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The experience of deliberate self -harm: Impulsive and compulsive features

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The Experience of Deliberate Self-Harm: Impulsive and Compulsive Features

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Abstract

Although non-suicidal deliberate self-harm (DSH) is often characterized as impulsive in the literature, the impulsive and compulsive features of DSH have not been adequately investigated. This study used qualitative and quantitative methods to examine the impulsive and compulsive features of DSH in two samples: clinicians describing the prototypical DSH client ($N = 115$) and undergraduates self-reporting on DSH experiences ($N = 96$). Of 3460 undergraduates, 12.14% endorsed a history of multiple DSH episodes. Both samples endorsed predominantly multiple methods including self-cutting, scratching, burning, and hitting. According to Simeon and Favazza's (2001) hypothetical model, these would be classified as "impulsive" DSH (98.25% in clinician sample, 94.79% in undergraduate sample). It was predicted that clinicians would describe DSH as more impulsive than compulsive, consistent with this model. In contrast, it was predicted that undergraduates would describe more compulsivity than impulsivity in association with DSH. Items generated to reflect impulsive and compulsive features of DSH were evaluated using expert ratings of these items and established measures of impulsivity and compulsivity. Analyses within and between the two samples revealed: (1) a set of items designed to reflect impulsive and compulsive features of DSH can be reduced to components relating to these two constructs in both samples; (2) impulsivity and compulsivity as reflected in these items show a negative correlation ($r = -.42$, $p < .01$); (3) clinicians described more compulsive than impulsive features in association with the prototypical DSH client's DSH; (4) undergraduates described more compulsive than impulsive features in association with DSH; (5) in undergraduates, general impulsivity and compulsivity positively predicted the number of methods of DSH, while DSH-specific compulsive features were positive predictors of number of methods, frequency, and frequency per year. Impulsive/urge-driven features positively predicted number of methods and negatively predicted severity. Qualitative data offered insights into the complex relationship between impulsivity and compulsivity. These findings suggest that it is inaccurate to qualify these forms of DSH as "impulsive" in clinical and non-clinical settings, and that compulsivity (particularly specifically as it relates to DSH) may play a unique and important role in DSH. Suggestions for future research are discussed.

Dedication

I would first like to thank the clinicians and undergraduates who took the time to participate in this project. Without their willingness to share their experiences, this project would not have been possible. I am encouraged by the comments offered by many of the clinician respondents, as they showed that excitement for research and support of doctoral training are alive and well. I am very grateful to the undergraduate participants who shared their personal experiences and provided rich insights into the experience of DSH. My hope is that I have done their efforts justice, and that this work contributes to an enhanced understanding of DSH.

I would also like to thank my advisor, Dr. Stephen Hibbard, who provided insights, suggestions, and consultation throughout the formulation and execution of this study. My committee members' enthusiastic and collaborative approach to their roles enhanced the project on many levels, and I thank them for helping to make this a rewarding experience for me.

My friends and family have been wonderful supports, and have helped me through this lengthy process in many ways. Those who have gone through the process of completing a doctoral dissertation - and those are going through it now - have been great source of information, advice, company, distraction, commiserating, and reframing the light at the end of the tunnel when it sometimes seemed a little dim. I am fortunate to have such great people in my life, and I look forward to our next adventures together.

Most of all, I want to thank my husband, Chris, who has been an endless source of support and encouragement throughout this process. Without exception, he has been dedicated to doing anything and everything to facilitate my graduate training. He cheerfully uprooted from Montreal to move to Windsor and then to Ottawa. He accepted going into debt and having little free time together without complaint. He quietly allowed me to be stressed out and preoccupied when I needed to be, and he offered fun diversions at precisely the right moments. Somehow in the meantime, he found time to change career paths, acquire a new skill set, launch a great career with an exciting future, and donate a substantial portion of his liver for transplant. In short, I could not have asked for a more loving and responsive partner who is just an all-around amazing person. I feel so lucky to have him in my life and I am looking forward to seeing what will be next for us.

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CHAPTER I

Introduction

Despite a long history and many anecdotal accounts in the literature, deliberate self-harm (DSH) remains a complex phenomenon that is only in the early stages of being examined empirically. Until relatively recently, researchers and theorists have struggled to define DSH, let alone understand the features and phenomenology of this behaviour in its varied forms and populations. Many contemporary researchers define DSH as the deliberate, direct destruction or alteration of one's own body tissue without conscious suicidal intent (Favazza, 1998).

Although several descriptive and hypothetical models of the etiology, phenomenology, and classification of DSH have been proposed, fewer studies have examined these aspects of DSH empirically. One popular such model suggests that DSH can be divided into compulsive DSH (i.e., hair pulling, nail biting, skin picking) and impulsive DSH (repetitive or episodic self-cutting, burning, hitting), with recognition that some impulsive and compulsive features may overlap (Favazza & Rosenthal, 1990; Simeon & Favazza, 1995). Notwithstanding the relative lack of systematic evaluation of this model, some researchers have referred to "impulsive DSH" and "compulsive DSH" as distinct entities, perhaps in part due to the model's intuitive appeal and convention. In addition, much of the research to date has focused on specific clinical samples, particularly borderline personality disorder and eating disorders, despite evidence that a substantial proportion of non-clinical samples engage in repetitive DSH. Thus, the degree to which findings might generalize to non-clinical or other samples is unclear.

Recent work has begun to examine DSH in more depth, and the beginnings of an empirically based understanding of the features and functions of DSH have begun to emerge. This study will contribute to an empirically based understanding of the process of *how* DSH occurs, namely by examining the impulsive and compulsive characteristics of repetitive DSH. Traditionally, DSH has been viewed as an impulsive act, characterized by a failure to resist impulses to self-harm. Indeed, contemporary researchers often make the assumption that "impulsive" DSH (skin cutting, burning, hitting) is indeed impulsive in nature, or is associated with impulsivity (for example, Favaro & Santonastaso, 1998; Fernandez-Aranda et al., 2006). However, findings in this

regard have not been consistent and many aspects of the experience of DSH seem to be more consistent with a compulsive act, even within the putative "impulsive DSH" category. The impulsive and compulsive features of DSH have not been examined in the literature in an in-depth manner and this topic merits investigation. This is an important aspect of DSH to consider as it has implications for understanding, classifying, researching, and treating DSH.

In order to address this gap in the literature, this study will employ both qualitative and quantitative methods to examine the impulsive and compulsive features of DSH. The inclusion of qualitative methods is essential to allow a description of the phenomenology of DSH. Phenomenology refers to the study of an individual's lived experience, including their detailed description of the experience in question and the subjective meaning they construct relating to that experience (Starks & Brown, 2007). Thus, qualitative methods were included to permit a rigorous description of the DSH experience from the perspective of the individual engaging in the behaviour. This will in turn allow for an integration of qualitative and quantitative data, strengthening the understanding of the experience or phenomenology of DSH.

In addition to using both qualitative and quantitative methods, DSH will be considered from two distinct perspectives. First, impulsive and compulsive features of DSH will be examined from the perspective of mental health professionals in reference to what they consider to be the prototypical client who engages in repetitive DSH. Second, these features of DSH will be examined from the perspective of a non-clinical sample of undergraduate students with a history of repetitive DSH. This study will provide an empirical basis upon which to base an understanding of the experience of DSH in terms of impulsive and compulsive features, both within and between these two groups. In addition, this study will employ multiple measures to capture the multidimensional constructs of impulsivity and compulsivity. These constructs will be concretely operationalized and they will be examined in terms of how they apply to the act of DSH in these samples. Finally, this study's inclusion of a non-clinical sample is important, as this represents a frequently overlooked population in the current literature.

DSH in Historical Context

Overview. Prior to the last 10 to 15 years, the majority of the literature on DSH could be characterized as descriptive reports and attempts to classify the behaviour using non-empirical means. Many researchers to date have been primarily focused on describing characteristics of DSH including the prevalence, age of onset, the most common types and frequency of self-harm, and associated features or characteristics. Some have focused on examining why DSH occurs from a motivational or functional perspective. Other researchers have made attempts to classify DSH, with the implicit aim of providing a framework within which the professional community can research and treat DSH.

In general, early studies are plagued with serious weaknesses that limit their utility and generalizability, including a tremendous variance in the definition of DSH, a predominance of single case studies and small samples, a heavy reliance on psychiatric inpatient or prisoner samples, and a lack of comparison and control groups (Feldman, 1988; Ross & McKay, 1979). Importantly, there has historically been a relative lack of literature concerning DSH in non-clinical samples despite the acknowledgement that DSH in non-clinical groups seems to be increasing in prevalence (Skegg, 2005) and may have unique characteristics as compared to clinical or prisoner samples. Furthermore, many researchers consider some forms of DSH to be an impulsive act without adequately evaluating the impulsive and compulsive features of DSH (Favazza & Rosenthal, 1993).

Despite these limitations, these studies have been imperative in providing a foundation on which researchers continue to build. They have clearly shaped the conceptualization of what constitutes DSH and guided the literature to date. Therefore, a review of selected contributions will demonstrate this study's place in the development of this body of work. With this foundation, it is possible to extend the literature beyond describing the features and functions of DSH, and begin to empirically address the question of how DSH occurs in terms of impulsive and compulsive processes.

Early contributions. Observations and case reports of DSH are evident in the literature, with some dramatic case reports and descriptions of DSH being noted as early as the 19th century (Favazza, 1998). Many of these reports presented sensationalized accounts of bizarre or severe acts of DSH without offering an integrated explanation of

the behaviour. The few authors that endeavoured to explain the puzzling phenomenon tended to use the predominant psychoanalytic perspective, pointing to actual or symbolic castration, or a compromise between life, death, or sexual drives as an explanation (Ackerman & Chidester, 1936; Dabrowski, 1937; Menninger, 1935). Standing out among these case studies, Emerson (1913) presented the psychoanalysis of a woman who engaged in repetitive self-cutting in order to relieve distress. According to this report, the woman "was not insane" (p. 41) and in fact was portrayed as quite insightful. Emerson interpreted the woman's self-harm as stemming from psychosexual trauma, symbolism associated with sexuality and menstruation, and aggressive tendencies against the self. Most notably, Emerson acknowledged that there was a "multiplicity of motives" (p. 51) underlying the behaviour, and suggested that self-harm of this nature "is too complex to be merely impulsive, it is the end result of a process of thinking, motivated by feelings and impulses aroused by the repressed memories of early sadistic and perverse treatment" (p. 50). Thus, while Emerson's emphasis was on psychoanalytic interpretations of the behaviour, he noted the likelihood of over-determined etiology and the nature of the act itself as being more complex than a simple impulsive response.

Early classification of DSH. Menninger is credited with the first documented attempt to classify DSH in his work, Man Against Himself (1938). He divided self-mutilation into six categories: Neurotic self-mutilation (nail-biting, skin-picking and disfiguring hair-removal); religious self-mutilation (genital self-mutilation); puberty rites (hymen removal and circumcision); psychotic self-mutilation (enucleation of the eyes and extremity amputation in psychosis); self-mutilation in organic diseases (intentional fracturing of fingers); and customary and conventional self-mutilation (shaving beards and clipping fingernails). In his conceptualization of this behaviour, Menninger considered the physiological and psychological functioning of the individual, the meaning of the self-harming behaviour in the individual's cultural or subcultural context, the severity and nature of the self-harm behaviour, and the psychodynamic origins of the behaviour. Thus, Menninger took an early bio-psycho-social approach to understanding DSH (Walsh & Rosen, 1988).

Like all classification systems, Menninger's model was imperfect as some examples of self-mutilation fit more than one category, and other examples did not fit into

his categories (Walsh & Rosen, 1988). However, Menninger's (1935) work presented a distinct advantage over the previous psychodynamic reports of DSH since it emphasized the importance of multiple factors beyond those relating only to intrapsychic or psychodynamic drives and conflicts. In addition, he considered self-harm to be present in both "normal" and pathological populations, disputing some of the sensationalized reports of severe DSH. Menninger emphasized that self-injury may be an attempt at self-healing or self-preservation. He was the first to make the important distinction between suicide and self-harming behaviour, highlighting the "paradox that local self-destruction is a form of partial suicide to avert total suicide" (Menninger, 1935, p. 450). The distinction between deliberate self-harm and suicide remained elusive to the field for decades, and the two were not consistently or adequately distinguished until relatively recently (Guertin et al., 2001). Therefore, although they were not integrated into the DSH dialogue for many years, Menninger's insights constitute groundbreaking contributions to our understanding of this complex phenomenon.

In an apparent endeavour to further consider the nature of DSH, Menninger (1935, 1938) contrasted neurotic self-mutilations with those of psychotic individuals, perhaps foreshadowing the distinction between compulsive and impulsive processes. According to psychoanalytic theory, the role of the ego is to find a compromise between the internal demands of the individual with those of the conscience or the external world (Ford & Urban, 1998). In the case of neurotic self-mutilation, Menninger (1935) explained that the conscience of the individual is stern or cruel and demands self-punishment, so the ego "concedes as little as possible to insistence of the conscience" (p. 411), the result of which is self-mutilating acts rather than more severe self-punishment. In contrast, he described the psychotic individual's ego as sick or powerless, and therefore unable to strike a compromise with the demanding conscience. He also implied that the psychotic individual is more moved by destructive urges, and less able to resist these due to an impaired ego. In Menninger's view, this results in the ego surrendering completely to the conscience's demands for self-punishment or to the destructive urges experienced, resulting in particularly severe acts of self-mutilation and self-amputation. He also suggested that 'normal' individuals are less at the mercy of the harsh conscience and are not as strongly moved by such destructive urges, and therefore are better equipped to

make a suitable compromise that does not involve self-harm. While clearly psychoanalytic in nature, this theory of self-harm behaviour suggests alternative processes to explain self-harm in different populations, perhaps with psychotic and neurotic self-harm corresponding in some respects to impulsive and compulsive processes, respectively.

Later in an alternative classification system of DSH, Pao (1969) identified two types of cutting behaviour, coarse and delicate self-cutting. Like Menninger, Pao's endeavour to distinguish deliberate self-harm from suicidality was an important distinction that was typically ignored prior to the late 1970s and 1980s. In Pao's model, coarse self-cutting consisted of single-episode, life threatening acts of self-harm, while delicate self-cutting referred to repeated episodes of superficial cuts that were non-life threatening in severity. In a study of 413 new admissions to a psychiatric hospital over a 10-year period, Pao (1969) found that 7.7 percent of admissions engaged in self-cutting, with 15.6 % engaging in coarse self-cutting and 84.4 % engaging in delicate self-cutting. He found that individuals who engaged in coarse self-cutting were older (at least 35 years of age), predominantly male, and typically suffering from a psychotic depression. In contrast, individuals who engaged in delicate self-cutting were younger (between age 16 and 24 years), predominantly female, and typically vacillating between "being psychotic and being 'normal'" (p. 195). He also noted that the delicate self-cutter exhibited periodic but marked withdrawal that was punctuated with "sudden 'impulsive' action such as breaking things" (p. 196), a pattern that was interspersed with periods of normal behaviour and appropriate functioning.

Pao (1969) focussed the majority of his discussion on the associated characteristics and dynamics of delicate self-cutting in women, describing the experience as an altered state comparable to depersonalization, derealization, or a fugue state. He suggested that due to mounting tension, the individual would become highly focused on the self and cease to allow the ego to monitor interactions with the environment, which would in turn result in the individual participating in the drive-dominated act of self-harm. More concretely, Pao explained that the woman would experience an unexplained increase in tension, would "struggle with herself over cutting or not cutting" (p. 198), and would suddenly realize that she had already cut herself. In addition, he reported that at

the moment of cutting, the individual was oblivious to her surroundings, unaware of the act of cutting, and did not experience a pain sensation. Once realizing what had happened, Pao indicated that the women might be overwhelmed with feelings of disgust, regret, or guilt but that pleasure was also experienced due to the relief of tension. It is interesting to note that Pao's description of mounting tension, acting on a drive-dominated impulse to self-cut, and experiencing pleasure and relief following the act is consistent with some definitions of an impulsive act (Oldham, Hollander & Skodol, 1996). However, the mounting tension before the act, the struggle over whether or not to engage in self-harm, and the tension reduction and guilt that followed the act may be more consistent with a compulsive behaviour (see Skodol & Oldham, 1996).

Focus on DSH in psychiatric inpatient facilities and hospital settings. Between the mid-1960s and mid-1970s there was a resurgence of publications that tended to centre specifically on self-cutting in psychiatric inpatient facilities and emergency departments, with authors often referring to DSH as 'wrist cutting' or 'wrist slashing' (for example, Graff & Mallin, 1967; Rosenthal, Rinzler, Wallsh, & Klausner, 1972). In general, this behaviour was viewed as reflecting particularly severe pathology, and these individuals were regarded as dramatic frequenters of inpatient services (Rosenthal et al., 1972). Indeed, Graff and Malin (1967) suggested that, "wrist slashers have become the new chronic patients in mental hospitals, replacing the schizophrenics" (p. 36). Although many authors failed to distinguish between individuals attempting suicide and those engaging in self-harm without suicidal intent, they endeavoured to describe various features of the "typical chronic cutter" (Rosenthal et al., 1972). Attempts to outline a 'wrist-cutting syndrome' resulted in some preliminary efforts to make generalizations about characteristics of this population. Most accounts during this time described individuals who engage in deliberate self-harm as attractive, intelligent, unmarried young women who, among other difficulties, have trouble relating successfully to others (for example, Graff & Malin, 1967; Grunebaum & Klerman, 1967). The seemingly paradoxical presentation of individuals with such positive qualities engaging in what was presented as an erratic and unsettling behaviour elicited a sensationalized style of reporting that persisted throughout the 1960s and 1970s.

Increasing scientific rigour. Some criticism was raised concerning the tremendous number of hypothetical causes of DSH and the anecdotal reports of extreme cases. Of particular note, Ross and McKay (1979) commented on the 'mind-boggling array' of explanations for DSH behaviour, and noted that these varied explanations tended to represent the predominant school of thought of the investigator. They criticized the lack of scientific rigour with which authors approached the subject to date. In particular, Ross and McKay noted that while explanations abound, data are often presented without statistical analysis or interpretation, and hypotheses explaining deliberate self-harm were very infrequently derived from theory, data, or a functional analysis of the behaviour. This critique of the predominant style of addressing DSH in the research literature proved to be an important contribution that encouraged a more thoughtful, empirically based approach.

Beginning in the 1980s, a second surge of publications regarding DSH began and has continued to be a trend to the present. The aforementioned contributions were integrated into the professional literature, producing an apparent increase in the level of interest in the many facets of deliberate self-harm. Furthermore, the demand to approach the topic in a more scientifically sound manner seemed to improve the quality of the work being produced. As a result, researchers endeavoured to utilize more sound methodology to define and classify DSH, determine prevalence rates, evaluate etiological factors and associated features, and expand on our understanding of the phenomenology of this apparently common but poorly understood phenomenon.

Classification of DSH. In the past two decades, the literature on DSH has evolved into a more focused, scientific, and useful body of work. Often cited as marking this important transition, Pattison and Kahan (1983) conducted an analysis of 56 case reports published between 1960 and 1980 in an effort to describe the characteristics of what they referred to as "the deliberate self-harm syndrome". In describing their view of DSH, Pattison and Kahan explained "there is impelling impulse with increasing tension, followed by psychic relief after the self-injury" (p. 867). The following symptoms of this syndrome are noted:

1. sudden and recurrent intrusive impulses to harm oneself without the perceived ability to resist;
2. a sense of existing in an intolerable situation which one can neither cope with nor

control;
3. increasing anxiety, agitation, and anger;
4. constriction of cognitive-perceptual processes resulting in a narrowed perspective on one's situation and personal alternatives for action;
5. a sense of psychic relief after the act of self-harm; and
6. a depressive mood, although suicidal ideation is not typically present (Pattison & Kahan, 1983, p. 867).

Based on this conceptualization, Pattison and Kahan (1983) used strict criteria, including cases of DSH of low lethality when there were data on individuals (rather than groups) and excluding cases judged to be highly lethal, substance overdoses, indirect self-harm, and involving young children. They found that approximately half of the population studied were women, the age of onset was typically in late adolescence, multiple episodes and multiple methods of deliberate self-harm were most commonly reported, the lethality of the harm was typically quite low, and the self-harming behaviour tended to continue over a period of many years. Despair, anxiety, anger, and cognitive constriction were noted to be predominant psychological symptoms. In addition, these researchers indicated that a lack of social support, substance abuse, homosexuality in men, and suicidal ideation in women were predisposing factors. Pattison and Kahan reported that 54% of the cases studied could be considered model cases containing all of the features noted above, while 16% were model cases containing all of the features except for the recurrence of episodes of self-harm. These authors viewed this finding as evidence to support a relatively uniform syndromal pattern of DSH.

Beyond attempting to describe a pattern of clinical features associated with DSH, Pattison and Kahan (1983) also proposed a classification model based on three distinct variables. First, the directness variable addresses how directly or indirectly the individual harms the self. Direct harm was described as involving direct and conscious intent to injure one's body tissue, such as cutting, hitting, or burning oneself. Indirect harm was described as involving actions over a longer period of time accompanied by a lack of conscious awareness of the destructive potential of the behaviour, such as severe obesity or reckless driving. Second, the lethality variable addressed the potential for death to occur following the behaviour. Third, the repetition variable addressed whether the act occurs as a single episode or multiple episodes. In combining these three variables into a conceptual model, Pattison and Kahan suggested that a wide range of behavioural

patterns could be captured. Within this dimensional model, DSH was described as a class of self-destructive behaviour characterized by direct harm to the self with low lethality in a repetitive pattern; in contrast, suicide could be described as direct harm to the self with high lethality in a single episode.

Of note, Pattison and Kahan (1983) noted that while DSH and other classes of self-destructive behaviour are problems that may require clinical attention, they are not necessarily associated with a particular diagnosis. Therefore, they argued that DSH should be considered an independent syndrome, suggesting it might be most appropriately classified as a disorder of impulse control, since it shares the essential features of failing to resist an impulse, increasing tension before committing the act, and experience of pleasure or gratification following the act. Similarly, Lacey and Evans (1986) described a 'multi-impulsive disorder' that involved a varied presentation of interchangeable symptoms of impulsivity such as binge eating, substance abuse, kleptomania, and self-mutilation. They suggested that individuals who have been diagnosed with this putative disorder tend to present with one or more of these symptoms; when the presenting impulsive symptom is treated, another impulsive problem emerges. The notion of a specific DSH impulse disorder has been supported by other researchers, most notably Favazza (1992) and Favazza and Rosenthal (1993), but to date the requisite research evidence has not been presented to support these hypotheses.

While these efforts to delineate a syndrome of deliberate self-harm were not widely adopted, Pattison and Kahan's emphasis on the three key variables of directness, lethality, and repetition became central to the work that would follow in the realm of deliberate self-harm research. Other models and variables were offered as alternative or adjunct factors to consider. For example, Walsh and Rosen (1988) suggested that the degree of physical damage (superficial, mild, moderate, severe), the individual's psychological state (benign, agitated, psychic crisis, psychotic decompensation), and the social acceptability of the act (acceptable in most social groups, acceptable within a specific subculture, unacceptable in most social groups, entirely unacceptable in all social groups) were important variables with which one could evaluate self-harming behaviour. Walsh and Rosen's model considered physical self-alteration as a continuum ranging from superficial, psychologically benign, and socially acceptable forms such as ear

piercing (referred to as Type I) to severe and socially unacceptable forms that occur during psychotic decompensation such as self-amputation or eye enucleation (referred to as Type IV). These researchers offered this as a heuristic schema to assist in distinguishing benign acts of DSH from those that would be considered dysfunctional and warrant clinical attention. These efforts to identifying key variables or dimensions helped to shape the definition of DSH and highlighted the clinical importance of DSH, sparking interest and research productivity in the area.

Marking another significant contribution to the literature, Favazza (1987, 1989, & 1996) published his perspectives of the area he referred to as self-mutilation, integrating cultural anthropology and clinical psychiatry. This work is often credited as a pivotal contribution to contemporary work on DSH in clinical populations, and the many references to his publications that followed support this assertion. In particular, as noted below, Favazza (1996) offered a comprehensive definition of DSH and a classification system for various types of DSH, both of which have been popularized in the current DSH literature. Like those before him (Lacey & Evans, 1986; Pattison & Kahan, 1983) Favazza (1992) considered repetitive and episodic DSH to be impulsive in quality. However, this distinction has not been adequately evaluated in a sound empirical manner. Despite this limitation, following Favazza's work and subsequent publications, the number of publications on the topic of deliberate self-harm grew exponentially. Various researchers endeavoured to break the topic into key components to investigate specific aspects of this phenomenon, which has advanced our understanding of DSH considerably. While a comprehensive understanding of the many facets of DSH still eludes us, the basis of our current understanding is more empirically based than ever before.

Summary of Historical Overview

Deliberate self-harm has been discussed as a part of the psychological literature since the early 1900s, with even earlier case reports being described (Favazza, 1996). These early works offered insights into the difference between DSH and suicide, the presence of DSH in "normal" or high functioning individuals, the consideration of multiple bio-psycho-social factors in DSH, the presence of multiple motives or reasons for DSH, the complexity of the DSH process (i.e., as not a simple impulsive behaviour),

and the potential for classifying various types or dimensions of DSH. However, despite this long history in the literature, many aspects of DSH remain poorly understood. Efforts to clarify the nature of DSH have tended to reflect the orientation of the writers, and the majority of the literature prior to the 1980s has reflected case descriptions and hypothetical models or dimensions of DSH. Researchers have tended to focus on describing characteristics of individuals who engage in DSH, offering hypotheses regarding possible etiology, and establishing a classification system for DSH. Methodological problems plagued much of the early literature on DSH as case studies were often employed, definitions of DSH were inconsistent, and samples often consisted of violent prisoners and psychiatric inpatients with severe pathology and complex presentations (or a mixture of such groups, further complicating interpretations). While many such studies were interesting from a theoretical perspective, they were often based on unsubstantiated theories and hypothetical constructs rather than scientific evidence.

It was not until the past two decades that a shift in the focus and quality of the literature occurred, and researchers began to produce more methodologically sound studies to contribute to our understanding of this complex phenomenon. However, it is apparent that the basic processes underlying DSH have still not been adequately explored. Although some researchers continue to refer to "impulsive" DSH processes based on hypothetical typologies and convention, the impulsive and compulsive aspects of DSH have not been systematically examined. The research on this aspect of DSH is relatively limited, and findings to date have been equivocal. The sections that follow review the more recent literature relating to DSH and the limited findings relating to the process of how DSH occurs with emphasis on impulsive and compulsive processes.

Definition of DSH

Defining DSH has proven to be a formidable task and inconsistencies in terminology and definitions have hindered the ability to review and integrate much of the literature. Over 30 terms have been identified to describe this phenomenon, including self-mutilation, parasuicide, cutting, auto-aggression, delicate self-cutting, symbolic wounding, local self-destruction, self-abuse, self-inflicted violence, and self-injurious behaviour (Ross & McKay, 1979). Various terms and definitions have been criticized for

being overly inclusive, too specific, misleading or judgemental (Connors, 2000). Some authors include indirect self-harming behaviour such as drinking heavily, major acts of self-harm such as self-amputation, and stereotypic self-injurious behaviour such as head banging, while others might be quite specific and exclude any self-harming behaviour that does not involve mild to moderate skin cutting in women (Feldman, 1988; Suyemoto, 1998). In addition, some include isolated episodes of DSH, while others require repetitive instances of DSH. 'Deliberate self-harm' or 'non-suicidal self-injury' are terms that tend to be considered accurate, non-judgemental, and sufficiently descriptive, and are therefore preferred terms for many researchers. As a result of these disparate definitions of DSH and the consequent differences in sample selection, the body of literature on this topic is quite heterogeneous. Further complicating this issue is the fact that publications on DSH appear in a wide variety of professional journals including but not limited to psychiatry, psychology, general medicine, surgical medicine, emergency medicine, dermatology, criminology, sociology, and anthropology. These factors can render it difficult to integrate findings or compare across studies.

Recognizing this challenge, Favazza (1996) endeavoured to integrate the important features of DSH into an appropriate operational definition. He defined DSH or self-mutilation as "the deliberate, direct destruction or alteration of body tissue without conscious suicidal intent" (Favazza, 1996, p. 260). He emphasized that the act is deliberate rather than accidental, direct rather than indirect, and not a consciously suicidal act. This definition addresses some of the problems of previous researchers who often broadened their definition to include suicidal gestures and attempts, and indirect forms of self-harm such as overdoses or high-risk behaviour. In his writing, Favazza (1996) also endeavoured to address the social acceptability of the act in cultural context.

Suyemoto (1998) extensively reviewed the literature and after integrating the features that appear to be commonly viewed as central to DSH, suggested the following as the best-fitting definition: "(DSH) is a direct, socially unacceptable, repetitive behavior that causes minor to moderate physical injury; when (deliberately self-harming), the individual is in a psychologically disturbed state but is not attempting suicide or responding to a need for self-stimulation or a stereotypic behavior characteristic of mental retardation or autism" (p. 532). Single episodes, self-stimulation or stereotypic

behaviour, indirect self-harm such as risk-taking behaviour, and culturally sanctioned acts like minor piercing or tattooing are therefore excluded from this definition. While perhaps somewhat cumbersome, this definition seems representative of the elements generally acknowledged to be central to DSH. As noted above, many studies of DSH continue to include any self-injury with both suicidal and non-suicidal participants in a single group (for example, Arensman, Townsend, Hawton, Bremner, & Feldman, 2001; Haw, Hawton, Houston & Townsend, 2001; Hawton, Hall, Simkin, Bale, Bond, Codd & Stewart, 2003; Hawton, Rodham, Evans & Weatherall, 2002; Hurry, 2000). This is an important distinction, as evidence supports the notion that suicidal behaviour and deliberate self-harm are likely distinct processes associated with different features (Fulwiler, Forbes, Santangelo, & Folstein, 1997; Walsh & Rosen, 1988). Given the explicit and comprehensive nature of Suyemoto's (1998) definition, this will be the definition used for the purposes of this study.

Classification of Impulsive and Compulsive DSH

Favazza and colleagues outlined a method for classifying DSH in a clinically relevant manner (Favazza, 1996; Favazza & Rosenthal, 1990; Simeon & Favazza, 1995). This classification system is frequently referred to in the contemporary literature and, while it is considered a heuristic or hypothetical model (rather than empirically derived), it has been used as a basis for classification of DSH in some studies (for example, Favaro & Santonastaso, 1998, 1999). At its most broad level, Favazza's categorization separated DSH into culturally sanctioned *versus* deviant-pathological self-injury. Culturally sanctioned DSH is that which involves rituals and practices that are repeated consistently across generations within a culture or society, and which reflects the traditions, beliefs, and symbolism of that group. Examples of this type of self-mutilation include religious healers self-harming and using blood in healing rituals, and scarification to identify social standing or tribal membership. These forms of self-injury are commonly encountered within specific cultural groups, and are therefore sanctioned and supported by those who identify with that culture. Deviant-pathological self-injury, on the other hand, refers to acts of DSH that are not culturally sanctioned, and are therefore viewed as problematic.

Favazza (1996) further divided deviant-pathological DSH into three sub-

categories. First, major DSH consists of sudden and severe acts of self-harm that are most commonly associated with psychosis or acute intoxication. These acts occur infrequently or most typically in a single episode and involve a great deal of tissue damage, such as self-amputation or eye enucleation. Favazza noted that such acts are often reported to be in response to hallucinations, literal interpretations of religious doctrines, or significant distortions in thinking and logic. Second, stereotypic self-injury involves stereotypic acts of self-harm that are repetitive in a monotonous and rhythmic pattern, for example repetitive head banging or constant biting that is often associated with pervasive developmental disorders and neurological dysfunction. Favazza (1996, 1998) explained that in this form of DSH, symbolic meaning or associated thought content or affect is difficult to discern or presumably absent, and the behaviour is believed to be highly biologically driven. Third, moderate/superficial DSH refers to self-harm that involves moderate tissue damage with low potential for lethality, including cutting, burning, skin scratching, skin picking, hair pulling, and carving.

According to Favazza's model (1996, 1998), moderate or superficial DSH can be further subdivided into three categories: compulsive, episodic, and repetitive. Favazza and others (Simeon & Favazza, 1995) describe compulsive self-mutilation as an act of superficial/moderate self-harm that occurs several times daily in a repetitive and ritualistic manner. Favazza (1998) cites trichotillomania, or recurrent hair-pulling, as the most studied and typical example of compulsive self-mutilation, although repetitive skin-picking and nail-biting are also classified as "compulsive." Trichotillomania is currently classified as a disorder of impulse control in the DSM-IV (2000), since it occurs in response to an irresistible urge or impulse and is followed by a sense of gratification or relief. However, trichotillomania has been described as occurring in an automatic fashion, and is typically devoid of conscious intent, elaborate thought content or affective experience; this is comparable to the presentation of individuals diagnosed with obsessive-compulsive disorder (OCD), with primarily compulsions and few or no obsessions (Favazza, 1998). Therefore, while it is referred to here as compulsive self-mutilation, it should be noted that this proposed form of DSH likely has both impulsive and compulsive elements (Simeon & Favazza, 1995).

In contrast with Favazza's description of compulsive DSH, which appears to focus

on the nature of the act itself, episodic and repetitive DSH derive their names from the frequency of occurrence of the act. Simeon and Favazza (1995; 2001) explained that the broader category of impulsive DSH could subsume both episodic and repetitive forms. However, despite this suggestion of a similar impulsive quality to the act, Favazza (1996, 1998) has noted some differences in the nature of DSH in these two remaining groups. Specifically, episodic DSH refers to self-injury that occurs 'every so often'. Favazza explained that individuals who engage in episodic DSH do not think a great deal about the behaviour, and they do not integrate the behaviour into an identity for themselves. These individuals tend to deliberately harm themselves to achieve a desirable result, such as to feel better, to get rapid relief from distressing thoughts and emotions, to relieve anxiety, or to regain a sense of control. Favazza described episodic DSH as occurring as a symptom or associated feature of a variety of DSM-IV diagnoses, as well as in response to general psychological distress, intrapsychic conflict, or stressful life circumstances. Thus, the conditions under which this type of self-injury occurs are quite varied, rendering it quite difficult to develop a cohesive sense of episodic DSH as an entity.

