Non Suicidal Self-Injury as an Addictive Behaviour

in Adolescents and Young Adults

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Abstract

Researchers have speculated about the addictive features of Non Suicidal Self-Injury (NSSI) for several years; however, little empirical research has examined this characteristic. The present study sought to advance knowledge of addiction and NSSI by demonstrating the presence of self-reported addictive features in high school and university students who engage in NSSI. A second aim was to identify a clinical profile of students who engage in NSSI with addictive features as compared with students with NSSI who lacked the addictive features. Results of this study indicated that clinically significant addictive features were endorsed by approximately 20% of individuals who self-injure in both the university and high school samples. In addition, significant differences were identified between those students with and without addictive features. University students with NSSI who showed clinically significant addictive features experienced more difficulties in emotion regulation, were more likely to have higher frequencies of NSSI, and were more likely to have engaged in uncontrolled drug abuse and risky sexual behaviour compared to their NSSI peers who lacked the addictive features. For high school students, those who engaged in NSSI with addictive features showed more difficulties in emotion regulation and higher severity of NSSI (significantly more methods, locations of injury, and frequency), as well as reported a higher likelihood of suicidal ideation, self reported depression, at-risk eating behaviours, and physical abuse, compared to those students with NSSI who did not show addictive features. Finally, the present study sought to examine which factors could predict whether addictive

features would be present in an individual with NSSI. Across both samples, frequency of NSSI was a significant predictor of addictive features, with high frequencies predicting higher likelihood of addictive features. Emotion regulation difficulties was also a significant predictor in the university sample, while total number of methods of NSSI was a predictor in the high school sample. The results of this study provide new information regarding NSSI as an addictive behaviour as well as the presence of a subtype of NSSI with clinically significant addictive features. These findings are explored in relation to current literature and implications for both researchers and service providers are discussed.

Resumé

Pendant des années, des chercheurs ont émis des hypothèses sur les caractéristiques addictives de l'automutilation non suicidaire (NSSI); cependant, peu de recherches empiriques ont examiné cet aspect. La présente étude a essayé de faire progresser les connaissances sur l'addiction et le NSSI en démontrant la présence d'aspects addictifs auto-déclarés chez les étudiants souffrant de NSSI dans les lycées et les universités. Un deuxième objectif a visé à identifier un profil clinique d'étudiants souffrant de NSSI avec des caractéristiques addictives en les comparant à ceux souffrant de NSSI sans aspect addictif. Les résultats de cette étude ont montré que des caractéristiques addictives cliniquement significatives ont été montrées par environ 20 % des individus qui s'automutilent aussi bien pour les sujets à l'université que pour ceux du lycée. De plus, on a constaté d'importantes différences entre les étudiants avec ou sans caractéristiques addictives. Les étudiants d'université avec le NSSI qui ont montré des aspects addictifs cliniquement significatifs avaient plus de mal à maîtriser leurs émotions, avaient généralement de plus grandes fréquences de NSSI et avaient une plus grande tendance à abuser de la drogue ou à avoir un comportement sexuel dangereux en comparaison avec leurs semblables sans aspect addictif. En ce qui concernent les lycéens, ceux atteints de NSSI avec des caractéristiques addictives avaient plus de mal à maîtriser leurs émotions et montraient un taux de gravité plus élevé de NSSI (bien plus de méthodes, de localisations de blessures et une fréquence plus élevée), de même ils ont signalé une plus grande probabilité d'idéation suicidaire, de dépression auto-déclarée, de comportement alimentaire à

risque et d'abus physique, en comparaison avec les lycéens avec NSSI sans aspect addictif. Enfin, l'étude présente a cherché à examiner les facteurs susceptibles de prédire des caractéristiques addictives chez un individu avec NSSI. Au travers de ces deux échantillonnages, la fréquence de NSSI a été un indicateur significatif des caractéristiques addictives, une plus haute fréquence signifiant une plus grande probabilité d'addiction. Les difficultés à maîtriser ses émotions a aussi représenté un indicateur significatif pour l'échantillon à l'université, alors que le nombre total de méthode de NSSI a été un indicateur pour l'échantillon au lycée. Les résultats de cette étude apporte de nouvelles informations concernant le NSSI en tant que comportement addictif ainsi que la présence d'un sous-type de NSSI avec des aspects addictifs cliniquement significatifs. Ces conclusions sont examinées en relation avec la littérature actuelle et on discute de ses implications aussi bien dans le domaine des chercheurs que dans celui des prestataires de service.

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Chapter I: Introduction

Statement of Problem

Recently there has been an increasing awareness of non suicidal self-injury (NSSI) in youth and young adults by practitioners, researchers, and the general public. This awareness has led to an enormous growth in the literature examining NSSI, especially as it occurs in non-clinical populations. With reported lifetime prevalence rates of NSSI ranging from 11% to 38% in samples of university or college students (Gratz, 2001, 2006; Gratz, Conrad, & Roemer, 2002; Hasking, Momeni, Swannell, & Chia, 2008; Heath, Toste, Nedecheva, & Charlebois, 2008; Whitlock, Eckenrode, & Silverman, 2006) and from 13.2% to 46.5% in samples of high school students (Alfonso & Dendrick, 2010; Baetans, Claes, Muehlenkamp, Grietens, & Onghena, 2011; Laye-Gindu & Schonert-Reichl, 2005; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Madge et al., 2008; Morey, Corcoran, Arensman, & Perry, 2008; Muehlenkamp & Gutierrez, 2007; Ross & Heath, 2002; Zoroglu et al., 2003), it is clear that NSSI is common in populations of both youth and young adults. The fact that self-injury occurs so frequently illustrates the importance of examining NSSI in these populations in order to further our understanding of this challenging behaviour. Gaining knowledge about the scope and severity of NSSI in community populations is of the utmost importance when working clinically with those who engage in NSSI.

In recent years much has been learned regarding the prevalence and function of, and risk factors for, NSSI. However, there are very few studies in the existing literature examining the possibility of NSSI as an addictive behaviour.

Although researchers have speculated about the addictive features of NSSI for several years (Favazza, 1989; Faye, 1995; Turner, 2002), their speculations have been based almost entirely on case study reports, with little empirical research. The potential addictive qualities of NSSI that have been proposed by researchers include the reinforcing aspects of its tension releasing features (Faye, 1995) and the failure to resist impulses to self-injure (Favazza & Rosenthal, 1993). Further, it has been found that some self injurers need to increase the frequency and severity of the behaviour over time in order to obtain the desired effects (Faye, 1995). Failure to resist impulses and the need to increase the severity and frequency of specific behaviours are often cited as key features in addiction (Turner, 2002). Despite these conjectures, there is a lack of empirical research specifically addressing the question of whether NSSI could be considered an addictive behaviour.

Within the population of those who engage in NSSI, there are some individuals who have only self-injured a few times while others have done so repeatedly over their lifetime. Those who engage in these behaviours repeatedly over time are classified by some researchers as repetitive self-injurers (Favazza, 1996; Simeon & Hollander, 2001). It is believed by these researchers that these repetitive self-injurers are a distinct type of self-injurer. In the definition set forth by Favazza (1996) there is no set frequency that must occur for an individual to be considered a repetitive self-injurer, as this classification focuses on the thoughts and beliefs surrounding the NSSI rather than the behaviour. Favazza (1996) further states that individuals who are classified as repetitive self-injurers

are especially of concern because the NSSI behaviour often begins in adolescence and may persist for decades with periods of high and low frequency of engaging in NSSI, compared to others who will engage in the behaviour a limited number of times over their life span. Recently, the DSM-IV defined repetitive NSSI as a frequency of five or more times in the last year, however, research is limited using this definition because of its recent release.

In cases of repetitive self-injury, the self-injuring behaviour is thought to have an addictive quality (Favazza, 1996), as the thoughts and beliefs surrounding the behaviour are similar to those seen in individuals with addiction (Turner, 2002). In addition, repetitive self-injurers are described as having an overwhelming preoccupation with NSSI and often report that they are addicted to the behaviour (Favazza, 1996). Although Favazza does not call self-injury an addiction per se, he uses the words "addictive" and "addicted" throughout his case reports of this type of repetitive self-injury.

In a study examining the addictive features of NSSI, Nixon, Cloutier, and Aggarwal (2002) adapted the DSM-IV criteria for Substance Dependence to obtain a measure of addictive features. Within these criteria, an individual had to endorse three or more of the seven items in order meet criteria for NSSI with addictive features. They assessed an inpatient sample of 42 adolescents (86% female). It was found that 97.6% of their sample endorsed three or more addictive features, meeting the criteria for NSSI with addictive features, and 81% endorsed five or more addictive features. Addictive features of NSSI were also found in an early pilot study by Schaub, Holly, Toste, and Heath (2006) in a

community sample. In their sample of 56 university students with NSSI, 31% endorsed three or more out of seven addictive features using the same measure as Nixon et al. (2002). The large disparity between the findings of these two studies may be attributable to differences in the sample compositions. A clinical sample is by nature more severe than a community sample, including more psychopathology and higher frequency of NSSI, and it is therefore likely that this higher severity lead to the increase in endorsement of addictive features.

The constellation of behaviours Favazza was describing in 1996 appears to be the same phenomenon that Nixon et al. in 2002 examined and referred to as NSSI with addictive features. Both researchers describe the preoccupation with NSSI as well as the failure to resist impulses to engage in NSSI. Unfortunately, Favazza's classification of repetitive self-injury has never been examined empirically; support for his proposed classification has come exclusively from case studies. Although other researchers have examined repetitive NSSI, the criteria that have been used for categorizing individuals as having repetitive NSSI have pertained to the frequency of the behaviour rather than the thoughts and beliefs as defined by Favazza (Simeon & Hollander, 2001). Investigating whether those who have been previously classified as repetitive self-injurers based on frequency are in fact experiencing a behavioural addiction could lead to the identification of a new subtype of NSSI. Although the idea of a new subtype of NSSI is consistent with the findings of the two studies presented above as well as with Favazza's case studies, little is known beyond the reports that some individuals who engage in NSSI endorse addictive features at clinically

significant levels. To date, it is unknown whether individuals who present with clinically significant levels of addictive features differ from those who do not. For instance, do those reporting clinically significant levels of addictive features present with different histories, features of the NSSI behaviour, or mental health issues? Those with repetitive NSSI have been known to engage in the behaviour for decades and information regarding a potential addictive component of NSSI may help to explain why some individuals continue self-injuring over time while others are able to stop doing so.

Adolescence has been cited as the age of onset for NSSI by many researchers (Lloyd Richardson, Perrine, Dierker, & Kelley, 2007; Nixon, Cloutier, & Jansson, 2008); however, it has been proposed that NSSI may begin later for some youth (Lloyd Richarson, Nock, & Prinstein, 2009). Whitlock and colleagues (2006) found that 40% of self-injurers in a sample of college students reported that they began to self-injure in late adolescence or early adulthood. This indicates that both adolescence and early adulthood are high risk periods for the onset of NSSI; therefore, it is important to examine individuals with NSSI at both life stages and to compare the findings between the groups. Such comparisons can help determine whether there are differences in presentation of NSSI, and specifically NSSI with addictive features, at different periods of development. Thus, the present study explored the presence and correlates of a potential addictive subtype of NSSI in both a university and high school sample. The intention was to provide valuable information regarding the factors that may predict whether high school and university students with NSSI are likely to report

clinically significant levels of addictive features, as well as the ways in which individuals who endorse clinically significant levels of addictive features differ from those without the addictive component. It was hoped that the results of this study would provide more support for the further investigation of an addictive subtype of self-injurer.

Brief Definition of Terms

For the sake of clarity, this section includes a brief introduction to and definition of the terms used in this dissertation. Please refer to the NSSI Definition and Terminology and Definition of Behavioural Addiction sections below for a more detailed examination of how these definitions were chosen.

In the NSSI literature many differing definitions and terms are used, leading to much confusion and difficulty comparing results across studies. For the purpose of this dissertation, NSSI is defined as "the deliberate, self-inflicted destruction of body tissue resulting in immediate damage, without suicidal intent and for purposes not socially sanctioned (Nixon & Heath, 2009, p. 4)". As such, this behaviour does not include suicidal behaviours involving an intent to die or drug overdoses. It also excludes other forms of self-injurious behaviours, including culturally-sanctioned behaviours performed for display or aesthetic purposes; repetitive, stereotypical forms of self-injury found among individuals with developmental disorders and cognitive disabilities; and other severe forms of self-injury, such as self-immolation and auto-castration, found among individuals with psychosis (Nixon & Heath, 2009).

Based on previous literature in the area of behavioural addictions, as well the few existing studies examining NSSI as an addictive behaviour, the definition of NSSI with addictive features used by Nixon et al. (2002) was chosen for this dissertation. As described above, Nixon and colleagues created criteria for NSSI with addictive features by adapting the DSM-IV criteria for Substance Dependence; they replaced the term "substance" with "NSSI"'. An individual must meet at least three of the seven following criteria to be considered to have NSSI with addictive features: (a) the NSSI must occur more often than intended; (b) the severity in which the NSSI occurs must have increased (e.g., deeper cuts, more locations on the body); (c) if the behaviour produced an effect when it was started, the individual now needs to self-injure more frequently or with greater severity to produce the same effect; (d) the behaviour or thinking about it must consume a significant amount of the individual's time (e.g., planning or thinking about it, engaging in it and recovering from it); (e) despite a desire to reduce or control the behaviour, the individual is unable to do so; (f) the individual continues the behaviour despite recognizing that it is harmful physically and/or emotionally; (g) the individual gives up or reduces important social, family, academic or recreational activities because of the behaviour (Nixon & Cloutier, 2004). In the context of this dissertation, the terms "NSSI with addictive features" and "clinically significant levels of addictive features" will refer to this definition, according to which an individual must have endorsed three or more of the addictive features to meet criteria.

Research Questions

Despite clinical and case reports that indicate that there may be an addictive component to NSSI, little empirical work has been done to examine NSSI as an addictive behaviour. Preliminary research that has examined this aspect of NSSI has shown that some individuals who engage in NSSI endorse addictive features at clinically significant levels while others do not (Nixon et al., 2002; Schaub et al., 2006), according to the definition described above based on adapted substance dependence criteria from the DSM-IV. This definition will be fully explored in the following section. However, there is no empirical evidence indicating whether the distinction between those who report addictive features and those who do not has any theoretical or practical implications. Do the individuals who endorse clinically significant levels of addictive features present with different histories, features of the NSSI behaviour, or mental health issues? These differences may be important in identifying those at risk for long term engagement in NSSI and could have implications for treatment of those who engage in NSSI and meet criteria for NSSI with addictive features.

The present study has three primary research questions. The first examined the rate at which clinically significant levels of addictive features were reported by university and high school students who self-injure. The second research question explored the differences between those who engage in NSSI and endorse clinically significant addictive features and those who engage in NSSI but do not present with the addictive component, in both university and high school samples. Specifically, differences in mental health status, environmental and individual risk factors such as childhood trauma or alcohol use, and severity

of NSSI were examined. These variables were chosen based on past literature in the areas of addiction and NSSI. The third question investigated which of these factors, or combination of factors, were most associated with an addictive subtype of NSSI in university and high school samples, and whether these factors could predict the likelihood of an individual being classified as the subtype of NSSI with addictive features.

The results of this study sought to inform assessment of, and treatment for, NSSI by highlighting a potential subtype of self-injurers. Further, by identifying factors that may be associated with an increased likelihood of NSSI with addictive features, the present study provided valuable information on the clinical profiles of those who endorse clinically significant addictive features of NSSI. The overall goal of the present study was to use these findings to provide guidance for future research on the addictive component of NSSI, as well as to inform practitioners in the identification, assessment, and treatment of the addictive subtype of self-injurer.

Chapter II: Literature Review

In the literature, non suicidal self-injury (NSSI) is referred to by several different terms including deliberate self-harm, self-mutilation, parasuicide, and self-injurious behaviour (Nixon & Heath, 2009; Nock & Favazza, 2009). Along with the varying terms used for this behaviour, there is also a lack of consensus as to how NSSI should be operationally defined. Often, definitions in the literature differ in the behaviours and intents included, resulting in varying findings for the prevalence of self-injurious behaviour. Unsurprisingly, prevalence rates are often higher when more-inclusive definitions are employed. For example, studies that include overdoses or self-injurious behaviours with suicidal intent show higher rates of prevalence (Nixon & Heath, 2009; Nock & Favazza, 2009) than when the definition is more limited.

Further, the addiction literature lists many different theories and criteria for addictions. Some definitions reserve the term "addiction" for substance-based addictions only, while others allow that behaviours may also be addictive (Martin & Petry, 2005). Yet other definitions outline criteria that one must meet to be considered addicted, such as showing tolerance and withdrawal symptoms, but do not specify what phenomena can or cannot be addictive (Griffiths, 2005; Griffiths & Larkin, 2004; Holden, 2001; Shaffer et al., 2004). There are theories regarding the origin and maintenance of an addiction that are purely biological, exclusively psychological, or strictly socially defined; other theories combine all three into a biopsychosocial model of addiction (Griffiths, 2005; Griffiths & Larkin, 2004; Holden, 2001; Shaffer et al., 2004). These differences lead to a great deal of

debate amongst researchers in the field of addiction. To further complicate this area, there are differing political, legal, and diagnostic implications of the varying conceptions of addiction (Hagedorn, 2009). It is therefore important to review and define what is meant by these terms in this dissertation. Thus, these issues will be addressed below in order to ensure that each construct is defined in a clear and empirically relevant manner, with reference to the existing literature.

NSSI Definition and Terminology

In the past, self-injury was commonly referred to as self-mutilation and was defined as the "deliberate destruction or alteration of body tissue without conscious suicidal intent" (Favazza, 1989, p. 137). This definition was refined by subsequent researchers who specified that the harm must be direct and the behaviour seen as not socially acceptable (Suyemoto, 1998). Later, when the term non suicidal self-injury (NSSI) was introduced, this definition was further refined to indicate that there must be immediate tissue damage (Nixon & Heath, 2009; Nock & Favazza, 2009). This specification was added to exclude behaviours such as binge drinking or overdoses, behaviours that could be considered as deliberately harming oneself but that some researchers believe to be fundamentally different than NSSI (Nixon & Heath, 2009; Nock & Favazza, 2009). Others, such as the Child and Adolescent Self-harm in Europe (CASE) group, take a different approach and use the term deliberate self-harm (DSH; Hawton, Rodham, Evans, & Weatherall, 2002). The CASE group defines DSH as "an act with a non-fatal outcome in which an individual deliberately did one or more of the following: Initiated behaviour (for example, self-cutting, jumping

from a height), which they intended to cause self-harm; Ingested a substance in excess of the prescribed or generally recognized therapeutic dose; Ingested a recreational or illicit drug that was an act that the person regarded as self-harm; Ingested a non-ingestible substance or object" (Hawton et al., 2002, p. 1208). This definition is considerably more inclusive than that described above for NSSI, encompassing behaviours such as overdose and those performed with suicidal intent. Therefore, this definition goes well beyond the construct of non suicidal self-injury. Finally, another term, non suicidal self-harm (NSSH), has been used by some researchers (Nixon, Cloutier, & Jansson, 2008). This term includes not only all of the behaviours defined within the construct of NSSI, it also includes overdoses. By including this extra behaviour, this definition removes the criterion in NSSI for immediate tissue damage (Nixon, Cloutier, & Jansson, 2008). Having such widely varying conceptualizations of self-harm and self-injury could result in significant differences in research findings, especially in terms of prevalence, risk factors, function of the behaviour, and gender (Heath, Schaub, Holly, & Nixon, 2009). Therefore, it is important to distinguish between NSSI, NSSH, and DSH when reviewing literature and conducting research in this area.

For the purpose of this study, NSSI is defined as "the deliberate, self-inflicted destruction of body tissue resulting in immediate damage, without suicidal intent and for purposes not socially sanctioned" (Nixon & Heath, 2009, p. 4). As such, this behaviour specifically excludes many behaviours, including self-harming behaviours involving an intent to die, drug overdoses, culturally-sanctioned behaviours performed for display or aesthetic purposes, repetitive or

stereotypical forms of self-injury present among individuals with developmental disorders and cognitive disabilities, and severe forms of self-injury such as self-immolation and auto-castration occasionally present as a symptom in individuals with psychosis. This dissertation will use the term NSSI to refer to the above outlined behaviours. In addition, the term NSSH will be used throughout to encompass all behaviours included in NSSI as well as overdoses, and the term DSH will be used in accordance with the CASE definition, as described above.

One final definition will be employed herein. Due to the nature of this dissertation, some literature examining self-injury by individuals with developmental delays will be reviewed. Self-injury within this population is not encompassed within any of the above mentioned definitions, and in fact is specifically excluded from them; however, due to the paucity of research in the area of NSSI as an addictive behaviour, a wider range of domains were reviewed in attempt to extrapolate possible hypotheses of NSSI within community samples. In this dissertation, the term self-injurious behaviour (SIB) will refer to the self-injuring behaviours (eg. head banging) associated with individuals with developmental disabilities (Sandman & Hetrick, 1995).

It is the belief of the current researchers that there is a subcategory of individuals with NSSI who show addictive features; however, as with all of the other speculated categories, this belief is based mainly on case study reports. Therefore, the overarching goal of this study was to empirically explore whether individuals who self-injure and present with addictive features could be classified into a subcategory of NSSI, as well as to examine potential characteristics

associated with this group. The following section will address the definition of a behavioural addiction both generally and in relation to NSSI.

Definition of Behavioural Addiction

Before defining how the term behavioural addiction will be used in this dissertation, it will be important to first address the belief held by some that behavioural addictions ought not to be classified as addictions at all. It has been argued by some researchers that addiction must involve the "self-administration of an agent to alter the experience of self or the environment (Martin & Petry, 2005, p. 1)." This has led to a debate amongst addiction researchers about whether or not behavioural addictions can properly be classified as addictions, as they do not involve substances that alter ones' experience (Martin & Petry, 2005). However, there has been an increasing movement towards the recognition that these behaviours may be addictive. This trend is driven by the growing body of research examining behaviours such as gambling, sex, eating, internet use, and other behaviours as potentially addictive (Griffiths, 2005; Holden, 2001; Shaffer et al., 2004). Further, this debate has been reviewed in several recent articles (e.g., Griffiths, 2005; Griffiths & Larkin, 2004; Holden, 2001; Shaffer et al., 2004; Victor, Glenn, & Klonsky, 2012), including one in *Science* magazine stating that the concept of addiction is changing based on recent research linking behavioural addictions to substance addictions by using neuroimaging (Holden, 2001). The question then becomes why there is such a push by some researchers to include certain behaviours as being potentially addictive? Why is it important to reconsider the concept of addiction so as to include these behaviours? These

questions will be addressed in the following section along with a discussion of evidence supporting this more inclusive understanding of addiction.

Theoretical views on the concept of behavioural addiction. The understanding of addiction varies between researchers, with each conceptualization carrying different political, legal, social, and diagnostic implications, depending on how the issue is presented. A consistent theoretical model of addiction is required in order to diagnose and provide treatment to all individuals who are affected by out of control behaviours, not only those struggling with substance abuse and dependence. It has been stated that an official diagnostic category of addiction that includes certain problem behaviours could lead to a better understanding of addictions, as well as the development of empirical research examining all types of addiction (Hagedorn, 2009; Shaffer et al., 2004). In addition, including potentially addictive behaviours with substance use disorders in the DSM-IV could allow clinicians to have a shared recognition of these disordered behaviours and be able to establish standardized assessment and treatment protocols, permitting clients to find effective treatment that can be covered under insurance policies (Buser & Buser, 2013; Hagedorn, 2009). In the DSM-IV gambling has been included in the category Substance Related and Addictive Disorders, furthering the movement towards considering behaviours as addictive (APA, 2013).

It has been reported that individuals who are affected by out of control behaviours are underserved compared to those affected by substance abuse and dependence (Hagedorn, 2009). Take, for example, the startling statistics about

intervention opportunities: in the United States, there are 30 facilities that are available to the 6 to 9 million individuals with compulsive gambling disorder, 25 facilities for those estimated 17 to 37 million who are believed to be addicted to sex, and 10 facilities for the estimated 17 to 41 million who are considered to be addicted to the internet, compared to the 17 000 facilities available for the 22.6 million who abuse or are dependent on substances (Hagedorn, 2009). It is clear that a model is required for the effective assessment and treatment of out of control behaviours which affect millions of people in the United States alone; however, this dissertation has yet to address why addiction should serve as that model. Consistent with many other researchers, it is believed that these problematic behaviours are similar to substance abuse and should therefore be considered as part of a larger syndrome of addiction (Buser & Buser, 2013; Shaffer et al., 2004). The following sections will present evidence that has been found in support this position.

