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Personality and early maladaptive schemas differentiating persons who engage in infrequent versus pathological non-suicidal self-injury

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Personality and Early Maladaptive Schemas Differentiating Persons who Engage in

Infrequent versus Pathological Non-Suicidal Self-Injury

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Abstract

Non-suicidal self-injury (NSSI) is used as a coping mechanism for regulating emotions and communicating distress. Research has contributed to understanding the prevalence, forms, and functions of NSSI, but little is known about the characteristics that distinguish individuals who have a brief NSSI history from those who repetitively self-harm. One hundred and fifty-six nonclinical participants selected from a larger pool and matched on sex, age, and clinical status were classified into a non-pathological NSSI group (less than 10 NSSI incidents and less than 3 methods), a pathological NSSI group (10 or more NSSI incidents or 3 or more methods), and a control group (no history of NSSI). The groups were then compared on the Big Five Inventory (BFI) and the Early Maladaptive Schema Questionnaire – Short Form (EMSQ-SF), assessing personality and cognitive distortions, respectively. Compared to the control group, both NSSI groups scored lower in extraversion, agreeableness, and conscientiousness, and exhibited increased neuroticism. As well, after controlling for depressive symptoms, the two NSSI groups scored higher than the control group in nearly all of the cognitive distortions measured by the EMSQ-SF higher-order domains. Comparing the non-pathological and pathological NSSI groups, no significant differences were found for any of the personality factors or maladaptive schema domains. These findings suggest that individuals with a history of self-harm are predisposed to engaging in NSSI, but that variables other than dispositional traits sustain the behaviour. Implications for clinical practice are discussed.

Keywords: non-suicidal self-injury, personality, cognitive schema, depression

"For I know the plans I have for you," declares the Lord, "plans to prosper you and not to harm you; plans to give you hope and a future."

(Jeremiah 29:11)

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Introduction

Non-suicidal self-injury (NSSI) is the intentional destruction of body tissue without suicidal intent, used to cope with distress (Nock, 2009). The reported NSSI rate is increasing as research advances; more youths are engaging in NSSI, aging into adult cohorts and increasing the reported lifetime prevalence of self-harm across multiple generations. Consequently, healthcare services have begun to feel burdened under the weight of self-mutilators who exhaust emotional and financial resources (Hawton & Sinclair, 2003; Shahid, Khan, Naqvi, & Razzak, 2008; Thompson, Powis, & Carradice, 2008).

Patients presented to healthcare professionals following an intentional act of self-harm are likely to injure themselves again (Haw, Bergen, Casey, & Hawton, 2007; Nock et al., 2006). Often individuals will escalate in severity of inflicted injuries (Farber, 2003; Nixon, Cloutier, & Aggarwal, 2002), coming into contact with multiple healthcare professionals (Allen, 1995) and increasing their risk for eventually committing suicide (Owens, Horrocks, & House, 2002; Nock et al., 2006; Zahl & Hawton, 2004). Working with patients who frequently self-harm increases the stress experienced by healthcare workers who struggle to understand and treat the behaviour (Thompson, Powis, & Carradice, 2008). The healthcare system would therefore benefit from knowing what sustains self-injurious behaviours, and what differentiates those who have self-harmed once or twice from those who become reliant on self-harm to cope with daily stressors.

Nock's (2009) model of the development and maintenance of NSSI proposed that distal risk factors (e.g., childhood maltreatment) lead to individual vulnerabilities (e.g., high aversive emotions) and to interpersonal vulnerabilities (e.g., poor communication skills), which then mediate stress responses (e.g., over-arousal) that are managed by the reinforcing functions of self-injury. Using this model, it can be argued that the more pervasive the initial risk factors the

greater the likelihood an individual will choose NSSI as a preferred method of coping. Previous research has reported evidence for this hypothesis. Repetitive self-harm is associated with the simultaneous presence of multiple distal risk factors (Velez, 2007), including physical and sexual abuse, insecure attachments, neglect, and prolonged childhood separation from caregivers (Gratz, Conrad, & Roemer, 2002). As well, those who report more psychopathological symptoms (e.g., personality disorders, disordered eating, anxiety, depression, etc.) practice NSSI more frequently (Klonsky, Oltmanns, & Turkheimer, 2003; Nock, Prinstein, & Sterba, 2009; Stanford & Jones, 2009), with a tendency to dissociate emerging as one of the most salient risk factors for repetitive self-injury (Gratz, 2002). However, non-psychiatric vulnerabilities predicting the frequent practice of NSSI have been less studied.

Initial research has found that individuals who engage in repetitive NSSI are prone to appraising distressing events more negatively than those who self-harm infrequently, and are also more likely to perceive the consequences of self-injury as rewarding (Brain, Hanies, and Williams, 2002). Preliminary investigations with personality have been able distinguish individuals who self-injure from normal populations (Brown, 2009; Goldstein, Flett, Wekerle, & Wall, 2009), but there is a scarcity of research differentiating repetitive self-harmers from those with a limited history of employing self-injury to cope with stress. Further investigation may elucidate whether an overall difference in individual characteristics (e.g., perceptions, cognitions, etc.) mediates between stressors, the initial episode of self-injury, and the decision to frequently use self-harm as a coping technique for managing distress. Such knowledge would advance the understanding of the functions and maintenance of self-injurious behaviour, and better inform clinicians on how to treat individuals who repetitively self-harm.

Historical Conceptions: Non-Suicidal Self-Injury

Intentional self-injury can range in severity from skin-picking, nail scratching, and self-hitting, to self-starvation, flesh gouging, and poison ingestion (Bell, 1985; Gratz, 2001; Walsh, 2006). Although society's perception of self-injury is invariably influenced by its zeitgeist, self-harm has consistently been associated with intense affective states, such as sadness, anger, profound emptiness, as well as ecstatic jubilation (Favazza, 1996). Most acts of self-injury contain a personal meaning that is as varied as the methods used. However, both anthropological and early clinical interpretations have noted recurrent themes, associating self-harming behaviour with spiritual and/or sexually-related motivations (Farber, 2003; Favazza, 1989; Favazza, 1996). Such conceptualizations have evolved and paved the way for research on the risk factors and functions of self-injury, integrating historical observations with contemporary scientific methodology.

Historically and cross-culturally, self-mutilative acts have been endorsed in the context of religious fervour. Some of the earliest records of self-harm are found in the Christian bible, where individuals, as a display of devotion to their pagan gods, would cut their bodies with swords and spears (1 Kings 18:26-28). In the age of the Roman Empire, men annually lamented the death of the Greek god, Attis, by slashing their bodies with blades and performing self-castrations (Frazer, 1994). In the 13th and 14th centuries, Christian flagellants would starve themselves and wound their flesh in consecration to the Will of God (Bell, 1985). Natives of the Tongan Islands have been observed to mutilate their bodies to appease their gods on behalf of an ailing loved one (Collocott, 1921), and some modern day Shiites embrace the day of Muharrum by engaging in self-flagellation (Heinz, 2007).

Sacrificing the body to redeem the soul is a concept inextricably entwined with the evolution of humanity (Farber, 2003). It was traditionally viewed as a sign of virtue; devout individuals who participated in such practices were revered as holy entities unto themselves (Bell, 1985; Frazer, 1994; Novotny, 1972). Indeed, nearly every religious tradition possesses, at its core, iconic figures – saints and martyrs – who deliberately mortified and injured themselves, transcending mortal states to reach an ascetic ideal (Farber, 2003; Favazza, 1996). Exemplifying this concept is the poignant image of Christ spilling his blood to atone for the sins of humankind. Further, the Christian bible requires that "nearly everything be cleansed in blood… without the shedding of blood there is no forgiveness" (Hebrews 9:22). Blood is a substance richly symbolic of the balance between life and death; the individual who controls its flow has in essence assumed a position of power akin to God. This sentiment persists in modern eras as individuals continue to relish the power gained by controlling their mortal needs; some open their veins to invoke redemptive cleansing (Strong, 1998), while others become "impossible sprite[s]" surviving on "air, on water, and on purity," (Harrison, 1997, p. 41). Such individuals have been referred to by Farber (2003) as destructive narcissists, whose existences fragment into two distinct identities – one as the contemptible and fragile self, and the other worthy of saintly distinction.

Related to spirituality, sexuality has been theorized to influence an individual's behaviour, including those manifested through deliberate self-injury. Notions of both spiritual and sexual identity were foundational to the psychoanalytic conceptualization of self-harm during an era when Freudian theory dominated the field of psychology (Favazza, 1989). Penetrating the dermis with foreign objects symbolized the subconscious fear of penetration by one's own father (Novotny, 1972), and gratified the libidinal instinct (Storr, 1968). Self-

mutilation also served as penance for the sexual urges experienced by the individual who perceived such primitive proclivities as sinful indulgences. As well, psychodynamic theorists globally interpreted self-injury as a manifestation of the death instinct, an act expressing the individual's innate desires to kill, be killed, and die. When these instincts overwhelmed the individual's drive for survival, he/she became susceptible to experiencing partial and/or complete self-destruction (Menninger, 1966).

As religious reign and societal superstitions yielded to scientific inquiry in the 19th century, public perception of self-harm began to associate the behaviour with severe mental illness. Early classifications of several psychiatric disorders, including borderline personality disorder (BPD), dissociative identity disorder (formerly multiple personality disorder), and factitious disorder with physical symptoms started listing self-injury as a diagnostic criterion (American Psychiatric Association, 1987). Medical records also reported substantially higher rates of self-mutilation in patients with mental retardation (Fernald, 1976), as well as schizophrenia (Ananth, Kaplan, & Lin, 1984), depression (Morgan, Burns-Cox, Pocock, & Pottle, 1975), and other psychiatric conditions (Favazza, 1996; Winchel & Stanley, 1991); however, initial estimates of self-injury in the general population were believed to be less than 1% (Favazza & Conterio, 1988). These estimates steadily increased as both clinical and public awareness of self-harm practices also increased. Recently, studies examining academic populations report that upwards of half of their samples endorse a lifetime history of self-injury (Hasking, Momeni, Swannell, & Chia, 2008; Hilt, Cha, & Nolen-Hoeksema, 2008; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Williams & Hasking, 2010), suggesting the social stigma has become considerably less pervasive. Consequently, the current zeitgeist has permitted a more holistic approach to exploring individual practices of self-injury and

conceptualizing multiple syndromes, one of which has garnered considerable attention in the last decade.

Modern Conceptualizations: Non-Suicidal Self-Injury

A century of observations and research has facilitated the classification of several disorders characterized by self-injurious behaviour. These include organic disorders and pathological disturbances in eating, as well as compulsive hair-pulling and sexual masochism (American Psychiatric Association, 2000). As both research and interventions advanced, a pattern of self-harming behaviour emerged that could not be adequately described by previous conceptualizations. This pattern was eventually referred to as the deliberate self-harm syndrome (Pattison & Kahan, 1983), then as non-suicidal self-injury (NSSI; Wilkinson & Goodyer, 2011), and conceptualized as a coping mechanism for regulating emotions and communicating distress. Pattison and Kahan (1983) first described this syndrome as having a pattern of onset in adolescence, with multiple episodes of low-lethality harm inflicted on the body, and the behaviour enduring at least several years. Three decades later, diagnostic criteria have been proposed for inclusion in the 5th edition of the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-V; Wilkinson & Goodyer, 2011), and a breadth of scientific literature now exists to enlighten the prevalence, forms, functions, and risk factors of this maladaptive coping technique.

Prevalence and methods. Lifetime history of NSSI is reported to range from 4% (Klonksy, Oltmanns, & Turkheimer 2003) to 65.9% (Lundh, Karim, & Quilisch, 2007). Estimates are often considerably higher in adolescent than adult populations, suggesting that either rates of NSSI have increased in younger generations or that adults are less willing to admit a history of self-harm (Nock, 2009). The frequency of self-harm is especially high among

youths identifying with Goth subculture, with 53% reported having engaged in the behaviour at least once (Young, Sweeting, & West, 2006). Prevalence estimates for repetitive NSSI have been reported as high as 29% in the community (Gratz, 2001) and 43% for clinical populations (Kripalani, Badanapuram, Gash, & Morris, 2007).

Some studies specify a wide range of inflicted traumas ranging from skin picking or interfering with wound healing, to cutting or burning the skin and breaking bones (Gratz, 2001); others restrict the definitions of self-harm to either self-injury or poisoning (Hawton & Harriss, 2008a). The most often reported method of NSSI is self-cutting (Gratz, 2001; Laye-Gindhu & Schonert-Reichl, 2005; Madge et al., 2008), but research has also found high rates of self-poisoning (Chen et al., 2010), hitting (Laye-Gindhu & Schonert-Reichl, 2005) and biting (Borrill, Fox, Flynn, & Roger, 2009; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007).

Self-harm does not vary as a function of ethnicity or socioeconomic status (Gratz, Conrad, & Roemer, 2002; Hilt, Nock, Lloyd-Richardson, & Prinstein, 2008). Some research reports that females are more likely than males to have a history of NSSI (Evans, Hawton, & Rodham, 2005; Laukkanen et al., 2009; Madge et al., 2008; Ross & Heath, 2002; Plener et al., 2009), while others find no sex difference (Borrill, Fox, Flynn, & Roger, 2009; Gratz, 2001; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Marchetto, 2006). The reported discrepancy in gender ratio may be a characteristic of the selected samples, the definition of self-harm, or the timeframe participants were asked to recall specific self-harming behaviours (e.g., lifetime versus previous year). Hawton and Harriss (2008b) found that the gender ratio of self-harm shifted with age, with females reported to be eight times more likely to engage in self-harm between the ages of 10 and 14 years, and the ratio difference becoming almost imperceptible after the age of 50. Compared to females, males are more likely to self-harm under the influence

of drugs or alcohol (Madge et al., 2008) and are at a greater risk for eventually committing suicide (Hawton & Harriss, 2008a; Zahl & Hawton, 2004).

Functions. Research has vastly contributed to understanding the functions of NSSI. Self-injury modulates emotions (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007) and sensory input, (Sandman, Touchette, & Lenjavi, 2003), relieves dissociative states (Matter, 2008; Zlotnick et al., 1996), regulates and controls undesirable personal qualities (Maitland, 1987; Favazza, 1996), communicates personal struggles to the social environment, and serves as a form of social control (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007). Each paradigm of research in psychology has contributed important conceptualizations of the functional characteristics of self-harm. The synthesis of these findings reveals the multifaceted function of NSSI behaviour as the individual struggles to cope with, and adapt to, his/her intra- and interpersonal environments (Suyemoto, 1998).

Modulating emotion. Among the reasons cited for engaging in NSSI, the modulation of affect emerges as the most endorsed response for both clinical and non-clinical samples (Kleindienst et al., 2008; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Madge et al., 2008; Nixon, Cloutier, & Aggarwal, 2002; Nock, Prinstein, & Sterba, 2009; Scoliers et al., 2009; Young, van Beinum, Sweeting, & West, 2007). Individuals describe an emotional lucidity following an act of self-injury, where previously overwhelming emotions are either assuaged or a sense of euphoria is induced (Nixon, Cloutier, & Aggarwal, 2002; Strong, 1998). Supporting this anecdotal evidence, neurophysiological processes have been shown to alter following an episode of NSSI. Haines, Williams, Brain, and Wilson (1995) found that, compared to an accidental injury or act of aggression, visualizing a personal experience with self-mutilation resulted in significantly reduced heart rate and skin resistance in prisoners with a history of self-

harm. This conditioned response highlights research reporting that opioids are released following the application of painful stimuli, creating an analgesic effect to the perception of pain (Sandman, Touchette, & Lenjavi, 2003; Willer, Dehen, & Cambier, 1981). In addition, studies have found that administering opioid antagonists significantly reduces self-injurious behaviour in clinical populations (Ricketts, Ellis, Singh, & Singh, 1993; Sandman, Hetrick, Taylor, & Chicz-DeMet, 1997). These findings suggest that the release of endogenous opiates in response to NSSI contributes to the reinforcing properties of NSSI, and that self-harm can effectively regulate stress-induced physiological arousal.

A specific affect prevalent in the NSSI literature describes an intolerable state of anger, which is mollified by self-harm (Allan, 1995; Briere & Gil, 1998; Claes, Vandereycken, & Vertommen, 2003). Polman (2011) conducted a series of studies and found that individuals induced to feel anger rated painful activities as significantly more desirable, generated more pain-related words, and were more likely to self-administer painful electric shocks. He also found that trait anger significantly predicted both a desire for painful experiences and a history of NSSI. Menninger (1966) suggested that one's body can act as a replacement when aggressive impulses toward another are not feasible/inhibited (e.g., by societal laws or fear of retaliation); instead, the individual's own body becomes the object of his/her displaced aggression. Once the act of aggression is fulfilled, the individual's psychophysiological tension is returned to a state of calm.

Sensory regulation and psychic pain. The subjective experience of pain is reported to exhibit "peak end-rule" phenomena (Kahneman, 2003), where the quality of pain remembered is a function of both the peak intensity and the final stage of stimulus application. As an example, participants will prefer a more intensely painful or prolonged stimulus over a less painful one, as

long as the intensity is mildly reduced near the end of the trial (Kahneman, Fredrickson, Schreiber, & Redelmeier, 1993; Schreiber & Kahneman, 2000). This pattern of stimuli application produces an amnesic effect on the overall memory of pain. Such phenomena offer therapeutic properties for the individual experiencing tremendous psychic pain; he/she can deliberately inflict a less threatening injury for the mind to process and store in its place (Korner, Gerull, Stevenson, & Meares, 2007). Even when intense negative affect does not precede an act of self-harm, painful stimulation has been endorsed as an enjoyable/preferred experience in certain contexts. The "peak" characteristic of cumulative memory indicates that perceived extremes within experiences – sensations, emotions, etc. – become the qualities that are encoded into memory (Fredrickson & Kahneman, 1993; Redelmeier & Kahneman, 1996). These salient properties are what create the personal and emotive qualities of episodic memories, allowing an individual to feel that he/she has lived and is, indeed, alive. Such notions would explain the choice to engage in NSSI out of boredom (Laye-Gindhu & Schonert-Reichl, 2005), to 'get a kick' (Kleindienst et al., 2008), or simply to feel something (Lloyd, 1998; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007), and also why those with severe identity disturbances would use NSSI to prove or solidify their existence (Strong, 1998).

Reintegrating the self. A dissociative state is experienced when an individual's consciousness, memory, identity, or perception of the environment is disrupted (APA, 2000). Pathological dissociation can create extended lapses in memory, veil everyday experiences in a dreamlike haze, cause body parts to feel foreign, or create an emotional numbness that leaves the individual unable to connect to his/her self or the physical world. Without the ability to maintain stable emotional connections to personal experiences, a person's identity becomes transient. In this state, individuals may embrace NSSI as a means of re-establishing a sense of reality or

tangibility. While studies on the functions of NSSI often report a significant positive relation between dissociative tendencies and the practice of NSSI (Gratz, 2002; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Matter, 2008; Zlotnick et al., 1996), the most compelling evidence emerges from qualitative descriptions by patients (Miller & Bashkin, 1974), interviewees (Strong, 1998), and personal memoirs (Harrison, 1997). Some express an inability to think and feel at the same time (Strong, 1998), while others confess to obsessing over their reflections in mirrors, afraid their physical presence would evaporate like steam (Harrison, 1997). Although not all persons report experiencing pain during self-injury (Nock et al., 2006; Lloyd, 1998; Russ et al., 1996), the stark and shocking sight of their own blood ensures those who self-harm that they tangibly exist (Strong, 1998). The resulting scars preserve a corporeal memory of events too traumatic for the mind to process (Miller & Bashkin, 1974), serving as a "physiological and psychological mortar that holds flesh and spirit together when a difficult world threatens to tear both apart" (Favazza, 1996, p. 322-323). The symbolic process and consequences of NSSI allow an individual with a fragmented identity to reintegrate his/her mind, body, and soul, if only for a brief period in time.

   Self-control and punishment. Punishment and control are frequent themes in the NSSI literature (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Nock & Prinstein, 2004), conveyed in some of the earliest records and conceptualizations of self-harm. Historically, many individuals have both mortified and mutilated their bodies to invoke redemption, some canonized for their religious devotion and staunch control over appetites of the flesh (Bell, 1985; Maitland, 1987). Modern anecdotal evidence still reflects a need for purging of "bad blood" (Favazza, 1996; Strong, 1998) and perfectionism, a construct which has emerged as a moderator between depression, acute stress, and NSSI (O'Connor, Rasmussen, & Hawton, 2010). A sense of

helplessness, or a pathological need to achieve unrealistic ideals, can lead an individual to self-harm as a means of controlling/suppressing his/her biological and emotional needs. This concept is particularly salient when one considers the average age in which individuals first embrace NSSI. The onset of puberty initiates a whirlwind of bodily transformations, and is also the period when self-harm typically begins (Nock & Prinstein, 2004). Individuals may feel discomforted at the sudden loss of control over their bodies, and it has been questioned whether the control of bleeding through self-injury compensates for an inability to control menstruation (Strong, 1998). Puberty is also a period when social expectations change; adolescents may not feel apt to fulfill those expectations and become self-conscious or ruminate, punishing themselves as the perceived source of their frustrations. Finally, those who self-harm, and practice suppressing other primitive desires, may experience pride in their abilities to transcend societal standards (Favazza, 1989), much like the saints who characterize the ascetic ideals of righteousness and purity (Farber, 2003). Such notions may be particularly appealing for those who have been victimized by humankind's capacity for evil.

Communication and social reinforcement. A large component of interpersonal communication involves processing symbolic information, such as words, pictures, and gestures. However, a concept can be so unspeakable that the individual has no reference for which it could be understood (Van der Kolk, 1994) or conveyed (Caruth, 1995); or attempts are made to communicate personal struggles but the efforts are undermined by unsympathetic responses. Self-inflicted injuries can express the gravity of an individual's suffering, acting as a bright red scream (Strong, 1998) when words were previously silenced, or communicating distress when tears no longer form. Such gestures can elicit much needed attention or nurturance from the environment (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007), or purpose as emotional

blackmail (Favazza, 1989). Other motivations include avoiding specific social experiences (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007), discouraging victimization by appearing tough (Nock, 2008), and ingratiating an individual with a particular group of peers (Young, Sweeting, & West, 2006; Nock, 2009). Ultimately, socially-oriented functions encompass an individual's desire to manage, communicate to, and be accepted by, others in his/her social environment.