Favazza (1998) suggested that episodic DSH becomes repetitive DSH when the individual becomes overwhelmingly preoccupied with self-harming. In his view, the individual may describe their self-harm as an addiction, as the behaviour "seems to assume an autonomous course" (Favazza, 1998, p. 264). These individuals are described as being preoccupied with acts of self-harm, they experience cravings to engage in the behaviour, and they may experience 'withdrawal' symptoms when prevented from acting. Furthermore, Favazza (1996; 1998) noted that individuals who engage in repetitive DSH may embrace an identity as 'a cutter' or 'a burner', and the behaviour takes on a more central role in the individual's life as compared to someone who engages in episodic DSH. Individuals engaging in repetitive DSH may develop a ritualized sequence of behaviours lasting for hours or days before acting (Connors, 2000). Favazza (1996) proposed that repetitive DSH is best regarded as an impulse control disorder due to its frequent, uncontrolled pattern and impulsive quality. Of note, Favazza (1998) also indicated that transition from episodic to repetitive self-injury as variable from person to person; the graduation from episodic to repetitive may occur between the 5^{th} and 10^{th} episode for one person, and between the 15^{th} and 25^{th} for another. This presents some

difficulty in attempting to delineate these two subgroups on an objective level.

Favazza's (1996) system for classifying DSH has been praised for its clinical utility, and seems to correspond with some general patterns in the literature. For example, the domain of self-injurious behaviour in children with developmental delays has been treated as a clinical issue associated with particular populations and features, but that area of work seems clearly separate from individuals who engage in singular acts of self-harm while in psychotic states, or who deliberately cut or burn themselves in response to distress. However, the distinction among the three proposed subtypes of superficial/moderate self-harm is less clear, and has not been sufficiently explored in the literature. As a result, some researchers have referred to "compulsive" and "impulsive" DSH as the two principal categories of moderate or superficial DSH (Simeon & Favazza, 1995). However, qualifying these subtypes in this way seems premature, given the relatively little empirical work that has attempted to validate the impulsive and compulsive qualities of DSH in these individuals.

Prevalence of DSH

Due to the variations in definitions of DSH, the varied populations studied, and the diverse nature of the problem, prevalence estimates have been somewhat difficult to ascertain. In addition, a number of authors have suggested a general increase in DSH in clinical and community populations in recent years (i.e., Hawton et al., 2003; Ross & Heath, 2002; Walsh & Rosen, 1988; Whitlock, Eckenrode, & Silverman, 2006; Yates, 2004). Several prevalence estimates have been offered in clinical and non-clinical populations, ranging from 4% to over 61% (Briere & Gil, 1998; DiClemente, Ponton, & Hartley, 1991; Muehlenkamp & Gutierrez, 2004).

Recent studies examining relatively large community or non-clinical samples have reported DSH rates of 4% in the general population (Briere & Gil, 1998) and in non-clinical military recruits (Klonsky, Oltmanns, & Turkheimer, 2003). As would be expected, the prevalence of DSH in clinical populations has been estimated to be considerably higher than that of the general population, in the range of 21% for a mixed clinical sample of inpatients and outpatients reported (Briere & Gil, 1998). Generally, in psychiatric inpatient populations, estimates have ranged from 4.3% to 20% (Suyemoto,

1998), although when adolescent inpatients alone are considered, estimates are as high as 40% (Darche, 1990) to 61% (DiClemente et al., 1991). DSH constitutes a symptom of Borderline Personality Disorder (APA, 2000), and rates in this population range from 63-80% (Shearer, 1994; Shearer, Peters, Quaytman, & Ogden, 1990). Prisoner populations have also received some attention in the literature, with up to 50% of prisoners reportedly engaging in self-harm behaviour and only 10% of these presenting with a serious suicidal risk (Chapman, Specht, & Cellucci, 2005; Haines, Williams, Brain, & Wilson, 1995). Many studies of DSH focus on psychiatric inpatients, adolescent inpatients, and prisoners given the high incidence and convenience of these samples (Walsh & Rosen, 1988).

Since the onset of DSH is commonly reported during the adolescent to young adulthood years and since DSH is often not disclosed to mental health professionals (Whitlock et al., 2006), non-clinical high school and undergraduate samples are particularly important to consider. In a study of public high school students, 15.9% admitted to engaging in DSH (Muehlenkamp & Gutierrez, 2004), while surveys of American undergraduate and graduate students have found 8% to 17% of students reporting DSH (Favazza, 1989, 1992; Whitlock et al., 2006). More strikingly, in some undergraduate samples, 35% (Gratz, 2001) to 40% (Paivio & McCulloch, 2004) of students admitted to a history of DSH on at least one occasion. Although these latter two studies included infrequent and minor acts of DSH, it is apparent that the proportion of non-clinical adolescents and young adults engaging in DSH is substantial.

Therefore, even the most conservative estimates suggest that DSH is a serious issue in both clinical and non-clinical populations. Indeed, more attention must be allotted to these non-clinical populations, since much of the literature to date has utilized samples of psychiatric inpatients, outpatients, and prisoners. The nature of DSH in these latter populations may not be generalizable to non-clinical populations who engage in DSH. Clearly, non-clinical adolescents and young adults engaging in DSH constitute a substantial sized population worthy of more in-depth study (Ross & Heath, 2002).

Age at Onset and Course

The estimated age at onset and course of DSH varies, perhaps in part due to the variability in definitions used, populations studied, type of DSH, and individual variables.

Many researchers have reported the age at onset to be in the range of early teens to early twenties (Favazza, 1992; Favazza & Conterio, 1988; Feldman, 1988; Graff & Malin, 1967; Pao, 1969; Pattison & Kahan, 1983; Rosenthal et al., 1972). Clinical reports tend to support these findings (Levenkron, 1998; Smith, Cox & Saradjian, 1999). One recent non-clinical sample of undergraduate and graduate students reported a range of age of onset from age 10 to 20 in approximately 86% of individuals, with an average age of onset of 15 to 16 years (Whitlock et al., 2006). In a study of non-clinical adolescents, the average age of onset was 13.5 (Nock & Mendes, 2008).

In terms of the course of DSH, some authors have indicated that repetitive DSH typically continues for 5 to 10 years (Favazza, DeRosear, & Conterio, 1989) or 10 to 15 years (Favazza & Rosenthal, 1993) before subsiding. Indeed, Briere and Gil (1998) found that rates of DSH tend to decline in middle adulthood in both clinical and community samples. However, DSH has been noted to persist for decades in some cases and may remain prominent into later adulthood (Favazza et al., 1989; Sansone, Gaither & Songer, 2002). In addition, the course may wax and wane, becoming more or less prominent at different points over the course of the individual's life (Favazza & Rosenthal, 1993). Explanations for this generally variable course have not yet been delineated, but are likely related in part to the tremendous variation in the types of DSH, the range of associated disorders, and the individual and environmental features related to this phenomenon.

Characteristics of DSH

Despite the methodological problems that have plagued the early literature on DSH, there has been some consistency with respect to the characteristics of DSH itself. Multiple episodes and multiple methods are commonly reported (Favazza & Conterio, 1989; Gratz, 2001; Nock & Mendes, 2008; Walsh & Rosen, 1988; Whitlock et al., 2006). For example, Pattison and Kahan (1983) found that in their sample, the number of episodes ranged from 1 to 100, with 59% reporting 5 to 100 episodes; of those with multiple episodes, a mean of 21 episodes and mode of 15 episodes was reported. Favazza and Conterio (1988) found that the average number of acts of DSH in their survey was 50. Studies of non-clinical adolescents engaging in DSH report up to 82% with multiple

episodes (Ross & Heath, 2002). In one study of community adolescents engaging in multiple episodes of DSH, an average of 62.6 episodes was reported (Nock & Mendes, 2008). Thus, multiple episodes appear to be common in both clinical and non-clinical samples.

The superficial/moderate form of DSH is considered to be the most varied and most common class of DSH seen in clinical practice (Favazza & Rosenthal, 1993). In a sample of 52 adolescent inpatients who admitted to DSH, Walsh and Rosen (1988) found that 91% caused themselves no more than moderate physical harm; of this group, 68% caused what was described as superficial or mild damage. Similarly, in a non-clinical college sample, less than one-quarter (21.1%) injured themselves more severely than expected on one occasion and a minority (6.5%) sought medical treatment at least once for a self-injury incident (Whitlock et al., 2006). Thus, this form of DSH appears to be typically of low lethality in clinical and non-clinical samples.

While most individuals identify a preferred method of DSH, the majority use multiple methods over time (Briere & Gil, 1998; Favazza, 1996; Favazza & Conterio, 1988; Pattison & Kahan, 1983; Walsh & Rosen, 1988; Whitlock et al., 2006). Cutting is overwhelmingly cited as the most common method of DSH but burning with heat or chemicals, hitting, scratching, picking, abrading, inserting sharp objects, biting, wound interference, breaking of bones and hair pulling are among the countless other methods reported (Favazza, 1996; Favazza & Conterio, 1998; Penn, Esposito, Schaeffer, Fritz, & Spirito, 2003; Ross & McKay, 1979; Smith et al., 1999; Walsh & Rosen, 1988; Whiltock et al., 2005). Although DSH may affect multiple areas of the body, DSH is most often reported to affect the wrists, forearms, and legs (Briere & Gil, 1998; Favazza, 1992, 1998; Herpertz, 1995; Whitlock et al., 2006). Although injury is by definition mild to moderate in degree, the scars that result from DSH can lead to permanent physical disfigurement, social isolation and rejection (Briere & Gil, 1998; Favazza, 1989). The experience of pain varies among this population, with some studies reporting up to half of individuals reporting total or relative analgesia during the act of self-harm (Winchel & Stanley, 1991). However, this may be in part related to sample selection, as borderline personality disorder, dissociation, and psychosis have been overrepresented in some samples.

Gender

The importance of considering gender in DSH has been identified but no consensus has been found. Many reports have suggested that the prevalence of DSH is much higher in females than in males (Favazza & Conterio, 1988; Ross & Heath, 2002; Suyemoto, 1998; Walsh & Rosen, 1988). Several works in the popular literature use only feminine language and case examples of women who engage in DSH, promoting the notion that DSH is almost exclusively a female problem (for example, Levenkron, 1998; Smith et al, 1998). Males who engage in DSH are sometimes excluded from studies, at times because males are believed to be "atypical" in some respects (i.e., Graff and Malin, 1967).

As a result of this focus on females who engage in DSH, there is relatively little known about males who may engage in this behaviour. However, it is important to note that some studies have found no significant differences in the rates or other characteristics of DSH in males as compared to females (Briere & Gil, 1998; DiClemente et al., 1991; Gratz, Conrad & Roemer, 2002; Klonsky et al., 2003). Some have suggested that the rates are truly equivalent but that males tend to present somewhat differently, possibly claiming an accidental reason for injury or using different methods of DSH (Claes, Vandereycken, & Vertommen, 2006; Whitlock et al., 2006); alternatively, women may be more willing to seek treatment in mental health facilities, while males may be more likely to remain silent or find themselves in a correctional facility (Connors, 2000). Further, the tendency towards using psychiatric samples may result in an overrepresentation of women in the literature (Yates, 2004). Therefore, while some studies have begun to examine DSH specifically in males (i.e., Gratz & Chapman, 2007), additional research is needed in this area.

Culture and Ethnicity

Few studies have focused attention on culture and ethnicity in the context of DSH. Most samples that explicitly report the ethnicity of participants have found much higher rates of DSH in Caucasians as compared to other ethnicities (for example, Favazza & Conterio, 1989; Garrison et al., 1993; Gratz, 2006; Ross & Heath, 2002; Whitlock et al., 2006), although this may be in part an artefact of the population being sampled rather

than an actual difference in prevalence across cultures. Some studies have begun to explore the prevalence and features of DSH in non-Caucasian samples, with 9.9% of Japanese high school students (Matsumoto & Imamura, 2008) and 21.4% of Turkish high school students (Zoroglu et al., 2003) reporting a history of at least one episode of DSH. Thus, while these suggest some similar prevalence rates cross-culturally, studies making direct comparisons focusing on cultural factors are needed.

DSH and the DSM-IV Nomenclature

Despite suggestions by some researchers to include DSH as an Axis I disorder of impulse control or an independent syndrome (Favazza, 1998; Favazza & Rosenthal, 1993; Muehlenkamp, 2005; Pattison & Kahan, 1983), deliberate self-harm does not currently appear as a diagnosable disorder in the DSM-IV (APA, 2000). However, it does appear in the context of Borderline Personality Disorder (BPD) which requires "a pervasive pattern of instability of interpersonal relationships, self-image and affects, and marked impulsivity beginning by early adulthood and presenting in a variety of contexts" (APA, 2000, p. 654) as indicated by five or more of nine symptoms. One of these symptoms is "recurrent suicidal behaviour, gestures, or threats, or self-mutilating behaviour" (APA, 2000, p. 654). It has been observed that many professionals tend to equate DSH with BPD, which may be an erroneous assumption. Diagnosing BPD can be a 'knee-jerk' response to self-harming behaviour, which unfortunately does not increase our understanding of DSH and may result in a failure to understand the full presentation (Greenspan & Samuel, 1989). BPD is a very heterogeneous diagnostic group, with widely varying symptoms that may or may not include DSH. Furthermore, the DSH-related criterion includes recurrent suicidal behaviour or gestures, which has been established as distinct from DSH in several important respects (Ross & McKay, 1979; Walsh & Rosen, 1988).

DSH may also be considered in the context of an Axis I diagnosis of Impulse Control Disorder Not Elsewhere Classified. According to the DSM-IV (APA, 2000), the class of impulse control disorders includes disorders where the individual fails to resist an impulse, drive or temptation to perform an act that is harmful to the individual or others. In most cases, the individual "feels an increasing sense of tension or arousal before

committing the act and then experiences pleasure, gratification, or relief at the time of committing the act. Following the act there may or may not be regret, self-reproach, or guilt" (APA, 2000, p.663). These disorders include intermittent explosive disorder, kleptomania, pyromania, pathological gambling, and trichotillomania. For disorders involving impulse control that do not meet criteria for these or other disorders, a diagnosis of impulse control disorder not otherwise specified (ICD NOS) is indicated (APA, 2000). This is often the diagnosis employed for individuals who engage in repetitive DSH when the self-harming behaviour is not exclusively part of BPD. It should be noted that the group of ICDs have been criticized for being among the most poorly delineated disorders, as most of them are viewed as sharing impulsive and compulsive features; however, relatively little empirical data has been offered to clarify the contribution of impulsive and compulsive processes in these disorders (McElroy, Pope, Keck, & Hudson, 1995). Indeed, perhaps in part for this reason, a DSM-V task force has recently been developed to consider the appropriate placement of OCD and ICDs in the DSM nomenclature, with new ICDs being proposed as "impulsive-compulsive" disorders (i.e., Impulsive-Compulsive shopping and Impulsive-Compulsive skin picking) (Dell'Osso, Altamura, Allen, Marazziti, & Hollander, 2006).

Diagnoses Associated with DSH

In general, self-harming behaviours including both DSH and suicide attempts have been associated with psychiatric disorders in clinical populations (Haw et al., 2001) and community populations (Skegg, Nada-Raja, & Moffitt, 2004). The most frequently reported associations link DSH to borderline personality traits (Herpertz, Sass, & Favazza, 1997; Zweig-Frank, Paris, & Guzder, 1994), dissociation (Shearer, 1997; Zweig-Frank et al., 1994), and anxiety (Simeon et al., 1992), although many of these studies were conducted exclusively with individuals diagnosed with borderline personality disorder which may limit their applicability to other DSH populations. Many studies have reported a relationship between DSH and childhood abuse or trauma (for example, Briere & Gil, 1998; Favazza & Conterio, 1989; Gratz, 2003; Romans et al., 1995; Wiederman, Sansone, & Sansone, 1999). In a sample of non-clinical college students, the most significant predictors of DSH were found to be dissociation, sexual

abuse, childhood separation, emotional neglect, physical abuse, and insecure attachment (Gratz et al., 2002). However, more recently, the specificity of the relationship between early abuse experiences and DSH has been questioned, as some evidence suggests that this association may be mediated by general psychiatric risk factors (Klonsky & Moyer, 2008), PTSD symptoms (Weierich & Nock, 2008), or a diagnosis of Borderline Personality Disorder (Zweig-Frank et al., 1994).

Depression has frequently been reported to occur in individuals who engage in DSH (Briere & Gil, 1998; Darche, 1990; Ross & Heath, 2002), although some researchers have found no effects for depression (Simeon et al., 1992) or lower rates of depression associated with DSH (Langbehn & Pfohl, 1993). High rates of eating disorders have been reported in individuals who engage in DSH, with some rates as high as 61% (Darche, 1990; Favazza, DeRosear & Conterio, 1989; Favazza & Rosenthal, 1993; Svirko & Hawton, 2007). Similarly, high rates of self-harm have been reported in female inpatients diagnosed with eating disorders, with a 35% lifetime rate of self-injury estimated in that group (Paul, Schroeter, Dahme, & Nutzinger, 2002). However, Zlotnick, Mattia and Zimmerman (1999) found no relationship between DSH and eating disorders.

DSH has also been reported to occur in association with a variety of other Axis I disorders including but not limited to posttraumatic stress disorder (Greenspan & Samuel, 1989), anxiety and anxiety disorders (Klonsky et al., 2003; Ross & Heath, 2002), learning disabilities (Lovell, 2008), substance abuse and a range of both internalizing and externalizing disorders (Nock, Joiner, Gordon, Richardson, & Prinstein, 2006). DSH has also been associated with Axis II disorders or symptoms apart from BPD (Klonsky et al., 2003; Nock et al., 2006). As noted above, DSH may occur in response to significant levels of anxiety or tension, which could be associated with virtually any formal DSM-IV disorder, as well as general psychological distress or stressful life circumstances. Thus, in many cases DSH transcends diagnostic categories and may be a component of virtually any presentation, and the evidence for diagnostic associations is not entirely clear.

Other Features Associated with DSH

In terms of other features associated with DSH, the literature outlines a myriad of correlations, but many studies have not been adequately replicated or scrutinized in appropriate samples. For example, studies have identified a relationship between DSH and family dysfunction and the absence of a family confidant (Tulloch, Blizzard, & Pinkus, 1997), parental criticism and alienation from parents (Yates, Tracy & Luthar, 2008), anger and hostility (Chapman & Gordon, 2007; Darche, 1990; Simeon et al., 1992), self-critical tendencies (Herpertz et al., 1997), physical illnesses and complaints (Herpertz, 1995), a history of early surgical procedures or illnesses (Favazza, 1992), sexual dysfunction (Graff & Malin, 1967), perfectionistic tendencies (Favazza, 1992), and socio-economic deprivation (Ayton, Rasool & Cottrell, 2003). Although suicidal behaviours are generally recognized as being quite different from non-suicidal DSH behaviour, there is some evidence of common risk factors (Walsh, 2006). Favazza and Conterio (1989) reported that 57% of people who engaged in repetitive DSH attempted suicide by overdose. It has been suggested that when these individuals attempt suicide, it is typically in a modality that is quite different from their usual method of DSH (Favazza & Conterio, 1989; Simeon & Favazza, 1995; Walsh, 2006).

Some have described individuals who engage in repetitive DSH as 'heavy users' of the mental health system in terms of hospitalizations and number of outpatient sessions (Favazza & Conterio, 1988; Favazza & Rosenthal, 1993). However, it has been noted that many such studies have utilized clinical populations, perhaps inflating the perceived association between DSH and serious psychopathology. In contrast, a study of college students found that 40% students reported they avoided disclosing DSH to a mental health professional (Whitlock et al., 2006) suggesting that DSH may tend to be considered a private act and help-seeking may be less frequent in some samples.

Recently, researchers have begun to explore aspects of emotion regulation in individuals who engage in DSH. In particular, these individuals have been found to have higher levels of negative affect in general, both in temporal proximity to DSH episodes and after DSH had discontinued for more than one year (Brown, Williams, & Collins, 2007). Deficits in emotional awareness and expression are also reported in individuals with a history of DSH (Gratz, 2006; Paivio & McCulloch, 2004; Zlotnick et al., 1996).

As noted below, one of the commonly identified functions of DSH has been affect regulation (Klonsky, 2007) and many theorize that difficulty tolerating affect, emotion dysregulation, and experiential avoidance are key factors (Chapman et al., 2005; Gratz, 2007).

One exploratory latent class analysis examined subgroups of non-clinical college students with a history of DSH based on DSH method, function (i.e. automatic versus social functions), and clinical variables including depression, anxiety, BPD symptoms, and suicidal behaviour (Klonsky & Olino, 2008). This study found four subgroups, to which participants were assigned and compared. Approximately 78% of participants were assigned to the first two classes (referred to as the "experimental" and the "mild" groups), which were associated with fewer psychiatric symptoms and fewer DSH behaviours. The remaining 22% of participants were assigned to the remaining two classes (referred to as the "multiple functions/anxious" and "automatic functions/suicidal" groups), which were associated with more varied DSH methods, multiple functions, and more psychiatric symptoms. Of note, the "automatic functions/suicidal" group endorsed a longer latency (i.e., more than one hour) from the urge to the act of DSH, suggesting a deliberate, premeditated (or non-impulsive) effort to regulate affect (Klonsky & Olino, 2008). Thus, recent research has begun to explore the multiple interrelated features associated with DSH including the types, functions, and clinical variables associated with DSH. Additional research and replication is needed in this area.

Functions of DSH

A variety of explanations have been offered to explain what motivates people to engage in DSH. Several researchers have offered interesting theoretical or hypothetical models explaining the functions of DSH (for example, Suyemoto, 1998), but fewer researchers have endeavoured to evaluate these themes empirically. In an early attempt to clarify the functions of DSH, Favazza and Conterio (1989) gathered data on 300 individuals who engaged in chronic DSH and identified themes such as to relieve symptoms, release tension, slow down racing thoughts and fluctuating emotions, terminate episodes of depersonalization, vent anger, elicit a caring response from others, feel special and less lonely, negate sexual feelings, fulfil the demands of alternate

personalities, and atone for sins.

More recently, Klonsky (2007) reviewed 18 studies that empirically examined the functions of DSH, including those from self-report of reasons for DSH, self-report of phenomenology of DSH, and laboratory studies of proxy DSH. Klonsky identified 7 functions that were repeatedly examined in the literature and evaluated the evidence for each. Affect regulation, or DSH serving to alleviate negative affect or aversive experiences, was the most commonly examined function of DSH and was the function with the most empirical support. Other functions identified included: an anti-dissociation function where DSH serves to end dissociation-related experiences or induce feeling; an anti-suicide function where DSH helps the individual resist suicidal urges by compromising or replacing suicide with a less lethal option; an interpersonal boundaries function where DSH helps the individual distinguish boundaries between the self and others, such as expressing autonomy or identity; an interpersonal-influence function where the individual uses DSH to communicate with or elicit a response in others; a self-punishment function where DSH is a means to express anger against the self or self-loathing; and a sensation-seeking function where DSH is used to bring about feelings of excitement or exhilaration. Apart from the strong support for the affect regulation function of DSH across studies, evidence for the self-punishment function was good and evidence for the remaining functions was more modest and variable across some studies. Klonsky also observed that this pattern of support for the various functions of DSH held fairly constant across clinical, non-clinical, forensic, adult, adolescent, male and female samples.

Other models of the functions of DSH have also begun to emerge. For example, Nock and Prinstein (2004) presented evidence of a four-function model based on the reinforcing effects of DSH. This model emphasized the automatic or self-reinforcing effects of DSH (including negative reinforcement or reduction of negative affect or states, and positive reinforcement or induction of positive affect or states) and the social or other-reinforcing effects of DSH (including negative reinforcement or removal of unpleasant social circumstances, and positive reinforcement or obtaining desirable social circumstances). In Nock and Prinstein's study, the automatic function of DSH was most commonly identified, suggesting that DSH is commonly used as a means of increasing or

decreasing emotional or physiological experiences (i.e., positive and negative affect or tension states). However, the social functions of DSH were also supported as important factors. In a subsequent study addressing antecedents of DSH, Nock and Prinstein (2005) identified an association between DSH and little or no contemplation before DSH (interpreted as indicative of impulsivity), an absence of pain, and an absence of substance abuse. However, Nock and Prinstein's (2004; 2005) samples consisted of adolescent psychiatric inpatients and the extent to which these findings might generalize to non-clinical or young adult populations is unclear.

Those who have explored the functions of DSH tend to acknowledge that these functions are likely complex and interrelated, requiring additional empirical evaluation. DSH is broadly considered to be an overdetermined behaviour, potentially serving a variety of functions for a given individual (Klonsky, 2007; Suyemoto, 1998). However, research is beginning to show some underlying functions and characteristics that are shared across many individuals' DSH. Although they are relatively infrequently examined in the literature on DSH, impulsive and compulsive characteristics may be among the relevant underlying processes. Indeed, they have been frequently referred to as categories or classes of DSH (Simeon & Favazza, 1995) despite relatively little empirical evidence for this distinction as outlined below. Clarifying the role or features of impulsivity and compulsivity in DSH would further contribute to an empirically-based understanding of the purpose and process of DSH.

Treatment of DSH

Perhaps due to the heterogeneity of the individuals who engage in DSH and the relatively early stage of empirical study of the functions and process of DSH, there are few treatments that have been consistently demonstrated to be effective with this population. Among the psychological interventions that have been studied, dialectical behaviour therapy (DBT; Linehan, 1993) is commonly referenced as an effective intervention for this group. DBT focuses on emotion dysregulation and combines cognitive behavioural approaches and acceptance and mindfulness approaches, and it has been demonstrated to reduce DSH in individuals with Borderline Personality Disorder (Linehan et al., 2006). An acceptance-based emotion regulation group therapy

intervention based on DBT and related therapies was also shown to be effective in reducing DSH frequency and variables related to emotion dysregulation (Gratz & Gunerson, 2006; Gratz, 2007). Some preliminary evidence for the effectiveness of cognitive behavioural therapies (CBT; Townsend et al., 2001), psychodynamic approaches (Levy, Yeomans, & Diamond, 2007), and feminist approaches (Brown & Bryan, 2006) have also been offered, and many authors highlight the importance of the therapeutic alliance for this population (Nafisi & Stanley, 2007; Walsh, 2006). The body of literature examining specific interventions for DSH is in its relatively early stages, and comparisons across modalities or efforts to delineate the effective components of treatment have not been systematically conducted to date.

This study will contribute to an empirically-based understanding of the impulsive and compulsive features of DSH and further develop the basis for treatment of this commonly encountered and complex problem. Since impulsivity and compulsivity will be concretely operationalized and examined in the context of DSH, these findings could enhance the ability of researchers and practitioners to design appropriate assessment and intervention strategies. The treatment approaches for impulsive behaviours and more compulsive behaviours can be quite different. For example, psychological intervention for an impulsive individual who has difficulty refraining from acting on a desirable impulse for gratification might focus on motivation for change, developing a sense of self-control, learning problem solving or other skills to enhance the ability to refrain from impulses, or developing more adaptive means of gratification (Stone, 1996). In contrast, psychological treatment for compulsive symptoms involving a difficulty resisting the compulsion to act for tension reduction could involve exposure and response prevention strategies, distress tolerance skills, anxiety management, or decreasing the exaggerated sense of responsibility (Barlow, 2008; Stone, 1996). Thus, the findings of this study may have implications for the assessment and treatment of DSH.

The Relationship Between Impulsivity and Compulsivity

Before examining impulsivity and compulsivity in DSH, it is important to develop a clear operationalization of these constructs. This is a more complex task than might be expected. The distinction between impulsivity and compulsivity is not a simple one to

make since the two constructs seem to have some overlapping components. In the most broad sense, both impulsivity and compulsivity are characterized by a sense of pressure (which may be described as a momentary impulse or urge, or as a generalized sense of mounting tension), which is followed by a behavioural response and in turn results in a sense of relief or a more positive state (APA, 2000; Oldham et al., 1996). Although some important distinguishing features have been outlined and are discussed below, the most basic descriptions of impulsivity and compulsivity share this similar pattern. Moreover, in discussions of what is believed to be an impulsive behaviour (such as episodic or repetitive DSH), many point to this pattern of pressure, action, and relief as evidence for an impulsive process; however, this assumption is problematic given that this general pattern is too vague and broad to capture the nature of impulsivity, and could equally reflect compulsivity. As noted, a DSM-V task force has been developed to consider the appropriate placement of OCD and ICDs in the DSM nomenclature and the relevance of impulsivity and compulsivity to ICDs, reflecting the potential relationship between the constructs (Dell'Osso et al., 2006). However, as outlined below, the literature base is underdeveloped and a more detailed examination of the phenomenology and relationship between these two constructs is necessary before DSH behaviours can be deemed impulsive or compulsive or both.

In recent years, conceptual models have been proposed to explain the relationship between impulsivity and compulsivity, in part to account for and clarify this overlap in the two constructs. An obsessive-compulsive (OC)-spectrum model has been proposed, in which groups of disorders or syndromes are believed to be related to OCD in clinical symptoms, neurobiology, and treatment response; three such groups consist of pre-occupations with bodily sensations or appearance, neurological disorders, and impulsive disorders (Hollander, 2005; Hollander & Wong, 1995). Hollander (1995) describes the cluster of 'impulsive disorders' as including the impulse control disorders and self-injury, where individuals give in to an impulse and engage in behaviour that is associated with pleasure or gratification.

Some models have suggested that impulsivity and compulsivity are separate orthogonal dimensions, and that high or low levels of both can exist in a single person or behaviour (Corr, 2002, 2004; Favaro & Santonastaso, 1998; Lacey & Evans, 1986;

Steiger et al., 2003). Others have proposed a continuum or spectrum on which impulsivity and compulsivity are at the two extremes, and mixed presentations involving some degree of both impulsivity and compulsivity fall at various points along the continuum (Oldham et al., 1996). Some studies cite correlations between impulsivity and compulsivity and the comorbidity of some impulsive and compulsive disorders as evidence for one or both of these models (i.e., Engel et al., 2005; Hollander, 1995; Li & Chen, 2007; Skitch & Hodgins, 2004; Stein, Hollander, Simeon, & Cohen, 1994). For example, impulsivity and compulsivity could be independent constructs that are positively correlated in some populations. Alternatively, they could be at opposite ends of a continuum (where a negative correlation would be expected between the two constructs) but share an underlying characteristic, such as repetitive behaviour and a defective mechanism for inhibiting or delaying that behaviour, resulting in a positive correlation (Engel et al., 2005).

Similarly, Abramowitz and Berenbaum (2007) have suggested that a positive correlation between impulsivity and compulsivity may be due to an emotion regulation function served by of both types of behaviours, and they found high levels of both pleasant and unpleasant emotions were associated with higher levels of impulsive-compulsive psychopathology (as reflected in problem eating, substance use, sexual behaviour and obsessive-compulsive behaviour) in a sample of undergraduates. Still others suggest the possibility of a progression from impulsive to compulsive occurs in areas such as the progression from impulsive (in response to positive affect) to compulsive (in response to negative affect) shopping (Billieux, Rochat, Rebetez & Van der Linden, 2008) or in substance abuse (Belin, Mar, Dalley, Robbins, & Everett, 2008). In addition, one recent study found different facets of impulsivity were differentially related to OC symptoms in a non-clinical population, with urgency on an impulsivity measure being associated most strongly with OC symptoms (Zermatten & Van der Linden, 2008). This suggests possibly varied relationships among specific impulsive and compulsive components.

In terms of the biological and neurotransmitter function in impulsivity and compulsivity, a model of serotonergic dysfunction has been explored whereby serotonergic function is decreased in association with impulsivity and increased in

association with compulsivity (see Kavoussi & Coccaro, 1996; Hollander & Cohen, 1996 for a review). Noradrenaline and dopamine have also been implicated in some studies, although the serotonin dysregulation hypothesis seems to have received more attention (i.e., Brewerton, 1995; Insel, Zohar, Benkelfat, & Murphy, 1990). In addition, neruoanatomical differences such as increased metabolic activity and blood flow in the frontal lobes in OCD, contrasted with some evidence of decreased frontal activity in some impulsive populations has been identified as an area of interest for further study (Hollander & Cohen, 1996). These distinctions are offered as evidence of a possible continuum of impulsivity and compulsivity based on serotonergic dysfunction and hyper/hypofrontality (Oldham, Hollander & Skodol, 1996), although the evidence is mixed and further examination of these hypotheses is needed (Steiger et al., 2003; Stein et al., 1996).

Thus, much of the research in this area is varied and the relationship between impulsivity and compulsivity appears complex. There is a general acknowledgement that both impulsivity and compulsivity represent multidimensional constructs that likely have a multifaceted relationship. Additional research is needed in this area to clarify the relationship between impulsivity and compulsivity in general, and how these constructs relate to specific populations.

In relating these models to DSH, two qualitatively different types of DSH have been proposed: "impulsive" DSH refers to episodic or repetitive self-cutting, burning, or hitting, while "compulsive" DSH includes highly repetitive hair-pulling, nail-biting, and skin-picking (Simeon & Favazza, 1995). These authors and others also acknowledge that both impulsive and compulsive components may be present in either form of DSH. This model could therefore be represented by two independent characteristics that can co-exist in a single individual or behaviour to varying degrees. It could also be represented in a continuum model with impulsive DSH and compulsive DSH at the extremes and varied mixed presentations along the continuum. However, it is difficult to consider either model at present since there is a striking lack of sound empirical support for a distinction between "impulsive" and "compulsive" DSH. Furthermore, these two constructs are multidimensional, they share some basic overlapping aspects, and they are neither consistently nor concretely operationalized in much of the literature. Therefore, it

remains difficult to consider these constructs individually, let alone in combination.

Since uncertainty about the relationship between the constructs of impulsivity and compulsivity remains, it has been difficult to address the impulsive and compulsive characteristics of DSH. While some researchers have attempted to evaluate the nature of these processes from an objective standpoint, no studies to date appear to have specifically and systematically addressed the impulsive and compulsive features of DSH. Therefore, this study will use a concrete definition of impulsivity and compulsivity, multiple measures and methods, and a fine-grained analysis of the process of DSH to evaluate the possible impulsive or compulsive features of DSH. This will provide an empirical basis on which to evaluate the involvement of impulsive and compulsive processes in DSH.

The Construct of Impulsivity

Despite the tendency to refer to 'impulsivity' as an entity unto itself, this construct has historically been difficult to operationalize. It is recognized as a component of a wide variety of clinical disorders, personality styles, and behavioural or physiological patterns. Furthermore, dealing with impulsivity is considered to be one of the most challenging and costly components of clinical work (Hollander & Stein, 1995). However, rendering this important construct more concrete has proven to be challenging. One of the few points of agreement in the impulsivity literature is that it appears to be a multidimensional construct (Barratt, 1985; Evendon, 1999; Gerbing, Ahadi, & Patton, 1987; Kindlon, Mezzacappa, & Earls, 1995; Moeller, Barratt, Doughtery, Schmitz, & Swann, 2001). At its most basic level, an impulse is conceptualized as a thought or idea that is tied to a forceful urge, whereas impulsivity refers to a constellation of repeated behaviours that are somehow related to those urges (McCowan & DeSimone, 1993). However, beyond this basic and somewhat vague conceptualization, there is no general consensus on what constitutes impulsivity. As a result, the term is defined and used inconsistently across studies (Herpertz, 1995).