Consulting the DSM-IV, one can see a clear conceptual differentiation between what is more traditionally known as an addiction (substance dependence) and other behavioural addictions (such as pathological gambling) as they are categorized in different sections of the manual: Substance Related Disorders and Impulse-Control Disorders, respectively. Importantly, it should also be noted that the DSM-IV does not specifically use the term addiction for either cluster of symptoms. The World Health Organization introduced the term dependence because of the disagreement and confusion surrounding the term addiction (World

Health Organization, 1969) and both the DSM-III and DSM-IV have opted to use this same terminology.

As was already discussed, there are several ways to understand addiction, leading to much debate amongst researchers. However, despite the variability in definitions in the literature, there is also a great deal of similarity in the conceptualization of addiction. In this dissertation the overall concepts of substance addiction and behavioural addiction are very similar to the criteria presented in the DSM-IV for substance dependence and pathological gambling. Although these two disorders are currently located in different sections of the DSM-IV, upon examination one can see that there is a great deal of overlap in the criteria for both substance dependence and pathological gambling. Specifically, both indicate that there must be unsuccessful attempts at reducing the behaviour, that the behaviour increases in intensity over time, and that there are social consequences to the behaviour (American Psychological Association, 2000). These similarities exist because, when pathological gambling first appeared in the DSM-III, the criteria were modelled on those for substance dependence, even though the two disorders were not placed in the same category. This was the first attempt not only to classify a disorder of this type but also to distinguish between normative behaviour and behaviour that is excessive and leads to harm (Westphal, 2007). Although there have been limited studies, it has been found that the general psychometric performance of the DSM-IV criteria for pathological gambling criteria has satisfactory reliability, validity, and classification accuracy (Westphal, 2009) indicating that these criteria are a good diagnostic tool for

gambling and potentially other addictive behaviours. Substance and behavioural addictions share conceptual similarities with both Substance Related Disorders and Impulse-Control Disorders as defined in the DSM-IV (American Psychological Association, 2000). However, it has been suggested that neither of these categories fully represent the entirety of an addiction (Hagedorn, 2009). Hagedorn (2009) is part of a growing movement focused on the understanding that substance and behavioural addictions may be different aspects of the same general disorder. He stated that having this common conceptualization as well as expanding the diagnostic criteria to include behavioural addictions is beneficial because a diagnosis can possibly provide information on the process of addiction and how all addictions can best be treated, leading to a better understanding of all addictions. Hagedorn (2009) further added that although adapted versions of all of the criteria encompassed in both substance dependence and pathological gambling (loss of control, social consequences, and increasing intensity) have proved helpful in examining and identifying putative behavioural addictions like sexual addiction, a diagnosis is required in order to properly train professionals working with individuals with addictions. The elements encompassed in the criteria for substance dependence and pathological gambling (compulsivity, loss of control, and continued use of the substance or behavior despite negative consequences) have been widely accepted as the elements of addiction (APA, 2000; Coombs, 1997; Smith & Seymour, 2001).

Others who believe that certain behaviours should be considered as potentially addictive have argued that it is not the object of the addiction

(behaviour or substance) per se that can lead to an addiction but rather the biopsychosocial antecedents interacting with the object (Griffiths, 2005; Larkin, Wood, & Griffiths, 2006; Shaffer, 1996; Shaffer et. al., 2004). It is still believed by these researchers that in order to be potentially addictive, an object must possess addictive qualities independent of the individual; these qualities are measured by the object's tendency to create tolerance and withdrawal symptoms.

Although these addictive qualities represent key factors in addiction, they are neither necessary nor sufficient for the development of an addiction, as they do not explain many common experiences of addiction (Griffiths, 2005; Larkin et al., 2006; Shaffer, 1996; Shaffer et. al., 2004). For example, addiction has been observed in respect to several objects (activities and substances) that do not show any severe withdrawal, such as gambling, methamphetamine, and cocaine (Larkin et al., 2006; Leshner, 2001), and individuals often resume addictive behaviours long after the effects of the withdrawal have dissipated, indicating that both context and the individual play a role in the addiction (Larkin et al., 2006). It is therefore believed that withdrawal does not play a role in addiction since it is just one factor in a very complex process (Griffiths, 2005; Larkin et al., 2006; Shaffer, 1996; Shaffer et. al., 2004). Further, according to the DSM-IV "neither tolerance nor withdrawal is necessary for a diagnosis of Substance Dependence" (APA, 2000, p.194). Thus, since the most similar diagnosis to substance addiction in the DSM-IV, Substance Dependence, does not require that either tolerance or withdrawal to be present for diagnosis, it should also not be a required component for behavioural addiction.

Shaffer and colleagues (2004) have supported the position that certain behaviours are potentially addictive, and they have suggested that addiction may be a syndrome with multiple expressions. A syndrome is defined as "a cluster of symptoms and signs related to an underlying condition" (Shaffer et al., 2004, p. 367). These researchers further explained that not all symptoms and signs are present in every expression and that each expression can have unique signs and symptoms; however, there is a distinctive temporal progression common to all expressions. This view was supported by Shaffer and colleagues by citing evidence that all addictions show similarities in the areas of neurobiological antecedents, psychological antecedents, and shared experience (i.e., manifestations and sequelae). Others have also argued that not only do behavioural addictions resemble substance addictions clinically, but they also share the same biological underpinnings (Holden, 2001) and etiological factors (Martin & Petry, 2005). The evidence presented by Shaffer and colleagues (2004), along with other support for the view that behaviours may be potentially addictive, will be reviewed below.

Empirical evidence supporting the concept of behavioural addiction. Upon review of the literature supporting the existence of behavioural addictions several factors have been found to be common to both behavioural and substance addictions. This section will review these factors.

The first area that will be examined is genetics. There has been some evidence suggesting that both substance addiction and behavioural addiction may have a common genetic component. The same molecular mechanisms have been

identified in genetic studies of drug addiction and compulsive running behaviour (Nestler, Barrot, & Self, 2001; Werme, Lindholm, Thoren, Franck, & Brene, 2002; Werme, Thoren, Olson, & Brene, 2000). It has also been reported that pathological gambling shares a common genetic vulnerability with alcohol dependence (Slutske et al., 2000). Further, in their study of male twins, Kendler, Jacobson, Prescott, and Neale (2003) found that genetic and environmental risk factors for psychoactive substances are for the most part nonspecific. This finding indicated that the researchers were unable find evidence that genetic factors could increase the risk of addiction to one specific substance; instead, the genetic component appeared to affect the risk for all substances. Several other researchers have found similar results indicating that genetic and environmental risk factors are nonspecific to the objects of addiction (Shaffer et al., 2004).

There is also considerable evidence that there are shared neurobiological factors between substance and behavioural addictions. It has been found that both psychoactive drugs and certain behaviours have the ability to stimulate the dopamine reward system in the brain (Betz, Mihalic, Pinto, & Raffa, 2000; Daigle, Clarke, & Landry, 1988; Goodman, 2008; Holden, 2001; Hollander et al., 2005; Hyman, 1994; Wise, 1996), which has been implicated as playing a major role in the development and maintenance of addictions (Kalivas & Volkow, 2005; West, 2006). Studies examining both substance (i.e., alcohol, cocaine, and heroin) and behavioural (i.e., gambling, eating, and sex) addictions using fMRI have showed that this reward system is activated in a similar manner for both types of addiction (Goodman, 2008; Holden, 2001; Hollander et al., 2005;

Pelchat, Johnson, Chan, Valdez, & Ragland, 2004; Shaffer et al., 2004). Based on these findings, it has been suggested that it is a malfunction in the dopamine system that makes an individual vulnerable to addiction. However, it has also been stated that although dopamine is the most well known neurobiological factor that plays a role in addiction, care should be taken to note that it is not involved to the exclusion of other neurotransmitters. For example, there are also neurobiological pathways that have been found to be active in both behavioural and substance addictions that include the hippocampus and amygdala (Goodman, 2008; Potenza, 2001).

Mental health factors have also been found to be common across the different types of addiction. It has been shown that those who seek treatment for substance abuse are more likely to have increased rates of anxiety and depressive disorders (Lapham, Smith, & Baca, 2001; Silk & Shaffer, 1996). In addition, there is an increased prevalence of psychopathology in those who are dependent on multiple substances (Feigelman, Wallisch, & Lesieur, 1998; Kessler et al., 1997; Tomasson & Vaglum, 1996). Similarly, in populations with mental health difficulties such as depression, anxiety, and posttraumatic stress disorder, there is also an increased prevalence of substance abuse disorders compared to the general population (Merikangas et al., 1998; Reiger et al., 1990; Whalen, Jamner, Henker, & Delfino, 2001). Further, it has been found that alcohol and cocaine abuse are typically preceded by other psychiatric conditions (Kessler et al., 1996; Nelson, Heath, & Kessler, 1998; Shaffer & Eber, 2002). Similar links have also been noted in behavioural addiction, where increased levels of depression and anxiety

compared to controls have been noted in individuals with sex (Griffiths, 2001; Raviv, 1993), internet (Shapira et al., 2000), and gambling (Raviv, 1993) addictions. It has also been found that those who report childhood abuse (sexual, physical, emotional) are more likely to show multiple addictions to both substances and behaviours (Carries & Delmonico, 1996).

Other subclinical risk factors have also been shown to be common across both substance and behavioural addiction. These factors include impulsivity, poor parental supervision, and delinquency (Brenner & Collins, 1998; Caetano, John, & Cunrandi, 2001; Davis & Claridge, 1998; Dawe & Loxton, 2004; Lawrence, Luty, Bogdan, Sahakian, & Clarke, 2009; Vitaro, Brendgen, Ladouceur, & Tremblay, 2001). Additionally, studies have shown that individuals who engage in one problem behaviour are likely to engage in others (Dawe & Loxton, 2004; Griffiths, 2001; West, 2006). Finally, there are sociodemographic risk factors such as geography, family, and peer groups, as well as factors relating to poverty, that have been shown to have an influence on both drug use and gambling and are believed to affect the likelihood of developing an addiction (Evans & Kantrowitz, 2002; Faregh & Derevensky, 2013; Shaffer, Freed, & Healea, 2002; West, 2006).

As discussed in the previous section, it has been hypothesized that it is not the object itself that causes the addiction but rather factors within the individual and their environment that predispose them to addiction. It has been found that opportunity plays a larger role in the development of addiction than does an individual's preference for a particular drug (Shaffer et al., 2004). This suggests that individuals are more likely to develop an addiction to a drug that is readily

available in their environment. Further, it has been shown that it is quite common for individuals, with and without treatment, to 'hop' from one addiction (substance and behavioural) to another, especially during recovery from the initial addiction. In a longitudinal study of the patterns of alcohol and narcotic use, it was found that there was a decrease in the consumption of alcohol when the narcotics began; similarly, when narcotic use decreased, alcohol consumption increased (Hser, Anglin, & Powers, 1990). Other behaviours have been found to show 'hopping' between addictions, including illicit drugs and nicotine (Conner, Stein, Longshore, & Stacy, 1999), alcohol and bulimia (Cepik, Arikan, Boratav, & Isik, 1995), and substance use and pathological gambling (Blume, 1994). This 'hopping' behaviour also occurs within behavioural addictions and across behavioural and substance addiction, indicating that 'hopping' can occur across all addictive behaviours.

Not only do some individuals 'hop' from one addiction to another, it has been well documented in the literature examining substance addiction that polysubstance dependence is common (Kessler et al., 1994). This co-occurrence can also be found between substance and behavioural addictions, as individuals who engage in pathological shopping, gambling, eating, and sex show higher prevalence of substance disorders compared to those who do not present with these disordered behaviours (Christenson et al., 1994; Dawe & Loxton, 2004; Doiron & Nicki, 2001; Griffiths, 2001; Merta, 2001; Rowan & Galasso, 2000; Wilson, 1991; Winters, Stinchfield, & Fulkerson, 1993). Similarly, those who present with substance dependence are more likely to also be pathological

gamblers compared to those without substance use disorders (Shaffer & Korn, 2002). It is believed that the 'hopping' and co-occurrence are due to an underlying predisposition that is responsible for addiction that can lead to differing expressions of the addiction (Shaffer et al., 2004).

Behavioural and drug addictions share many sequelae, including emotional consequences such as shame, guilt, and dysthymia (Shaffer, 2002), and neurobiological reactions such as tolerance and withdrawal. Tolerance and withdrawal are well documented in drug addiction literature; however, there are relatively fewer studies illustrating neuroadaptation in behavioural addiction research. Despite this paucity of research, there is evidence to illustrate that some behaviours, like gambling, show both tolerance and withdrawal (Carnes, 2001; Goodman, 2008; Griffiths, 2005; Griffiths & Larkin, 2004; Levin, 1999; Shaffer et al., 2004). Disordered gamblers often show a pattern of increasing bets in order to gain the same excitement level they previously experienced, in a manner analogous to a substance abuser "chasing the high," which is believed to illustrate tolerance. In relation to withdrawal, it has been found that when gamblers reduce or cease their gambling behaviours, they show adverse signs and symptoms that are only relieved when they are able to gamble again (Shaffer et al., 2004).

Another parallel between behavioural and substance addictions can be found in the way in which addictions are developed. The process appears to begin with environmental and individual risk factors, and then continues with exposure to the potential object of addiction (Shaffer, 1997; Slutske, Jackson, & Sher, 2003). It has been found that once this basic addiction pattern emerges, the

process of developing specific addictions presents in a similar manner. It has also been hypothesized that if the same process can be seen in the addiction to a variety of drugs which have differing biochemical compositions, it is reasonable to think that the object of the addiction is not as important in the course of addiction as was previously thought (Shaffer, et al., 2004). These patterns likely reflect a common underlying addiction process which challenges the common belief that there are distinct addictive disorders (Shaffer, 1997, 1999, 2002).

To further support this conceptualization, research studies have found similar processes for both drug and behavioural addictions. For example, a prospective study of a large sample of casino employees with disordered drinking, gambling, or both problems revealed that the problem behaviours showed almost identical patterns of improvement, relapse, and remission, irregardless of whether the problem was related to a substance or a behaviour (Shaffer & Hall, 2002). In addition, in a review paper examining 84 studies, it was found that alcohol, heroin, and tobacco have very similar relapse patterns (Shaffer et al., 2004). From these findings it has been suggested that the expression of addiction is similar in behavioural and substance addictions (Shaffer et al., 2004).

Finally, the nonspecificity of treatment in addictions has been cited as support for an overarching construct of addiction that includes both substances and behaviours (Shaffer et al., 2004). Similar pharmacological and nonpharmacological treatments have been found to be effective in the treatment of both substance and behavioural addictions (Kim, Grant, Adson, & Shin, 2001; Shaffer & LaSalvia, 1992). In terms of non pharmacological treatments,

cognitive-behavioural, psychodynamic, and behaviour therapy are often used interchangeably and have all shown efficacy in both substance and behavioural addictions (Shaffer et al., 2004).

Several pharmacological treatments reportedly have an effect on addictive behaviours beyond those that are specifically targeted. For example, methadone, which is commonly used to treat opioid addictions, has been shown to reduce cocaine abuse in opioid dependent patients (Shaffer & LaSalvia, 1992), and naltrexone, which is also used for the treatment of opioid dependence has shown some efficacy in the treatment of pathological gambling (Kim, Grant, Adson, & Shin, 2001). It has also been demonstrated that topiramate, a common treatment for seizures that acts on the dopamine pathways in the brain, has efficacy in treating alcohol addiction (Johnson et al., 2003). Further, the anti-depressant buproion, often employed as an aid in smoking cessation, affects the dopamine pathway in the brain and is thought to act by reducing the reinforcing effect of the nicotine and lessening the withdrawal (Hurt et al., 1997). The findings that treatments are often nonspecific have been cited as support for the hypothesis that there are common underlying biopsychosocial factors that make up all kinds of addiction (Shaffer et al., 2004; Trotzky, 2002; von Ranson & Cassin, 2007; Zywiak, 2009).

Evidence has been presented in support of the belief that behavioural and substance addictions share many associated factors and follow a similar pattern. This evidence suggests that specific out-of-control behaviour may be best conceptualized as addictions and indicates that NSSI can be examined as a

potentially addictive behaviour. Given that evidence supports the idea of behaviours as addictions, we need to establish the components of a behavioural addiction. This will be addressed below, along with the rationale for including NSSI within the category of behavioural addiction.

NSSI as a behavioural addiction. Researchers tend to employ a fairly consistent definition of behavioural addiction across studies. This definition usually includes elements of loss of control over , tolerance to, withdrawal from, and social consequences of the behaviour, as well as the amount of time taken up by the behaviour, the desire to reduce the behaviour, and the continued engagement in the behaviour despite awareness of its negative effects (Buser & Buser, 2013; Griffiths, 2001, 2005; Gupta & Derevensky, 1998; Shaffer et al., 2004; Young, 1998). These criteria are consistent with the DSM-IV criteria for Substance Dependence and Impulse Control Disorders (including pathological gambling); in fact, some researchers actually use DSM-IV criteria in their studies, or adapted forms if no specific criteria are available. It has been suggested that the best way of determining whether a behaviour can be considered an addiction is to compare it against the clinical criteria that have been established for a 'typical' or drug related addiction (Griffiths, 2005).

For the purpose of this dissertation, NSSI with addictive features will be defined in accordance with a set of criteria adapted from DSM-IV classification of Substance Dependence. These criteria were adapted to be applicable to NSSI by Nixon and colleagues (2002) by simply replacing the object of the addiction in the criteria: substituting "engaging in NSSI" for "using substances." The adaptation

included all of the key factors outlined in the DSM-IV such as loss of control, tolerance, and withdrawal; as well, this adaptation maintained the standard that three or more of these criteria must be met in order for an individual to be classified as having an NSSI with addictive features. The criteria for an NSSI with addictive features are as follows: (a) the NSSI must occur more often than intended; (b) the severity with which the NSSI occurs must have increased (e.g., deeper cuts, more locations on the body); (c) if the behaviour produced an effect when it was started, the individual now needs to self-injure more frequently or with greater severity to produce the same effect; (d) the behaviour or thinking about it must consume a significant amount of the individual's time (e.g., planning or thinking about it, engaging in it and recovering from it); (e) despite a desire to reduce or control the behaviour, the individual is unable to do so; (f) the individual continues the behaviour despite recognizing that it is harmful physically and/or emotionally; (g) the individual gives up or reduces important social, family, academic or recreational activities because of the behaviour (Nixon & Cloutier, 2004).

This definition was chosen for the current dissertation because the DSM-IV is one of the most commonly used guides for diagnostic criteria. Similarly, it is in accordance with another commonly used diagnostic guide, the ICD-10, which also focuses on loss of control, tolerance, and withdrawal (World Health Organization, 2010). This definition was modelled after the criteria for Substance Dependence in the DSM-IV, which as noted above was likewise used to create the criteria for Pathological Gambling in the DSM-IV. Using this model to create

criteria for problematic gambling has proved to be successful, as the criteria have been shown to be psychometrically sound (Griffiths, 2001; Griffiths, Szabo, & Terry, 2005). Therefore, as this method of creating criteria for out of control behaviours has proved to be successful in the past, it is a good model to follow for creating criteria for other out of control behaviours (or behavioural addictions). Further, using this definition it allows for comparisons with the existing study by Nixon et al. (2002) examining NSSI as an addictive behaviour. In addition, this or similar definitions have been used in other behavioural addictions research examining behaviours such as gambling, exercise, sex, and internet use (Griffiths, 2001; Griffiths, Szabo, & Terry, 2005; Gupta & Derevensky, 1998; Young, 1998).

Finally, this definition is similar to that presented by Griffiths, a researcher who has made multiple and significant contributions to the development of psychological models of addiction. His components model of addiction posits that there are many required elements for an addiction to develop, including salience (the behaviour is the most important in one's life), mood modification (the behaviour causes a change in emotion), tolerance (increasing amounts of the behaviour are needed to experience the change in emotion that is desired), withdrawal (there are unpleasant feelings or physical effects when the behaviour is stopped), conflict (interpersonal or intrapsychic conflict about the behaviour), and relapse (tendency to relapse to previous levels of the behaviour) (Griffiths, 2005). These components are encompassed within the adapted DSM-IV criteria as described above and have been widely accepted as indicative of addiction

(APA, 2000; Buser & Buser, 2013; Coombs, 1997; Smith & Seymour, 2001). For example, the component of tolerance is evident in the DSM-IV adapted criteria referring to the fact that the behaviour occurs more frequently or with greater severity in order to achieve the desired effect. Similarly, the component of salience is illustrated in the two criteria stating that the behaviour or thinking about it takes up a significant amount of one's time and that important social, family, academic or recreational activities are given up or reduced as a result of the behaviour.

Thus, this definition for NSSI with addictive features was chosen because it is based on a model that has been shown to be reliable and valid for pathological gambling. It is also in accordance with other definitions of addiction including the components model of addiction presented by a leading researcher in the area of behavioural addiction.

Evidence for NSSI as an Addictive Behaviour

Researchers have been speculating about the addictive features of NSSI for years (Favazza, 1989; Faye, 1995; Turner, 2002); however, the majority of these speculations have been based on case study reports. Thus, there is very little empirical evidence to substantiate these ideas (Turner, 2002). There are, however, two empirical studies which have found that NSSI shows addictive features (Nixon et al., 2002; Schaub et al., 2006; Victor et al., 2012), as well as an abundance of anecdotal evidence to suggest that NSSI may be addictive (Conterio & Lader, 1998; Favazza, 1996; Simeon & Hollander; 2001; Turner, 2002). This evidence supporting NSSI as an addictive behaviour will be presented below in

three sections. First, the indirect empirical evidence will be reviewed, followed by the anecdotal evidence and the two studies of NSSI with addictive features.

Indirect empirical evidence for NSSI as an addictive behaviour. Several authors have reported indirect evidence suggesting that NSSI may in fact have addictive features. For example, in their study examining 94 young adults (ages 17 to 19) recruited from both the community and an outpatient mental health clinic, Dilberto and Nock (2008), found that 78% of their sample reported at least one reason to stop NSSI. This means that despite being aware of at least one negative consequence, 78% of their sample continued to engage in this behaviour. This finding is in accordance with the set of criteria from the DSM-IV for Substance Dependence indicating that a behaviour is continued despite the recognition that it is harmful (APA, 2000).

Referring back to the earlier section regarding whether behavioural addictions should be considered addictions, it was noted that the dopamine reward system has been implicated as playing a major role in the development and maintenance of addictions (Kalivas & Volkow, 2005; West, 2006). Although no fMRI studies to date have been completed in relation to NSSI, it has been hypothesized by some researchers that dopamine plays a role in the development of self-injury, as it does in other behavioural and substance addictions. Specifically, the addictive nature of self-injury has been hypothesized to be a result of a behaviour that links self-injury with alterations in the dopaminergic pathways (Winchel & Stanley, 1991). It is proposed that those who self-injure have a change in their dopaminergic signaling or have oversensitive dopamine

receptors, particularly receptors D1 and D2 (Osuch & Payne, 2009). Unfortunately, this hypothesis has yet to be examined in normative populations and has a paucity of literature in human research. Therefore, one can only make inferences about the role of dopamine in normative populations of those who engage in NSSI.

Studies examining individuals with Lesch-Nyhan syndrome, a developmental disorder in which Self-Injurious Behaviour (SIB) is prominent, have shown some support for these theories. Post-mortem studies of the brains of individuals with Lesch-Nyhan syndrome have found a functional loss of dopamine terminals in the corpus striatum, indicating that a dopamine abnormality may be related to their SIB (Lloyd, et al., 1981). However, as these studies were only conducted on a specific population is it unknown whether the results would generalize to all populations who self-injure, especially NSSI in normative populations. In addition, it is unclear whether this abnormality relates specifically to self-injury or if it is related to the syndrome as a whole. Similarly, animal studies provide further circumstantial support for this theory. Dopamine has been found to be linked to self-injurious behaviours in rats and monkeys, specifically that if dopamine receptors were blocked, SIB decreased (Breese et al., 1984; Goldstein et al., 1986). While these findings are consistent with the hypothesis that the dopamine system is involved in the addictive components of NSSI, as stated above, this evidence is suggestive rather than conclusive.