Summary of functions. Self-harm both influences and regulates an individual's emotions, sensory processing, identity, and social environment. From a holistic perspective, NSSI "touches upon the very profound human experiences of salvation, healing, and orderliness" (Favazza, 1996, p. xix), helping individuals to cope in a world that seems chaotic and unkind. As these functions allude, risk factors for NSSI include both inter- and intrapersonal vulnerabilities, many of which begin to take shape in early childhood.

Interpersonal risk factors. While quantitative research reports that NSSI assuages negative affect, personal descriptions often describe the sensation of warm blood as soothing, like a comforting blanket (Strong, 1998). Psychoanalysts have likened the effect to a mother-substitute (Kafka, 1969) similar to the cheesecloth cylinders Harlow and Zimmerman's (1959) rhesus monkeys clung to after they were removed from their mothers at birth. In the prolonged absence of a secure mother-object (e.g., actual mother or terry cloth surrogate), these monkeys developed persistently erratic and self-injurious behaviour. Such animal models provided early evidence of the importance of caretaker-infant relationships in the cognitive and social development of a child.

Retrospective studies with human populations have found that physical and emotional neglect, as well as prolonged separation from a primary caretaker in infancy, are significantly

and positively related to NSSI (Gratz, 2002; Van der Kolk, Perry, & Herman, 1991). They also report a positive relation to child abuse (Gratz, 2003), with sexual abuse as one of the most reliable predictors of self-injurious behaviour (Boudewyn & Liem; Fliege, Lee, Grimm, & Klapp, 2009; Gratz, 2003; Van der Kolk, Perry, & Herman, 1991). As well, a history of painful medical procedures is related to self-injury (Favazza, 1996; Strong, 1998), as is prolonged exposure to invalidating social environments (Nock, 2008; Sim et al., 2009). Such experiences during critical periods of development pathologically alter a child's cognitions and perceptions. Love and pain (physical or psychological) become interchangeable concepts, where the individual embraces self-inflicted pain as a distorted expression of comfort or love (Farber, 2003). This may be what was modeled by the abusive "love" of caregivers who did not protect the child, a form of self-stimulation in the absence of a consistent caretaker, or the consequence of desired, yet painful, physical contact during the course of medical interventions. Peer victimization also poses a risk of NSSI for children (Barker et al., 2008), causing some to feel unsafe and isolated from the support of others; however, the negative impact of bullying is buffered by authoritative parenting (Hay & Meldrum, 2010). Each of these risk factors is an assault to the child/adolescent's development and expression of identity, predisposing him/her to mental health disturbances later in life.

Intrapersonal risk factors. Individual variables comprise various intrinsic vulnerabilities; these include poor skills in problem solving and interpersonal communication, a persistently heightened state of physiological arousal, and low distress tolerance (Nock & Mendes, 2008). Self-harm also significantly and positively predicts maladaptive dispositional traits, such as temperament and/or personality (Baetens et al., 2011; Brown, 2009; Goldstein, Flett, Wekerle, & Wall, 2009), coping strategies (Evans, Hawton, & Rodham, 2005; Sarno,

Madeddu, & Gratz, 2010), and increased emotional reactivity (Nock, Wedig, Holmberg, & Hooley, 2008). These risk factors are shared with disorders that are highly co-morbid with NSSI behaviour, like depression (Darche, 1990), eating disorders (Farber, 1997; Sansone & Levitt, 2002), borderline personality disorder (Linehan, 1993), post-traumatic stress (PTSD; Dyer et al., 2009) and alexithymia (Borrill, Fox, Flynn, & Roger, 2009; Zlotnick et al., 1996). Overall, NSSI is significantly associated with psychopathological disturbances; the greater the disturbance, the greater the likelihood of participating in severe and persistent self-injury.

Personality

An individual's personality manifests as a constellation of interacting attributes, including perceptions and cognitions, affectivity, behaviour, and ways of relating to the self and others. The product of this interaction is a relatively stable disposition with features emerging as early as infancy and enduring the individual's lifespan (Caspi, 2000). Nearly a century of theoretical approaches have provided differing perspectives in the development and expression of personality traits, each one contributing to the prominent domain of personality research as it exists today. One of the first, and arguably most influential, conceptualizations of personality emerged from the proponents of psychodynamic theory, which offer unique perspectives into the origins of psychopathology and self-destructive behaviour.

Psychodynamic perspectives of personality development. The foundation of Freud's psychoanalytic approach argued that all human behaviour is motivated by either sexually- or aggressively-oriented instincts (see Murphy, 1949). Similarly, Freud believed that an individual's personality emerged as a consequence of how intrapsychic conflicts were resolved during the stages of psychosexual development. If these conflicts were not successfully resolved, the individual became susceptible to experiencing psychiatric disturbances. Although

Freud's motivational theory of personality development lost popularity over time (Western, Glen, & Ortigo, 2008), his contentions that personality was influenced by both nature and the environment, and that childhood experiences shaped character development into adulthood, have remained essential to theories of personality. Consequently, the field of psychoanalysis expanded into a broader domain of psychodynamic theory, elaborating the processes of identity and personality development, including the impact of caregiver-infant relationships.

Psychodynamic theories described the importance of object relations for a child's ego development, a cognitive state capable of distinguishing primal needs from reality (Ainsworth, 1969). Prior to developing a differentiated ego, the infant has no concept of the self as separate from others or the environment (Gaddini, 1987). However, as the mother continues to respond to her child's needs through feedings and physical contact, the infant begins to internalize these interactions, creating a symbolic representation (mother-object) that helps the infant relate to him/herself and the world (Kris, 1954). This need satisfaction and tension creation (when the mother delays responses, or forces the child to adapt to her schedule) facilitates ego development, creating boundaries for the infant as an entity separate from the environment (Kris, 1954). Disruptions in this process were believed to disturb the psychosocial development of the child, predisposing the child to psychopathology, including anxiety disorders, melancholia, and borderline personality disorder. Supporting this concept, some engage in self-harm as a form of self-stimulation, while others express an inability to determine where the world ends and they begin, mutilating their skin to establish the boundaries of their identity (Farber, 2003). A psychodynamic perspective would argue that specific childhood experiences interfered with the individual's ego development, preventing the formation of a fully differentiated sense of self.

This branch of 'ego psychology' shares similar themes with attachment theory, which developed during the latter half of the same era (Ainsworth, 1969; Ainsworth & Bowlby, 1991). Whereas object relations theory viewed the infant as a passive recipient to environmental stimuli, attachment theories stressed the infant as an active agent, capable of effecting desired social responses through adaptive behaviours (e.g., smiling, grasping, etc.). Such behaviours encourage a caregiver to bond with the infant, facilitating responses that nurture the child's needs and welfare. It is through this relationship that the child learns if the world can be trusted or if his/her needs will be met, developing internal working models that shape his/her perceptions, emotions, thoughts, and expectations in later relationships.

As implied by attachment theory, both infant and caregiver contribute to the experienced quality of the relationship. Although newborns cannot consciously elicit desired responses from the social environment, each child is intrinsically predisposed to displaying specific attributes, which may facilitate or hinder infant-caretaker interactions. These rudimentary elements of personality are referred to as the child's temperament, impacting the idiosyncratic expression of personality as the child matures (Caspi, 2000).

Temperament. Conceptualized as the ways in which a child experiences and regulates emotional and physiological responses (Nigg, 2006), a child's temperament is believed to be based on individual differences in heredity (Goldsmith et al., 1987). While the literature has proposed several ways in which to conceptualize temperament (De Pauw & Mervielde, 2010), it is often described in terms of emotionality, shyness, sociability, and activity level (Sanson, Hemphill, & Smart, 2004). Emotionality is the child's susceptibility to experiencing intense upset, like anger or fear, as well as the ease in which he/she can be soothed. Shyness, a facet of inhibition (Kagan, 1997), refers to the child's withdrawal behaviour in new social situations,

while sociability describes the child's preference for affiliating with others (Sanson, Hemphill, & Smart, 2004). Finally, activity is the energy level the child naturally exhibits (McClowry, 1995), and is related to personality measures of extraversion and surgency (Rothbart, Ahadi, & Evans, 2000). These traits are believed to emerge in infancy (within the first year of life) independent of environmental influences, and set the trajectory for personality development (Goldsmith et al. 1987).

Conducted over several decades, the Dunedin study (Caspi, 2000) found that expressions of temperament at age 3 significantly predicted personality structure, quality of interpersonal relationships, and psychopathology at ages 18 and older. The researchers examined 22 dispositional attributes in children, classifying their temperaments as undercontrolled (impulsive, restless, negativistic, distractible, and emotionally labile), inhibited (socially reserved, fearful, and easily upset by strangers), or well-adjusted (disciplined, self-confident, easily adapts to new situations). Compared to the well-adjusted group, children characterized as undercontrolled were more likely to report significant emotional and interpersonal disturbances, with an 18-fold increase in suicide attempts by the age of 21. Participants characterized with an inhibited temperament were significantly more likely than well-adjusted children to experience reduced social competence, develop major depression, and were seven times more likely to attempt suicide. Although effect sizes ranged from small to medium, Caspi found that the underlying mechanisms of temperament remained consistent relative to the trait trajectories exhibited by peers.

Continuity in disposition has been reported by other studies (Chen & Zhang, 2011; Neppl, 2010) and research continues to delineate the relation between childhood temperament and adult psychiatric disturbances (Nigg, 2006; De Pauw & Mervielde, 2010; Tackett, 2010).

However, temperament is not as stable a construct as personality (Caspi, 2000). The person-situation phenomenon of personality development states that while individuals may be predisposed from birth to exhibit maladaptive responses to intra- and interpersonal stimuli, the expression of such traits can be buffered or worsened by the quality of environmental transactions. Such transactions shape the developing constitution of the individual, creating a relatively stable way of relating to the self, others, and the world, once the child transitions to adulthood. As an adult, the individual may alter his/her behaviour to suit a situation, and show subtle changes in personality as he/she ages, but the expression of his/her personality will likely exhibit consistency when averaged over time. Attempts to conceptualize the personality construct have contributed to a breadth of related literature, with proponents of different theories emphasizing various models and methods of assessment.

       Conceptualizing personality. The evolution of personality theory emerged from two distinct philosophies, one emphasizing the unique, moment-to-moment, characteristics of the individual (Allport, 1937) and the other denoting universal attributes, which generalized to the person or specific demographics as a whole (Stagner, 1961). Subsequently, these ideographic and nomothetic approaches have contributed decades of qualitative (e.g., case studies) and quantitative (e.g., correlational) research, respectively, demarcating the vast correlates of personality expression that predict human behaviour. From these perspectives emerged various models, including motivation/biology (Eyesnck, 1967; Plomin, Chipuer, & Loehlin, 1990; Sheldon, Stevens, & Tucker, 1940; Stagner, 1961), cognitive (Weiner, 2008), self (see Funder, 2001), and trait-oriented theories of personality (Costa & Widiger, 2002). Trait theories are perhaps the most embraced method of conceptualizing personality, often incorporated into correlational research investigating personality as a construct of interest.

Trait models of personality. Allport (1936) believed that an abundance of traits, as many as the lexicon describes, interact with both each other and various stimuli (e.g., physiological processes, environmental input, etc.) to produce responses unique to the individual and situation (Allport, 1937). While exploring the ways in which each definable trait describes an individual would be both tedious and unrealistic, factor analytic studies have substantially reduced the attributes to facilitate meaningful comparisons. These models range from two (Digman, 1997) to well over a dozen (Cattell & Mead, 2008) factors; each factor often contains multiple facets that span the spectrum of intrapersonal experiences, including emotionality, behaviour, and perceived quality of interpersonal relationships. The most common trait-model assessing "normal" personality used in contemporary research includes five factors (FFM; Funder, 2001). Although several versions of this model exist (Goldberg et al., 2006), the overall factors include Neuroticism, Extraversion, Agreeableness, Openness to Experience, and Conscientiousness (Costa & Widiger, 2002). Neuroticism is a measure of emotional adjustment and lability. Both extraversion and agreeableness are interpersonal dimensions; extraversion refers to the quality of preferred relationships, need for stimulation, and capacity for joy; agreeableness is the level of compassion one has for others and his/her tendency to either embrace or reject social assimilation. Openness to experience describes the individual's level of curiosity, as well as appreciation for both new experiences and artistic expression. Finally, conscientiousness is the degree of one's self-discipline and intrinsic drive for achievement.

Whereas disorders of personality are typically diagnosed using a categorical approach (APA, 2000), assessments outside of clinical settings tend to embrace a dimensional perspective. Such models examine traits along a continuum, where an individual can score high on some traits and low on others. This methodological approach allows the individual's personality to be

correlated with other mental health and behavioural constructs, as well as be compared to participants in both similar and divergent populations.

Personality traits and psychopathology. The maladaptive/extreme expression of one or more variants of personality is predictive of psychopathology, particularly on dimensions representing emotional instability. The FFM measure of neuroticism is positively and significantly related to poor self-esteem (Aluja, Rolland, García, & Rossier, 2007), perfectionistic ideals (Rice, Ashby, & Slaney, 2007), pathological dependence/neediness (Dunkley et al., 2006), alexithymia (Luminet et al., 1999), substance use disorders (Ruiz, Pincus, & Schinka, 2008), and disordered eating (Tasca et al., 2009). Neuroticism also positively predicts both major and chronic minor depression (Dunkley, Blankstein, & Flett, 1997; Harkness, Bagby, Joffe, & Levitt, 2002), as well as increased hospitalizations related to depression (Kim et al., 2011). Additionally, combinations of factor scores on the FFM significantly distinguish each of the 10 personality disorders (Saulsman & Page, 2004) as diagnosed by the DSM-IV-TR (APA, 2000). As an example, the FFM describes borderline personality disorder (which includes self-harm as a diagnostic criterion; APA, 2000) as consistently related to high neuroticism and low agreeableness (Saulsman & Page, 2004). In addition to BPD, research reports that psychiatric disorders characterized by high neuroticism are often predictive of self-injurious behaviour (Borrill, Fox, Flynn, & Roger, 2009; Darche, 1990; Dyer et al., 2009; Goldstein, Flett, Wekerle, & Wall, 2009; Kim et al., 2011; Sansone & Levitt, 2002; Zlotnick et al., 1996). This suggests that specific mechanisms of personality expression predispose an individual to experiencing various psychopathology, including those expressed through NSSI.

Personality traits, addiction, and NSSI. The five-factor model of personality has been

used to conceptualize various addictive behaviours, including substance use disorders (Ruiz,

Pincus, & Schinka, 2008), alcohol dependence (Coeffec, 2011), gambling (MacLaren, Best,

Dixon, & Harrigan, 2011), and smoking (Malouff, Thorsteinsson, & Schutte, 2006), each of

which has been characterized by high neuroticism, low agreeableness, and low

conscientiousness. In addition, neuroticism negatively predicts substance abstinence (Fortino,

2003) and positively predicts an individual's risk for relapsing following a period of sobriety

(Bottlender & Soyka, 2005). Anderson, Barnes, and Murray (2011) developed the Addiction-

Prone Personality (APP) scale to differentiate individuals whose traits predicted patterns of

addictive behaviour (e.g., alcohol dependence). Comparing it to the NEO Five-Factor Inventory

(NEO-FFI), the authors reported that the APP significantly profiled participants with high

neuroticism, low agreeableness, and low conscientiousness. Such research indicates that there

are, indeed, specific personality traits predisposing individuals to developing addictions.

In the NSSI literature, compulsive tendencies have been exhibited by those who

repetitively self-harm (Csorba et al., 2009; Nixon, Cloutier, & Aggarwal, 2002); self-harm is

often used in conjunction with other addictive coping mechanisms (Goldstein, Flett, Wekerle, &

Wall, 2009; Haw et al., 2005; MacLaren & Best, 2010; Ogle & Clements, 2008) and the

trajectory toward frequent use of NSSI to cope with distress parallels that of general addictions

(Winchel & Stanley, 1991). The similarities between frequent self-harm and other addictive

behaviours have implications for the personality mechanisms underlying NSSI. Assessing an

undergraduate population, Brown (2009) reported that self-harm was significantly associated

with high levels of neuroticism and openness to experience, and low levels of agreeableness and

conscientiousness. MacLaren and Best (2010) found that undergraduates who frequently

engaged NSSI were characterized by the NEO-FFI with increased neuroticism, and decreased agreeableness and conscientiousness. These studies suggest that repetitive self-harm better represents the addictive personality conceptualized by Anderson, Barnes, and Murray (2011), while infrequent self-harm is additionally associated with traits reflecting the appreciation of novel experiences (as assessed by the FFM dimension, Openness to Experience). Supporting this distinction, Stanford and Jones (2009) found that self-harmers could be categorized into three groups – pathological, impulsive, and "normal" self-injurers. Compared to the psychologically "normal" and impulsive groups (who scored similarly on most measures), those who engaged in pathological self-injury reported a marked increase in frequency of NSSI, psychiatric symptoms, maladaptive cognitions and coping strategies, and disturbances in interpersonal relationships. It appears that there is something qualitatively different from infrequent and frequent self-harmers, which is reflected in dimensions describing personality traits. Subsequently, it was plausible that repetitive NSSI would be associated with personality traits predisposing an individual to experiencing severe psychopathology and/or developing addictions, while infrequent NSSI would also significantly predict openness to new experiences.

Schema Theory

Cognitive schemas are systems of beliefs, attitudes, and expectations that shape an individual's perception. They are the filters through which stimuli (internal and external) are processed – algorithms that compare new information against previous similar encounters, facilitating both evaluation and the creation of personal meaning (Eysenck, 1990). These filters affect how memory is encoded and recalled, often eliminating details that are incongruent with expectations, or distorting the information upon recollection to better assimilate it with a pre-existing schema (Bartlett, 1967).

Cognitive schemas facilitate goal-oriented behaviour by organizing prior information into relevant cause-and-effect relationships. They also influence an individual's interaction with his/her interpersonal and cultural environments by shaping personal habits and expectations (Kelly, 1955). Kelly offers as an example the custom in which pie is usually served (often without explicit instruction) – in angular wedges with the point oriented toward the individual for whom the slice is intended. Information is actively or passively learned, and unconsciously incorporated into systems of related constructs (e.g., how to cut and present a pie). These constructs shape perception and also guide the manner in which daily activities are performed (Bartlett, 1967), which may be characteristic of the culture to which the individual identifies (e.g., etiquette of serving pie) or idiosyncratic (e.g., personal preference for dessert).

Although cognitive schemas bias the individual's behavioural and emotional responses, the influence is not considered unidirectional. Kelley (1955) viewed the individual as a scientist, developing working models that describe relations between stimuli, testing hypotheses, and modulating these models to best represent an evolving repertoire of personal experiences. The existence of cognitive schemas explains why individuals may have differing reactions to the same stimuli, or why one person responds similarly to strikingly different situations (Kovacs & Beck, 1978).

Schemas vary from simplistic (e.g., rain is water that falls from clouds) to complex (e.g., steps to solve an algebraic equation), and can exist at multiple levels in a hierarchy of related concepts (e.g., Red Delicious are a kind of apple, which is fruit, which grows on trees, etc.). The formulation of these working models begins in infancy, paralleling a person's developing capacity to perceive and manipulate information gleaned from his/her physical and social environments (Kelly, 1955; Kovacs & Beck, 1978; Young, 1994). They allow the individual to

absorb and store relevant information, without becoming overwhelmed with the details of each unique encounter with a particular concept. Over time, concepts generalize to form prototypes, which then bias the individual's memory; details consistent with the prototype are retained, while those contradicting expectations are discarded (Bartlett, 1967).

Schema theories have since expanded, describing various concepts innate to the individual, including representations not only of the general world, but specifically of the self, others, and the future (see Funder, 2001; Beck, 1967). Although cognitive constructs have been postulated as the basis for which personality is uniquely expressed (Kelly, 1963), they have been argued to be more malleable than personality traits (Beck & Wynnewood, 1964). The effect of such constructs on human behaviour is subject to effortful control, but only if the individual is consciously aware of the presence and influence of his/her schemas. These concepts emerged during psychology's cognitive revolution (Dember, 1974), which argued that the nature of one's thinking motivated his/her behaviour and affective experiences. Eventually, the cognitive perspective extended to the realm of abnormal psychology, citing the quality of immediate and ongoing cognitive processes as the origins of psychiatric disturbances.

Beck (1967) and Ellis (1962) pioneered the application of cognitive principles to psychotherapy, with Beck (1963, 1964) initially relating them to theories of depression. Beck noticed that the content of his patients' ideations often contained cognitive distortions characterized by defeatist attitudes and self-deprecation. Information appeared to be processed through a pessimistic filter, selectively focusing on minute or irrelevant details, diminishing self-worth, and inflating the abilities and successes of others. Additionally, he found that his clients' capacities to generate alternative interpretations of events or solutions to problems were severely limited. As well, both Beck (1963; 1967) and Ellis (1962) reported that the internal dialogue of

their clients was often marked by unreasonable imperatives, the "should," "musts," and "oughts" of personal convictions (e.g., I should never have impure thoughts; I must be liked by everyone), or what Ellis (1997) referred to as "musturbation." Consequently, these distorted cognitions precipitated dysphoric states marked by a myriad of possible symptoms, including despair, anxiety, loss of hope, self-handicapping, and somatic complaints (Beck, 1972).

