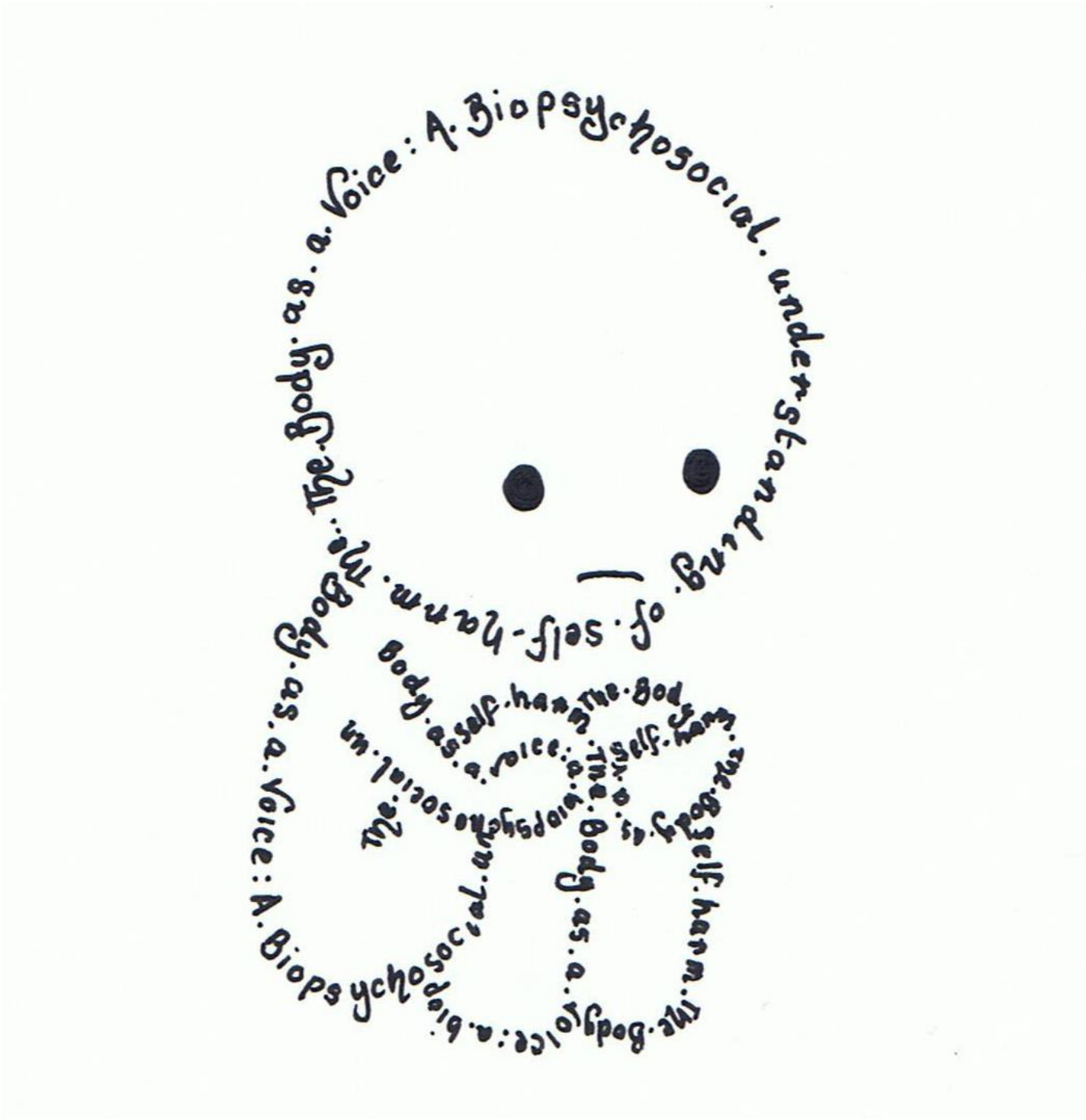
- **The body as a voice: A biopsychosocial understanding of deliberate self-harm**

We are inviting any practitioners (e.g., Psychologists, Social Workers, Counsellors, Psychiatrists, Youth Workers) working with individuals who deliberately self-harm to take part in this study, which aims to generate an understanding of deliberate self-harm within a subclinical population.

[View website](#)

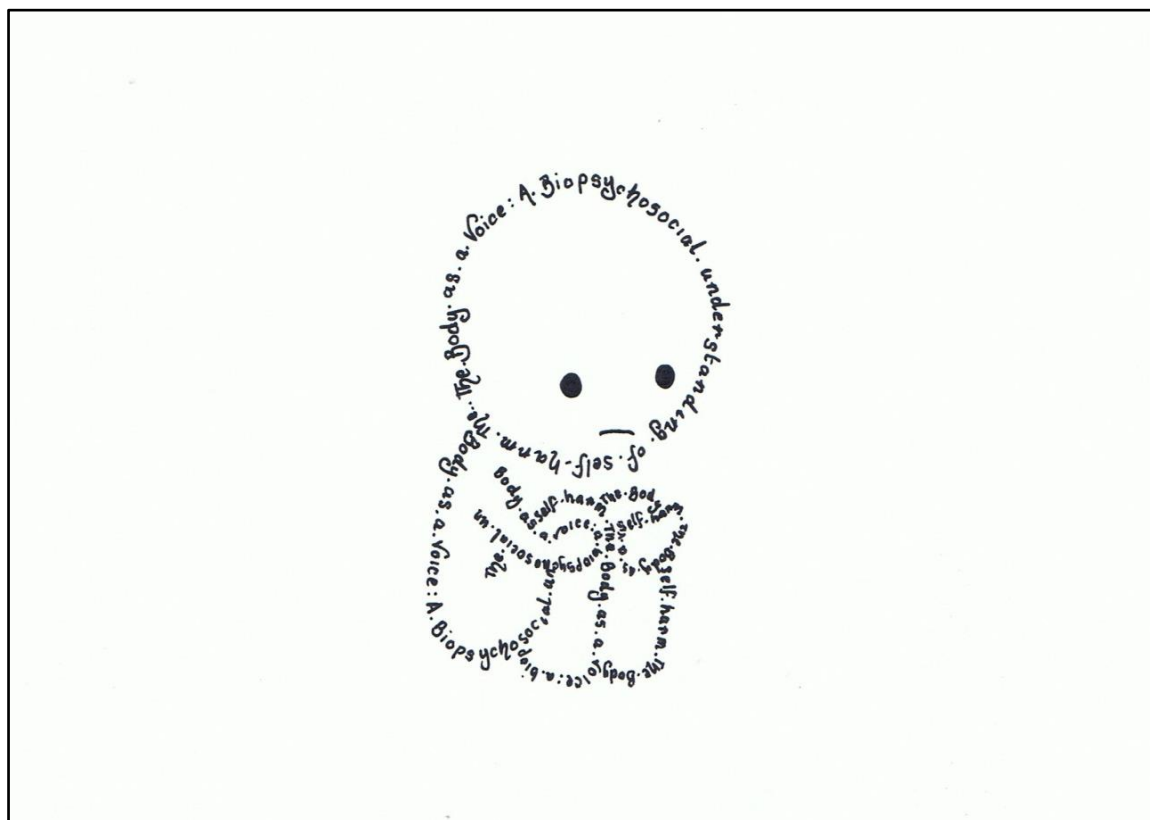
- **Practicum experiences of Australian post-graduate psychology students**

The practical aspects of post-graduate psychology training are an essential part of a students' growth as a psychologist, and so the practica that make up the post-graduate psychology degree are paramount to this process. [View website](#)





Appendix I3: Promotional postcard



**Online  
Research  
Study**



*The Body As A Voice: A Biopsychosocial Understanding of Self-Harm*

This study aims to explore what personal, psychological, social and relationship factors influence the commencement of self-harming behaviours.