Researchers have found that neurotransmitter systems, such as the endogenous opioid system, may play a role in engaging in NSSI. This system

contains the group of endogenous opioid peptides known as endorphins (Koneru, Satyanarayana, & Rizwan, 2009). The release of endorphins can cause analgesia (absence of pain) and lead to an increase sense of comfort and control or power (Koneru et al., 2009). The role of the endogenous opioid system has been discussed in connection with alcoholism. It has been found that ingestion of an alcoholic substance initially increases levels of endorphins (Gianoulakis, 2001). Researchers have suggested that the endogenous opioid system may be activated by engagement in NSSI due to the experience of pain accompanying NSSI (Sandman & Hetrick, 1995; Sandman & Touchette, 2001). It is hypothesized that the release of endorphins may then serve to improve the mood of the person engaging in NSSI (Koneru et al., 2009; Sandman & Touchette, 2001; Yates, 2004). It has been further hypothesized that as individuals who self-injure they may develop tolerance to the endorphins triggered by NSSI (Sandman & Hetrick, 1995; Yates, 2004). This would result in an increase in both the frequency and severity of the NSSI behaviour in order to reach the desired result **(**Yates, 2004**).** This theory is partially supported by studies showing that the use of naltrexone, which is an opiate antagonist that obstructs the pain-relieving effects of the endogenous opioid system, has been successful in reducing a range of self-injurious behaviors (Griengl, Sendera, & Dantendorfer, 2001; Roth, Ostroff, & Hoffman, 1996; Sandman & Hetrick, 1995; Sonne, Rubey, Brady, Malcolm, & Morris, 1996).

Although tolerance and withdrawal have not been extensively studied in NSSI so as to enable a direct comparison between NSSI and other addictions,

there is an abundance of literature examining the associated features of NSSI. Like other addictions, there have been studies that have found that substance use disorders are common among people who engage in NSSI (Alfonso & Dendrick, 2010; Brausch, Decker, & Hadley, 2011; Hasking et al., 2008; Matsumoto & Imamura, 2008; Zlotnick, Mattia, & Zimmerman, 1999). One study found that in a sample of 89 adolescents (aged 12-17) who engaged in NSSI, 60% presented with substance dependence disorders (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). NSSI has also been linked with eating disorders, another behaviour that has been suggested to be addictive (Alfonso & Dendrick, 2010; Brausch, Decker, & Hadley, 2011; Claes, Klonsky, Muehlenkamp, Kuppens, & Vandereycken, 2010; Davis & Claridge, 1998; Whitlock et al., 2006). It has been found that approximately 44% of those who engage in self-injury in a clinical sample also had a co-occurring eating disorder (Zlotnick et al., 1999). This follows with the theory that there are common underlying factors to all addictions that lead to co-occurring addictions (Shaffer et al., 2004) and further supports the conceptualization of NSSI as an addictive behaviour.

In relation to the nonspecificity of treatment, it has been shown that naltrexone, an opioid receptor antagonist that is used in the management of alcohol dependence, can reduce or even eliminate SIB in certain clinical populations, as it has been shown to do with gambling behaviour (Buzan, Thomas, Dubovsky, & Treadway, 1995; Crews, Rhodes, Bonaventura, Rowe, & Goering, 1999; Sandman & Hetrick, 1995; Singh, Ricketts, Ellis, & Singh, 1993). Unfortunately, the literature in this area consists mainly of case studies and open

trials with no double blind or placebo controls. Thus, the efficacy of these medications overall are not clear at this time. Further, these studies focus on populations with developmental delays, so it is unclear whether these results would generalize to community samples of individuals with NSSI.

Although there is only limited indirect evidence indicating that NSSI has addictive features, the findings reviewed above are consistent with that hypothesis. There is also a large amount of anecdotal clinical evidence to support this conceptualization, which this second section will review.

Clinical evidence for NSSI as an addictive behaviour. Almost every clinical book regarding NSSI refers to this behaviour as addictive in some manner, whether it is drawing parallels between NSSI and addiction, proposing that it is an addiction, or reporting that those who self-injure call it an addiction (Conterio & Lader, 1998; Favazza, 1996; Gratz & Chapman, 2009; Hollander, 2008; McVey-Noble, Khemlani-Patel, & Neziroglu, 2006; Simeon & Hollander, 2001; Turner, 2002). Conterio and Lader, Founders of S.A.F.E. Alternatives, a treatment program for those who engage in self-injury, wrote a book in 1998 in which they referred to NSSI as an "addictive-like" behaviour. They described that they were hesitant to call it an addiction because in their opinion, the word addiction removed the notion that NSSI was a choice and could therefore be successfully treated. However, with the recent developments in addiction theory, the term addiction no longer implies that there is a lack of choice involved in the addiction process. In fact, Shaffer and colleagues (2004) addressed this specific issue stating that although there are underlying biopsychosocial factors that make

individuals prone to addiction, these factors alone cannot cause the addiction. An individual must make the choice to engage in an addictive behaviour for the addiction to occur, and another, albeit more difficult, choice, to end the behaviour as well. This makes the concept of addiction more comparable to the phenomenon described as "addictive–like" behaviour by Conterio and Lader in 1998.

Other books have also referred to NSSI as an "addictive–like" behaviour (Favazza, 1996; McVey-Noble et al., 2006; Simeon & Hollander, 2001), some describing what they call repetitive self-injury and proposing that it be included in the Impulse Control Disorders section of the DSM-IV (Favazza, 1996; Simeon & Hollander, 2001). Although these authors do not suggest that NSSI should be considered a behavioural addiction per se, other behavioural addictions such as gambling are found in the Impulse Control Disorders section. As discussed above, the criteria for Impulse Control Disorders are very similar to that for Substance Dependence, suggesting that although these authors are proposing different terminology, they appear to be advocating that it be considered as part of the same phenomenon.

Although many authors do not go beyond calling NSSI an addictive like behaviour, one author goes as far as to propose a model of addiction in NSSI (Turner, 2002). In the book titled *Secret Scars: Uncovering and Understanding the Addiction of Self-Injury*, Turner (2002), discussed NSSI and why she believes that NSSI is addictive. Turner is a clinical psychologist whose clinical and academic speciality is working with adolescents with addictive disorders, and

although the book does not contain a great deal of empirical evidence to support this theory, she provided several case studies to support the theory that NSSI is addictive, including her own experience with self-injury. Turner believes, based on the limited empirical evidence and her extensive clinical experience, that NSSI is a potentially addictive behaviour. There is even a proposed set of criteria for Self-Injury Dependence presented in the book, using the DSM-IV as a model. These criteria are almost identical to the ones used by Nixon and colleagues (2002) that were endorsed by clinical patients who engage in NSSI. One piece of empirical evidence that is presented is that it is not only clients who feel this behaviour is addictive; service providers also understand that NSSI can be addictive. In a survey of 290 service providers in college counselling centres, 25% described NSSI as very addictive and 55% described it as somewhat addictive, while only 14% described it as not addictive at all (Whitlock, Eells, Cummings, & Purington, 2009).

Another book that refers to NSSI as an addiction is *Freedom from Self-Harm* by Gratz and Chapman (2009), both researchers in the field of self-injury. In their book, the authors described preoccupation, difficulty stopping, doing more harm than intended, tolerance, and withdrawal in the patients with whom they have worked. Of particular interest are the withdrawal symptoms they described, because it had been thought that withdrawal was not present in those with NSSI. Gratz and Chapman (2009) described a young woman who would feel "achy and tense" in her arms where she would most often burn herself, and reported that she could not stop thinking about injuring herself, in part to get rid

of that feeling in her arms. The symptoms these researchers documented closely mirror those present in an addiction.

Statements from those who self-injure have been quoted in many sources, each revealing a remarkable continuity with substance abusers. One individual with NSSI reported that "my nicotine urges are less powerful than self-injury urges" (Conterio & Lader, 1998, p. 25). In relation to a conversation with a drug addict, another individual with NSSI stated "He related to me how it felt when he injected the drug, and his description of the feeling was exactly the same feeling I get when I self-injure" (Conterio & Lader, 1998, p. 25). Other statements indicating a lack of control over the behaviour are also common amongst those with NSSI, such as the failure to resist impulses to self-injure (Conterio & Lader, 1998; Favazza & Rosenthal, 1993; Hollander, 2008; McVey-Noble et al., 2006; Simeon & Hollander, 2001). There are reports of tolerance in those who self-injure, or the need to engage in the behaviour more and more to achieve the same desired effect (Conterio & Lader, 1998; Gratz & Chapman, 2009; Turner, 2002). References to the phenomenon of 'hopping' between addictions can also be found in statements such as "I think I might be using alcohol as a substitute for cutting (Hollander, 2008, p. 20)."

Some individuals who engage in NSSI even state explicitly that they are addicted to it. For example, in a study of 240 female self-injurers who had sought treatment, 71% considered their behaviour to be an addiction (Favazza, 1996). One does not have to search for long to find individuals who will state that they are addicted to NSSI; one can find examples of this in videos on YouTube

posted by individuals who engage NSSI. In a study examining the themes of these self-injury related videos have found that it is common for individual to state that they are addicted to NSSI (Lewis, Heath, Michal, & Duggan, 2012). In another internet based study Whitlock, Powers, and Eckenrode (2006) analyzed 3,219 posts, or written statements, from 10 online NSSI message boards and classified the posts with various content codes, including one called 'addictive elements'. The 'addictive elements' code was assigned to 9% of the posts analyzed. The themes described in these posts were surrounding the inability to stop engaging in NSSI despite wanting to do so and inability to control the urge to engage in NSSI. Thus, even in this informal, internet-based social medium, support for the hypothesis that NSSI may be an addiction can be found.

Although anecdotal evidence on its own is not sufficient to enable the conclusion that NSSI is addictive, it does present a compelling argument that this phenomenon requires further study to determine whether it will hold up to empirical examination. The scarcity of empirical evidence may be related to the fact that the questions that may uncover the addictive features present in some self-injurers are not yet commonly asked. These questions have only just begun to be asked by some researchers, and the results of these pioneering studies appear to support the hypothesis that NSSI may be a potentially addictive behaviour. These studies are presented in the following section.

Empirical Studies of NSSI and addiction. The concept of NSSI as an addiction was examined by Victor and colleagues (2012), in 58 adolescents who were receiving psychiatric treatment, by comparing craving for substances to

cravings for NSSI. It was found that craving scores were significantly lower for NSSI compared to craving scores for substances. Victor and colleagues (2012) believe that their findings indicate that NSSI is better suited to an emotion regulation model rather than an addiction model. Research clearly indicates that emotion regulation difficulties is connected to NSSI (Claes et al., 2010; Franklin et al., 2010; Gratz, 2003; Hilt, Cha, & Nolen-Hoeksema, 2008; Klonsky, 2007, 2011), however, it is believed that for some individuals a behaviour that started as a coping strategy may develop into an addictive behaviour. Although the participants cravings scores were lower for NSSI compared to cravings for substance use, the participants did indicate that they craved the NSSI behaviour (Victor et al., 2012). It has been found that cravings are involved in many addictions (Buser & Buser, 2013). It is important to note that at the time of the study 28% of the sample met criteria for substance abuse/dependence and 24% met criteria for alcohol abuse/ dependence but it was unclear the level of severity of the NSSI at the time of the study as the measure examined lifetime prevalence (Victor et al., 2012) . Therefore, it is unclear whether the participants were current self-injurers or if they had engaged in the behaviour in the past but have stopped which may have an effect on their level of craving. Without the additional information on the current severity of the participants NSSI behaviours it is difficult to rule out NSSI as a potentially addictive behaviour. Although this study does present some interesting findings, due to it's limitations it does not eliminate the possibility of NSSI as an addictive behaviour.

The addictive aspects of NSSI were examined by Nixon and colleagues (2002) in a sample of 42 adolescents (86% female) in an inpatient treatment program and an acute partial hospitalization program. To measure addictive features, the authors used a self-report questionnaire based on the adapted DSM-IV criteria for NSSI, as described earlier. The questionnaire contained seven items including, "Since you have started to self injure, have you found that the behaviour occurs more often and/or severity has increased?" and "Since you have started to self injure, have you found that the frequency and/or intensity has increased in order to achieve the same effect?" To meet criteria for dependence according to the DSM-IV an individual was required to endorse three or more items listed. In their sample of adolescents, it was found that 97.6% of their sample endorsed three or more of the addictive symptoms and 81% endorsed five or more addictive symptoms. Based on the above criteria for dependence, the vast majority of their sample could be considered to be experiencing a behavioural addiction. Nixon and colleagues also found that both frequency of urges and frequency of acts of NSSI were related to the number of addictive features endorsed. Thus, a second key finding of this study was that the individuals with the most severe symptoms of self-injury were also those who reported the most symptoms of addiction. This study clearly demonstrated that a large proportion of individuals with NSSI in a hospital setting appear to experience clinically significant symptoms of addiction.

Addictive features of NSSI were also found in an early pilot study with a community sample of 56 university students (89% female) by Schaub and

colleagues in 2006. In this sample it was found that 31% of participants endorsed at least three of the seven addictive features using the same measure as Nixon et al. (2002). The most commonly endorsed items were "Despite a desire to cut down or control this behaviour, are you unable to do so?"; "Has the severity in which the self-injurious behaviour occurs increased?"; and "Has the self-injurious behaviour occurred more often than intended?", with endorsement rates of 47.0%, 34.5%, and 32.7% respectively. Further, in response to a question regarding the function of NSSI, 14.9% reported addiction as the main reason for continuing to engage in NSSI and 12.8% reported addiction as a factor but not the most central. Although Nixon et al. (2002) found a much larger percentage of participants who met criteria for addiction to NSSI, it should be noted that their sample was an inpatient sample with a high level of severity (83.3% engaging in acts of NSSI more than once a week) making it a qualitatively different sample. Based on these studies, it appears that addictive features may be a factor in both clinical and community samples of female non suicidal self-injurers.

Factors associated with addictions and NSSI. There is an enormous amount of literature in the area of addiction and it is often segregated into different addictive behaviours, making an extensive review of all factors relating to addictions a task beyond the scope of this dissertation. Therefore, an attempt will be made to present a brief review of all of the commonly cited factors associated with addiction. In an effort to avoid redundancy, this section will briefly review the factors covered in the above sections while relating this information to what is known regarding factors related to NSSI.

Based on the review above it is known that there are several individual and environmental factors that are common across differing addictions, including poor parental supervision and delinquency (Shaffer et al., 2004). Childhood abuse (sexual, physical, and emotional) has also been found to be positively related to the number of reported addictions in adulthood, such that higher frequency of reports of childhood abuse were associated with higher numbers of reported addictions (Carries & Delmonico, 1996). Similarly, links have been made between NSSI and sexual, physical, emotional abuse, as well as neglect (Gratz, 2003). In a review study conducted by Gratz in 2003, childhood sexual abuse was found to be associated with NSSI in both clinical and community populations. However, a more recent meta-analysis examining 43 studies of NSSI and childhood sexual abuse it was found that the relationship between these variables was relatively small (Klonsky & Moyer, 2008). The authors concluded that based on the evidence reviewed, childhood sexual abuse likely does not have a central or causal role in the development of NSSI; rather, it appears to play a moderate role since both childhood sexual abuse and NSSI are correlated with the same psychiatric risk factors (Klonsky & Moyer, 2008). Therefore, although several links have been found between NSSI and sexual abuse, it does not appear to be central in the development of NSSI.

The results of studies in both the clinical and general populations examining the association between childhood physical abuse and NSSI are mixed; however, the majority show a relation between NSSI and childhood physical abuse. In a study looking at NSSI in 249 female college students, Gratz (2006),

found that childhood maltreatment reliably distinguishes those with frequent NSSI from those with no history of NSSI (Gratz, 2006). Further, in a sample of 862 high school students (61.1% female), it was shown that those who engaged in NSSI reported more frequent physical, emotional, and sexual abuse than those who did not engage in NSSI (Zoroglu et al., 2003). However, in a sample of female outpatients, Zweig-Frank, Paris, and Guzder (1994), found no relation between physical abuse and NSSI. This pattern of results indicates that, although childhood physical abuse may be a risk factor in many samples, it may not generalize to all samples, making it imperative not to make assumptions regarding physical abuse and NSSI in all samples. Recently mediating factors have been explored to explain the variability in the findings linking abuse and NSSI (Muehlenkamp, Kerr, Bradley, & Larsen, 2010). Emotion regulation, post traumatic stress, and self-criticism have all shown to be mediating factors between NSSI and abuse. In a study of 2238 college students it was found that those who engage in repetitive NSSI (classified as a frequency greater than five) were more likely to have experienced physical abuse compared to those who are episodic or single time self-injurers (Muehlenkamp, Kerr, Bradley, & Larsen, 2010). Similar results have been found indicating that physical abuse is linked with repetitive self-injury (Evren and Evren, 2005; Yates et al., 2008; Zoroglu et al., 2003). Given theses findings, childhood physical abuse may be a factor that differentiates those who engage in NSSI and endorsed clinically significant addictive features from those who engage in NSSI but do not demonstrate the addictive features.

As stated above, it is common for individuals to have multiple behavioural and/or substance addictions within the same period of time as well as sequentially; this shifting focus of addiction was referred to above as 'addiction hopping' (Shaffer et al., 2004).

It has also been found that those with multiple addictions show an increased prevalence of psychopathology (Kessler et al., 1997). Conversely, substance abuse is more common in populations with psychopathology than in the general population (Whalen et al., 2001). Although it has been herein argued that behavioural addictions should be conceptualized in the same manner as substance addictions, only those aspects of psychopathology that have been specifically associated with behavioural addictions will be examined in the present study. It has been found that there is a particularly strong association between internalizing disorders, specifically depression and anxiety, and behavioural addictions (Griffiths, 2001; Raviv, 1993; Shapira et al., 2000). Given the strength of this association, and the fact that general psychopathology represents an incredibly vast field, the remainder of the dissertation will focus on depression and anxiety rather than general psychopathology.

Looking now at NSSI, there has been a great deal of research linking mental health disorders with self-injury (Krysinska, Heller, & De Loe, 2006; Welch, 2001). NSSI has been positively associated with eating disorders (Alfonso & Dendrick, 2010; Claes et al., 2010; Claes, Vandereychen, & Vertommen, 2005; Solano, Fernandez-Aranda, Aitken, Lopez, & Vallejo, 2005; Stein, Lilenfeld, Wildman, & Marcus, 2004; Whitlock et al., 2006), Borderline

Personality Disorder (Klonsky, Otmanns, & Turkheimer, 2003; Walsh & Rosen, 1985; Zlotnick et al., 1999), and substance abuse (Alfonso & Dendrick, 2010; Brausch et al., 2011; Evren, Kural, & Cakmak, 2006; Hasking et al., 2008; Matsumoto & Imamura, 2008). In addition, although reported symptoms are not always at clinical levels, those who engage in NSSI also tend to show more anxiety and depressive symptomology than controls (Brausch & Gutierrez, 2010; Cloutier et al., 2010; Glenn & Klonsky, 2009; Haavisto, et al., 2005; Ross & Heath, 2002; Serras, Saules, Cranford, & Eisenberg, 2010).

Other subclinical factors have been linked with NSSI. Individuals who engage in NSSI are more likely to report engaging in risky behaviours such as substance abuse, recklessness, and gambling compared to those who do not engage in NSSI (Brausch et al., 2011; Laye-Gindhu & Schonert-Reichl, 2005; Matsumoto & Imamura, 2008; Serra et al., 2010). Females who engage in NSSI are also more likely to report smoking than those who do not engage in NSSI (Laye-Gindhu & Schonert-Reichl, 2005).

Another subclinical factor that has been consistently implicated in the formation of NSSI is emotion regulation (Claes et al., 2010; Franklin et al., 2010; Gratz, 2003; Hilt, Cha, & Nolen-Hoeksema, 2008; Klonsky, 2007, 2011). Klonsky (2007) conducted a review of the literature examining the functions of NSSI and concluded that most of the support was for the affect regulation model. In this review, he also found that research indicates that an increase in negative affect often precedes NSSI, while a decrease follows it. This finding suggests that the intention of the NSSI was to relieve this negative affect. Further, Gratz (2006)

found that emotional inexpressivity can reliably distinguish between female college students who engage in NSSI and those who do not, with those who self-injure rating themselves higher on measures of emotional inexpressivity. Similarly, in a sample of 200 university students, emotion regulation was found to consistently predict engagement in NSSI (Holly, 2011).

This evidence suggests that those who use NSSI as a coping strategy to manage negative affect likely have difficulties regulating their emotions. Thus, emotion regulation may represent both a risk factor for and a function of NSSI, making it a very important variable to examine it in relation to NSSI. This variable will therefore be examined in the proposed study of the addictive features of NSSI to determine if difficulty regulating emotions puts an individual at higher risk for experiencing NSSI with addictive features. With emotion regulation appearing to play such a central role in NSSI behaviour, it is imperative to examine it in different samples of self-injurers, such as those who report experiencing addictive features of the behaviour.

The previous sections have suggested that it is valid to conceptualize certain behaviours, including NSSI, as potentially addictive and considerable evidence has been presented in support of this hypothesis. Factors such as childhood trauma, anxiety, depression, emotion regulation, and other problem behaviours have been linked with both NSSI and addiction, and will therefore be examined in a comparison of individuals who self-injure and meet criteria for NSSI with addictive features and those who self-injure but do not show addictive features. In addition, other factors that are specific to NSSI such as frequency of

NSSI, methods of NSSI, and medical treatment for NSSI will also be examined in these samples. Since these factors are often associated with the severity of NSSI, they should be considered relevant to the understanding of the addictive features of NSSI.

Summary of evidence of NSSI as an addictive behaviour. Overall, there is limited evidence supporting the hypothesis that NSSI is an addictive behaviour, and most of that evidence is either indirect or anecdotal. Given this lack of direct empirical evidence, more information would be required prior to drawing conclusions regarding the addictive nature of NSSI. Although Nixon and colleagues (2002) concluded that NSSI does show addictive features, their results were based on a clinical sample composed of predominantly white females; questions remain, therefore, as to whether these results would generalize to other populations. The pilot study conducted by Schaub and colleagues (2006) was able to extend these findings to a community sample, although it was also composed primarily of females. This latter sample was also quite small and did not allow for further investigation of factors associated with the identified addictive features. Thus, neither study provided information regarding factors associated with addictive features in NSSI beyond an association between the number of addictive features endorsed and the frequency of the acts of self-injury (Nixon et al., 2002), leaving many questions unanswered. It remains unknown whether NSSI in these individuals presents differently in terms of method, severity, location on body, and suicidal ideation, than it does in those who do not endorse addictive features. Further, it is also unknown if those who endorse

clinically significant addictive features are more likely to present with factors that have been previously associated with other addictions compared to those who lack the addictive features. It is these questions that will be addressed by the current study.

Chapter III: Objectives of Present Study

Two samples, one of university students and one of high school students, were recruited in order to examine the association between NSSI and addiction. These samples were chosen as they have been shown to represent the age groups having the highest rates of NSSI (Heath et al., 2009). Further, the developmental periods of adolescence and early adulthood have been found to be the most common times at which NSSI is initiated, indicating that they are age groups in which it is most imperative to further understand NSSI. Using the two samples examining adolescence (high school) and early adulthood (university) allowed for a comparison of the presentation of NSSI with addictive features between the two samples. The objectives of the study are outlined below and are very similar for each sample; however, there are slight differences due to the measures available for each age group. As a result, the objectives are presented separately for each sample to ensure clarity.

University Sample

Objective I. The first objective was to ascertain whether a community sample of university students who engage in NSSI would endorse clinically significant addictive features. Within this objective, the goal was to examine which addictive features were most endorsed and what percentage of those who endorsed addictive features met criteria for NSSI with addictive features based on the aforementioned threshold of reporting three or more symptoms. Based on research indicating that addictive features are present in inpatient populations of self-injurers (Nixon et al., 2002) and a community-based sample of university

students (Schaub et al., 2006), and community members with repetitive NSSI (Favazza & Rosenthal, 1993), it was hypothesized that some individuals within the current sample would endorse sufficient symptoms to meet criteria for NSSI with addictive features.

Objective II. The second objective was to examine the differences between university students who meet criteria for NSSI with addictive features and those who engage in NSSI but do not report addictive features. Specific areas that were investigated to determine whether differences existed were the following: a) mental health factors (emotion regulation and suicidal ideation); b) environmental factors (childhood trauma); c) individual factors (uncontrolled alcohol abuse, uncontrolled drug abuse, excessive gambling, and risky sexual behaviour); and d) factors related to the severity of the NSSI behaviour (frequency of NSSI, total methods of NSSI, and medical treatment for NSSI).

It was hypothesized that those who engage in NSSI and met criteria for NSSI with addictive features would present with more difficulties regulating their emotions, would be more likely to endorse suicidal ideation, would report higher rates of childhood trauma, and would present with additional problem behaviours compared to those who engage in NSSI but did not meet criteria for NSSI with addictive features. This hypothesis is consistent with research reporting similar results in individuals with other addictions (Shaffer et al., 2004).