Perhaps due to the general acknowledgement that impulsivity is multidimensional, the construct has been conceptualized in a variety of ways including a personality characteristic, behavioural tendency, motor response, neurobiological predisposition, or

intrapsychic process, with no single explanation prevailing (Oldham et al., 1996). Corresponding measures of impulsivity have been developed, including neuropsychological tests, behavioural tasks, self-report scales, and observer-related measures (Webster & Jackson, 1997). While this multidimensional approach is commendable, it essentially perpetuates the lack of consistency in definitions of impulsivity, which has become an area of interest in its own right. There are many ways in which impulsivity can be manifested, including but not limited to cognitive, emotional, and motoric (Kindlon et al., 1999). Therefore, impulsivity may present in a variety of forms, as exemplified by the many disorders and problems discussed in the clinical literature as impulsive.

A review of the various conceptualizations of this construct reveals some points of interest and suggests some commonalities across definitions. In particular, impulsivity has been described as a problem of under-control of impulses, which has also been referred to as behavioural disinhibition or a tendency towards giving in to impulses or urges (Skodol & Oldham, 1996). Disorders typically referred to as 'impulsive' disorders include substance use disorders, paraphilias, bulimia nervosa, and impulse control disorders, as well as borderline and antisocial personality disorders (APA, 2000; Oldham et al., 1996). Indeed, the impulse control disorders are often referred to as the prototypic disorders of impulsivity, although some have compulsive features as well; these include intermittent explosive disorder, kleptomania, pyromania, pathological gambling, and trichotillomania (APA, 2000; Skodol & Oldham, 1996). As noted, some researchers have suggested that DSH should also be considered an impulse disorder (Favazza, 1998; Favazza & Rosenthal, 1990), although this has not been adequately empirically examined to date.

Features of Impulsivity

In terms of features often associated with impulsivity, the individual is often described as experiencing a powerful urge, drive, or temptation to perform the act in question, and is drawn or attracted to the act itself in some way (Skodol & Oldham, 1996). Thus, the impulsive act is described as ego-syntonic; there is a pleasurable or desirable component to the act, and the behaviour is sensible to the individual (McElroy

et al., 1995; Skodol & Oldham, 1996). The impulse is most typically described as irresistible, and the individual feels as though they cannot stop themselves from acting on the urge (McElroy et al., 1995). Simeon, Stein & Hollander (1995) suggested that since the impulsive act is ego-syntonic, there is less resistance to the behaviour overall. In fact, in some cases the individual may describe craving the behaviour (Favazza, 1990; McElroy et al., 1995). If there are efforts to resist the urge to act, these are usually driven by external consequences (i.e., financial or legal problems) rather than an internal dislike or desire to avoid the act (Skodol & Oldham, 1996).

The individual is often described as acting on the impulse in an unpremeditated and sudden way, and has difficulty stopping the behaviour or evaluating consequences of their actions (Vaughan & Salzman, 1996). This quick action and failure to evaluate consequences has been described as resulting from a variety of cognitive and motor processes including motor disinhibition, failure to repress responses, a fast cognitive tempo at the expense of accuracy, a decreased tendency to evaluate consequences, a present-needs orientation and a deficiency in future-oriented problem solving (Stein, 1996). It has also been suggested that these individuals overemphasize external cues, have an external locus of control, and view the environment as responsible for change (Stein, 1996). When the act itself is performed, the individual often reports relief over having acted on the urge; however, the act itself is typically characterized as rewarding or gratifying even if there are negative consequences that follow (Skodol & Oldham, 1996).

Models and Measures of Impulsivity

It has been suggested that impulsivity is associated with a particular temperament, cognitive style, or behavioural tendency and a wide range of models have been offered in that regard. Despite the many studies that have been conducted to examine this construct, no unified measure of impulsivity has been supported, perhaps due to the multidimensional nature of impulsivity (Caseras, Avila, & Torrubia, 2003). As such, it is important to consider impulsivity from several perspectives to allow for an adequate conceptualization and measurement of this multifaceted construct.

Broadly, building on Eysenck's personality model of personality and the constructs of extraversion and neuroticism, Gray (1981) hypothesized two constructs

which he referred to as the Behavioural Inhibition System (BIS) and Behavioural Approach (or Activation) System (BAS). Behavioural inhibition has been described as a response tendency that is activated in response to signals of aversive stimuli, punishment or frustrative non-reward; in contrast, behavioural activation has been described as the activation of behaviour in response to novelty, signals of reward, or signals of relief from punishment (Caseras et al., 2003). These systems have been supported in animal research (see Gray, 1982 for a review). Applying this model to humans, the BIS system has been likened to anxiety or a tendency towards being cautious, avoiding harm, or inhibiting a response (Caseras et al., 2003). In contrast, the BAS system has been referred to as impulsivity or a tendency towards actively responding to reward or novelty (Caseras et al., 2003; Gray, 1982; Zelenski & Larsen, 1999). In conceptualizing impulsivity from Gray's theory, an individual can be viewed as being high or low on BIS or BAS, which would impact how likely either system will be activated. For example, an individual with a dominant BAS system will be more likely to detect and respond to rewarding or novel stimuli than someone who is low on BAS; similarly, an individual with a dominant BIS system will be more prone to detecting a punishing stimulus and inhibiting a response to it. Some have suggested that these two dimensions are independent and can coexist (Corr, 2002, 2004).

Considering impulsivity as a personality trait or temperamental factor, several separable and independent factors have been offered (Evenden, 1999). Eysenck and Eysenck (1977) described two factors related to impulsivity: impulsiveness referred to acting quickly without considering the consequences, while venturesomeness referred to considering the consequences and consciously deciding to act. The latter construct has also been referred to as risk-taking or sensation seeking (Evenden, 1999). The impulsiveness scale from the Impulsiveness, Venturesomeness and Empathy questionnaire (Eysenck, Pearson, Easting & Allsopp, 1985) has been used as an index of BAS functioning (Evenden, 1999). Similarly, Barrett (1985) described a three subtrait model of impulsivity based on an item-analysis of self-report questionnaires. Barrett found that impulsivity consists of a motor component related to acting without thinking (e.g., I do things without thinking); a cognitive factor that entails making quick decisions (e.g., I make up my mind quickly); and a non-planning element that is associated with a

lack of future-orientation (e.g., I am more interested in the present than the future). Barrett (1985) later translated these subtraits into a self-report questionnaire, the Barratt Impulsiveness Scale (BIS-11; Patton, Stanford & Barratt, 1995), which yields a total impulsivity score and subscores on motor impulsivity, cognitive impulsivity, and non-planning impulsivity.

In addition, Carver and White (1994) developed the BIS/BAS questionnaire to measure Gray's systems or dimensions. The BIS/BAS questionnaire includes one scale to evaluate BIS functioning, and one three-factor scale measuring BAS functioning (reward responsiveness, drive, and fun seeking; Caseras et al., 2003). Cloninger (1996) also built on this model in his theory of personality and spoke specifically to the notion of impulsivity. Cloninger's Tridimensional Personality Questionnaire (TPQ; 1987) was developed to assess individual differences in three dimensions of temperament; novelty seeking, harm avoidance, and reward dependence. He later added a fourth dimension, persistence, which was supported by confirmatory factor analysis (Cloninger, Przybeck, & Svarkic, 1991). Cloninger referred to novelty seeking as a personality dimension related to behavioural activation, and harm avoidance as a dimension related to behavioural inhibition (Cloninger, 1996). Cloninger also described reward dependence, which refers to instances where behaviour that was previously rewarded is later maintained for a period of time without continued reinforcement. Although he initially suggested that novelty seeking could be a suitable measure of impulsivity, Cloninger (1996) later explored impulsivity in relation to his four-factor model of temperament and found that impulsive individuals tend to have high novelty seeking, low harm avoidance, and low persistence. Some have suggested that reward dependence may also be related to BAS functioning (Zelenski & Larsen, 1999)

Many other researchers have developed models and measures of impulsivity, and have suggested additional variations on these constructs including high-neuroticism-high-extraversion (Eysenck & Eysenck, 1977) and sensitivity to reward or high reward expectancies (Ball & Zuckerman, 1990). A factor analysis of several such measures revealed three factors, which were labelled impulsivity-thrill seeking, reward sensitivity, and punishment sensitivity (Zelenski & Larsen, 1999). These researchers concluded that the scales from Eysenck's, Gray's, and Cloninger's models were related as expected, but

noted that no one theory emerged as superior. Similarly, a factor analysis of several commonly used measures of impulsivity produced four factors termed lack of premeditation, urgency, sensation seeking, and lack of perseverance (Whiteside & Lynam, 2001). These studies suggest that impulsivity is not a unitary construct measurable by one instrument, and that any attempt to study impulsivity must consider various components as relevant aspects of impulsivity. Therefore, any effort to evaluate DSH as an impulsive act must appreciate the multifaceted nature of the construct of impulsivity by employing multiple measures to capture these various components.

DSH as an Impulsive Act

Despite these difficulties in defining impulsivity and the corresponding limitations in the literature, many authors refer to DSH as a generally impulsive act (for example, Dohm et al., 2002; Favazza & Rosenthal, 1993). Siomopoulos (1974) referred to repetitive self-cutting as an "impulse neurosis," and DSH has been proposed to be part of an impulse disorder, variously defined (Lacey & Evans, 1986; Favazza, 1996; Favazza & Rosenthal, 1990; Pattison & Kahan, 1983). Indeed, when it occurs repetitively, DSH may meet criteria for a DSM-IV impulse control disorder not otherwise specified (APA, 2000). Many seem to make the determination of impulsivity in DSH based largely on the observation of an increase in tension that is relieved following the act of DSH; this is regarded as evidence that DSH is impulsive. As noted, this general description overlaps substantially with compulsivity, and it could be argued that a compulsive process might also explain this pattern. However, some researchers have offered more concrete evidence that suggests DSH may be impulsive in nature.

Some authors (Favazza & Conterio, 1989; Herpertz, 1995) have characterized repetitive DSH as an impulsive behaviour in part because it has been reported to occur at a high frequency, 78% decide to self-harm on the spur of the moment (rather than thinking through or ruminating about the act), and the majority demonstrate an inability to resist the urge once it arises (81% 'always' or 'almost always' follow the urge). In another study, less than 15% reported an inner struggle to resist the behaviour (Gardner & Gardner, 1975), which seems consistent with an impulsive behaviour. In adolescent inpatients, Nock and Prinstein (2005) found that DSH was associated with decreased

contemplation, with the more than 75% of participants endorsing a few seconds or no contemplation prior to acting.

Furthermore, as noted above, Lacey and Evans (1986) described a "multi-impulsive disorder" in which the individual engages in interchangeable impulsive behaviours including binge-eating, substance abuse, kleptomania, and DSH. This notion suggests that impulsive behaviours cluster together, a finding that has received some support in the literature (Favazza & Rosenthal, 1993; Herpertz et al., 1995). In particular, high rates of DSH have been reported in individuals with eating disorders, particularly bulimia nervosa which is often regarded as impulsive in nature (Favaro & Santonastaso, 1998). For example, in a population of male prisoners, high motor impulsiveness on the BIS-10 was found to be related to a higher number of impulsive acts including self-harm (Stanford & Barratt, 1992). Further, in a group of individuals with eating disorders, those who engaged in DSH were found to have higher levels of psychological dysfunction and impulsiveness than those who did not self-harm (Claes et al., 2001). In a study of individuals with personality disorders, Simeon and colleagues (1992) found that while all had above-normal impulsivity, those who engaged in DSH had high levels of both impulsivity and aggression. In addition, lowered serotonergic activity was found to be related to more severe levels of DSH in individuals with severe personality disorders (Simeon et al., 1992).

However, as with much of the literature on DSH, many of these studies utilized small prisoner or clinical samples with specific or significant pathology and no comparison or control groups. Therefore, these findings may not necessarily generalize to other populations or non-clinical samples. Furthermore, single unidimensional measures of impulsivity are often used which limits our ability to draw conclusions about this multidimensional construct in these studies.

In perhaps one of the most impressive investigations of impulsivity in DSH to date, Herpertz and colleagues (1997) examined impulsivity in 165 participants who were divided into four groups: moderate/superficial DSH in inpatients in treatment for personality disorders; impulsive behaviour other than DSH in inpatients in treatment for personality disorders (for example, bulimia nervosa, binge-eating, substance abuse, impulse control disorders); no impulsive behaviours in inpatients in treatment for

personality disorders; and non-clinical controls. Participants were interviewed regarding DSH and impulsive behaviours, and completed questionnaires to assess impulsiveness (BIS-10), anger, hostility and depression. Herpertz and colleagues found that individuals who engaged in DSH showed various modes of impulsive behaviour, a deficit in future-oriented problem-solving, and affective hyper-reactivity as compared to other groups. This has been frequently cited as evidence of the importance of impulsivity in DSH. However, it is important to note that impulsivity was only assessed with the BIS-10, which may not capture the multidimensional nature of the construct. In addition, these results may be limited to individuals with severe personality disorders, and replication of these findings is needed. Given the apparently high prevalence of DSH in non-clinical high school and undergraduate populations, it is important to examine whether impulsivity is a central factor in DSH in non-clinical populations as well.

The Construct of Compulsivity

As in the case of impulsivity, compulsivity involves an experience of pressure which precipitates a behavioural response that is in turn followed by a sense of relief or more positive state. Also similar to impulsivity, compulsivity is described as a component of certain psychological disorders, personality styles, and behavioural or physiological patterns (Oldham et al., 1996). However, in the case of compulsivity, this sense of pressure is more likely to be described as a sense of mounting tension resulting from fear, anxiety, obsessive thoughts or a sense of necessity to perform certain behaviour. As discussed in more detail below, the nature and phenomenology of compulsions have been described as quite varied, rendering it somewhat difficult to describe the phenomenology of compulsivity in general terms (Rasmussen & Eisen, 1991).

There seems to have been less professional dialogue on delineating the nature of the construct of compulsivity as compared with impulsivity, and compulsivity is often described in behavioural terms or in relation to obsessional thinking or obsessive-compulsive disorder. In contrast to obsessions which are characterized by persistent ideas or thoughts that result in anxiety or distress, compulsions are repetitive behaviours or mental acts that serve to prevent or reduce the anxiety or distress created by such

obsessive thinking (APA, 2000; Skodol & Oldham, 1996). Therefore, discussions of compulsiveness in the literature tend to evaluate the characterological or behavioural tendency to perform such repetitive behaviours or otherwise act in a manner that serves to reduce anxiety or prevent some dreaded event or situation (APA, 2000). However, it has been noted that compulsivity has been associated with or likened to a variety of constructs including anxiety, neuroticism, harm avoidance, perfectionism, and behavioural inhibition (Oldham et al., 1996). Measures of compulsivity often reflect the frequency and types of compulsive acts, or the temperamental, cognitive, and behavioural style of individuals who characteristically exhibit compulsive over-control or inhibition of behaviour. Disorders typically referred to as 'compulsive' in nature include obsessive compulsive disorder (OCD), body dysmorphic disorder, hypochondriasis, anorexia nervosa, and trichotillomania, as well as obsessive compulsive personality disorder (APA, 2000; Oldham et al., 1996). OCD is often referred to as the prototypic disorder of compulsivity, although it has been noted that this disorder may have an impulsive component since obsessional thoughts are sometimes described as impulses, and since compulsions can be experienced as irresistible (APA, 2000; Skodol & Oldham, 1996). As noted, some researchers have suggested that some forms of DSH could be considered compulsive, including hair pulling, skin picking, and nail biting (Simeon & Favazza, 2005; Simeon, Stein & Hollander, 1995)

Features of Compulsivity

In terms of features associated with compulsivity, Rasmussen and Eisen (1991) used interview and quantitative data to examine the phenomenology of compulsivity. They noted that despite the apparent diversity of presentations among obsessive-compulsive spectrum disorders, there are some remarkable consistencies in how compulsive behaviours occur. Based on their work, Rasmussen and Eisen reported that the individual often experiences a sense of mounting tension, anxiety or dread that stems from obsessive thoughts. Anxiety was noted as the dominant affective symptom of these individuals, along with a sense of fear or dread that something terrible will happen for which they will be responsible. Obsessive thoughts may relate to specific worries such as a preoccupation with avoiding contamination or illness, or to a more general sense of

dread such as fear of losing control or "going crazy." These authors noted that the individual feels compelled to engage in a particular behaviour to reduce this tension or anxiety, or to prevent a dreaded event from happening. However, the behaviour may not be thematically linked to the obsessional worry or dreaded event in a logical way (for example, compulsively counting tiles to prevent injury to a loved one). Initially, the compulsive behaviours serve to reduce anxiety over the short term, and the individual may describe feeling as though they 'need to' or 'have to' engage in the behaviour; if prevented from doing so they typically describe a sense of discomfort or tension. Over time, it appears that the compulsive behaviour is reinforced by the tension-reducing effects, resulting in an eventual tendency to quickly engage in the compulsive behaviour with little forethought or resistance (Rasmussen & Eisen, 1991). In these cases, the individual may appear to engage in the behaviour almost automatically without premeditation, presenting with behaviour that is highly repetitive and seemingly habitual (Simeon et al., 1995). This is often the description offered in cases of compulsive hair-pulling and skin-picking, which are described as automatic, highly repetitive, and minimally resisted (Favazza, 1996).

It has been suggested that unlike impulsivity which often involves acting on impulses to which the individual is drawn or finds inherently gratifying, the individual engaging in compulsive behaviour is not drawn towards or attracted to the act itself but instead feels compelled to engage in the act to derive its anxiety-reducing effects (Simeon et al., 1995). In fact, the individual engaging in compulsive acts may view the act as senseless, unrewarding, and inherently distressing (Skodol & Oldham, 1996). In these cases, unlike the ego-syntonic nature of impulsive acts, the compulsive act is described as ego-dystonic whereby the individual views the act as senseless or distasteful and resists it as much as possible (McElroy et al., 1995; Simeon et al., 1995; Skodol & Oldham, 1996). In these circumstances, the act is only carried out when the individual can no longer tolerate the mounting anxiety or tension that persists as long as they do not act on their 'need' to engage in the compulsive behaviour. Guilt, embarrassment, shame, and disgust can be reported following the act (Rasmussen & Eisen, 1991). Thus, the individual may experience a sense of anxiety leading up to the act, a struggle or resistance against performing the act, distress or puzzlement surrounding the act itself, guilt or shame

following the act, but also relief at having completed the act and effectively having relieved the mounting tension. It has been noted that although the act itself is not inherently rewarding or gratifying, the curbing of the mounting tension and the prevention of a dreaded event (e.g., harm avoidance) is described as rewarding or relief-producing (Skodol & Oldham, 1996).

In addition, it has been noted that some compulsive behaviours seem quite logical to the individual, since the act has proven to be effective in relieving a sense of mounting tension or satisfying a sense of necessity to complete the act. For example, individuals with compulsions surrounding a need for symmetry or precision have been reported to experience relatively less anxiety and distress surrounding the act itself, and the compulsion may be described as more ego-syntonic (Rasmussen & Eisen, 1991). In these cases the individual may demonstrate little or no resistance to the compulsion and may report relatively low levels of anxiety surrounding their compulsions, unless they are prevented from acting on them or are unable to carry them out with the precision they feel is needed. Whether the compulsion is experienced as ego-syntonic or ego-dystonic, the compulsive individual almost universally experiences some degree of anxiety in relation to the compulsion, and obtains some relief or tension reduction when allowed to act on the compulsion. Furthermore, the compulsive individual seems prone to placing great emphasis on possible negative contingencies or punishment and may be easily conditioned to negatively reinforced events (Rasmussen & Eisen, 1991). Thus, it appears that the compulsive individual, regardless of presentation, is most strongly impacted by a need to avoid harm.

Usually, the individual who is prone to compulsiveness is described as rigidly over-controlled, whether this is in cognitive style, emotional expression, or motor control (Skodol et al., 1996). In contrast with the impulsive individual, a compulsive individual is likely to think through responses, weigh options, and repress a response until all avenues are fully explored (Stein, 1996). Further, they typically demonstrate a future-oriented problem-solving style which, when in excess, may render them prone to rumination about possible scenarios and outcomes at the expense of action (Stein, 1996). This compulsive style has been described as resulting from a variety of cognitive and motor processes including motor inhibition, repression of responses, a slow cognitive

tempo to maximize thoroughness or accuracy, perfectionism, conscientiousness, an increased tendency to evaluate consequences, and a future-oriented problem solving orientation (Skodol & Oldham, 1996; Stein, 1996). It has also been suggested that these individuals overemphasize internal cues, have an internal locus of control, and view themselves as responsible for change; this may increase proneness to rumination and guilt over the act in question (Stein, 1996).

It has also been suggested that much of the individual's energy is expended in controlling desires or urges and inhibiting action and, when the associated anxiety becomes too intense to be managed, compulsive symptoms arise as a means to contain or defend against these negative affective states (Vaughan & Salzman, 1996). Thus, unlike impulsivity in which the individual is driven to perform the impulsive act which is experienced as gratifying, the compulsive individual engages in the compulsive act as a means to defend against or prevent an unpleasant or dreaded experience. As noted, the individual feels compelled to do something that may be regarded as senseless or unappealing but ultimately engages in the undesirable behaviour to cause a reduction in anxiety or internal distress (Perry, 1996). Furthermore, the compulsive individual is often described as having a rigid and harshly self-critical tendency to monitor behaviour and ensure that the individual acts in a manner consistent with internalized or societal expectations (Shapiro, 1999). As such, the individual is typically described as conscientious, cautious and responsible, but experiences significant guilt and anxiety when they are unable to adequately meet these expectations (Stein, 1996).

Models and Measures of Compulsivity

As with impulsivity, it has been suggested that compulsivity is associated with a particular temperament, cognitive style, or behavioural tendency. As a personality trait or temperamental factor, compulsivity has been described in terms of neuroticism, anxiety, perfectionism, conscientiousness, and proneness towards harm avoidance (Oldham et al., 1996). These multiple conceptualizations of this construct render it somewhat difficult to suggest any particular measure of compulsivity, and suggest that compulsivity may also be multidimensional in nature. As discussed above, Gray's (1981) Behavioural Inhibition System (BIS) has been described as a response tendency that is activated in response to

signals of aversive stimuli, punishment or frustrative non-reward; this has been likened to anxiety or a tendency towards being cautious or inhibiting a response (Caseras et al., 2003; Zelenski & Larsen, 1999). As noted, Carver and White (1994) developed the BIS/BAS questionnaire, which includes one scale to evaluate BIS functioning or a tendency towards inhibiting responses (Caseras et al., 2003). Measures of compulsiveness such as the Padua Inventory Revised (van Oppen, Hoekstra & Emmelkamp, 1995) and the Yale Brown Obsessive Compulsive Scale (Y-BOCS; Goodman et al., 1986) evaluate obsessive and compulsive symptoms, and both of these measures are able to distinguish between thoughts, behaviours, and tendencies of individuals diagnosed with OCD as compared with those diagnosed with other anxiety disorders. In addition, as he did with impulsivity, Cloninger (1996) examined compulsivity in relation to his four-factor model of temperament and found that in contrast to impulsive individuals, compulsive individuals tend to have low novelty seeking, high harm avoidance, and high persistence.

Therefore, although compulsivity has not received the same degree of attention in the literature, it has been contrasted with impulsivity in Gray's model of the BIS/BAS, as well as in Cloninger's model of temperament. Furthermore, several measures have been offered to evaluate behavioural, cognitive, and temperamental styles consistent with compulsivity. Given the substantial overlap between impulsivity and compulsivity and the suggestion that compulsivity may be involved in DSH, it seems clear that compulsivity is worthy of examination in this population.

DSH as a Compulsive Act

Since DSH has traditionally been considered an impulsive act, there are very few studies that address the compulsive characteristics of DSH. Those that do examine compulsivity in DSH tend to consider it as somewhat of an afterthought. However, Favazza (1998) has suggested that hair-pulling, nail-biting and skin picking constitute compulsive DSH, which he described as occurring several times daily in a repetitive and ritualistic nature. Further, descriptive studies often report a tension reducing function of DSH which may be consistent with compulsivity. Some research evidence supports the notion of a compulsive quality to DSH, and that individuals who engage in DSH

demonstrate some compulsive features. In particular, some authors have described individuals who struggle with their decision to self-harm (Pao, 1969), while others have observed a tendency towards perfectionism in individuals who engage in DSH (Favazza, 1990; Gardner & Gardner, 1975). In addition, individuals diagnosed with OCD have been reported to have coexisting DSH (Winchel & Stanley, 1991). Similarly, individuals diagnosed with anorexia nervosa (which is often regarded as a disorder of over-control) have been found to have high rates of DSH, in the order of 35% (Winchel & Stanley, 1991). More directly, in one study (Gardner & Gardner, 1975), non-psychotic female inpatients who engaged in DSH were found to have significantly higher scores on the obsessionality section of the Tavistock Inventory, a measure of obsessive and compulsive traits, when compared to a similar group who did not engage in DSH. Another study of women diagnosed with eating disorders found that self-injuring women exhibited significantly more obsessive-compulsive thoughts and behaviours than did non-injuring women (Paul et al., 2002). These few studies support the notion that compulsivity may be an important aspect of DSH that has been largely neglected in the literature. Considering the complexity of the constructs of impulsivity and compulsivity, it is important that these constructs be delineated and carefully examined in this population.

Evaluating Impulsivity and Compulsivity in DSH

Although some authors have suggested that superficial/moderate DSH can be divided into impulsive and compulsive subgroups, there has been little empirical investigation of this question. While some authors have provided some evidence for either the impulsive or compulsive aspects of DSH, none appear to have systematically investigated both impulsive and compulsive characteristics as a primary point of interest in their investigation. Simeon and Favazza (1995) admitted that the differentiation between compulsive and episodic/repetitive DSH is not sharp, particularly in reference to compulsive and impulsive characteristics. They suggested that researchers should explore "the unique combination of obsessive compulsive and impulsive traits that characterize individuals and possibly shape the type, frequency, and other characteristics of their (DSH) behaviour" (Simeon & Favazza, 1995; p. 190). Some preliminary efforts have been exerted to do so, but this area remains generally under-examined.

In a study of DSH in female inpatients diagnosed with eating disorders evaluated DSH, trauma, dissociation, impulsiveness, and compulsiveness in this group (Paul et al., 2002). These researchers used the Barratt Impulsiveness Scale to measure impulsivity, and the Y-BOCS to measure obsessive-compulsive thoughts and behaviours. Paul and colleagues found that compared to non-self-injuring women, self-injuring women experienced a significantly higher number of traumatic events, higher dissociation scores, and more obsessive-compulsive thoughts and behaviours than did non-injuring women. In terms of impulsivity, they found that women diagnosed with bulimia nervosa showed significantly higher scores on all three scales (motor, cognitive, non-planning) of impulsivity as compared to women diagnosed with other eating disorders, and that only cognitive impulsivity distinguished between injuring and non-injuring women overall. This suggests that an obsessive-compulsive component of DSH is important to consider in our evaluation of this phenomenon, despite the fact that it has been neglected in much of the literature to date. It also supports the notion that impulsivity is a multidimensional construct, and assessing impulsivity in the DSH population must consider multiple components of impulsivity. A comprehensive study of this issue should include a non-eating disordered sample and multiple measures of impulsivity and compulsivity, rather than simply relying on one measure to reflect each construct.

In another study of patients diagnosed with bulimia nervosa, Favaro and Santonastaso (1998) addressed the notion of impulsive and compulsive types of DSH. These researchers performed a principal components analysis to evaluate how different behaviours broadly defined as self-injuring might be classified; they included self-induced vomiting, laxative abuse, suicide attempts, self-cutting and burning, substance and alcohol abuse, severe nail-biting, and hair pulling. Favaro and Santonastaso found that two factors accounted for 42.4% of total variance and that the factors were uncorrelated. The first factor included self-induced vomiting, severe nail-biting and hair-pulling, which they referred to as "compulsive acts"; the second factor included suicide attempts, substance and alcohol abuse, laxative abuse, and skin-cutting and burning, which they referred to as "impulsive acts." These authors suggested that these findings support Simeon and Favazza's (1995) suggestion of two distinct types of DSH characterized by impulsivity and compulsivity, respectively. It is important to note that

Favaro and Santonastaso suggested that compulsive characteristics may serve a protective function, as individuals whose scores loaded highly on the "compulsive" factor were reportedly less likely to drop out of therapy; in contrast, individuals whose scores loaded highly on the impulsive factor were much more likely to drop out of treatment. However, it should be noted that these authors did not include specific measures of impulsivity and compulsivity to verify the validity of classifying DSH as impulsive and compulsive. Subsequent studies have continued to employ this distinction, defining self-cutting and self-burning as impulsive, and skin-picking or hair-pulling as compulsive in various analyses (Favaro & Santonastaso, 1999; Favaro et al., 2005; Favaro et al., 2008). Moreover, it is not clear whether this classification would apply in non-eating-disordered or non-clinical samples.

These studies provide some preliminary support for the notion that both impulsive and compulsive features of DSH merit attention. Furthermore, these features likely have important implications for the evaluation and treatment of DSH. Unfortunately, there has been no systematic and focused examination of impulsivity and compulsivity in DSH to date. Furthermore, the majority of studies have utilized a single measure to reflect each of the constructs. The findings to date suggest that multiple measures should be employed given the complex and multidimensional nature of these constructs. Given the apparent tendency for clinicians and researchers to make assumptions about the nature DSH, it is important to examine impulsivity and compulsivity in this understudied population.

Rationale and Purpose of the Present Study

Despite the evidence that DSH may be increasing in prevalence in both clinical and non-clinical samples, the empirical basis for our understanding of this phenomenon remains somewhat limited. DSH is an issue that is relevant to clinical and prison settings, school environments, and family and community health. Much of the literature to date has focused on DSH in prison or clinical samples with specific and/or severe psychopathology, and the extent to which these findings might generalize to non-clinical populations is unclear. Thus, examining DSH in both clinical and non-clinical settings is important to evaluate possible similarities and differences. In addition, some studies are

highly inclusive in defining DSH, including risk taking, single-episodes of DSH, or suicide attempts. This study will use a commonly accepted and circumscribed definition of DSH (that which occurs on more than one occasion, and consists of deliberate, directly inflicted harm to bodily tissue causing minor to moderate physical injury, with non-suicidal intent). Thus, this study will use a concrete, circumscribed definition of DSH that is frequently used in the literature to enhance the generalizability and ability to integrate results across studies.

Furthermore, there has historically been a tendency to assume that DSH is an impulsive act, but the evidence for this is equivocal. A hypothetical classification system that divides DSH into impulsive DSH (cutting, burning, hitting) and compulsive DSH (skin-picking, hair-pulling, nail-biting) has been hypothesized and used by some researchers (Favaro & Santonastaso, 1998; Simeon & Favazza, 1995). However, this model has not been adequately examined empirically. Indeed, a systematic evaluation of the impulsive and compulsive features of DSH does not appear to have been conducted to date. It has been suggested that DSH may have both impulsive and compulsive components, and a fine-grained examination of this question is called for.

Further complicating this question, various models of the relationship between impulsivity and compulsivity have been offered and the evidence is generally mixed. The constructs of impulsivity and compulsivity are complex and multidimensional, and the relationship between the two is unclear. Previous studies of impulsivity and compulsivity in DSH and other areas have used single measures of each or have assumed the presence of one or the other without including psychometric data on both. Therefore, this study will use multiple measures of general impulsivity and compulsivity. In addition, specific items to assess impulsive and compulsive features of the act of DSH will be examined based on the impulsive and compulsive processes that were identified in the literature review.

Finally, given the complex relationship between impulsivity and compulsivity, and the relatively underdeveloped literature base in the area of DSH, triangulation of qualitative and quantitative methods is advantageous in this study. The inclusion of qualitative analyses provides more rich material from which to understand the phenomenology of DSH. Qualitative approaches can also complement the quantitative

findings, and enhance clarity with respect to the phenomenon in question (Flick, 1992). If qualitative findings are consistent with quantitative results, confidence in the findings can be increased. However, it has also been noted that dissonance between qualitative and quantitative results can be informative and may also contribute to more sound inferences (Perlesz & Lindsay, 2003). Thus, this study includes both qualitative and quantitative measures to enhance the understanding of DSH. Expanding the empirical basis for understanding DSH with respect to impulsive and compulsive features is an important endeavour as it strengthens the foundation for future research, contributes to an improved understanding of DSH for those affected, and provides a basis for approaching the assessment and treatment of DSH.

Overview of the Present Study

This study examines both the impulsive and the compulsive features of DSH. As impulsivity and compulsivity are multidimensional constructs that are intertwined to some degree, multiple measures and methods were included to evaluate both general impulsive and compulsive characteristics, as well as impulsive and compulsive features of DSH behaviour. DSH was examined in terms of clinicians' perceptions of the DSH experiences of clients, and in terms of the self-reported DSH experiences of an undergraduate sample. These two data sources were used to allow the examination of DSH from different perspectives and in varied settings. Moreover, this study utilized both qualitative and quantitative measures. Integrating qualitative and quantitative approaches permits an examination of the impulsive and compulsive features of DSH from both narrative accounts and from established measures of the two constructs.

The features of DSH were explored in two ways. First, mental health professionals were surveyed by mail. In addition to basic demographics and information relating to their history of treating DSH, these professionals were surveyed to determine whether their current conceptualization of DSH is more consistent with the notion of impulsivity or compulsivity. As noted, the literature seems to have historically promoted a conceptualization of repetitive or episodic DSH as impulsive in nature. This survey provides some insight into how DSH is perceived and treated in the mental health community and gauges the professional community's current conceptualization of this

phenomenon in terms of impulsive and compulsive features.

Second, undergraduates who engage in DSH provided various forms of quantitative data. First, they provided demographic information about themselves. Second, all participants completed a series of questions specific to their own DSH acts. This was done to catalogue the type, nature, frequency, duration and severity of their DSH. Third, each participant also responded to several personality or temperament measures that were thought to be relevant to gauging the impulsivity or compulsivity of DSH. Fourth, participants completed a 20-item measure constructed for this study to further assess the impulsivity or compulsivity of DSH. This combination of demographic and questionnaire self reports provide quantitative measures from the undergraduates. In addition, there were two forms of qualitative data gathered from the undergraduates. First, all undergraduates generated a free-associative paragraph regarding their experience of DSH before, during and after DSH. In addition, a subset of these participants completed an in-depth semi-structured interview regarding their experience of DSH. Particular attention was paid to participants' thoughts, feelings and behaviour that occur before, during, and after the act of DSH, with the goal of examining the impulsive and compulsive features that may present at these different stages.