- ★ Are you over 18 years of age?
  - ★ Would you like to help us learn more about the complex nature of self-harm?
  - ★ We are looking for participants to complete an anonymous online survey.
- We need people who:
- a) currently self-harm
  - b) used to self-harm
  - c) have *never* self-harmed.

For more information or to complete the survey, go to:  
[http://vuaehd.qualtrics.com/SE/?SID=SV\\_7OqtDc4F9baT0tm](http://vuaehd.qualtrics.com/SE/?SID=SV_7OqtDc4F9baT0tm)

This research study is being conducted by Madeline Wishart for her PhD at Victoria University (VU). The study is supervised by Associate Professor Adrian Fisher & Dr. Karen Hallam in the School of Psychology at VU.

Complete the survey & enter the draw to win one of 50 online iTunes vouchers valued at \$20 each.

✉ [madeline.wishart@live.vu.edu.au](mailto:madeline.wishart@live.vu.edu.au)  
<http://facebook.com/thebodyasavoice>

Participation in this research is entirely voluntary, & you may withdraw from the study at any time, for any reason, without penalty.





## THE BODY AS A VOICE

By Madeline Wishart

AAAAAARRRRGGGHHHHH! I just want to scream, S C R E A M! S C R E A M! But I can't scream, nope. I can't even yell. Mum (or worse Dad) would come running in asking "what's wrong? Are you OK?" No one understands. They just don't get it. How can I explain it, when I don't even understand. There's nothing REALLY wrong. I just can't seem to sort out all these thoughts. RRRRRR! My head hurts, it's too much, my head just feels all tangled up. I feel all tangled up. I try to distract myself by watching TV, but I just can't concentrate. There is only one thing that will make me feel better, only one thing will help, only one thing will stop all these thoughts and feelings. I don't want to do it. It's like an addiction. It's all I can think about, because I know it will instantly calm me down. My friends seem to cope with stuff ok, worse stuff even, why can't I? What's wrong with me? Why do I need to cut myself to feel better?

Many of us cope with our problems in ways that are risky or harmful to ourselves. Some drink or eat too much, smoke or drive too fast, gamble or make ourselves sick through overwork and stress. Self-harm, although more shocking, is very like these more socially acceptable forms of self-harm. Like drinking or over-exercising, hurting oneself sometimes provides an escape from intolerable emotional pain.

Self-harm may be viewed as a maladaptive way of coping. It is

typically not a failed suicide attempt. This is an important distinction because self-harm (particularly cutting) is often misunderstood as a failed attempt to kill oneself. However, self-harm rarely results in suicide. Whilst self-harm appears dangerous and destructive, it can actually be conceptualised as an attempt at self-healing or self-preservation.

Many adolescents experiment with self-harm and it is much more common than most people think. This is because self-harm is typically a very personal act conducted in private. It is not a manipulative or attention seeking behaviour. Individuals who self-harm often go to great lengths to hide their behaviour from family and friends, rarely disclosing their behaviour to others, or seeking psychological help or medical attention for their self-harm. Consequently, no one really knows how many people in our community are engaging in deliberate self-harm. Self-harm is not specific to any particular subcultures (e.g. Emo, Goth); people of all ages, genders, cultural backgrounds, religions, sexual

preferences, and educational levels engage in self-harm.

Some people may self-harm just once or twice. For others it can become an habitual response to any overwhelming situation. They might self-harm several times per day during difficult periods in their life. Therefore, it is important that the issue is addressed immediately. If you have been self-harming, please seek support and advice from your general practitioner who can refer you to a psychologist who can help. If you suspect a friend or family member has been self-harming, try to be supportive whilst not making any assumptions about why they are self-harming or what they need. It is important that you do not force them to stop self-harming before they have developed other ways of successfully coping with their emotional distress. Gently recommend they speak to a mental health professional about their self-harm.

*Madeline Wishart is conducting a study into deliberate self-harm for her PhD at Victoria University. She is inviting anyone aged between 18 and 40 years of age who deliberately self-harm (or who has a history of self-harm), and those who have never self-harmed, to take part in this online study.*

*Email Madeline Wishart at [madeline.wishart@live.vu.edu.au](mailto:madeline.wishart@live.vu.edu.au).*



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*Migdala House*  
25 Albert Street, Warragul

to participate in sports or other planned activities after school or weekends. Physical activity can also be incorporated into family outings such as family walks or bike rides, playing Frisbee or other games at the park or going to the local swimming pool.

Pets are also another excellent

## Free online course for older people to manage stress and anxiety

BEYONDBLUE, the national depression initiative and the eCentreClinic of Macquarie

University, NSW have teamed up to create Australia's first FREE online courses, to help older adults manage the symptoms of anxiety, stress and depression.

The two e-learning courses: *Managing your Mood* and *Managing Stress and Anxiety*, run for eight weeks and participants log onto the course three times a week via the internet.

A clinical psychologist contact participants every week by phone or email to guide them through the course.

Deputy CEO of Beyondblue Dr Nicole Highet, said less than half of all older Australians with depression and anxiety get the help they need for a range of reasons.

"The content of the course is tailored to the specific need of this age group, and there is a strong focus on supporting people while they learn practical skills to overcome their symptoms," says Dr Highet. "Depression and anxiety shouldn't be accepted as a normal part of ageing. It is important we work with older people so they can recognise the

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Ring for appointment

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Altona Meadows researcher explores the hurt

5 OCT 11 @ 07:00AM BY ANDRE AWADALLA

Researcher Madeline Wishart. Picture: DAVID SMITH

SELF-HARM may traditionally be a taboo subject, but one [REDACTED] researcher hopes to shed some light on the practice.

“I really want to find out why people start self-harming,” she said.

Ms Wishart said many people who

turned to hurting themselves did so as “a way of communicating their distress and emotional turmoil” when they found it difficult to express themselves verbally.

“It’s a hugely confronting behaviour and its prevalence is largely unknown,” she said.

People who self-harm or have self-harmed are sought, as well as those who do not self-harm.