In addition, it was hypothesized that those who met criteria for NSSI with addictive features would have a higher frequency of NSSI, report using more methods for NSSI, and be more likely to have received medical treatment for their

NSSI behaviour compared to those who did not meet criteria for NSSI with addictive features. This prediction was follows from a study concluding that increased severity of NSSI behaviours was positively related to the number of addictive features endorsed (Nixon et al., 2002). Further, increased severity of the behaviour is one of the criteria for addiction, so it should follow that those who met criteria for NSSI with addictive features would likely be higher on measures of severity

Objective III. The third objective of the present study was to investigate which of the associated mental health, individual, environmental, and severity factors, were most predictive of being a self-injurer with addictive features. Each factor was examined with respect to its ability to predict the likelihood of being classified as showing NSSI with addictive features. To examine this relation, the predictive power of the variables on the likelihood of NSSI with addictive features was tested using samples of self-injurers with and without clinically significant addictive features. Based on previous research, NSSI severity factors were expected to be the strongest predictors of NSSI with addictive features (Nixon et al., 2002). However, mental health, individual, and environmental factors were also hypothesized to be predictors of one's likelihood of being identified as NSSI with addictive features.

High School Sample

Objective I. The first objective was to investigate what percentage of individuals who engage in NSSI in a community high school sample met criteria for NSSI with addictive features. A subsidiary goal of this objective was to

examine which addictive features were endorsed by a high school sample of non suicidal self-injurers. It was hypothesized that addictive features sufficient to meet the above stated criteria for NSSI with addictive features would be endorsed in this high school population, albeit at a lower percentage than in the university sample. As with Objective I for the university sample, this hypothesis is also based on research indicating that addictive features are present in individuals with NSSI (Nixon et al., 2002; Schaub et al., 2006). It is believed that the percentage of individuals who meet criteria will be lower in high school students compared to university students since high school students are likely at an earlier stage in the process of NSSI and may not have developed addictive features to the same extent as university students.

Objective II. The second objective was to examine the differences between high school students who engage in NSSI with addictive features and those who engage in NSSI but lacked addictive features. The specific factors examined were as follows: a) mental health factors (emotion regulation, depression, suicidal ideation, and at risk eating behaviour); b) environmental factors (childhood abuse); c) individual factors (use of addictive substances, for example, drugs, alcohol, cigarettes); and d) factors related to the severity of the NSSI behaviour (frequency of NSSI, total locations on body of NSSI, and total methods of NSSI).

Similar to the university study, it was hypothesized that those who met criteria for NSSI with addictive features would present with more difficulty regulating emotions, would be more likely to endorse at risk eating behaviour and

symptoms of depression, would be more likely to report experiencing childhood abuse, and would use more addictive substances (drugs, alcohol, cigarettes, etc.) compared to those who engage in NSSI but did not show addictive features. This is in agreement with the research described above regarding other addiction-based research (Shaffer et al., 2004). It was also hypothesized that those who met criteria for NSSI with addictive features would shower higher severity of NSSI behaviour compared to those who engage in NSSI and did not meet criteria NSSI with addictive features. The rationale for this hypothesis is identical to that described in Objective II for the university-based sample.

Objective III. The third objective of the present study was to investigate which of the mental health, individual, environmental, and NSSI severity factors listed above were most predictive of being a self-injurer with clinically significant addictive features. To examine this relationship, the predictive power of the variables on likelihood of NSSI with addictive features was tested using a sample of both self-injuring participants with clinically significant addictive features and self-injuring participants without clinically significant addictive features. Based on previous research, NSSI severity factors were expected to be the strongest predictors of NSSI with addictive features (Nixon et al., 2002). However, mental health, individual and environmental factors were also hypothesized to be significant predictors of one's likelihood for NSSI with addictive features.

Chapter IV: Method

University Sample

Participants. Screening data was collected from 5612 university students (1989 male, 3613 female). These participants were recruited in first year undergraduate courses at a large Canadian University as a part of a larger study being conducted by Dr. Heath and her research team on coping strategies in young adulthood. The screening questionnaire collected basic demographic information, such as gender, age, native language, and country of residence, as well as specific information regarding engagement in risky behaviours and non suicidal self-injury. The participants ranged from 18 to 25 years of age with a mean age of 19.59 (SD = 1.40). The top five faculties represented in the sample were Arts (44.9%), Science (22.2%), Engineering (10.9%), Management (9.3%), and Education (5.5%). Of the sample 77.6% listed Canada as their country of residence and 12.8% the USA, with the remaining 9.6% citing other countries as their place of residence. The most frequently endorsed place of birth was Canada (61.4%), followed by the USA (12.7%), Asia (10.7%), Europe (6.2%), and the Middle East (2.9%).

Informed consent for the inclusion of their data in the larger research program was obtained by having the participants sign the informed consent sheet (Appendix A) attached to the screening questionnaire. Participants were given the option to participate in follow up questionnaires by providing their contact information on a form attached to the screening questionnaire (Appendix B). Overall, 52.5% of the screening participants consented to be contacted for follow

up questionnaires. Of the 5612 (1989 male and 3613 females) who filled out the screening questionnaire, 439 (111 male and 214 females; 7.8%) indicated that they had engaged in non-suicidal self-injury at least once. Presence of NSSI was determined first by endorsement of the item "I hurt myself on purpose" on a screening questionnaire, followed by an examination of the NSSI section on the screening questionnaire to ensure that their responses were consistent with this study's definition of NSSI (e.g., excluding those who endorsed the item in the follow up section indicating that they hurt themselves on purpose with suicidal intent).

Of the original 439 participants who self-identified with NSSI, 274 (62.4%) indicated that they were willing to participate further in the study. These NSSI participants were sent an invitation to participate in the follow-up via email. Informed consent was obtained from the follow-up participants by having them read and sign the consent form (Appendix C) with an electronic signature before accessing the measures online. Of those who were contacted (N = 274), 67% (N = 184) completed the follow up survey; these 184 participants comprised the complete NSSI sample.

Two smaller samples were created from within this complete NSSI sample. Based on their responses to the addictive features items presented, 50 (18.2%) participants met criteria for NSSI with addictive features (endorsed three or more of the seven addictive features items) and were selected for the NSSI with addictive features group. The comparison group was matched on sex and age within two years, resulting in 50 (3 male, 47 female) matched pairs. The mean

age of the NSSI with addictive features group was 19.59 (SD = 1.37) and comparison group was 19.42 (SD = 1.66). A matched comparison group was formed from the remaining NSSI participants. A list of all possible matches in the NSSI without addictive features group was generated for each participant in the NSSI with addictive features group. From this list, a match was randomly selected using a computerized list randomizer.

Procedure. The data collection for this study was completed as part of a large ongoing project examining several areas of NSSI. This study was completed in two parts: initial screening and follow-up. The screening portion examining stress and coping strategies in young adults was conducted in first year undergraduate classes at a large Canadian University. First, an email was sent out to instructors from various faculties to solicit their participation. Instructors were asked to allow members of the research team to enter their classrooms in order to administer a screening questionnaire. Instructors were given the following options: allowing students approximately 15 minutes to complete the screening measure during class time or the research team could distribute the screening questionnaire at the beginning of class and collect the completed ones at the end of class.

The research team visited each of the participating classes and read a description of the study out loud to the students (Appendix D). Since the study was presented as being focused on stress and coping strategies in young adults rather than specifically looking at NSSI, the use of mild deception was used to avoid selection bias and the possible risk of contagion that has been observed

when individuals openly discuss their non suicidal self-injurious behaviours (Hodgeson, 2004). Potential participants were also read a statement of informed consent, highlighting that their participation was completely voluntary, that they could stop at anytime, and that their responses were confidential. Students were informed that surveys would be given to all students, and that if they choose not to participate, they were to hold on to the survey until the research team collected them at the end of the 15 minute administration time. The screening questionnaire and informed consent sheets were distributed to the students. In order for their data to be included in the research program, students were required to sign the informed consent form (Appendix A).

Students were also provided with a copy of the invitation to participate in the follow-up study (Appendix B). To indicate their willingness to do so, participants completed the form with their contact information. They were informed that their names would be entered into a draw to win one of three gift certificates (one $200 gift certificate for a shopping mall, two $50.00 gift certificates for HMV) if they provided their contact information. Upon completion of the questionnaire, each participant was given an information sheet (Appendix E) which provided a debriefing of the study and included the contact information for further participation or to obtain resources.

Of those students in the screening sample who indicated that they were non suicidal self injurers (as determined first by the endorsement of the item "I hurt myself on purpose" on the screening questionnaire, and a response on the follow up section of the screening questionnaire that stipulated the self-injury was

"without intent to die", to ensure that their responses were consistent with the definition of NSSI presented above) any who stated that they were willing to participate in the follow-up were selected as the NSSI participants. The NSSI participants were sent an invitation to participate in the follow-up via email. If the participant indicated that they were willing to complete the follow-up portion of the study, they were provided with a website link and participant code that allowed them to access the online questionnaires (hosted by Zap Survey). Informed consent was obtained from the follow-up participants by having them read and sign the online consent form (Appendix C) with an electronic signature before accessing the measures. Upon completion of the questionnaire, another email was sent inviting the participant to meet with one of the primary researchers to receive their debriefing information (Appendix F). All data were coded then entered into a database with no identifiable information.

Measures. Several measures were employed in the current study, including the screening measure *How I deal with Stress Questionnaire* (HIDS; Heath & Ross, 2007) and the follow up measures *Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004), *Childhood Trauma Questionnaire- Short Form* (CTQ-SF; Bernstein et al., 2003), and *Ottawa Self-injury Inventory* (OSI; Nixon & Cloutier, 2004). Psychometrics for these scales are presented in the section below. In order to determine NSSI in the screening sample, those who endorsed the statement "I physically hurt myself on purpose" item on the HIDS, excluding those who indicated that the intention of the behaviour was suicidal or who reported methods that do not fall within the

definition of NSSI, were considered to be non suicidal self-injurers. The seven addictive features used to classify those who engage in NSSI into NSSI with clinically significant addictive features and NSSI without clinically significant addictive features groups were measured using the OSI. Based on the above mentioned criteria for NSSI with addictive features, those who endorsed three or more of the seven addictive features were classified as NSSI with addictive features and those who endorsed fewer than three addictive features were classified as NSSI without clinically significant addictive features.

In order to investigate the differences between these two groups, four variables were examined. The first was mental health factors, and specifically emotion regulation difficulties and suicidal ideation. The mental health factor of emotion regulation was measured using the DERS (full psychometric properties listed below). The variable of suicidal ideation was measured using an item on the HIDS that assesses the intent of the individual's self-injury.

The second variable used to explore the differences between the two groups of NSSI was the environmental factor of childhood trauma, and was measured using the CTQ (full psychometric properties listed below).

Thirdly, individual factors were examined. This study looked at problem behaviours such as uncontrolled alcohol abuse, uncontrolled drug abuse, excessive gambling, and risky sexual behaviour. The presence of these behaviours was measured in the risky behaviours section of the HIDS and are assessed in a yes/no format.

Finally, factors related to the severity of the NSSI behaviour, including frequency of NSSI, total methods of NSSI, and medical treatment for NSSI, were also assessed. The NSSI severity variables were measured in the NSSI section of the HIDS. Frequency was measured as a categorical variable wherein participants indicated the frequency with which they engage in NSSI: one time, 2 to 4, 5 to 10, 11 to 50, 51 to 100, or more than 100. To examine methods of NSSI, the five most common methods were listed and the participants endorsed all the methods they had. The number of methods was summed for each participant and a total was produced. Medical treatment was measured with a yes/no item asking if the participant had ever required medical treatment for their NSSI.

Screening Measure. For the purpose of this study, the measure *How I deal with Stress Questionnaire* (HIDS; Heath & Ross, 2007) was employed. The HIDS was developed by Ross and Heath (2002) as a screening measure for NSSI, and was updated in 2007. It contains 24 statements about different adaptive and maladaptive coping mechanisms. Each item is rated on a Likert scale, with '0' representing never and '3' representing frequently. Items include a variety of coping activities such as reading, crying, listening to music, smoking, doing risky things, or physically hurting themselves on purpose.

On the HIDS, there are also sections in which participants are able to supply additional information when they endorse the specific coping activities. Once participants endorse that they "talk to someone" in order to cope, they are requested to complete an additional information section containing items regarding who they talk to and how well they feel this strategy works for them

when they are stressed. Similarly, for reporting that they "do risky things," the participants are asked to indicate their preferred behaviour from a list of several options (uncontrolled alcohol abuse, uncontrolled drug abuse, excessive gambling, risky sexual behaviour, reckless driving, theft, and vandalism) and to state how it makes them feel after engaging in these activities. Finally, after endorsing the statement "**physically hurt myself on purpose**," participants are asked to provide information on the methods in which they have intentionally hurt themselves **without suicidal intent** (i.e., cut, burn, scratch etc.), frequency (how many times), duration (when did they start, how long did they continue), severity of the injury (was medical attention required). Participants who completed the NSSI additional information section "check anyway that you have intentionally hurt yourself, without suicidal intent," excluding those who endorsed methods that do not fall within the definition of NSSI, were considered to be non suicidal self-injurers. These questions soliciting further information regarding NSSI were based on the Deliberate Self-Harm Inventory (DSHI; Gratz, 2001), a behaviourally-based measure of non suicidal self-injury. In a preliminary reliability analysis completed by the authors of the HIDS, a test-retest reliability of .88 over a four week period with a sample of 102 first year university students (Holly, 2010). No validity information is available at this time.

Follow-up Measures. Below, the follow-up measures that were used in the current study are discussed. As this study was part of a larger project, other measures were included in the follow-up that are not reviewed in this section since they are not relevant to this study.

Ottawa Self-injury Inventory (OSI; Nixon & Cloutier, 2004). The OSI was designed to assess the psychosocial correlates of NSSI. This measure was created as a modified version of the Queen's Self-Injury Questionnaire which was developed by Epstein and colleagues in affiliation with the Queen's University Department of Child and Adolescent Psychiatry. The OSI contains a variety of quantitative and qualitative items and has a total of 37 questions. Some items are rated on Likert scales with several appropriate descriptors, while others are open ended allowing for more detailed descriptions of their behaviours. This measure examines the participant's urges, acts, and feelings surrounding NSSI behaviours, as well as the impulsivity, sequelae, efficacy, and motivation to stop engaging in these behaviours. The OSI also includes seven items based on the DSM-IV criteria for substance dependence which are used to assess the addictive qualities of self-injurious behaviour, providing information on the initiation and maintenance of self-injurious behaviour. As described above, those who endorse three or more addictive items on the OSI are considered to meet criteria for NSSI with addictive features. This section of the measure (seven items) was used in the study to examine NSSI with addictive features. The OSI is an unpublished measure; therefore there are limited data available on the measure's psychometric properties. However, test-retest reliability was initially assessed by the authors using a sample of 23 adolescents from a mental health outpatient clinic. Results showed that, over a span of two weeks, the test-retest reliabilities for addictive symptoms endorsed (r = .55) and for motivation to stop (r = .52) were acceptable (Nixon & Cloutier, 2004).

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is a questionnaire that assesses emotion regulation on six dimensions: Non-Acceptance (acceptance or denial of emotions), Goals (ability to function when overwhelmed with emotion), Impulse (ability to control emotions and reactions), Awareness (ability to acknowledge their emotions), Strategies (ability to use different methods to regulate emotions), and Clarity (ability to understand their emotions). There are 36 items, each of which is rated on a five point Likert scale ranging from 1 indicating "almost never" to 5 indicating "almost always". The DERS has been found to have high test-retest reliability (pI = .88, p < .01; Gratz & Roemer, 2004). It has also been shown to have good internal consistency (α = .93) and adequate construct validity (r = .60) when correlated with the Negative Mood Regulation Scale, another commonly used measure of emotion regulation (Gratz & Roemer, 2004).

Childhood Trauma Questionnaire- Short Form (CTQ-SF; Bernstein et al., 2003). This short version of the CTQ was created from the full CTQ which contains 70 items. The CTQ-SF assesses childhood trauma retrospectively on five dimensions: emotional abuse (e.g., "People in my family said hurtful and insulting things to me"), physical abuse (e.g., "I was punished with a belt, board, cord, or some other hard object"), sexual abuse (e.g., "Someone tried to touch me in a sexual way or make me touch them"), emotional neglect (e.g., "People in my family didn't seem to know or care what I was doing"), and physical neglect (e.g., "There was enough food in the house for everyone"). This measure contains 28 items that are rated on a four point Likert ranging from 1 indicating 'never' to 4

indicating ‘almost always’. The CTQ has been found to have high test–retest reliability (interclass correlation = .88) and good internal consistency (Cronbach’s alpha between .79 and .94; Bernstein et al., 2003). In a study investigating criterion validity, it was shown that CTQ scores significantly predicted the observational scores of therapists in a variety of samples, with regression coefficients ranging from .24 and .27) (Bernstein et al., 2003).

High School Sample

Participants. Survey data were collected from 710 high school students across grades 8, 10, and 12 (344 male, 366 female), ranging in age from 12 to 18 years (M = 15.12, SD = 1.79). Participants were recruited from a school district in the Greater Kansas City Metro area in early 2009. In total, students from 6 schools participated. Of the classes that were asked to participate, 80.23% of the students completed the survey. Tables 1 and 2 provide the breakdown of the screening sample by grade and ethnicity.

On the survey, to screen for NSSI, participants were asked if they had ever physically hurt themselves on purpose. Participants who endorsed this item (n = 145) were asked a follow-up question to assess suicidal intent: “Did you ever hurt yourself because you wanted to die?” Participants were given the options of “No, never”, “Yes, sometimes” and “Yes, always;” only those who endorsed “No, never” on the suicidal intent item were included in the NSSI sample, making the final sample n = 137 (51 male, 86 female). The ethnic breakdown of the NSSI group was as follows: 80.3% White, 6.6% African American, 5.8% Multiethnic, 2.2% Hispanic, 2.2% Pacific Islander, 1.5% Native Alaskan or Native American,

and 1.5% self-identified as "other."

Using the same criteria as the previous study (endorsement of three or more addiction items), respondents who engaged in NSSI were divided into two groups: NSSI with addictive features (N = 28, 11 male, 17 female) and NSSI without addictive features (N = 109, 40 male, 69 female). Using the same procedure that was described above, NSSI with addictive features participants were matched with participants in the NSSI without addictive features group based on gender, ethnicity, age within two year, and grade, resulting in 28 matched pairs. There were two individuals in the NSSI with addictive features group who could not be matched for ethnicity. In these cases, the match was randomly selected from a list of the closest matches. Thus, of the 28 matches, 26 (92.86%) were matched on gender, ethnicity, age within two years, and grade, while the remaining 2 were only matched on the other three demographic characteristics. The mean age of the NSSI with addictive features group was 14.71 (SD = 1.72) and NSSI without addictive features group was 14.98 (SD = 1.75). The ethnic breakdown for the NSSI with addictive features sample was as follows: White 82.14%, Multiethnic 7.14%, Hispanic 3.57%, African American 3.57%, and Native Alaskan or Native American 3.57%. The ethnic breakdown for the comparison group was as follows: White 89.29%, Multiethnic 7.14%, and African American 3.57%.

Procedure. Schools in the Greater Kansas City Metro area were contacted to solicit their participation in a study examining topics related to teen health. Similar surveys examining teen health topics are carried out yearly in Kansas City

schools; thus, students and parents were generally familiar with the content and purpose of such surveys. Parental consent was obtained for all students in grades 8, 10, and 12 across each school in the district. Each school contacted the student's parents by letter about the nature of the survey and alerted them to their right to refuse. For the purpose of this study, participants were asked to complete an online survey. Prior to the administration of the survey, participants were informed that no individual responses would be examined, and that all published results would be cumulative. The adolescents provided their own informed assent prior to completing the survey, and were free to not participate. The survey was completed online during class time in computer labs located within the schools. Group administration was conducted; however, each student worked on his/her own individual computer and was not permitted to discuss his/her responses with other students. Students were given between 40 and 115 minutes to complete the survey. Since it was estimated that the survey would take 30 minutes to complete, all students were provided with sufficient time to fully respond to all questions.

Measures. The McLouth Teen Survey (MTS; McLouth, 2008) was used to collect data from the participating students. The MTS was developed as a comprehensive lifestyle survey that covers domains containing questions related to adolescents' physical, social, and emotional well-being. The goal of the MTS project was to evaluate the status of teen well-being and report the data to guide the development and implementation of targeted prevention programs. The MTS contains 119 items, with the majority presented in either multiple choice or checklist format (Appendix G). There are also some open-ended items that allow

the respondent to type in his or her own answer. The MTS is an online survey that is computer-adaptive, in that students' responses to earlier items influence which following questions are presented. Therefore, most respondents are not presented with all 119 items. The survey was developed and administered online using SurveyCrafter Professional 4.0 software.

The MTS collects information about the participants' lifestyles in a wide variety of area. There is a section for demographic information, with questions regarding gender, age, grade, ethnicity/race, and religious association. Several family characteristics are also investigated, including family economic status, family composition, level of after-school supervision, and level of trust in parents. The MTS has questions pertaining to participants' school functioning, asking about average school grades, participation in academic programs, how many classes are skipped, level of trust in school personnel (teachers, administrators, counsellors), likelihood of graduation, and expectation of attending postsecondary education. Participants' neighbourhood characteristics, in terms of feelings of safety in the community and worries about violence in the neighbourhood, were also queried. The next area focused on alcohol and drug use, and asked abut frequency of cigarette smoking, drug use, and alcohol consumption; types of drugs tried; and the age at which substances were first tried. The MTS also examines a participant's safety and violence-related behaviours, including the following: ever carried a weapon; ever threatened/injured on school property; absences because felt school was unsafe; frequency of physical fights; ever been bullied; participation in school bullying; ever been physically, mentally, or

sexually abused; engagement in self-injury and/or suicide-related behaviours; Participants were asked about their nutrition, reporting on such aspects as consumption of fruit, vegetables, and milk; height and weight; amount of exercise; and engagement in dieting behaviours such as fasting, using laxatives, and restricting calories. Finally, television and internet use, as measured by the average number of hours spent watching TV and using the internet, parental use of control software for internet, and engagement in internet activities such as gambling or chatting, was assessed.

NSSI was determined by the NSSI section (Appendix G, items 66 to 77) within the safety and violence-related behaviours portion of the MTS. In that section participants were asked if they have ever physically hurt themselves on purpose without wanting to die (Appendix I, item 68). Participants who endorsed this item were selected and their responses on the NSSI variables were examined to ensure that their behaviour fit the definition of NSSI indicated above. As such, those who indicated that the intent of the injury was suicidal or the behaviours were outside the realm of the definition of NSSI (e.g., overdose, piercing) were excluded. NSSI with addictive features was determined using the seven addictive features items in the NSSI section of the MTS. Based on the previously mentioned criteria for NSSI with addictive features, those students who endorsed three or more addictive items were classified as NSSI with addictive features.

Several factors were investigated to explore the differences between those who engage in NSSI and meet criteria for NSSI with addictive features and those who did not: a) mental health factors (emotion regulation, depression, suicidal

ideation, and at risk eating behaviour); b) environmental factors (childhood abuse); c) individual factors (use of other addictive substances, for example, drugs, alcohol, cigarettes); and d) factors related to the severity of the NSSI behaviour (frequency of NSSI, total locations on body of NSSI, and total methods of NSSI).

Within the mental health factors, emotion regulation was assessed using three items (Appendix G, items 78 to 80) taken from the *Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004). These items were chosen to assess emotion regulation because they are the items on the DERS that have been found to be most predictive of NSSI (Heath et al., 2008). The emotion regulation items are rated on a Likert scale, with the response options being never, some of the time, half of the time, most of the time, and always. In order to obtain a single score for this variable, responses were summed across all three items. Self-reported depressive mood was measured by a single yes or no item in the same section, asking whether the participant had felt sad or hopeless almost every day for two weeks or more in a row that [he/she] stopped doing some usual activities during the past 12 months (Appendix G, item 81). Similarly, suicidal ideation was assessed using a different yes or no question from the MTS that asked if the participant had considered attempting suicide in the past 12 months (Appendix G, item 82). At risk eating behaviour was measured by three yes or no items from the nutrition portion of the MTS (Appendix G, items 95 to 97). These items inquired about the use of diet aids, laxatives, vomiting, or fasting for 24 hours or more for the purpose of losing weight or to keep from gaining weight in the past

30 days.

The environmental factor of childhood abuse was measured by three yes or no items which ask whether the participant has ever been physically, emotionally or sexually abused (Appendix G, items 63 to 65). These were examined as three separate dichotomous variables.

As for individual factors, substance use was measured using several items in the drug/alcohol use portion of the MTS (Appendix G, items 27 to 53). In this section the participants were asked if they had ever tried each substance (yes or no; e.g. cigarettes, alcohol, marijuana, cocaine/crack, and methamphetamine), how old they were when they first tried it, their frequency of use in the past 30 days and the past seven days. Fourteen other substances are presented in a yes or no format of whether the participant ever used each substance, such as chewing tobacco, mushrooms, PCP and LSD. The items of interest are those that asked if the participant ever used each substance. Yes responses were assigned a value of 1 and no responses a value of 0; the sum of these values was used to create the total substance use variable. Totals could range from 0 to 19.