These data were examined to address the following research questions:

1. In general, what are clinicians' perceptions of DSH? Specifically, do clinicians tend to view DSH as a problem of impulsivity, or as a compulsive behaviour?
2. Does the structure of DSH reveal both impulsive and compulsive components?
3. Is the structure of DSH similar or different among those who evaluate and treat DSH from those who engage in DSH?
4. In general, how do undergraduates who engage in DSH experience this phenomenon? In particular, what are the impulsive and compulsive characteristics of DSH in an undergraduate sample?
5. Do characteristics of DSH vary depending on certain key features (in particular, do frequency, duration, severity, and type of DSH vary depending on impulsivity or compulsivity)?

Hypotheses

In addressing these research questions, four specific hypotheses were made. First, it was hypothesized that the component structure of a set of items designed to survey both compulsive and impulsive components of prototypical DSH clients will reveal at least two such distinct factors, one indicating compulsivity, the other indicating impulsivity. In order to test this hypothesis, a series of items was generated based on the operationalization of impulsivity and compulsivity discussed in the literature review. Items were designed to assess impulsivity and compulsivity in relation to DSH. As discussed in Chapter II (p. 56), these items formed the DSH-C, a 21-item questionnaire that was completed by clinician respondents in reference to the prototypical DSH client. The first hypothesis was tested using a principal components analysis (PCA) of the DSH-C items to extract components (see Chapter III, pp. 68 to 72), which were in turn evaluated to determine which, if any, of the components were representative of impulsivity and / or compulsivity. Expert ratings were used to assess the validity of the items as impulsive versus compulsive (see pp. 72 to 80).

In parallel to the first hypothesis, the second hypothesis predicted that the component structure of a set of items designed to survey both compulsive and impulsive components of undergraduates with a history of multiple DSH episodes will reveal at least two such distinct factors, one indicating compulsivity, the other indicating impulsivity. Nearly identical to the DSH-C, the DSH-U is a 20-item self-report questionnaire that was completed by undergraduate participants (see Chapter IV, p. 87). Items were intended to assess impulsivity and compulsivity in relation to participants' DSH experiences. The second hypothesis was tested using a PCA of the DSH-U items to extract components (see Chapter V, pp. 105 to 108), which were in turn evaluated to determine which, if any, of the components were representative of impulsivity and / or compulsivity. Expert ratings (pp.108 to 113) and intercorrelations with established measures of impulsivity and compulsivity (pp. 116 to 120) were used to assess the validity of the items and extracted components.

Next, based on the literature review which suggested a tendency of researchers to regard DSH as impulsive in nature, the third hypothesis predicted that clinicians will characterize the prototypical DSH client's self-harm behaviour as impulsive in nature,

rather than compulsive. Finally, although it was expected that both impulsive and compulsive features would be present among undergraduates to a degree, the fourth hypothesis predicted that undergraduates' descriptions of DSH will share more features with a compulsive behaviour rather than with an impulsive act. In order to address the third and fourth hypotheses, a 2-scale version of the items common to the DSH-C and DSH-U was constructed to represent impulsivity and compulsivity, with scales referred to as DSH-Impulsivity and DSH-Compulsivity (see Chapter V, pp. 120 to 125). Then, a mixed design ANOVA was conducted to compare impulsivity and compulsivity scores both within and between samples (pp. 125 to 129). As an additional means to examine DSH in both samples, qualitative data was gathered from clinicians (Chapter III, pp. 65 to 68) and undergraduates (Chapter V, pp. 143 to 170) to provide additional insights into possible impulsive and compulsive features of DSH.

In addition to these formal hypotheses, certain DSH characteristics in the undergraduate sample were examined in relation to the constructs of impulsivity and compulsivity. No specific hypotheses were made regarding these relations, since there is no empirical basis on which to do so. Specifically, the ability to predict the frequency, duration, density (number of episodes per year), number of methods, and severity of DSH from various indicators of impulsivity and compulsivity was evaluated (Chapter V, pp. 131 to 143). Simultaneous regression analyses were used to predict frequency, duration, density, and number of methods from established measures of impulsivity and compulsivity from the DSH-U components, and from the DSH-Impulsivity and DSH-Compulsivity scales. Logistic regression was used to predict severity.

Finally, although no formal hypotheses were made directly pertaining to the qualitative analyses, the qualitative data were used to examine the phenomenology of DSH with an emphasis on impulsive and compulsive components. For the clinician sample, qualitative data analysis consisted of a simple frequency count of themes or ideas identified in a narrative paragraph written by clinicians concerning the prototypical DSH experience (Chapter III, pp. 65 to 68). For the undergraduate sample, qualitative data were gathered from two sources. First, the content of a written paragraph about the experience of DSH before, during and after the act itself was examined. Second, a subset of participants completed a semi-structured interview, producing a detailed narrative of

their subjective DSH experience before, during, and after engaging in DSH. These data are presented in Chapter V (pp. 143 to 170). The purpose of including these qualitative analyses was to enhance the understanding of the phenomenology of DSH, with particular emphasis on the subjective perspective of the individual's experience before, during, and after DSH. The qualitative analyses emphasized impulsive and compulsive features of DSH to allow triangulation of the qualitative and quantitative methods and enhance the empirical basis for understanding the phenomenology of DSH.

Taken together, this study provides an in-depth examination of the experience of DSH in terms of impulsive and compulsive characteristics in a non-clinical undergraduate sample, and an evaluation of a sample of current professionals' perspectives on DSH. It will also allow a comparison of professionals' perceptions of DSH in clinical populations in terms of impulsivity and compulsivity on one hand, to self-reported experiences of DSH in a non-clinical sample on the other. This will in turn permit an evaluation of the hypothetical classification of DSH as impulsive versus compulsive in the literature. More broadly, this study will provide a basis for understanding, responding to, and treating DSH more effectively and enhance awareness about impulsive and compulsive characteristics of DSH in a non-clinical sample. It may also encourage a more systematic and person-centred approach to DSH as it emphasizes the individual's perspective and personal experience.

CHAPTER II

Study 1 (Clinician Survey)

Method

Participants and Procedure

Participants. Table 1 summarizes the demographic characteristics of the survey participants. A random selection of 115 psychologists and psychiatrists registered or licensed in Ontario, Canada were included in this study. There were approximately equal numbers of male and female participants (49.12% and 50.88%, respectively). The age of these clinicians ranged from 30 to 75 years (M = 49.44 years, Mdn = 51.00 years). The majority of the respondents were psychologists (83.33%) with a Ph.D. level education (78.95%). The most common work environments identified were full time non-hospital outpatient settings (for example, private or group practice, school counselling setting, etc.; 47.37%) and a combination of inpatient and outpatient settings (31.58%). Nearly half of clinicians identified their primary orientation as Cognitive Behavioural or Behavioural (48.67%), with Eclectic or Integrative (21.24%) and Psychodynamic or Psychoanalytic (17.70%) also proving popular. Experiential (4.42%) and Family Systems (0.88%) were less commonly identified as primary orientations, but were identified as secondary (6.14% and 8.87%, respectively) and tertiary (1.75% and 3.51%, respectively) orientations. In terms of the number of years in professional practice, 36.84% reported being in practice for more than 20 years. Indeed, 57.02% reported 15 years or more of professional practice. The remaining respondents identified less than 5 years (17.54%), 5 to 9 years (18.42%), and 10 to 14 years (7.02%) of experience.

Table 1:

Demographics of Clinician Respondents (N = 115)

Demographic	*N*	%
Sex		
Male	56	49.12
Female	58	50.88
Profession		
Psychologist	95	83.33
Psychiatrist	19	16.77

Table 1 (continued):

Demographic	*N*	%
Education		
Ph.D.	90	78.95
M.D.	10	8.77
Other	14	12.28
Work setting		
Inpatient	4	3.51
Hospital Outpatient	12	10.53
Non-hospital outpatient	54	47.37
Other	8	7.02
Combination of above	36	31.58
Primary Orientation		
Cognitive Behavioural / Behavioural	55	48.67
Psychodynamic / Psychoanalytic	20	17.70
Experiential	5	4.42
Family Systems	1	0.88
Eclectic or Integrative	24	21.24
Other	8	7.08
Years in Professional Practice		
Less than 5 years	20	17.54
5 to 9 years	21	18.42
10 to 14 years	8	7.02
15-20 years	23	20.18
More than 20 years	42	36.84

Procedure. A random selection of 550 psychologists and psychiatrists registered or licensed in Ontario, Canada were sent a brief questionnaire with an invitation to participate in this study. Those who did not respond were sent up to two reminders reiterating the request at 1-month intervals (Appendix A7). They received no compensation for participating. Of the 550 psychologists and psychiatrists surveyed, 217 (39.45%) responded to the survey. Forty-eight (22.12%) of those who responded declined to participate in the study, while 53 (24.42%) consented to participate but reported having no clinical experience with clients who engaged in DSH. Of those who responded, 116 respondents (53.46%) consented to participate and reported professional contact with at least one client who had engaged in DSH. One of these respondents was excluded because the client example used was not consistent with the specified definition of DSH (i.e., stereotypic behaviour associated with Autism). Thus, a total of 115

respondents (53.00% of those who responded to the survey; 20.91% of the total number of clinicians contacted) were included in the analyses. Missing data were minimal, with one to two participants omitting certain data points (i.e. age, number of sessions). Since the missing data were minimal and appeared evenly and randomly dispersed across variables, these data points were omitted from analyses but no statistical corrections or omission of cases were made. For this reason, tables do not total 115 in all cases.

An information form (Appendix A1) was enclosed outlining information about the study, confidentiality, and contact information for the researcher. Clinicians consenting to participate in the study provided information about their professional background and theoretical orientation (Appendix A2). They also outlined their history of working with individuals who engage in DSH and provided details regarding their recollection of the most *typical or salient* client who engaged in DSH. In reference to this prototypical client, clinicians provided information about the individual's DSH history, diagnosis, and a brief qualitative description of the DSH experience (Appendix A3). They were then asked a series of questions aimed to clarify their specific perceptions regarding the impulsive and compulsive features of that individual's DSH behaviour (DSH-C; Appendix A4). Thus, both quantitative and qualitative data were gathered to provide an in-depth examination of DSH, with an emphasis on impulsive and compulsive features. Integrating qualitative and quantitative data strengthens the understanding of the phenomenology of DSH, as the qualitative component allows for a more detailed, individualized account of the DSH experience than would be permitted with quantitative data alone.

If clinicians consented to participate but had not worked with a client who engaged in DSH, they were asked to complete demographics information and return a response card to that effect (Appendix A5). This was done in anticipation of being able to compare the demographics and settings of individuals who encounter DSH in practice versus those who do not. Many of these clinicians did not complete the demographics information before returning the response card, so these analyses were not completed. All clinicians were provided with a sealed debriefing form (Appendix A6) for review after completion of the survey, which explained the rationale for the study and provided contact information in the event of questions or concerns.

Tests and Measures

DSH Questionnaire for Clinicians (DSH-C). The DSH-C (Appendix A4) consists of 21 items that are rated on a scale from 1 (strongly disagree) to 5 (strongly agree). Since there are no established measures that explicitly evaluate the impulsive and compulsive features of DSH, face-valid items were generated to comprise the DSH-C. Item content was based on the conceptualization of impulsivity and compulsivity outlined in the literature review. To provide an index of how well the items measure the constructs of interest, the items were also rated by 8 psychology faculty at the University of Windsor holding a Ph.D. in clinical psychology who would be considered 'experts' (Appendix A8). These experts rated each item twice, once on how much each item reflects impulsivity and once on how much each reflects compulsivity on a scale from 1 (not at all) to 10 (very much so). The instructions given to experts for rating the 21 items on impulsivity were as follows:

> "Please rate the following items using the scale below (circle a number from 1 to 10 for each item). We are interested in how descriptive or representative you believe each questionnaire item is of **impulsivity** as you understand this construct. For example, a rating of **1** would indicate that you believe the item is not at all representative or completely inconsistent with your understanding of impulsivity, while a rating of **10** would indicate that you believe the item is a very good representation or entirely consistent with your understanding of impulsivity.

The same instructions asking for ratings of **compulsivity** were repeated, requesting the experts rating of each item a second time for this construct. The rating form including the instructions and items can be found in Appendix A8. This was intended to provide an external indication of which items are viewed to be most reflective of these two constructs. Additional analyses provided a preliminary evaluation of the construct validity of this measure, and these are discussed below.

CHAPTER III

Study 1 (Clinician Survey)

Results

Since quantitative and qualitative data were gathered to provide an in-depth examination of DSH, the results for each analysis are presented in turn. First, the quantitative results are presented, and then the qualitative findings are discussed.

Description of Clinicians' Experiences with Clients Engaging in DSH

Experience base with clients engaging in DSH. Clinician respondents reported having treated from 1 to 750 clients who engaged in DSH ($M = 34.66$, $Mdn = 11.00$ clients). Thus, half of respondents reported having provided treatment to at least 10 clients who engaged in DSH. Forty-seven respondents (42.73%) reported having treated 20 or more such clients.

Description of the "most typical or salient" DSH client. Table 2 outlines selected data pertaining to clinicians' descriptions of their experiences with clients who engage(d) in DSH. When asked to consider the "most typical or salient" DSH client with whom they worked, clinicians described predominantly female clients (90.43%) seen on an outpatient basis (51.30% non-hospital outpatient, and 17.39% hospital-based outpatient). The average client age at the time of treatment ranged from 2 to 59 years ($M = 24.65$, $Mdn = 23.00$ years). The course of treatment varied from 2 sessions to 1600 sessions, with a mean of 96.90 and a median of 21 sessions. Thus, approximately half of clients were seen for what is often considered a "standard" course of treatment (up to 20 sessions) while half engaged in a more extended course of treatment. DSH was considered to be a central issue in the treatment or clinical presentation in some cases (21.05%), but in the majority of cases DSH was identified as a non-central issue addressed in treatment (69.30%). The majority of respondents qualified the treatment as somewhat successful (42.98%) to very successful (35.96%), noting that "some" to "substantial" progress in important areas was made.

Table 2:

Description of "most typical or salient" DSH Client (N = 115)

	n	%
Sex		
Male	11	9.56
Female	104	90.43
Setting		
Inpatient	8	6.96
Hospital Outpatient	20	17.39
Non-hospital outpatient	59	51.30
Other	11	9.57
Combination of above	17	14.78
DSH as Focus of Presentation or Treatment		
Yes, it was a central focus	24	21.05
It was an issue, but not central	79	69.30
No	11	9.65
Response to Treatment		
Not at all successful; no progress	4	3.51
Not very successful; some progress	20	17.54
Somewhat successful; some progress in important areas	49	42.98
Very successful; substantial progress	41	35.96

DSH characteristics. Table 3 presents selected data on the nature of DSH for these clients. Respondents described the "most typical or salient" DSH client as having an age of onset of DSH ranging from 5 years to 43 years of age ($M = 16.42$, $Mdn = 23.00$ years). The duration of DSH (from the onset of DSH to the discontinuation of DSH behaviour) ranged from 1 month to 35 years ($M = 94.95$ months, $Mdn = 48.00$ months). The number of different methods of DSH was also reported, with 1 to 8 methods per client being described ($M = 2.40$, $Mdn = 2.00$). Approximately one quarter (24.56%) of respondents described clients who engaged in only one method of self-harm, with the remaining respondents describing multiple methods of DSH in their clients.

Table 3:

Age at Onset and Course for "most typical or salient" DSH Client (N = 115)

Demographic	*M*	*Mdn*	Min.	Max.
Client's Age at Time of Treatment	24.65	23.00	2.00	59.00
Client's Age at Onset of DSH (years)	16.42	15.00	5.00	43.00
Duration of Client's DSH (months)	94.95	48.00	1.00	420.00
Total Number of DSH Methods	2.40	2.00	1.00	8.00

Table 4 outlines the specific methods of DSH reported for the client of reference. Respondents were encouraged to rank the client's DSH methods from most prominent to least prominent. The column labelled 'Primary' represents the proportion of clients who were described as engaging most prominently in the DSH method listed. The columns labelled 'Secondary' and 'Tertiary' represent the second and third most prominent methods described, respectively, for those engaging in more than one DSH method. For the 114 participants who provided data on this item, cutting was by far the most prominent method of DSH (78.07%), followed by scratching (8.77%), carving into skin (3.51%), and sticking pins or needles into skin (2.63%). Other methods were less common, with respondents identifying burning, punching or hitting, banging head, and "other" methods as primary (1.75% for each). For those engaging in more than one method ($n = 87$), scratching (24.14%), carving into skin (20.69%) and burning (19.54%) were most commonly identified as the second most prominent methods. Scratching (26.67%) and interfering with wound healing (20.00%) were identified as the most common tertiary DSH methods ($n = 45$).

Of note, only 2 respondents (1.75%) reported methods that would be considered "compulsive DSH" under Simeon and Favazza's (2001) hypothetical model, involving exclusively hair pulling and / or skin picking. Thus, the vast majority of this sample (98.25%) endorsed methods that would be considered "impulsive DSH" under this model (i.e. a combination of self-cutting, burning, hitting etc.).

Table 4:

DSH Methods for "most typical or salient" DSH Client (N = 114)

	Primary (n = 114)		Secondary (n = 87)		Tertiary (n = 45)	
	n	%	n	%	n	%
Method						
Cutting	89	78.07	5	5.75	1	2.22
Scratching	10	8.77	21	24.14	12	26.67
Carving into Skin	4	3.51	18	20.69	7	15.56
Sticking Pins/Needles into Skin	3	2.63	4	4.60	1	2.22
Burning	2	1.75	17	19.54	2	4.44
Punching/Hitting	2	1.75	5	5.75	4	8.89
Banging Head	2	1.75	5	5.75	5	11.11
Interfering with Wound Healing	0	0.00	7	8.05	9	20.00
Other	2	1.75	5	5.75	4	8.89

Diagnoses. Table 5 summarizes the Axis I and Axis II diagnoses offered for the "most typical or salient" DSH clients described by respondents. Respondents were asked to list Axis I and Axis II diagnoses for the clients described. There was no limit on the number of diagnoses permitted. Most respondents provided DSM-IV based diagnoses, while some provided non-DSM-IV based information pertaining to the client's presenting problem (i.e., "affect regulation difficulties"). Although these are not considered diagnoses, they provide valuable descriptive information and were therefore retained as "diagnosis" categories. Of the 115 respondents, 3 (2.61%) did not provide a diagnosis (it is not clear whether this item was omitted, or there was simply no diagnosis made). The number of diagnoses made ranged from 0 to 7 per client (M = 1.97, Mdn = 2.00). Of the 112 clients for whom diagnoses were provided, 56 (50.00%) were given only Axis I diagnoses and 13 (11.61%) were given only Axis II diagnoses. The remaining 43 clients (38.39%) received a combination of Axis I and Axis II diagnoses.

Of those with at least one diagnosis (n = 99) the most common primary Axis I diagnosis was depression or dysthymia (29.29%), followed by posttraumatic stress disorder (PTSD; 16.16%) and bipolar disorder (10.10%). Dissociative disorders (5.05%), a history of abuse or neglect (5.05%), generalized anxiety disorder (GAD; 4.04%) and anorexia nervosa (4.04%) were also commonly noted. Of those with a second diagnosis (n = 44), most commonly reported secondary Axis I diagnoses included depression or

dysthymia (18.18%), GAD (9.09%), ADHD/CD/ODD (9.09%), PTSD (6.82%), general anxiety (6.82%), and communication disorder (6.82%). Of those with a third Axis I diagnosis (n = 17), a history of abuse or neglect (17.65%), general anxiety (11.76%), bulimia nervosa (11.76%) and non-specific eating disorder (11.76%) were most commonly reported.

When all diagnoses were considered, a total of 163 diagnoses were offered for the 99 clients of reference. Mood and anxiety disorders were most common, accounting for 29.45% and 28.83% of diagnoses, respectively. Unipolar and bipolar mood disorders accounted for 23.31% and 6.13% of diagnoses, respectively. Anxiety disorders were varied, with PTSD being most commonly reported (12.27%), followed by GAD (5.52%), general anxiety (4.91%), OCD (2.45%), panic disorder (1.84%), and situational stress (0.06%). Eating disorders accounted for 7.98% of diagnoses made, including anorexia nervosa (3.68%), bulimia nervosa (2.45%), and non-specific eating disorder (1.84%). Additional diagnoses included a history of abuse and neglect (6.13%), dissociation (6.13%), ADHD/ODD/CD (4.29%), substance use disorders (3.07%) and emotion regulation difficulties (3.07%). Each of the remaining diagnoses accounted for less than 2% of the total diagnoses offered: communication disorder, attachment difficulties, developmental disability, traumatic brain injury, autism spectrum disorder, learning disability, gender identity disorder, schizoaffective disorder, factitious disorder, somatoform disorder, and body dysmorphic disorder. Thus, it appears that while a wide range of diagnoses were reported, mood disorders (both unipolar and bipolar), trauma and dissociation, anxiety, a history of abuse and neglect, and ADHD/CD/ODD are the most commonly represented Axis I diagnoses for the "most typical or salient" clients described by survey respondents.

Of the 56 clients for whom respondents offered an Axis II diagnosis, the majority (87.50%) were identified as having a primary diagnosis of Borderline Personality Disorder or borderline personality traits. Antisocial Personality Disorder or traits was identified in 3.57% of cases, while diagnoses of Paranoid, Schizoid, Schizotypal, Avoidant, and Obsessive Compulsive Personality Disorder or traits were identified less frequently (1.79% for each). Five clients were offered a second Axis II diagnosis, while two clients were offered a third. Thus, most respondents who provided an Axis II

diagnosis reported borderline personality disorder or traits in the client described, and a single Axis II diagnosis was most commonly identified.

Table 5:

Diagnoses for "most typical or salient" DSH Client (N = 112)

	Primary (n = 99)		Secondary (n = 44)		Tertiary (n = 17)	
	n	%	n	%	n	%
Axis I						
Depression, dysthymia	29	29.29	8	18.18	1	5.88
Posttraumatic Stress Disorder	16	16.16	3	6.82	1	5.88
Bipolar Disorder	10	10.10	0	--	0	--
Dissociation, dissociative disorder	5	5.05	2	4.55	0	--
History of abuse or neglect	5	5.05	1	2.37	3	17.65
Generalized Anxiety Disorder	4	4.04	4	9.09	1	5.88
Anorexia Nervosa	4	4.04	2	4.55	0	--
Anxiety (general reference)	3	3.03	3	6.82	2	11.76
Substance use/abuse	3	3.03	1	2.27	1	5.88
ADHD, CD, or ODD	3	3.03	4	9.09	0	--
Other	17	17.17	16	36.36	8	47.06
	Primary (n = 56)		Secondary (n = 5)		Tertiary (n = 2)	
	n	%	n	%	n	%
Axis II						
Borderline Personality	49	87.50	2	40.00	0	--
Antisocial Personality	2	3.57	1	20.00	0	--
Other	5	8.93	2	40.00	2	100.00

Examination of respondents' reports based on number of sessions. The "most typical or salient" qualifier was used to focus the respondents' description of what they view as the best example of the DSH experience based on their clinical contact with an individual client. However, a specific amount of clinical contact (i.e., a minimum number of sessions) was not required. Therefore, clinician data were grouped based on the number of sessions reported with the client described (1 to 7 sessions, and 8 or more sessions) to evaluate whether significant differences exist on selected characteristics depending on the amount of clinical contact. The 8 session criterion was chosen arbitrarily as there are no clear guidelines for determining how long it would take to

develop a clinical sense of a client's DSH experience; however, 8 sessions was selected as it would likely allow a reasonable amount of time to conduct an intake interview and permit DSH to become part of the dialogue in the intervention. Of the 115 respondents, 95 (82.61%) reported having seen the client for eight or more sessions, while 14 (12.17%) reported having less than eight sessions with the client. Six (5.22%) were missing data on the number of sessions and were excluded from this analysis.

Independent samples t-tests were conducted comparing these two groups on the age of the client, the age at onset of DSH, the duration of DSH behaviour, the number of methods and the number of diagnoses. These results are summarized in Table 6.

Table 6:

Independent Samples t-tests Comparing Groups Based on Number of Sessions.

Group	*n*	*M (SD)*	*t*	*df*
Age of client (years)				
Less than 8 sessions	14	17.79 (5.95)	-4.17**	27.74‡
8 or more sessions	93	25.86 (10.68)		
Age at onset of DSH (years)				
Less than 8 sessions	14	14.14 (3.08)	-1.65	99
8 or more sessions	87	16.91 (6.14)		
Duration of DSH (months)				
Less than 8 sessions	14	35.00 (44.24)	-4.03**	44.07‡
8 or more sessions	87	101.75 (108.45)		
Number of DSH methods				
Less than 8 sessions	14	2.57 (1.28)	0.55	106
8 or more sessions	94	2.37 (1.25)		
Number of diagnoses				
Less than 8 sessions	14	2.07 (1.07)	0.23	107
8 or more sessions	95	1.99 (1.25)		

Note. ‡ Equal variances not assumed. * $p < .05$; ** $p < .01$. Two-tailed.

Referencing Table 6, it is apparent that the clinicians who described clients they had seen for less than 8 sessions tended to describe younger clients who had engaged in DSH for a shorter period of time as compared to clinicians who described clients they had seen for 8 or more sessions. However, on variables relating to the age of onset of DSH, number of methods, and number of diagnoses there were no significant difference

between these two groups. The younger age and shorter duration of DSH in the "less than 8 sessions" group may reflect a subgroup that is earlier in the development of DSH or associated clinical problems. It may also be partially reflective of the setting in which the client was seen (i.e., a school setting). However, the fact that this group is relatively small and is comparable on other relevant variables suggests that it is acceptable to combine these subsamples for subsequent analyses.

Qualitative Analyses

The 115 clinician respondents were asked to make brief qualitative comments about the client used as the "most typical or salient" example of DSH above. Specifically, respondents were asked to outline how they understand the client's DSH behaviour and DSH in general, including the role of DSH and the clients' experience of DSH. These responses were intended to provide more rich detail about the individual clinicians' views on DSH to enhance the quantitative findings and strengthen the understanding of DSH. Given the brief nature of the responses provided, a simple frequency count of specific themes was conducted for the 115 responses. Since many respondents offered more than one idea pertaining to their understanding of the client's DSH experience, each identifiable "theme" or "reason" for DSH was coded separately. The above literature search was used as a basis for coding and the commonly identified themes or etiological factors were included as specific themes. General characteristics of the client or more distal causes of DSH (i.e., low self-esteem, chaotic family background) were not included since these were not necessarily proximally or concretely related to the DSH experience. Thus, only more immediate or concretely identified reasons or processes associated with DSH were coded. After the initial coding of these specific themes was completed, the themes were organized into more broad concepts based.

Interrater reliability. In order to evaluate the reliability of coding, an independent individual coded 25% of the qualitative comments, randomly selected, according to the coding frames provided. General instruction was provided and specific training was conducted on five samples. The training examples were not included in reliability analysis. Interrater reliability was excellent for the nine broad coding frames (Affect Regulation, Expression of Affect, Avoidance of Affect, Induce Positive Affect,

Dissociation-related, Self-oriented, Other-oriented, Drive to DSH, and Other; intraclass correlation = .98, CI = .92 to .99) and for the narrow categories under each of these broad coding frames (intraclass correlation = .99, CI = .98 to .99).

Themes identified in qualitative analysis. A total of 280 instances of distinct ideas or themes were identified from the clinicians' qualitative descriptions of DSH. For conceptual clarity, the themes are presented in language that is as close to the original wording as possible. Table 7 presents a summary of the themes and concepts that were identified in this analysis.

Table 7:

Qualitative Analysis of Clinician-Identified DSH Themes (N = 115)

Concepts and Themes	*n*
Affect Regulation (non-specific reference to affect regulation)	48
Expression of Affect	26
Expression of multiple, complex, intense emotions	10
Expression of anger against others, anger in general	8
Expression of anger against self, self-hatred	8
Avoidance of Affect	38
Distract from emotional pain	18
Convert emotional pain to more tolerable physical pain	11
Numb or block out emotional pain	8
Keep in emotions, avoid letting them out	1
Induce Positive Affect	43
To decrease tension or anxiety	25
Induce positive feelings or sensations (i.e., calm, relief)	10
Self-soothing, self-calming	8
Dissociation-Related	23
DSH while in dissociated state	5
To end numbness, to feel something	5
To symbolize, reenact, replay abuse experiences	5
To feel real, present, grounded	4
To end dissociation or regulate dissociative states	3
To end flashbacks and return to present	1
Self-oriented	48
To punish self, atone for bad thoughts	22
To feel, express, regain control	11
Response to self-hatred, loathing, shame	7
Identity-related (to feel less invisible, a sense of self)	7
To cleanse aspects of self that are viewed as "bad"	1

Table 7 (continued):

Concepts and Themes	*n*
Other-oriented	25
To communicate something to others, 'cry for help'	7
To gain attention, sympathy, response from others	6
Peer pressure, to fit in with group, learned from peers	6
Response to isolation, loneliness, abandonment	4
Defy or escape demands of authority	2
Draw to DSH	11
"Addiction" or craving	5
Interest or fascination	2
Exhilaration, gratification, euphoria associated with DSH	2
Need for stimulation, high risk	2
Other	18
Lack of healthy coping strategies or outlets	5
Biological (endorphins, neurotransmitters)	4
Compulsion, "have to" do it	4
Impulse control problems	3
Ego function compromised	2

As outlined in Table 7, many clinicians identified DSH as being associated with some form of affect regulation or emotion management. Specifically, on 48 occasions, respondents offered a general reference to non-specific emotion regulation, such as "to deal with (intense, complex, ambivalent, overwhelming) feelings," "to process emotional pain," or "to regulate difficult emotions." More specific references to affect regulation or emotional processing were offered, such as DSH as an effort to reduce negative affect and induce positive feelings ($n = 43$), DSH as an effort to avoid or escape negative, unpleasant or intense affect ($n = 38$), and DSH as a means to express affect ($n = 26$) with anger being specifically noted in several instances ($n = 16$).

Dissociative experiences were noted in 23 instances, with DSH occurring in association with the following: while in a dissociative state ($n = 5$); to end numbness or to induce feeling ($n = 5$); to symbolize or re-enact (as in re-experiencing) abuse experiences ($n = 5$); to feel real, present or grounded ($n = 4$); to end dissociation or regulate dissociative states ($n = 3$); and to end flashbacks and return to the present ($n = 1$).

Another group of themes appeared to be primarily self-oriented ($n = 48$), focusing mainly on the internal experience of the individual. These included DSH to punish

oneself and atone for bad thoughts or acts (n = 22), to feel, express, or regain a sense of control (n = 11), to respond to feelings of self-hatred and/or shame (n = 7), to manage issues relating to identity such as establishing a sense of self or feeling less invisible (n = 7), and to cleanse aspects of the self that were viewed as "bad" or "dirty" (n = 1). In contrast, another group of themes were other-oriented (n = 25), involving a reaction to others or an effort to elicit a response from others. For example, these themes included DSH to communicate a message to others (n = 7), to gain attention, sympathy or a response from others (n = 6), to fit in with peers or to respond to peers' expectations (n = 6), to respond to feelings of loneliness, isolation, disconnectedness from others, or abandonment (n = 4), or to defy or escape demands of authority figures (n = 2).

The final two themes were less frequently endorsed. A draw or attraction to DSH itself was noted in 11 instances, including DSH as an "addiction" or craving (n = 5), interest or fascination in DSH (n = 2), exhilaration or gratification associated with DSH (n = 2), and a need for varied forms of stimulation or risk-taking (n = 2). Other themes were identified on 18 occasions and included the following: lack of healthy coping strategies or outlets (n = 5); biological strivings for neurotransmitter or endorphin effects (n = 4); a compulsion or sense of "having to" engage in DSH (n = 4); impulse control problems (n = 3); and compromised ego function (n = 2).

Taken together, it appears that the central themes offered by clinician respondents to explain or qualify the DSH they observed in their clients involve internally driven efforts to regulate or manage intense negative affect. Thus, these individuals are described as using DSH as a means to process, express, avoid, escape from, or reduce unpleasant emotions or states in many cases (n = 155). They are also described as using DSH in the context of managing dissociative experiences (n = 23) or other aversive internal experiences such as a need for punishment, guilt, shame, self-loathing, lack of control, or identity problems (n = 48). DSH is less frequently described as attention-seeking, "manipulative," or otherwise relating to significant others (n = 25), and even less frequently characterized as something the individual is drawn to in its own right as fascinating, exciting, or euphoria-inducing (n = 11). Thus, it appears that clinicians surveyed most commonly viewed their clients' DSH experiences as an effort to manage intense and unpleasant affective states and internal experiences, and to return to a more

positive state and/or deal with emotional pain. However, it is also apparent that a range of factors were viewed as relevant to the DSH experience.

Analysis of DSH-C Questionnaire Data

In an effort to systematically examine clinicians' perceptions of certain features of DSH, the 21-item DSH-C was administered to gather specific information on possible impulsive and compulsive features of DSH in the "most typical or salient" client of reference. The survey produced 115 completed DSH-C questionnaires.

Principal components analysis. A principal components analysis (PCA) of the DSH-C questionnaire was performed to evaluate whether the items designed to reflect impulsive and compulsive items are represented by identifiable components (Tabachnick & Fidell, 2007). The assumptions for PCA and appropriateness of data reduction were assessed and deemed adequate to proceed. Bartlett's test of sphericity was significant ($\chi 5$ (210, $N = 21$) = 877.90, $p < 0.01$), confirming that the items are sufficiently correlated to proceed. The Kaiser-Meyer-Olkin (KMO) statistic was calculated to determine whether the variables in the correlation matrix belong together psychometrically. The KMO value was 0.80, which is in the *good* range according to Field (2001) and was therefore in the acceptable range for PCA.

PCA was conducted first using oblique rotation ($\Delta = 0$), as the likelihood of correlations among factors was uncertain. The 21 items of the DSH-C were included as variables for data reduction. Of note, the factor structure produced by oblique rotation was comparable to that produced using orthogonal rotation and principal axis factoring. Therefore, varimax rotation was selected as this method simplifies the factors by increasing high loadings and decreasing low ones, which facilitates the determination of which variables load on which factor (Tabachnick & Fidell, 2007). Based on the relative eigenvalues and the inspection of the scree plot, it was determined that a four factor solution is the most appropriate way to summarize the data; including more than four factors does not appreciably explain additional variance or add to the interpretability of the solution. As noted in Table 8, the four factor solution explained 52.43% of the variance following varimax rotation.