<http://hobsons-bay-leader.whereilive.com.au/news/story/altona-meado...>

Madeline Wishart, with her Victoria University colleagues Associate Professor Adrian Fisher and Dr Karen Hallam, is conducting a study into why people harm themselves.

Ms Wishart said the literature on the subject was silent as to “what makes a person initially self-harm instead of doing something else”.

“It’s a way of hurting a part of themselves to keep the rest of themselves (feeling) alive,” Ms Wishart said.

But she said there had been little research published about why people hurt themselves rather than setting down another path.

Ms Wishart also said that there were no statistics about the number of people harming themselves because those presenting at emergency wards may only be “the tip of the iceberg”.

Ms Wishart and her research partners are seeking participants aged 18 to 40 for their study, which involves an anonymous online survey.

To take part, contact Ms Wishart at [madeline.wishart@live.vu.edu.au](mailto:madeline.wishart@live.vu.edu.au) or visit [this website](#). If you need help or someone to talk to, call Lifeline on 131 114 or Kids Helpline on 1800 551 800.

## Appendix I6: Star Newspaper Article

Self harm awareness study | St Albans... x +
madeline wish

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Star

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### Self harm awareness study

Posted on 28 February 2012.

By VANESSA CHIRCOP

THIS Thursday is Self-Injury Awareness Day and while it is recognised widely in the United Kingdom and parts of the United States, Australia is yet to mark it. Madeline Wishart would like to see this change. The PhD student at St Albans' Victoria University is researching why young people initially start self-harming for her 80,000 word thesis *The Body as a Voice: A Biopsychosocial Understanding of Self-Harm*.

"We're trying to gain an understanding of why people initially start self-harming – what makes them first pick up an implement and actually hurt themselves as opposed to using another coping mechanism," she said.

"We all cope in strange ways, some of us eat when we're stressed, some of us become gym junkies, some of us smoke or drink or take a pill but some of us self-harm ... particularly in adolescents it's quite prevalent."

The [redacted] resident and her PhD supervisor, Dr Karen Hallam, hope her research will help dispel some of the myths surrounding self-harm and give Australia a broader understanding of the behaviour.

"We're looking at a biopsychosocial, so we're looking with a broad angled lens at the whole area ... why people do it, why they continue to do it but also we're looking at what's helped them to stop, so we can aim to create an intervention that's more empirically sound."

Ms Wishart is surveying not just people who have self-harmed, but mental health practitioners and also those who have never self-harmed.

More than 700 people have already taken part in the survey.

"With Self-Injury Awareness Day, I thought this is a great opportunity to get this out there and dispel some

Madeline Wishart, front, and her supervisor Dr Karen Hallam hope her research will make a difference to the lives of some young people. 77317 Picture: DAMJAN JANEVSKI

Madeline Wishart, front, and her supervisor Dr Karen Hallam hope her research will make a difference to the lives of some young people. 77317 Picture: DAMJAN JANEVSKI

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Heroes saluted 29/04/2014

Sharks are circling 29/04/2014

## **Appendix J**

Social media employed in the recruitment

Appendix J1: *The body as a voice on Facebook*

The screenshot shows a Facebook page for "The Body As A Voice: An Understanding of Nonsuicidal Self-Injury". The page header includes the name and a search bar. The profile picture is a drawing of a person with text forming their body. The cover photo is a large image of many monarch butterflies flying against a blue sky. The page is viewed as a visitor, as indicated by a message at the top: "This is what your Page looks like to a visitor. Switch back to your view to manage this Page." The left sidebar contains navigation options: Home, About, Photos, Likes, Notes, Events, Posts, and a "Create a Page" button. The main content area features a "Featured for you" section with a post titled "Get in touch with The Body As A Voice: An Unde..." showing hands forming a heart shape with a rainbow projection. Below the post, it states "100% response rate" and "Typically replies within a day". To the right, there is a "Community" section with options to "Invite friends to like this Page" and "Online research survey into self-harm". Below that, it shows "243 Likes" and "243 people" who liked the page. The bottom right corner has a "Visitor Posts" section.

Appendix J2: *The body as a voice on Twitter*

**Body as a Voice**  
@bodyasavoice

Online research study examining the psychosocial aspects of nonsuicidal self-injury (NSSI). Debunking myths, dispelling stereotypes & creating awareness of NSSI

Melbourne, Australia  
facebook.com/thebodyasavoice  
Joined April 2012

145 Photos and videos

**TWEETS** 1,783   **FOLLOWING** 368   **FOLLOWERS** 216   **LIKES** 73   **LISTS** 5   **MOMENTS** 0

**Tweets**   Tweets & replies   Media

**Pinned Tweet**  
Body as a Voice @bodyasavoice - 25 Aug 2012

☀️ a HUGE thank you to all of you who participated in my research. I greatly appreciate your time, thoughts & feelings 🌈

THANK YOU

of all scars show, of all wounds heal, sometimes you can't always see the pain anyone feels.

**E BOLD OR ITALIC NEVER ARGUE.**

You Retweeted



Appendix J3: *The body as a voice on Pinterest*



# Body as a Voice



Melbourne, Australia / [facebook.com/thebodyasavoice](https://facebook.com/thebodyasavoice)

Online research study examining the biopsychosocial aspects of nonsuicidal self-injury (NSSI). Debunking myths, dispelling stereotypes & creating awareness of NSSI.

**3**  
boards

**145**  
Pins

**52**  
likes

**127**  
followers

**14**  
following



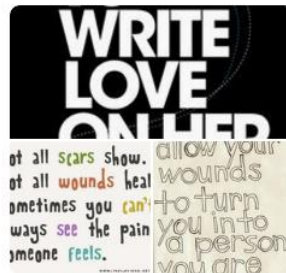
**Body as a Voice: PhD ...**  
3 Pins

Edit



**Inspirational Quotes**  
92 Pins

Edit



**Self-harm**  
42 Pins

Edit



Appendix J4: *The body as a voice on Instagram*



bodyasavoive Edit Profile ⋮

146 posts 74 followers 33 following

Body as a Voice Online research examining the psychosocial aspects of nonsuicidalself-injury. Debunking myths, dispelling stereotypes & creating awareness of NSSI [www.facebook.com/thebodyasavoive](http://www.facebook.com/thebodyasavoive)



## Appendix K

### Intentional Self-Harm Behaviours listed in the ICD-10-AM

Intentional Self-Harm Behaviours extracted from *Trends in hospitalised injury, Australia, 1999–00 to 2010–11* (Australian Institute of Health and Welfare: Pointer, 2013, pp. 93-94) listed in the *International statistical classification of diseases and related health problems, 10th revision, Australia modification (ICD-10-AM)*, range X60–X84 in Chapter XX External causes of morbidity and mortality.