As the cognitive paradigm evolved, the association between maladaptive cognitions and mental illness expanded from theories of depression to become incorporated into conceptualizations of various psychopathologies, including mania (Beck, 1972), social phobia (Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006), obsessive-compulsive disorder (Atalay, Atalay, Karahan, & Çaliskan, 2008), post-traumatic stress (Cockram, Drummond, & Lee, 2010), as well as various eating (Unoka, Tolgyes, Czobor, & Simon, 2010) and personality (APA, 2000; Beck, 1990; Carr & Francis, 2010) disorders. An analysis of many psychiatric disturbances indicates cognitive distortions characteristic of each disorder (APA, 2000), and reveals how dysfunctional cognitions affect a person's intra- and interpersonal experiences.

Various psychological instruments have been developed to assess patterns of maladaptive cognitions (Glaser et al., 2002; Parslow, Christensen, Griffiths, & Groves, 2006; Varra, Pearlman, Brock, & Hodgson, 2008), and cognitive distortions are now symptoms targeted by popular psychotherapeutic interventions (Mahoney, 1995), including mindfulness (Baer, 2003), schema-focused (Young, Klosko, & Weishaar, 2003), cognitive-behavioural (Mahoney, 1995), and dialectical-behavioural (Linehan, 1993) therapies. Most cognitive interventions embrace an antecedent-consequence approach, teaching clients to actively change how they perceive distressing stimuli, thus reducing the severity of the consequences experienced (e.g., anxiety, anger, guilt, depression, etc.).

Early maladaptive schemas. Early maladaptive schemas (EMS) are implicit dysfunctional beliefs about the self in relation to one's environment (Young, 1994) – personal truths comprised of memories, emotions, cognitions, and bodily sensations (Young, Klosko, & Weishaar, 2003). EMS must, by definition, cause a degree of distress for the individual, which may manifest in a variety of intra- and interpersonal domains. They are activated by environmental stimuli relevant to the construct (e.g., the belief that one is incompetent would be activated during an exam), provoke high levels of emotionality (e.g., rage, grief, panic, etc.), and are self-perpetuating (Young, 1994). As an example, a person who believes that he/she is unworthy of love might react to potential suitors by sabotaging his/her relationships or attaching to abusive partners. In this way, the individual's response invites personal suffering (e.g., isolation, dysphoria, etc.) and rejection, thus fulfilling the validity of the maladaptive schema. EMS exist, to varying degrees, within both clinical and nonclinical populations, but the prevalence and severity of EMS are significantly increased across psychiatric samples (Young, Klosko, & Weishaar, 2003).

Origins of early maladaptive schemas. The interaction between unmet (or overindulged) emotional needs, traumatic experiences, and emotional temperament predispose an individual to developing maladaptive schemas (Young, Klosko, & Weishaar, 2003). EMS are believed to emerge during the first years of life, when dysfunctional familial and/or peer relationships fail to adequately nourish a child's core emotional needs. Core needs include secure attachment (safety, stability, nurturance, and acceptance), autonomy and reasonable freedom of expression, spontaneity and play, and realistic limits and self-control. Ultimately, children need to feel safe and cared for by an environment that cultivates their creativity, curiosity, and self-worth.

Maladaptive schemas that develop during the presymbolic stage are especially pervasive, as noxious events (e.g., neglect, abuse, illness, etc.), and the underlying assumptions they evoke (e.g., unworthy, unlovable, helpless, etc.), cannot be easily recalled or unlearned (Millon, 1996). Consequently,

> Significant experiences of early life may never recur again, but their
>
> effects remain and leave their mark… they… do more than passively
>
> contribute their share to the present… they guide, shape or distort the
>
> character of current events. Not only are they ever present… but they
>
> operate insidiously to transform new stimulus experiences in line with
>
> the past (Millon, 1981, p. 101).

According to Millon (1981) and Young (1994,) EMS develop from, and are strengthened by, frequent encounters with similar experiences. When combined with intrinsic emotional vulnerability (e.g., labile, anxious, dysthymic, irritable, etc.), toxic events reinforce distorted beliefs and shape how the individual perceives him/herself and the encompassing world. These beliefs become both familiar and resistant to change, often leading the individual to avoid, distort, or overcompensate for experiences that threaten his/her maladaptive cognitions. The resulting consequences are that the individual repeats destructive childhood experiences throughout his/her adolescent and adult life. EMS are postulated to be the root cause of maladaptive behaviour (Young, Klosko, & Weishaar, 2003), including the individual's approach to coping with daily stressors. This renders him/her susceptible to engaging in dysfunctional coping techniques (Lewis, 2005), including (arguably) the use of NSSI.

Early maladaptive core schemas. During their practice, Young and colleagues (2003) noticed common themes in the cognitive distortions of their patients, originally identifying 15

maladaptive schemas. The authors arranged these schemas into 5 domains: (1) Disconnection and Rejection, (2) Impaired Autonomy and Performance, (3) Impaired Limits, (4) Other-Directedness, and (5) Overvigilance/Emotion Inhibition. Under this model, the Disconnection and Rejection domain represents the "core schemas" most detrimental to the individual's functionality and well-being. These schemas comprise (a) abandonment/instability, the belief that others will not provide dependable support or protection due to erratic or unstable dispositions, or will leave in preference for someone else; (b) mistrust/abuse, expectations that others will intentionally hurt, humiliate, lie, or take advantage of the individual; (c) emotional deprivation, the belief that one will not receive nurturance, empathy, or strength/guidance from others; (d) defectiveness/shame, the belief that one is intrinsically defective and incapable of being accepted or loved if exposed to others; and (e) social isolation/alienation, the feeling that one is isolated, different from other people, and not a part of any group or community. While schemas from other domains can disrupt an individual's well-being and quality of relationships, the presence of one or more of these core schemas render the individual vulnerable to increasingly distressing psychiatric disturbances.

Early maladaptive schemas and psychopathology. Early maladaptive schemas negatively predict well-being and are positively related to chronic pain (Saariaho, Saariaho, Karila, & Joukamaa, 2010), addiction (Brummet; 2008), as well as various psychopathological symptoms (Welburn et al., 2002) and disorders (Brummett, 2008; Cockram, Drummond, & Lee, 2010; D'Adria, 2004; Harris & Curtin, 2002; Halvorsen, Wang, Eisemann, & Waterloo, 2010; Meyer, Leung, Feary, & Mann, 2001; Unoka, Tolgyes, Czobor, & Simon, 2010; Young, Klosko, & Weishaar, 2003). Harris and Curtin (2002) found that specific maladaptive schemas (defectiveness/shame, insufficient self-control, vulnerability, and incompetence/inferiority)

mediated between retrospective perceptions of parenting and depression developed in adulthood. Performing a longitudinal study, Halvorsen, Wang, Eisemann, and Waterloo (2010) reported that the Disconnection and Rejection, Impaired Autonomy, and Impaired Limits EMS domains positively predicted the number and severity of depressive episodes over nearly a decade of assessment. Halvorson and associates proposed that cognitive distortions represented by these domains may indicate a trait-vulnerability for depression.

Exploring the EMS held by patients receiving inpatient care, Unoka, Tolgyes, Czobor, and Simon (2010) found that patterns of disordered eating were also significantly related to the expression of maladaptive cognitions. Discriminant analyses indicated that participants who used laxatives, and engaged in both binging and purging behaviours, were more likely to experience sentiments of emotional deprivation and abandonment/abuse, as well as subjugation, enmeshment, and emotional inhibition. Blissett and Meyer (2006) sampled from a population of mothers with young children, reporting that defectiveness/shame beliefs positively predicted drive for thinness, body dissatisfaction, and bulimia. Interestingly, the relation was stronger for mothers of girls; the authors suggested that the mother-daughter relationship may exacerbate eating pathology within the mother, mediated by the mother's pre-existing cognitive distortions.

Maladaptive cognitions have also demonstrated the capacity to predict anxiety disorders (Atalay, Atalay, Karahan, & Çaliskan, 2008; Hedley, Hoffart, & Sexton, 2001; Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006), including post-traumatic stress (Cockram, Drummond, & Lee 2010; Wright, Collinsworth, & Fitzgerald, 2010). Conducting two studies, Cockram, Drummond and Lee (2010) assessed EMS in war veterans, and examined the effectiveness of schema-focused therapy for these veterans, respectively. First, the authors examined not only PSTD symptomology and cognitive distortions, but also childhood negative parenting

behaviours. They found that experiencing indifference, abuse, and over-control from one or both parents predicted PTSD symptomology, and that all facets assessed by the EMS were positively related to the development of PTSD following exposure to war. The second study explored the efficacy of schema-focused therapeutic techniques applied to a war-related PTSD group program. Compared to control groups that received cognitive-behavioural interventions, veterans in the schema-focused group experienced a significant decrease in PTSD and anxiety symptoms. Overall, the veterans also reported clinically reduced PTSD, anxiety, and depression, with the schema-focused intervention accounting for 26.1% of the variance in symptom reduction. The authors concluded that Young, Klosko, and Weishaar's (2003) conceptualization of the origins and expression of psychiatric symptoms was largely supported, and that the development of early maladaptive schemas predisposes an individual to exhibiting increased psychopathology after exposure to triggers of traumatic stress.

As well, patterns of EMS have demonstrated the ability to characterize dysfunctional expressions of personality (Ball & Cecero, 2001; Lewis, 2005; Thimm, 2010), with recent literature focusing on their capacity to predict borderline personality disorder (Jovev & Jackson, 2004; Lawrence, Allen, & Chanen, 2011; Mauchand, Lachenal-Chevallet, & Cottraux, 2011; Young, Klosko, & Weishaar, 2003). Compared to nonclinical controls, Mauchand, Lachenal-Chevallet, and Cottraux (2011) found that participants with BPD scored significantly higher on each of the 15 maladaptive schemas measured by a modified version of the Young-Schema Questionnaire. Similarly, Ball and Cecero (2001) examined EMS in personality disordered adults with opiate addictions, reporting that BPD individuals experienced significantly increased sentiments of mistrust/abuse and abandonment/instability. The authors also found that participants with depressive and/or avoidant personality disorders possessed characteristics

associated with EMS. Those diagnosed with depressive personalities scored significantly higher on the mistrust/abuse, social isolation, and defectiveness/shame constructs, and experienced more cognitive distortions related to personal failure. Additionally, both depressive and avoidant personality disorders significantly predicted the need to subjugate personal and emotional needs, in favour of gaining love and approval from others. The authors concluded by suggesting that knowledge of both personality and schema constructs would facilitate more effective treatment planning for personality disordered patients with co-morbid substance dependence.

Specifically investigating cognitive distortions and addiction, Brummet (2008) assessed the relation between EMS and addiction severity in a sample of opiate-dependent adults. Selecting from a methadone-maintenance treatment centre, they reported that the Disconnection and Rejection domain was related to not only psychiatric and interpersonal disturbances, but positively and significantly predicted severity of drug abuse. This study remains among the few to include addictions as a construct of interest when investigating the role that early maladaptive schemas play in the development and maintenance of destructive coping behaviour.

Relation to NSSI. Research exploring the relation between NSSI and early maladaptive schemas is non-existent. However, the dysfunctional beliefs characteristic to various disorders associated with self-injurious behaviour have been previously outlined. Symptoms of severe PTSD can often manifest (behaviourally, emotionally, and interpersonally) in a manner similar to borderline personality disorder (APA, 2000; Linehan, 1993), and both predict the practice of NSSI (Dyer et al., 2009; Muehlenkamp, Ertelt, Miller, & Claes, 2011). Eating pathology (Farber, 1997; Sansone & Levitt, 2002) and substance dependence (Harned, Najavits, & Weiss, 2006) are also related to comorbid self-harm, and the three are characterized as dysfunctional methods of coping with real or perceived stress.

The maladaptive schemas most predictive of severe psychopathology are represented by the Disconnection and Rejection EMS domain (Young, Klosko, & Weishaar, 2003), which describe distorted beliefs positively related to PTSD (Cockram, Drummond, & Lee 2010) and BPD (Lawrence, Allen, & Chanen, 2011; Mauchand, Lachenal-Chevallet, & Cottraux, 2011) pathology, as well as depression (Halvorsen, Wang, Eisemann, and Waterloo (2010), eating disorders (Unoka, Tolgyes, Czobor, & Simon, 2010), and substance dependence (Brummet, 2008). However, all 15 maladaptive schemas measured by the Young-Schema Questionnaire are associated with psychopathology (Welburn et al., 2002), which increase the likelihood of engaging in self-destructive behaviour.

Dale et al. (2010) examined the capacity of Young's EMS to predict repetition of suicide attempts in a sample of individuals who engaged in suicide-related behaviour. Comparing scores to clinical and nonclinical controls, the authors reported that the social isolation and defectiveness/shame schemas significantly and uniquely correlated with repetition of suicide attempts. Repetitive self-injury as a method of managing stress increases the individual's risk for eventually committing suicide (Owens, Horrocks, & House, 2002; Zahl & Hawton, 2004). The trajectory toward the development and maintenance of NSSI is analogous to that of other addictive behaviours (Winchel & Stanley, 1991) and its functions are comparable to other forms of self-destructive coping, including eating pathology (Farber, 1997) and substance dependence (English, 2009). Thus, it was likely that repetitive self-injury would predict the same underlying mechanisms marked by these psychiatric disturbances, with the most robust cognitive distortions represented by the Disconnection and Rejection domain of Young and Brown's (2005) Early Maladaptive Schema Questionnaire. However, as previously described, NSSI serves a myriad of possible functions that, while dysfunctional, are not all indicative of severe psychopathology. It

was therefore expected that overall endorsement of maladaptive schemas would differentiate individuals with a history of self-harm from those who have never engaged in NSSI.

Present Study

Objective and Rationale

The present study examined differences in personality characteristics and early maladaptive schemas among three groups of individuals, defined by the practice and severity level of their NSSI behaviours. The groups were participants without a history of NSSI, those with a non-pathological history of NSSI, and individuals who have pathologically used NSSI to cope with distress. The definitions of non-pathological and pathological NSSI were based on both the frequency of lifetime incidents and the number of methods used. Previous research has suggested that a lifetime history of 10 or more NSSI incidents indicates clinical significance (Zanarini et al., 2006) and that multiple methods suggests increased psychopathology (Walsh, 2006; Zanarini et al., 2006). Following these guidelines and using the grouping scheme employed by MacLaren and Best (2010), the present study divided participants into three groups: the non-pathological NSSI group was composed of participants who endorsed between one to nine lifetime NSSI incidents, and less than three methods; the pathological NSSI group included individuals who endorsed 10 or more lifetime NSSI incidents, or three or more methods; and finally the no NSSI group consisted of individuals who reported no lifetime history of NSSI. Subsequent analyses compared the three groups on their personality traits and maladaptive schemas.

A bulk of the NSSI research to date has focused on identifying distal risk factors and co-morbid psychopathology. These efforts have enlightened the prevalence, forms, and functions of NSSI, furthering both scientific conceptualizations and public awareness. Knowledge of

environmental risk factors aids prevention programs for at risk children and adolescents, while psychopathological correlates alert professionals to who is in danger of harming themselves. The developing research has also informed clinicians as they plan courses of treatment addressing the needs of clients who self-harm. However, there is a gap in the literature failing to delineate why one individual deliberately harms him/herself once or twice in his/her lifetime and why another chooses to frequently embrace self-injury to cope with distress, particularly if both individuals share comparable life experiences.

Reducing suicidal gestures and non-suicidal self-injury often takes precedence over other concerns in therapy (Linehan, 1993); self-destructive behaviour must be addressed before other long-term goals are pursued. Although NSSI is associated with negative childhood experiences, nothing can be offered therapeutically to alter or erase those events. Also, NSSI is associated with psychopathology but is not indicative of any one disorder (Nock et al., 2006). Consequently, interventions developed for specific psychiatric symptoms associated with NSSI (e.g., depression, eating pathology, PTSD, etc.) may not adequately address the underlying mechanisms perpetuating self-injurious behaviours.

The significant comorbidity between NSSI and a wide array of psychiatric disturbances suggests that dispositional characteristics predispose individuals to experiencing dysphoria and engaging in self-destructive coping techniques. Both personality traits and maladaptive schemas are shaped from transactional experiences with the environment (Caspi, 2000; Young, Klosko, & Weishaar, 2003), but genetic predispositions also play a role. Individual temperaments significantly predict mental health, behaviour, and interpersonal relationships, with quality of emotionality showing the most robust correlation with both personality expression and nature of internalized thought processes. The interaction between temperament and life experiences

shapes the constitution of the individual, which can either buffer against or exacerbate psychiatric symptoms and the methods used to cope with distress. Once formed, these traits endure the ebb and flow of both "normal" and psychopathological experiences.

Understanding the intrinsic characteristics rendering an individual vulnerable to engaging in repetitive NSSI would allow clinicians to more effectively modify their therapeutic interventions. Expressions of personality traits indicate an individual's natural inclinations for relating to the self and the sum of his/her environments, while assessing maladaptive cognitions identifies specific environmental triggers and their underlying assumptions (Young, Klosko, & Weishaar, 2003). Knowledge of both constructs, and their relations to NSSI, would advance research and facilitate more effective practices to treat repetitive non-suicidal self-injury.

Research Questions and Conceptual Hypotheses

The first research question addressed differences in personality characteristics among the members of the no NSSI, non-pathological NSSI, and pathological NSSI groups. It was hypothesized that compared to members of the no NSSI group, individuals with a history of NSSI (non-pathological and pathological) would be marked by a greater degree of neuroticism and openness to experience, and lower degree of agreeableness and conscientiousness. As well, it was expected that the pathological NSSI group would significantly differ from the non-pathological NSSI group in their higher degree of neuroticism, and lower degree of agreeableness, conscientiousness, and openness to experience.

The second research question addressed differences in early maladaptive schemas that characterized the members of the no NSSI, non-pathological NSSI, and pathological NSSI groups. It was hypothesized that compared to the no NSSI group, both non-pathological and pathological NSSI groups would score higher on all maladaptive schema domains. It was also

anticipated that the pathological NSSI group would score higher on the Disconnection and Rejection domain than the non-pathological NSSI group.

Method

Sample Description

Three hundred and forty-four participants (65 males, 277 females, 1 transgendered, and 1 gender queer) were recruited from the staff and students at Lakehead University and Confederation College, clinical settings, and the general community of Thunder Bay. Participants from other communities, including southern Ontario and southern New Brunswick, also participated. Participant ages ranged from 18 to 65 years ($M = 25.23$, $SD = 8.14$). Most participants identified themselves as White ($N = 305$) or Aboriginal ($N = 20$). Several individuals self-identified with more than one ethnicity ($N = 8$). A majority of the participants were single ($N = 224$), though many were either in common-law relationships ($N = 52$) or married ($N = 48$). A large proportion of the sample had completed secondary education at the college/trade school ($N = 75$), undergraduate ($N = 74$), or graduate ($N = 14$) levels. Depending on whether the participant had a current psychiatric diagnosis or was currently receiving (or on the waitlist to receive) mental health services, individuals were classified as members of either clinical ($N = 107$) or non-clinical ($N = 237$) populations. Among those diagnosed with a psychiatric illness ($N = 81$), most had a mood ($N = 47$) and/or anxiety ($N = 48$) disorder. See Table 1 for further demographic description of the overall sample.

Group classification. All participants completed a self-harm inventory (see Measures section titled *Deliberate Self-Harm Inventory*), which assessed self-injurious behaviour and permitted each individual to be assigned to one of three groups, based on frequency and the number of methods endorsed. Those with no history of NSSI ($N = 146$) were assigned to the

control group; the other participants were divided among the non-pathological ($N = 56$) and pathological ($N = 142$) self-harm groups. It is important to note that although qualitative information was collected on NSSI methods not listed in the self-harm inventory (e.g., in an open-ended option, participants admitted to punching walls, dropping heavy objects on themselves, overdosing on substances, etc.) these methods were not included in the decision to assign participants to one of the three groups, as these methods have not been validated in the original measure. Initial group characteristics are displayed in Table 2.

Given the large disparity in group sizes, a sub-sample of participants ($N = 156$) was used to test the main hypotheses. This sample was derived by selecting participants from the control and pathological NSSI groups and matching them to participants in the non-pathological NSSI group based on sex, age, and (where possible) clinical status. This grouping process created a new independent variable (Matched Group) with three levels: matched-control (MC), matched-non-pathological (MNP), and matched-pathological (MP). The matched groups consisted of 52 participants (9 males, 43 females) each, with mean ages of 24.35 ($SD = 6.42$), 24.79 ($SD = 8.00$), and 24.65 ($SD = 7.52$) for the MC, MNP, and MP groups, respectively (see Table 4 for demographic description of the matched groups). There were no significant group differences in mean age, $F(2, 153) = 0.05$. The MP ($n = 12$, 23.08%) group represented an increased number of psychiatric diagnoses compared to the MNP ($n = 7$, 13.46%) and MC ($n = 4$, 7.69%) groups. It should also be noted that there was a significant group difference in depression scores, as measured by the Centre for the Epidemiology Studies – Depression Scale (see Measures section titled *Centre for the Epidemiology Studies – Depression Scale*), $F(2,152) = 21.48$, $p < .001$, partial $\eta^2 = .22$. There was a systematic increase in depression scores, where the post-hoc LSD

tests showed the MP group ($M = 4.38$, $SD = 2.75$) to score higher than the MNP group ($M = 2.76$, $SD = 3.07$), that in turn scored higher than the MC group ($M = 0.98$, $SD = 2.03$).

Measures

Demographics: Background information, such as age, sex, marital status, ethnicity, etc., was collected using a brief demographics questionnaire (see Appendix A). To distinguish non-clinical from psychiatric populations, participants were asked about their historical and current use of mental health services, as well as if they currently have a diagnosis of a psychological disorder.