Table 8:

Total Variance Explained for PCA of DSH-C (N = 115)

Component	Initial Eigenvalue	% of Variance (After Rotation)	Cumulative % of Variance (After Rotation)
1	5.91	21.74	21.74
2	2.09	11.32	33.06
3	1.57	9.91	42.97
4	1.44	9.47	52.43

The rotated component matrix from this PCA (Table 9) revealed that 11 items loaded on the first component (items 1, 3, 8, 9, 11, and 16 loaded positively, and items 2, 10, 12, 17, and 20 loaded negatively). These items appear to reflect the general characteristic of acting quickly based on urges or whim, with little deliberation or caution. It also includes reference to engaging in DSH on impulse or whim, without thinking about one's behaviour. This component operationalizes the construct of impulsivity described above, and will be referred to as DSH-C Impulsivity.

Four items had their highest loadings on the second component (items 8, 14, 18, and 19). These items appear to reflect a positive orientation or draw to DSH (i.e., feeling excited by DSH and wanting to engage in DSH) and a general excitement-seeking orientation. Of note, item 8 had salient loadings on the first two components. Four items loaded negatively on the second component (items 4, 10, 12 and 15) suggesting that this component is related to an ego-syntonic experience of DSH and a lack of caution, inhibition, or generalized anxiety. This pattern suggests the notion of excitement-seeking or novelty-seeking and an orientation towards DSH as exciting or desirable in some way. This component will be referred to as DSH-C Excitement.

The third component was defined by five items, all of which loaded positively (items 5, 7, 12, 20 and 21). This component appears to reflect the construct of compulsivity and includes reference to a compulsion to engage in DSH well before acting, viewing DSH as something that is "needed" (as opposed to "wanted"), a gratifying or rewarding quality, and a tendency to do what one "should do" as opposed to what one "wants." This will be referred to as DSH-C Compulsivity.

The fourth component consisted of four items that loaded positively (items 6, 7, 13, and 15) and one item that loaded negatively (item 14). The fourth component appears

to reflect shame and regret following DSH, a delay in performing DSH due to a period of deliberation or conflict over DSH, and an experience of DSH as ego dystonic. This will be referred to as DSH-C Shame and Delay. Of note, item 7 reflects a compulsion to engage in DSH well in advance of the behaviour and loaded on both the third and fourth components.

Taken together, these four components appear to operationalize the constructs of impulsivity, excitement-seeking, compulsivity, and a negative appraisal of the self if one succumbs to DSH and a related delaying effort. The first two seem to fit with the constructs of impulsivity and excitement-seeking, while the latter two appear more to relate to compulsivity and inhibition or anxiety described above.

Table 9:

Variable Loadings on Four Extracted Components for DSH-C (Varimax Rotation, N = 115)

		Component			
Item		1	2	3	4
17	...tends to consider all aspects of a problem or situation before deciding how to approach it	**-.82**	-.09	.02	.29
16	...tends to make decisions quickly without thinking them through	**.82**	.17	-.14	-.19
1	...is impulsive in many areas of life	**.81**	.11	-.14	-.13
11	...lets his/her urges and emotions dictate what he/she does	**.68**	.24	-.07	.05
3	...engages in DSH on impulse or on a whim, without thinking about his/her behaviour	**.61**	-.19	.01	-.23
9	...seems to exert little or no control over his/her thoughts, feelings or behaviour	**.58**	.10	.13	-.30
10	...is a cautious individual who prefers to "play it safe" and avoid new or risky situations	**-.57**	**-.43**	.24	-.06
12	...is more influenced by what he/she "should" do than by what he/she actually wants	**-.51**	**-.42**	**.40**	.07
2	...is a perfectionist in many areas of life, working hard to make sure he/she does everything "just right"	**-.48**	.00	.24	-.08
18	...feels excited by his/her DSH	.23	**.69**	.08	-.22
8	...desires excitement and enjoys new or risky situations	**.47**	**.60**	.04	.03
19	...understands DSH as something he/she *wants* to do	.02	**.57**	.11	-.05
4	...engages in DSH because he/she becomes overwhelmed with generalized anxiety and does not know how to cope	-.05	**-.46**	.34	-.06

Table 9 (continued):

Item		Component 1	2	3	4
14	...only regrets his/her DSH behaviour because he/she gets in trouble (i.e. by family, friends, physician)	.13	**.42**	.31	**-.42**
21	...feels compelled to engage in DSH	.00	-.08	**.79**	.13
7	...has a compulsion to engage in DSH well before acting, rather than just doing it on a whim	-.17	.05	**.64**	**.35**
20	...understands DSH as something he/she *needs* to do	**-.37**	-.02	**.48**	-.04
5	...engages in DSH because something about the behaviour itself is rewarding or gratifying	-.04	.30	**.48**	-.07
13	...is typically ashamed or regretful after he/she engages in DSH behaviour	-.20	-.17	.11	**.75**
6	...engages in DSH only after having agonized over or trying to avoid the behaviour for a substantial period	-.27	.07	.15	**.74**
15	...experiences DSH as ego-dystonic or alien, rather than ego-syntonic	.15	**-.43**	.05	**.45**

Internal consistency of four-factor solution. In order to evaluate the internal consistency of each of the four DSH-C components, the coefficient alpha values were calculated for each component. This was calculated by first multiplying each participant's rating of each item with the loading for the component in question, then by calculating the coefficient alpha value for that component ($n_{items} = 21$, $n_{cases} = 115$). The alpha values for the four components were as follows: DSH-C Impulsivity ($\alpha = .85$), DSH-C Excitement ($\alpha = .74$), DSH-C Compulsivity ($\alpha = .66$), DSH-C Shame and Delay ($\alpha = .69$). Thus, the four factor solution generated components that demonstrated adequate internal consistency to proceed with the subsequent statistical analyses.

Expert Ratings Analysis.

Expert ratings. The DSH-C items were rated by 8 clinical psychologist faculty members at the University of Windsor (Appendix A7). These professionals were asked to rate each of the 21 items to indicate how much they believe the item reflects impulsivity on a scale from 1 (not at all) to 10 (very much so). They were also given this same list of 21 items and asked to rate each item on the same scale as to how much they believe the item reflects compulsivity. These ratings were gathered in anticipation of bolstering any

findings in the PCA that would indicate that one or more components reflect greater compulsivity and other components reflect greater impulsivity.

With respect to the expert ratings of impulsivity for the 21 items, ratings were found to have good reliability (Intraclass correlation coefficient = .87, 95% CI = .76 to .94). The expert ratings of compulsivity for the 21 items, were also found to have good reliability (Intraclass correlation coefficient = .81, 95% CI = .66 to .91). The means and standard deviations of these items are found in Table 10, along with a series of dependent *t*-tests which were conducted to compare the mean scores for impulsivity and compulsivity ratings for each item.

Table 10:

Expert Ratings of Impulsivity and Compulsivity for DSH-C Items (N = 8)

		Rating for Impulsivity		Rating for Compulsivity		
Item		*M*	SD	*M*	SD	*t* (7)
1	...is impulsive in many areas of life	8.38	1.92	3.63	2.45	4.39**
2	...is a perfectionist in many areas of life...	2.38	1.51	7.50	1.07	-8.83**
3	...engages in DSH on impulse or on a whim...	6.13	2.17	3.75	2.38	2.26
4	...engages in DSH because he/she becomes overwhelmed with generalized anxiety...	5.75	2.66	6.63	2.56	-.85
5	...engages in DSH because something about the behaviour itself is rewarding or gratifying	6.63	2.26	6.75	2.12	-.12
6	...engages in DSH only after having agonized over or trying to avoid the behaviour...	3.25	2.19	5.88	2.70	-3.19*
7	...has a compulsion to engage in DSH well before acting, rather than just doing it on a whim	4.00	2.39	7.88	1.36	-4.65**
8	...desires excitement and enjoys new or risky situations	6.13	2.30	3.13	1.55	3.38*
9	...seems to exert little or no control over his/her thoughts, feelings or behaviour	6.75	2.71	4.38	2.97	2.19
10	...is a cautious individual who prefers to "play it safe" and avoid new or risky situations	2.00	0.93	6.25	1.83	-6.56**
11	...lets urges and emotions dictate what he/she does	7.75	1.39	5.13	2.23	2.38*
12	...is more influenced by what he/she "should" do than by what he/she actually wants	3.13	1.46	6.75	1.83	-4.30**
13	...is typically ashamed or regretful after he/she engages in DSH behaviour	4.75	1.91	6.63	1.19	-2.45*
14	...only regrets his/her DSH behaviour because he/she gets in trouble...	4.38	2.26	4.13	1.46	.22

Table 10 (continued):

Item		Rating for Impulsivity		Rating for Compulsivity		
		M	SD	*M*	SD	*t* (7)
15	...experiences DSH as ego-dystonic or alien...	3.50	1.93	6.00	1.93	-3.99**
16	...tends to make decisions quickly without thinking them through	7.75	2.55	2.88	1.55	6.57**
17	...tends to consider all aspects of a problem or situation before deciding how to approach it	1.87	0.99	5.38	1.92	-4.95**
18	...feels excited by his/her DSH	4.38	2.83	4.38	2.07	.00
19	...understands DSH as something he/she *wants* to	4.63	2.33	3.88	1.55	1.11
20	...understands DSH as something he/she *needs* to	4.63	1.92	6.75	2.25	-2.19
21	...feels compelled to engage in DSH	5.25	1.58	8.38	1.51	-4.21**

*$p < .05$, 2-tailed; **$p < .01$, 2-tailed.

Dependent *t*-tests revealed significant differences in experts' ratings on 13 items when comparing how representative each item was of impulsivity versus compulsivity. For items 1, 8, 11, and 16, experts clearly rated these items as significantly more representative of impulsivity as compared to compulsivity. Items 2, 6, 7, 10, 12, 13, 15, 17 and 21 were rated as significantly more representative of compulsivity as compared to impulsivity. The ratings on these 13 items were such that experts identified these items as highly reflective of impulsivity (above the average impulsivity rating) and low on compulsivity (below the average compulsivity rating) on items that were designed to reflect impulsivity, and vice versa in the case of items designed to reflect compulsivity. These findings also mirror the PCA loadings, which are discussed in detail below. Experts appear to view impulsivity and compulsivity (at least as pertaining to these items) as distinct constructs that are inversely related; high scores on one are accompanied by low scores on the other. Efforts to examine the possible impact of demand characteristics are described below.

Eight items were rated comparably as to the degree of impulsivity and compulsivity represented, as dependent t-tests were not significant for items 3, 4, 5, 9, 14, 18, 19, and 20. Item 3 (...engages in DSH on an impulse or on a whim, without thinking about his/her behaviour) and item 9 (...seems to exert little or no control over his/her thoughts, feelings or behaviour) showed a trend towards impulsivity, while item 20 (...understands DSH as something he/she *needs* to do) showed a trend towards

compulsivity. The remaining items were quite similarly rated for impulsivity and compulsivity. Thus, items reflecting DSH associated with generalized anxiety and lack of coping ability (item 4), a rewarding or gratifying quality (item 5), regret exclusively due to external consequences (item 14), excitement (item 18), and *wanting* to engage in DSH (item 19) were rated by experts as approximately equally reflective (or equally unreflective) of impulsivity and compulsivity. When compared to the PCA loadings of these items, it is apparent that four of the 5 items that were rated as equally reflective (or unreflective) of impulsivity and compulsivity loaded highly on the DSH-C Excitement component (items 5, 14, 18, and 19). Item 5 loaded highly on DSH-C Excitement and DSH-C Compulsivity, while item 4 loaded highly on DSH-C Compulsivity. Thus, the items that were rated equivocally as to how representative the item was of impulsivity versus compulsivity consisted mainly of items that loaded on the excitement or novelty seeking component, although one item loaded highly on the excitement and compulsivity components. Thus, experts may have considered item content relating to excitement seeking or novelty seeking as distinct from impulsivity and compulsivity.

Intra- and intercorrelations of experts' ratings on impulsivity and compulsivity with DSH-C components. In order to consider findings from correlations of the expert ratings with each other, the correlations of the DSH-C components with each other, and the extent to which the former might predict the latter, a Pearson bivariate correlation matrix was constructed using six variables, using the 21 items as "people." The first variable is the mean expert rating of the degree to which each of the 21 items reflects impulsivity (Expert Impulsivity). The second variable consists of the mean expert rating of the degree to which each item reflects compulsivity (Expert Compulsivity). The remaining four variables represent the loadings for each of the 21 items on each of the four components of the DSH-C as produced from the PCA of clinician ratings of the "most typical or salient" DSH client (referred to as DSH-C Impulsivity, DSH-C Excitement, DSH-C Compulsivity, and DSH-C Shame and Delay). Table 11 presents the Pearson correlation coefficient matrix.

Table 11:

Correlations for Expert Ratings and DSH-C Component Loadings (N = 21)

	Expert Imp.	Expert Comp.	DSH-C Impulsiv-ity	DSH-C Excite-ment	DSH-C Compulsiv-ity	DSH-C Shame and Delay
Expert Impulsivity	1.00	--	--	--	--	--
Expert Compulsivity	-.48*	1.00	--	--	--	--
DSH-C Impulsivity	.88**	-.68**	1.00	--	--	--
DSH-C Excitement	.33	-.52*	.40†	1.00	--	--
DSH-C Compulsivity	-.30	.79**	-.50*	-.20	1.00	--
DSH-C Shame and Delay	-.37†	.44*	-.41†	-.33	.07	1.00

† $p < .10$, 2-tailed; *$p < .05$, 2-tailed; **$p < .01$, 2-tailed.

Intracorrelations of expert ratings. A significant negative correlation exists between the Expert Impulsivity ratings and Expert Compulsivity ratings ($r = -.48$, $p < .05$). Thus, if an item was rated by the experts as indicating impulsivity, it was also rated low by them on compulsivity, and vice versa. This seems to suggest that within the context of the DSH experience, experts view the presence of either impulsivity or compulsivity as simultaneously representing an absence of the other. Given the method used to collect the expert ratings, it is possible that this negative correlation reflects in part demand characteristics of the expert rating form. Specifically, asking experts to first rate items on impulsivity and then rate the same items on compulsivity may have implied an expectation of differential ratings on the two constructs. In order to use the expert ratings to meaningfully corroborate the interpretation of DSH-C items as reflecting impulsivity or compulsivity based on the component loadings, the sub-analyses below were conducted.

Intracorrelations of DSH-C components. A significant negative correlation exists between DSH-C Impulsivity and DSH-C Compulsivity based on the component loadings for the 21 items ($r = -.50$, $p < .05$). This finding mirrors the negative correlation between Expert Impulsivity and Expert Compulsivity ratings ($r = -.48$, $p < .05$) noted above.

Thus, high loadings on DSH-C items reflecting impulsivity are associated with low loadings reflecting a relative absence of compulsivity, and vice versa.

A general trend, though not statistically significant, suggests that the components related to behavioural activation (DSH-C Impulsivity and DSH-C Excitement) tend to correlate positively with one another ($r = .40, p = .08$). DSH-C Impulsivity also tends to correlate negatively with the components related to behavioural inhibition (DSH-C Compulsivity and DSH-C Shame and Delay; $r = -.50, p < .05$ and $r = -.41, p = .07$, respectively). This supports the notion that the constructs of impulsivity and compulsivity are not independent constructs in the case of the DSH-C, but rather are inversely related. As noted above, the sub-analyses below were conducted to examine whether Expert Impulsivity and Expert Compulsivity, independent of one another, predict DSH-C Impulsivity and DSH-C Compulsivity.

It is somewhat unexpected that the two components appearing to be related conceptually to behavioural inhibition (DSH-C Compulsivity and DSH-C Shame and Delay) show a very low correlation ($r = .07, p > 0.05$). While these two components may reflect aspects of compulsivity as conceptualized here, they could represent distinct aspects of the compulsivity construct that are not significantly correlated. Alternatively, the items comprising DSH-C Shame and Delay may be related to another construct (i.e., proneness to guilt and shame).

Relations of expert ratings to DSH-C components. Referencing the correlations in Table 11, it is evident that Expert Impulsivity ratings correlate strongly with item loadings on DSH-C Impulsivity ($r = .88, p < .01$). Similarly, the Expert Compulsivity ratings correlate strongly with DSH-C Compulsivity and DSH-C Shame and Delay ($r = .79, p < .01$ and $r = .44, p < .05$). Thus, the expert ratings of these items strongly agree with the component analytic results.

There is also a degree of divergent validity in that each of the expert ratings correlates negatively with the hypothesized contrary DSH-C component, with Expert Impulsivity tending to correlate negatively with DSH-C Shame and Delay ($r = -.37, p = .10$) and Expert Compulsivity correlating negatively with DSH-C Impulsivity and DSH-C Excitement ($r = -.68, p < .01$ and $r = -.52, p < .05$, respectively). However, it is apparent that the correlation of Expert Impulsivity with the DSH-C components is more focused

and circumscribed than is that of Expert Compulsivity. The former correlates significantly with only two DSH-C components (DSH-C Impulsivity and DSH-C Shame and Delay; $r = .88, p < .01$ and $r = -.37, p = .10$), whereas the latter correlates significantly with all four components (DSH-C Impulsivity, DSH-C Excitement, DSH-C Compulsivity and DSH-C Shame and Delay; $r = -.68, p < .01$, $r = -.52, p < .05$, $r = .79, p < .01$ and $r = .44, p < .05$, respectively). Thus, Expert Compulsivity is more negatively related to these activation components than Expert Impulsivity is negatively related to the inhibition components. The question remains as to whether this may be the result of negative correlations of the two expert ratings, negative correlations between DSH-C Impulsivity and DSH-C Compulsivity, or both.

In order to clarify the relations of Expert Impulsivity, independent of Expert Compulsivity, to the DSH-C components, two regression analyses were conducted. First, Expert Impulsivity was entered as the dependent variable, Expert Compulsivity was entered in the first block, and all four DSH-C components were entered simultaneously in the second block (Table 12). Then, this analysis was repeated using Expert Compulsivity as the dependent variable, Expert Impulsivity in the first block, and the four DSH-C components simultaneously in the second block (Table 13). The resulting statistics represent the degree to which the expert ratings, independent of one another, predict component scores when all other components are held constant.

Table 12:

Sequential Regression for Variables Predicting Expert Impulsivity Ratings (N = 21)

	Variable	*B*	*SE B*	Standardized β	*t*
Step 1					
	Expert Compulsivity	-0.56	0.24	-.48	-2.38*
Step 2					
	Expert Compulsivity	0.22	0.35	.19	0.64
	DSH-C Impulsivity	4.03	0.62	1.00	6.52**
	DSH-C Excitement	0.18	0.81	.03	0.23
	DSH-C Compulsivity	0.46	1.77	.06	0.26
	DSH-C Shame and Delay	0.21	0.90	-.03	-0.24

Note. $R^2 = .23$ for Step 1, $p < .05$; $\Delta R^2 = .58$ for Step 2, $p < .01$.
* $p < .05$; ** $p < .01$

Referencing Table 12, Expert Compulsivity entered in Step 1 explains 23% of the variance ($R^2 = .23$, $F(1, 19) = 5.66$, $p < .05$) and negatively predicts Expert Impulsivity. Adding the four DSH-C components as predictors in Step 2 explains an additional 58% of the variance in the outcome variable ($R^2 = .81$, $F(5, 15) = 12.69$, $p < .01$). However, when all variables are entered simultaneously and held constant, Expert Compulsivity does not significantly predict scores on Expert Impulsivity. Rather, of the four components, DSH-C Impulsivity is the only one that significantly contributes to the prediction of Expert Impulsivity ($\beta = 1.00$, $t = 6.52$, $p < .01$). Hence, DSH-C Impulsivity mediates all of Expert Compulsivity's correlation with Expert Impulsivity. Given this finding combined with the fact that the formation of DSH-C Impulsivity as a scale had absolutely no involvement in the expert rating task, it is impossible that the negative relationship between Expert Impulsivity and Expert Compulsivity is due simply to demand characteristics of the task.

Table 13:

Sequential Regression for Variables Predicting Expert Compulsivity Ratings (N = 21)

Variable	*B*	*SE B*	Standardized β	*t*
Step 1				
Expert Impulsivity	-0.41	0.17	-.48	-2.38*
Step 2				
Expert Impulsivity	0.12	0.19	.14	0.64
DSH-C Impulsivity	-1.00	0.85	-.29	-1.17
DSH-C Excitement	-1.16	0.51	-.25	-2.27*
DSH-C Compulsivity	4.03	0.79	.62	5.13**
DSH-C Shame and Delay	1.31	0.57	.25	2.28*

Note. $R^2 = .23$ for Step 1, $p < .05$; $\Delta R^2 = .63$ for Step 2, $p < .01$. * $p < .05$; ** $p < .01$

Similarly, referencing Table 13, Expert Impulsivity entered in Step 1 explains 23% of the variance ($R^2 = .23$, $F(1, 19) = 5.66$, $p < .05$) and negatively predicts Expert Compulsivity. Including the four DSH-C components in Step 2 explains an additional 63% of the variance in the outcome variable ($R^2 = .86$, $F(5, 15) = 18.09$, $p < .01$).

However, when all other variables are entered simultaneously and held constant, Expert Impulsivity does not significantly predict scores on Expert Compulsivity. Interestingly, neither is DSH-C Impulsivity a significant (negative) predictor of Expert Compulsivity. Instead, DSH-C Excitement is significant ($\beta = -.25$, $t = -2.27$, $p < .05$) and emerges as negatively correlated with Expert Compulsivity. In addition, DSH-C Compulsivity and DSH-C Shame and Delay demonstrate a significant positive relationship to the outcome variable ($\beta = .62$, $t = 5.13$, $p < .01$ and $\beta = .25$, $t = 2.28$, $p < .05$, respectively). As above, because the DSH-C components mediate all of Expert Impulsivity's relation to Expert Compulsivity, and because the formation of the DSH-C scales was entirely independent of the expert ratings, it is not possible that the negative correlation between Expert Impulsivity and Compulsivity is due to demand characteristics of the expert rating task.

Finally, to further examine these relationships, the partial correlations of Expert Impulsivity and Expert Compulsivity with the DSH-C components were examined. This provides an index of the inter-correlations of the isolated expert ratings with component scores without controlling for the common variance among the components. Correlations of Expert Impulsivity, controlling for Expert Compulsivity, with the components revealed a significant positive correlation of Expert Impulsivity with DSH-C Impulsivity ($pr = .86$, $p < .01$). The remaining correlations of Expert Impulsivity with DSH-C components were not significant. Correlations of Expert Compulsivity, controlling for Expert Impulsivity, with the components revealed a significant positive correlation with DSH-C Compulsivity ($pr = .77$, $p < .01$) and a significant negative correlation with DSH-C Impulsivity ($pr = -.61$, $p < .01$).

Summary of DSH-C Questionnaire Data

Clinician responses to the DSH-C were aimed to delineate impulsive and compulsive characteristics of DSH in the clinician's "most typical or salient" client who engaged in DSH. A principal components analysis of the DSH-C produced four components, DSH-C Impulsivity, DSH-C Excitement, DSH-C Compulsivity, and DSH-C Shame and Delay. The former two appear to relate to the constructs of impulsivity and sensation seeking, while the latter seem related to compulsivity. The four components demonstrated adequate internal consistency for analysis. Expert ratings of the 21 DSH-C

items for representation of the impulsivity and compulsivity constructs showed a high level of consistency and reliably distinguished 4 items as highly representative of impulsivity (and unrepresentative of compulsivity), and 9 items as highly representative of compulsivity (and unrepresentative of impulsivity).

Expert ratings of items as impulsive and compulsive, intracorrelations of the DSH-C components, and intercorrelations between the expert ratings and component loadings showed an inverse relationship between impulsivity and compulsivity. It was demonstrated that the demand characteristics of the expert rating task were not responsible for this negative relationship. Thus, two independent and reliable sources of data showed a distinct inverse relationship between impulsive and compulsive items on the DSH-C, with high expert ratings and component loadings on impulsivity being associated with low levels of compulsivity and vice versa.

Taken together, these findings lend support to the first hypothesis as the items designed to reflect impulsivity and compulsivity in clinician ratings of prototypical DSH clients show at least two distinct components, and that these components relate meaningfully to the constructs of impulsivity and compulsivity. These results also suggest that the constructs of impulsivity and compulsivity as reflected in the DSH-C items are not independent constructs, but rather are inversely related. This may be more representative of an impulsivity-compulsivity continuum, with high ratings for one construct being associated with low ratings or an absence of the other.

Construction of Impulsivity and Compulsivity Scales using the DSH-C

The high level of consistency across expert ratings of DSH-C items and DSH-C component loadings supports the presence of reliable, inversely related constructs of impulsivity and compulsivity within the DSH-C. As noted, the internal consistency of the DSH-C components was adequate for statistical analysis. In order to conduct a statistical comparison of the degree of impulsivity and compulsivity present in clinician ratings of the prototypic DSH client's experience, a 2-scale version of the DSH-C and the DSH-U was constructed to reflect impulsivity and compulsivity (DSH Impulsivity and DSH Compulsivity). The construction of these scales and the subsequent analyses are discussed below in Chapter V (pp. 120-131), including a comparison of the levels of

impulsivity and compulsivity within and between samples based on these scales. The implications of these findings for the third hypothesis are also discussed in Chapter V.

Summary of Clinician Respondent Data (Study 1)

The data generated by this survey were provided by clinician respondents who show a high level of professional experience in general, as well as with the area of DSH. The "most typical or salient" client who engaged in DSH were described in a manner consistent with the current literature on DSH in terms of gender, age of onset and DSH characteristics. Cutting, scratching, carving and burning were most frequently endorsed methods, and multiple methods were common. The duration of DSH ranged widely, with a median duration of 4 years, suggesting that this reference group consists primarily of repetitive or episodic DSH over a substantial period of time. The vast majority (98.25%) of prototypical clients described would be classified as "impulsive" DSH according to Simeon and Favazza's (2001) model of "impulsive" versus "compulsive" DSH. Most frequently reported Axis I diagnoses in the prototypical DSH client were mood disorders, anxiety disorders, trauma and dissociation, and eating disorders, although a wide cross-section of diagnoses were reported attesting to the wide-ranging diagnostic groups that engage in DSH. Nearly half of the respondents identified an Axis II disorder, with the vast majority of these being Borderline Personality Disorder or traits. Thus, while Borderline Personality characteristics pictured prominently among Axis II diagnoses offered, other Axis II diagnoses were reported and half of the sample had exclusively Axis I diagnoses.

An examination of the qualitative description of the "most typical or salient" client's DSH experience revealed that clinician respondents tend to view clients' DSH experiences as relating to an internally driven effort to regulate or manage intense negative affect or aversive states. Managing dissociative experiences or other aversive internal states (i.e., need for self-punishment, guilt, shame, self-loathing, lack of control, or identity problems) were also common themes. Themes of attention-seeking, "manipulation," or communicating to others through behaviour were less frequently noted. In a few cases DSH was described as fascinating, gratifying, exciting or euphoria-inducing to the individual; however this was infrequently endorsed compared to other

themes or reasons for DSH. Thus, clinicians appear to most commonly view the "most typical or salient" clients' DSH experiences as an effort to manage intense and unpleasant affective states and internal experiences, and to return to a more positive state. This is a similar pattern to some recent findings relating to functions of DSH (Klonsky, 2007; Nock & Prinstein, 2004).

A PCA of the DSH-C revealed that these data can be best reduced to four components, referred to as DSH-C Impulsivity, DSH-C Excitement, DSH-C Compulsivity, and DSH-C Shame and Delay. The first two seem to fit with the impulsivity/sensation seeking construct, while the latter two appear to capture the construct of compulsivity described above. Expert ratings of each item's degree of representation of impulsivity and compulsivity supported this distinction and the interpretation of components as reflecting the constructs of impulsivity and compulsivity. Examination of the relationships among the DSH-C component loadings from clinician data revealed a significant negative correlation between DSH-C Impulsivity and DSH-C Compulsivity. Thus, at least as they relate to these data, the constructs of impulsivity and compulsivity might be best characterized as negatively related, with high levels of one being associated with correspondingly low levels of the other.

A DSH Impulsivity and DSH Compulsivity scale was constructed using the DSH-C and DSH-U items, with item selection being informed by expert ratings of each item, PCA loadings from the DSH-C and DSH-U, and the pattern of item-total correlations (discussed in Chapter V, pp. 120 to 125). Based on a review of the literature and the apparent tendency to refer to the types of DSH in this sample (repetitive or episodic DSH involving multiple methods such as cutting, burning, and hitting) as "impulsive DSH" (i.e., Simeon & Favazza, 2001), it was hypothesized that clinician ratings of the prototypic DSH client would be more consistent with an impulsive act, rather than a compulsive behaviour. The DSH Impulsivity and DSH Compulsivity scales were compared both within and between subjects for the clinicians and the undergraduate participants. Results of these analyses are presented in Chapter V (pp. 125 to 131) and the implications relating to the third hypothesis are also discussed.

CHAPTER IV

Study 2 (Undergraduate Sample)

Method

Participants and Procedure

Participants. Ninety-eight undergraduate participants were recruited through the University of Windsor participant pool as outlined below. Table 14 outlines selected demographic data for the undergraduate participants. Of the 98 participants, 87.50% were female and 12.50% were male. The age of participants ranged from 18 to 44 years ($M = 21.23$, $Mdn = 20.00$). The majority of the respondents identified themselves as Caucasian or of European descent (88.54%), with a minority self-identifying as being of Asian (6.25%), African (3.13%), Middle Eastern (1.04%), or Latino (1.04%) background. Most participants were single (81.25%) although some reported being married or in a common law relationship (7.29%) or divorced or separated (2.08%). In terms of the participant's perception of the family of origin's financial status, the majority of participants identified a family of origin with little or no financial concerns in the family home (59.38%). The most common university major reported was psychology (48.96%), criminology (12.50%), and social work or social and family relations (11.46%). The participants were fairly evenly distributed in terms of their year in university, with 23.96% in first year, 32.29% in second year, 25.00% in third year, and the remaining 18.75% in fourth year or higher.

Table 14:

Demographics of Undergraduate Participants (N=96)

Demographic	*n*	%
Sex		
Male	12	12.50
Female	84	87.50
Ethnicity		
Caucasian or European descent	85	88.54
Asian, Asian American or Canadian	6	6.25
African, African American or Canadian	3	3.13
Middle Eastern American or Canadian	1	1.04
Latina/Latino	1	1.04

Table 14 (continued):

Demographic	*n*	%
Marital Status		
Single	78	81.25
Married or commonlaw	7	7.29
Separated or divorced	2	2.08
Other	9	9.38
Family of Origin		
Very comfortable, did not worry about money at all	15	15.63
Fairly comfortable, did not worry much about money	42	43.75
Somewhat comfortable, had to be careful with money	30	31.25
Moderately low, had to do without some things	8	8.33
Very low, had to do without a lot of things	1	1.04
Year in University		
First	23	23.96
Second	31	32.29
Third	24	25.00
Fourth	15	15.63
Fifth or higher	3	3.13
Major		
Psychology	47	48.96
Criminology	12	12.50
Social Work or Social and Family Relations	11	11.46
Drama or Bachelor of Fine Arts	5	5.21
Other	21	21.88

Procedure. Of the 3460 undergraduate students who participated in the participant pool program at the University of Windsor, 420 students (12.14%) responded affirmatively to the selection question (*"On more than one occasion, I injured myself on purpose (i.e. by hitting, cutting, scratching, picking, burning, biting or otherwise injuring myself)"*). Undergraduate students who endorsed this item were contacted by telephone and invited to participate in the study. Eligibility was confirmed in a brief telephone screen (Appendix B1). For inclusion, participants were required to be at least 18 years of age, and on more than one occasion they must have engaged in self-harm that was direct (rather than indirect, such as taking pills or engaging in risky behaviour), self-inflicted, and intentional (rather than accidental). Participants were excluded if the act occurred exclusively as a suicide attempt or exclusively while psychotic or acutely intoxicated. If the participant endorsed significant problems with substance abuse (including problems functioning at work, school or in relationships) or serious suicidal thoughts (including a

plan or intent) in the past 6 months, they were excluded from the study to avoid any emotional strain that could be associated with involvement in the study and they were offered mental health resources. Participants in this study received three bonus points towards their choice of psychology courses wherein course credit was offered in exchange for participation in research.

Interested participants who met inclusion criteria met individually with the investigator and informed consent was obtained (Appendix B2). For each participant, data collection took place in a private one-on-one setting with the researcher and all data were collected in a single meeting. An information form (Appendix B3) was provided to outline information about the study, mental health referrals, and contacts in the event of questions or concerns. Participants provided demographics information (Appendix B4) and details about their DSH behaviour (DSH-U; Appendix B5). The Deliberate Self Harm Inventory (DSHI) was also completed.

Then, participants completed up to two qualitative components of the study. First, all participants were asked to write a brief paragraph about their experience of DSH, emphasizing their thoughts, feelings and sensations before, during and after DSH (Appendix B6). A subset of participants who engaged in persistent and repetitive DSH (n = 20) also participated in a semi-structured interview emphasizing their experience of DSH in more detail (Appendix B7). Interviews were audiotaped and transcribed for qualitative analysis. The inclusion of these qualitative methods was essential to providing a detailed description of the phenomenology of DSH, emphasizing the individual's subjective experience of DSH before, during, and after engaging in DSH. This phenomenological account of DSH was intended to complement the quantitative analyses and provide an opportunity to triangulate the findings from a narrative, individualized perspective with those from a standardized, quantitative perspective.

Finally, all participants completed a series of questionnaires geared towards identifying impulsive and compulsive aspects of their general personality style, typical behaviour, and DSH behaviour. Questionnaires were presented in random order to control for order effects. The Paulhus Deception Scales (PDS; Paulhus, 1984) was included as a measure of social desirability. Participants with a T-score over 80 on the PDS Total score or a T-score over 65 on the PDS Impression Management subscales were

omitted due to the likelihood that responses would be skewed or misrepresented by conscious impression management. Following participation in the study, a debriefing form (Appendix B8) was provided and the researcher discussed the research experience with the participant.

Of those students who endorsed the selection question, 168 participated in the telephone screen and 68 were excluded. Reasons for exclusion were as follows: DSH occurred on only one occasion ($n = 9$); DSH occurred exclusively as a suicide attempt ($n = 2$) or exclusively while intoxicated ($n = 2$); serious suicidal thoughts or substance abuse was reported in the past 6 months ($n = 6$); DSH was not deliberate, direct or intentional such as self harm in the course of martial arts training, risky behaviour, or punching walls ($n = 6$). An additional 8 students were excluded because they misunderstood the selection question, while 35 students met criteria but had already received the maximum number of bonus points for the semester. Two students declined to participate because they did not wish to discuss their DSH experience. The remaining 98 students met inclusion criteria and consented to participate in the study.