- Intentional self-poisoning by and exposure to nonopioid analgesics, antipyretics and antirheumatics (X60)
- Intentional self-poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified (X61)
- Intentional self-poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified (X62)
- Intentional self-poisoning by and exposure to other drugs acting on the autonomic nervous system (X63)
- Intentional self-poisoning by and exposure to other and unspecified drugs, medicaments and biological substances (X64)
- Intentional self-poisoning by and exposure to alcohol (X65)
- Intentional self-poisoning by and exposure to organic solvents and halogenated hydrocarbons and their vapours (X66)

- Intentional self-poisoning by and exposure to other gases and vapours (X67)
- Intentional self-poisoning by and exposure to pesticides (X68)
- Intentional self-poisoning by and exposure to other and unspecified chemicals and noxious substances (X69)
- Intentional self-harm by hanging, strangulation and suffocation (X70)
- Intentional self-harm by drowning and submersion (X71)
- Intentional self-harm by handgun discharge (X72)
- Intentional self-harm by other and unspecified firearm discharge (X74)
- Intentional self-harm by explosive material (X75)
- Intentional self-harm by smoke, fire and flames (X76)
- Intentional self-harm by steam, hot vapours and hot objects (X77)
- Intentional self-harm by sharp object (X78)
- Intentional self-harm by blunt object (X79)
- Intentional self-harm by jumping from a high place (X80)
- Intentional self-harm by jumping or lying before moving object (X81)
- Intentional self-harm by crashing of motor vehicle (X82)
- Intentional self-harm by other specified means (X83)
- Intentional self-harm by unspecified means (X84).

## Appendix L

### The Evolution of The Nomenclature for NSSI in the Literature

The many varied terms below have been used inconsistently, and often synonymously in the scholarship for NSSI since Emerson first addressed the topic in 1914. However, many of these represent self-injurious behaviours that are either more focused (i.e., wrist cutting) or broad (i.e., DSH) in their application than our current understanding of NSSI. Nonsuicidal self-injury (NSSI) is defined as an intentional, self-inflicted and non-socially sanctioned behaviour, undertaken without suicidal intent, and resulting in low lethality tissue damage (American Psychiatric Association, 2013; Crawford, Geraghty, Street, & Simonoff, 2003; Favazza, 1996; Nock & Favazza, 2009; Walsh, 2006). The fundamental points of differentiation between these behaviours and NSSI have been listed in the table below.

Term (Abbreviation)	Points of Differentiation from NSSI	Citation
Self-mutilation (SM)	May delineate acts of major self-injury which result in greater tissue damage or severe physical injury of a more permanent nature (e.g., amputation, castration, enucleation). These acts typically occur with less frequency and are often associated with profound mental illness (i.e., schizophrenia spectrum disorders, other psychotic disorders). The term also has negative and pejorative connotations; and is potentially stigmatizing. May also include suicidal behaviours.	Andover, Pepper, & Gibb (2007) Bennum (1984) Briere & Gil (1998) Brodsky, Cloitre, & Dulit (1995) Dabrowski (1937) Emerson (1914) Favazza & Conterio (1988) Nock & Prinstein (2004) Offer & Barglow (1960) Podvoll (1969) Walsh & Rosen (1985) Winchel & Stanley (1991)

Term (Abbreviation)	Points of Differentiation from NSSI	Citation
“Accidental” self-injury	Highlights the recurrent nature of self-injury. Described minor injuries that could be perceived as typical childhood “accidents” (i.e., stubbed toes, skinned knees, cut fingers). However, they were self-inflicted and on a frequent (i.e., daily) basis. Also, included interference with wound healing.	Ackerman & Chidester (1936)
Focal suicide	Menninger used this as an overarching term to delineate a self-destructive impulse directed to a part of the body (i.e., self-castration, self-mutilation), rather than total destruction, as in suicide. Similarly, Rosen & Hoffman described the self-enucleation of two patients during psychotic episodes. As such, it was used interchangeably with self-mutilation to describe acts of major self-injury. May also include suicidal behaviours. The term is also associated with psychoanalytic theory.	Menninger (1938) Rosen & Hoffman (1972)
Self-inflicted injuries	The authors used this broad term to encompass suicide attempts; self-mutilation without conscious motive; and self-mutilation deliberately undertaken for conscious gain.	Battle & Pollitt (1964)
Wrist slashing	May include suicide attempts. Focuses only on one method (i.e., cutting) and one location (i.e., wrist); whereas NSSI may be enacted using multiple methods (e.g., burning, scratching, biting, carving etc.) in numerous locations on the body (e.g., thighs, stomach, chest etc.). The term “slashing” is also negative, pejorative and indicative of a label.	Graff (1967) Grunebaum & Klerman (1967)
Wrist cutting	May include suicide attempts. Focuses only on one method (i.e., cutting) and one location (i.e., wrist); whereas NSSI may be enacted using multiple methods (e.g., burning, scratching, biting, carving etc.) in numerous locations on the body (e.g., thighs, stomach, chest etc.).	Clendenin & Murphy (1971) Close (1974) Graff & Mallin (1967) Rosenthal, Rinzler, Wallsh, & Klausner (1972) Weissman (1975)

Term (Abbreviation)	Points of Differentiation from NSSI	Citation
Wrist scratching	Whilst the term implies only one method (i.e., cutting), Asch also discussed slashing and carving under this heading. Indicates only one location (i.e., wrist). The author specified that the act is nonsuicidal but this cannot be inferred from the term.	Asch (1971)
Self-cutting	May include suicide attempts. Focuses only on one method (i.e., cutting); whereas NSSI may be enacted using multiple methods (e.g., burning, scratching, biting, carving etc.).	Greenspan & Samuel (1989) Himber (1994) Malon & Berardi (1987) Novotny (1972) Suyemoto & MacDonald (1995) Walsh (2006)
Delicate self-cutting	Focuses only on one method (i.e., cutting); whereas NSSI may be enacted using multiple methods (e.g., burning, scratching, biting, carving etc.). Typically described very superficial incisions made on the wrist or forearms.	Pao (1969)
Repeated self-cutting	May include suicide attempts. Focuses only on one method (i.e., cutting); whereas NSSI may be enacted using multiple methods (e.g., burning, scratching, biting, carving etc.). Emphasises the repetitive and addictive quality of the behaviour.	Siomopoulos (1974)
Delicate self-mutilation	Cross used this term in same way Pao (1969) used “delicate self-cutting” to detail superficial, delicate, and repeated carefully made incisions typically to the wrist or forearm.	Cross (1993)
Self-destructive behaviour	May describe a far greater range of self-destructive behaviours than NSSI or DSH, and could include indirect methods, acts by omission, risk taking behaviours, and repetitious acts associated developmental or neuropsychological disorders. Could also incorporate suicidal behaviours.	Figuroa (1988) Firestone & Seiden (1990) Green (1978) Simpson (1980) Van der Kolk, Perry, & Herman (1991)