Deliberate Self-Harm Inventory. The Deliberate Self-Harm Inventory (DSHI; Gratz, 2001; see Appendix B) is a self-report questionnaire that assesses the practice and severity of NSSI. It lists 16 acts of self-harm (e.g., cut your wrists; burned yourself with a cigarette; prevented wounds from healing; etc.), as well as an open-ended option for behaviours not included in the list. Each item asks the participant whether he/she had ever purposefully inflicted the injury on his/her body. Gratz stresses that each injury must have been severe enough to cause a mark or degree of tissue damage, and also that the act occurred without conscious suicidal intent. If the participant answers yes, follow-up questions inquire the age he/she first used that method, the number of times, and recency that he/she had employed that particular type of NSSI. The individual is then finally asked whether the behaviour ever required medical attention. Gratz employed this method of assessing NSSI behaviour to allow the measurement of either a continuous variable based on severity, or a dichotomous variable with the option to classify individuals as with or without a history of NSSI.

The severity of self-harming behaviour is defined as the number of times an individual has engaged in NSSI across the different DSHI methods. For example, an individual who has

used cutting four times and scratching to the point of bleeding 10 times would receive a severity score of 14. Individuals can be classified as either having a history of NSSI if they answered affirmatively on any of the DSHI items, or no NSSI if they fail to endorse any DSHI methods. The format of the DSHI also allows the user to classify participants based on a combination of these two approaches, which is the scoring method embraced by the present study. Several research studies have defined clinically significant self-harming behaviour as a history of 10 or more incidents or the use of at least three methods (MacLaren & Best, 2010; Zanarini et al., 2006). Summing participant responses on the DSHI total item frequency, as well as the total methods employed, individuals were categorized as having no history of NSSI (e.g., total items endorsed = 0), a history of non-pathological NSSI (e.g., between 1 and 9 reported incidents of NSSI, or less than three methods endorsed), or a history of pathological NSSI (e.g., 10 or more reported incidents, or three or more methods endorsed).

Gratz (2001) selected items for the DSHI on the basis of clinical observations, patient testimonies, and literature reviews. Initial testing with an undergraduate population showed that the DSHI demonstrates high internal consistency (α = .82) and adequate test-retest reliability over a 2 to 4-week period (r = .68, p <. 001). As well, the number of NSSI items endorsed on the first and second administrations was highly correlated (r = .92, p < .001). These results have been replicated by Fliege and colleagues (2006), who also found that the DSHI showed moderately high convergent validity with other measures of intentional self-injury (Fliege et al., 2006), and positively predicts psychopathological symptoms, including stress, depression, anxiety, and hostility. Frequency of self-injury, as measured by the DSHI, also significantly correlates with borderline features, as well as the severity of other concurrent addictive behaviours (MacLaren & Best, 2010). Finally, assessments of discriminant validity indicate that

the DSHI differentiates well between NSSI and suicide attempts (Gratz, 2001), and negatively predicts self-efficacy (Fliege et al., 2006). Although it has demonstrated utility in both clinical (Fliege et al., 2006) and nonclinical samples (Gratz, 2001; MacLaren & Best, 2010), the DSHI is more commonly administered to non-clinical populations.

   Functional Assessment of Self-Mutilation. The Functional Assessment of Self-Mutilation (FASM; Llyod, 1998; see Appendix C) is a self-report questionnaire created to evaluate the forms and functions of self-injurious behaviour. The FASM is divided into two main parts. The first section is similar to the DSHI and lists 12 forms of self-injury in which the participant indicates whether and how often he/she had used each method in the previous year.

   The second part contains a checklist of 23 items, each of which reflects a particular reason an individual might choose to hurt him/herself (e.g. to relieve feeling numb or empty; to punish yourself; etc.). Each item is rated on a 4-point Likert scale that ranges from 0 (never) to 3 (often), representing the frequency that each reason precipitated incidents of self-harm. The 23 items load on four factors (Nock & Prinstein, 2004) that include automatic-negative reinforcement (items 2 and 14), automatic-positive reinforcement (items 4, 10, and 22), social-negative reinforcement (items 1, 5, 9, and 13) and social-positive reinforcement (items 3, 6, 7, 8, 11, 12, 15, 16, 17, 18, 19, 20, 21). Automatic-negative reinforcement occurs when the individual engages in NSSI to relieve adverse intrapsychic experiences (e.g., "To stop bad feelings") while automatic-positive reinforcement induces desirable intrapsychic experiences (e.g., "To punish yourself" or "To feel relaxed"). Individuals who endorse social-negative reinforcement use NSSI to avoid or prevent social experiences (e.g., To avoid school, work, or other responsibilities"); those who seek social-positive reinforcement wish to provoke a specific social response (e.g., "To get attention"). Higher scores on any of these factors indicate that the

participant's NSSI behaviour is more often motivated by the reinforcing consequences characterized by that particular factor.

The FASM demonstrates moderate to good internal consistency, with α coefficients ranging between .62 and .85 across the four factors (Nock and Prinstein, 2004). The FASM has been validated using both psychiatric (Guertin et al., 2001; Lloyd, 1998) and normative samples (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Yates, Tracy, & Luthar, 2008). For example, Lloyd (1998) found that the number of functions endorsed was positively related to a history of suicide attempts. Lloyd-Richardson and associates (2007) reported that all four FASM functions were significantly related to psychiatric treatment, in-patient care, suicide attempts, and suicide ideation. As well, individual FASM factors have demonstrated the capacity to predict specific psychopathological symptoms, including depression, hopelessness, PTSD, social-perfectionism, and peer victimization (Hilt, Cha, & Nolen-Hoeksema, 2008; Nock & Prinstein, 2005). Individuals who report automatic-negative reinforcement-only are less likely to engage in repetitive self-harm; those endorsing all four functions are at an increased risk for practicing pathological NSSI (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007).

For the present study, only the second section of the FASM was used. The FASM was included to further characterize and compare the self-harm behaviours among the two NSSI groups.

Big Five Inventory. The 44-item Big Five Inventory (BFI; see Appendix D) was designed by John, Donahue, and Kentle (1991) as an alternative to the 181-item NEO Personality Inventory (NEO-PI; Costa & McCrae, 1985) to minimize administration time without compromising its psychometric properties (John, Naumann, & Soto, 2008). Each BFI item describes a particular trait on which participants rate using on a 5-point Likert scale (1 = disagree

strongly; 5 = agree strongly).   Similar to previous 5-factor inventories, the BFI measures

neuroticism (items 4, 9, 14, 19, 24, 29, 34, 39; e.g., item 9 = Worries a lot), extraversion (items

1, 6 11, 16, 21, 26, 31, 36; e.g., item 1 = Is talkative), conscientiousness (items 3, 8, 13, 18, 23,

28, 33, 38, 43; e.g., item 28 = Perseveres until the task is finished), agreeableness (items 2, 7, 12,

17, 22, 27, 32, 37, 42; e.g., item 17 = Has a forgiving nature), and openness to experience (items

5, 10, 15, 20, 25, 30, 35, 40, 41, 44; e.g., item 20 = Has an active imagination). Items 2, 6, 8, 9,

12, 18, 21, 23, 24, 27, 31, 34, 35, 37, 41, and 43 are reverse-coded. Items that load on each of

the five factors (Neuroticism, Extraversion, Conscientiousness, Agreeableness, and Openness to

Experience) are summed and averaged to obtain a mean factor score. The higher the mean factor

score, the more a participant is said to exhibit that particular trait.

The BFI format uses brief and easy to comprehend phrases that provide more detail than

adjective-only approaches, and are less complicated than the trait-descriptive statements used by

the NEO-PI. This approach is ideal when sampling from diverse populations, constrained by

time, and/or when information on individual domain facets is not critical for the research

question. The BFI has high internal consistency, with coefficient alphas ranging between .79

and .87 for the five factors (John, Naumann, & Soto, 2008), and an average test-retest stability of

.90 (Hampson & Goldberg, 2006). As well, the BFI shows good convergent validity with other

measures of personality. John, Naumann, and Soto (2008) compared both the BFI and

Goldberg's Trait Descriptive Adjectives (TDA) to Costa and McCrae's NEO-PI, which is

currently the gold standard in assessing "normal" personality. Overall, the BFI personality

domains averaged correlations of .95 with each of the TDA and NEO-FFI, which was

considerably higher than the convergent validity between the TDA and NEO-FFI. The authors

also re-analyzed the data collected by DeYoung (2006) and found a significant correlation

between the BFI and peer reports, averaging *r* of .55 across the personality domains. The BFI

has been validated cross-culturally (Rammstedt & John, 2007) and longitudinally (Hampson &

Goldberg, 2006). As well, the extreme expression of BFI traits predicts psychiatric disturbances,

including distress tolerance and PTSD symptom severity (Marshall-Berenz et al., 2010), major

depression (Kendler & Myers, 2010), and each of the personality disorders conceptualized by the

DSM-IV (Tromp & Koot, 2010)

Early Maladaptive Schema Questionnaire – Short Form. The 75-item Early

Maladaptive Schema Questionnaire – Short Form (EMSQ-SF; Young & Brown, 2005; see

Appendix E) was created to assess the dysfunctional cognitive beliefs that individuals develop in

childhood and maintain throughout their adult lives. The EMSQ-SF is the abbreviated version of

Young's (1994) 205-item Schema Questionnaire (SQ) and presents a more parsimonious

instrument for use in research. It contains the highest-loading items on 15 subscales (Schmidt,

Joiner, Young, & Telch, 1995), which in turn form five higher-order EMS domains (Young &

Brown, 2005; see Table 3). The participant judges the degree to which each statement represents

his/her personal beliefs by rating each statement on a 6-point Likert scale (1 = completely untrue

of me; 6 = describes me perfectly).

All EMSQ-SF items are positively-scaled. For the present study, participant scores were

interpreted at the each of the higher-order domain levels. Typically, subscale scores are derived

by averaging item responses on each subscale. The higher an individual scores on a particular

subscale, the more he/she experiences the maladaptive cognitions represented by that factor.

Higher-order domains are then created from related lower-level subscales. However, to reduce

errors associated with rounding of numbers and the subscale level, domain scores were obtained

by averaging all the items that load on the domain. Higher domain scores reflect a stronger

presence of the maladaptive schemas that characterize the domain.

The psychometric properties of the EMSQ-SF are comparable to the original SQ (Glaser

et al., 2002), demonstrating excellent internal consistency and good external validity.

Cronbach's α's have been reported to range between .76 and .93 for the 15 subscales of the

EMSQ-SF (Welburn et al., 2002). Although test-retest reliability has not been reported for the

EMSQ-SF, the original SQ demonstrates adequate retest stability, averaging .76 across its

subscales (Schmidt, Joiner, Young, & Telch, 1995). The EMSQ-SF has also been established as

a good predictor of various psychopathological symptoms and disorders (Welburn et al., 2002)

including those marked by cognitive distortions like depression (Halvorsen, Wang, Eisemann, &

Waterloo, 2010; Welburn et al., 2002) and disordered personalities (Ball & Cecero, 2001; Jovev

& Jackson, 2004; Lawrence, Allen, & Chanen, 2011; Mauchand, Lachenal-Chevallet, &

Cottraux, 2011; Thimm, 2010). The EMSQ-SF has been administered cross-culturally

(Saariaho, Saariaho, Karila, & Joukamaa, 2010) and validated in both clinical and nonclinical

populations (Cecero, Nelson, & Gillie, 2004; Schmidt, Joiner, Young, & Telch, 1995).

Centre for the Epidemiology Studies – Depression Scale. To ensure that the

dysfunctional cognitions captured by the EMSQ-SF were not entirely reflected by a depressive

state, which would present a methodological confound in the current study, a brief depression

inventory, the revised Centre for Epidemiology Studies – Depression Scale (CES-D; Santor &

Coyne, 1997; see Appendix F) was used as a covariate in the statistical analysis. The original

CES-D was developed by Radloff (1977) for an epidemiological study to assess distress

experienced by individuals in nonclinical populations. Two decades later, Santor and Coyne

(1997) revised this scale by selecting the items that best differentiated clinically depressed from

nondepressed individuals. The revised version of the CES-D contains nine statements that characterize the prototypical symptoms of depression (e.g., I felt everything I did was an effort; I felt sad); participants rate items on a 4-point Likert scale (0 = rarely or none of the time; 3 = most or all of the time) the frequency with which they experienced each symptom in the previous week.

The items on the revised CES-D are scored dichotomously, where endorsing a symptom with a "0" or "1" receives a score of "0", and endorsing a "2" or "3" receives a score of "1." Using this method, a participant's final score on the revised CES-D can range between 0 and 9. To maximize specificity, Santor and Coyne (1997) designated a score of "4" as a meaningful cut-off point; participants scoring at, or above, this mark are considered to be exhibiting signs of clinical depression. The revised CES-D has good internal consistency (K-R 20 = .87) and highly correlates with total scores on the original CES-D (r = .93). Compared to the original version, the specificity and positive predictive value of the revised CES-D improved by 20% and 56%, respectively.

Procedure

Recruitment procedure. Various recruitment methods were used to solicit the participation of individuals. The Lakehead University and Confederation College populations were notified about the study via a Communications Bulletin (see Appendix G) and posters (see Appendix H) placed in high traffic areas on the campuses. Clinical establishments (St. Joseph's Care Group and Thunder Bay Regional Hospital) were also approached with information about this study; once approval was granted by the respective Research Ethic Boards, recruitment posters were posted on approved bulletin boards. The general public was notified through

posters placed in local gyms and tattoo parlors. As well, an ad was posted online on Kijiji, recruiting participants from Thunder Bay.

Individuals who responded to the recruitment advertisement by visiting the survey url provided were presented with a cover letter that provided full details about the study, with the option to advance to the actual online survey if they so wished. Those who contacted the researcher had their questions answered to ensure that their decision to participate was fully informed.

Main study procedure. Individuals who accessed the online questionnaire were first greeted with a welcome letter (see Appendix I), which explained the nature and procedure of the study. This was followed by a consent form (see Appendix J). Participants who clicked on the "PROCEED" button at the bottom of the form were redirected to a separate weblink containing the research survey so that they could complete the survey anonymously.

Incentives for participation included a promise to be entered into a draw to win one of five gift certificates worth $40 to a business of the participant's choosing. As well, participating Introductory Psychology students at Lakehead University, Thunder Bay campus, were offered one bonus mark as course credit for participating in this study.

The research survey began with a set of general instructions (see Appendix K) followed by a demographics questionnaire, DSHI, FASM, BFI, EMSQ-SF, and CES-D, and ended with a debriefing page (see Appendix L). The debriefing page contained a message of appreciation from the researchers, greater details about the study, sources of information for contacting the researchers, and a list of Thunder Bay counselling resources.

Results

Design

For the present study, the independent variable was Matched Group with three levels: matched-control (MC), matched-non-pathological (MNP), and matched-pathological (MP). The dependent variables included the (1) BFI (Big Five Inventory) which assessed five dimensions of personality (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience), and the (2) EMSQ-SF (Early Maladaptive Schema Questionnaire, Short Form), which examined five domains of maladaptive cognitions (Disconnection & Rejection, Impaired Autonomy & Performance, Overvigilance/Emotion Inhibition, Other Directedness, and Impaired Limits). The CES-D (Centre for the Epidemiology Studies – Depression Scale) was used as a covariate for analyses involving the EMSQ-SF to control for the association between maladaptive cognitions and depressive symptoms (Rupke, Blecke, & Renfrow, 2006), as measured by the CES-D. The decision to include a measure of depression as a covariate was affirmed following several data analyses, which showed the CES-D to be highly correlated with each of the EMSQ-SF domains (see Table 5) and to also contribute substantially to the total variance observed when testing group differences on the EMSQ-SF (see the Results section titled *Comparing groups on the EMSQ-SF*).

Software Used in the Statistical Analyses

The computer software program, Statistical Package for the Social Sciences – Version 19.0 (SPSS-19.0) was used to assess pre-analyses issues with the original database (see section titled *Pre-analyses Issues* below) as well as the main analyses (see section titled *Main Analyses*), which included Multivariate Analysis of Variance and Multivariate Analysis of Covariance and correlations.

Pre-Analysis Issues

Missing values. Ninety-eight cases had missing values on one or more items. According to Tabachnick and Fidell (2001), "the pattern of missing data is more important than the amount missing" (p. 62). Subsequently, after the participants were divided into the control, non-pathological, and pathological NSSI groups, missing items were inspected to discern whether a pattern existed within one or more groups. The missing items were randomly distributed within each group. The missing items were then examined for each case. A dataset can tolerate 5% of missing values (Tabachnick & Fidell, 2001); for the present study, cases with more than two missing values on a given subscale were rejected from further analyses. This resulted in the elimination of three cases from analyses which included the BFI as a dependent variable and 17 cases from analyses which included the EMSQ-SF or CES-D as dependent variables. The remaining missing values for a given case were then derived by calculating the mean group score for a missing item and inserting this mean value as the participant's missing item score. As an example, case #5 was missing item 36 on the EMSQ-SF. Case #5 was classified as a member of the non-pathological NSSI group, so the mean score for item 36 on the EMSQ-SF was calculated for the non-pathological NSSI group (2.27) and inserted as the missing item value for this participant. It should be noted that the structure of the FASM does not support adjusting data to accommodate missing values, as participants are requested to check only the items which apply.

Outliers. The data was screened for within-group univariate and multivariate outliers to determine whether a participant's response on one or more dependent variables would exert undue influence on subsequent analyses. To assess for univariate outliers, standardized z-scores were computed for all of the raw subscale scores within the matched groups and screened for values which exceeded $\pm$ 3.29 (three standard deviations from the mean). No univariate outliers

were indicated.   Multivariate outliers are unusual combinations of responses, where one or more

dependent variables may fall within normal range, but together create a response profile that

places a participant at an extreme distance from the normal cluster of responses. To screen for

multivariate outliers, a Mahalanobis distance was computed to assess whether an individual's

combination of subscale responses would add undue leverage to subsequent analyses. With a

conservative p value set at .001, no multivariate outliers were indicated. To further this finding,

a Cook's distance was computed to ensure that a participant's combination of responses would

not inordinately influence the analyses. Again, with the criterion set at ≥ 1, no multivariate

outliers were indicated.

      Normality. Multivariate normality is the assumption that each variable, and all linear

combinations of the variables, are normally distributed around a central mean. For the present

study, the criteria that skewness or kurtosis divided by the standard error be less than 3.29 was

used to discern whether the variables were normally distributed within each group (Tabachnick

& Fidell, 2001). In addition, visual inspection of histograms verified these values. While many

variables were normally distributed, some exhibited violations to the assumption of normality.

      The variables that deviated from normality included the EMSQ-SF Disconnection and

Rejection (MC and MNP) and Impaired Autonomy (MC) subscales, as well as the CES-D (MC

and MNP). Also, most of the FASM subscales demonstrated deviations from normality,

including the Automatic Negative Reinforcement (MNP), Social Negative Reinforcement (MNP

and MP), and Social Positive Reinforcement (MNP and MP) subscales. Each of these variables

was positively skewed. One approach to managing violations of the normal distribution would

be to transform the data. However, most of the deviations occurred in measures that were either

supplemental to the main analyses (FASM) or included to control for possible confounding

influences (CES-D). Furthermore, transforming data can render the results difficult to interpret; subsequently, transformations were not undertaken for the present study. Therefore, it is important to note that the validity of the results may be less robust due to some deviations from normality for some of the variables.

Internal Consistency of Scales

Cronbach's α was used to assess the internal consistency of each of the variables (see Table 6 for full values). The subscales of both the BFI (α's range from .78-.87) and EMSQ-SF (α's range from .78-.96) demonstrated moderate to high internal consistency. The CES-D also showed high internal consistency ($\alpha = .91$). The internal consistency of the FASM subscales was acceptable (α's range from .63-.82) and fairly consistent with previous research (Nock & Prinstein, 2004).

Validity of Group Classification

The validity of the group classification was explored by assessing group differences on the variables used to define the groups. An ANOVA was performed on both the frequency of NSSI incidents and the number of NSSI methods employed as a function of Matched Group, which revealed significant Matched Group effects of $F(2, 145) = 6.91$, $p = .001$, partial $\varepsilon^2 = .09$ and $F(2, 153) = 197.43$, $p < .001$, partial $\varepsilon^2 = .72$, respectively. Post-hoc LSD test showed that compared to the MNP group ($M = 2.79$, $SD = 2.26$), the MP group ($M = 155.43$, $SD = 416.81$) scored higher in NSSI frequency; the MP group ($M = 4.2$, $SD = 1.85$) also endorsed more NSSI methods than the MNP group ($M = 2.79$, $SD = 2.26$). Although the classification criteria for the control group included no history of NSSI, the MNP did not score significantly higher on NSSI frequency than the control, but did exhibit a significant difference in the number of NSSI methods.

Detailed Description of Self-Harm Behaviour in Participants

Entire sample. Among the 344 individuals who participated in the study, 198 (57.56%) participants endorsed a history of self-harm. The mean age for first act of self-harm was 12.66 ($SD = 3.82$); participants engaged in NSSI for an average of 6.65 ($SD = 7.15$) years and endorsed a mean of 3.29 methods ($SD = 2.14$). The most common methods employed were cutting (65.66%), including carving words (31.31%) or pictures (19.19%) into the body, scratching (45.96%), sticking pins or sharp objects into the body (33.33%), self-punching (25.76%), preventing wounds from healing (25.76%), and burning the skin with a lighter or match (22.22%). To the author's knowledge, this is the first study using the DSHI in which every one of the items was endorsed at least once, including the more severe NSSI methods, such as individuals breaking their own bones (2.02%), and one participant endorsed dripping acid on her body. Those with a history of NSSI most often reported cutting (42.92%) and scratching (24.42%) within their first year of engaging in self-harm, and to lesser degrees sticking pins or sharp objects (14.65%) and/or self-punching (10.61%). As well, many individuals described other methods of self-harm not listed in the DSHI, including punching solid objects (e.g., brick walls, etc.) with the intention of inflicting personal injury (4.55%), overdosing or purposefully mixing drugs to cause personal harm (3.54%), and pulling out their hair (1.52%). The more dramatic NSSI methods mentioned in the DSHI open-ended option included removing fingernails and toenails, self-choking, self-drowning (with the intention of someone finding them), electric shock, and throwing oneself down flights of stairs.