There were no missing data for 97 participants as all forms were reviewed and missing information was completed by participants prior to debriefing. For one participant, the study proved to be emotionally taxing and the researcher elected to stop the session before completion, which resulted in incomplete questionnaire data. This participant's demographic data, DSH-U data, written paragraph and semi-structured interview were retained for analyses, but questionnaire data were missing and therefore this participant was omitted from all related quantitative analyses. Two participants were omitted from the study due to significant elevations on the PDS (specifically, impression management scores and total PDS scores were found to be over the established threshold for inclusion). Thus, 96 participants were included in demographic and qualitative analyses, while 95 participants were retained for the quantitative analyses of questionnaire data.

Tests and Measures

DSH questionnaire for Undergraduates (DSH-U). The DSH-U (Appendix B5) contains virtually the same items as the DSH-C above, although the wording was changed

slightly to reflect the respondent's perspective. (Of note, the DSH-C has an additional item representing compulsivity that was not included in the DSH-U, and item 17 varies across the two measures.) As noted above, given the absence of established measures to evaluate the impulsive and compulsive features of DSH, items were generated based on the conceptualization of impulsivity and compulsivity outlined from the literature review. The DSH-U consists 20 items that are rated on a scale from 1 (strongly disagree) to 5 (strongly agree). As described in relation to the DSH-C, expert ratings and additional analyses were conducted to evaluate the construct validity of the DSH-U so that it could be used to evaluate impulsive and compulsive features of DSH in this sample.

Frequency of Impulsive and Compulsive Acts (FICA). The FICA was constructed using a list of behaviours that are often referred to as impulsive or compulsive in the literature. Participants were asked to endorse how frequently they have engaged in each impulsive act on a scale from 1 to 5 (1=never; 2=once; 3=on occasion (2-3 times in your life); 4= sometimes (4-20 times in your life); 5=regularly (more than 20 times in your life). They were also asked whether or not they engage in certain compulsive acts (yes or no format). These items were generated by surveying commonly used items in the literature that are believed to reflect impulsive and compulsive behaviour, and psychometric data are therefore not available for these items. However, researchers have utilized this and similar formats to describe which acts are most prevalent and how pervasively an individual engages in such acts (e.g., Herpertz et al., 1997).

The Deliberate Self-Harm Inventory (DSHI). The DSHI (Gratz, 2001) is a 17-item self-report questionnaire that was developed to assess DSH from a behaviourally-based perspective. DSH is defined as "the deliberate, direct destruction or alteration of body tissue without conscious suicidal intent, but resulting in injury severe enough for tissue damage (e.g., scarring) to occur" (Gratz, 2001, p. 255). The questionnaire lists 17 distinct forms of self-harm and includes items geared towards measuring frequency, severity, duration, and type of self-harming behaviour. The DSHI has demonstrated good internal consistency with a Cronbach's alpha of .82, and adequate test-retest reliability over 2 to 4 weeks with a test-retest correlation of .68 (Gratz, 2001).

Gratz (2001) also offered some preliminary evidence for the construct validity, convergent validity, and discriminant validity of the DSHI. In her study, the dichotomous

DSHI variable (DSH versus no DSH) was significantly and moderately correlated with the self-harm items of three measures. Specifically, correlations of .49 ($p < .001$), .43 ($p < .001$), and .35 ($p < .001$) were found between the dichotomous variable of the DSHI and self-harm items from Boudewyn and Liem's Mental Health History Form (Boudewyn & Liem, 1995), The Diagnostic Interview for Borderlines, Revised (Zanarini, Gunderson, Frankenburg, & Chauncey, 1989), and The Suicide Behaviors Questionnaire (Linehan, 1993), respectively. She also noted that convergent validity was supported by a correlation (.48, $p < .001$) between the DSHI's frequency variable and the Borderline Personality Organization Scale (Oldham et al., 1985). Discriminant validity was supported by a relatively lower correlation between DSH and variables fundamentally different from DSH, such as a history of suicide attempts (.21, $p < .05$). In addition, the lack of a correlation between DSH and variables believed to be unrelated to DSH (age, hours employed per week) was offered as evidence of discriminant validity. However, it should be noted that Gratz (2001) considered these findings to be preliminary and called for additional studies to replicate and expand on these findings.

The Barratt Impulsiveness Scale, version 11 (BIS-11) The BIS-11 (Barratt, 1985) is a 30-item self-report measure that uses a 4-point Likert scale where 1= rarely/never and 4= almost always/always. The BIS-11 yields a total impulsivity score, as well as subscales measuring a motor component related to acting without thinking (e.g., I do things without thinking); a cognitive factor that entails making quick decisions (e.g., I make up my mind quickly); and a non-planning element that is associated with a lack of future-orientation (e.g., I am more interested in the present than the future). The BIS-11 has been widely used to measure impulsivity in a variety of subject populations (Patton et al., 1995; Cherek, Moeller, Dougherty, & Rhoades, 1997; Swann, Anderson, Dougherty, & Moeller, 2001). The reliability and validity of the BIS-11 has been repeatedly shown in a variety of languages (Bayle et al., 2000; Fossati, DiCeglie, Acquarini, & Barratt, 2001; Patton et al., 1995; Someya et al., 2001). Barratt (1994) conducted a factor analysis of the BIS-11, the findings of which offered support for his three factor model. Internal consistency for the BIS-11 ranged from .79 to .83 in an American sample (Patton et al., 1995) and .79 in an Italian sample (Fossati et al., 2001). In the Italian version, two-month test-retest reliability was .89, and principal components analysis was consistent with the

factors identified in the English version (Fossati et al., 2001). Furthermore, in Fossati and colleagues' (2001) study, the BIS-11 total score was found to be significantly correlated with aggression and ADHD measures, and significantly differentiated between high and low levels of binge eating, alcohol consumption, and cigarette smoking.

The I.7. The I.7 (Eysenck et al., 1985) is a 19-item subscale of a self-report measure, the Impulsiveness, Venturesomeness and Empathy questionnaire. This 54-item, true/false format questionnaire conceptualizes Impulsivity as behaving without thinking and without realizing the risk involved, while Venturesomeness refers to behaviour in which the individual realizes the risk involved but acts anyway. An Empathy subscale is also included. Each subscale was developed as a unidimensional measure, and the factor structure of the I.7 has been replicated (Parker & Bagby, 1997). Given the purpose of this study, only the 19-item Impulsiveness subscale was included. In general, the psychometric data for the I.7 are good (Parker & Bagby, 1997). For the Impulsiveness subscale, the alpha coefficient was .84 in a sample of 559 men and .83 in a sample of 761 women (Eysenck et al., 1985). One-year test-retest reliability was .76 for the Impulsiveness subscale (Luengo, Carrillo-de-la-Pena, & Otero, 1991). In addition, the Impulsiveness subscale has been demonstrated to be related to other measures of behavioural activation and impulsivity (Caseras et al., 2003) and distinct from more broad personality dimensions such as neuroticism, extraversion and psychoticism (Parker & Bagby, 1997).

The Behavioural Inhibition/Behavioural Activation Scales (BIS/BAS). The BIS/BAS (Carver & White, 1994) is a 20-item, self-report measure that uses a 4-point Likert scale where 1 = strongly agree and 4 = strongly disagree. The scale consists of four subscales, one measuring BIS sensitivity and three tapping BAS reactivity (e.g., BAS Reward Responsiveness, BAS Drive, and BAS Fun-Seeking). The BIS scale is composed of items asking about potential negative future events and reactions to them (i.e., 'I worry about making mistakes' and 'criticism or scolding hurts me quite a bit') and has been found to have an alpha reliability of .74 and a test-rest correlation of .66 (Carver & White, 1994). The BAS Reward Responsiveness consists of items about positive reactions to reward (e.g., 'When I get something I want, I feel happy and excited' and 'it would excite me to win a contest'). BAS Drive reflects individuals' appetitive motivation or approach

(e.g., 'When I want something, I usually go all-out to get it'), while BAS Fun-Seeking contains items regarding tendency to look for new and exciting experiences and do them at a moments notice (e.g., 'I often act on the spur of the moment' and 'I'm always willing to try something new if I think it will be fun'). The BAS subscales alpha reliabilities and test-retest correlations are as follows: BAS Reward Responsiveness, .73 and .59; BAS Drive.76 and .66; and BAS Fun-Seeking, .66 and .69, respectively (Carver & White, 1994). Similar alphas have been subsequently reported (Jorm et al., 1999).

The Tridimensional Personality Questionnaire (TPQ). The TPQ (Cloninger, 1987) is a 100-item self-administered, paper and pencil, true/false instrument. The instrument measures three personality dimensions, Novelty Seeking, Harm Avoidance, and Reward Dependence. Novelty Seeking refers to a tendency to respond with intense excitement to novel stimuli, or to cues for potential rewards. Harm Avoidance refers to a tendency to respond intensely to aversive stimuli, inhibiting or stopping behaviour. Reward dependence reflects a tendency to respond intensely to signals of potential reward, and the maintenance of particular behaviours for a period of time without continued reinforcement. Each dimension consists of four, lower-order dimensions. Of note, Persistence is a subscale of Reward Dependence and reflects a tendency to persevere in behaviours that have been associated with reward or removal of aversive stimuli; this subscale can be considered separately from the three remaining Reward Dependence subscales as factor analytic studies show that it does not load as strongly on this scale (Cloninger et al., 1991). The TPQ has good reliabilities overall. Cronbach's alphas have been reported to range between .77 and .85 for Harm Avoidance; .68 and .75 for Novelty Seeking, and .61 and .69 for Reward Dependence (Cloninger et al., 1991). As well, the measure is reported to have good temporal stability over six months, with test-retest correlations of .70 for Reward Dependence; .76 for Novelty Seeking; and .79 for Harm Avoidance (Cloninger et al., 1991). The Harm Avoidance scale appears to be a good reflection of Gray's anxiety dimension (Caseras et al., 2003), while the Novelty Seeking scale is thought to fit with the impulsivity axis (Cloninger, 1996). In terms of reflecting impulsivity and compulsivity, Cloninger's model suggests that high Novelty Seeking, low Harm Avoidance, low Persistence, and rarely low Reward Dependence are related to impulsive behaviour; while low Novelty Seeking, high Harm Avoidance, high

Persistence, and rarely high Reward Dependence are related to compulsive behaviour (Cloninger, 1996).

The State Trait Anxiety Inventory (STAI). The STAI (Speilberger, Gorsuch, & Lushene, 1969) is a widely used 40-item self-report measure of anxiety that yields a state anxiety score and a trait anxiety score. State anxiety is conceptualized as transitory emotional state characterized by self-reported feelings of tension and apprehension, while trait anxiety refers to relatively stable differences in proneness to anxiety. Test-retest reliability with intervals of one hour to 104 days was found to vary accordingly, with coefficients for trait anxiety ranged from .65 to .86, while test-retest reliability for state anxiety was much lower and ranged from .16 to .62 (Speilberger, 1983). The validity of the STAI has been supported by correlations between the STAI and other measures of trait-anxiety, including the Taylor Manifest Anxiety Scale, the IPAT Anxiety Scale, and the Multiple Affect Adjective Check List with correlations of .80,.75, and .52, respectively (Speilberger, 1983). The STAI has also been translated and reliability and validity of the STAI have been replicated in various cultures and age groups (e.g., Iwata et al., 2000; Turgeon & Chartrand, 2003).

The Yale-Brown Obsessive Compulsive Scale (Y-BOCS). The Y-BOCS (Goodman et al., 1986) is a 10-item clinician-rated measure of the severity of obsessive and compulsive symptoms. Five items pertain to obsessions, and five items pertain to compulsions, yielding two subscale scores and a total scale score. Each item is rated on a scale from 0 (no symptoms) to 4 (extreme symptoms). Internal consistency has been demonstrated to range between .69 to .91 in clinical samples, and .88 in a non-clinical sample, interrater reliability has been reported to be high (.89-.93), while test-retest reliability has been more variable (.61 for a 48-day interval, .97 for a one week interval) (Steketee, Frost & Bogart, 1996). Evidence has been offered as support of convergent validity and construct validity, although discriminant validity has been difficult to establish (Steketee et al., 1996). The Y-BOCS has been widely used as a measure of obsessive-compulsive symptoms, and has received general support in the literature. Computer-administered and self-report versions of the Y-BOCS have been evaluated by three groups of researchers (see Steketee et al., 1996). Of particular relevance, Warren, Zqourides and Monto (1993) administered a self-report version to 180 undergraduates

and 50 medical patients. These researchers found excellent internal reliability (.88-.91). In general, it has been noted that these alternative versions have similar psychometric properties to the original clinician-rated form, with variance in scores being minimal from one version to the other. Steketee and colleagues (1996) found that the self-rated Y-BOCS showed excellent internal consistency and test-retest reliability, strong convergent validity with an interview, and discriminated between OCD and non-OCD clinical participants.

The Padua Inventory (PI). The PI (Sanavio, 1988) is a 60-item self-report measure of obsessional and compulsive behaviour. The PI assesses both the number of symptoms and the amount of distress caused by them, and includes items relating to intrusive thoughts, doubts, and checking and cleaning behaviours, as well as items relating to senseless or unacceptable urges, repetitive thinking about low-probability dangers, and recurrent repugnant images. Each item is rated on a 0 to 4 scale (0 = the item is not at all disturbing, 4 = the item is very much disturbing). Psychometric data in American, Dutch, Australian, Italian, and British samples have consistently supported the reliability, validity, and factor structure of this measure (Macdonald & de Silva, 1999; Sanavio, 1988; van Oppen, 1992). Internal consistency of the PI ranged between .90 and .94, and test-retest reliability at a 30-day interval ranged from .78 to .83 (Sanavio, 1988). The PI total score correlated highly with other measures of obsessionality (Macdonald & de Silva, 1999; Sanavio, 1988, van Oppen, 1992), and discriminated between individuals diagnosed with OCD and individuals with other anxiety disorders (Sanavio, 1988). Factor analyses have substantially reproduced the four-factor structure originally reported by Sanavio (Macdonald & de Silva, 1999; van Oppen, 1992), which consisted of impaired control over mental activities (e.g., I invent doubts and problems about most of the things I do), concerns about becoming contaminated (e.g., I wash my hands more often and longer than necessary), checking behaviour (e.g., I tend to keep on checking things more often than necessary), urges and worries of losing control over motor behaviours (I sometimes feel I need to break or damage things for no reason).

The Paulhus Deception Scales (PDS). The PDS (Paulhus, 1998), also known as the Balanced Inventory of Desirable Responding, Version 7 is a 40 item self-report questionnaire designed to measure the tendency to give socially acceptable or desirable

responses. It includes two scales that measure distinct styles of socially desirable responding, referred to as self-deceptive enhancement (SDE) and impression management (IM). Self-deception refers to a tendency to give honest but inflated self-descriptions due to a lack of insight and an unconscious bias toward favourable self-portrayal. Impression management (also referred to as other-deception) refers to a conscious effort to distort or enhance one's presentation in a favourable manner. Coefficient alpha for internal reliability for the PDS subscales and the total PDS score were satisfactory, and the coefficients for the SDE scales ranged from .70-.75 and IM and PDS total coefficients ranged from .81-.86 (Paulhus, 1998). In factor analysis, the SDE is strongly associated with other factor measures of desirable responding, and IM is grouped with the second factor. The IM scale correlates highly with a cluster of measures known as lie scales, and role playing measures. A number of studies of the convergent validity, structural validity, and discriminant validity of the PDS and its subscales have been reported (Paulhus, 1998).

Qualitative Methods. Two qualitative methods were employed in order to examine detailed accounts of the phenomenology of DSH from the undergraduates' perspectives. First, undergraduate participants were asked to write a brief paragraph commenting on their DSH experience (Appendix B6). This exercise was intended to provide participants an opportunity to describe in their own words, the most salient or personally relevant aspects of their DSH experience. Participants were asked to respond to the following directions:

"In the space provided below, please describe in a few sentences *how you understand your DSH behaviour.* We are interested in the essence of what purpose you believe DSH serves for you, and what it is like for you when you engage in DSH.

As you are writing, please try to address what it is like for you through each step of DSH; what are you thinking and feeling immediately before you engage in DSH, while you are actually engaging in the behaviour, and afterwards."

Participants were encouraged to write whatever came to mind. Once the participant had finished writing, the researcher read the paragraph and asked probing questions under two circumstances. If the participant had omitted an aspect of the description (i.e. before, during, or after DSH) they were asked, "What about (before, during, after)? What is/was that like for you?" If the participant used vague or ambiguous wording such as "upset" or

"messed up" they were asked, "What did you mean by (upset, messed up)? Can you tell me more what that was like for you?" This was intended to ensure that all aspects of the description were provided in detail and simultaneously minimize the impact of the researcher on the participant's response. It was determined that maintaining the integrity of the open-ended narrative format was essential to ensure that the themes and processes described were indeed spontaneous and reflective of the participants' experiences.

Second, 20 undergraduate participants were selected to participate in a semi-structured interview (Appendix B7) to gain additional information regarding the DSH experience, with particular attention to the individual's experience before, during and after DSH. A semi-structured approach was used to provide some consistency across interviews and to focus on possible signs of impulsive or compulsive processes in the individual's description of DSH. The guide for the interview was structured to gather data on thoughts, feelings, physical sensations, and surroundings or circumstances. The focus of the interview progressed gradually from the hours and moments leading up to DSH, through the experience of DSH as it occurred, and in the moments and hours following DSH. This format was intended to help the participant recall as concretely and vividly as possible the DSH experience. The interviewer deviated from this structure as needed to allow for elaboration of responses, but ensured that all areas of the guide were eventually completed. Given the potential for emotional strain on the participant, the researcher was attentive to signs of distress and consulted frequently with the participant on his or her experience of the interview process. In contrast to the written paragraphs, liberal use of questions and probes was made during these interviews to explore various aspects of the individual's DSH experience as they arose. This approach has been described as an important way to permit in-depth exploration of themes, ideas, and processes (Berg, 1998). Thus, the semi-structured interview was intended to provide a more in-depth examination of DSH experiences and potential impulsive or compulsive features of DSH in these individuals.

CHAPTER V

Study 2 (Undergraduate Sample)

Results

Since both quantitative and qualitative data were gathered to provide an in-depth examination of DSH, the results for each analysis are presented in turn. First, the quantitative results are discussed. Then, an in-depth exploration of the phenomenology of DSH based on the qualitative findings is presented.

Description of Undergraduate Participants Engaging in DSH

Evidence relating to reporting. In the process of collecting data from the undergraduate participants, there was evidence of inconsistent reporting or possible underreporting. For example, a number of participants advised the researcher that other students had denied self harm on the participant pool questionnaire despite a history of repetitive DSH. Participants attributed this denial of DSH to a preference for privacy, a sense of shame or embarrassment, or a concern that participation in such a study would be too emotionally taxing. Moreover, a number of participants speculated that had they been asked the selection question at an earlier stage in their DSH history (i.e. when more actively engaging in self-harm or when more distressed by DSH-related experiences) they would also have responded "no" to the selection question and/or declined to participate in the study. Therefore, the proportion of undergraduates endorsing a history of repetitive DSH in this study should likely be considered an underestimation of the actual proportion of students with such a history, and it may represent a subset of individuals who are in relatively less acute distress regarding DSH-related issues.

In addition, multiple methods were used to gather DSH-related data from undergraduate participants. For example, the data on the age of onset of DSH, the duration of DSH, the age at which DSH stopped, the frequency of DSH, and the number of DSH methods were gathered from two sources: the demographics forms (consisting of categorical checklists and open ended questions) and the DSHI (consisting of systematic and direct questions asked for each DSH method). These were sometimes inconsistent. The DSHI sometimes generated an earlier age of onset, later age of cessation, longer

duration, and higher frequency of DSH. In general, the DSHI seemed to generate more reliable data. For example, a number of participants expressed that the systematic nature of the DSHI cued certain DSH behaviours they had "forgotten" when completing the demographics form. All inconsistencies were in the direction of underreporting on the demographics form. Therefore, the DSH-related data gathered from the DSHI are reported here.

Finally, the participants' history of suicide attempts were assessed verbally in the telephone screen, and subsequently in paper and pencil format on the FICA form which itemizes the frequency of engagement in certain behaviours. On the FICA, participants endorsed more frequent suicide attempts and suicidal gestures than were reported in the telephone screen. It appears that participants may have inadvertently underreported or consciously minimized this aspect of their history when asked verbally.

In general, inconsistencies and questionable reliability of self-reported data in these areas is not surprising given the sensitive nature of the material and the potential for underreporting due to a combination of embarrassment, shame, stigma, or more or less conscious efforts to present in a particular way. For some participants, failure to recall specific details of DSH-related experiences may be in part due to the retrospective nature of the study for some individuals; some participants had discontinued DSH several months or years prior to the study. In addition, the emotionally laden nature of DSH experiences for some participants could interfere with accurate recall. However, efforts were made to gather data through multiple methods to obtain the most reliable data possible. When underreporting was suspected in these areas, the data judged to be more reliable was used.

Gender. As noted above, this sample was predominantly female (12.50% male, 87.50% female). In order to evaluate possible differences by gender, independent samples t-tests were conducted for key variables such as frequency of DSH, duration of DSH, number of methods of DSH, and measures of anxiety, compulsivity and impulsivity included in the study. No significant differences were found on any measures ($p > .05$). Therefore the male and female participants were included in all analyses.

Age at onset and course of DSH. Table 15 summarizes details regarding the age of onset and course of DSH for this sample. Based on the DSHI, the mean age of onset of

DSH was 12.94 years (*Mdn* = 13.25 years), ranging from 2.75 to 22.50 years. The mean age at which DSH was stopped was 19.33 years (*Mdn* = 19.00), ranging from 13 to 44 years. The duration of DSH (the period of time spanning from the first DSH episode to the last episode) also varied considerably from two weeks to 40 years, with an average duration of just over 6 years (*Mdn* = 4.0 years). Similarly, the frequency of DSH for all methods ranged widely from 2 to 2030 times, with a mean of 160.56 (*Mdn* = 61.50) occurrences of DSH. Of the 96 participants, 31 (32.29%) indicated that DSH was ongoing at the time of this study. For the remaining participants who had stopped engaging in DSH some time prior to the study, 29 (30.21%) reported their last episode of DSH occurred within the past year and 36 (37.50%) reported that their last episode was more than 1 year prior to the study. Although 31 (32.29%) indicated that DSH was ongoing at the time of this study, 23 (23.96%) indicated that they currently view DSH as a problem. Thus, eight participants (8.33%) continued to engage in DSH but did not view it as problematic at the time of the study.

Table 15:

Age at Onset and Course of DSH for Undergraduate Participants (N = 96)

Demographic	*M*	*Mdn*	Min.	Max
Age at onset of DSH (in years; DSHI)	12.94	13.25	2.75	22.50
Age at which DSH was stopped (in years, DSHI)	19.33	19.00	13.00	44.00
Duration of DSH (in months, DSHI)	76.92	48.00	0.50	480.00
Frequency of DSH (for all methods; DSHI)	160.56	61.50	2.00	2030.00
Number of DSH methods (DSHI)	4.31	4.00	1.00	12.00
	n	%		
Time since last engaged in DSH				
DSH is ongoing	31	32.29		
1 year ago or less	29	30.21		
More than 1 year ago	36	37.50		
DSH currently considered a problem				
Yes	23	23.96		
No	73	76.04		

Number and type of DSH methods. Table 16 outlines the type of methods of DSH endorsed. Endorsement of multiple methods of DSH was common, with 89.58% of participants reporting more than one DSH method on the DSHI. Participants reported

between 1 and 12 methods of DSH, with an average of 4.31 methods (*Mdn* = 4.00). Participants identified specific DSH methods on the DSHI, and these were ranked based on the frequency of each method from most prominent to least prominent (Table 16). The column labelled 'Primary' represents the proportion of participants who reported engaging most frequently in the DSH method listed. The columns labelled 'Secondary' and 'Tertiary' represent the second and third most frequent methods described, respectively, for those engaging in more than one DSH method. For the 96 participants, cutting was the most prominent method of DSH (47.92%), followed by scratching (18.75%), punching or hitting (10.42%), carving into skin (6.25%), and interfering with wound healing (6.25%). Fewer participants identified sticking pins or needles into skin, burning, and biting as primary methods (1.04% for each), although 7.29% identified "other" methods as primary (i.e., intentionally slamming fingers in drawers, scalding with an iron). For those engaging in more than one method (n = 86), interfering with wound healing (22.09%), carving into skin (20.93%) scratching (12.79%), "other" methods (12.79%), and punching or hitting (9.30%) were most commonly identified as secondary methods. Carving into skin (28.77%), punching or hitting (19.18%), scratching (17.81%) and sticking pins or needles into skin (10.96%) were identified as the most common tertiary DSH methods (n = 73).

Table 16:

DSH Methods for Undergraduate Participants (N=96)

	Primary (n = 96)		Secondary (n = 86)		Tertiary (n = 73)	
Method	*n*	%	*n*	%	*n*	%
Cutting	46	47.92	7	8.14	3	4.11
Scratching	18	18.75	11	12.79	13	17.81
Punching/hitting self	10	10.42	8	9.30	14	19.18
Carving into skin	6	6.25	18	20.93	21	28.77
Interfering with wound healing	6	6.25	19	22.09	6	8.22
Sticking pins/needles into skin	1	1.04	5	5.81	8	10.96
Burning	1	1.04	5	5.81	1	1.37
Biting	1	1.04	2	2.33	1	1.37
Other	7	7.29	11	12.79	6	8.22

It is noteworthy that only 5 participants (5.21%) endorsed a DSH method that would be representative of Simeon and Favazza's (1995) hypothetical "compulsive DSH" category, involving severe nail biting (to the point of bleeding), skin picking, and wound interference in the absence of other "impulsive DSH" methods such as cutting, burning, or hitting. All of the statistical analyses described below were re-run with these participants excluded, and none of the findings were altered in a significant way. Thus, this sample and the findings below can be considered to be largely (94.79%) representative of Simeon and Favazza's proposed "impulsive DSH" category.

Mental health and medical treatment history. In terms of mental health treatment (Table 17), 48 participants (50.00%) reported having sought mental health treatment at some point, but only 27 (28.12%) reported having sought mental health treatment specifically relating to DSH. Of the 27 participants who sought treatment relating to DSH, 33.33% sought treatment from a social worker, 18.52% from a psychologist, 14.81% from a psychiatrist, and 7.41% from another mental health professional. The remaining 25.93% sought treatment from a combination of these professionals. The majority of those seeking treatment engaged in individual therapy (74.07%), while 18.52% engaged in a combination of individual and group or family therapy. The number of sessions completed ranged from 1 to 200, with a mean of 37.13 sessions and a median of 10 sessions. Thus, approximately half of participants completed a relatively brief course of therapy, while half engaged in a longer course of treatment. In terms of the therapy experience, participants were evenly distributed with equal thirds finding treatment to be "very helpful," "partially helpful," and "not helpful."

As a measure of the severity of DSH experiences, 10 participants (10.42%) indicated that they had received medical treatment for a DSH incident, and 4 (4.17%) reported a history of hospitalization in a mental health facility relating to problems with DSH. Fifteen (15.63%) endorsed a history of at least one suicide attempt, with the most common method being overdosing ($n = 7$), followed by cutting wrists ($n = 3$), cutting wrists and overdosing ($n = 3$), and hanging ($n = 2$).

Table 17:

Mental Health and DSH Treatment History in Undergraduate Participants (N = 96)

	N	%
History of general mental health treatment		
Yes	48	50.00
No	48	50.00
History of mental health treatment for DSH		
Yes	27	28.12
No	69	71.88
Mental health professional consulted		
Psychologist	5	5.21
Psychiatrist	4	4.17
Social worker	9	9.38
Another mental health professional	2	2.08
Combination of above	7	7.29
N/A	69	71.88
Treatment modality		
Individual	20	20.83
Group	1	1.04
Family	1	1.04
Combination of above	5	5.21
N/A	69	71.88
Perceived effectiveness of treatment		
Very helpful	9	9.38
Partially helpful	9	9.38
Not at all helpful	9	9.38
N/A	69	71.88
History of medical treatment for DSH		
Yes	10	10.42
No	86	89.58
History of hospitalization for DSH		
Yes	4	4.17
No	92	95.83
History of suicide attempt (from telephone screen)		
Yes	15	15.63
No	81	84.38

Diagnoses. Table 18 summarizes respondents' diagnoses based on their self-report of having been diagnosed by a mental health or medical professional (i.e. family physician). There was no limit on the number of diagnoses permitted. Diagnoses were not ranked in order of priority or prominence in the clinical picture since they were self-reported rather than provided by a clinical professional; therefore, the column labelled "First" reflects the first diagnoses on the list, followed by "Second," "Third," and

"Fourth" for those participants who reported more than one diagnosis. Thirty-nine participants (40.63%) recalled having been made aware of at least one diagnosis. Specifically, 21 participants (21.88%) endorsed one diagnosis, 10 (10.42%) endorsed two diagnoses, 6 (6.25%) endorsed three diagnoses, and 2 (2.08%) endorsed four diagnoses.

For the 39 individuals who reported diagnoses, unipolar mood disorders were the most common diagnoses, with 30 participants (76.92%) identifying depression or dysthymia. Anxiety disorders were also well-represented with 20 anxiety diagnoses in total (51.28% of the participants with diagnoses): 7 participants identified generalized anxiety disorder (GAD); 6 identified obsessive compulsive disorder (OCD); 3 made general reference to "anxiety problems;" 2 endorsed panic disorder or panic attacks; 1 endorsed posttraumatic stress disorder (PTSD); and 1 endorsed a specific phobia. Eleven (28.21%) of the diagnosed participants endorsed eating disorder diagnoses, with 6 diagnoses of anorexia nervosa, 4 diagnoses of bulimia nervosa, and 1 diagnosis of a non-specific eating disorder. Other diagnoses endorsed included 2 diagnoses of ADHD, one diagnosis of ODD or CD, one diagnosis of substance abuse or dependence, one diagnosis of chronic pain, and one diagnosis of a personality disorder. It should be noted that although respondents were specifically offered an opportunity to identify diagnoses in the impulse control domain (i.e., kleptomania, pyromania, pathological gambling, and intermittent explosive disorder) no participants reported these diagnoses.

Table 18:

Diagnoses for Undergraduate Participants (N=39)

	First (n = 39)		Second (n = 18)		Third (n = 8)		Fourth (n = 2)	
Diagnosis	*n*	%	*n*	%	*n*	%	*n*	%
Depression, Dysthymia	30	76.92	--	--	--	--	--	--
Generalized Anxiety Disorder	4	10.26	1	2.56	2	5.13	--	--
Anxiety (general reference)	1	2.56	1	2.56	1	2.56	--	--
Obsessive Compulsive Disorder	--	--	6	15.38	--	--	--	--
Posttraumatic Stress Disorder	--	--	--	--	1	2.56	--	--
Panic Disorder or Attacks	--	--	1	2.56	1	2.56	--	--
Phobia	--	--	1	2.56	--	--	--	--

Table 18 (continued):

	First (n = 39)		Second (n = 18)		Third (n = 8)		Fourth (n = 2)	
Diagnosis	n	%	n	%	n	%	n	%
Anorexia Nervosa	2	5.13	2	5.13	1	2.56	1	2.56
Bulimia Nervosa	--	--	3	7.69	1	2.56	--	--
Nonspecific Eating Disorder	1	2.56	--	--	--	--	--	--
Substance Abuse or Dependence	1	2.56	--	--	--	--	--	--
Attention Deficit Hyperactivity Disorder	--	--	--	--	1	2.56	1	2.56
Oppositional Defiant and/or Conduct Disorder	--	--	1	2.56	--	--	--	--
Chronic Pain	--	--	1	2.56	--	--	--	--
Personality Disorder	--	--	1	2.56	--	--	--	--

Note. The percentage reported in each column reflects the percentage of clients who reported at least one diagnosis (n = 39) who included that diagnosis.

Frequency of impulsive and compulsive acts. Participants reported the frequency of impulsive and compulsive acts (FICA) to provide an indication of a history of behaviours that are traditionally considered to be impulsive or compulsive. The most frequently reported impulsive behaviours are listed in Table 19. Of the non-DSH related impulsive behaviours, participants reported that several behaviours occurred "sometimes" or "regularly," defined as four or more times over participants' lifetimes. Specifically, well over one third of participants endorsed "sometimes" or "regularly" engaging in substance abuse, pushing oneself physically to the limit, impulsive spending, binge eating, taking risks or engaging in dangerous acts, and suicidal thoughts or impulses. Sexual promiscuity or unsafe sexual activity was less frequently endorsed, as approximately one fifth of participants endorsed engaging in these activities "sometimes" or "regularly." As noted above, on the FICA form 26 participants (27.37%) endorsed one or more suicide attempts and 54 participants (56.84%) showed one or more suicide gestures, suggesting more frequent suicidal behaviour than was disclosed in screening.

Table 19:

Impulsive Behaviours Endorsed by Undergraduate Participants (N = 95)

Behaviour (four or more times)	*N*	%
Consumed too much alcohol	58	61.05
Pushed self physically to the limit	48	50.53
Took recreational drugs	46	48.42
Spent impulsively	45	47.38
Went on an eating binge	36	37.89
Took risks or engaged in dangerous acts	36	37.89
Had suicidal thoughts or impulses	33	34.74
Took too many risks	25	26.32
Engaged in unsafe sex	21	22.11
Engaged in sexual promiscuity	19	20.00
Drove after drinking or taking drugs	19	20.00
Drove recklessly	19	20.00
Stole material goods from a store	19	20.00
Spent more money than (I) had	19	20.00
Showed suicide gestures	13	13.68
Engaged in sex when did not want to	13	13.68
Stole food	13	13.68

In terms of the eleven compulsive acts listed on the FICA form, the mean number of acts endorsed was 5.56 and the median was 6.00. The proportion of participants endorsing specific acts is reported in Table 20. Of the 95 participants, the following compulsive acts were endorsed most commonly: putting personal belongings in set places (74.74%); difficulty making up my mind (66.67%); checking things several times (60.00%); turning things over in my mind for a long time before deciding what to do (58.95%); paying great attention to details (58.95%). The remaining compulsive acts were endorsed in less than half of participants.

Table 20:

Compulsive Behaviours Endorsed by Undergraduate Participants (N = 95)

Behaviour Endorsed	*n*	%
I like to put my personal belongings in set places	71	74.74
I have difficulty making up my mind	64	66.67
I often have to check things several times	57	60.00
I have to turn things over and over in my mind for a long time before being able to decide what to do	56	58.95
I am the sort of person who has to pay a great deal of attention to details	56	58.95

Table 20 (continued):

Behaviour Endorsed	*n*	%
I like to get things done exactly right down to the smallest detail	47	49.47
I dislike having a room untidy or not quite clean for even a short time	43	45.26
I have to do things over again a certain number of times before they seem quite right	41	43.16
I like to keep a certain order to undressing and dressing or washing and bathing	39	41.05
I go back and check doors, cupboards, or windows to make sure they are really shut	38	40.00
I take great care in hanging and folding my clothes at night	16	16.84

Analysis of DSH-U Questionnaire Data

Principal components analysis. Since 96 participants completed the DSH-U, a PCA of the DSH-U questionnaire was performed in the same manner and with the same rationale as the DSH-C described above. The assumptions for PCA and appropriateness of data reduction were assessed as above and deemed satisfactory to proceed. Bartlett's test of sphericity was significant ($\chi 5$ (190, $N = 20$) = 560.47, $p < 0.01$), confirming that the items are correlated sufficiently. The KMO statistic was 0.62 and in the *mediocre* range according to Field (2005), and was acceptable for PCA (Tabachnick & Fidell, 2007).