Lastly, variables related to the severity of the NSSI were obtained from the NSSI section of the MTS (Appendix G, items 75, 71, and 72 respectively). Frequency of NSSI was measured as a categorical variable on which participants indicated which range best captures the frequency with which they engage in NSSI: one time, 2 to 4, 5 to 10, 11 to 50, 51 to 100, or more than 100. To examine methods of NSSI, the five most common methods were listed and the participants were requested to endorse all methods they have used when engaging

in NSSI. The total number of methods variable was calculated based on the number of methods endorsed by each participant. Location of NSSI was assessed through an item that lists the six most common locations on the body which are injured in episodes of NSSI; the participant was asked to endorse all areas on which they have injured themselves on purpose. The total number of locations variable was a frequency count of the number of locations endorsed by each participant.

Chapter V: Results

University Sample

Data Cleaning. All data were analyzed using *Statistical Package for the Social Sciences 16.0 (SPSS 16.0).* No extreme outliers were found when the data were examined as a total group, or split into the NSSI with addictive features and comparison groups separately. Although the Kolmogorov-Smirnov test for normality was significant for several of the variables, the skewness and kurtosis statistics were close to zero and examination of normality plots and histograms suggested the distributions were normal.

Objective I. The first objective was to ascertain whether some individuals who engage in NSSI in a community-based sample of university students met criteria for NSSI with addictive features. The goal was to examine which addictive features were most frequently endorsed and to ascertain what percentage of those who endorsed NSSI met criteria for NSSI with addictive features (endorsing three or more addictive features items). To address this objective, the data were examined with respect to the frequency with which addictive features items (items 36 to 41 on the OSI, completed by participants during the follow-up portion of the study) were endorsed by those who engaged in NSSI. This frequency data for all NSSI participants (n = 184) in the follow-up portion of the study is presented in Table 3. The most frequently endorsed item was "You continue NSSI despite recognizing that it is harmful to you physically/emotionally?", with 35.3% of the follow-up NSSI sample endorsing this item. This was followed by "Has the severity in which the NSSI occurs

increased?" and "Has NSSI occurred more often than intended?", with endorsement rates of 32.1% and 31.0% respectively.

The frequency with which university students met criteria for NSSI with addictive features was obtained by creating a total addictive features score. Each addictive features item that was endorsed was assigned one point, and these endorsements were summed across all seven items. Total addictive features scores ranged from zero (no items endorsed) to seven (all items endorsed). Participants with scores of 3 or more were considered to have met criteria for NSSI with addictive features. This total score was then transformed into a dichotomous variable, with 0 representing all non suicidal self-injurers who did not meet criteria for NSSI with addictive features (endorsing fewer than three addictive features items, score of less than three) and 1 encompassing all non suicidal self-injurers who met criteria for NSSI with addictive features (endorsing three or more addictive features items, score of three or more). Of the 184 NSSI participants who completed the follow-up portion of the study 50 (27.2%) met criteria for NSSI with addictive features.

Objective II. The second objective was to examine the differences between university students who both engaged in NSSI and met criteria for NSSI with addictive features and those who engaged in NSSI but did not meet the criteria for NSSI with addictive features. Four sets of factors were examined: a) mental health factors (emotion regulation difficulties and suicidal ideation); b) environmental factors (childhood trauma); c) individual factors (uncontrolled alcohol abuse, uncontrolled drug abuse, excessive gambling, and risky sexual

behaviour); and d) factors related to the severity of the NSSI behaviour (frequency of NSSI, total methods used, and medical treatment for NSSI).

To address this objective, several statistical analyses were conducted. First, to examine group differences in emotion regulation, a MANOVA was conducted with group membership (NSSI with addictive features and NSSI without addictive features) as the independent variable and total scores on each of the seven subscales of the DERS (Non-Acceptance of Emotional Responses, Difficulties Engaging in Goal-Directed Behavior, Impulse Control Difficulties, Limited Access to Emotion Regulation Strategies, Lack of Emotional Clarity, and Lack of Emotional Awareness) as the dependent variables. Means for the DERS subscales and totals for each group can be seen in Table 4. MANOVA was chosen as a preliminary analysis in order to control the type I error rate.

Prior to conducting the analysis, assumptions of the MANOVA were tested to ensure they were not violated. Skew statistics ranged from 0.17 to 1.36 and kurtosis statistics ranged from 0.06 to 1.85 for the DERS subscales. Kline (1998) argues that non-normality is only problematic when skew and kurtosis statistics are above 3 and 10, respectively, indicating that the skew and kurtosis of the current variables fall within the acceptable range. Correlation analyses run on the subscales of the DERS (excluding the total score) ranged from low negative to high positive correlations between the dependent variables, with coefficients ranging from -.15 to .70. Despite this range, the majority of the correlation coefficients clustered around the moderate level. Intercorrelation coefficients for the subscales of the DERS are presented in Table 5. Scatterplots of these

intercorrelations were examined to ensure appropriate linear relationships among dependent variables; linearity was confirmed. Box's Test of Equality of Covariance was then examined, to test for homogeneity of variance at the $p < .001$ significance level (Field, 2009). Results indicated that Box's Test was non-significant ($F(21, 35323.50) = 1.16$, $p = .281$), indicating no violations of the assumption of homogeneity of variance. As such, the test statistic Wilks' Lambda was used in the subsequent multivariate analysis.

MANOVA results indicated significant differences across the DERS subscales between the groups, $\Lambda = .85$, $F(6, 93) = 2.69$, $p < .05$, *partial* $\varepsilon^2 = .15$. Univariate follow-up revealed significant differences between groups for the Impulse and Strategies subscales (see Table 6), such that the NSSI with addictive features group was found to have significantly more difficulty with impulse control and developing appropriate coping strategies than the NSSI group without addictive features. All effect sizes were medium to large according to the conventions proposed by Cohen (1977). This means that a substantial proportion (8-15% for significant results) of the variance was accounted for by each separate variable. No other differences were identified between the two groups in terms of emotional regulation.

To investigate group differences in endorsement of a suicidal ideation item, a Pearson Chi-Square test was used. No significant difference was found between the groups in relation to the suicide item, $\chi^2 (1) = .30$, $p = .585$, *Cramer's* $V = .06$ (see Table 8 for frequencies), indicating that the two groups were equally likely to report that they had thought of committing suicide in the past 12 months.

A second MANOVA was conducted to examine group differences related to childhood trauma, with each of the CTQ subscales (physical abuse, physical neglect, emotional abuse, emotional neglect, and sexual abuse) as the dependent variables and group membership (NSSI with addictive features, NSSI without addictive features) as the independent variable. For all the CTQ subscales except sexual abuse, skew statistics ranged from 0.52 to 1.98 and kurtosis statistics ranged from 0.30 to 8.17. Skew and kurtosis statistics for the sexual abuse subscale were 4.35 and 20.94 respectively. Given Kline (1998)'s argument described above, the skew and kurtosis of the variables fell within the acceptable range for all subscales on the CTQ except for sexual abuse. The fact that this subscale violated the assumption of normality suggests that a more robust test statistic should be used for analyses involving this variable. Means for the CTQ subscales and totals for the NSSI with addictive features and NSSI without addictive features groups can be seen in Table 4.

Correlation analyses were run between the subscales of the CTQ (excluding the total score), and the resulting statistics ranged from low to high positive correlations, with coefficients ranging from .03 to .68. Despite this range, the majority of the correlation coefficients clustered around the moderate level. Intercorrelation coefficients for the subscales of the CTQ are presented in Table 7. Scatterplots were examined to ensure appropriate linear relationships among all variables, and linearity was confirmed. Box‘s Test of Equality of Covariance was then examined in order to test for the assumption of homogeneity of variance at the $p < .001$ significance level (Field, 2009). Results revealed that

Box's Test was significant ($F(15, 38668.74) = 4.10$, $p < .001$), indicating that the assumption of homogeneity of variance had been violated. As such, the Pillai's Trace test statistic was used in the subsequent multivariate analysis because it is more robust to assumption violations. No significant differences were found across any of the CTQ subscales between groups, $V = .98$, $F(5,94) = .47$, $p = .798$, *partial* $\varepsilon^2 = .02$. This indicates that university students who engage in NSSI with addictive features reported similar experiences with childhood abuse to those without addictive features.

A series of Pearson Chi-Square tests were conducted to investigate group differences on the individual factors. For each analysis, the first variable was group membership with two levels (NSSI with, and NSSI without, addictive features). The second variable was one of the individual factors (uncontrolled alcohol abuse, uncontrolled drug abuse, excessive gambling, and risky sexual behaviour), each with two levels (yes and no). Significant group differences were found in the expected direction for uncontrolled drug abuse ($\chi^2(1) = 4.33$, $p < .05$, *Cramer's V* = .21) and risky sexual behaviour ($\chi^2(1) = 11.11$, $p < .001$, *Cramer's V* = .33; for frequencies see Table 8), indicating that the NSSI with addictive features group was more likely to report having engaged in uncontrolled drug abuse and risky sexual behaviour than the NSSI without addictive features group. No significant differences were found for uncontrolled alcohol abuse ($\chi^2(1) = 1.77$, $p = .183$, *Cramer's V* = .13) or excessive gambling ($\chi^2(1) = 2.04$, $p = .153$, *Cramer's V* = .14; for frequencies see Table 8).

To test for group differences on factors related to the severity of the NSSI behaviours, a final set of Chi-Square analyses were performed. For all analyses in this section, group membership (NSSI with and without addictive features) was used as one of the independent variables. A Pearson Chi-Square anaylsis was used to examine medical treatment for NSSI (a dichotomous variable with yes and no as the response options), while an ordinal Chi-Square analysis was used to examine frequency of NSSI (a categorical variable with six levels: one time, 2 to 4, 5 to 10, 11 to 50, 51 to 100, or more than 100). No significant group differences were found between the NSSI with addictive features and NSSI without addictive features groups on the medical treatment variable $\chi^2(1) = 2.68$, $p = .102$, *Cramer's V* = .16 (for frequencies see Table 8), indicating that a similar number of individuals from both groups had required medical treatment for NSSI. Significant groups differences were found between the NSSI with addictive features and comparison groups on frequency $\chi^2(5) = 30.12$, $p < .001$, *Cramer's V* = .55 (see Table 8). This last analysis revealed that individuals who reported addictive features also reported engaging in NSSI more frequently than those who lacked the addictive features.

Objective III. In order to examine the ability of each variable to predict the likelihood that an individual would be classified as having NSSI with addictive features, a Binary Logistic Regression was computed. Specifically, the most common method, Forward Logistic Regression, was used to determine which of the predictor variables were associated with NSSI with addictive features. Several predictor variables were entered into the model, including three

continuous variables: emotion regulation (as measured by the total score on the DERS), childhood trauma (as measured by total score on the CTQ), and number of methods of NSSI used (as measured by the sum of all methods endorsed). Further, an additional three categorical variables were entered as predictors of group membership: suicidal intent (yes/no), and the requirement for medical treatment (yes/no), and frequency of NSSI (with 6 levels: one time, 2 to 4, 5 to 10, 11 to 50, 51 to 100, or more than 100). The criterion variable was the dichotomous variable assessing participants' group membership in one of two samples: NSSI with addictive features and NSSI without addictive features. In accordance with the Forward Logistic Regression method, all predictor variables were entered in the same step, and the likelihood-ratio was used to determine variable selection (Field, 2009).

In order to test for multicollinearity, a preliminary logistic regression was computed. In this analysis, the predictors entered into the model were the product of each continuous predictor (total score on the DERS, total score on the CTQ, and number of methods of NSSI used) and the log transformation of the same variables. This method of creating interaction terms between each variable and its log and using the products as predictors tests the assumption of multicollinearity (Hosmer & Lemeshow, 1989). None of the interaction terms were significant, indicating that the assumption of linearity of the logit was not violated (regression coefficients for the interaction terms are presented in Table 10).

Regression results indicated that the overall model fit of two predictors (emotion regulation and frequency) was statistically reliable in distinguishing

between self-injurers with addictive features and self-injurers without addictive features (*-2 Log Likelihood* = 153.25; χ^2 (7) = 58.80, $p < .001$). This model correctly classified 78.80% of cases. Hosmer and Lemeshow's goodness-of-fit test was non-significant (χ^2 (8) = 11.12, $p = .195$), suggesting a well-fitting model. Regression coefficients are presented in Table 11. Wald statistics indicated that two of the variables entered (emotion regulation and frequency) significantly predicted the likelihood of being correctly classified as either a self-injurer with addictive features or a self-injurer without addictive features. Using the Forward Logistic Regression method yielded frequency of NSSI as a significant predictor at the first step, with emotion regulation adding significant predictive power to the model in the second step. The other variables were not significant predictors in the model at the first step and also failed to significantly predict group membership at the second step. This analysis showed that university students who engaged in NSSI more frequently and had more difficulty with emotion regulation were more likely to be classified as reporting addictive features.

High School Sample

Data Cleaning. As described above, all data were analyzed using *Statistical Package for the Social Sciences 16.0 (SPSS 16.0).* No extreme outliers were found when the data were examined as a total group, or split into the smaller comparison samples of high-school students with NSSI with addictive features and high-school students with NSSI without addictive features. Although the Kolmogorov-Smirnov test was significant for several of the variables, the skew and kurtosis statistics were closer to zero and visual examination of the normality

plots and histograms for each variable suggested the distributions were normal. Skew statistics ranged from 0.52 to 1.98 and kurtosis statistics ranged from 0.36 to 4.20. Recommendations by Kline (1998) argue that non-normality is only problematic when skew and kurtosis statistics are above 3 and 10, respectively, indicating that the skew and kurtosis of the variables fall within the acceptable range.

Objective I. The first objective was to ascertain whether some individuals who engage in NSSI in a community high school sample met criteria for NSSI with addictive features. The goal was to examine which addictive features were endorsed by a high school sample of non suicidal self-injurers and what percentage of those who endorsed addictive features met criteria for NSSI with addictive features, as described above. Responses to the HIDS items assessing addictive features were examined to determine the frequency with which each addictive behaviour was endorsed by those who engage in NSSI (n = 137). Table 12 shows the frequencies for these items. The most frequently endorsed item was "You continue NSSI despite recognizing that it is harmful to you physically/ emotionally?", with 25.5% of the follow-up NSSI sample endorsing this item. This was followed by "Has NSSI occurred more often than intended?" and "Has the severity in which the NSSI occurs increased?", with endorsement rates of 22.6% and 16.8% respectively.

This same data was examined to determine the percentage of high school students who met criteria for NSSI with addictive features. The number of addictive features items endorsed was summed to create a total addictive features

score. This total score was then used to divide the sample into two distinct groups: students who endorsed two or fewer items were classified as NSSI without addictive features and assigned a score of 0, while those who endorsed three or more features were considered to have met criteria for NSSI with addictive features and assigned a score of 1. Of the 137 high school participants with NSSI who completed the follow-up portion of the study, 28 (20.4%) met criteria for NSSI with addictive features.

Objective II. The second objective was to examine the differences between high school students with NSSI with addictive features and those who engage in NSSI but lacked the addictive features. Specific difference that were examined were as follows: a) mental health factors (emotion regulation, depression, suicidal ideation, and at risk eating behaviour); b) environmental factors (childhood abuse); c) individual factors (use of other addictive substances such as drugs, alcohol, cigarettes); d) factors related to the severity of the NSSI behaviour (frequency of NSSI, total methods of NSSI, and total locations of NSSI).

The first set of analyses tested group differences in mental health factors. In order to do this, an independent samples t-test was conducted, with group membership as the independent variable (NSSI with addictive features and NSSI without addictive features). The dependent variable, emotion regulation, was calculated by summing the three emotion regulation items to produce a total emotion regulation score. Significant group differences were found in emotion regulation ($t(54) = 4.38$, $p < .001$; see Table 14 for means). This result indicated

that high-school students who meet criteria for NSSI with addictive features reported significantly more difficulty regulating their emotions than did students who engaged in NSSI but lacked the addictive features.

A series of Pearson Chi-Square tests were conducted to examine group differences between the two groups in terms of depression (yes/no), suicidal intent (yes/no), and at risk eating behaviour (24 hours no eating, using diet aids, and vomit/laxatives, each of which was yes/no). Significant differences were found between groups for depression (χ^2 (1) = 4.99, $p < .05$, *Cramer's V* = .30), suicidal intent (χ^2 (1) = 6.17, $p < .05$, *Cramer's V* = .43), 24 hours no eating (χ^2 (1) = 6.79, $p < .01$, *Cramer's V* = .35), and use of Diet Aids (χ^2 (1) = 4.31, $p < .05$), *Cramer's V* = .28) variables (see Table 13 for frequencies). These differences were all in the expected direction, with the NSSI with addictive features group being more likely to report having felt depressed, experienced suicidal ideation, fasted for 24 hours, and used diet aids. In contrast, no significant difference was found between the two groups on the vomit/laxatives variable (χ^2 (1) = 2.99, $p = .084$, *Cramer's V* = .23;see Table 13 for frequencies).

With respect to the environmental factor of child abuse, differences between NSSI with addictive features and the comparison group were tested using three Pearson Chi-Square tests. For each analysis, one of the child abuse items (physical, emotional, and sexual abuse) was used as the dependent variable with group membership as the independent. A significant difference was found between groups for physical abuse (χ^2 (1) = 4.57, $p < .05$, *Cramer's V* = .29). This indicates that individuals who present with NSSI with addictive features

were more likely to have been physically abused as a child than those who lack the addictive features. Although there was no significant effect for emotional abuse (χ^2 (1) = 1.31, p = .252, *Cramer's V* = .15), there was a trend towards sexual abuse being more frequently reported in individuals with NSSI with addictive features (χ^2 (1) = 2.95, p = .086, *Cramer's V* = .23; see Table 13 for frequencies).

The individual factor that was investigated for this sample was total substance abuse. This score represents the total number of substances that each participant reported using. Between-group differences were analyzed using an independent samples t-test. No significant difference was found on the substance use variable (t(54) = 1.76, p = .083; see Table 14 for means). However, this result does represent a distinct trend towards those who met criteria for NSSI with addictive features having reported using more substances than those with NSSI without the addiction component.

To examine group differences in factors related to the severity of the NSSI, another set of analyses were conducted. The first analysis was an independent samples t-test with group membership as the independent variable and total number of methods of NSSI (the sum of all methods that each participant reported using) as the dependent variable. A second independent samples t-test was performed with the same independent variable and the total number of locations of NSSI (the sum of all the locations on the body that each participant reported injuring) as the dependent variable. Both the total methods (t(54) = 4.54, p < .001) and total locations (t(54) = 2.55, p < .05) analyses were found to be significant (see Table 14 for means). Finally, an ordinal Chi-Square

analysis was run examining the frequency of NSSI for each group. Group membership was the first independent variable, while the second was the reported frequency of NSSI (one time, 2 to 4, 5 to 10, 11 to 50, 51 to 100, or more than 100). Significant groups differences were found between the NSSI with addictive features and the comparison group on frequency ($\chi^2(5) = 25.42$, $p < .001$, *Cramer's V* = .70; see Table 15). These results indicate that high-school students who meet criteria for NSSI with addictive features are more likely to report NSSI symptoms that are more severe in terms of number of methods, number of locations, and frequency than those with NSSI who lack the addictive features.

Objective III. In order to examine the ability of each variable to predict the likelihood of being classified as meeting criteria for NSSI with addictive features, a Binary Logistic Regression was conducted. Specifically, the most common method, Forward Logistic Regression, was used to enter the predictor variables into the model. The predictor variables included emotion regulation, number of substances used, total number of methods of NSSI, and total number of locations of NSSI. In addition, several categorical variables were included in the model, including frequency (one time, 2 to 4, 5 to 10, 11 to 50, 51 to 100, or more than 100), suicidal ideation (yes/no), depression (yes/no), at risk eating (three yes/no items), and abuse (three yes/no items). The criterion variable was a dichotomous variable assessing participants' group membership (NSSI with addictive features, NSSI without addictive features). In accordance with this Forward Logistic Regression method, all IVs were entered and the likelihood-ratio was used to determine variable selection (Field, 2009). In order to test the

assumption of multicollinearity, a preliminary logistic regression was computed that included as predictors the interaction between each continuous predictor and its log (Hosmer & Lemeshow, 1989). None of the interaction terms were significant, indicating that the assumption of linearity of the logit was not violated (regression coefficients for the interaction terms are presented in Table 16).

Regression results indicated that the overall model fit of two predictors (total methods used and frequency of NSSI) was statistically reliable in distinguishing between self-injurers with addictive features and self-injurers without addictive features in a high school sample (*-2 Log Likelihood* = 74.85; χ^2 (6) = 57.98, $p < .001$). The model correctly classified 87.70% of cases. Hosmer and Lemeshow's Test of goodness-of-fit was non-significant χ^2 (6) = 4.45, p = .617), suggesting a well-fitting model. Regression coefficients are presented in Table 17. Wald statistics indicated that two of the variables entered (total methods used and frequency of NSSI) significantly predicted likelihood of being appropriately classified in one of the two groups of self-injurers. The Forward Logistic Regression approach indicated that the total number of methods used was a significant predictor at the first step, with frequency of NSSI adding significant predictive power to the model in the second step. The other variables were not significant predictors in the model at the first step and also failed to significantly predict group membership at the second step. These results revealed that high-school students who engaged in NSSI more frequently and used more methods of NSSI were more likely to be correctly classified as NSSI with addictive features.

Chapter VI: Discussion

Non suicidal self-injury in youth is a phenomenon that has been gaining the attention of both clinicians and researchers. Some experts have identified this behaviour as an important mental health challenge for youth today, a view that is illustrated by the significant percentages of both high school and university students who report engaging in NSSI. Prevalence reports from university samples have been found to range from 11% to 38% (Gratz, 2001, 2006; Gratz, Conrad, & Roemer, 2002; Hasking, Momeni, Swannell, & Chia, 2008; Heath, Toste, Nedecheva, & Charlebois, 2008; Whitlock, Eckenrode, & Silverman., 2006), while the rate appears to be even higher amongst high-school students, ranging from 13.2% to 45.6% (Laye-Gindu & Schonert-Reichl, 2005; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Madge et al., 2008; Morey, Corcoran, Arensman, & Perry, 2008; Muehlenkamp & Gutierrez, 2007; Ross & Heath, 2002; Zoroglu et al., 2003). In recent years, interest in NSSI has been increasing; this attention has led to a broadening of knowledge about the prevalence and function of NSSI, as well as some of the risk factors that may increase an individual's likelihood of engaging in NSSI.

However, despite an abundance of anecdotal clinical reports regarding the addictive nature of NSSI (Conterio & Lader, 1998; Favazza, 1996; Gratz & Chapman, 2009; Hollander, 2008; McVey-Noble, Khemlani-Patel, & Neziroglu, 2006; Simeon & Hollander, 2001; Turner, 2002), as well as preliminary studies that found that some individuals who engage in NSSI endorse clinically significant levels of addictive features (Nixon et al., 2002; Schaub et al., 2006),

few empirical studies have examined the possibility that NSSI may in fact be an addictive behaviour. Further, it is not known whether those who engage in NSSI and endorse clinically significant levels of addictive features differ in any meaningful way from those who lack the addictive features.

The present study sought to explore the conceptualization of NSSI as an addictive behaviour. It investigated how prevalent addictive features of NSSI are in both a university and a high school sample while also examining the similarities and the differences between those who presented with addictive features and those who did not. This study was completed in the expectation of gaining knowledge regarding this unique subset of self-injurers. The results of the present study are interpreted below and discussed with respect to relevant research findings in the NSSI literature and related fields.

Addictive Features of NSSI

The first objective in both samples in the current study was to explore whether there are teenagers and young adults who meet criteria for NSSI with addictive features (defined previously as endorsing three or more of the seven addictive features), and which addictive features were the most commonly endorsed. In both the university and high school samples, there was a substantial minority of participants who met criteria for NSSI with addictive features. Specifically, 27% of the university NSSI sample met criteria for NSSI with addictive features while 20% of the high school sample of self-injurers met criteria for NSSI with addictive features. Interestingly, the top three most endorsed addictive features were similar across the two samples. Participants in

both samples most frequently reported continuing to engage in NSSI despite being aware that it is harmful physically and/or emotionally. This was followed by the items addressing increasing frequency and severity of the behaviour in both samples. According to Hagedorn (2009), increasing severity and consequences of the behaviour represent some of the core constructs of a behavioural addiction.