Matched groups. Among the 156 participants who were classified into one of the three matched groups, those in the MP group ($M = 155.43$, $SD = 416.81$) endorsed a significantly higher frequency of self-harm than the MNP group ($M = 2.79$, $SD = 2.26$; it should be noted that

five participants in the MP group did not provide frequency estimates, stating that the number of previous NSSI incidents was too high to count) and number of methods ($M = 4.21$, $SD = 1.85$ versus $M = 1.35$, $SD = 0.48$). Compared to the MNP group, the MP group started self-harming at a younger age, $F(1, 99) = 16.17$, $p < .001$ ($M = 11.54$, $SD = 3.76$ versus $M = 14.41$, $SD = 3.41$), engaged in self-harm over a longer period of time $F(1, 96) = 62.97$, $p < .001$ ($M = 8.93$ years, $SD = 6.85$ versus $M = .90$ years, $SD = 1.55$), and were more likely to have harmed themselves within the previous year, $\chi^2 (2, N = 156) = 50.38$, $p < .001$ (57.69% versus 15.38%). Compared to the MNP group, the MP group was also significantly more likely to endorse most of the NSSI methods, with the largest differences demonstrated for cutting, $\chi^2 (2, N = 156) = 66.85$, $p < .001$ (76.92% versus 32.69%), sticking the body with pins or sharp objects, $\chi^2 (2, N = 156) = 51.79$, $p < .001$ (55.76% versus 11.54%), scratching, $\chi^2 (2, N = 156) = 48.62$, $p < .001$ (57.69% versus 17.31%), and preventing wounds from healing, $\chi^2 (2, N = 156) = 31.82$, $p < .001$ (30.77 % versus 1.92%). For further information on the frequency that each item was endorsed as a function of group, see Table 7.

Overview of Main Analyses

Prior to conducting the main analyses, a series of Pearson correlations were performed on the dependent variables included in each of the main hypotheses to test the multivariate analysis of variance-covariance assumption that the dependent variables would be moderately correlated with each other. As well, these correlations were assessed to ensure that no two variables were correlated highly enough to suggest that they were measuring the same construct. With the exception of several correlations with the Openness to Experience subscale, the BFI satisfied this assumption (r's ranged from .02 to -.45). The EMSQ-SF also satisfied this assumption by

demonstrating small to moderate correlations among its domains (r's ranged from .41 to .79).

See Table 5 for further detail on correlations between measure subscales.

A multivariate analysis of variance (MANOVA) was then employed to test for group differences on the five BFI personality factors. Where omnibus significance was indicated, separate ANOVAs were performed on each of the personality factors with Matched Group (MC, MNP, and MP) as the between-subject factor. To control for Type 1 error, the Bonferroni correction was used so that each ANOVA was assessed at $\alpha = .05/5 = .01$. Significant group differences demonstrated by the ANOVAs were followed up with post-hoc LSD tests to assess for pairwise means difference.

A multivariate analysis of covariance (MANCOVA) was then performed to test for group differences on the five EMSQ-SF domains. Where omnibus significance was indicated, separate ANCOVAs were conducted on each domain with Matched Group (MC, MNP, and MP) as the between-subject factor. To control for Type 1 error, the Bonferroni correction was used so that each ANOVA was evaluated at $\alpha = .05/5 = .01$. Significant group differences indicated by the ANCOVAs were followed up with post-hoc LSD tests to identify pairwise means difference.

Finally, a multivariate analysis of variance (MANOVA) was performed to test for group differences on the four FASM subscales. Participants classified into the MC group were excluded from analyses using the FASM as they had no NSSI history. Where omnibus significance was indicated, separate ANOVAs were performed on each of the FASM factors with Matched Group (MNP and MP) as the between-subject factor. To control for Type 1 error, the Bonferroni correction was used so that each ANOVA was assessed at $\alpha = .05/4 = .0125$. Significant group differences demonstrated by the ANOVAs were followed up with post-hoc LSD tests to assess for pairwise means difference.

Although Box's *M*, which tests for the assumption of homogeneity of variance-covariance matrices, was used for each of the main analyses, violations to this assumption were not considered critical because robustness of significance testing is expected given the equal sample sizes (Tabachnick & Fidell, 2001). However, the dependent variables which violated this assumption will be outlined in the main analyses for the information of the reader. The results of the statistical analyses are discussed below.

Comparing groups on the BFI. Within-group means on each of the five BFI personality factors are visually represented in Figure 1. *SEM* bars are provided as an indicator of the reliability of the mean estimates.

A one-way MANOVA with Matched Group as the independent variable and the five BFI personality factors as dependent variables was conducted to test the hypothesis that individuals with graded histories of self-harm (control, non-pathological NSSI, and pathological NSSI) would exhibit different personality clusters. Box's *M* statistic was used to test for homogeneity of covariances and found to be significant, $p = .025$. A significant omnibus MANOVA effect was found, Wilk's lambda (λ) = .67, $F(10, 298) = 6.27$, $p < .001$. The multivariate effect size (η^2) was estimated at 0.174, indicating that 17.4% of the variance in the canonically-derived dependent variable was accounted for by group classification.

The significant multivariate effect was then followed up with five separate ANOVAs to determine which of the five personality factors accounted for the group discrimination. Each ANOVA was interpreted at $\alpha = .01$.

Neuroticism. An ANOVA test showed a significant group effect for the BFI Neuroticism subscale, $F(2, 153) = 28.84$, $p < .001$, partial $\eta^2 = .274$. Post-hoc tests revealed that the MC

group mean ($M = 2.61$, $SD = 0.67$) was lower than either the MNP ($M = 3.45$, $SD = 0.85$) or MP ($M = 3.66$, $SD = 0.70$) groups.

Extraversion. An ANOVA test indicated a significant Matched Group effect for the BFI Extraversion subscale, $F(2, 153) = 8.17$, $p < .001$, partial $\eta^2 = .097$. Post-hoc tests showed that the MC group ($M = 3.69$, $SD = 0.76$) scored higher on Extraversion than either the MNP ($M = 3.29$, $SD = 0.84$) or MP ($M = 3.05$, $SD = 0.85$) groups.

Agreeableness. An ANOVA test demonstrated a significant Matched Group effect for the BFI Agreeableness subscale, $F(2, 153) = 12.66$ $p < .001$, partial $\eta^2 = .142$. Post-hoc tests revealed that the MC group ($M = 4.06$, $SD = 0.55$) scored higher on agreeableness than either the MNP ($M = 3.67$, $SD = 0.65$) or the MP ($M = 3.41$, $SD = 0.76$) groups.

Conscientiousness. An ANOVA test revealed a significant group effect for the BFI Conscientiousness subscale, $F(2, 153) = 9.65$, $p < .001$, partial $\eta^2 = .112$. Post-hoc tests revealed that the MC group ($M = 3.98$, $SD = 0.49$) scored higher than either the MNP ($M = 3.60$, $SD = 0.59$) or the MP ($M = 3.48$, $SD = 0.69$) groups.

Openness to Experience. An ANOVA test showed no significant group effects for the BFI Openness to Experience subscale, $F(2, 153) = .21$, *ns*.

Comparing groups on the EMSQ-SF. Within-group means on each of the five EMSQ-SF domains are visually represented in Figure 2. *SEM* bars are provided as an indicator of the reliability of the mean estimates.

A one-way multivariate analysis of covariance (MANCOVA) with Matched Group as the independent variable and the five EMSQ-SF domains as the dependent variables was performed to test the hypothesis that individuals with a history of self-harm would score higher on each of the maladaptive schemas than the control group. CES-D total depression score served as the

covariate. Prior to reporting the results, it should be noted the one participant in the MNP NSSI group was excluded from the analysis due to an incomplete score on the CES-D.

Box's M statistic was used to test for homogeneity of covariances and found to be significant, $p < .001$. A significant omnibus MANCOVA effect was observed for the CES-D covariate, Wilk's $\lambda = .82$, $F(10, 294) = 30.48$, $p < .001$, demonstrating a robust η^2 of .509. After controlling for depressive symptoms, a significant omnibus multivariate effect was observed for Matched Group, Wilk's $\lambda = .49$, $F(5, 147) = 3.09$, $p = .001$. The η^2 was estimated at 0.095, indicating that 9.5% of the variance in the canonically-derived dependent variable was uniquely accounted for by group classification. Follow-up ANCOVAs were run on each of the five EMSQ-SF domains to determine which domain(s) contributed to the group discrimination. The results were interpreted at $\alpha = .01$.

Disconnection and Rejection. An ANCOVA test indicated a significant Matched Group effect for the Disconnection and Rejection EMSQ-SF domain, $F(2, 151) = 8.12$, $p < .001$, partial $\eta^2 = .098$. Post-hoc tests showed that the MC group ($M = 1.53$, $SD = 0.61$) scored lower than either the MNP ($M = 2.53$, $SD = 0.90$) or MP ($M = 2.93$, $SD = 1.33$) groups.

Impaired Autonomy. An ANCOVA test demonstrated a significant group effect for the Impaired Autonomy EMSQ-SF domain, $F(2, 151) = 4.79$ $p = .010$, partial $\eta^2 = .060$. Post-hoc tests showed that the MC group (M = 1.42, SD = 0.44) scored lower than either the MNP ($M = 2.05$, $SD = 0.74$) or the MP ($M = 2.43$, $SD = 1.02$) groups.

Other Directedness. An ANCOVA test revealed a significant group effect for the Other Directedness EMSQ-SF domain, $F(2, 151) = 5.67$, $p = .004$, partial $\eta^2 = .070$. Post-hoc tests showed that the MC group ($M = 2.49$, $SD = 0.69$) scored lower than either the MNP ($M = 3.06$, $SD = 0.76$) or the MP ($M = 3.55$, $SD = 1.04$) groups.

Overvigilance/Emotion Inhibition. An ANCOVA test revealed a significant group effect for the Overvigilance/Emotion Inhibition EMSQ-SF domain, $F(2, 151) = 8.28$, $p < .001$, partial $\eta^2 = .099$. Post-hoc tests showed that the MC group ($M = 2.07$, $SD = 0.59$) scored lower than either the MNP ($M = 2.82$, $SD = 0.73$) or the MP ($M = 2.95$, $SD = 0.84$) groups.

Impaired Limits. An ANCOVA test indicated no significant group effects for the Impaired Limits EMSQ-SF domain, $F(2, 151) = 1.53$, $p = .220$, *ns*.

Comparing groups on the FASM. Within-group means on each of the four FASM domains are visually represented in Figure 3. *SEM* bars are provided as an indicator of the reliability of the mean estimates.

A one-way multivariate analysis of variance (MANOVA) with Matched Group as the independent variable and the four FASM subscales as the dependent variables was performed to further explore group differences in NSSI behaviour. Prior to reporting the results, it should be noted that not all of the participants completed the FASM. Within the MNP group, cell sizes ranged from 44-45 cases; for the MP group, cell sizes ranged from 48-50 cases.

Box's *M* statistic was used to test for homogeneity of covariances and not found to be significant, $p = .002$. A significant omnibus MANOVA effect was observed for the Matched Group, Wilk's $\Lambda = .59$, $F(4, 82) = 6.44$, $p < .001$. The multivariate η^2 was estimated at 0.235, indicating that 23.5% of the variance in the canonically-derived dependent variable was uniquely accounted for by group classification. Follow-up ANOVAs were run on each of the four FASM subscales to determine which factor(s) contributed to the group discrimination. The results were interpreted at $\alpha = .0125$.

Automatic Negative Reinforcement. An ANOVA test revealed a significant group effect for the Automatic Negative Reinforcement FASM subscale, $F(2, 92) = 20.50$, $p < .001$, partial η^2

= .311. Post-hoc tests showed that the MNP group ($M = 1.64$, $SD = 0.87$) scored lower than the MP group ($M = 2.85$, $SD = 1.02$).

Automatic Positive Reinforcement. An ANOVA test revealed a significant group effect for the Automatic Positive Reinforcement FASM subscale, $F(2, 92) = 30.00$, $p < .001$, partial η^2 = .397. Post-hoc tests showed that the MNP group ($M = 1.53$, $SD = 0.53$) scored lower than the MP group ($M = 2.62$, $SD = 0.82$).

Social Negative Reinforcement. An ANOVA test indicated no significant group effects for the Social Negative Reinforcement FASM subscale, $F(2, 94) = 2.65$, *ns*.

Social Positive Reinforcement. An ANOVA test indicated no significant group effects for the Social Positive Reinforcement FASM subscale, $F(2, 93) = 1.56$, *ns*.

Discussion

The last two decades have witnessed a tremendous increase in literature exploring how and why individuals engage in self-injurious behaviour. As conceptualizations of NSSI evolve, studies are reporting prevalence rates in nonclinical samples that range from 4% (Klonksy, Oltmanns, & Turkheimer, 2003) to 65.5% (Lundh, Karim, & Quilisch, 2007), with the highest estimates often reported for adolescents and young adults.   While most studies to date have investigated variables which increase an individual's risk for NSSI, clinicians have now begun to ask what sustains NSSI behaviour so that they can better treat clients who repetitively self-harm (Kripalani, Badanapuram, Gash, & Morris, 2007). To enlighten this phenomenon, the present study focused on enduring dispositional traits, examining personality and early maladaptive schemas to differentiate high and low NSSI groups and to also compare participants with and without a NSSI history.

Group Classification

Prior to discussing the results of this study, the criteria used to classify and compare participants should be restated. Participants were assigned to one of three groups as a function of their NSSI history: control group (no NSSI history), non-pathological NSSI group (less than 10 NSSI incidents and less than three methods), and pathological NSSI group (more than 10 incidents or more than three methods). For the purposes of this study, NSSI was defined as the "deliberate, direct destruction or alteration of body tissue without conscious suicidal intent… resulting in injury severe enough for tissue damage (e.g., scarring) to occur" (Gratz, 2001, p. 255). The measure used to assess NSSI behaviour also emphasized that participants not consider socially sanctioned acts, such as tattoos or piercings, when recounting their NSSI history. To test the main hypotheses, a sub-sample of participants were selected from each group, matching participants on sex, age, and (where possible) clinical status.

Overview of the Discussion

The following sections will discuss the results of the analyses. The first section will outline group differences on the five BFI personality factors, while the second section will discuss group comparisons on the five EMSQ-SF domains. The results will be discussed in relation to the hypotheses in the study. This will be followed by an examination of differences in the NSSI functions endorsed by the NSSI groups. Next, more general results will be presented, including a discussion of NSSI prevalence in the sample, as well as some methodological considerations. Each section will integrate previous research findings to better conceptualize which factors sustain NSSI behaviour as a preferred coping mechanism for stress. Finally, a summary of the present study, as well as future directions and conclusions, will be provided.

Personality

An individual's personality encompasses the enduring and idiosyncratic way he/she relates to him/herself and the sum of his/her environments. Although environmental transactions contribute to personality development, the individual is predisposed to exhibiting certain emotional and behavioural qualities (Caspi, 2000). Once adulthood is reached, the interaction between life experiences and a person's natural disposition will colour the individual's perceptions and emotions, as well as direct his/her behaviour, for the duration of his/her life. To identify personality profiles which increase an individual's risk for both experimenting with and choosing NSSI as a preferred method of coping, the present study used the trait model of personality to compare three groups with graded NSSI histories.

Control group versus NSSI history. It was first hypothesized that compared to the control group, those with a history of self-harm would exhibit increased neuroticism and openness to experience, and show decreased agreeableness and conscientiousness. This hypothesis was partially supported in that individuals with a history of self-harm (pathological and non-pathological) reported higher levels of neuroticism and lower levels of agreeableness and conscientiousness than those who did not have a history of self-harm. However, no differences were found among the groups with respect to openness to experience. The results also showed that both self-harming groups reported lower levels of extraversion than the control group. This pattern of personality traits has been found in previous research to be associated with various psychopathologies (Ruiz, Pincus, & Schinka, 2008), including borderline personality disorder (Saulsman & Page, 2004) and addictions (Anderson, Barnes, & Murray, 2011).

The profile of personality traits observed in the present study also bears similarity to that reported by both MacLaren and Best (2010) and Brown (2009) when they examined NSSI in student samples. Unlike the findings of Brown (2009), this study did not show that individuals with a NSSI history were higher in openness to experience than the control group. One possible explanation for the discrepancy in results between these two studies might lie in their methodologies. Brown administered the measures to a group of Introductory Psychology students (mean age 19.2 years) whereas the participants in the present study (mean age 25.23 years) were recruited from a wider population that included the general public. The divergence in findings associated with openness to experience might in part be related to age differences in the two studies.

Pathological versus non-pathological NSSI group. It was also predicted that compared to the non-pathological NSSI group, the pathological NSSI group would score higher in neuroticism, and exhibit decreased agreeableness, conscientiousness, and openness to experience. This hypothesis was not corroborated as no group differences were found on any of the five factor traits. MacLaren and Best (2010) reported similar findings when examining high and low NSSI groups in a sample of Introductory Psychology students. For the present study, it was anticipated that including participants from clinical and nonclinical populations would better differentiate high and low NSSI groups on personality traits, but this was not the case. This finding is interesting given that over half of the participants in the pathological group had harmed themselves more than 50 times, one quarter over 100 times, several endorsed more than a thousand incidents, and a few indicated that the number was so high that it could not be counted. In contrast, the non-pathological group engaged in self-harm to a lesser degree with respect to frequency and type of methods. Research has found that various addictions and NSSI

behaviour are related (MacLaren & Best, 2010). Perhaps, individuals in the non-pathological NSSI group are expressing themselves in other types of self-injurious behaviours that were not assessed in the present study, such as drug abuse or gambling.

Early Maladaptive Schemas

Similar to personality traits, transactions with the environment affect how the individual perceives the world and the interpersonal roles he/she must play. Often such lessons are learned at a very young age as the entirety of a child's existence is regulated by the guardians who care for him/her. Depending on how consistently the child's emotional and physical needs are met, the child is implicitly taught his/her intrinsic worth, health, abilities, and place in the world. When these messages are distorted, the child internalizes schematic representations of these transactions, negatively affecting how he/she perceives and responds to future encounters with similar environmental cues (Young, Klosko, & Weishaar, 2003). Such cognitive distortions are predictive of both emotional and psychiatric disturbances across the lifespan (Cockram, Drummond, & Lee, 2010; D'Adria, 2004; Harris & Curtin, 2002; Halvorsen, Wang, Eisemann, & Waterloo, 2010; Meyer, Leung, Feary, & Mann, 2001; Unoka, Tolgyes, Czobor, & Simon, 2010). To identify maladaptive schemas which increase an individual's risk for both experimenting with and choosing NSSI as a preferred method of coping, the present study used the five higher order EMSQ-SF domains to compare the control, non-pathological NSSI, and pathological NSSI groups.

Control group versus NSSI history. It was hypothesized that compared to the control group, those with a history of NSSI would score higher on each of the five EMSQ-SF domains. This hypothesis was generally supported. With the exception of the Impaired Limits domain, both NSSI groups scored higher on all of the maladaptive schema domains, including

Disconnection and Rejection, Impaired Autonomy, Other Directedness, and Overvigilence/Emotion Inhibition. This suggests that compared to individuals without a NSSI history, those who self-harm internalize beliefs which diminish their self-worth, abilities, and autonomy, and overly restrict emotional expression. These maladaptive schemas support research which shows that individuals engage in self-harm to regulate emotional (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007) and sensory experiences (Sandman, Touchette, & Lenjavi, 2003), to punish themselves (Nock & Prinstein, 2004), and to control their social environments (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007). People who feel unworthy and incapable often have unmet emotional and physical needs because they do not know how to solicit personal and environmental resources to meet those needs. Self-harm is one way to both suppress and satisfy these needs without demanding external resources.

The one EMSQ-SF domain that did not show group differences describes the participant's degree of impaired limits. This factor assesses entitlement and insufficient self-control, characterizing individuals who believe that they are superior to others, and who are unable or unwilling to control their emotions and impulses. This finding corroborates previous research that reports that individuals who self-harm are not typically characterized by a lack of self-control (Holly, 2011). In fact, NSSI is often performed to regain a sense of control over a variety of intrapersonal and interpersonal experiences (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007).

Pathological versus non-pathological NSSI group. It was predicted that compared to the non-pathological NSSI group, the pathological group would score specifically higher on the Disconnection and Rejection EMSQ-SF domain. The results did not support this hypothesis as no group differences were found once depressive symptoms had been accounted for. The

decision to partial out the effects of depressive symptoms prior to examining group differences ensured that the cognitive distortions measured by the EMSQ-SF were not a symptom of a transient depressive state, but were representative of enduring maladaptive schemas. One could argue against this decision on the grounds that depressive symptoms are the result of increased maladaptive schemas and, therefore, their effects should not be statistically controlled when comparing groups on their maladaptive schemas. However, depressive symptoms could also be associated with a dysregulation in neurochemical functioning (Werner & Coveñas, 2010). Partialling out the severity of symptoms in the analyses presents a way of controlling for the effects of biological correlates and allows a clear examination of group differences in maladaptive schemas.

There are several possible explanations for why the two NSSI groups did not differ from each other on the EMSQ-SF domains. The first posits that while high and low NSSI groups exhibit similar maladaptive schemas, individuals who pathologically self-harm encounter more stimuli which trigger their distorted beliefs. This would explain why NSSI is more prevalent in younger samples (Hawton & Harriss, 2008b; Hilt, Cha, & Lundh, Karim, & Quilisch, 2007; Nolen-Hoeksema, 2008; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007) and also why NSSI rates in academic environments are so high. Children have little control over their environments and, consequently, cannot escape the very transactions which shaped their dysfunctional schemas. As well, scholastic environments, whether at the grade or university level, encompass a wide array of social, cognitive, and emotional challenges, which are highly concentrated and magnified within the walls of academic institutions. A majority of the present study consisted of a student sample, and the size of the pathological NSSI group nearly tripled that of the non-pathological NSSI group. This suggests that while individuals might have similar

maladaptive schema profiles, the severity of the self-harm behaviours (as expressed through frequency and type of method) might be associated with the degree of exposure to environmental triggers.