The 20 items of the DSH-U were included as variables for data reduction using varimax rotation (oblique rotation produced a highly similar solution). Based on the relative eigenvalues, the amount of variance explained, and the pattern of loadings it was determined that a four factor solution is an appropriate representation of these data. The 4 extracted components cumulatively explained 50.00% of the variance (Table 21).

Table 21:

Total Variance Explained for PCA of DSH-U (N= 96)

Component	Initial Eigenvalue	% of Variance (After Rotation)	Cumulative % of Variance (After Rotation)
1	3.21	13.17	13.17
2	2.65	12.56	25.74
3	2.47	12.39	38.13
4	1.68	11.88	50.00

The rotated component matrix (Table 22) revealed that 4 items have high loadings on the first component (items 19, 18, 5, and 14) and two items have negative loadings (items 13 and 15). This pattern appears to reflect a DSH-specific tendency to be excited by, drawn to, or otherwise rewarded by the act of DSH. These items refer to wanting to engage in DSH, feeling excited by DSH, finding DSH rewarding or gratifying, and being deterred from DSH behaviour primarily by external consequences. Items loading negatively reflect an absence of shame or regret following DSH and an ego-syntonic orientation to DSH. These items all relate to gratifying or positively rewarding experiences associated with DSH. Thus, this component will be referred to as DSH-U DSH-Specific Excitement.

The second component is comprised of 7 items with high positive loadings (items 7, 6, 20, 17, 4, 9 and 13). This pattern appears to reflect a DSH-specific tendency feel compelled to engage in DSH in advance, overwhelming generalized anxiety prior to DSH, agonizing and trying to avoid DSH in advance, a need to engage in DSH, and shame or regret following DSH. These aspects are consistent with the construct of compulsivity, and refer specifically to the DSH experience (as opposed to more general compulsive styles or tendencies). This component also includes reference to DSH as a means of self-punishment or atonement (item 17) and a general tendency to exert little control over thoughts, feelings and behaviour (item 9). These two items also load on the fourth component. These could be interpreted as relating to compulsivity as a general compulsive style can involve highly self-critical internal dialogues, and intrusive thoughts and compulsions can be experienced as beyond ones' control (Oldham, Hollander, & Skodol, 1996). The second component will be referred to as DSH-U DSH-Specific Compulsivity.

The third component consists of 3 items with high positive loadings (items 10, 2, and 12) and 3 items with negative loadings (items 8, 1, and 16). These items refer to a general tendency towards avoiding harm or risk, perfectionism, and a drive to behave as one "should" and are consistent with a general harm avoidant or compulsive style. The third component will be referred to as DSH-U Cautious/Perfectionist.

Finally, the fourth component consists of 5 items that load positively (items 11, 16, 9, 1, and 17). These items represent a tendency to let urges or emotions dictate behaviour, quick decision making with an absence of deliberation, little control over thoughts, feelings and behaviour and general impulsivity. This component also includes reference to DSH as a means of self-punishment or atonement (item 17) and a general tendency to exert little control over thoughts, feelings and behaviour (item 9). These two items also load on the second component. The fourth component will be referred to as DSH-U Urge-driven/Impulsive.

Table 22:

Variable Loadings on Four Extracted Components for DSH-U (Varimax Rotation, N= 96)

		Component			
Item		1	2	3	4
19	...understand DSH as something I *want* to do	**.74**	-.21	.09	.18
18	...feel excited by my DSH	**.69**	.28	-.19	.00
5	...engage in DSH because something about the behaviour itself is rewarding or gratifying	**.68**	.28	-.04	-.12
13	...am typically ashamed or regretful after I engage in DSH behaviour	**-.55**	**.35**	.30	-.01
15	...experience DSH as alien or senseless	**-.55**	.05	-.02	.12
14	...only regret my DSH behaviour because I get in trouble (i.e. by family, friends, physician)	**.48**	.19	-.09	.14
7	...have a compulsion to engage in DSH well before acting, rather than just doing it on a whim	.11	**.79**	.02	-.05
6	...engage in DSH only after having agonized over or trying to avoid the behaviour for a substantial period	-.27	**.70**	-.23	-.03
20	...understand DSH as something I *need* to do	.31	**.58**	.17	.15
4	...engage in DSH because I become overwhelmed with generalized anxiety and do not know how to cope	.10	**.44**	.12	.20
10	...am a cautious individual who prefers to "play it safe" and avoid new or risky situations	-.02	-.08	**.88**	-.09
8	...desire excitement and enjoy new or risky situations	.02	.02	**-.81**	.07
2	...am a perfectionist in many areas of life, working hard to make sure he/she does everything "just right"	-.12	.28	**.42**	.14
12	...am more influenced by what I "should" do than by what I actually want	-.10	.01	**.39**	-.06

Table 22 (continued):

		Component			
Item		1	2	3	4
11	...let my urges and emotions dictate what I do	.08	.07	.31	**.75**
16	...tend to make decisions quickly without thinking them through	.01	-.18	**-.37**	**.72**
9	...seem to exert little or no control over my thoughts, feelings or behaviour	.05	**.39**	-.06	**.62**
1	...am impulsive in many areas of life	-.20	.00	**-.46**	**.58**
17	...engage in DSH because I feel that it makes up for bad or wrong things I have done	.08	**.45**	-.04	**.58**
3	...engage in DSH on impulse or on a whim, without thinking about my behaviour	-.19	-.19	-.20	.24

Internal consistency of four-factor solution. In order to evaluate the internal consistency of each of the four components derived from the above PCA, the coefficient alpha values were calculated for each component as above. This was calculated by first multiplying each participant's rating of each item with the loading for the component in question, then by calculating the coefficient alpha value for that component ($n_{items} = 20$, $n_{cases} = 96$). The alpha values for the four components were as follows: DSH-U DSH-Specific Excitement ($\alpha = .66$), DSH-U DSH-Specific Compulsivity ($\alpha = .65$), DSH-U Cautious/Perfectionist ($\alpha = .64$), DSH-U Urge-driven/Impulsive ($\alpha = .65$). Thus, the four factor solution generated components that demonstrated adequate internal consistency to proceed with the subsequent statistical analyses.

Relations of Expert Ratings to DSH-U Components

In order to evaluate the relationship between the expert ratings (see Chapter III, page 87) and the DSH-U components, a bivariate Pearson correlation matrix was constructed. This included the mean expert rating for each item on impulsivity (Expert Impulsivity), the mean expert rating for each item on compulsivity (Expert Compulsivity), and the loadings for each item on the DSH-U components (DSH-U DSH-Specific Excitement, DSH-U DSH-Specific Compulsivity, DSH-U Cautious/Perfectionist, and DSH-U Urge-driven/Impulsive). Since the expert ratings were collected using the 21 item DSH-C which varied slightly from the DSH-U, two

items were omitted from the following analyses; item 17 varied across the DSH-C and DSH-U, and item 21 was not included in the DSH-U. Thus, a total of 19 items were included in these analyses (again, with items being included as "people"). Table 23 presents this correlation matrix.

Table 23:

Correlations Between Expert Ratings and DSH-U Components (N= 19)

	Expert Impulsivity	Expert Compulsivity	DSH-U DSH-Specific Excitement	DSH-U DSH-Specific Compulsivity	DSH-U Cautious / Perfectionism	DSH-U Urge-driven / Impulsive
Expert Impulsivity	1.00	--	--	--	--	--
Expert Compulsivity	**-.58****	1.00	--	--	--	--
DSH-U DSH-Specific Excitement	.11	-.16	1.00	--	--	--
DSH-U DSH-Specific Compulsivity	-.24	**.62****	.00	1.00	--	--
DSH-U Cautious / Perfectionism	**-.57***	**.66****	-.06	.05	1.00	--
DSH-U Urge-driven/ Impulsive	**.74****	**-.55***	-.10	-.32	-.25	1.00

*$p < .05$; **$p < .01$ (2-tailed).

Referencing the correlations in Table 23, it is evident that Expert Impulsivity ratings correlate strongly with item loadings on DSH-U Urge-driven/Impulsive ($r = .74, p < .01$). Similarly, the Expert Compulsivity ratings correlate strongly with item loadings on DSH-U Cautious/Perfectionism ($r = .66, p < .01$) and DSH-U DSH-Specific Compulsivity ($r = .62, p < .01$). This indicates that high expert ratings for impulsivity and compulsivity, respectively, correspond to high loadings on the expected components. It also lends support to the interpretation of DSH-U components as relating to impulsivity (Urge-driven/Impulsive) and compulsivity (DSH-Specific Compulsivity and Cautious/Perfectionism), respectively.

There is also a degree of divergent validity in that each of the expert ratings correlates negatively with the hypothesized contrary DSH-U component loadings. Expert Impulsivity correlates negatively with DSH-U Cautious/Perfectionism ($r = -.57, p$

< .05) and Expert Compulsivity correlates negatively with DSH-U Urge-driven/Impulsive (r = -.55, p < .05). This inverse relationship suggests that when aspects of the DSH experience or general qualities are characterized as reflecting impulsivity, they can also be said to reflect an absence of compulsivity, or even "negative compulsivity" and vice versa.

Intracorrelations among DSH-U components. It is evident from Table 23 that there are no significant correlations among the four DSH-U components. There is a modest trend for DSH-U Urge-driven/Impulsive to correlate negatively with a compulsivity-related component (DSH-U DSH-Specific Compulsivity; r = -.32, p = .19), although this correlation was not statistically significant. There was no correlation between the two components that are believed to be related to compulsivity (DSH-U DSH-Specific Compulsivity and DSH-U Cautious/Perfectionism). This suggests that the items relating to behaviour or experiences that are specifically related to a compulsive DSH experience (i.e., feeling mounting anxiety, experiencing a compulsion to DSH in advance, efforts to avoid engaging in DSH, and regret after DSH) are distinct and unrelated to items reflecting a more general harm avoidant or perfectionistic style.

Relations of expert ratings to DSH-U components. In order to clarify the relations of Expert Impulsivity, independent of Expert Compulsivity, to the DSH-U components, two regression analyses were conducted in the same manner described in reference to the DSH-C. First, Expert Impulsivity was entered as the dependent variable, Expert Compulsivity was entered in the first block, and all four DSH-U components were entered simultaneously in the second block (Table 24). Then, this analysis was repeated using Expert Compulsivity as the dependent variable, Expert Impulsivity in the first block, and the four DSH-U components simultaneously in the second block (Table 25). The resulting statistics represent the degree to which the expert ratings, independent of one another, predict component scores when all other components are held constant.

Table 24:

Sequential Regression for Variables Predicting Expert Impulsivity Ratings (N = 19)

	Variable	*B*	*SE B*	Standardized *β*	*t*
Step 1					
	Expert Compulsivity	-0.69	0.24	-.58	-2.95**
Step 2					
	Expert Compulsivity	0.53	0.42	.44	1.25
	DSH-U DSH-Specific Excitement	1.06	0.74	.21	1.44
	DSH-U DSH-Specific Compulsivity	-1.51	1.45	-.24	-1.04
	DSH-U Cautious / Perfectionism	-3.16	1.21	-.63	-2.62*
	DSH-U Urge-driven / Impulsive	5.17	1.19	.77	4.35**

Note. $R^2 = .34$ for Step 1, $p < .01$; $\Delta R^2 = .42$ for Step 2, $p < .01$.
* $p < .05$; ** $p < .01$

Referencing Table 24, Expert Compulsivity entered in Step 1 explains 34% of the variance ($R^2 = .34$, $F(1, 17) = 8.72$, $p < .01$) and negatively predicts Expert Impulsivity ($\beta = -.58$, $t = -2.95$, $p < .01$). Adding the four DSH-U components as predictors in Step 2 explains an additional 42% of the variance in the outcome variable ($R^2 = .76$, $F(5, 13) = 8.00$, $p < .01$). However, when all variables are entered simultaneously and held constant, Expert Compulsivity does not significantly predict scores on Expert Impulsivity. Rather, of the four components, DSH-U Urge-driven/Impulsive positively predicts Expert Impulsivity ($\beta = .77$, $t = 4.35$, $p < .01$) and DSH-U Cautious/Perfectionism negatively predicts Expert Impulsivity ($\beta = -.63$, $t = -2.62$, $p < .05$). Hence, DSH-U Urge-driven/Impulsive and DSH-U Cautious/Perfectionism mediate all of Expert Compulsivity's correlation with Expert Impulsivity. As noted in the analysis of the DSH-C and expert ratings, given this finding and the fact that the formation of DSH-U as a scale had no involvement in the expert rating task, it is impossible that the negative relationship between Expert Impulsivity and Expert Compulsivity is due simply to demand characteristics of the expert rating task.

Table 25:

Sequential Regression for Variables Predicting Expert Compulsivity Ratings (N = 19)

	Variable	*B*	*SE B*	Standard-ized β	*t*
Step 1					
	Expert Impulsivity	-0.49	0.17	-.58	-2.95**
Step 2					
	Expert Impulsivity	0.20	0.16	.24	1.25
	DSH-U DSH-Specific Excitement	-0.78	0.44	-.19	-1.77
	DSH-U DSH-Specific Compulsivity	2.71	0.57	.51	4.76**
	DSH-U Cautious / Perfectionism	2.72	0.55	.65	4.98**
	DSH-U Urge-driven / Impulsive	-2.39	0.95	-.42	-2.50*

Note. $R^2 = .34$ for Step 1, $p < .05$; $\Delta R^2 = .53$ for Step 2, $p < .01$. * $p < .05$; ** $p < .01$

Similarly, referencing Table 25, Expert Impulsivity entered in Step 1 explains 34% of the variance ($R^2 = .34$, $F(1, 17) = 8.72$, $p < .01$) and negatively predicts Expert Compulsivity. Including the four DSH-U components in Step 2 explains an additional 53% of the variance in the outcome variable ($R^2 = .87$, $F(5, 13) = 16.67$, $p < .01$). However, when all other variables are entered simultaneously and held constant, Expert Impulsivity does not significantly predict scores on Expert Compulsivity. Instead, DSH-U Urge-Driven/Impulsive is a significant negative predictor ($\beta = -2.39$, $t = -2.50$, $p < .05$). In addition, the two compulsivity components, DSH-U DSH-Specific Compulsivity and DSH-U Cautious/Perfectionism, emerge as strong positive predictors of Expert Compulsivity ($\beta = .51$, $t = 4.76$, $p < .01$ and $\beta = .65$, $t = 4.98$, $p < .01$, respectively). As above, this indicates that the DSH-U components mediate all of Expert Impulsivity's relation to Expert Compulsivity, and it is not possible that the negative correlation between Expert Impulsivity and Compulsivity is due simply to demand characteristics of the rating task.

Finally, to further examine these relationships, the partial correlations of Expert Impulsivity and Expert Compulsivity with the DSH-U components were examined. This provides an index of the inter-correlations of the isolated expert ratings with component scores without controlling for the common variance among the components. Correlations of Expert Impulsivity, controlling for Expert Compulsivity, with the components revealed a significant positive correlation of Expert Impulsivity with DSH-U Urge-driven Impulsive ($pr = .62$, $p < .01$). The remaining correlations of Expert Impulsivity with

DSH-U components were not significant. Correlations of Expert Compulsivity, controlling for Expert Impulsivity, with the components revealed significant positive correlations with the two compulsivity-related components, DSH-U DSH-Specific Compulsivity ($pr = .61, p < .01$) and DSH-U Cautious/Perfectionist ($pr = -.49, p < .05$). These findings address the second hypothesis, as distinct components reflecting impulsivity and compulsivity were extracted from the items designed to pull for impulsive and compulsive components of undergraduates' DSH experiences.

Analysis of Impulsivity and Compulsivity Questionnaire Data

Since the constructs of impulsivity and compulsivity are multidimensional, additional measures of these constructs were included for analysis. The purpose of this was twofold: to use established measures of impulsivity and compulsivity to evaluate whether the DSH-U adequately captures these constructs, and to enhance the prediction of features of DSH (such as frequency, duration, number of methods, and severity) from measures of impulsivity and compulsivity. The means and standard deviations of the measures used (STAI (trait), Y-BOCS total score, Padua Inventory total score, BIS-11, BIS/BAS Behavioural Inhibition, BIS/BAS Drive, BIS/BAS Fun Seeking, BIS/BAS Reward Responsiveness, Eysenck I7, TPQ Total Novelty Seeking, TPQ Total Harm Avoidance, and TPQ Total Reward Dependence) are presented in Table 26.

Table 26:

Questionnaire Data for Undergraduate Sample (N= 95)

Questionnaire	*M*	*SD*
STAI (Trait)	46.41	11.79
Y-BOCS Total (self-report)	12.12	7.72
Padua Inventory Total	51.78	34.12
BIS-11 Total	65.12	11.07
BIS/BAS Behavioural Inhibition	22.10	3.30
BIS/BAS Drive	10.23	2.84
BIS/BAS Fun Seeking	10.61	3.03
BIS/BAS Reward Responsiveness	16.55	1.79
Eysenck I.7	7.62	4.62
TPQ Total Novelty Seeking	16.47	6.24
TPQ Total Harm Avoidance	18.14	7.89
TPQ Total Reward Dependence	19.00	5.00

PCA of impulsivity and compulsivity questionnaire data. Since multiple intercorrelated measures were employed to capture the various dimensions of impulsivity and compulsivity constructs, a PCA was conducted to summarize the data and reduce it to meaningful components that could be used in the regression analyses below. The measures included in the analysis were the STAI (trait), Y-BOCS total score, Padua Inventory total score, BIS-11, BIS/BAS Behavioural Inhibition, BIS/BAS Drive, BIS/BAS Fun Seeking, BIS/BAS Reward Responsiveness, Eysenck I7, TPQ Total Novelty Seeking, TPQ Total Harm Avoidance, TPQ Total Reward Dependence (without Persistence), and TPQ Persistence. The TPQ Reward Dependence score was broken down to extract the Persistence subscale, since the literature has suggested that factor analytic studies show that Persistence loads somewhat differently than the other Reward Dependence subscales (Cloninger et al., 1991). Ninety-five participants completed these measures in full and were included in this analysis. The assumptions for PCA and appropriateness of data reduction were assessed as above and these data were found to be adequate for analysis.

Bartlett's test of sphericity was significant ($\chi 5$ $(78, N = 13) = 520.84, p < 0.01$), confirming that the variables are sufficiently correlated. The KMO statistic was 0.73 and was in the *good* range (Field, 2005). PCA was conducted first using oblique rotation (Δ=0), as the likelihood of correlations among factors was uncertain. The oblique and orthogonal rotations produced similar solutions, so varimax rotation was selected. Two components were desired to reflect impulsivity or behavioural activation and compulsivity or behavioural inhibition, and therefore two components were extracted for this analysis. The two components cumulatively accounted for nearly half of the variance (47.98%) in scores. Table 27 presents the initial eigenvalues and the amount of variance explained.

Table 27:

Total Variance Explained for PCA of Impulsivity and Compulsivity Measures (N = 95)

Component	Initial Eigenvalue	% of Variance (After Rotation)	Cumulative % of Variance (After Rotation)
1	3.57	26.78	26.78
2	2.67	21.20	47.98

Examination of the rotated component matrix (Table 28) shows that the first component is defined most strongly by the TPQ Total Novelty Seeking, Eysenck I7, BIS-11, and the BIS/BAS Fun Seeking and Drive scales. These measures are associated with the broad construct of impulsivity which includes sensation seeking, acting quickly on impulse, and a lack of deliberation or concern over consequences of actions. The BIS/BAS Behavioral Inhibition Scale, TPQ Harm Avoidance and TPQ Persistence scales loaded negatively on this component, which fits conceptually with this construct. The second component is defined by strong loadings from the STAI Trait, Padua Inventory total score, TPQ Total Harm Avoidance, Y-BOCS total score, and BIS/BAS Behavioral Inhibition Scale. These measures, best described as anxious compulsivity, involve anxiety, a vigilance and motivation to avoid harm, cautiousness, obsessive or intrusive thoughts and compulsive behaviours. The first component appears to be a good representation of the construct of impulsivity or behavioural activation and will be referred to as Impulsivity/Sensation Seeking. The second component seems to reflect the construct of general anxiety and compulsivity and will be referred to as Anxious Compulsivity. Regression scores from this PCA were saved to retain individual scores on the two components, so that individual scores on the components could serve as predictor variables in regression analyses below.

Table 28:

Variable Loadings on Two Extracted Components for Impulsivity and Compulsivity Measures (Varimax Rotation, N = 95)

	Component	
Questionnaire	1	2
TPQ Novelty Seeking (Total)	**.89**	-.11
Eysenck I.7	**.86**	.20
BIS-11	**.82**	.22
BIS/BAS Fun Seeking Scale	**.77**	-.19
BIS/BAS Behavioral Inhibition Scale	**-.44**	**.35**
TPQ Persistence Scale	**-.39**	.24
BIS/BAS Drive Scale	**.38**	-.03
BIS/BAS Reward Responsiveness Scale	-.10	.00

Table 28 (continued):

	Component	
Questionnaire	1	2
STAI (Trait)	-.10	**.89**
Padua Inventory (Total)	.19	**.80**
TPQ Harm Avoidance (Total)	**-.35**	**.74**
Y-BOCS (Total)	.13	**.68**
TPQ Reward Dependence (Total, without Persistence)	-.08	.08

Comparing DSH-U Components and Questionnaire Components

As a further step to examine the nature of the four DSH-U components discussed above (referred to as DSH-U DSH-Specific Excitement, DSH-U DSH-Specific Compulsivity, DSH-U Cautious/Perfectionism, and DSH-U Urge-driven/Impulsive), the findings from the PCA of the impulsivity and compulsivity questionnaires were used in a regression analysis. Specifically, the participants' DSH-U component scores were used to predict their component scores for Impulsivity/Sensation Seeking and Anxious Compulsivity extracted from the questionnaire data. Each component was entered simultaneously into the equation. First, the four DSH-U components were entered simultaneously to predict the dependent variable, Impulsivity/Sensation Seeking from the questionnaire data (Table 29). Then, this analysis was repeated using Anxious Compulsivity from the questionnaire data as the dependent variable (Table 30). The resulting statistics represent the degree to which the DSH-U components predict scores on the Impulsivity/Sensation Seeking and Anxious Compulsivity components derived from the PCA of standardized questionnaire data.

Table 29:

Simultaneous Regression for DSH-U Components Predicting Impulsivity/Sensation Seeking (N = 95)

Variable	*B*	*SE B*	Standard-ized β	*t*	Zero-order correlation
Step 1					
DSH-U DSH-Specific Excitement	-0.07	0.07	-.07	-0.94	-.11
DSH-U DSH-Specific Compulsivity	-0.03	0.07	-.02	-0.33	-.05
DSH-U Cautious/Perfectionism	-0.67	0.07	-.66	-9.47**	-.66
DSH-U Urge-driven/Impulsive	0.35	0.07	.36	5.11**	.36

Note. $R^2 = .57$ for Step 1; * $p < .05$; ** $p < .01$.

Referencing Table 29, the four DSH-U components explain 57% of the variance ($R^2 = .57$, $F(4, 90) = 29.60$, $p < .01$). It is apparent that DSH-U Urge-driven/Impulsive predicted scores on Impulsivity/Sensation Seeking ($\beta = .35$, $t = 5.11$, $p < .01$), and DSH-U Cautious/Perfectionism negatively predicts outcome on this variable ($\beta = -.67$, $t = -9.47$, $p < .01$). The two DSH-Specific components which are comprised of excitement-seeking or compulsive qualities specifically relating to DSH behaviour did not predict outcome on the Impulsivity/Sensation Seeking component.

Table 30:

Simultaneous Regression for DSH-U Components Predicting Anxious Compulsivity (N = 95)

Variable	*B*	*SE B*	Standard -ized β	*t*	Zero-order correlation
Step 1					
DSH-U DSH-Specific Excitement	-.09	.09	-.09	-1.03	-.08
DSH-U DSH-Specific Compulsivity	.32	.09	.32	3.59**	.33
DSH-U Cautious/Perfectionism	.26	.09	.26	2.91**	.26
DSH-U Urge-driven/Impulsive	.34	.09	.34	3.84**	.31

Note. $R^2 = .30$ for Step 1; * $p < .05$; ** $p < .01$.

Table 30 shows that these components explain 30% of the variance ($R^2 = .30$, F (4, 90) = 9.51, p<.01). It is apparent that Anxious Compulsivity is predicted by three of the DSH-U components, DSH-Specific Compulsivity ($\beta = .33$, $t = 3.59$, $p < .01$), Cautious/Perfectionism ($\beta = .26$, $t = 2.91$, $p < .01$), and Urge-driven/Impulsive ($\beta = .34$, $t = 3.84$, $p < .01$). The finding relating to the latter component is somewhat counter-intuitive, as data thus far have suggested an inverse relationship between impulsivity and compulsivity. To evaluate for possible suppression effects, zero-order correlations were calculated and showed significant and positive correlations for DSH-Specific Compulsivity, Cautious/Perfectionism, and Urge-driven/Impulsive ($pr = .33, .26$, and $.30$, respectively), confirming that the three components are indeed positively correlated with Anxious Compulsivity. It may be that DSH-U Urge-driven/Impulsive is not specifically related to impulsivity, but rather is a general underlying factor relating to a vulnerability to acting on emotions or ideas. This could relate equally to the constructs of impulsivity (as in, acting quickly on impulses) and compulsivity (as in, giving in to intrusive thoughts or compulsions). As noted above, two of the items on the Urge-driven Impulsive component also loaded on DSH-Specific Compulsivity, suggesting some overlap on the DSH-U. Again, DSH-Specific Excitement did not predict outcome on the Impulsivity/Sensation Seeking component.

Correlations between DSH-U components and measures of impulsivity and compulsivity. In order to examine the relationship between DSH-U components and individual measures of impulsivity and compulsivity, a bivariate Pearson correlation matrix was conducted (Table 31).

Table 31:

Bivariate Pearson Correlations between DSH-U Components and Measures of Impulsivity and Compulsivity (N = 95).

	DSH-U Components			
Measure	DSH-Specific Excitement	DSH-Specific Compulsivity	Cautious / Perfectionism	Urge-driven / Impulsive
STAI (Trait)	-.13	**.34****	**.32****	.17
Y-BOCS Total	-.10	.16	.03	.01
Padua Inventory Total	.01	**.21***	.05	**.33****
BIS-11 Total	-.14	.13	**-.45****	**.37****
BIS/BAS Behavioral Inhibition	-.03	.07	**.47****	.01
BIS/BAS Drive	.08	.05	**-.23***	.19
BIS/BAS Fun Seeking	-.04	-.14	**-.69****	.17
BIS/BAS Reward Responsiveness	**.31****	-.12	.08	-.02
Eysenck I.7	-.15	-.05	**-.48****	**.53****
TPQ Total Novelty Seeking	-.14	-.10	**-.56****	**.29****
TPQ Total Harm Avoidance	-.04	**.29****	**.47****	**.22***
TPQ Total Reward Dependence (without Persistence)	.10	.01	.15	.15
TPQ Persistence	-.01	.17	.15	-.07

** $p < .05$; ** $p < .01$.

Table 31 shows that in many respects, as highlighted in the above regression analyses, measures of impulsivity correlate strongly with DSH-U Urge-driven/Impulsive, and measures of compulsivity correlated strongly with DSH-U Cautious/Perfectionist and DSH-Specific Compulsivity. However, two key measures relating to compulsivity, the Padua Inventory and the TPQ Harm Avoidance scale, showed a mixed profile. First, somewhat unexpectedly, the Padua Inventory correlated positively with both the DSH-Specific Compulsivity component ($r = .21, p < .05$) and the Urge-driven/Impulsive component ($r = .33, p < .01$). To consider reasons for this unexpected correlation between the DSH Impulsivity scale and the Padua Inventory, the subscales were

examined. Three of the Padua Inventory subscales were positively correlated with DSH-U Urge-driven/Impulsive ("impaired mental control," $r = .36, p < .01$; "contamination," $r = .25, p < .05$; and "checking," $r = .23, p < .05$) while two subscales correlated positively with DSH-Specific Compulsivity ("impaired mental control," $r = .24, p < .05$; and "urges and worries about loss of control," $r = .29, p < .01$).

Second, TPQ Harm Avoidance correlated positively with DSH-Specific Compulsivity ($r = .29, p < .01$), Cautious/Perfectionism ($r = .47, p < .01$), and Urge-driven/Impulsive ($r = .22, p < .05$). Examination of the Harm Avoidance subscales (anticipatory worry and pessimism vs uninhibited optimism, fear of uncertainty, shyness with strangers, fatigability and asthenia) showed that each subscale correlated significantly with one or both of the compulsivity components. DSH-U Cautious/perfectionist correlated positively with anticipatory worry and pessimism ($r = .36, p < .01$), fear of uncertainty $r = .64, p < .01$, and shyness with strangers ($r = .32, p < .01$) while DSH-U DSH-Specific Compulsivity correlated positively with shyness with strangers ($r = .33, p < .01$) and fatigability and asthenia ($r = .25, p < .05$). Only the shyness with strangers subscale correlated with DSH-U Urge driven/Impulsive component ($r = .27, p < .01$).

Thus, these findings suggest that two measures of compulsivity show some association with aspects of urge-driven impulsiveness as they correlate positively not only with compulsivity components but with impulsivity as reflected in DSH-U Urge-driven/Impulsive. This may be a cue to the overlap in constructs discussed in the literature review, such as the apparent similarity between compulsively acting on intrusive obsessive thoughts and acting on impulsive urges. It may also be a cue to the coexistence of certain impulsive and compulsive features.

Construction of DSH Impulsivity and DSH Compulsivity Scales

In response to the first and second hypotheses, items designed to identify impulsive and compulsive aspects of DSH in the clinician sample and in the undergraduate sample were successful in extracting four components each, and evidence presented demonstrates that these can be said to reflect the constructs of impulsivity and compulsivity to varying degrees. Certainly, in both the DSH-C and the DSH-U, there are

components that show an association with expert ratings of impulsivity and compulsivity, and with established measures of the two constructs. There was a high level of consistency across expert ratings and component loadings for items on the DSH-C and DSH-U, along with adequate internal consistency of the individual components. Thus, the presence of reliable constructs related to impulsivity and compulsivity are evident within these measures, although there was also evidence of some potential overlap in these constructs for the undergraduate sample. Some overlap is not surprising, as discussed in the literature review. However, when considering the DSH-C and DSH-U collectively, expert ratings and PCA component loadings were able to identify reliable impulsive and compulsive components on the DSH-C and DSH-U.

In order to conduct a direct statistical comparison of the degree of impulsivity and compulsivity present in the DSH questionnaire items from the two data sets (the clinician ratings of the prototypic DSH client's experience on one hand, and the undergraduates self-reported DSH experiences on the other), two scales, an impulsivity scale and a compulsivity scale, were constructed to reflect these constructs in both samples. The two scales are referred to as DSH Impulsivity and DSH Compulsivity. This analysis was intended to allow within subjects (DSH Impulsivity versus DSH Compulsivity) and between subjects (clinicians versus undergraduates) comparisons of impulsive and compulsive characteristics of DSH to address the third and fourth hypotheses.

First, in constructing the DSH Impulsivity and DSH Compulsivity scales, the clinician ratings of DSH-C items and the undergraduate ratings of DSH-U items were combined into a single data set. In combining the two data sets, items 17 and 21 were omitted, as these were not consistent across the two measures. The mean ratings and standard deviations for the 21 DSH-C items, the 20 DSH-U items, and the 19 items of the combined data set are presented in Table 32.

The intraclass correlation coefficient was calculated to compare the clinician scores and undergraduate scores on each item, with the 19 items' mean scores for the two groups entered as "people." The intraclass correlation coefficient was .80 (CI = .48 to .92). This shows a high level of agreement in scores across the two samples.

Table 32:

Statistics for DSH Items for Clinicians (N = 115), Undergraduates (N = 96) and Combined Samples (N = 211)

		Clinicians	*Under-graduates*	*Combined*
Item		*M* (SD)	*M* (SD)	*M* (SD)
1	...am impulsive in many areas of life	3.43 (1.34)	3.01 (1.13)	3.24 (1.27)
2	... am a perfectionist in many areas of life, working hard to make sure I do everything "just right"	3.27 (1.28)	3.78 (1.09)	3.50 (1.22)
3	...engage in DSH on impulse or on a whim, without thinking about my behaviour	2.71 (1.13)	3.39 (1.14)	3.02 (1.18)
4	...engage in DSH because I become overwhelmed with generalized anxiety and do not know how to cope	4.14 (0.91)	3.94 (0.94)	4.05 (0.92)
5	...engage in DSH because something about the behaviour itself is rewarding or gratifying	3.95 (0.92)	3.42 (1.23)	3.71 (1.10)
6	...engage in DSH only after having agonized over or trying to avoid the behaviour...	2.75 (1.14)	2.54 (1.06)	2.65 (1.10)
7	...have a compulsion to engage in DSH well before acting, rather than just doing it on a whim	3.20 (1.11)	2.90 (1.23)	3.06 (1.17)
8	...desire excitement and enjoy new or risky situations	2.44 (1.18)	2.97 (1.24)	2.68 (1.23)
9	...seem to exert little or no control over my thoughts, feelings or behaviour	2.85 (1.09)	2.53 (1.09)	2.71 (1.09)
10	...am a cautious individual who prefers to "play it safe" and avoid new or risky situations	2.65 (1.24)	2.79 (1.16)	2.72 (1.20)
11	...let urges and emotions dictate what I do	3.50 (0.95)	3.03 (1.00)	3.29 (1.00)
12	...am more influenced by what I "should" do than by what I actually want	3.13 (1.18)	3.32 (1.06)	3.22 (1.13)
13	...am typically ashamed or regretful after I engage in DSH behaviour	3.50 (1.09)	3.44 (1.23)	3.47 (1.15)
14	...only regret my DSH behaviour because I get in trouble (i.e. by family, friends...)	2.31 (1.11)	2.21 (1.11)	2.26 (1.11)
15	...experience DSH as alien or senseless	2.84 (0.97)	2.74 (1.06)	2.80 (1.01)
16	...tend to make decisions quickly without thinking them through	3.01 (1.22)	2.68 (1.09)	2.86 (1.17)
17	...tend to consider all aspects of a problem or situation before deciding how to approach it	2.49 (1.08)	2.38(1.20)	--
18	...feel excited by my DSH	2.27 (0.99)	2.15 (1.20)	2.21 (1.09)
19	...understand DSH as something I *want* to do	2.75 (1.11)	3.02 (1.24)	2.97 (1.18)
20	...understand DSH as something I *need* to do	3.74 (0.80)	2.70 (1.27)	3.27 (1.16)
21	...feel compelled to engage in DSH	3.89 (0.77)	--	--

Note. Item 17 for the Undergraduate Sample is "...engage in DSH because I feel that it makes up for bad or wrong things I have done."