When compared with the results from the study by Nixon and colleagues (2002), there appears to be a large disparity between the percentage of those who met NSSI with addictive features criteria in the present study and Nixon et al.'s reported prevalence (97.6% of their sample met criteria for NSSI with addictive features). It must be noted, however, that this higher frequency of NSSI with addictive features was found in a clinical sample rather than a community sample such as was used in this study. This clinical sample reported very high levels of NSSI, with 83% of their sample engaging in self-injurious acts more than once a week; in contrast, in the present study, only 40% of the university NSSI sample and 21% of the high school NSSI sample reported engaging in NSSI more than 11 times in their lifetime. By their very nature, clinical samples tend to be considerably more severe than community samples, so it is not surprising that there would be a difference in prevalence of reported NSSI with addictive features between the two studies. Another major difference between the two studies is that Nixon and colleagues (2002) only looked at recent NSSI while the present study examined lifetime prevalence. It has been found that individuals who have not recently self-injured or are not currently engaging in self-injury are less likely to endorse addictive features (Martin et al., in press).

However, it is important to note that although the presence of self-reported NSSI with addictive features was lower in the community sample, there was still a considerable portion of university and high school students who met criteria for NSSI with addictive features. The findings from both the present study and that by Nixon and colleagues support previous clinical reports indicating that there is a subset of individuals who engage in NSSI and report a clinically significant addictive component to their self-injurious behaviour (Conterio & Lader, 1998; Favazza, 1996; Gratz & Chapman, 2009; Hollander, 2008; McVey-Noble, Khemlani-Patel, & Neziroglu, 2006; Simeon & Hollander, 2001; Turner, 2002). More information about this subset of self-injurers will be required in order to determine whether this component of NSSI identifies a meaningful subgroup that is distinct in some way from those who engage in NSSI but do not report addictive features. This was investigated in the current study and the results of the group differences are discussed below.

Group Differences

The second objective in each sample was to examine the ways in which the NSSI with addictive features group differed from the comparison group in terms of several factors, including mental health, individual, and environmental, as well as measures of severity of NSSI. This section summarizes the findings from both samples while illustrating the similarities and differences between the results in each sample.

As hypothesized, emotion regulation was revealed to be one of the major differences between both high-school and university students with NSSI with

addictive features and those who lacked the addictive component. It was found that individuals in both samples who met criteria for NSSI with addictive features showed significantly more difficulties regulating their emotions as compared to the matched comparison group.

The current findings depicted a detailed picture of the ways in which students with NSSI with addictive features struggle with emotion regulation. University students in this group had particular difficulty with impulse control, or the ability to control emotions and reactions, as well as the generation of different strategies to help regulate emotions. These specific areas of difficulty are in accordance with the findings from the high school sample, since two of the three items that were used to measure emotion regulation in high school students directly assessed these components of emotion regulation. The items, "When I feel upset, I feel out of control," and "When I am upset, I believe that there is nothing I can do to make myself feel better," were from the Impulse Control and Strategies subscales on the DERS, respectively.

In studies using university samples it has been previously found that those who engage in NSSI are more likely to have difficulties with emotion regulation than those who do not self injure (Claes et al., 2010; Franklin et al., 2010; Gratz, 2003; Hilt, Cha, & Nolen-Hoeksema, 2008; Holly, 2011; Klonsky, 2007; Klonsky, 2011). Individuals with NSSI showed specific weaknesses in several areas, including difficulty accepting their emotions, functioning when overwhelmed with emotions, controlling their emotions and reactions, using different methods or strategies to regulate emotions, and clearly understanding

their emotions (Gratz, 2003; 2006; Holly, 2011; Schaub et al., 2006). The combination of these findings indicates that while as a group those who engage in NSSI show more difficulties compared to non-NSSI controls in many areas of emotion regulation, those who engage in NSSI and met criteria for NSSI with addictive features appear to show even more severe difficulties with impulse control and strategy use compared to self injurers who lacked the addictive component. Although in general, individuals who engage in NSSI show impairments in emotion regulation, greater deficits may place self injurers at greater risk for addiction to these behaviours. Thus, individuals who meet criteria for NSSI with addictive features may represent a unique subtype of self injurers who show particularly pronounced difficulties with emotion regulation.

It was also shown that high school students who met criteria for NSSI with addictive features were more likely to endorse risky eating behaviours than those who did not meet criteria. Similarly, self-reported depression was also more common among the group of high school students who presented with addictive features. Consistent with these current findings, previous research in the area of addictions has illustrated a relation between emotional difficulties and behavioural addictions (Griffiths, 2001; Raviv, 1993; Shapira et al., 2000), and has also specifically linked depression with several behavioural and substance addictions (Shaffer et al., 2004). For example, individuals with a gambling addiction are more likely to show increased levels of anxiety and depression compared to non-addicted controls (Faregh & Derevensky, 2013; Raviv, 1993).

This relation has been found in the NSSI literature as well, with researchers showing a positive correlation between emotional difficulties and engagement in NSSI (Darche, 1990, Laye-Gindu &Schonert-Reichl, 2005, Nixon et al., 2008; Ross & Heath, 2002). In a population based survey it was found that people who reported five or more symptoms related to depressed mood were more likely to report engaging in self-injury compared to those who endorsed fewer than five symptoms (Nixon et al., 2008). Results of the present study are consistent with these other studies indicating that there are shared mental health factors across differing addictions, particularly depression. Although these shared mental health factors alone do not indicate that NSSI is an addictive behaviour, in combination with other findings that are consistent with behavioural addictions research, it does lend support to the argument that NSSI should be further investigated as a potentially addictive behaviour. This pattern of results also raises the question of whether those who engage in NSSI as a group are more likely to endorse depressive mood symptoms or if there are certain subgroups within the population of self injurers whose symptoms are responsible for the group differences between NSSI and non-NSSI controls. For example, it may be possible that individuals who endorse addictive features of NSSI show particularly elevated levels of mood disturbance that creates an artificially elevated average for the overall NSSI group as compared with controls.

Among the high school students, it was found that participants with NSSI with addictive features were more likely than those who lacked addictive features to indicate that they have hurt themselves with suicidal intent in addition to their

non-suicidal self-injurious behaviours. However, this factor did not differentiate between these two groups in the university sample. It is unclear why there was a different pattern in the two samples. It may be that the high school sample is more representative of the general population of those with NSSI whereas the university sample is instead a more uniform subset of students, lacking diversity in terms of overall functioning or resources. As a whole, university students tend to represent the higher ranges of functioning and often have more resources available to them compared to the general population. As such, this university sample may have underrepresented the more severe end of the NSSI population, or may not have included the most impaired individuals, while the high school sample included the entire range. This consistent with research reporting similar results in individuals with other addictions (Shaffer et al., 2004).

Similarly interesting results between samples were also found for childhood abuse. High school students with NSSI with addictive features were more likely to endorse having been physically abused than the comparison group. Although there was no significant difference for sexual or emotional abuse, observation of the frequencies showed higher rates of endorsement of sexual and emotion abuse in the NSSI with addictive features group. In contrast, university students did not indicate significant differences in any area of childhood trauma. As noted above, it may be that the university sample is a more uniform subset of students, lacking diversity in terms of overall functioning or resources and the high school sample is more representative of the general population of those with NSSI. The results of past research are equally mixed and unclear. Some studies

have shown a significant link between abuse and several types of addiction (Carries & Delmonico, 1996; Shaffer et al., 2004). Other studies show a link for all types of abuse (physical, emotional, sexual) or for only one specific type, and yet others show no relationship at all (Klonsky & Glenn, 2009). Differences in methods of measurement, sample recruitment, and population may account for some of the mixed results.

In the current study, as discussed above, these differences may be a result of the characteristics of the sample, in that the high school sample may be more generally representative while the university sample may be a particularly high functioning subset of students. Alternately, it may be that the measures used may have contributed to this pattern of results. In the university sample, students completed a 28-item validated scale (CTQ) assessing specific definitions or aspects of abuse, such as having been hit with a hard object, each of which was rated on a Likert scale. In comparison, the high school students responded to three yes/no questions asking if they had ever experienced physical, sexual, or emotional abuse. The differences among the measures, in terms of the clarity of the meaning of abuse or the depth of questioning, may have led to differential reporting.

In regards to individual factors, risky behaviours successfully differentiated between university students with NSSI with addictive features and those who lacked the addictive component. Individuals who met criteria for NSSI with addictive features were more likely to report that they engaged in uncontrolled drug abuse and promiscuous or unsafe sex than were those who did

not meet criteria for NSSI with addictive features. In contrast, there was no difference between the groups for high school students in terms of substance use; high school students were not asked about risky sexual behaviours. This finding appears to be discordant from the findings in the university sample; however, the variables used to examine substance use in each sample were quite different. In the high school sample, the total number of substances the participant reported having used at least once was compared across groups while in the university sample, the participants were asked if they felt they engaged in uncontrolled drug abuse. Therefore, the two variables were looking at different dimensions of substance use. Although experimenting with more substances may be viewed as risky behaviour, it could be that continued engagement in substance use, specifically when it is considered to be 'uncontrolled', is more associated with addiction than experimentation alone. Further research exploring the frequency of use in high school students may shed more light in this area.

Overall these findings indicate a possible pattern of more frequent risky behaviour in university students who met criteria for NSSI with addictive features compared with those who did not. This finding is consistent with the addiction literature which has reported that people who engage in one problem behaviour are more likely to engage in another (Dawe & Loxton, 2004; Griffiths, 2001; West, 2006). For example, this phenomenon has been illustrated in gambling studies in which substance use and gambling have been positively correlated (Blume, 1994; Faregh & Derevensky, 2013). Risky behaviours such as substance use (Brausch et al., 2011; Matsumoto & Imamura, 2008) and engaging in self-

asphyxiation ('choking game'; Brausch et al., 2011) have also been associated with NSSI. These findings suggest that while risky behaviours may be related to NSSI in general, certain behaviours (such as uncontrolled substance use and risky sexual behaviour) may be more related to the addictive subtype of NSSI than to the full spectrum of NSSI behaviours.

In relation to the severity of NSSI symptoms, the results for frequency were similar, with both sets of students showing significant differences in frequency. It was revealed that the majority of students who met criteria for NSSI with addictive features indicated that they had engaged in NSSI at least 11 times in their lifetime (78% university and 75% high school), while the majority of students in the comparison group indicated having engaged in NSSI fewer than 11 times ever (76% university and 93% high school). This pattern of frequency is in accordance with the findings of Nixon et al. (2002), who found that frequency of NSSI was positively correlated with the number of addictive features endorsed. Based on the findings of the current study, it appears that there may be a threshold frequency at which it is more likely that an individual would meet criteria for NSSI with addictive features.

The current study found that the frequency of NSSI differed between possible subtypes of NSSI, which is in agreement with previous research (Jacobson & Gould, 2007; Lloyd-Richardson et al., 2007; Whitlock et al. 2008; You et al., 2011). Approaching the issue of frequency from another perspective, one study showed that subgroups created using the frequency of NSSI differed on several important characteristics. In a large sample of adolescents (N=6374), You

et al. (2011) found that repetitive self-injurers (frequency of six or more) showed more emotional and impulse control problems compared to episodic self-injurers (frequency of less than six). This subgroup of repetitive self-injurers seems to show some similarities to the subgroup of self-injurers with addictive features identified in the present study. Based on the nature of addiction, one could infer that there would likely be a great deal of overlap between repetitive self-injurers and those endorsing NSSI with addictive features. However, the frequencies identified in the current study make it is clear that there are some other meaningful differences between repetitive self-injurers and those with addictive features, since approximately one quarter of the current participants who could have been classified as repetitive self-injurers did not meet criteria for NSSI with addictive features. This indicates that self-injurers with addictive features likely represent a subgroup that is distinct from repetitive self-injurers. It further suggests that there are other factors that uniquely identify the subset of self-injurers with addictive features that go beyond a simple increase in frequency of NSSI. The final area examined as a potential unique feature of NSSI with addictive features was locations of NSSI. High school students with NSSI with addictive features reported self-injuring significantly more locations on the body than those in the comparison group. Similarly, they also indicated having used significantly more methods of NSSI than those who lacked addictive features. Given the nature of addictions, it could follow logically that an indication of severity such as more locations or methods of NSSI would differentiate between those who meet criteria for NSSI with addictive features and those who do not.

However, this pattern did not hold true in the university sample. There was no equivalent variable in this sample for the number of locations, and university students did not differ in terms of the number of methods used. It is unknown why this difference between samples would occur. It is possible that students who endorse addictive features at a younger age may represent a particularly severe presentation of NSSI, and so report having used more methods than older students with addictive features.

Predicting Addiction to NSSI

The third objective sought to explore the factors that would predict classification as NSSI with addictive features. The results from the university sample indicated that frequency of NSSI was the strongest predictor of NSSI with addictive features, while emotion regulation also contributed significant predictive power to the overall model. It was found that university students who had injured themselves 11 times or more were most likely to be identified as having NSSI with addictive features. In the high school sample results indicated that total methods of NSSI was the strongest predictor of NSSI with addictive features, with frequency adding significant predictive power to the overall model. As with the university students, frequencies of more than 11 instances of self-injury were found to be the most predictive of membership to the NSSI with addictive features group for high school students. This pattern of results is in accordance with the findings above that those who engage in NSSI and meet criteria for NSSI with addictive features were more likely to report self-injuring 11 or more times compared to those who do not meet criteria for addiction to

NSSI. This furthers the notion that there may be a threshold frequency beyond which an individual is more likely to self-identify as having addictive features of NSSI.

Based on these findings, severity of NSSI appears to be a significant predictor of NSSI with addictive features, but is not the only factor, since for some individuals, emotion regulation also seems to play a role. It is noteworthy that emotion regulation, a construct that has been shown to predict NSSI engagement (Gratz, 2003; 2006; Holly, 2011), is able to predict whether university students can be classified as having NSSI with addictive features. Impairments in emotion regulation, therefore, may confer a specific vulnerability to the addictive component of NSSI. This possibility begs the question as to whether the strong relationship that has been previously identified between NSSI and emotion regulation may be due in part to the considerable deficits shown by individuals in this specific subset of self-injurers. It is clear from the abundance of research connecting NSSI with emotion regulation that it does play a role in NSSI (Claes et al., 2010; Franklin et al., 2010; Gratz, 2003; Hilt, Cha, & Nolen-Hoeksema, 2008; Klonsky, 2007; Klonsky, 2011); however, based on the results of the present study, it appears that this relationship may be more complex than previously thought, since different impairments in emotion regulation may potentially identify different subsets of self-injurers.

Further, emotion regulation failed to show unique predictive power in the high school sample. This result was unexpected, given that a significant difference in ability to regulate emotions was found between high school students

who met criteria for NSSI with addictive features and the comparison group. However, one can postulate that because emotion regulation plays a large role in the continued engagement of NSSI rather than just the initiation of the behaviour (Gratz & Chapman, 2007; Holly 2011), individuals show more difficulties with emotion regulation may be more likely to continue this behaviour for a long period of time. As the most common age of onset of NSSI is in adolescence (Nixon & Heath, 2009), it would follow that young adults who endorse clinically significant addictive features of NSSI would have engaged in the behaviour for a longer period of time compared to adolescents who endorse clinically significant addictive features of NSSI. An avenue for further investigation could be to examine whether the time since onset of NSSI is related to impairments in emotion regulation and predictive of NSSI with addictive features.

NSSI as an Addictive Behaviour

The term addiction has created a great deal of debate among researchers, specifically whether behaviours can in fact be addictive. There are copious amounts of research arguing both sides of this debate, some of which was summarized in the literature review above. Many researchers believe that based on shared neurobiological, environmental, and mental health factors, behaviours can in fact be addictive (Griffiths, 2005; Holden, 2001; Larkin et al., 2004; Shaffer et al., 2004). One such behaviour that may be considered addictive could be NSSI. As of yet, there is not enough empirical evidence to indicate that NSSI is definitively an addictive behaviour; however, the findings of the current study are in accordance with the definition and theory of addiction presented above.

This definition was adapted from the criteria for substance dependence in the DSM-IV and is the most commonly used definition in the literature on addictive behaviours. The current study found that 27% of the university and 20% of the high school self-injures met criteria for NSSI with addictive features. The fact that students endorse these symptoms indicates that this set of criteria, that has been previously accepted within the field of behavioural addictions, can be applied to NSSI. In addition, the theory described above stated that all addictive behaviours share an underlying predisposition. These preliminary results suggest that those who met criteria for NSSI with addictive features also shared some of the same factors that have been previously identified as creating a vulnerability to addiction. For example, this study identified that students with NSSI with addictive features also reported symptoms of depression and engagement in other risky behaviours, two elements that have been found to predispose individuals to addictions.

However, there is a great deal more to be explored in order to confirm that NSSI can in fact be classified with other addictive behaviours. For example, other addictive behaviours have been found to be similar to each other through fMRI and gene studies. At this point, the findings from the current study, the results from Nixon and colleagues (2002), and the evidence from the significant number of studies indicating that behaviours can in fact be addictive (Griffiths, 2005; Holden, 2001; Larkin et al., 2004; Shaffer et al., 2004), show that it is a possibility worth further investigation. Despite the fact that more investigation is required in this area to discover if NSSI is in fact an addictive behaviour, what is

known is that there is a subset of those who engage in self-injury who self-identify as having clinically significant addictive features of NSSI. Furthermore, this subset differs from those who do not endorse clinically significant addictive features of NSSI in terms of their emotion regulation, mental health, and severity of NSSI.

Clinical Implications for School Psychologists

This study expands on the existing knowledge of NSSI by suggesting that it may be possible to conceptualize it as a behavioural addiction in at least some cases. This study was the first exploration of the addictive features of NSSI in both undergraduate and high school students who engage in NSSI. Information regarding the presence of addictive features and the correlates of an addictive profile of community-based individuals with NSSI can help guide mental health professionals working with self-injuring youth. Before treating NSSI, it has been argued that it is important to conduct a thorough assessment in order to better understand the behaviour in relation to the individual presenting for treatment (Miller, Muehlenkamp, & Jacobson, 2009; Muehlenkamp, 2006; Washburn et al., 2012; Whitlock & Knox, 2009). Results of this study can help clinicians to better navigate the assessment process as they can ask questions specifically relating to addictive features, particularly in people who show indications of the factors associated with addiction outlined above, such as higher frequency of NSSI. It is imperative that clinicians understand differences in the functions, motivations, and characteristics of NSSI found in community and clinical populations of self-injurers in order to provide the best possible care to their clients. Acknowledging

and understanding an individual's motivation and feelings surrounding NSSI is essential in the creation of a therapeutic alliance, and this understanding should extend to feelings surrounding the addictive features of NSSI.

When we are better able to identify and understand different populations of individuals who engage in NSSI, we can find interventions that are specifically tailored to their needs. There is currently little empirical evidence regarding effective treatments for NSSI (Miller, Muehlenkamp, & Jacobson, 2009; Muehlenkamp, 2006; Nixon, Townsend, & Atherton, 2009; Washburn et al., 2012), meaning that there is also a lack of guidelines for best practice. This lack, along with the many factors associated with NSSI, makes assessment and treatment of this issue very difficult (Miller, Muehlenkamp, & Jacobson, 2009; Muehlenkamp, 2006; Nixon, Townsend, & Atherton, 2009; Washburn et al., 2012). Several researchers have commented on the heterogeneity of individuals who engage in NSSI, proposing that there may be specific subtypes that each would present with its own unique features and considerations for treatment (Klonsky & Olino, 2008; Whitlock et al. 2008; You et al., 2011). Authors have proposed subtypes based on method (Andover et al., 2005; Nock et al., 2006; Whitlock et al. 2008; You et al., 2011), function (Nock & Prinstein, 2005; Klonsky, 2009), and frequency (Jacobson & Gould, 2007; Lloyd-Richardson et al., 2007; Whitlock et al. 2008; You et al., 2011) of NSSI. Identifying a subtype, or a somewhat homogeneous group, of self-injurers based on their presenting features could help to refine the assessment process and create empirically validated treatments for this specific subpopulation. It is the belief of this author

that one such subtype can be defined by self-reported addictive features. Having identified a subgroup of NSSI with addictive features, it would be possible to refine assessment procedures for this subtype. In addition, empirically validated treatments could be explored through studies that could examine the effectiveness of different treatment modalities for self-injurers who present with an addictive component. For example, treatments could be targeted to the specific areas of difficulty displayed by this subtype, such as impairments in impulse control and use of strategies to regulate emotions. This study describes a profile of adolescents and young adults that should not be ignored and requires a response. This profile is associated risky behaviour and the importance of frequency is highlighted in identifying these individuals. This is consistent with research indicating that repetitive NSSI is associated with more difficulties in emotion regulation and impulse control (You et al., 2011).

Moreover, knowing about the addictive aspect of NSSI is important because 80 to 90% of individuals who are in remission from an addiction have been found to relapse within the first year following treatment (Prochaska, DiClemente, & Norcross, 1992). The present results, along with previous research findings, indicate that NSSI may be an addictive behaviour. If the course of addiction to NSSI is similar to other addictions, this could be essential knowledge for a treatment provider as they will be able to put measures in place to reduce the chances of relapse, although the exact course of this behaviour is yet to be studied. In addition, there could be an exploration of new treatment modalities for this population drawing from effective treatments for other

behavioural addictions. Gaining knowledge about a subtype of NSSI with addictive features could have the potential to improve treatment outcomes for those who present with an addictive component to their NSSI behaviour.

Limitations and Future Directions

Despite the fact that the findings of the present study represent a valuable addition to the previous literature, they do have some limitations. First, the use of self-report measures presents some potential problems such as social desirability. Although most researchers investigating non-suicidal self-injurious behaviour have used self-report measures (Favazza & Conterio, 1988; Favazza & Conterio, 1989; Gratz, 2002; Gratz, 2001; Ross & Heath, 2002), social desirability could lead to the underreporting of this behaviour. In an effort to reduce this effect, the actual focus of the study was not revealed to participants so that their comfort in disclosing their experiences might be increased.

The second limitation is related to the methodological and measurement differences between the university and high school samples. Assessment tools for several of the variables differed between the samples, which made it difficult to make direct comparisons of the results. These variations in methodology were due to collaborations with multiple researchers that were necessary in order to gain access the samples required to complete this study. Although these differences are unfortunate because they limit the comparisons between samples, both samples independently provided pertinent information about similar aspects

of the addictive features of NSSI. This study constitutes the first study to examine the factors associated with clinically significant addictive features of NSSI, and is therefore somewhat exploratory. Future studies could continue to build up the profile of the addicted subtype of NSSI that was initiated in the present study by using more in depth measures of associated variables such as depression and abuse to examine the differences between individuals with and without addictive features.

Another limitation of this study is the use of the word addiction, as its applicability to behaviours is highly debated. Based on the literature review above, it is the belief of this author that behaviours can be addictive and that NSSI should therefore be examined as potentially addictive. A more thorough examination is required to fully determine how well NSSI fits within the construct of behavioural addiction. Similar to other addictive behaviours, research in the areas of genetics, brain imaging (e.g., fMRI), and psychosocial factors related to behavioural addiction could further the case that NSSI belongs in the category of potentially addictive behaviours. However, despite one's beliefs regarding the concept of behavioural addiction, it is important to note that there is a group of individuals who engage in NSSI and self-identify as being addicted to NSSI. Clients' perceptions of their own behaviours are important to address in both assessment and treatment whether or not they represent true 'addiction'.

The present study provided initial evidence supporting a distinct profile of individuals who endorse NSSI with addictive features. This information creates a starting point for others to continue to build and examine this profile in order to

fully determine the implications for the study, assessment, and treatment of NSSI. These initial results indicate that NSSI appears to be an addictive behaviour that even individuals in a community sample of self-injurers endorsed. The addictive component of this behaviour sheds some light on the reasons why some individuals may continue to engage in NSSI despite being aware that it is destructive. In addition, individuals who met criteria for NSSI with addictive features showed significant differences from those who did not meet criteria in terms of frequency of NSSI, emotion regulation, and mental health. These group differences have potential implications for both assessment of and intervention with NSSI. Assessing an individual's degree of addiction may provide some insight into his/her NSSI behaviour, and this awareness of his/her perceptions of 'addiction' to NSSI could potentially be used in the context of treatment.