The second explanation for why the two NSSI groups did not differ on the EMSQ-SF relates to possible differences in the behavioural expressions of their maladaptive schemas. Young, Klosko, and Weishaar (2003) identified three response styles which parallel the fight, flight, or freeze response organisms display when confronted with a threat. As a reaction to their maladaptive beliefs, individuals may overcompensate (fight), avoid (flight), or surrender (freeze) to environmental triggers. Each response style reflects how an individual shapes and responds to his/her interpersonal environment, including circumstances which activate his/her schemas and subsequent need to cope using NSSI. To illustrate, persons with an abandonment schema (perceiving others as unreliable or unstable) may leave intimate relationships before they can be abandoned (overcompensate), refuse to enter intimate relationships for fear of being abandoned (avoid), or select unstable partners who are likely to abandon them (surrender). Persons who overcompensate for, or avoid, the experiences which activate their negative beliefs would also circumvent the consequences of triggering those maladaptive schemas. However, an individual who surrenders to his/her schemas seeks out familiar experiences which confirm his/her beliefs, thus resulting in increased psychopathological symptoms which are regulated with NSSI behaviour. It is possible that comparing how individuals respond to their schemas, instead of the underlying maladaptive beliefs, would demonstrate differences between high and low NSSI groups.

A final possibility for why the two NSSI groups did not differ on any of the EMSQ-SF higher-order domains describes the methodological confound stated earlier. Non-suicidal self-

injury is similar to other self-harming addictions, like drug abuse or gambling, which are maladaptive coping behaviours for managing distress. Subsequently, it is likely that NSSI and other addictive behaviours are underscored by similar cognitive distortions. Perhaps participants with a limited NSSI history had an increased history of other addictive behaviour not assessed by the present study. This would explain the similar maladaptive beliefs demonstrated between the high and low NSSI groups. However, no participants reported addiction-related disorders in the clinical diagnosis section of the demographics form. Though, this does not mean an absence of addictions in the study sample as failure to mention an addiction-related disorder might reflect a denial of the problem.

NSSI Functions

The groups were assessed on their NSSI functions as measured with the FASM scales. It was found that, compared to the non-pathological NSSI group, those with a pathological NSSI history were more likely to report engaging in self-injurious behaviour to experience automatic negative and automatic positive reinforcement. This indicates that individuals who embrace self-harm as a preferred method of coping use it to relieve distressing emotional and sensory stimuli, or to induce desirable experiences. This supports the present study's finding that compared to the non-pathological NSSI group the pathological group endorsed significantly more depressive symptoms. Other research has found a consistent and positive correlation between depression and NSSI behaviour (Darche, 1990), and the most often endorsed reason for engaging in NSSI is to modulate negative emotions (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Madge et al., 2008; Nixon, Cloutier, & Aggarwal, 2002; Nock, Prinstein, & Sterba, 2009; Scoliers et al., 2009). Indeed, individuals with extensive NSSI histories often struggle with regulating emotions and are uncomfortable experiencing heightened emotional states. As well, disorders

characterized by deficits in processing emotions (e.g., alexithymia) report samples with increased levels of NSSI behaviour (Borrill, Fox, Flynn, & Roger, 2009). Similar to the biological underpinnings of depression, there may be biological factors contributing to the individual's reduced ability to regulate emotions, variables which are not easily detected using self-report measures of personality traits and cognitive schemas.

Prevalence of NSSI in Pooled Sample

Although individuals were recruited from multiple academic, clinical, and general communities, most of the sample consisted of participants affiliated with Lakehead University or Confederation College. Within the pooled sample, approximately 58% endorsed a history of self-harm; although this estimate approximates other prevalence reports (Hasking, Momeni, Swannell, & Chia, 2008; Lundh, Karim, & Quilisch, 2007; Williams & Hasking, 2010), the present study found a higher NSSI frequency than many other studies utilizing similar populations and survey techniques (Gratz, 2001; Hasking, Momeni, Swannell, & Chia, 2008; MacLaren & Best, 2010). Given that recruitment materials did not disguise the nature of the study, it is possible that the reported NSSI frequency was inflated as a result of a self-selection bias. Individuals with a history of self-harm likely have an interest in sharing their experiences and would be cued to participating in research that is personally relevant. However, there were extrinsic factors such as bonus marks or random prize draws offered in return for research participation that might appeal equally to individuals regardless of history of self-harm, and thereby reducing the likelihood of a self-selection bias among those who self-harm.

Another likely contribution to the increased NSSI prevalence would be the nature of the measure used to assess self-harm. Studies which use a detailed checklist of self-injurious behaviour, as was employed by the present study, often report a higher NSSI prevalence than

those which limit their definitions to one or a few items. Checklists prime individuals to

remember or endorse behaviours that are not stereotypically considered self-harm (e.g., self-

punching, preventing wounds from healing, etc.), but nonetheless fall within the broader

conceptualization of non-suicidal self-injury. Finally, the age mean (25.23) and range (18-65)

were higher than other studies (Hasking, Momeni, Swannell, & Chia, 2008; MacLaren & Best,

2010; Williams & Hasking, 2010), representing increased years and opportunity that participants

had to experiment with, and thus report, a lifetime history of self-injurious behaviour. Each of

these variables likely contributed to the high NSSI prevalence found in the present study.

Methodological Considerations

Comparing individuals with graded NSSI histories is a relatively new endeavour in

research. Operationally defining what constitutes non-pathological and pathological self-harm is

currently a function of both clinical judgment and an estimation of what one could reasonably

expect to find in nonclinical populations. The limited research that exists has used both NSSI

frequency and the number of methods endorsed to classify participants into high and low NSSI

groups. Previous literature has found that 10 or more NSSI incidents indicates clinical

significance (Zanarini et al., 2006), and multiple methods suggest increased psychopathology

(MacLaren & Best, 2010; Walsh, 2006; Zanarini et al., 2006). Subsequently, the current sample

was divided into the control, non-pathological, and pathological groups according to these

theoretical guidelines. While the classification method employed by the present study has been

reported previously (MacLaren & Best, 2010), it is more conceptually than empirically derived.

However, as NSSI research advances, these classification criteria may prove to be empirically

sound, or it may lead to refining the conceptualization of pathological versus non-pathological

NSSI to maximize group differences.

Another difficulty with classifying NSSI groups pertains to the measure used to assess NSSI behaviour. The self-harm inventory employed for the present study encompassed a comprehensive, but not exhaustive, list of NSSI items. Although there was an open-ended option where participants could list behaviours not included in the standardized items, these were not considered when assigning participants to groups. Consequently, two individuals with a history of self-harm were assigned to the control group, simply because they only endorsed the open-ended section of the DSHI. However, only one of these participants was included in the main analyses, likely rendering any statistical influence insignificant.

As well, NSSI items ranged in severity from scratching and preventing wounds from healing, to burning oneself with cigarettes, breaking bones, and dripping acid on oneself. Although, intuitively, some methods denote a more profound psychological disturbance than others, all methods were judged equally for the purpose of this study. This could arguably result in classifying participants who endorsed a more severe method (e.g., inflicting eight cigarette burns) into the non-pathological group, while assigning an individual with an intuitively less severe NSSI history (e.g., scratched oneself 10 times) to the pathological NSSI group. However, the present study found that most participants began with self-cutting and scratching, and advanced to more serious methods over time. This resulted in significantly more participants in the pathological NSSI group endorsing a history of severe NSSI methods. Also, while some participants were mainly classified in the pathological group based on endorsing a higher frequency of less severe NSSI behaviour (e.g., preventing wounds from healing in the form of picking scabs), this behaviour was still often endorsed at an exceptionally high rate, suggesting an underlying pathological compulsion. Subsequently, while the criteria used for classifying

participants into groups were not without fault, they still proved useful for the purposes of this study.

One of the strengths of the present study was that a sub-sample of participants ($N = 156$) was employed to test the main hypotheses, selected from the initial groups and matched for sex, age, and (where possible) clinical status. Due to limited existing research consisting of smaller sample sizes, as well as a disproportionately lower number of individuals with a NSSI history versus control groups, previous NSSI research requires greater caution when interpreting comparisons between high and low NSSI groups. However, the design of the present study circumvented these challenges.

Summary

Overall, the hypotheses which predicted personality and schema differences between participants with and without a NSSI history were generally supported. Compared to the control group, the two NSSI groups exhibited increased neuroticism, and decreased agreeableness and conscientiousness – personality profiles which characterize psychopathologies associated with self-injurious behaviour (Anderson, Barnes, & Murray, 2011; Ruiz, Pincus, & Schinka, 2008; Saulsman & Page, 2004). Contrary to what was predicted, the two NSSI groups did not score higher than the control in openness to experience, but they did exhibit decreased extraversion. Comparing those with and without a NSSI history on the EMSQ-SF, the two NSSI groups scored higher than the control group on four of the five EMSQ-SF domains, including Disconnection and Rejection, Impaired Autonomy, Other Directedness, and Emotion Inhibition. No group differences were found on the Impaired Limits domain.

Comparing pathological and non-pathological self-harmers, no differences were found on any of the BFI factors or EMSQ-SF domains. Three possible explanations have been offered to

describe why the two NSSI groups, which differ substantially in NSSI frequency, would exhibit similar personality and maladaptive schema profiles. The first posits that these individuals were predisposed to engaging in deliberate self-harm, but that factors other than dispositional traits sustain the behaviour. Conceptualizing the results in this manner reduces the stigma burdened by those who repetitively engage in NSSI. It suggests that they are constitutionally no different than individuals who have briefly experimented with NSSI, but that increased environmental stressors reinforce the rewarding functions of NSSI behaviour. The second explanation suggests that other variables not captured by the BFI or EMSQ-SF (e.g., coping styles, biological correlates, etc.) are contributing to the reinforcing functions of self-injurious behaviour. The final explanation states that variables not assessed by the present study, such as other forms of self-harm behaviours, better differentiate the three groups. Each of these explanations, which postulate why no differences were found between the two NSSI groups, point toward directions for future research.

Future Directions

First and foremost, research comparing high and low NSSI groups should attempt to control for a history of other addictive behaviours to ensure maximum group differentiation. Relatedly, more empirical research is needed to discern how to best operationalize pathological and non-pathological self-harm (or high and low NSSI groups). Identifying consistently meaningful criteria to divide the groups, and using similar validated measures of self-injurious behaviour, will help clarify research findings when comparing pathological and non-pathological self-harmers on various constructs.

Given that the present study did not demonstrate dispositional differences between the two NSSI groups, it would be useful to explore other individual variables. These include

examining group differences in the threat response styles outlined by Young, Klosko, and Weishaar (2003), or assessing the biological correlates of stress to discern whether high NSSI groups exhibit abnormal neurophysiological responses to emotional stimuli. Understanding how clients respond behaviourally to their schemas, particularly if they "surrender" by seeking experiences which confirm their maladaptive beliefs (Young, Klosko, & Weishaar, 2003), would guide clinicians as they choose behavioural modifications to use during treatment. Additionally, abnormal neurophysiological functioning would suggest using psychopharmacologic interventions when treating NSSI or altering daily routines to better regulate underlying biological processes. Examining factors outside the individual (e.g., family and peer dynamics, academic stressors, etc.) could determine whether pathological self-harmers experience more environmental stressors which trigger their maladaptive schemas and result in the need to cope using NSSI. Such knowledge might suggest incorporating various systems theories when conceptualizing cases and designing treatment interventions.

Beyond comparing pathological and non-pathological self-harm, it would be informative to separate high NSSI groups into those who have self-harmed recently from individuals who have abstained from NSSI for at least several years prior to participating in the research. Psychological constructs (e.g., coping strategies, cognitions, etc.), psychosocial histories, use of mental health services, etc., may show variable patterns which suggest why some individuals are able to overcome their self-injurious behaviour and others continue to struggle with NSSI. As well, individuals who prefer specific NSSI methods (e.g., self-punching versus cutting versus cigarette burns, etc.) may hold particular maladaptive cognitions or traits unique to the behaviour. Further, patterns of self-harming behaviour (e.g., methods used, areas of the body injured, how wounds are treated after they are inflicted, etc.) may correlate with specific

underlying pathologies, maladaptive traits, distorted thought processes, or even relate to particular environmental stressors (e.g., social/familial, academic, etc.).

Continuing to explore the many nuances of NSSI behaviour, both individually and performing group comparisons, will advance how NSSI and treatment practices are conceptualized. This will, in turn, serve to demystify the underlying processes of this dysfunctional coping strategy, as well as provide more effective interventions for those who struggle with the urge to hurt themselves.

Conclusion

Although deliberate self-harm remains shrouded in social stigma, research continues to enlighten the symbolic and arguably adaptive nature of this behaviour. Self-inflicted wounds regulate intrapsychic experiences and communicate a depth of suffering that words are inapt to convey. Understanding the narratives which both elicit and sustain NSSI behaviour helps clinicians perceive their clients beyond the stigma and recognize that these clients are simply persons struggling to create meaning of their personal experiences.

While the present study did not find differences between high and low NSSI groups on dispositional traits, it did provide further evidence that some individuals are at an increased risk for participating in NSSI. This was demonstrated by the common personality and maladaptive schema profiles (characteristics which emerge in early childhood and are underscored by one's capacity to regulate emotions) exhibited between individuals with limited versus pathological NSSI histories. The results of this study also point toward future investigations, suggesting that research focus on more current and situational stressors, which might show a greater ability to predict repetitive self-harm in those already predisposed to self-injurious behaviour.

Non-suicidal self-injury will likely remain a universal expression of the human experience, but increasing insights into its underlying mechanisms will inform more than just clinical practice; it will also guide the efforts of significant others. Individuals close to the at-risk person may better recognize dispositional and situational risk factors, intervening to prevent the behaviour from emerging or escalating, and informing healthcare professionals on best practices with those prone to self-injurious behaviour. Finally, these insights would provide the vulnerable individual with the very goals he/she would otherwise pursue through non-suicidal self-injury, which is to be heard, understood, and valued. Once realized, the urge to self-harm might finally be assuaged.

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    440X(96)90044-9

Table 1

Pooled Sample Characteristics

Sample Characteristic	Frequency
Age	
M (*SD*)[Range]	25.23 (8.14)[18-65]
Missing	10
Sex (%)	
Male	65 (18.90)
Female	277 (80.52)
Other [a]	2 (0.58)
Ethnicity (%)	
Aboriginal	20 (5.81)
White, not of Hispanic origin	305 (88.66)
Black, not of Hispanic origin	2 (0.58)
Asian/Pacific Islander	7 (2.03)
Latino or Hispanic	1 (0.29)
Other [b]	8 (2.32)
Missing	1(0.29)
Marital Status (%)	
Single	224 (65.12)
Common-law	52 (15.16)
Married	48 (13.95)
Divorced	6 (1.74)
Separated	11 (3.20)
Widowed	2 (0.58)
Missing	1(0.29)
Highest Education Achieved	
Grade 8 or earlier	3 (0.87)
High school	176 (51.16)
College or trade school	75 (21.80)
Undergraduate degree	74 (21.51)
Graduate degree	10 (2.91)
PhD/Post-doctoral	4 (1.16)
Missing	2 (0.58)
Clinical Status [c] (%)	
Non-Clinical	237 (68.90)
Clinical	107 (31.10)
Psychiatric Diagnoses [d] (%)	
Mood Disorder	46 (13.37)
Anxiety Disorder	47(13.66)
Eating Disorder	7 (2.03)
Personality Disorder	3 (0.87)
Disorders Diagnosed in Infancy, Childhood, or Adolescence [e]	7 (2.03)
Other [f]	2 (0.58)
No Diagnosis	263 (76.45)
NSSI History (%)	
No History of NSSI	146 (42.44)
History of NSSI	198 (57.56)

Note. *N*= 344. NSSI = Non-suicidal self-injury; [a] Self-identified as transgendered or gender-queer; [b] Self-identified as more than one ethnicity; [c] Currently receiving mental health assistance/on the waitlist for mental health assistance and/or with a current psychiatric diagnosis; [d] Participants with comorbid diagnoses are counted more than once; [e] ADD/ADHD or Asperger's; [f] Trichotillomania, Gender Identity Disorder, Tourettes Syndrome.

Table 2

Sample Characteristics by Group, Not Matched

	Control $n = 146$	Non-Pathological NSSI $n = 56$	Pathological NSSI $n = 142$
Age			
M (SD)[Range]	26.37 (9.11)[18-65]	24.78 (7.85)[18-60]	24.25 (7.03)[18-57]
Missing	4	4	2
Sex (%)			
Male	30 (20.55)	9 (16.07)	26 (18.31)
Female	116 (79.54)	47 (83.93)	114 (80.28)
Other [a]	-	-	2 (1.41)
Ethnicity (%)			
Aboriginal	6 (4.11)	3 (5.36)	11 (7.75)
White, not of Hispanic origin	135 (92.47)	51 (91.07)	119 (83.80)
Black, not of Hispanic origin	-	-	2 (1.41)
Asian/Pacific Islander	4 (2.74)	1 (1.79)	2 (1.41)
Latino or Hispanic	1 (0.68)	-	-
Other [b]	-	1 (1.79)	7 (4.93)
Missing	-	-	1 (1.41)
Marital Status (%)			
Single	92 (63.01)	40 (71.43)	92 (65.79)
Common-law	20 (13.70)	3 (5.36)	29 (20.42)
Married	26 (17.81)	9 (16.07)	13 (9.15)
Divorced	3 (2.05)	-	3 (2.11)
Separated	5 (3.42)	3 (5.36)	3 (2.11)
Widowed	-	1 (1.79)	1 (0.70)
Missing	-	-	1 (0.70)
Highest Education Achieved			
Grade 8 or earlier	1 (0.68)	1 (1.79)	1 (0.70)
High school	66 (45.21)	28 (50.00)	82 (57.75)
College or trade school	27 (18.49)	13 (23.21)	35 (24.65)
Undergraduate degree	41 (28.08)	12 (21.43)	21 (14.79)
Graduate degree	7 (4.93)	2 (3.57)	1 (0.70)
PhD/Post-doctoral	3 (2.05)	-	1 (0.70)
Missing	1 (0.69)	-	1 (0.70)
Clinical Status [c] (%)			
Non-Clinical	125 (85.62)	39 (69.64)	74 (52.11)
Clinical	21 (14.38)	17 (30.35)	68 (47.89)
Psychiatric Diagnoses [d] (%)			
Mood Disorder	7 (4.79)	5 (8.93)	34 (60.7)
Anxiety Disorder	9 (6.16)	7 (12.50)	31 (55.4)
Eating Disorder	-	-	7 (12.5)
Personality Disorder	-	-	3 (5.4)
Disorders Diagnosed in Infancy, Childhood, or Adolescence [e]	2 (1.47)	2 (3.57)	3 (2.11)
Other [f]	-	-	2 (1.41)
Total [g]	14 (9.59)	11 (19.64)	56 (39.44)

Note. NSSI = Non-suicidal self-injury; Percentages represent group (*n*) percentages; [a] Self-identified as transgendered or gender-queer; [b] Self-identified with more than one ethnicity; [c] Currently receiving mental health assistance/on the waitlist for mental health assistance and/or with a current psychiatric diagnosis; [d] Participants with comorbid diagnoses are counted more than once; [e] ADD/ADHD or Asperger's; [f] Trichotillomania, Gender Identity Disorder, Tourettes Syndrome; [g] Total number of individuals within the non-matched group who have one or more psychiatric diagnoses.