Term (Abbreviation)	Points of Differentiation from NSSI	Citation
Deliberate self-harm (DSH)	May describe a much broader range of self-injurious behaviours than NSSI, particularly indirect methods of self-harm and behaviours with ambiguous intent (i.e., ingesting non-ingestible substances or objects; exceeding prescribed dosage of medications; taking recreational or illicit drugs; jumping from a height). Therefore, may include suicide attempts. May not involve tissue damage. The term “deliberate” has negative connotations.	Allen (1995) Chapman, Gratz, & Brown (2006) Gratz (2001) Hawton et al., (1998) Hawton, Bergen, Mahadevan, Casey, & Simkin (2012) Klonsky, Oltmanns, & Turkheimer (2003) Morgan (1979) Morgan, Burns-Cox, Pocock, & Pottle (1975) Pattison and Kahan (1983)
Self-injury	May include suicidal behaviours and behaviours with ambiguous intent.	Burgess (1991) Connors (1996) Johnson, Ferrence, & Whitehead (1973) Johnstone (1995) Martin, Swannell, Hazell, Harrison, & Taylor (2010) Matthews (1968)
Repeated self-injury	May include suicidal behaviour. Emphasises the repetitive and addictive quality of the behaviour.	Crowe & Bunclark (2000) Tantam & Huband (2009)
Self-injurious behaviour (SIB)	May include suicidal behaviours and behaviours with ambiguous intent.	de Young (1982) Favazza (1990) Herpertz (1995) Muehlenkamp (2005) Winchel & Stanley (1991)
Parasuicide	The use of the prefix “para” indicates that the behaviour is ‘near’ or ‘relating to’ suicide, as such it is likely to include suicidal behaviours and behaviours with ambiguous intent.	Evans, Williams, O’Loughlin, & Howells (1992)
Self-wounding	Authors used this term to describe NSSI (e.g., cutting, slashing, hitting, burning). Despite specifying the lack of suicidal intent in the definition, the term does not clearly preclude suicidal behaviour.	Huband & Tantam (1999) Sharkey (2003) Tantam & Whittaker (1992)

Term (Abbreviation)	Points of Differentiation from NSSI	Citation
Nonsuicidal physically self-damaging acts	May describe a much broader range of self-injurious behaviours than NSSI, and acts of major self-injury (i.e., bone breaking).	Garrison, Addy, McKeown, Cuffe, Jackson, & Waller (1993)
Non-fatal deliberate self-harm	May describe a much broader range of self-injurious behaviours than NSSI. The term “deliberate” has negative connotations. The term “non-fatal” does not negate suicidal intent only the physical outcome.	Morgan, Jones, & Owen (1993) Osman & Ibrahim (1997)
Non-fatal self-harm	May describe a much broader range of self-injurious behaviours than NSSI. The term “non-fatal” does not negate suicidal intent only the physical outcome.	Bergen et al., (2012) Dear, Thomson, Hall, & Howells (2001)
Self-harm	May describe a much broader range of self-injurious behaviours than NSSI, particularly indirect methods of self-harm and behaviours with ambiguous intent. Could include suicide attempts. May not involve behaviours resulting in tissue damage.	Ennis, Barnes, Kennedy, & Trachtenberg (1989) Rosen & Heard (1995) Schwartz, Cohen, Hoffmann, & Meeks (1989) Stanley, Winchel, Molcho, Simeon, & Stanley (1992)
Self-injurious thoughts and behaviours (SITB)	A broad term that may delineate a range of behaviours and cognitions involving NSSI, self-harm or suicidality.	Nock, Holmberg, Photos, & Michel (2007) Nock, Prinstein, & Sterba (2010) Sonne, Rubey, Brady, Malcolm, & Morris (1996)
Direct self-injurious behaviour (D-SIB)	Encompasses a broader range of behaviours that involve directly inflicting damage to the surface of the skin, regardless of intent.	Brunner et al., (2013)



## Appendix M

### Process for Mental Illness Classification

The current study initially aimed to recruit a nonclinical sample of individuals both with and without a history of NSSI. However, a considerable percentage (42.3%,  $n = 547$ ) of the total sample disclosed a current or prior diagnosis of mental illness. A history of mental illness was assessed using the following four core questions devised by the researcher and embedded within the Stressful Life Events Screening Questionnaire (SLESQ):

1. Have you ever been diagnosed with a mental illness? (Yes/No).
  - a.) At what age? (dropdown list, 0 – 100).
  - b.) Please list the diagnosis and the approximate age you were first diagnosed? (The option for five separate diagnoses was provided in a qualitative text entry matrix table).
2. Have you ever been hospitalised for a mental health issue? (Yes/No).
  - a.) How many times have you been hospitalised for a mental health issue? (dropdown list, 0 – 100).
3. Please list any medications you are currently taking (text box).
4. Please list any medications you have been prescribed in the past for mental health reasons (text box).

After running a simple frequency analysis and ascertaining the significant number of participants who self-reported a mental illness, the researcher read through the qualitative responses to ensure that participants had not self-diagnosed and that their mental illness was within the DSM 5 classification. For example, one participant reported having Asperger's Syndrome but in the column asking for the age at diagnosis they stated they were self-diagnosed with the text "Self Dx", therefore this participant was recoded as *not* being diagnosed with a mental illness.

Participants' responses were recoded into a new yes/no dichotomous variable. In deciding whether to code a self-reported mental illness as a "yes" or "no" the researcher considered:

1. If the diagnosis was within the DSM 5 classification
  - a. If the diagnosis was not within the DSM 5 criteria, the participant was recoded as *not* having a mental illness.
2. Was the medication they had listed as being currently prescribed indicated for the mental illness/es they had disclosed?
  - a. If participants did not list any current medications, the researcher checked, firstly, if they had been prescribed any medications for mental health in the past. Secondly, the researcher examined if they had been hospitalised for a mental health issue. If they had not been hospitalised for mental health concerns, the participant was recoded as *not* having a mental illness.
  - b. If the medication listed was not indicated for the mental illness reported (i.e., the contraceptive pill, vitamin supplements), the participant was recoded as *not* having a mental illness.
3. Was the medication they had listed as being prescribed in the past indicated for the mental illness/es they had disclosed?
  - a. If participants did not list any past medications, the researcher examined if they had been hospitalised for a mental health issue. If they had not been hospitalised for mental health concerns, the participant was recoded as *not* having a mental illness.
  - b. If the medication listed was not indicated for the mental illness reported (i.e., analgesics, asthma medication), the participant was recoded as *not* having a mental illness.

All self-reported qualitative diagnoses were then entered under a new variable and another frequency analysis was run to examine the number of participants across the range of diagnoses. Categories were then created by diagnoses, and diagnoses with frequencies of 10 or greater were retained. However, the umbrella diagnostic label was employed for the purposes of this research unless the frequency was greater than 10 within any given domain. For example, Clinical depression, Major Depressive Disorder, and severe depression were all categorised as Depression. Those with less than 10 frequencies were collapsed under the category “Other” (Table M.1). In total, including the classification of “other”, 10 diagnostic categories were retained to reflect the mental health histories of the current sample (Table M.2).