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Table 1

Composition of Overall Sample by Grade in High School Sample

Grade	n	Percent of Total
8	309	43.5
10	212	29.9
12	189	26.6

Table 2

Composition of Overall Sample by Ethnicity

Ethnicity	n	Percent of Total
Asian/Pacific Islander	11	1.5
African American	69	9.7
Native Alaskan/Native American	6	0.8
Spanish/Hispanic	17	2.4
White	566	79.7
Multi-Ethnic	36	5.1
Other	5	0.7

Table 3

Frequency of Endorsement of Addictive Features Items by Non Suicidal Self-Injury (NSSI) Participants in a University Sample

Addiction Item	Frequency (%) (*n* = 184)
Has NSSI occurred more often than intended?	57 (31.0)
Has the severity in which the NSSI occurs increased?	59 (32.1)
If it produced an effect, do you need to do it more frequently/intensely to get this effect?	30 (16.3)
Does engaging in or thinking about NSSI consume a significant amount of your time?	27 (14.7)
Despite a desire to cut down or control this behaviour, are you unable to do so?	25 (13.6)
You continue to NSSI despite recognizing that it is harmful to you physically/emotionally?	65 (35.3)
Important social, family, academic, or recreational activities are given up because of NSSI?	23 (12.5)

Table 4

Means (SD) for Non Suicidal Self-Injurious with Addictive Features and Non Suicidal Self-Injurious without Addictive Features Groups on the DERS and CTQ

Variable	Non Suicidal Self-Injurious with Addictive Features (n = 50) *M* (*SD*)	Non Suicidal Self- Injurious without Addictive Features (n = 50) *M* (*SD*)
DERS Total Scale	110.08 (21.11)	96.66 (20.52)
DERS Nonacceptance Subscale	17.82 (5.78)	16.24 (6.50)
DERS Goal Directed Subscale	18.88 (4.51)	17.58 (4.63)
DERS Impulse Subscale	16.96 (5.37)	13.92 (4.62)*
DERS Emotional Awareness Subscale	16.12 (4.85)	14.62 (4.71)
DERS Strategies Subscale	26.12 (6.62)	21.20 (6.33)**
DERS Clarity Subscale	14.18 (3.69)	13.10 (3.76)
CTQ Total Scale	38.16 (11.36)	35.68 (9.34)
CTQ Physical Neglect Subscale	6.32 (1.96)	5.98 (2.03)
CTQ Emotional Abuse Subscale	10.52 (4.23)	8.34 (3.20)
CTQ Emotional Neglect Subscale	6.38 (2.91)	10.02 (4.48)
CTQ Physical Abuse Subscale	5.80 (3.11)	5.78 (1.33)
CTQ Sexual Abuse Subscale	5.36 (1.14)	5.56 (1.88)

Note. DERS stands for Difficulties in Emotion Regulation Scale and CTQ stands for the Childhood Trauma Questionnaire. High scores are negative for all three scales.

*p<.01. *p<.001

Table 5

Summary of Intercorrelations for Subscale Scores on the DERS

DERS Subscales	1	2	3	4	5	6
1. Non Acceptance	-	.34*	.44*	.31*	.42*	.41*
2. Goal Directed		-	.37*	-.15	.53*	.17
3. Impulse Control			-	.24	.70*	.40*
4. Access to ER Strategies				-	.17	.56*
5. Emotional Clarity					-	.43*
6. Emotional Awareness						-

Note. DERS stands for Difficulties in Emotion Regulation Scale

*p<.01.

Table 6

Univariate Results for the DERS

Scale	*Df*	*F*	η^2	*p*
DERS – Non Acceptance	1	1.65	.017	.202
DERS – Goal Directed	1	2.03	.020	.158
DERS – Impulse Control	1	9.21*	.086	.003
DERS –Emotional Awareness	1	2.46	.025	.120
DERS – Access to ER Strategies	1	14.42**	.128	.000
DERS – Emotional Clarity	1	2.10	.021	.151

Note. DERS stands for Difficulties in Emotion Regulation Scale.

*p<.01. *p<.001

Table 7

Summary of Intercorrelations for Subscale Scores on the CTQ

CTQ Subscales	1	2	3	4	5
1. Physical Neglect	-	.37*	.4*	.31*	.23
2. Emotional Abuse		-	.69*	.38*	.03
3. Emotional Neglect			-	.27*	.22
4. Physical Abuse				-	.26
5. Sexual Abuse					-

Note. CTQ stands for Childhood Trauma Questionnaire

*$p<.01$

Table 8

Frequency of Endorsement of Mental Health, Individual and Non Suicidal Self-Injury Severity Factors Across NSSI with Addictive Features and NSSI without Addictive Features Groups in a University Sample

	Non Suicidal Self-Injurious with Addictive Features (n = 50)	Non Suicidal Self- Injurious without Addictive Features (n = 50)
Variable	Frequency (%)	Frequency (%)
Suicidal Ideation	9 (18%)	7 (14%)
Uncontrolled Drug Abuse	10 (20%)	3 (6%)*
Uncontrolled Alcohol Abuse	11 (22%)	6 (12%)
Excessive Gambling	2 (4%)	0 (0%)
Promiscuous/ Unprotected Sex	10 (20%)	0 (0%)**
Medical Treatment	11 (22%)	5 (10%)

* $p < .05$ ** $p < .001$

Table 9

Frequency of Endorsement of Frequency Categories Across NSSI with Addictive Features and NSSI without Addictive Features Groups in a University Sample

	Non Suicidal Self-Injurious with Addictive Features (n = 50)	Non Suicidal Self- Injurious without Addictive Features (n = 50)
Frequency Categories	Frequency (%)	Frequency (%)
One Time	4 (8%)	9 (18%)
2 to 4 Times	3 (6%)	16 (32%)
5 to 10 Times	4 (8%)	13 (26%)
11 to 50 Times	19 (38%)	7 (14%)
51 to 100 Times	12 (24%)	3 (6%)
More Than 100 Times	8 (16%)	2 (4%)

Table 10

Summary of Logistic Regression Analysis Testing for Interaction Variables Testing for Multicollinearity in a University Sample

Interaction Variable	*B*	*Wald*	*Df*	*P*	Odds Ratio
Methods Total	1.69	2.74	1	.098	5.42
DERS Total	0.06	0.52	1	.469	1.07
CTQ Total	0.21	1.76	1	.185	1.23

Note. DERS stands for Difficulties in Emotion Regulation Scale and CTQ stands for Childhood Trauma Questionnaire.

Table 11

Summary of Logistic Regression Analysis for Variable Predicting the Likelihood of NSSI with Addictive Features at First and Second Step (N = 184) in a University Sample

Variable	*B*	*Wald*	*df*	*p*	Odds Ratio
Step 1					
Frequency[a]	-	31.94**	5	.000	-
Frequency: 2 to 4 Times	-0.47	0.33	1	.568	0.66
Frequency: 5 to 10 Times	-0.44	0.33	1	.564	0.65
Frequency: 11 to 50 Times	1.78	7.76*	1	.005	5.93
Frequency: 51 to 100 Times	2.14	8.67*	1	.003	8.47
Frequency: More than 100 Times	2.29	7.77*	1	.005	9.89
Step 2					
Frequency[a]	-	28.94**	5	.000	
Frequency: 2 to 4 Times	-0.36	0.19	1	.666	0.70
Frequency: 5 to 10 Times	-0.71	0.82	1	.366	0.49
Frequency: 11 to 50 Times	1.70	6.77*	1	.009	5.49
Frequency: 51 to 100 Times	1.99	7.10*	1	.008	7.30
Frequency: More than 100 Times	2.05	5.87*	1	.015	7.73
DERS Total	.03	7.11*	1	.008	1.03

Note. DERS stands for Difficulties in Emotion Regulation Scale. [a]All variables were dummy coded to refer to the first variable in frequency which is the category One Time.

* $p < .05$ ** $p < .001$

Table 12

Frequency of Endorsement of Addictive Features Items by Non Suicidal Self-Injury(NSSI) Participants in a High School Sample

Addictive Features Item	Frequency (%) (n = 137)
Has NSSI occurred more often than intended?	31 (22.6)
Has the severity in which the NSSI occurs increased?	23 (16.8)
If it produced an effect, do you need to do it more frequently/intensely to get this effect?	22 (16.1)
Does engaging in or thinking about NSSI consume a significant amount of your time?	19 (13.9)
Despite a desire to cut down or control this behaviour, are you unable to do so?	20 (14.6)
You continue to NSSI despite recognizing that it is harmful to you physically/emotionally?	35 (25.5)
Important social, family, academic, or recreational activities are given up because of NSSI?	19 (13.9)

Table 13

Frequency of Endorsement of Mental Health, Individual and Non Suicidal Self-Injury Severity Factors Across NSSI with Addictive Features and NSSI without Addictive Features Groups in a High School Sample

Variable	Non Suicidal Self-Injurious with Addictive Features (n = 28) Frequency (%)	Non Suicidal Self- Injurious without Addictive Features (n = 28) Frequency (%)
Depression	22 (78.6%)	14 (50.0%)*
Suicide	22 (78.6%)	13 (4.4%)*
24 Hour No Eating	10 (35.7%)	2 (7.1%)**
Use of Diet Aids	4 (14.3%)	0 (0.0%)*
Vomit/ Laxatives	5 (17.9%)	1 (3.6%)
Physical Abuse	18 (64.3%)	10 (35.7%)*
Emotional Abuse	21 (75.0%)	17 (60.7%)
Sexual Abuse	12 (42.9%)	6 (21.4%)

*p<.05 **p<.01

Table 14

Means (Standard Deviations) for Non Suicidal Self-Injurious with Addictive Features and Non Suicidal Self-Injurious without Addictive Features Groups on Mental Health, Environmental and Non Suicidal Self-Injury Severity Factors in a High School Sample

	Non Suicidal Self-Injurious With Addictive Features (n = 28)	Non Suicidal Self- Injurious Without Addictive Features (n = 28)
Variable	*M* (*SD*)	*M* (*SD*)
Emotion Regulation Total	10.71 (3.23)	7.29 (2.59)**
Substance Use Total	5.46 (4.52)	3.61 (3.25)
Methods Used Total	3.11 (1.45)	1.67 (.82)**
Locations Total	2.64 (1.59)	1.68 (1.22)*

*p<.05 **p<.001

Table 15

Frequency of Endorsement of Frequency Categories Across NSSI with Addictive Features and NSSI without Addictive Features Groups in a High School Sample

Frequency Categories	Non Suicidal Self-Injurious with Addictive Features (*n* = 28) Frequency (%)	Non Suicidal Self- Injurious without Addictive Features (*n* = 28) Frequency (%)
One Time	0 (0.0%)	8 (28.6%)
2 to 4 Times	4 (14.3%)	12 (78.6%)
5 to 10 Times	3 (10.7%)	6 (21.4%)
11 to 50 Times	12 (42.9%)	2 (7.1%)
51 to 100 Times	8 (28.6%)	0 (0.0%)
More Than 100 Times	1 (3.6%)	0 (0.0%)

Table 16

Summary of Logistic Regression Analysis Testing for Interaction Variables Testing for Multicollinearity in a High School Sample

Interaction Variable	*B*	*Wald*	*Df*	*P*	Odds Ratio
Methods Total	0.27	0.06	1	.804	1.31
Locations Total	0.46	0.36	1	.546	1.59
Emotion Regulation Total	-0.20	0.14	1	.706	0.82
Substance Total	-0.21	0.79	1	.374	0.82

Table 17

Summary of Logistic Regression Analysis for Variable Predicting the Likelihood of NSSI with Addictive Features at First and Second Step (N = 137) in a High School Sample

Interaction Variable	*B*	*Wald*	*Df*	*P*	Odds Ratio
Step 1					
Total Methods	1.04	25.50**	5	.000	2.83
Step 2					
Total Methods	0.84	10.09*	1	.001	2.32
Frequency[a]	-	16.74*	5	.005	-
Frequency: 2 to 4 Times	1.40	1.39	1	.239	4.07
Frequency: 5 to 10 Times	1.99	2.80	1	.094	7.34
Frequency: 11 to 50 Times	3.07	6.58*	1	.010	21.45
Frequency: 51 to 100 Times	5.26	11.52*	1	.001	192.33
Frequency: More than 100 Times	1.43	0.59	1	.443	4.19

[a]All variables were dummy coded to refer to the first variable in frequency which is the category One Time.

* $p < .05$ ** $p < .001$

Appendix A: University Screening Consent Form

HOW YOUNG ADULTS DEAL WITH STRESS

CONSENT TO PARTICIPATE IN RESEARCH

This is to state that I agree to participate in the research project investigating stress coping mechanisms conducted by the research team of Dr. Nancy Heath at McGill University. The purpose of this project is to examine the prevalence and type of specific coping strategies used by young adults in times of stress.

All of the information provided is kept completely confidential. The questionnaires will be kept entirely confidential, and consent forms will be stored separately, in a locked cabinet accessible only to the primary researcher. I understand that this will maintain my confidentiality and anonymity in this study. I fully understand that participation in this research is voluntary and will not, in any way, affect my grades or evaluation of my course work. Participation in this study will provide the participant access to resource information as well as help to develop our knowledge about behaviours related to stress and coping for young adults

The questionnaire I am being asked to complete will take approximately fifteen minutes. While there are no risks involved in participation in this research project, some participants might be sensitive to, or uncomfortable with, some of the questions. Should this issue arise, I am free to withdraw from the study, at any time, without penalty or prejudice. I am also free to not answer any item that makes me uncomfortable.

I understand the purpose of the study and know the risks, benefits, and inconveniences that are involved in this research project. I realize that the data will be used for the above stated research purposes and that I am invited to visit a study outcome website which will be shared with me upon completion of the study. If you have any questions or concerns about your rights as a research subject in this study, please contact the McGill Research Ethics Officer at 514-398-6831.

I have read the above and I understand all of the conditions. I freely consent and voluntarily agree to participate in this study.

Name (please print):_____

Signature: _____
Date:_____

Shareen Holly, M.A. Nancy Heath, Ph.D.

McGill University, Project Coordinator
Faculty of Education
Doctoral Student
(514) 398-1232
shareen.holly@mcgill.ca

McGill University,

Professor
(514) 398-3439

nancy.heath@mcgill.ca

Appendix B: University Screening Contact Information Sheet

Are you interested in participating in further research related to stress and coping in young adults?

Participants will be asked to complete a complete a 30-minutes online survey. Like the study you've just participated in, all the information provided in the second study is confidential. All participants in the second study will be automatically entered in a draw to win one of three gift certificates ($200 certificate from the Eaton Center, or two $50 certificates from HMV). Participants will be given a $20.00 compensation for their participation in follow up questionnaires!

If you are interested, please provide us with your contact information.

This form will be stored separately from the questionnaire you have just completed. You are under no obligation to participate.

Name: _____

E-mail: _____

Phone # (required): _____

Appendix C:University Follow-up Consent Form

HOW YOUNG ADULTS DEAL WITH STRESS: PHASE II

CONSENT TO PARTICIPATE IN RESEARCH

This is to state that I agree to participate in the research project, investigating stress coping mechanisms among young adults, being conducted by the research team of Dr. Nancy Heath at McGill University. The purpose of this project is to examine the risk and protective factors of adaptive and maladaptive coping strategies.

All of the information provided is completely confidential, excluding any disclosure of serious intent to harm self or others. The survey will be entirely confidential – consent forms and e-mail addresses will be stored separately, in a locked cabinet accessible only to the primary researcher. I understand that this will maintain my confidentiality and anonymity in this study. I fully understand that participation in this research is voluntary. Participation in this study will provide the participant access to resource information as well as help to develop our knowledge about behaviours related to stress and coping for young adults.

The survey I am being asked to fill out consists of a series of six questionnaires and will take approximately thirty minutes to complete. The questionnaires will address issues surrounding childhood, family relationships, body image and engagement in risky behaviours. While there are no risks involved in participation in this research, some participants might be sensitive to or uncomfortable with, some of the questions. Should this issue arise, I understand that I am free to withdraw at anytime from the study, without any penalty or prejudice. I am also free to not answer any item that makes me uncomfortable. Participants are encouraged to refer to the research website should they require support during the course of the study. Resources will be provided at the following link _____.

I understand the purpose of the study and know the risks, benefits, and inconveniences that are involved in this research project. I realize that the data will be used for the above stated research purposes and that I am invited to visit a study outcome website which will be shared with me upon completion of the study. If you have any questions or concerns about your rights as a research subject in this study, please contact the McGill Research Ethics Officer at 514-398-6831.

I have read the above and I understand all of the conditions. I freely consent and voluntarily agree to participate in this study.
Please type name ➢

Sincerely,
Shareen Holly, M.A.
McGill University, Project Coordinator
Doctoral
(514) 398-1232
shareen.holly@mcgill.ca

Nancy Heath, Ph.D.
McGill University, Faculty of Education
Student Professor
(514) 398-3439
nancy.heath@mcgill.ca

Appendix D: University Script for Data Collection

SPEECH FOR UNIVERSITY CLASSES
(questionnaires being completed during class time)

Hello. My name is _____ and I'm from the research team of Dr. Nancy Heath in the Faculty of Education. We are conducting a study on adaptive and maladaptive coping strategies employed by young adults and we would very much appreciate your participation. It will help us to better understand how university students cope with stress. Our questionnaire takes about 15 minutes to complete and it is completely confidential. If you have completed this in another class please do not complete it again.

Other lab members can begin to pass out the questionnaires while delivering speech.

Your names and consent forms will be stored separately from your responses and only the primary researchers will have access to this confidential information. Your participation is completely optional and it will have no impact on your grade in this class. You may choose not to answer a question if it makes you uncomfortable and you are also free to withdraw from the study at any time, without penalty or prejudice. If you have questions raise your hand and a research assistant will come to you. You must be at least 18 years old to participate. The research assistants will give every student a copy of the questionnaire. If you choose not to participate, just hold on to it until everyone is done and then hand it in blank.

The first page is a consent form. Please read it carefully and sign it if you agree to participate. Then, please fill out the questionnaire silently and turn it over when you have finished. It is very important that there be no talking and that the questions be filled out individually. Otherwise our results will not be valid.

Thank you very much for your time. We invite you to participate in further studies that our lab is conducting, with the possibility of remuneration. Participants in our future studies will be automatically entered into a draw to win one of three gift certificates (one for $200 and two for $50). If you are interested please provide your contact information on the page following the questionnaire. Your contact information will be stored separately from your questionnaire. When you hand back your papers, you will be given a sheet with our contact information. Please feel free to contact us at the e-mail we've provided if you have any questions about our studies. Thanks again.

Lab members can be waiting to collect the questionnaires and pass out the additional information sheet.

Appendix E: Phase I Debrief

Thank you for participating in our survey on coping strategies!

The information you provided will help us to understand how young adults cope with stress. The purpose of this study is to examine the different ways in which students deal with stress, by looking at both adaptive and maladaptive (or risky) behaviours.

Previous studies from our research group have shown that university students engage in the following behaviours:

Coping Strategy	Frequency
Talk to Someone	93%
Try to Solve the Problem	98%
Listen to Music	88%
Physically Injure Self on Purpose	8%
Smoke	50%
Eat	21%

Many of the strategies are typical ways for young adults to deal with stressful situations. However, of particular interest to our team is the frequency with which young adults have endorsed physically hurting themselves on purpose. We will continue to investigate this phenomenon, and invite you to contact our team if you have any questions or concerns about these findings.

If you are interested in knowing more about this study or the research conducted by the ***Research Team of Dr. Nancy Heath,*** please visit our website:
www.education.mcgill.ca/heathresearchteam

DR. HEATH'S RESEARCH TEAM
McGill University, Faculty of Education
Tel.: (514) 398-1232

Additional Resources

McGill Services

McGill Mental Health Service: 398-6019
McGill Nightline (6pm to 3am, daily): 398-6246
Sexual Assault Centre of McGill Students' Society: 398-8500

Mental Health Support

Tel-Aide Montreal: (514) 935-1101
Suicide-Action Montreal: (514) 723-4000
St-Mary's Hospital Crisis Clinic: (514) 345-3621

Stress Websites

Coping with stress: http://www.helpguide.org/mental/stress_management_relief_coping.htm
Stress handout: http://www.uiowa.edu/~ucs/copstress.html

Coping with stress:
http://familydoctor.org/online/famdocen/home/common/mentalhealth/stress/167.html

Appendix F: Phase II Debrief for Participants

Control Debrief:

Dear participant,

Thank you for taking part in our survey. Your participation will help us to better understand the various ways in each young adults, such as yourself, cope with stress. Our study focused on a variety of adaptive as well as maladaptive and risky behaviours that university students use when dealing with stress. We also looked at different risk and resilience factors, as well as some of the personality traits that may contribute to one's overall well-being.

As a thank you for your time and cooperation, you will be entered in our draw for several gift certificates and we will contact you via email if you win. We are planning to conduct an additional study in this area in the coming months. Please let us know if you are interested in participating for monetary compensation.

We are providing all of our participants with a list of resources for their own use. Although we do not endorse all of the information on these websites, we think they may be of interest to some of our participants. Please make use of the resources below should you require any additional assistance.

Thank you,

The research team of Dr. Nancy Heath

(514) 398-1232

Participants are referred to:
McGill Services
McGill Mental Health Service: 398-6019
McGill Nightline (6pm to 3am, daily): 398-6246
Sexual Assault Centre of McGill Students' Society: 398-8500

Mental Health Support
Tel-Aide Montreal: (514) 935-1101
Suicide-Action Montreal: (514) 723-4000
St-Mary's Hospital Crisis Clinic: (514) 345-3621

Stress Websites
Coping with stress:
http://www.helpguide.org/mental/stress_management_relief_coping.htm
Stress handout: http://www.uiowa.edu/~ucs/copstress.html

Coping with stress:
http://familydoctor.org/online/famdocen/home/common/mentalhealth/stress/167.html

Addiction Websites
Addiction information: *http://www.addictionrecov.org/addict.htm*
Addiction information: *http://www.addictions.co.uk/index.asp*
Alcoholics Anonymous: *http://www.alcoholics-anonymous.org/*
Gamblers Anonymous: *http://www.gamblersanonymous.org/index.html*
Narcotics Anonymous: *http://www.na.org/*

NSSI Debrief:

Dear participant,

Thank you for taking part in our survey. Your participation will help us to better understand non-suicidal self-injury (NSSI) and other maladaptive behaviours. Research has shown that rates of NSSI are high among adolescents and young adults in the community, and furthermore, these rates appear to be increasing. The purpose of the study that you have participated in is to better understand the initiation and maintenance of NSSI among youth in terms of risk and resilience, the social learning processes involved, and the potential addictive features of NSSI among late adolescents and young adults. The findings of this study will aid to the growing knowledge we have about NSSI and help practitioners and researchers more effectively help youth engaging in NSSI through advances in prevention and intervention.

As a thank you for your time and cooperation, you will be entered in our draw for several gift certificates and we will contact you via email if you win. We are planning to conduct an additional study in this area in the coming months. Please let us know if you are interested in participating for monetary compensation.

We are providing all of our participants with a list of resources for their own use. Although we do not endorse all of the information on these websites, we think they may be of interest to some of our participants. Please make use of the resources below should you require any additional assistance.

Thank you,

The research team of Dr. Nancy Heath

(514) 398-1232

Participants are referred to:

Dr. Norman Hoffman
Mental Health Services
Student Services
BROWN Student Services Building
Telephone: (514) 398-6019

McGill Services
McGill Mental Health Service: 398-6019
McGill Nightline (6pm to 3am, daily): 398-6246
Sexual Assault Centre of McGill Students' Society: 398-8500

Non-Suicidal Self-Injury (NSSI) Websites
The S.A.F.E. program : *http://selfinjury.com/index.html*
Self-injury and related issues: *http://www.siari.co.uk*
Young people and self-harm: *http://www.selfharm.org.uk*

Addiction Websites
Addiction information: *http://www.addictionrecov.org/addict.htm*
Addiction information: *http://www.addictions.co.uk/index.asp*
Alcoholics Anonymous: *http://www.alcoholics-anonymous.org/*
Gamblers Anonymous: *http://www.gamblersanonymous.org/index.html*
Narcotics Anonymous: *http://www.na.org/*

Appendix G: MTS

Missouri Teen Survey

Welcome to the Missouri Teen Survey!

The answers provided by students in the Missouri Teen Survey help community and school officials develop programs to help students in many ways!!

It is important that you be as honest and accurate as possible.

Please be aware that we will not collect any information about you that can be used to identify you. All of your answers will be combined with other students in your school district before the results are calculated. No school official will be able to see the results until all data has been collected in your school district and individual student data will not be made available to any school district official or other person.

When completing the survey, you must answer all questions on a page before you will be allowed to continue. In order to begin, please enter the password provided to you, in the box below.