Table 3

EMSQ-SF Domains and Subscale Descriptions

Disconnection & Rejection

Items	Subscale	Definition	Example
1, 16, 31, 46, 61	Emotional Deprivation	Believes that others will not nurture or empathize with his/her emotional needs	*I haven't felt that I am special to someone.*
2, 17, 32, 47, 62	Abandonment/ Instability	Perceives others as unreliable & unstable	*I need other people so much that I worry about losing them.*
3, 18, 33, 48, 63	Mistrust/Abuse	Expects that others will hurt, manipulate, or take advantage of him/her	*It is only a matter of time before someone betrays me.*
4,19, 34, 49, 64	Social Isolation	Feels that he/she is isolated or different from others	*I don't belong; I'm a loner.*
5, 20, 35, 50, 65	Defectiveness/ Shame	Believes that he/she is inherently defective, bad, & unwanted	*I feel that I'm not lovable.*

Impaired Autonomy & Performance

Items	Subscale	Definition	Example
6, 21, 36, 51, 66	Failure to Achieve	Believes that he/she is inadequate and will inevitably fail	*I'm not as talented as most people are at their work.*
7, 22, 37, 52, 67	Dependence/ Incompetence	Believes that he/she in incompetent & helpless without others	*I lack common sense.*
8, 23, 38, 53, 68	Vulnerability to Harm	Perceives catastrophes as imminent, excessively fearing them	*I worry about being attacked by other people.*
9, 24, 39, 54, 69	Enmeshment	Lacks personal identity; feels smothered by, or fused with, a significant other	*I often feel that I do not have a separate identity from my parent(s) or partner.*

Impaired Limits

Items	Subscale	Definition	Example
10, 25, 40, 55, 70	Entitlement	Believes that he/she is superior to others & has special privileges	*I hate to be constrained or kept from doing what I want.*
11, 26, 41, 56, 71	Insufficient Self-Control	Low frustration tolerance, inpatient, unrestrained in emotions & impulses	*I have rarely been able to stick to my resolutions.*

Other-Directedness

Items	Subscale	Definition	Example
12, 27, 42, 57, 72	Subjugation	Often surrenders control to others; supresses preferences, desires, & emotions	*I think that if I do what I want, I'm only asking for trouble.*
13, 28, 43, 58, 73	Self-Sacrifice	Excessive volunteering to take care of others, even at the expense of personal desires and needs	*I've always been the one who listens to everyone else's problems.*

Note. EMS-SF = Early Maladaptive Schemas – Short Form; See Young (1994) for extended subscale descriptions

Table 3 (continued)

EMSQ-SF Domains and Subscale Descriptions

Overvigilance/Emotion Inhibition

Items	Subscale	Definition	Example
14, 29, 44, 59, 74	Emotional Inhibition	Inhibits spontaneous action or feeling, usually to avoid disapproval from others	*People see me as uptight emotionally.*
15, 30, 45, 60, 75	Unrelenting Standards	Believes he/she must meet high internalized standards of performance	*I try to do my best; I can't settle for "good enough."*

Note. EMS-SF = Early Maladaptive Schemas – Short Form; See Young (1994) for extended subscale descriptions

Table 4

Sample Characteristics of Matched Groups

	Control n = 52	Non-Pathological NSSI n = 52	Pathological NSSI n = 52
Age			
M (SD)[Range]	24.35 (6.42)[18-40]	24.79 (8.00)[18-60]	24.65 (7.52)[18-51]
Sex (%)			
Male	9 (17.31)	9 (17.31)	9 (17.31)
Female	43 (82.69)	43 (82.69)	43 (82.69)
Ethnicity			
Aboriginal	3 (5.77)	3 (5.77)	4 (7.69)
White, not of Hispanic origin	48 (92.31)	47 (90.38)	42 (80.77)
Asian/Pacific Islander	1 (1.92)	1 (1.92)	-
Black, not of Hispanic origin	-	-	1 (1.92)
Other [a]	-	1 (1.92)	5 (9.62)
Marital Status (%)			
Single	38 (73.07)	37 (71.15)	33 (63.46)
Common-law	8 (15.38)	3 (5.77)	10 (19.23)
Married	4 (7.69)	8 (15.38)	6 (11.54)
Divorced	1 (1.92)	-	1 (1.92)
Separated	1 (1.92)	3 (5.77)	-
Widowed	-	1 (1.92)	1 (1.92)
Not Specified	-	-	1 (1.92)
Highest Education Achieved			
Grade 8 or earlier	-	1 (1.92)	-
High school	30 (57.69)	25 (48.08)	33 (63.46)
College or trade school	11 (21.15)	13 (25.00)	14 (26.92)
Undergraduate degree	9 (17.31)	11 (21.15)	5 (9.62)
Graduate degree	1 (1.92)	2 (3.85)	-
PhD/Post-doctoral	1 (1.92)	-	-
Clinical Status [b] (%)			
Non-Clinical	45 (86.54)	37 (71.15)	36 (69.23)
Clinical	7 (13.46)	15 (28.85)	16 (30.77)
Psychiatric Diagnoses [c] (%)			
Mood Disorder	2 (3.85)	5 (9.62)	8 (15.38)
Anxiety Disorder	3 (5.77)	5 (9.62)	7 (13.46)
Eating Disorder	-	-	5 (9.62)
Total [d]	4 (7.69)	7 (13.46)	12 (23.08)

Note. NSSI = Non-suicidal self-injury; Percentages represent group (*n*) percentages; [a] Self-identified as more than one ethnicity; [b] Currently receiving mental health assistance/on the waitlist for mental health assistance and/or with a current psychiatric diagnosis; [c] Participants with comorbid diagnoses are counted more than once; [d] Total number of individuals within the group who have one or more psychiatric diagnoses.

Table 5
Correlations Among Measures

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	N
1. E [a]																341
2. A [b]	.28**															341
3. C [c]	.32**	.31**														341
4. N [d]	-.45**	-.41**	-.39**													341
5. O [e]	.16**	.04	.02	-.12*												341
6. D&R [f]	-.45**	-.44**	-.39**	.65*	.05											327
7. IA [g]	-.42**	-.32**	-.42**	.64*	-.03	.79**										327
8. IL [h]	-.26**	-.06	-.20**	.43**	.02	.71**	.59**									327
9. OD [i]	-.38**	-.39**	-.16**	.46**	.03	.67**	.56**	.59**								327
10. O/E [j]	-.36**	-.41**	-.53**	.41**	.05	.56**	.52**	.41**	.50**							327
11. Dep. [k]	-.18*	-.34**	-.38**	.63**	.06	.68**	.67**	.46**	.50**	.48**						327
12. ANR [l]	-.24**	-.13	-.28**	-.27**	.03	.34**	.29**	.24**	.29**	.20**	.38**					185
13. APR [m]	-.19**	-.06	-.20**	.32**	.06	.39**	.37**	.26**	.36**	.18*	.39**	.77**				183
14. SNR [n]	.10	.07	-.09	.24**	.01	.34**	.39**	.26**	.28**	.23**	.31**	.36**	.42**			189
15. SPR [o]	.10	.07	.06	.04	.00	-.02	.09	.08	.01	.00	.06	.26**	.31**	.42**		184

Note. [a] Extraversion; [b] Agreeableness; [c] Conscientiousness; [d] Neuroticism; [e] Openness to Experience; [f] Disconnection & Rejection; [g] Impaired Autonomy; [h] Impaired Limits; [i] Other Directedness; [j] Overvigilance/Emotion Inhibition; [k] Centre for the Epidemiology Studies – Depression Scale; [l] Automatic Negative Reinforcement; [m] Automatic Positive Reinforcement; [n] Social Negative Reinforcement; [o] Social Positive Reinforcement.
* $p < .05$. ** $p < .01$.

Table 6

Subscale Mean, Standard Deviation, and Internal Consistency (Cronbach's α) of Dependent Measures

	M	*SD*	*α*
BFI [a]			
Extraversion	3.26	.83	.87
Agreeableness	3.72	.65	.78
Conscientiousness	3.62	.64	.79
Neuroticism	3.27	.85	.86
Openness to Experience	3.63	.59	.75
EMSQ-SF [b]			
Disconnection & Rejection	2.40	1.14	.96
Impaired Autonomy	2.03	.83	.91
Impaired Limits	2.90	.93	.82
Other Directedness	3.15	.95	.82
Overvigilance/Emotion Inhibition	2.64	.79	.78
CES-Depression [c]	2.80	2.97	.91
FASM [d]			
Automatic Negative Reinforcement	2.48	1.07	.74
Automatic Positive Reinforcement	2.27	.90	.68
Social Negative Reinforcement	1.26	.47	.63
Social Positive Reinforcement	1.38	.42	.82

Note. [a] Big Five Inventory; [b] Early Maladaptive Schema Questionnaire – Short Form; [c] Centre for the Epidemiology Studies – Depression Scale; [d] Functional Assessment of Self-Mutilation.

Table 7

Frequency (Percentage) of Each Self-Harm Method by Group

	Non-Pathological NSSI $n = 56$	Pathological NSSI $n = 142$	Matched-Non-Pathological NSSI $n = 52$	Matched-Pathological NSSI $n = 52$
Method (%)				
Cutting	20 (35.71)	110 (77.46)	17 (32.69)	40 (76.92)
Burned with a cigarette	4 (7.14)	19 (13.38)	4 (7.69)	4 (7.69)
Burned with a lighter	5 (8.93)	39 (27.46)	4 (7.69)	14 (26.92)
Carved words	8 (14.29)	54 (38.03)	7 (13.46)	19 (36.54)
Carved pictures	6 (10.71)	32 (22.53)	5 (9.62)	13 (25.00)
Scratched	9 (16.07)	82 (57.75)	9 (17.31)	30 (57.69)
Biting	2 (3.57)	28 (19.72)	2 (3.85)	13 (25.00)
Sandpaper	1 (1.79)	9 (6.34)	1 (1.92)	2 (3.85)
Dripped acid	0	1 (0.70)	0	0
Scrubbed with bleach or cleaner	0	3 (2.11)	0	1 (1.92)
Pins or other sharp objects	7 (12.50)	59 (41.55)	6 (11.54)	29 (55.77)
Rubbed glass into body	0	5 (3.52)	0	2 (3.85)
Broken bones	0	4 (2.82)	0	0
Banged Head	5 (8.93)	36 (25.35)	5 (9.62)	16 (30.77)
Punched self	10 (17.86)	41 (28.87)	9 (17.31)	19 (36.54)
Prevented wounds from healing	2 (3.57)	49 (34.51)	1 (1.92)	16 (30.77)

Note. NSSI = non-suicidal self-injury. Items are from the Deliberate Self-Harm Inventory (Gratz, 2001).
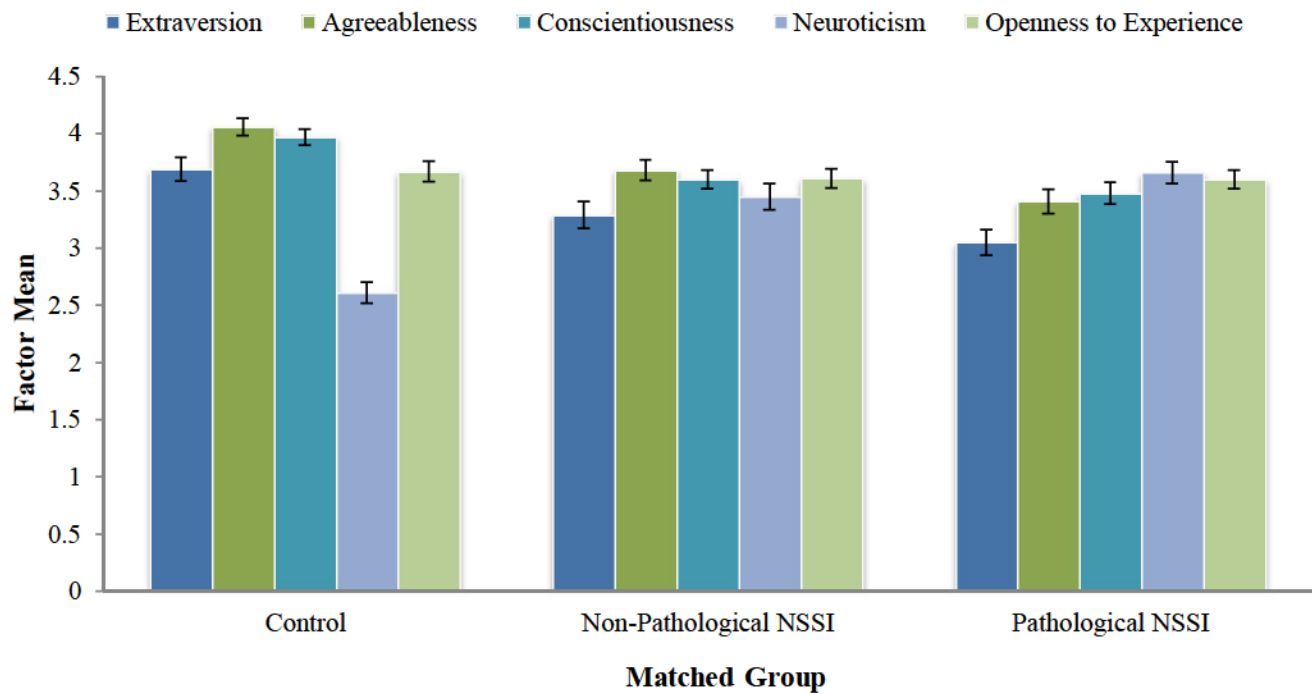
Figure 1. Matched-group mean differences on the five personality factors represented by the Big Five Inventory. Standard errors are represented in the figure by the *SEM* bars attached to each column.
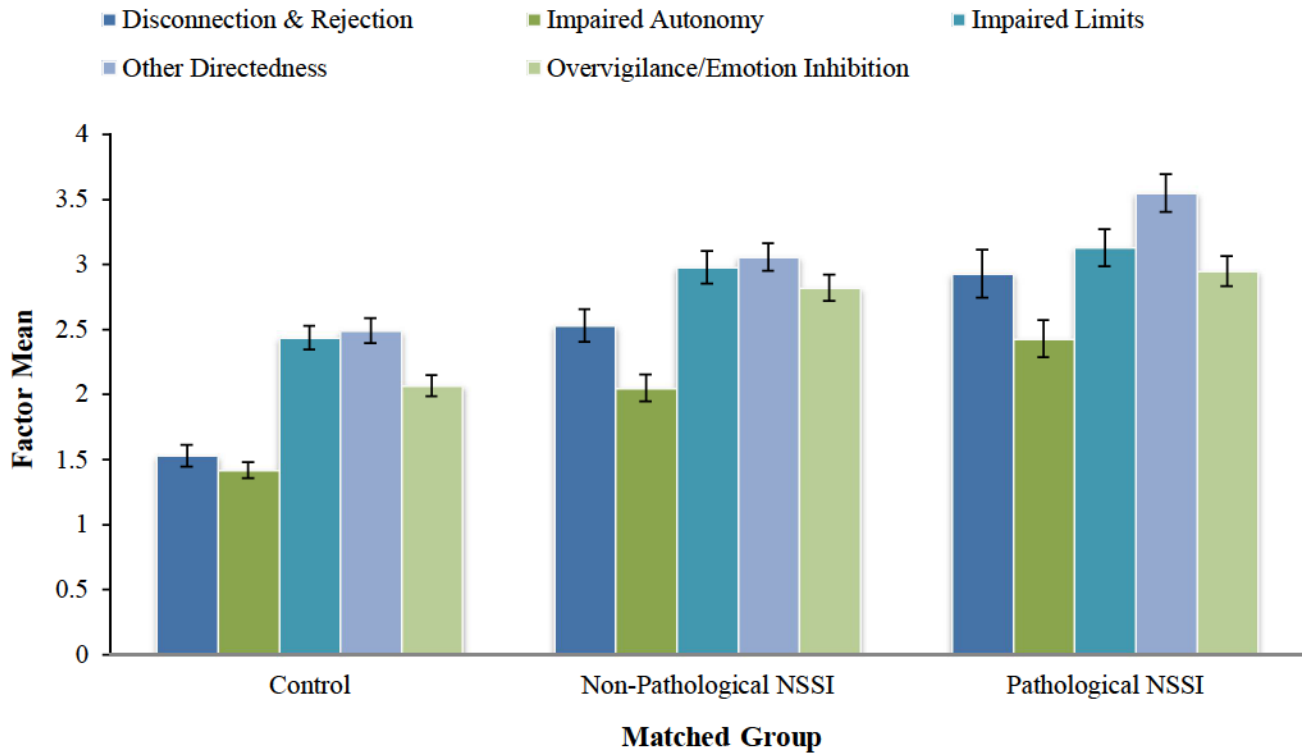
Figure 2. Matched-group mean differences in cognitive distortions represented the five Early Maladaptive Schema-Short Form higher-order domains. Standard errors are represented in the figure by the *SEM* bars attached to each column.

Figure 3. Matched-group mean differences on the four Functional Assessment of Self-Mutilation subscales, which characterize the reasons participants engaged in self-harm. Standard errors are represented in the figure by the *SEM* bars attached to each column.

Appendix A
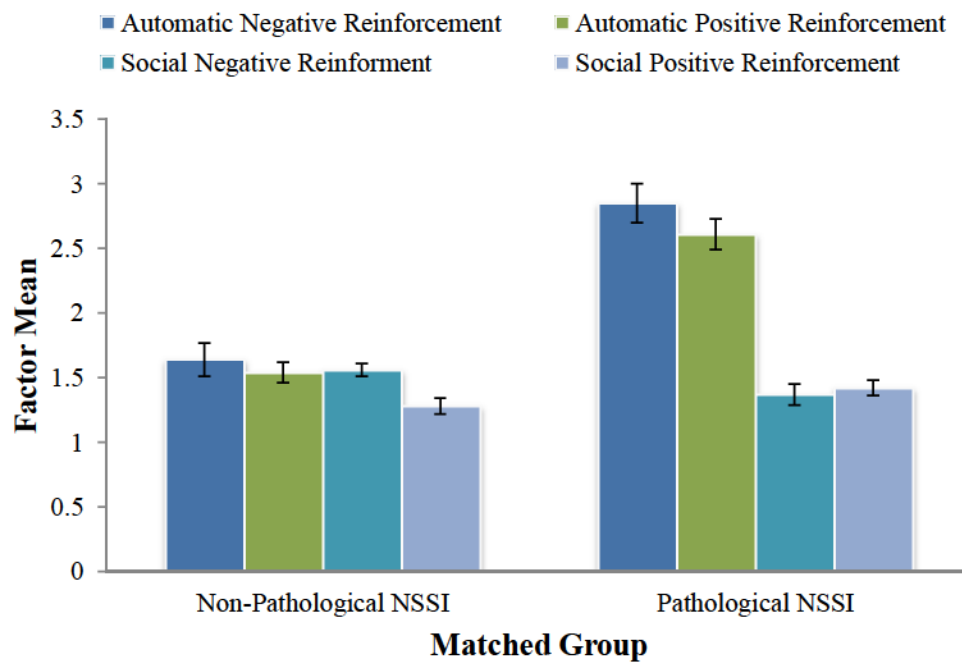Demographics Questionnaire

Background Information

If you do not feel comfortable answering any one of these background questions, please skip.

1. **Age:** _____years

2. **Sex:** ____Female   ____Male

   Or, you may self-classify your sex: **_____**

3. **Marital Status:**

   ____Single   ____Common-law   ____Married   ____Divorced   ____Separated   ____Widowed

4. **Ethnicity, select one:**

   _____ Aboriginal
   _____ White, not of Hispanic origin (origins in Europe, North Africa, Middle East)
   _____ Black, not of Hispanic origin (origins in Africa)
   _____ Asian/Pacific Islander (origins in far East, Southeast Asia, India Subcontinent, Pacific Islands)
   _____ Latino or Hispanic (Mexican, Puerto Rican, Cuban, Central or South American, or other
          Spanish culture or origin)
   _____ Other, please specify _____

5. **Highest level of education achieved:**

   _____ Completed Grade 8 or earlier
   _____ Completed high school
   _____ Completed college or trade school
   _____ Completed undergraduate degree program
   _____ Completed graduate degree program
   _____ PhD/Post-doctoral

6. **Have you ever received mental health assistance from a counsellor, therapist, social worker, psychologist, or psychiatrist?**

   ____Yes   ____No

7. **Are you currently receiving, or waiting to receive, mental health assistance from a counsellor, therapist, social worker, psychologist, or psychiatrist?**

   ____Yes   ____No

8. **How many times have you visited a counsellor, therapist, social worker, psychologist, or psychiatrist, to receive psychological help?**

   _____None   _____ 1 visit only   _____ 2 to 5 visits   _____ 5-10 visits
   _____ 10-15 visits   _____ 15-20 visits   _____ > 20 visits

9. **What diagnosis of a mental health disorder, if any, do you currently have?**

 No diagnosis _____

Current diagnosis (please specify) _____

Appendix B

Deliberate Self-Harm Inventory

Directions: This questionnaire asks about a number of different things that people sometimes do to hurt themselves.   Please be sure to read each question carefully and respond honestly. Often, people who do these kinds of things to themselves keep it a secret, for a variety of reasons. However, honest responses to these questions will provide us with greater understanding and knowledge about these behaviors and the best way to help people. **Please answer yes to a question only if you did the behavior *intentionally, or on purpose*, to hurt yourself, *without intending to kill yourself*.** Do not respond yes if you did something accidentally (e.g., you tripped and banged your head on accident). Also, please be assured that your responses are completely confidential.

1.	**Have you ever intentionally (i.e., on purpose) *cut your wrist, arms, or other area(s) of your body* (without intending to kill yourself)?** ____Yes ____No
	If yes: How old were you when you first did this? _____ How many times have you done this? _____ When was the last time you did this? _____ How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____ Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____
2.	**Have you ever intentionally *burned yourself with a cigarette?* ____Yes ____No**
	If yes: How old were you when you first did this? _____ How many times have you done this? _____ When was the last time you did this? _____ How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____ Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____
3.	**Have you ever intentionally *burned yourself with a lighter or a match?* ____Yes ____No**
	If yes: How old were you when you first did this? _____ How many times have you done this? _____ When was the last time you did this? _____ How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____ Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

4.   **Have you ever intentionally *carved words into your skin?* ____Yes   ____No**

If yes: How old were you when you first did this? _____

How many times have you done this? _____

When was the last time you did this? _____

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

5.   **Have you ever intentionally *carved pictures, designs, or other marks into your skin?* ____Yes   ____No**

If yes: How old were you when you first did this? _____

How many times have you done this? _____

When was the last time you did this? _____

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

6.   **Have you ever intentionally *severely scratched yourself,* to the extent that *scarring or bleeding occurred?* ____Yes   ____No**

If yes: How old were you when you first did this? _____

How many times have you done this? _____

When was the last time you did this? _____

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

7.   **Have you ever intentionally *bit yourself,* to the extent that you *broke the skin?* ____Yes   ____No**

If yes: How old were you when you first did this? _____

How many times have you done this? _____

When was the last time you did this? _____

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

8. **Have you ever intentionally *rubbed sandpaper on your body?* ____Yes   ____No**

If yes: How old were you when you first did this? _____

How many times have you done this? _____

When was the last time you did this? _____

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

9. **Have you ever intentionally *dripped acid onto your skin?* ____Yes   ____No**

If yes: How old were you when you first did this? _____

How many times have you done this? _____

When was the last time you did this? _____

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

10. **Have you ever intentionally *used bleach, comet, or oven cleaner to scrub your skin?* ____Yes   ____No**

If yes: How old were you when you first did this? _____

How many times have you done this? _____

When was the last time you did this? _____

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

11. **Have you ever intentionally *stuck sharp objects such as needles, pins, staples, etc. into your skin*, not including tattoos, ear piercing, needles used for drug use, or body piercing? ____Yes   ____No**

If yes: How old were you when you first did this? _____

How many times have you done this? _____

When was the last time you did this? _____

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

12. **Have you ever intentionally *rubbed glass into your skin*?** ____Yes ____No

> *If yes:* How old were you when you first did this? _____
>
> How many times have you done this? _____
>
> When was the last time you did this? _____
>
> How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____
>
> Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

13. **Have you ever intentionally *broken your own bones*?** ____Yes ____No

> *If yes:* How old were you when you first did this? _____
>
> How many times have you done this? _____
>
> When was the last time you did this? _____
>
> How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____
>
> Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

14. **Have you ever intentionally *banged your head against something,* to the extent that you *caused a bruise to appear*?** ____Yes ____No

> *If yes:* How old were you when you first did this? _____
>
> How many times have you done this? _____
>
> When was the last time you did this? _____
>
> How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____
>
> Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

15. **Have you ever intentionally *punched yourself,* to the extent that you *caused a bruise to appear*?** ____Yes ____No

> *If yes:* How old were you when you first did this? _____
>
> How many times have you done this? _____
>
> When was the last time you did this? _____
>
> How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____
>
> Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

16. Have you ever intentionally *prevented wounds from healing?* ____Yes ____No

If yes: How old were you when you first did this? _____

How many times have you done this? _____

When was the last time you did this? _____

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

17. Have you ever intentionally *done anything else to hurt yourself* that was not asked about in this questionnaire? ____Yes ____No

If yes: what did you do to hurt yourself? _____

How old were you when you first did this? _____

How many times have you done this? _____

When was the last time you did this? _____

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) _____

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? _____

Appendix C

Functional Assessment of Self-Mutilation

Directions: If you previously responded that you have deliberately harmed yourself, without intending to kill yourself, did you harm yourself for any of the reasons listed below? Please check all that apply.