Table M1: *Diagnoses by frequency in the “other” category for mental illness*

Diagnoses (self-reported)	Frequency
Adjustment Disorder	1
Agoraphobia	7
Antisocial Personality Disorder	3
Asperger’s or Autism	5
Avoidant Personality Disorder	2
Body Dysmorphic Disorder	2
Dependent Personality Disorder	1
Gender Identity Disorder	3
Oppositional Defiant Disorder	2
Personality Disorder (unspecified)	5
Psychosis	9
Receptive Language Disorder	1
Schizoaffective Disorder	4
Schizoid Personality Disorder	1
Schizophrenia	5
Substance Use Disorder	1

*Note.* 3 participants each self-reported two diagnoses within the “Other” category.

Table M2: *Descriptive statistics for mental illness of the entire sample (n = 1219)*

Diagnoses	<i>n</i>	<i>M</i>	<i>SD</i>	Skewness		Kurtosis	
				Statistic	Std. Error	Statistic	Std. Error
ADD/ADHD	21	.02	.130	7.430	.070	53.288	.140
Anxiety	210	.17	.378	1.738	.070	1.022	.140
Bipolar Disorder	83	.07	.252	3.433	.070	9.805	.140
BPD	94	.08	.267	3.174	.070	8.090	.140
Depression	450	.37	.483	.543	.070	-1.708	.140
DID	16	.01	.114	8.566	.070	71.499	.140
Eating Disorders	63	.05	.221	4.055	.070	14.468	.140
OCD	33	.03	.162	5.835	.070	32.104	.140
PTSD	86	.07	.256	3.358	.070	9.293	.140
Other	47	.04	.193	4.799	.070	21.068	.140

*Note.* ADD = Attention Deficit Disorder; ADHD = Attention Deficit Hyperactivity Disorder; BPD = Borderline Personality Disorder; DID = Dissociative Identity Disorder; OCD = Obsessive Compulsive Disorder; PTSD = Post Traumatic Stress Disorder

## Appendix N

The Inventory of Statements about Self-injury: A comparison across studies

ISAS function scales	My Study			Klonsky & Glenn (2009)			Kortge, Meade & Tennant (2013)		
	Mean	SD	$\alpha$	Mean	SD	$\alpha$	Mean	SD	$\alpha$
ISAS Total Scale	21.15	11.54	.90	14.3	13.3		26.24	9.90	
Intrapersonal	15.15	7.58	.95	8.5	7.0	.80	17.1	4.95	.54
Affect Regulation	4.36	1.96	.84	3.0	2.1	.69	5.20	1.16	.30
Anti-Dissociation	2.67	2.16	.84	1.0	1.6	.50	3.51	1.98	.48
Anti-Suicide	2.20	2.13	.89	0.8	1.5	.42	2.64	2.15	.34
Marking Distress	2.36	1.99	.77	1.5	1.8	.82	2.91	1.87	.38
Self-Punishment	3.55	2.22	.86	2.0	2.1	.84	4.31	1.82	.50
Interpersonal	6.01	5.80	.87	5.6	8.0	.88	6.56	6.88	.78
Autonomy	0.64	1.29	.81	0.6	1.3	.64	.89	1.41	.67
Interpersonal Boundaries	0.88	1.40	.76	0.8	1.4	.52	1.41	1.55	.40
Interpersonal Influence	0.87	1.31	.69	0.8	1.4	.54	1.09	1.46	.40
Peer-Bonding	0.11	0.51	.65	0.5	1.3	.98	.10	.49	.68
Revenge	0.45	1.05	.79	0.6	1.4	.53	.49	1.13	.63
Self-Care	1.44	1.68	.72	0.8	1.4	.41	1.93	1.66	.42*
Sensation-Seeking	0.59	1.08	.59	0.7	1.3	.87	.70	1.19	.813
Toughness	1.04	1.48	.75	1.0	1.4	.65	1.06	1.59	.62

*Note.* \*Loaded on the Intrapersonal scale here NOT Interpersonal

## Appendix O

Table O1: A Comparison of Coping Strategies by Sexual Orientation

<i>Coping strategies</i>	Heterosexual ( <i>n</i> = 984)		Bisexual ( <i>n</i> = 168)		Lesbian ( <i>n</i> = 65)		Gay ( <i>n</i> = 20)		Asexual ( <i>n</i> = 55)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Seek social support	53.52	28.77	49.64	27.49	48.62	26.03	60.50	30.08	51.55	30.48
Focus on solving the problem	59.44	29.33	55.71	28.58	53.63	27.77	63.75	30.84	56.02	31.14
Work hard	65.38	33.09	58.00	32.00	66.12	33.50	61.60	33.58	57.65	35.36
Worry	58.46	29.97	67.11	31.22	60.85	29.46	57.75	28.39	56.18	33.87
Improve relationships	41.42	24.90	42.59	24.92	39.54	23.04	41.75	26.96	34.73	25.50
Wishful thinking	48.80	26.61	54.49	28.16	46.46	26.48	53.00	28.44	48.27	28.02
Tension reduction	45.36	25.19	53.96	27.05	49.62	24.96	41.75	25.87	43.73	27.56
Social action	24.48	17.92	29.23	18.58	26.92	17.40	28.50	18.85	29.64	18.93
Ignore the problem	53.03	29.89	58.83	30.16	56.11	28.66	50.05	28.48	56.38	33.61
Self-blame	59.83	32.61	68.60	33.82	71.77	33.90	52.75	27.41	60.73	34.98
Keep to self	57.26	31.14	63.90	32.36	64.15	31.04	56.50	32.93	55.55	33.29
Seek spiritual support	34.32	27.73	28.33	23.74	27.68	20.83	28.00	22.37	35.25	31.13
Focus on the positive	49.13	26.62	41.99	25.28	38.62	22.26	48.75	28.51	42.73	26.72
Seek professional help	42.85	29.24	45.15	29.04	52.23	32.76	31.50	21.09	50.55	34.56
Seek relaxing diversions	58.77	28.53	56.88	29.91	54.46	26.22	63.00	29.39	53.73	29.97
Physical recreation	45.53	28.22	37.54	24.42	37.15	22.48	44.80	30.15	41.49	28.44
Protect self	46.92	23.98	48.01	23.93	41.00	21.96	47.75	23.03	43.55	26.83
Humour	48.80	29.11	50.21	29.37	45.66	29.57	59.15	31.75	50.53	31.27
Not cope	51.36	31.09	65.21	30.89	58.05	30.75	46.55	26.61	54.22	33.28

## **Appendix P**

### Correlational Analyses



Table P1: Spearman Rank Order Correlations Between NSSI, Gender and Sexual Orientation

Scale	1	2	3	4	5	6	7
1. NSSI	-						
2. Gender	.23**	-					
Sexual Orientation							
3. Heterosexual	-.20**	.02	-				
4. Gay	-.03	-.31**	-.22**	-			
5. Lesbian <sup>6</sup>	.11**	.09**	-.41**	-.03	-		
6. Bisexual <sup>7</sup>	.17**	.00	-.69**	-.05	-.09**	-	
7. Asexual	.04	.03	-.38**	-.03	-.05	-.08**	-

Note. \*\*  $p < .01$  (2-tailed).