Password	_____

1.	What grade are you currently in:	
	○	Grade 8
	○	Grade 10
	○	Grade 12

2.	What is your current age:
	[- Select One -]

3.	What is your gender:	
	○	Female
	○	Male

4.	Please choose the ONE answer that best describes your ethnicity/race:		
	○	White	
	○	African American/Black	
	○	Hispanic	
	○	Asian or Pacific Islander	
	○	American Indian or Alaskan Native	
	○	Multi-Ethnic	
	○	Other	_____

5.	Which of the following programs have you participated in this year? Select all that apply.	
	☐	IEP
	☐	ELL
	☐	Advanced Studies
	☐	Focus Room
	☐	Recovery Programs
	☐	None of the above

6.	How tall are you? (Select the answer closest to your height)
	[- Select One -]

7.	What is your weight?	____

8.	Think of where you live most of the time. Which of the following people live there with you? (Choose all that apply)	
	☐	Mother
	☐	Father
	☐	Stepmother
	☐	Stepfather
	☐	Foster mother
	☐	Foster father
	☐	Sister(s)
	☐	Brother(s)
	☐	Step-sister(s)
	☐	Step-brother(s)
	☐	Grandmother
	☐	Grandfather
	☐	Aunt
	☐	Uncle
	☐	Other adults
	☐	Other children

9.	When you think about your lifestyle, how would ***you*** describe your family's income?	
	○	Low Income
	○	Lower Middle Income
	○	Middle Income
	○	Upper Middle Income
	○	Upper Income

10.	On average, what grades do you usually get in school?
	[- Select One -]

13.	What is your religious association?	
	○	Christian
	○	Jewish
	○	Muslim
	○	Buddhist
	○	Hindu
	○	Atheist/Agnostic
	○	None
	○	Other _____

11.	During the last month, how many classes have you missed because you skipped or "cut"?
	[- Select One -]

12.	After school, do you have adult supervision?

12.	After school, do you have adult supervision?
	○ No
	○ Yes

14.	How safe and comfortable are you with people in your neighborhood?
	○ Very safe and comfortable
	○ Somewhat safe and comfortable
	○ No opinion
	○ Somewhat unsafe or uncomfortable
	○ Very unsafe or uncomfortable

15.	How safe and comfortable are you with other students in your school?
	○ Very safe and comfortable
	○ Somewhat safe and comfortable
	○ No opinion
	○ Somewhat unsafe or uncomfortable
	○ Very unsafe or uncomfortable

16.	How safe and comfortable are you with people at your church or place of worship?
	○ Very safe and comfortable
	○ Somewhat safe and comfortable
	○ No opinion
	○ Somewhat unsafe or uncomfortable
	○ Very unsafe or uncomfortable

17.	How much do you trust the police in your community?
	○ Trust very much
	○ Trust somewhat
	○ No opinion
	○ Distrust somewhat
	○ Distrust very much

18.	How much do you trust your parents?
	○ Trust very much
	○ Trust somewhat
	○ No opinion
	○ Distrust somewhat
	○ Distrust very much

19.	How much do you trust your teachers?
	○ Trust very much
	○ Trust somewhat
	○ No opinion
	○ Distrust somewhat
	○ Distrust very much

20.	How much do you trust your school administrators?
	○ Trust very much
	○ Trust somewhat
	○ No opinion
	○ Distrust somewhat
	○ Distrust very much

21.	How much do you trust your school counselors?
	○ Trust very much
	○ Trust somewhat
	○ No opinion
	○ Distrust somewhat
	○ Distrust very much

23.	Do you expect to attend college or technical school?
	○ Definitely will not
	○ Probably will not
	○ Not sure
	○ Probably will
	○ Definitely will

22.	Do you expect to graduate from high school?
	○ Definitely will not
	○ Probably will not
	○ Not sure

22.	Do you expect to graduate from high school?	
	○	Probably will
	○	Definitely will

24.	Do you expect to join the military to further your education?	
	○	Definitely will not
	○	Probably will not
	○	Not sure
	○	Probably will
	○	Definitely will

25.	In this section we are interested in knowing how concerned you are about things that affect your life currently.					
			Not at all worried	A little worried	Somewhat worried	Very worried
	a.	How concerned are you about your use or abuse of alcohol?	○	○	○	○
	b.	How concerned are you about your use or abuse of drugs?	○	○	○	○
	c.	How concerned are you about getting hurt in your neighborhood?	○	○	○	○
	d.	How concerned are you about gun violence?	○	○	○	○
	e.	How concerned are you	○	○	○	○

25.	In this section we are interested in knowing how concerned you are about things that affect your life currently.					
			Not at all worried	A little worried	Somewhat worried	Very worried
		about gang violence?				
	f.	How concerned are you about having something of yours stolen?	○	○	○	○
	g.	How concerned are you about sexual harassment?	○	○	○	○
	h.	How concerned are you about rape or date rape?	○	○	○	○
	i.	How concerned are you about getting AIDS?	○	○	○	○
	j.	How concerned are you about being or becoming a teen parent?	○	○	○	○
	k.	How concerned are you about getting a sexually transmitted disease (other than AIDS)?	○	○	○	○

26.	In this section we are interested in knowing how concerned you are about things that may affect your future.					
			Not at all worried	A little worried	Somewhat worried	Very worried
	a.	How concerned are you about having money for school (after high school)?	○	○	○	○
	b.	How concerned are you about getting a good education?	○	○	○	○
	c.	How concerned are you about having a job that will allow you to buy the things you want?	○	○	○	○
	d.	How concerned are you about having a job that will be interesting?	○	○	○	○
	e.	How concerned are you about being healthy?	○	○	○	○
	f.	How concerned are you about having a family?	○	○	○	○
	g.	How concerned are you about being a good parent?	○	○	○	○
	h.	How concerned are you about military conflict or terrorism?	○	○	○	○

27.	Read each of the following and respond as honestly, as you can.

			Very wrong	Somewhat wrong	A little wrong	Not wrong at all
	a.	How wrong do you feel it is for people your age to smoke cigarettes?	○	○	○	○
	b.	How wrong do you feel it is for people your age to drink alcohol?	○	○	○	○
	c.	How wrong do you feel it is for people your age to smoke marijuana?	○	○	○	○
	d.	How wrong do you feel it is for people your age to bring a weapon to school?	○	○	○	○
	e.	How wrong do you feel it is for people your age to bully someone at school?	○	○	○	○
	f.	How wrong do you feel it is for people your age to be involved in a fist fight at school?	○	○	○	○
	g.	How wrong do you feel it is for people your age to tease someone at school?	○	○	○	○

28.	Have you ever had a cigarette?

	○	Yes
	○	No
	○	I have only had one or two puffs

29.	How old were you when you smoked a whole cigarette for the first time?	
	○	Under 11
	○	11
	○	12
	○	13
	○	14
	○	15
	○	16
	○	17
	○	18

30.	How many cigarettes have you smoked in the last month (30 days)?	
	○	I have not had even a puff
	○	Part or all of a cigarette
	○	2 to 4 cigarettes
	○	5 to 20 (one pack)
	○	1 to 5 packs
	○	More than 5 packs

31.	How many cigarettes have you smoked in the last week (7 days)?

31.	How many cigarettes have you smoked in the last week (7 days)?	
	○	I have not had even a puff
	○	Part or all of a cigarette
	○	2 to 4 cigarettes
	○	5 to 20 (one pack)
	○	1 to 5 packs
	○	More than 5 packs

32.	Why do you think you have never smoked? Rank the three answers that best describe your feelings, from 1 to 3, with 1 being the most important reason.	
	My religion doesn't allow it.	__
	No one ever offered me one.	__
	My parents would be angry.	__
	I just don't like to breathe smoke.	__
	I wouldn't be good at sports.	__
	I would get lung cancer.	__
	It is wrong.	__

33.	Have you ever had even one sip of alcohol (beer, wine, wine cooler, hard liquor)? DO NOT INCLUDE ALCOHOL USE AS PART OF A RELIGIOUS SERVICE.	
	○	Yes
	○	No

34.	Why do you think you have never drank alcohol? Rank the three answers that best describe your feelings, from 1 to 3, with 1 being the most important reason.	
	My religion doesn't allow it.	__
	No one ever offered me a drink.	__
	My parents would be angry.	__
	I just don't like the taste of alcohol.	__
	I wouldn't be good at sports.	__
	It would hurt my health	__
	It is wrong.	__

35.	When you drink now (or when you drank before) is/was it mostly...
	○ to be sociable, but not to get drunk.
	○ in order to get drunk.
	○ to experiment.
	○ with family on special occasions.

36.	Do you think drinking alcohol makes parties more fun?
	○ Yes
	○ Probably
	○ No
	○ I don't know

37.	How old were you when you had your first drink of alcohol? DO NOT INCLUDE ALCOHOL USE AS PART OF A RELIGIOUS SERVICE.	
	○	Under 11
	○	11
	○	12
	○	13
	○	14
	○	15
	○	16
	○	17
	○	18

38.	How many alcoholic drinks have you had in the last month (30 days)?	
	○	I have not had even a sip
	○	Part or all of one drink
	○	2 to 4 drinks
	○	5 to 10 drinks
	○	11 to 20 drinks
	○	More than 20 drinks

39.	How many alcoholic drinks have you had in the last week (7 days)?	
	○	I have not had even a sip
	○	Part or all of one drink
	○	2 to 4 drinks

39.	How many alcoholic drinks have you had in the last week (7 days)?	
	○	5 to 10 drinks
	○	11 to 20 drinks
	○	More than 20 drinks

40.	How often are you around people your own age who have been drinking?	
	○	Often
	○	Sometimes
	○	Hardly ever
	○	Never

41.	How often are you around adults who have been drinking?	
	○	Often
	○	Sometimes
	○	Hardly ever
	○	Never

42.	Have you ever had any marijuana?	
	○	No
	○	Yes

43.	How old were you when you first smoked marijuana?	
	○	Under 11
	○	11
	○	12
	○	13
	○	14
	○	15
	○	16
	○	17
	○	18

44.	How many times have you used marijuana in the last month (30 days)?	
	○	None
	○	Once
	○	2 to 4 times
	○	5 to 10 times
	○	11 to 20 times
	○	More than 20 times

45.	How many times have you used marijuana in the last week (7 days)?
	○ None
	○ Once
	○ 2 to 4 times
	○ 5 to 10 times
	○ 11 to 20 times
	○ More than 20 times

46.	Have you ever used cocaine/crack?
	○ No
	○ Yes

47.	How old were you when you first tried cocaine/crack?
	○ Under 11
	○ 11
	○ 12
	○ 13
	○ 14
	○ 15
	○ 16
	○ 17
	○ 18

48.	How many times have you used cocaine/crack in the last month (30 days)?
	○ None
	○ Once
	○ 2 to 4 times
	○ 5 to 10 times
	○ 11 to 20 times
	○ More than 20 times

49.	Have you ever used Meth (methamphetamine, speed, crystal, crank, ice)?
	○ No
	○ Yes

50.	How old were you when you first tried meth?
	○ Under 11
	○ 11
	○ 12
	○ 13
	○ 14
	○ 15
	○ 16
	○ 17
	○ 18

51.	How many times have you used meth in the last month (30 days)?	
	○	None
	○	Once
	○	2 to 4 times
	○	5 to 10 times
	○	11 to 20 times
	○	More than 20 times

52.	Please indicate whether you have EVER used any of the following substances.			
			No	Yes
	a.	Chewing tobacco	○	○
	b.	Over the counter medication to get high (cough medicine, Sudafed, etc.)	○	○
	c.	Mushrooms to get high (psilocybin, magic mushrooms, shrooms)	○	○
	d.	PCP	○	○
	e.	Inhalants to get high (glue, gasoline, aerosol cans, paint, magic markers, etc.)	○	○
	f.	Downers (sleeping pills, tranquilizers, barbiturates, roofies, valium, etc.)	○	○
	g.	LSD (acid, sugar, white lightning)	○	○
	h.	Opiates (heroin, horse, morphine, opium)	○	○
	i.	Steroids without a doctor's	○	○

52.	Please indicate whether you have EVER used any of the following substances.			
			No	Yes
		prescription		
	j.	Ketamine (Special K, Vitamin K, Big K)	○	○
	k.	Ecstasy (Adam, XTC, E, X)	○	○
	l.	Uppers (speed other than meth, ephedrine, ephedra, etc.)	○	○
	m.	Prescription drugs not prescribed for you	○	○
	n.	Pyroxihidrate (Pyro)	○	○

53.	If you have not used drugs, why do you think you have never used drugs? Rank the three answers that best describe your feelings, from 1 to 3, with 1 being the most important reason.	
	My religion doesn't allow it.	__
	No one ever offered me any.	__
	My parents would be angry.	__
	I just don't like them.	__
	I wouldn't be good at sports.	__
	It would hurt my health	__
	It is wrong.	__

The next several questions ask about personal safety and violence related behaviors:

54.	During the last year have you carried a weapon such as a gun, knife, or club?	
	○	No
	○	Yes

55.	How many days in the past month (30 days) have you carried a weapon?	
	○	None
	○	Once
	○	2 to 4 times
	○	5 to 10 times
	○	11 to 20 times
	○	More than 20 times

56.	Have you ever carried a weapon on school property or to a school activity?	
	○	No
	○	Yes

57.	During the past 12 months, has someone threatened or injured you on school property?	
	○	No
	○	Yes

58.	During the past 30 days, how many times did you NOT go to school because you felt you would be unsafe at school or on your way to or from school?
	○ None
	○ Once
	○ 2 to 4 times
	○ 5 to 10 times
	○ 11 to 20 times
	○ More than 20 times

59.	During the past 12 months, how many times were you in a physical fight?
	○ None
	○ Once
	○ 2 to 4 times
	○ 5 to 10 times
	○ 11 to 20 times
	○ More than 20 times

60.	During the past 12 months, how many times were you in a physical fight on school property?
	○ None
	○ Once
	○ 2 to 4 times
	○ 5 to 10 times
	○ 11 to 20 times
	○ More than 20 times

61.	During the past 12 months, has someone bullied you on school property?	
	○	No
	○	Yes

62.	During the past 12 months, have you teased or bullied another student on school property?	
	○	No
	○	Yes

The following section asks questions about emotions and feelings.

63.	Do you feel that you have ever been physically abused?	
	○	No
	○	Yes

64.	Do you feel that you have ever been emotionally/verbally abused?	
	○	No
	○	Yes

65.	Do you feel that you have ever been sexually abused?	
	○	No
	○	Yes

66.	Students have to deal with a lot of stress. When you have had problems to deal with, have you ever physically hurt yourself on purpose?	
	○	Never did this.
	○	Did this only once.
	○	Did this a few times to cope with stress.
	○	Frequently did this to cope with stress.

You indicated that you have physically hurt yourself on purpose before, when you did this...

67.	Did you choose to hurt yourself because you wanted to die?	
	○	No, never.
	○	Yes, a few times.
	○	Yes, always.

68.	Did you physically hurt yourself to deal with problems or stress (e.g. cutting/burning your skin) without wanting to die?	
	○	Never did this.
	○	Did this only once.
	○	Did this a few times to cope with stress.
	○	Frequently did this to cope with stress.

69.	Did you physically hurt yourself for another reason?	
	○	No
	○	Yes

70.	If you answered yes to the above, please explain	_____ _____ _____

71.	Check any of the ways that you have hurt yourself on purpose without wanting to die (this is sometimes called "self-injury").		
	☐	Cut your wrists, arms, or other areas of your body.	
	☐	Burned yourself.	
	☐	Scratched yourself, to the extent that scarring or bleeding occurred.	
	☐	Banged your head against something, to the extent that you caused a bruise to appear.	
	☐	Punched yourself, to the extent that you caused a bruise to appear.	
	☐	Other	_____

72.	What parts of your body have you hurt? (Check all that apply)	
	☐ Arms.	
	☐ Legs.	
	☐ Stomach.	
	☐ Chest.	
	☐ Genitals.	
	☐ Face.	
	☐ Other	_____

73.	How old were you when you first hurt yourself on purpose this way?	___

74.	Who knows that you have hurt yourself on purpose this way? Check all that apply.
	☐ Parent.
	☐ Brother/Sister.
	☐ Other relative.
	☐ Friend(s).
	☐ Boyfriend/Girlfriend.
	☐ Internet friend.
	☐ Teacher.
	☐ Coach or instructor.
	☐ Doctor.
	☐ Nurse.
	☐ Social worker.

74.	Who knows that you have hurt yourself on purpose this way? Check all that apply.		
	☐	Psychologist.	
	☐	Counselor.	
	☐	No one knows.	
	☐	Other	_____

75.	About how many times have you hurt yourself on purpose throughout your life?	
	☐	One time
	☐	2 to 4 times
	☐	5 to 10 times
	☐	11 to 50 times
	☐	51 to 100 times
	☐	More than 100 times

76.	**Since the first time you hurt yourself on purpose, have you found that...**			
			No	Yes
	a.	You hurt yourself more often than intended?	○	○
	b.	The severity of the behavior has increased (e.g., deeper cuts, more cuts)?	○	○
	c.	If the injury produced an effect, you now need to do it more frequently or with greater intensity to get this effect?	○	○

76.	**Since the first time you hurt yourself on purpose, have you found that...**			
			No	Yes
	d.	Engaging in this behavior or thinking about it consumes a significant amount of your time?	○	○
	e.	Despite a desire to reduce or stop this behavior, you are unable to do so?	○	○
	f.	You continue this behavior even though you recognize that it is harmful to you physically and/or emotionally?	○	○
	g.	Important social, family, academic, or recreational activities are given up/reduced because of this behavior?	○	○

77.	If your school offered a program to help kids with self-injury, would you go (or would you have gone in the past)?	
	○	No
	○	Yes

78.	When I'm upset, I feel out of control.	
	○	Never.
	○	Some of the time.
	○	Half of the time.
	○	Most of the time.
	○	Always.

79.	When I'm upset, I believe that there is nothing I can do to make myself feel better.	
	○	Never.
	○	Some of the time.
	○	Half of the time.
	○	Most of the time.
	○	Always.

80.	When I'm upset, I have difficulty thinking about anything else.	
	○	Never.
	○	Some of the time.
	○	Half of the time.
	○	Most of the time.
	○	Always.

81.	During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?	
	○	No
	○	Yes

82.	During the past 12 months, did you ever seriously consider attempting suicide?	
	○	No
	○	Yes

83.	During the past 12 months, did you make a plan about how you would attempt suicide?	
	○	No
	○	Yes

84.	During the past 12 months, did you actually attempt suicide?	
	○	No
	○	Yes

85.	When you attempted suicide did the attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?	
	○	No
	○	Yes

The following section asks about nutrition and diet habits.

86.	During the past 7 days, how many times did you eat fruit? (Do not count juice.)	
	○	I have not had any in the past 7 days
	○	1 to 3 times in the past 7 days
	○	4 to 6 times in the past 7 days
	○	1 time per day
	○	2 times per day
	○	3 times per day
	○	4 or more times per day

87.	During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do NOT count punch, Kool-aid, sports drinks or other flavored drinks such as Gatorade)	
	○	I have not had any in the past 7 days
	○	1 to 3 times in the past 7 days
	○	4 to 6 times in the past 7 days
	○	1 time per day
	○	2 times per day
	○	3 times per day
	○	4 or more times per day

88.	During the past 7 days, how many times did you eat potatoes? (Do not count french fries, fried potatoes or potato chips.)
	○ I have not had any in the past 7 days
	○ 1 to 3 times in the past 7 days
	○ 4 to 6 times in the past 7 days
	○ 1 time per day
	○ 2 times per day
	○ 3 times per day
	○ 4 or more times per day

89.	During the past 7 days, how many times did you eat green salad?
	○ I have not had any in the past 7 days
	○ 1 to 3 times in the past 7 days
	○ 4 to 6 times in the past 7 days
	○ 1 time per day
	○ 2 times per day
	○ 3 times per day
	○ 4 or more times per day

90.	During the past 7 days, how many times did you eat other vegetables?	
	○	I have not had any in the past 7 days
	○	1 to 3 times in the past 7 days
	○	4 to 6 times in the past 7 days
	○	1 time per day
	○	2 times per day
	○	3 times per day
	○	4 or more times per day

91.	During the past 7 days, how many glasses of milk did you drink? (Include the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)	
	○	I have not had any in the past 7 days
	○	1 to 3 times in the past 7 days
	○	4 to 6 times in the past 7 days
	○	1 time per day
	○	2 times per day
	○	3 times per day
	○	4 or more times per day

92.	How do YOU describe your weight?	
	○	Very underweight
	○	Slightly underweight
	○	About the right weight
	○	Slightly overweight
	○	Very overweight

93.	Which of the following are you trying to do about your weight?	
	○	Lose weight
	○	Gain weight
	○	Stay the same weight
	○	I am not trying to do anything about my weight

94.	During the past 30 days, did you eat less food, fewer calories, or foods low in fat to lose weight or to keep from gaining weight?	
	○	No
	○	Yes

95.	During the past 30 days, did you go without eating for 24 hours or more (also called fasting) to lose weight or to keep from gaining weight?	
	○	No
	○	Yes

96.	During the past 30 days, did you take any dieting aids, without a doctor's advice to lose weight or to keep from gaining weight?	
	○	No
	○	Yes

97.	During the past 30 days, did you vomit or take laxatives to lose weight or to keep from gaining weight?	
	○	No
	○	Yes

98.	During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spend in any kind of physical activity that increases your heart rate and makes you breathe hard some of the time.)	
	○	0 days
	○	1 day
	○	2 days
	○	3 days
	○	4 days
	○	5 days
	○	6 days
	○	7 days

This section asks about media including, television and internet activity.

99.	On an average school day, how many hours do you watch television?	
	○	I do not watch television on an average school day
	○	Less than an hour per day
	○	1 hour per day
	○	2 hours per day
	○	3 hours per day
	○	4 hours per day
	○	5 or more hours per day

100.	On an average weekend, how many hours do you watch television?	
	○	I do not watch television on weekends
	○	Less than an hour per day
	○	1 hour per day
	○	2 hours per day
	○	3 hours per day
	○	4 hours per day
	○	5 or more hours per day

101.	On an average school day, how many hours do you spend on the internet?	
	○	I do not use the internet on an average school day
	○	Less than an hour per day
	○	1 hour per day
	○	2 hours per day
	○	3 hours per day
	○	4 hours per day
	○	5 or more hours per day

102.	On an average weekend, how many hours per day do you spend on the internet?	
	○	I do not use the internet on weekends
	○	Less than an hour per day
	○	1 hour per day
	○	2 hours per day
	○	3 hours per day
	○	4 hours per day
	○	5 or more hours per day

103.	Do your parents monitor your internet activity personally or with parental control software?	
	○	Parents do not monitor internet activity
	○	Parents monitor activity personally
	○	Parents use parental control software
	○	I don't know

104.	Which of the following internet activities have you done in the past 30 days? (Check ALL that apply.)		
	☐	Research for homework	
	☐	Email	
	☐	Chatting with friends	
	☐	Blogging	
	☐	Making new friends (networking)	
	☐	Reading news or sports	
	☐	Personal Web Page	
	☐	Online game playing	
	☐	Gambling	
	☐	Other	_____

105.	Which, if any, of the following websites do you have a web page on, or regularly visit? (Check all that apply)		
	☐	Bebo	
	☐	Classmates	
	☐	Facebook	
	☐	MySpace	
	☐	Xanga	
	☐	YouTube	
	☐	Other	_____

106.	Have you ever posted something on the internet in order to hurt or scare someone else?	
	○	No
	○	Yes

107.	Has anyone ever posted something about you on the internet that hurt or scared you?	
	○	No
	○	Yes

108.	While on the internet, have you asked someone for sex, photographs of themselves, or sex related chat?	
	○	No
	○	Yes

109.	While on the internet, have you ever posted revealing photos of yourself?	
	○	No
	○	Yes

110.	While on the internet, have you been asked to participate in illegal or inappropriate activities?	
	○	No
	○	Yes

111.	While on the internet, have you been solicited for sex, photographs of yourself, or sex related chat?	
	○	No
	○	Yes

112.	Do you have a cell phone?	
	○	No
	○	Yes

113.	Does your cell phone have texting capabilities?	
	○	No
	○	Yes

114.	Have you ever received a text message that was meant to be threatening, to you or someone you know?	
	○	No
	○	Yes

115.	Have you ever sent a text message that was meant to be threatening, to someone you know?	
	○	No
	○	Yes

Here are some questions on what you think about religion. Read each one carefully and select the appropriate answer.

116.	How important is it to you to believe in a personal God/Higher Power.	
	○	Not at all important.
	○	A little important.
	○	Pretty important.
	○	Very important.

117.	How important is it to you to be able to rely on religious teachings when you have a problem.	
	○	Not at all important.
	○	A little important.
	○	Pretty important.
	○	Very important.

118.	How important is it to you to be able to turn to prayer/meditation when you have a problem.	
	○	Not at all important.
	○	A little important.
	○	Pretty important.
	○	Very important.

119.	How important is it to you to rely on your religious beliefs as a guide for day-to-day living.	
	○	Not at all important.
	○	A little important.
	○	Pretty important.
	○	Very important.

Thanks for taking the Missouri Teen Survey! Your participation is greatly appreciated.