Note: If you responded that you have never intentionally injured yourself, without suicidal intentions, please check here _____ and go to the next page.

1 = Never	2 = Rarely	3 = Some	4 = Often

Reason	Rating
1. To avoid school, work, or other responsibilities	
2. To relieve feeling "numb" or empty	
3. To get attention	
4. To feel something, even if it was pain	
5. To avoid doing something unpleasant you don't want to do	
6. To get control of a situation	
7. To try to get a reaction from someone, even if it's a negative reaction	
8. To receive more attention from your parents or friends	
9. To avoid being with people	
10. To punish yourself	
11. To get other people to act differently or change	
12. To be like someone you respect	
13. To avoid punishment or paying the consequences	
14. To stop bad feelings	
15. To let other know how desperate you were	
16. To feel more a part of a group	
17. To get your parents to understand or notice you	
18. To give yourself something to do when you're alone	
19. To give yourself something to do when with others	
20. To get help	
21. To make others angry	
22. To feel relaxed	
23. Other:	

Appendix D

Big Five Inventory

How I am in general

Directions: Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who *likes to spend time with others*? Please write a number next to each statement to indicate the extent to which **you agree or disagree with that statement.**

I am someone who…	Disagree Strongly	Disagree a little	Neither Agree nor Disagree	Agree a little	Agree Strongly
1. Is talkative.	1	2	3	4	5
2. Tends to find fault with others	1	2	3	4	5
3. Does a thorough job.	1	2	3	4	5
4. Is depressed, blue.	1	2	3	4	5
5. Is original, comes up with new ideas.	1	2	3	4	5
6. Is reserved.	1	2	3	4	5
7. Is helpful and unselfish with others.	1	2	3	4	5
8. Can be somewhat careless.	1	2	3	4	5
9. Is relaxed, handles stress well.	1	2	3	4	5
10. Is curious about many different things.	1	2	3	4	5
11. Is full of energy.	1	2	3	4	5
12. Starts quarrels with others.	1	2	3	4	5
13. Is a reliable worker.	1	2	3	4	5
14. Can be tense.	1	2	3	4	5
15. Is ingenious, a deep thinker.	1	2	3	4	5
16. Generates a lot of enthusiasm.	1	2	3	4	5
17. Has a forgiving nature.	1	2	3	4	5

I am someone who…	Disagree Strongly	Disagree a little	Neither Agree nor Disagree	Agree a little	Agree Strongly
18. Tends to be disorganized.	1	2	3	4	5
19. Worries a lot.	1	2	3	4	5
20. Has an active imagination.	1	2	3	4	5
21. Tends to be quiet.	1	2	3	4	5
22. Is generally trusting.	1	2	3	4	5
23. Tends to be lazy.	1	2	3	4	5
24. Is emotionally stable, not easily upset.	1	2	3	4	5
25. Is inventive.	1	2	3	4	5
26. Has an assertive personality.	1	2	3	4	5
27. Can be cold and aloof.	1	2	3	4	5
28. Perseveres until the task is finished.	1	2	3	4	5
29. Can be moody.	1	2	3	4	5
30. Values artistic, aesthetic experiences.	1	2	3	4	5
31. Is sometimes shy, inhibited.	1	2	3	4	5
32. Is considerate and kind to almost everyone.	1	2	3	4	5
33. Does things efficiently.	1	2	3	4	5
34. Remains calm in tense situations.	1	2	3	4	5
35. Prefers work that is routine.	1	2	3	4	5
36. Is outgoing, sociable.	1	2	3	4	5
37. Is sometimes rude to others.	1	2	3	4	5
38. Makes plans and follows through with them.	1	2	3	4	5

I am someone who…	Disagree Strongly	Disagree a little	Neither Agree nor Disagree	Agree a little	Agree Strongly
39. Gets nervous easily.	1	2	3	4	5
40. Likes to reflect, play with ideas.	1	2	3	4	5
41. Has few artistic interests.	1	2	3	4	5
42. Likes to cooperate with others.	1	2	3	4	5
43. Is easily distracted.	1	2	3	4	5
44. Is sophisticated in art, music, or literature.	1	2	3	4	5

Appendix E

Early Maladaptive Schema Questionnaire – Short Form

Directions: Listed below are statements that people might use to describe themselves. Please read each statement, then rate it based on how accurately it fits you *over the past year*. When you are not sure, base your answer on what you *emotionally feel*, not on what you think to be true.

A few of the items ask about your relationships with your parents or romantic partners. If any of these people have died, please answer these items based on your relationships when they were alive. If you do not currently have a partner but have had partners in the past, please answer the item based on your most recent significant romantic partner.

Choose the **highest score from 1 to 6** on the rating scale below that best describes you, then write your answer on the line before each statement.

1 = Completely untrue of me 2 = Mostly untrue of me 3 = Slightly more true than untrue	4 = Moderately true of me 5 = Mostly true of me 6 = Describes me perfectly

	Item	Rating
1.	I haven't had someone to nurture me, share him/herself with me, or care deeply about everything that happens to me.	
2.	I find myself clinging to people I'm close to because I'm afraid they'll leave me.	
3.	I feel that people will take advantage of me.	
4.	I don't fit in.	
5.	No man/woman I desire could love me once he or she saw my defects or flaws.	
6.	Almost nothing I do at work (or school) is as good as other people can do.	
7.	I do not feel capable of getting by on my own in everyday life.	
8.	I can't seem to escape the feeling that something bad is about to happen.	
9.	I have not been able to separate myself from my parent(s) the way other people my age seem to.	
10.	I think that if I do what I want, I'm only asking for trouble.	
11.	I'm the one who usually ends up taking care of the people I'm close to.	
12.	I am too self-conscious to show positive feelings to others (e.g., affection, showing I care).	
13.	I must be the best at most of what I do; I can't accept second best.	
14.	I have a lot of trouble accepting "no" for an answer when I want something from other people.	
15.	I can't seem to discipline myself to complete most routine or boring tasks.	

1 = Completely untrue of me	4 = Moderately true of me
2 = Mostly untrue of me	5 = Mostly true of me
3 = Slightly more true than untrue	6 = Describes me perfectly

	Item	Rating
16.	I don't have people to give me warmth, holding, and affection.	
17.	I need other people so much that I worry about losing them.	
18	I feel that I cannot let my guard down in the presence of other people, or else they will intentionally hurt me.	
19.	I'm fundamentally different from other people.	
20.	No one I desire would want to stay close to me if he or she knew the real me.	
21.	I'm incompetent when it comes to achievement.	
22.	I think of myself as a dependent person when it comes to everyday functioning.	
23.	I feel that a disaster (natural, criminal, financial, or medical) could strike at any moment.	
24.	My parent(s) and I tend to be over-involved in each other's lives and problems.	
25.	I feel as if I have no choice but to give in to other people's wishes, or else they will retaliate, get angry, or reject me in some way.	
26.	I am a good person because I think of others more than myself.	
27.	I find it embarrassing to express my feelings to others.	
28.	I try to do my best; I can't settle for "good enough."	
29.	I'm special and shouldn't have to accept many of the restrictions or limitations placed on other people.	
30.	If I can't reach a goal, I become easily frustrated and give up.	
31.	I haven't felt that I am special to someone.	
32.	I worry that people I feel close to will leave me or abandon me.	
33.	It is only a matter of time before someone betrays me.	
34.	I don't belong; I'm a loner.	
35.	I'm unworthy of the love, attention, and respect of others.	
36.	Most other people are more capable than I am in areas of work and achievement.	
37.	I lack common sense.	

1 = Completely untrue of me	4 = Moderately true of me
2 = Mostly untrue of me	5 = Mostly true of me
3 = Slightly more true than untrue	6 = Describes me perfectly

	Item	Rating
38.	I worry about being physically attacked by people.	
39.	It is very difficult for my parent(s) and me to keep intimate details from each other without feeling betrayed or guilty.	
40.	In relationships, I usually let the other person have the upper hand.	
41.	I'm so busy doing things for the people that I care about that I have little time for myself.	
42.	I find it hard to be free-spirited and spontaneous around other people.	
43.	I must meet all my responsibilities.	
44.	I hate to be constrained or kept from doing what I want.	
45.	I have a very difficult time sacrificing immediate gratification or pleasure to achieve a long-range goal.	
46.	I have not had someone who really listens to me, understands me, or is tuned into my true needs and feelings.	
47.	When someone I care for seems to be pulling away or withdrawing from me, I feel desperate.	
48.	I am quite suspicious of other people's motives.	
49.	I feel alienated or cut off from other people.	
50.	I feel that I'm not lovable.	
51.	I'm not as talented as most people are at their work.	
52.	My judgment cannot be counted on in everyday situations.	
53.	I worry that I'll lose all my money and become destitute or very poor.	
54.	I often feel as if my parent(s) are living through me – that I don't have a life of my own.	
55.	I've always let others make choices for me, so I really don't know what I want for myself.	
56.	I've always been the one who listens to everyone else's problems.	
57.	I control myself so much that many people think I am unemotional or unfeeling.	
58.	I feel that there is constant pressure for me to achieve and get things done.	

1 = Completely untrue of me		**4 = Moderately true of me**
2 = Mostly untrue of me		**5 = Mostly true of me**
3 = Slightly more true than untrue		**6 = Describes me perfectly**

	Item	Rating
59.	I feel that I shouldn't have to follow the normal rules or conventions that other people do.	
60.	I can't force myself to do things I don't enjoy, even when I know it's for my own good.	
61.	I haven't had a strong or wise person to give me sound advice or direction when I'm not sure what to do.	
62.	Sometimes I am so worried about people leaving me that I drive them away.	
63.	I'm usually on the lookout for people's ulterior or hidden motives.	
64.	I always feel on the outside of groups.	
65.	I am too unacceptable in very basic ways to reveal myself to other people or to let them get to know me well.	
66.	I'm not as intelligent as most people when it comes to work (or school).	
67.	I don't feel confident about my ability to solve everyday problems that come up.	
68.	I worry that I'm developing a serious illness, even though nothing serious has been diagnosed by a doctor.	
69.	I often feel I do not have a separate identity from my parent(s) or partner.	
70.	I have a lot of trouble demanding that my rights be respected and that my feelings be taken into account.	
71.	Other people see me as doing too much for others and not enough for myself.	
72.	People see me as uptight emotionally.	
73.	I can't let myself off the hook easily or make excuses for my mistakes.	
74.	I feel that what I have to offer is of greater value than the contributions of others.	
75.	I have rarely been able to stick to my resolutions.	

Appendix F

Centre for the Epidemiology Studies – Depression Scale, Short Form

Directions: Below is a list of ways you might have felt or acted. Please check if you have felt this way in the *past week*.

	Reason	Rating
0 = Rarely or none of the time (less than 1 day)		
1 = Some or little of the time (1-2 days)		
2 = A moderate amount of time (3-4 days)		
3 = Most or all of the time (5-7 days)		
1.	I was bothered by things that usually don't bother me.	
2.	I felt that I could not shake off the blues even with the help from my family and friends.	
3.	I had trouble keeping my mind on what I was doing.	
4.	I felt depressed.	
5.	I felt everything I did was an effort.	
6.	My sleep was restless.	
7.	I was happy.	
8.	I enjoyed life.	
9.	I felt sad.	

Appendix G

Communication's Bulletin

The Department of Psychology is looking for individuals aged 18 or older to participate in a confidential and anonymous research survey on different types of self-harm behaviours, which range from mild, such as scratching one's self, to severe, such as cutting one's self. We are looking for both individuals who hurt themselves and who do not. For more information and/or to participate, please visit <www.surveymonkey.com/s/MVHLNTX> or contact Sarah Arthurs at sarthurs@lakeheadu.ca, tel 343-8168 (leave a message). All participants will be entered in 5 random prize draws for $40 gift certificates at a store of their choice.

Appendix H

Recruitment Poster

Appendix I

Welcome Page

Individual Traits and Self-Harm

Thank you for your interest in our research study. It is being conducted by Sarah Arthurs (sarthurs@lakeheadu.ca; 343-8168), a MA clinical psychology student at Lakehead University, and her supervisor, Dr. Josephine Tan (jtan@lakeheadu.ca; 346-7751).

This study is intended only for individuals aged 18 or older. It looks at self-harm behaviours in relation to thinking style and personality traits. Self-harm behaviours may range from mild, such as hitting one's self, to severe, such as cutting one's self. We are interested in hearing from people who have a history of self-harm behaviours, as well as those who have never engaged in those behaviours.

Participation in this study consists of filling out a survey that will ask you questions about self-harm behaviours, your thinking style, and your personality style. The survey will take you between 20–50 minutes, depending on your speed and your responses. All information you provide will be kept confidential; only the researchers involved in this study will have access to your information. Also, your questionnaire responses will be separated from all identifying information to ensure complete anonymity. We will not be able to identify your survey or track your answers back to you. You are free to not answer any questions if you feel uncomfortable, and you are free to drop out of the survey anytime you wish. However, once you complete and submit the survey, you will be unable to withdraw your survey responses from the study as we will not be able to identify which survey belongs to you. We do not anticipate any physical or psychological harm or benefit to you as a result of completing the survey. However, some of the questions on self-harm behaviours might cause you discomfort to read them.

The results of this study will be disseminated via conference presentations as well as academic publications. No identifying information will be associated with the data, which will be presented in aggregate, not individual form. If you are interested in receiving a summary of our findings upon the completion of the study, we will be pleased to send you a copy. There will be an opportunity for you to request the information.

As a sincere token of our appreciation for your help in this survey, you will be entered into a random prize draw to win one of 5 gift certificates of $40 each to a store of your choice. If you are an Introductory Psychology student at the Lakehead University Thunder Bay campus, you will be given one bonus point towards your course mark.

If you have any questions either before or after you have completed the survey, please feel free to contact us. The nature of all correspondences will be kept in confidence. As well, this research has been approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at 807-343-8283 or swright@lakeheadu.ca.

If you would like to continue, please read the informed consent that follows.

Appendix J

Informed Consent

Informed Consent

Read the details of this consent form carefully. If you understand the information we've provided and wish to continue with the study then please follow the directions outlined at the bottom of the page. This study is meant for those who are at least 18 years old.

Title of Research:	Individual Traits & Self-Harm
Researchers:	Sarah Arthurs, MA Clinical Psychology student Dr. Josephine Tan, Psychology faculty and project supervisor
Objective of Study:	To understand personality and thinking style related to self-harming behaviour. *All individuals 18 or older are invited to participate, whether or not they have a history of self-harming behaviour.*
Procedure of Study:	Completion of a survey that takes 20-50 minutes, depending on the speed of the respondent.
Important Issues:	Your information is voluntary, which means you can choose not to answer any question you wish and you can cease your participation at any time without penalty. All information you provide will be kept confidential and anonymous. Only the researchers involved in this study will have access to your survey packet. As well, once you provide your consent to participate, you will be redirected to a different url to complete the survey. This is to separate your identifying information from your questionnaire responses, so that your responses cannot be tracked back to you. Subsequently, once you submit your questionnaire, you will be unable to withdraw your responses from this study as we will not be able to identify which survey belongs to you. The survey will be kept in secure storage with Dr. Tan for a minimum of 5 years at Lakehead University. There is no anticipated risk or benefit to you as a result of your participation. However, some people might find some of the questions on self-harming behaviours discomforting. You can request a summary of the results upon the completion of the project. You will be entered in a random prize draw for 1 of 5 gift certificates of $40 from a store of your choice. If you are an Introductory Psychology student from Lakehead University Thunder Bay campus, you will receive 1 bonus point towards your course mark.

Please note that the online survey is hosted by "Survey Monkey" which is a web survey company located in the USA. All responses to the survey will be stored and accessed in the USA. This company is subject to the U.S. laws, in particular, to the US Patriot Act that allows authorities access to the records of internet service providers. If you choose to participate in the survey you understand that your responses to the questions will be

stored and accessed in the USA. The security and privacy policy for Survey Monkey can be viewed at http://www.surveymonkey.com.

Contact Information

You are free to leave this section blank and simply advance to the survey.

How may we contact you if you are a winner in our random prize draws? Please provide your name and contact information for the summer of 2012 (remember that all identifying information will be kept confidential and will not be linked to your questionnaire responses):

If you would like to receive a copy of the summary of results from this study when it has been completed, please provide your name and contact information for fall of 2012:

If you are an Introductory Psychology student at Lakehead University Thunder Bay campus, you will receive 1 bonus point towards your course mark. Please provide your name, student ID number, and name of your Introductory Psychology professor:

By clicking on "PROCEED," I agree that I have read and understood the above information, and am providing my consent to participate in this study. Clicking on "PROCEED" will take you to a different weblink containing the research survey.

PROCEED

Appendix K

Study Directions

Survey Directions

The following pages contain a series of questions related to demographic information, behaviours you might participate in, and preferences for certain activities or experiences. Please read the directions for each section carefully before answering.

If you need to stop for any reason, you can exit the survey and resume at a later time. If you have questions or concerns, please contact Sarah at sarthurs@lakeheadu.ca, or call 343-8168.

Please be assured that your personal information will be kept confidential. As well, the answers you provide on the questionnaire packet will be separated from your personal information so that none of your responses can be tracked back to you.

*Note: If you decide to exit the survey early, simply click the "Exit this survey" button on the top right hand corner. This will bring up the final page, which contains a list of mental health resources available to you, if you or someone you know is experiencing distress.

Appendix L

Debriefing Form

Debriefing Form

First, we would like to thank you for helping us out with this study. Without volunteers like you, who are willing to share information with us, it would not be possible for psychological research to advance. At this time, we would like to share more information about this study.

This study is investigating differences in personality and thinking style between individuals who have a limited history of non-suicidal self-injury (NSSI), those who frequently practice NSSI, and those with no history of NSSI. NSSI occurs when a person deliberately injures his/her body, without intending to kill him/herself. It can take many forms, like self-cutting or self-burning, and is often used to cope with overwhelming emotions or stress. The number of people with a history of self-harm is increasing, with some studies reporting that nearly half of their samples had intentionally hurt themselves at least once in their lifetime. The rate of individuals who frequently injure themselves to cope with distress is also increasing.

Research has not fully examined how an individual's personality and thinking style (e.g., beliefs about his/her worth and competence) relate to self-harming behaviour. An individual's personality often influences his/her behaviours, emotions, and quality of social relationships, while his/her personal beliefs affect his/her thoughts and mental health. When a personality trait or core belief becomes highly negative, a person is more likely to experience mental health concerns. This may lead to maladaptive coping behaviours, which includes the use of non-suicidal self-injury. Understanding which traits relate to repetitive self-harming behaviours can help clinicians identify high risk individuals and to develop more effective treatments to help them.

The anonymity and confidentiality of our participants is of the utmost importance to us and we would like to assure you of both. If you are a winner of the prize draw, you will be contacted in the summer of 2012. Also, Introductory Psychology students at Lakehead University, Thunder Bay campus, will be given one bonus mark as course credit.

We request that you please refrain from discussing the nature of this study with others. This may affect the responses of future participants and influence the validity of our results. If you would like to learn more about non-suicidal self-injury and current treatment practices, one of the following references may be a good place to start:

Nock, M. K. (2010). Self-injury. *Annual Review of Clinical Psychology, 6*(3), 339-363. doi: 10.1146/annurev.clinpsy.121208.131258

Walsh, B. W. (2006). *Treating self-injury: A practical guide.* New York: Guilford Press.

If you have any questions or concerns about this study, or wish to obtain information on this study's results, please feel free to contact one of the following researchers:

Sarah Arthurs: sarthurs@lakeheadu.ca (343-8168)

Dr. Josephine Tan: jtan@lakeheadu.ca (346-7551)

Finally, we are pleased to provide you with a list of Thunder Bay Mental Health Resources in case you or someone you know might be interested:

- Emergency services are available at the Thunder Bay Regional Health Sciences Centre (980 Oliver Road. If you approach the hospital from the Oliver Road entrance, the emergency department will be to your immediate left, the entrance doors facing Oliver Road)

- A family physician or a walk-in clinic physician can be consulted for a referral to a mental health service

- Lakehead University Health and Counselling services – free to all LU students (807) 343-8361

- Thunder Bay counselling Centre: (807) 684-1880 or visit www.tbaycounselling.com

- Self-referral to any mental health professional in private practice (look up the Yellow Pages under *Psychologists and Psychological Associates; Psychotherapy: or Marriage, Family, & Individual Counsellors*)

- Find more resource information from the Thunder Bay Canadian Health Association: (807) 345-5564

- Thunder Bay crisis response line: (807) 346-8282

- Or, if you are located outside of the Thunder Bay region, please search for a crisis response centre near you:

    http://www.pmhl.ca/webpages/reports/CANADIAN%20CRISIS%20RESPONSE.pdf