Table P2: Pearson Product-Moment Correlations Between NSSI, Piercings, Tattoos, Body Modifications and Cosmetic Procedures

Scale	1	2	3	4	5
1. NSSI	-				
2. Number of Piercings	.20**	-			
3. Number of Tattoos <sup>8</sup>	.15**	.33**	-		
4. Number of Body Modifications	.07*	.20**	.15**	-	
5. Number of Cosmetic Procedures	-.03	.02	.05	-.01	-

Note. \*  $p < .05$ , \*\*  $p < .01$  (2-tailed).

<sup>6</sup> An arbitrary cut-off point of .20 was set for inclusion in the binary logistic regression. Despite attaining a significance of  $r = .15$ ,  $p < .01$ , a decision was made to include this variable in the analyses given its significant result in the chi-square analyses (Table 5).

<sup>7</sup> This variable also did not meet the cut-off point of .20, attaining a significance of  $r = .17$ ,  $p < .01$ , but was also retained in the binary logistic regression due to the significance in the chi-square analysis (Table 5).

<sup>8</sup> This variable was also run in the binary logistic regression due to the significance in the chi-square analysis.

Table P3: *Spearman Rank Order Correlations Between NSSI, Self-Esteem, Number of Diagnoses for Mental Illness and Family History of Mental Illness*

Scale	1	2	3	4	5
NSSI	-				
Self-Esteem	-.58**	-			
Number of Diagnoses for Mental Illness	.42**	-.44**	-		
Family History of Mental Illness <sup>9</sup>	.10**	-.10**	.28**	-	
Violent Crime Victimization	.28**	.28**	.34**	.25**	-

Note. \*\*  $p < .01$  (2-tailed).

<sup>9</sup> An arbitrary cut-off point of .20 was set for inclusion in the binary logistic regression. Despite attaining a significance of  $r = .10$ ,  $p < .01$ , a decision was made to include this variable in the analyses given its significant result in the chi-square analyses (Table 5).

Table P4: *Pearson Product-Moment Correlations Between NSSI and Attachment Subscales of the IPPA*

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14
15. NSSI	-													
Mother Attachment														
16.Total Attachment	-.38**	-												
17.Trust	-.33**	.95**	-											
18.Communication	-.36**	.94**	.83**	-										
19.Alienation	.39**	-.89**	-.78**	-.77**	-									
Father Attachment														
20.Total Attachment	-.36**	.50**	.44**	.49**	-.47**	-								
21.Trust	-.30**	.48**	.46**	.45**	-.42**	.95**	-							
22.Communication	-.35**	.44**	.37**	.48**	-.41**	.94**	.83**	-						
23.Alienation	.37**	-.42**	-.35**	-.39**	.49**	-.82**	-.67**	-.69**	-					
Peer Attachment														
24.Total Attachment	-.33**	.31**	.27**	.30**	-.32**	.29**	.27**	.27**	-.27**	-				
25.Trust	-.26**	.27**	.25**	.25**	-.26**	.25**	.25**	.22**	-.20**	.96**	-			
26.Communication	-.26**	.26**	.22**	.27**	-.23**	.24**	.23**	.24**	-.17**	.93**	.90**	-		
27.Alienation	.38**	-.32**	-.25**	-.28**	.41**	-.31**	-.25**	-.25**	.39**	-.72**	-.54**	-.50**	-	
28.Total Attachment	-.47**	.82**	.75**	.78**	-.75**	.81**	.77**	.74**	-.69**	.65**	.59**	.57**	-.56**	-

Note. \*\*  $p < .01$  (2-tailed).

Table P5: *Pearson Product-Moment Correlations Between NSSI and Coping Subscales of the CSA*

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
12. NSSI	-																			
13. Social support	-.26**	-																		
14. Problem solving	-.23**	.82**	-																	
15. Work hard	-.17**	.72**	.85**	-																
16. Worry	.10**	.60**	.64**	.62**	-															
17. Improve r/ships	-.22**	.75**	.76**	.66**	.54**	-														
18. Wishful thinking	-.06*	.61**	.68**	.61**	.78**	.60**	-													
19. Tension reduction	.14**	.56**	.56**	.55**	.77**	.52**	.69**	-												
20. Social action	-.14**	.66**	.68**	.58**	.52**	.65**	.55**	.50**	-											
21. Ignore problem	.16**	.44**	.52**	.53**	.74**	.44**	.71**	.69**	.45**	-										
22. Self-blame	.20**	.48**	.53**	.55**	.85**	.44**	.70**	.77**	.46**	.79**	-									
23. Keep to self	.20**	.35**	.53**	.57**	.76**	.39**	.67**	.69**	.42**	.82**	.83**	-								
24. Spiritual support	-.08**	.43**	.46**	.43**	.40**	.39**	.47**	.33**	.47**	.36**	.36**	.38**	-							
25. Focus positive	-.35**	.74**	.84**	.74**	.49**	.72**	.62**	.45**	.60**	.45**	.40**	.43**	.49**	-						
26. Seek profess. help	.10**	.53**	.51**	.47**	.58**	.42**	.44**	.51**	.55**	.49**	.57**	.48**	.36**	.39**	-					
27. Seek relaxation	-.24**	.86**	.84**	.75**	.63**	.75**	.67**	.59**	.63**	.55**	.54**	.50**	.46**	.81**	.51**	-				
28. Physical recreat.	-.25**	.61**	.68**	.67**	.43**	.59**	.47**	.37**	.52**	.40**	.37**	.40**	.39**	.68**	.37**	.70**	-			
29. Protect self	-.18**	.73**	.82**	.70**	.67**	.72**	.72**	.64**	.65**	.57**	.57**	.56**	.46**	.75**	.50**	.80**	.64**	-		
30. Humour	-.15**	.63**	.69**	.59**	.54**	.59**	.59**	.52**	.58**	.54**	.50**	.49**	.36**	.68**	.42**	.69**	.53**	.66**	-	
31. Not cope	.20**	.48**	.50**	.50**	.81**	.46**	.67**	.73**	.47**	.70**	.80**	.71**	.35**	.36**	.55**	.50**	.32**	.56**	.47**	-

Note. \*  $p < .05$ , \*\*  $p < .01$  (2-tailed).

Table P6: Spearman Rank Order Correlations Between NSSI and Violent Crime Victimization

Scale	1	2	3	4	5	6	7	8	9
1. NSSI	-								
2. Violent Crime Victimization	.28**	-							
3. Force/weapon in robbery	.01	.27**	-						
4. Sexual assault	.24**	.66**	.07**	-					
5. Attempted sexual assault	.19**	.54**	.07**	.37**	-				
6. Other sexual assault	.18**	.53**	.07**	.20**	.21**	-			
7. Child physical abuse	.13**	.55**	.14**	.25**	.20**	.17**	-		
8. Adult physical assault	.13**	.55**	.11**	.28**	.22**	.13**	.17**	-	
9. Threatened with a weapon	.06*	.36**	.12**	.17**	.14**	.13**	.18**	.23**	-

Note. \*  $p < .05$ , \*\*  $p < .01$  (2-tailed).

Table P7: Spearman Rank Order Correlations Between NSSI and Noncrime Traumatic Events

Scale	1	2	3	4	5	6	7	8
1. NSSI	-							
2. Noncrime Traumatic Events	.02	-						
3. Life threatening illness	-.02	.35**	-					
4. Life threatening accident	-.03	.43**	.07**	-				
5. accident, homicide, or suicide death of family	-.01	.60**	.06**	.11**	-			
6. Witnessed trauma	.04	.55**	.11**	.08**	.11**	-		
7. Other serious injury or threat to life	.01	.22**	.07**	.02	.00	.07*	-	
8. Other frightening or horrifying situation	.05	.44**	.02	.05*	.05	.16**	.07**	

Note. \*  $p < .05$ , \*\*  $p < .01$  (2-tailed).

## Appendix Q

Table Q1: *Multinomial Logistic Regression Analysis Predicting Time From Urge To Action*

Variable	B	S.E.	Wald	p	OR	95% C.I for OR	
						Lower	Upper
<b>&lt; 1 hour</b>							
Frequency	.18	.06	10.45	.001	1.20	1.07	1.34
Severity	-.18	.09	3.97	.046	.84	.70	.99
Pain	-.22	.19	1.27	.260	.80	.55	1.17
Intrapersonal Functions	.06	.02	8.43	.004	1.06	1.02	1.11
Interpersonal Functions	-.04	.02	3.85	.050	.96	.91	1.00
Desire to Stop	-.37	.29	1.55	.213	.69	.38	1.24
<b>1 - 3 hours</b>							
Frequency	.23	.06	13.70	< .001	1.26	1.11	1.42
Severity	-.17	.10	2.95	.086	.84	.69	1.02
Pain	-.19	.22	.73	.392	.83	.54	1.27
Intrapersonal Functions	.09	.02	15.65	< .001	1.10	1.05	1.15
Interpersonal Functions	-.06	.03	4.67	.031	.95	.90	.99
Desire to Stop	-.01	.34	.00	.971	.99	.51	1.92
<b>3 - 6 hours</b>							
Frequency	.14	.08	2.91	.088	1.15	.98	1.35
Severity	-.04	.13	.12	.728	.96	.35	1.12
Pain	-.46	.29	2.47	.116	.63	.89	2.81
Intrapersonal Functions	.08	.03	5.76	.016	1.08	1.01	1.15
Interpersonal Functions	-.06	.04	3.00	.083	.94	.87	1.01
Desire to Stop	-.78	.42	3.46	.063	.46	.20	1.04
<b>6 - 12 hours</b>							
Frequency	.16	.09	2.97	.085	1.18	.98	1.42
Severity	-.08	.14	.30	.584	.92	.70	1.22
Pain	-.57	.35	2.67	.102	.57	.29	1.12
Intrapersonal Functions	.14	.04	12.22	< .001	1.15	1.07	1.25
Interpersonal Functions	-.03	.04	.80	.370	.97	.90	1.04
Desire to Stop	-.41	.49	.68	.411	.67	.25	1.75
<b>12 - 24 hours</b>							
Frequency	.129	.09	1.75	.186	1.14	.94	1.38
Severity	-.10	.16	.42	.515	.90	.66	1.23
Pain	-.64	.34	3.56	.059	.52	.27	1.02
Intrapersonal Functions	.05	.04	1.85	.173	1.05	.98	1.13
Interpersonal Functions	-.04	.04	.93	.34	.96	.88	1.04
Desire to Stop	-.44	.51	.76	.383	.64	.24	1.74

Note. OR = Odds Ratio. C.I. = Confidence Interval.

## Appendix R

Table R1: *Exploratory Binary Logistic Regression to Predict Nonsuicidal Self-Injury*

Variable	<i>B</i>	<i>S.E.</i>	Wald	<i>p</i>	OR	95% CI for OR	
						Lower	Upper
Gender	.81	.28	8.09	.004	2.24	1.28	3.91
Sexual Orientation							
Heterosexual	-.39	.44	.80	.370	.67	.28	1.600
Bisexual	.29	.54	.28	.598	1.33	.46	3.87
Lesbian	.17	.75	.05	.821	1.19	.27	4.22
No. of Tattoos	.27	.07	14.33	> .001	1.31	1.14	1.51
No. of Piercings	.07	.04	2.59	.11	1.07	.98	1.16
No. of Mental Health Diagnoses	.46	.12	15.59	> .001	1.59	1.26	1.99
Family History of Mental Illness	.63	.19	10.22	.001	1.89	1.28	2.78
Self-esteem (RSE)	-.19	.02	60.59	> .001	.83	.79	.87
Violent Crime Victimization (SLESQ)	.31	.09	12.36	> .001	1.37	1.15	1.63
IPPA							
Father Trust	.06	.02	11.36	.001	1.06	1.02	1.09
Father Communication	-.05	.02	6.36	.012	.95	.91	.99
Father Alienation	.05	.02	3.25	.072	1.05	.99	1.10
Mother Trust	-.00	.02	.05	.822	.99	.96	1.03
Mother Communication	-.04	.02	4.46	.035	.96	.92	.99
Mother Alienation	-.04	.03	1.73	.189	.96	.89	1.02
Peer Trust	.04	.03	1.92	.166	1.04	.98	1.09
Peer Communication	-.07	.03	4.30	.038	.93	.87	.99
Peer Alienation	-.00	.03	.01	.936	.99	.95	1.05
CSA							
Social Support	-.02	.01	4.04	.044	.98	.97	1.00
Problem Focus	.03	.01	11.27	.001	1.03	1.01	1.04
Improve relationships	-.01	.01	1.57	.211	.99	.98	1.00
Tension Reduction	.02	.01	11.39	.001	1.02	1.01	1.03
Self-blame	-.02	.01	5.76	.016	.98	.97	.99
Keep to self	-.01	.01	2.38	.123	.99	.98	1.00
Focus on the Positive	-.04	.01	28.08	< .001	.96	.95	.98
Seek relaxation	.01	.01	2.67	.102	1.01	.99	1.03
Physical recreation	.00	.00	.99	.320	1.00	.99	1.01
Not cope	.01	.00	1.71	.191	1.01	.99	1.02

*Note.* CI = confidence interval. OR = odds ratio. RSE = Rosenberg Self-esteem Scale; SLESQ = Stressful Life Events Screening Questionnaire; IPPA = Inventory of Parent & Peer Attachment; CSA = Coping Scale for Adults.