In order to select items with the most compelling empirical support, the expert ratings were used as a guide initially, with each item's loading on the PCAs being examined to confirm its association with the construct of interest. More concretely, the mean expert rating for impulsivity was calculated, and items with an above-average rating on impulsivity were included as preliminary items on the DSH-Impulsivity scale. The same process was conducted to use the expert ratings of compulsivity to select items for the DSH-Compulsivity scale. It is noteworthy that the original design of these items as reflecting impulsivity or compulsivity and the PCA loadings on the impulsivity and compulsivity constructs matched the expert ratings.

This initial effort to construct the DSH Impulsivity and DSH Compulsivity scales using expert ratings as a guide produced a DSH Impulsivity scale with 2 DSH-specific items and 6 general items relating to impulsivity, and a DSH Compulsivity scale with 5 DSH-specific items and 3 general items relating to compulsivity. This imbalance between general items (i.e. reflecting a general trait or style) and DSH-specific items (i.e. items making specific reference to DSH processes) was problematic for the desired analysis, as it would result in a comparison of a scale representing a general impulsive style to a DSH-specific compulsive process. It was apparent that this imbalance was the result of lower expert ratings on DSH-specific excitement/sensation-seeking items (indicating that experts did not view these items as representative of impulsivity) and separate PCA loadings for the impulsivity and excitement-seeking items.

Considering this imbalance in general versus specific items, the DSH-specific items relating to excitement or sensation-seeking were included on the DSH Impulsivity scale. Although the experts did not rate these items as significantly more impulsive than compulsive, there was a trend for DSH-C Impulsivity and DSH-C Excitement loadings to correlate positively, and for DSH-C Compulsivity and Shame and Delay loadings to correlate negatively with DSH-C Impulsivity and DSH-C Excitement loadings (see Table 11). In addition, since the PCA of the established measures of impulsivity and excitement or novelty seeking loaded together on the Impulsivity/Sensation Seeking component, it seems reasonable to consider these two constructs as being subsumed under this broad construct. Therefore, it was determined that the sensation-seeking or excitement-oriented items should be included on the DSH Impulsivity scale, with the understanding that this

reflects a broad construct relating to impulsivity and excitement-seeking or novelty seeking.

Thus, expert ratings and PCA loadings (on the compulsivity-related items, and the impulsivity/excitement items) were considered and the items were divided into two scales. Items 4, 5, and 11 were omitted as they were rated highly on both impulsivity and compulsivity by experts, and they showed less clear loadings on the PCAs in some respects. Examining the content of these items (referencing DSH due to generalized anxiety, finding DSH gratifying or rewarding, and letting urges and emotions dictate behaviour) these items could be interpreted as impulsive and as compulsive. Given that there was a lack of support by expert ratings and that the purpose of the DSH Scales was to distinguish impulsive and compulsive features, these items were not included. Items 8 and 15 were omitted due to low item-total correlations. After eliminating items with a low item-total correlation (< .20) and ensuring equal representation of general and specific items, the DSH Impulsivity scale consisted of 7 items ($\alpha = .65$) and showed item-total correlations ranging from .20 to .55. This scale was comprised of 3 general impulsivity/sensation-seeking items and 4 DSH-specific impulsivity/sensation-seeking items. The DSH Compulsivity scale consisted of 7 items ($\alpha = .62$) and showed item-total correlations ranging from .25 to .43. This scale also consisted of 3 general compulsivity-related items and 4 DSH-specific compulsivity items. A bivariate Pearson correlation of the combined samples ($N = 211$) showed that DSH Impulsivity and DSH Compulsivity were significantly negatively correlated ($r = -.42, p < .01$). The items and their item-total correlations, along with the value of Cronbach's Alpha if that item were deleted, are found in Table 33.

Table 33:

Item-total Statistics for DSH Impulsivity and DSH Compulsivity Scales (N = 211)

Scale and Items		Item-total correlation	α if item deleted
DSH Impulsivity Scale			
1	... am impulsive in many areas of life	.47	.57
3	...engage in DSH on impulse or on a whim, without thinking about my behaviour	.22	.65

Table 33 (continued):

Scale and Items		Item-total correlation	α if item deleted
DSH Impulsivity Scale			
9	...seem to exert little or no control over my thoughts, feelings or behaviour	.38	.60
14	...only regret my DSH behaviour because I get in trouble (i.e. by family, friends, physician)	.33	.62
16	...tend to make decisions quickly without thinking them through	.55	.55
18	...feel excited by my DSH	.36	.61
19	...understand DSH as something I *want* to do	.20	.66
DSH Compulsivity Scale			
2	...am a perfectionist in many areas of life, working hard to make sure I do everything "just right"	.28	.60
6	...engage in DSH only after having agonized over or trying to avoid the behaviour for a substantial period	.32	.58
7	...have a compulsion to engage in DSH well before acting, rather than just doing it on a whim	.41	.55
10	...am a cautious individual who prefers to "play it safe" and avoid new or risky situations	.29	.59
12	...am more influenced by what I "should" do than by what I actually want	.43	.55
13	...am typically ashamed or regretful after I engage in DSH behaviour	.34	.58
20	...understand DSH as something I *need* to do	.25	.60

Comparing DSH Impulsivity and DSH Compulsivity within and between samples. A mixed design, 2 x 2 x 2 ANOVA was conducted to compare scores on DSH Impulsivity and DSH Compulsivity both within and between subjects. Specifically, there were two within subjects variables. The first within subjects variable is referred to as DSH Engagement Style (DSH-ES; impulsivity versus compulsivity) and refers to the general style or process whereby DSH occurs. This includes the general style of the individual's engagement in the world (i.e., being generally impulsive versus cautious), as well as specific aspects of the process of DSH including precipitating experiences, cognitions, emotions, and behaviours associated with the individual's engagement in DSH. The second within subjects variable is referred to as Engagement Style Specificity (ES-Specificity; general items versus specific items). ES-Specificity refers to the

dimension of how general or specific the engagement style is to the DSH process, with 'general' reflecting a general tendency or style (i.e., "I am impulsive in many areas of life"), and 'specific' reflecting specific aspects of engagement style that are concretely related to DSH behaviour (i.e., "I engage in DSH on impulse or on a whim, without thinking"). As noted above, the general versus specific variable was included to examine the potential interaction of item specificity with impulsivity and compulsivity. Finally, the between subjects variable is referred to as Group (clinicians versus undergraduates). Table 34 summarizes the findings for the main effects and the interaction effects. The partial eta squared statistic (partial η^2) and the r value are provided as an estimate of effect size for the significant effects.

Table 34:

Mixed Design ANOVA for DSH-Engagement Style (Impulsivity versus Compulsivity) by Engagement Style Specificity (General versus Specific) by Group (Clinicians versus Undergraduate, N = 211)

Source	df	*F*	*p*	Partial η^2	*r*
Between Subjects					
Group	1	2.76	.10	--	--
Error	209	(5.96)			
Within Subjects					
DSH-ES	1	26.23	.00**	.11	.33
DSH-ES X Group	1	0.16	.69	--	--
Error (DSH-ES)	209	(14.58)			
ES-Specificity	1	231.03	.00**	.53	.72
ES-Specificity X Group	1	1.26	.26	--	--
Error (ES-Specificity)	209	(4.70)			
DSH-ES X ES-Specificity	1	14.01	.00**	.06	.25
DSH-ES X ES-Specificity X Group	1	39.81	.00**	.16	.40
Error (DSH-ES X ES-Specificity)	209	(5.94)			

Note. Values enclosed in parentheses represent mean square errors. DSH-ES = DSH Engagement Style; ES-Specificity = Engagement Style Specificity.
* $p < .05$; ** $p < .01$

Referencing Table 34, a significant 3-way interaction of DSH-ES, ES-Specificity, and Group (F (1, 209) = 39.81, $p < .01$) was found, showing a medium-large effect size (r = .40) according to Cohen's (1992) guidelines. Specifically, among clinicians (N = 115), at the level of general items, the DSH-ES is not significantly different (impulsivity M = 9.29, SD = 3.03; compulsivity M = 9.05, SD = 2.80; t (114) = 0.48, $p > .05$) but at the level of specific items, compulsivity is significantly higher than impulsivity (compulsivity M = 13.19, SD = 2.80; impulsivity M = 10.04, SD = 2.77; t (114) = -7.49, $p < .01$). In contrast, among undergraduates (N = 96), compulsivity is greater than impulsivity at the general level (compulsivity M = 9.90, SD = 2.33; impulsivity M = 8.22, SD = 2.53; t (95) = -4.26, $p < .01$) and this difference approached significance at the specific level (compulsivity M = 11.57, SD = 3.12; impulsivity M = 10.76, SD = 2.85; t (95) = -1.89, p = .06). Thus, clinicians' scores describing prototypical DSH clients showed comparable levels of general (or trait) impulsivity and compulsivity, but characterized specific DSH behaviours or processes as more compulsive than impulsive. Undergraduates scored significantly higher on general (or trait) compulsivity than impulsivity, and showed a non-significant trend towards higher compulsivity than impulsivity on specific DSH features.

In addition, a significant two-way interaction was found between DSH-ES and ES-Specificity (F (1, 209) = 14.01, $p < .01$) with a medium effect size (r = .25). This interaction revealed that compulsivity is significantly higher than impulsivity at the specific level (compulsivity M = 12.46, SD = 3.05; impulsivity M = 10.37, SD = 2.82; t (210) = -6.71, $p < .01$), and at the general level (compulsivity M = 9.44, SD = 2.62; impulsivity M = 8.80, SD = 2.85; t (210) = -1.94, $p < .05$). Thus, the DSH Engagement Style was found to be significantly more compulsive than impulsive at both the general and the DSH-specific levels.

A significant main effect of ES-Specificity (F (1, 209) = 231.03, $p < .01$) with a large effect size (r = .72) is evident, showing that scores on specific items are much greater than scores on general items (specific M = 22.82, SD = 3.75; general M = 18.24, SD = 2.72; t (210) = -15.35, $p < .01$). Finally, there was a significant main effect of DSH-ES (F (1, 209) = 26.23, $p < .01$) with a medium effect size (r = .33). This effect showed that compulsivity is significantly higher than impulsivity (compulsivity M = 21.89, SD =

4.48; impulsivity $M = 19.17$, $SD = 4.58$; $t\ (210) = -5.19$, $p < .01$). For both DSH-ES and ES-Specificity, the interaction with Group was not significant ($F\ (1, 209) = .16$, $p > .05$ and $F\ (1, 209) = 1.26$, $p > .05$, respectively) indicating that these effects were similar across clinicians and undergraduates. Similarly, the between subjects effect was not significant ($F\ (1, 209) = 2.76$, $p = .10$) with no difference between clinician and undergraduate ratings overall.

Clearly, the largest effect from this analysis is the effect of ES-Specificity, with scores on specific items being much higher than scores on general items. Most likely, the reason that specific impulsive and compulsive DSH items are scored more highly than general compulsivity and general impulsivity items, both by the clinicians and the undergraduates, is that they are "double-barreled" items (DeVelis, 2003). That is, to endorse the specific, but not the general items, respondents are endorsing both that the person engaged in DSH and that the person did this in a certain way or for a certain reason. In all likelihood, the specific DSH items had more salience for both clinicians and undergraduates. Since all those scored in the study (undergraduate participants or clinicians' prototypical clients) engaged in DSH, the use of "double barreled" items is valid and reasonable. However, this effect highlights the importance of balancing specific DSH items across compulsivity and impulsivity scales.

More germane to the central research questions, these findings show a clear and significant difference effect of DSH Engagement Style, with compulsivity being significantly higher than impulsivity for clinicians (in reference to the prototypical DSH client) and for undergraduates (in reference to personal DSH experiences). A medium effect size was found (10.89% of variance explained), establishing the importance of this effect. These findings are contrary to what was expected in the third hypothesis, as it was predicted that clinicians would perceive DSH as more strongly related to impulsivity than compulsivity based on the literature review. Thus, clinicians' descriptions of the prototypical DSH client in a clinical setting (which would be regarded by Simeon and Favazza's [2001] model as "impulsive DSH") are more compulsive in nature than impulsive on the DSH Impulsivity and DSH Compulsivity scales. Compulsive items reflected a cautious and perfectionistic style, as well as DSH-specific factors (having a compulsion to DSH in advance, feeling a *need* to engage in DSH, a period of agonizing

over or avoiding DSH, and shame and regret following DSH). These items are in contrast with impulsive items, which reflect a general impulsive and novelty-seeking style, and DSH-specific factors (engaging in DSH quickly on a whim without thinking, a sense of excitement relating to DSH, a sense of *wanting to* engage in DSH, and regret primarily due to external consequences).

Furthermore, in response to the fourth hypothesis these findings offer evidence that, as predicted, undergraduates describe more compulsive experiences in association with DSH, as opposed to impulsivity. As in the clinician sample, the DSH profile of the undergraduate sample would be considered "impulsive DSH" based on Simeon and Favazza's (2001) model. Thus, from the perspective of a non-clinical sample, the process of DSH also shows more prominent elements of a compulsive process as compared to impulsiveness, even within a sample of individuals who would be considered to be engaging in "impulsive DSH" by some models or conventions. Taken together, these findings suggest that compulsivity is indeed an important consideration in DSH in a clinical reference sample and in a non-clinical sample. The characterization of these samples as being higher on compulsive features as compared to impulsive features is contrary to the predominant view in the literature, and raises some question as to the appropriateness of the "impulsive DSH" label employed by Simeon and Favazza (2001) and others.

Correlations between DSH scales and measures of impulsivity and compulsivity. In order to examine the relationship between the DSH Impulsivity and DSH Compulsivity scales and the individual measures of impulsivity and compulsivity, a correlation matrix was generated for these measures in the undergraduate sample (Table 35). Of note, the correlation between the DSH Impulsivity scale and DSH Compulsivity scale was not significant for the undergraduate sample ($r = -.11$, $p = .31$).

Table 35:

Bivariate Pearson Correlations between DSH Scales and Measures of Impulsivity and Compulsivity (N = 95).

Measure	DSH Scales	
	DSH Impulsivity	DSH Compulsivity
STAI (Trait)	-.11	**.36****
Y-BOCS Total	-.07	.10
Padua Inventory Total	**.20***	.11
BIS-11 Total	**.38***	-.15
BIS/BAS Behavioral Inhibition	-.01	**.35****
BIS/BAS Drive	.19	-.13
BIS/BAS Fun Seeking	**.33****	**-.48****
BIS/BAS Reward Responsiveness	.11	-.10
Eysenck I.7	**.50****	**-.25***
TPQ Total Novelty Seeking	**.34****	**-.39***
TPQ Total Harm Avoidance	.01	**.44****
TPQ Total Reward Dependence (without Persistence)	.13	.06
TPQ Persistence	-.11	**.31****

** $p < .05$; ** $p < .01$.

Referencing Table 35, it is apparent that in many respects, the DSH Impulsivity and DSH Compulsivity scales correlated with the expected measures of impulsivity and compulsivity. Significant positive correlations were found between the DSH Impulsivity scale and established measures of impulsivity (BIS-11, $r = .38, p < .01$; BIS/BAS Fun Seeking, $r = .33, p < .01$; Eysenck I.7, $r = .50, p < .01$; and TPQ Novelty Seeking $r = .34$, $p < .01$). The latter three measures also showed significant negative correlations with the compulsivity components and scales ($r = -.48, p < .01$, $r = -.25, p < .05$, and $r = -.39, p < .01$, respectively). Similarly, significant positive correlations between the DSH-Compulsivity scale were found between established measures of compulsivity and trait anxiety (STAI-Trait, $r = .36, p < .01$; BIS/BAS Behaviorual Inhibition, $r = .35, p < .01$; TPQ Harm Avoidance $r = .44, p < .01$; and TPQ Persistence $r = .31, p < .01$).

One compulsivity measure, the Padua Inventory, showed an unexpected positive correlation with the DSH Impulsivity scale ($r = .23, p < .05$) and not the DSH Compulsivity scale ($r = .11, p = .27$). (As noted above, the Padua Inventory Total score

was positively correlated with both the DSH-Specific Compulsivity component ($r = .21, p < .05$) and the Urge-driven/Impulsive component ($r = .33, p < .01$), and some subscales were found to correlate (positively) with both impulsivity and compulsivity components.) To consider reasons for this unexpected correlation between the DSH Impulsivity scale and the Padua Inventory, the subscales were examined. This revealed a significant correlation between the subscale "Urges and worries about losing control over motor behaviors" and DSH Impulsivity ($r = .26, p < .05$). This subscale contains items relating to violent urges, impulses of suicide, or fear of losing control over unpleasant or unacceptable urges (i.e., "I sometimes have an impulse to steal other people's belongings, even if they are of no use to me"). This subscale may be related to DSH Impulsivity in the sense that it reflects fears of giving in to urges or impulses. With the exception of the unexpected correlation of the DSH Impulsivity scale with the Padua Inventory, it appears that DSH Impulsivity and DSH Compulsivity are adequate representations of the constructs in question.

Predicting DSH Characteristics from Impulsivity and Compulsivity

In order to examine the additional research question regarding the ability to predict DSH characteristics from indicators of impulsivity and compulsivity in the undergraduate sample, a series of regression analyses were conducted. Specifically, first the established measures of general impulsivity and compulsivity were used to determine whether impulsivity scores, compulsivity scores, or an interaction of these scores would predict DSH characteristics of interest. Then, the DSH-specific measures of impulsivity and compulsivity (first the DSH-U components, then the constructed DSH Impulsivity and DSH Compulsivity scales) were used to predict the same DSH characteristics. The outcome variables were defined as follows: frequency of self harm (DSHI total frequency for all methods), the duration of self harm (DHSI duration as measured by the time in years from onset to cessation of DSH), and the number of methods (DSHI total number of methods). In addition, a variable termed "density" was created, which was calculated by dividing the frequency of self harm (DSHI frequency) by the duration of self-harm (DSHI duration). This may give a more precise reflection of self harm experience. For example, a frequency of 50 self harm incidents over 6 months may be clinically quite different

from the same number of incidents over 5 years, and relate differently to impulsivity versus compulsivity. Finally, the severity of self harm (DSHI severity as measured by the presence or absence of a history of medical treatment for DSH) is analyzed separately as this outcome variable was categorical. Each analysis is discussed in turn.

Predicting DSH Characteristics from Measures of Impulsivity and Compulsivity

In order to examine whether established measures of impulsivity and compulsivity could predict DSH characteristics (i.e., frequency, duration, density, number of methods, and severity of DSH), a series of regression analyses were conducted. The three predictors were the saved regression scores from the Impulsivity/Sensation Seeking component, the saved regression scores from the Anxious Compulsivity component, and the interaction between these two components. The outcome variables were the frequency, duration, density, and number of methods of DSH. The three predictors (Impulsivity/Sensation Seeking, Anxious Compulsivity, and Interaction) were entered simultaneously into the equation to predict DSH characteristics. First, the three predictors were used to predict the frequency of DSH. Then, this analysis was repeated to predict duration of DSH, density of DSH, and number of DSH methods. The resulting statistics are presented in Table 36. Although these results represent four separate regression analyses, the scores are summarized in a single table for clarity.

Table 36:

Summary of Simultaneous Regression Analyses for Impulsivity/Sensation Seeking and Anxious Compulsivity Components Predicting DSH Characteristics (N = 95)

Outcome	Predictors	*B*	*SE B*	Standardized β	*t*
Frequency	Impulsivity/Sensation Seeking	-31.15	32.34	-.10	-.96
	Anxious Compulsivity	-42.18	32.64	-.13	-1.29
	Interaction	50.36	35.61	.15	1.41
Duration	Impulsivity/Sensation Seeking	.15	.67	.02	.23
	Anxious Compulsivity	-1.09	.67	-.17	-1.62
	Interaction	.30	.74	.04	.40

Table 36 (continued):

Outcome	Predictors	*B*	*SE B*	Standardized β	*t*
Density	Impulsivity/Sensation Seeking	-10.00	5.61	-.18	-1.78
	Anxious Compulsivity	3.22	5.67	.06	.57
	Interaction	-.91	6.18	-.02	-.15
Number of Methods	Impulsivity/Sensation Seeking	.66	.24	.25	2.74**
	Anxious Compulsivity	.99	.24	.38	4.09**
	Interaction	.46	.26	.16	1.74

Note. $R^2 = .05$ for Frequency; $R^2 = .03$ for Duration; $R^2 = .04$ for Density; $R^2 = .23$ for Number of Methods. * $p < .05$; ** $p < .01$.

It is apparent from Table 36 that the components from the PCA of the impulsivity and compulsivity questionnaires did not significantly predict frequency of DSH, duration of DSH, or density of DSH. Indeed, the amount of variance explained for these three analyses was quite low, with R^2 values ranging from .03 to .05 ($R^2 = .05$, $F(3, 91) = 1.69$, $p > .05$ for frequency; $R^2 = .03$, $F(3, 91) = 1.04$, $p > .05$ for duration; $R^2 = .04$, $F(3, 91) = 1.21$, $p > .05$ for density). In contrast, the predictors accounted for 23% of the variance in the number of methods of DSH used ($R^2 = .23$, $F(3, 91) = 8.78$, $p < .01$). In this case, the number of methods was significantly predicted by both Impulsivity/ Sensation Seeking ($\beta = .25$, $t = 2.74$, $p < .01$) and Anxious Compulsivity ($\beta = .38$, $t = 4.09$, $p < .01$), but not by the interaction of the two components. Thus, high scores on a component representing measures of Impulsivity/Sensation Seeking and high scores on a component representing Anxious Compulsivity were associated with a higher number of DSH methods.

Residual statistics, scatterplots of residuals, and normal probability plots were examined for each analysis. In predicting frequency and density of DSH, the distribution of residuals departed from normality, and 2 outliers were identified in each analysis. Outliers were defined as cases with a standardized residual with an absolute value greater than 3.00 (Field, 2005). In predicting duration of DSH, the residuals approximated a normal distribution and 1 outlier was identified. In predicting number of methods, the residuals appeared normally distributed and no outliers were detected. Influence statistics were assessed and based on the Cooks distance (Cook & Weisberg, 1982) and leverage

values (Stevens, 1992) it was determined that these outliers were not exerting undue influence on the regression. As an additional assessment of the impact outliers, these analyses were re-run with outliers omitted until no outliers remained, and the findings did not change significantly despite an improvement in the distribution of residuals. Similarly, as suggested by Tabachnik and Fidell (2007), it can be appropriate to change the value on the outlier to reduce the impact of the case; thus, for each regression analysis, the value of each outlier was changed to the closest value in the distribution and the analysis was re-run until no outliers remained. As with deletion of outliers, changing the values of outliers improved the normal distribution of residuals but did not significantly change the overall findings.

Since the outcome variable termed severity is dichotomous, logistic regression was used to predict this outcome from the impulsivity and compulsivity questionnaire data. Specifically, as with the above analysis, the Impulsivity/Sensation Seeking component, the Anxious Compulsivity component, and the interaction term were simultaneously entered as predictors. The outcome variable was the severity of DSH as indicated by the presence or absence of a reported history of medical treatment for a DSH incident. There were 90 cases with no history of medical treatment for DSH, and 5 cases with a positive history. Table 37 presents selected statistics for this analysis.

Table 37:

Logistic Regression for Impulsivity/Sensation Seeking and Anxious Compulsivity Components Predicting DSH Severity (N = 95)

Predictors	X^2	*-2 Log likelihood*	*B*	SE (*B*)	Exp (*β*)	*95% CI for Exp (β)*
Step 1	1.09	38.09				
Impulsivity/Sensation Seeking			-.18	.51	.84	.31 to 2.27
Anxious Compulsivity			-.37	.49	.69	.27 to 1.80
Interaction			.32	.51	1.37	.50 to 3.75

* $p < .05$; ** $p < .01$.

As noted in Table 37, the model as a whole does not contribute to the ability to predict severity of DSH (X^2 (3, N = 95) = 1.09; p > .05) and it does not significantly improve the ability to predict outcome over the constant, with both models predicting 94.7% of cases. The high percentage of participants endorsing an absence of medical treatment for DSH resulted in a high number of correct classifications in the initial model (constant only). The individual predictor variables did not contribute to the ability to correctly classify cases as severe or non-severe based on self-reported history of medical treatment for DSH.

Predicting DSH Characteristics from DSH-U Components

Given the largely non-significant findings in predicting DSH characteristics from the components derived from the impulsivity and compulsivity questionnaire data (Impulsivity/Sensation Seeking and Anxious Compulsivity), the DSH-U components were used as predictors in the following regression analyses. Since these components were supported in the above analyses when compared with the expert ratings and given the internal consistency of each component, inclusion of these components as predictors for regression analyses was justified. These analyses were carried out to further examine whether DSH characteristics could be predicted from measures of impulsivity and compulsivity.

As above, a series of regression analyses were conducted to determine whether the components from the PCA of the DSH-U would predict the frequency, duration, density methods, and severity of self harm as measured by the DSHI. The four predictors were the saved regression scores from the four DSH-U components (DSH-Specific Excitement, DSH-Specific Compulsivity, Cautious/Perfectionism, and Urge-driven/Impulsive). As above, outcome variables were the frequency of self harm, the duration of self harm, the density of self-harm and the number of methods. First, the four predictors were entered simultaneously into the equation to predict frequency of DSH. Then, this analysis was repeated to predict duration, density, and number of methods. Results of these four separate regression analyses are summarized in Table 38.

Table 38:

Summary of Simultaneous Regression Analyses for DSH-U Components Predicting DSH Characteristics (N = 96)

Outcome	Predictors	*B*	*SE B*	Standardized β	*t*
Frequency	DSH-Specific Excitement	40.67	31.27	.13	1.30
	DSH-Specific Compulsivity	71.47	31.11	.23	2.30*
	Cautious/Perfectionism	4.73	31.22	.02	.15
	Urge-driven/Impulsive	-59.54	31.06	-.19	-1.92
Duration	DSH-Specific Excitement	-.06	.67	-.01	-.09
	DSH-Specific Compulsivity	.27	.66	.04	.40
	Cautious/Perfectionism	-.58	.67	-.09	-.87
	Urge-driven/Impulsive	-1.04	.66	-.16	-.16
Density	DSH-Specific Excitement	8.97	6.01	.14	1.49
	DSH-Specific Compulsivity	23.71	5.98	.38	3.97**
	Cautious/Perfectionism	2.57	6.00	.04	.43
	Urge-driven/Impulsive	-2.56	5.97	-.04	-.43
Number of Methods	DSH-Specific Excitement	.36	.24	.14	1.48
	DSH-Specific Compulsivity	.83	.24	.32	3.50**
	Cautious/Perfectionism	-.31	.24	-.12	-1.30
	Urge-driven/Impulsive	.75	.24	.29	3.15**

Note. $R^2 = .11$ for Frequency; $R^2 = .04$ for Duration; $R^2 = .17$ for Density; $R^2 = .22$ for Number of Methods. * $p < .05$; ** $p < .01$

It is apparent from Table 38 that none of the components contributed to the prediction of duration of DSH, and the R^2 value was quite low for this model ($R^2 = .04$, $F(4, 91) = 0.84$, $p > .05$). However, the DSH-U components contributed to the prediction of the remaining outcome variables to a significant degree ($R^2 = .11$, $F(4, 91) = 2.77$, $p < .05$ for frequency; $R^2 = .17$, $F(4, 91) = 4.62$, $p < .05$ for density; $R^2 = .22$, $F(4, 91) = 6.32$, $p < .01$ for number of methods). Specifically, DSH-Specific Compulsivity was the only component to significantly predict frequency ($\beta = .23$, $t = 2.30$, $p < .05$) and density ($\beta = .38$, $t = 3.97$, $p < .01$). Both DSH-Specific Compulsivity and Urge-driven/Impulsive

significantly predicted the number of methods of DSH ($\beta = .32$, $t = 3.50$, $p < .01$ and ($\beta = .29$, $t = 3.15$, $p < .01$, respectively).

Residual statistics, scatterplots of residuals, and normal probability plots were examined for each analysis. In predicting frequency, duration and density of DSH, the distribution of residuals was positively skewed and outliers were identified in each analysis (2 for frequency, 1 for duration and 3 for density). In predicting number of methods, the residuals appeared normally distributed and one outlier were detected. Influence statistics were assessed and based on the Cooks distance (Cook & Weisberg, 1982) and leverage values (Stevens, 1992) it was determined that these outliers were not exerting undue influence on the regression.

As above, these analyses were re-run first with all outliers omitted and then with outlier values changed to equal the closest non-outlying value in the distribution (Tabachnik and Fidell, 2007). Although the distribution of residuals normalized following these modifications, the findings did not change appreciably for the equations predicting frequency of DSH, duration of DSH, and number of methods of DSH. However, in the case of predicting the density of DSH (or the frequency of DSH episodes per year), changing the values of outliers resulted in an increase in the amount of variance explained ($R^2 = .20$; $F(4, 91) = 5.73$) and a significant finding for both DSH-U Specific Compulsivity ($\beta = .37$, $t = 3.98$, $p < .01$) and DSH-U Specific Excitement ($\beta = .21$, $t = 2.21$, $p < .05$). However, it should be noted that 6 cases required modification to eliminate outlier values. This degree of modification may have distorted data and these findings must be interpreted with caution.

Again, logistic regression was used to predict severity outcome from the DSH-U components. The four components from the PCA of the DSH-U (DSH-Specific Excitement, DSH-Specific Compulsivity, Cautious/Perfectionism, and Urge-driven/Impulsive) were entered simultaneously as predictors. The outcome variable was the severity of DSH as indicated by the presence or absence of a reported history of medical treatment for a DSH incident. There were 90 cases with no history of medical treatment for DSH, and 6 cases with a positive history. Table 39 presents selected statistics for this analysis.

Table 39:

Logistic Regression for DSH-U Components Predicting DSH Severity (N = 96)

Predictors	X^2	*-2 Log likelihood*	*B*	SE (*B*)	Wald	Exp (*b*)	*95% CI for Exp (b)*
Step 1	8.55	36.33					
DSH-Specific Excitement			-.58	.54	1.16	.56	.20 to 1.60
DSH-Specific Compulsivity			-.53	.46	1.31	.59	.24 to 1.46
Cautious/Perfectionism			-.43	.44	.95	.65	.27 to 1.55
Urge-driven/Impulsive			-1.07	.50	4.56*	.35	.13 to .92

* $p < .05$; ** $p < .01$

As noted in Table 39, the model as a whole does not contribute to the ability to predict severity of DSH (X^2 (4, $N = 96$) = 8.55; $p > .05$) and it does not significantly improve the ability to predict outcome over the constant. The constant predicted 94.7% of cases correctly, while the above model predicted 94.8% of cases. Again, the high proportion of participants with an absence of medical treatment for DSH resulted in a high number of correct classifications in the initial model (constant only).

Three of the predictor variables (DSH-Specific Excitement, DSH-Specific Compulsivity and Cautious/Prefectionsim) did not contribute to the ability to correctly classify cases as severe or non-severe based on self-reported history of medical treatment for DSH. However, the fourth predictor, Urge-driven/Impulsive, showed a significant finding ($B = -1.07$; Wald = 4.56, $p < .05$) which indicates that the Urge-driven/Impulsive predictor is making a significant contribution to the prediction of outcome. The relationship is negative, and as such an increase in the score on the Urge-driven/Impulsive component is associated with a decrease in the likelihood of severe self harm (as defined by a self-reported history of medical treatment of DSH). This finding may be due to an actual relationship between these variables, although it is possible that the association is related to treatment-seeking behaviour (i.e., individuals with an urge-driven, impulsive style may be less likely to seek treatment in the event of a serious DSH incident).

Predicting DSH Characteristics from DSH Impulsivity and DSH Compulsivity Scales

Since the development of a two-scale version of the DSH-U and DSH-C (DSH Impulsivity scale and DSH Compulsivity scale) was supported in the above analyses, these two scales and their interaction were used to predict DSH characteristics in the same manner described above. The variables were centred prior to analysis to reduce multicollinearity (Tabachnik and Fidell, 2007). A series of regression analyses were conducted to determine whether DSH Impulsivity, DSH Compulsivity, or the interaction between the two would predict the frequency, duration, density and number of methods of self harm as measured by the DSHI. First, the three predictors were entered simultaneously into the equation to predict frequency of DSH. Then, this analysis was repeated to predict duration, density, and number of methods. The resulting statistics are presented in Table 40. Although these results represent four separate regression analyses, the scores are summarized in a single table.

Table 40:

Summary of Simultaneous Regression Analyses for DSH Impulsivity and DSH Compulsivity Predicting DSH Characteristics (N = 96)

Outcome	Predictors	*B*	*SE B*	Standardized β	*t*
Frequency	DSH Impulsivity	1.93	7.98	.03	0.24
	DSH Compulsivity	17.83	7.96	.24	2.24*
	Interaction	-0.81	1.73	-.05	-0.47
Duration	DSH Impulsivity	-0.15	0.17	-.10	-0.89
	DSH Compulsivity	0.03	0.17	.02	-0.19
	Interaction	0.00	0.04	.00	0.02
Density	DSH Impulsivity	1.21	1.53	.08	0.79
	DSH Compulsivity	4.02	1.53	.27	2.64**
	Interaction	-0.56	0.33	-.17	-1.67
Number of Methods	DSH Impulsivity	0.21	0.06	.33	3.24**
	DSH Compulsivity	0.07	0.06	.11	1.06
	Interaction	0.01	0.01	.04	0.35

Note. $R^2 = .07$ for Frequency; $R^2 = .01$ for Duration; $R^2 = .13$ for Density; $R^2 = .11$ for Number of Methods. * $p < .05$; ** $p < .01$

It is apparent from Table 40 that none of the components contributed to the prediction of duration of DSH, with almost no variance explained in this model ($R^2 = .01$, $F(3, 92) = 0.31, p > .05$). Similarly, the overall model was not significant for frequency ($R^2 = .07, F(3, 92) = 2.13, p = .10$). However, the DSH scales contributed significantly to the prediction of density ($R^2 = .13, F(3, 92) = 4.72, p < .01$) and number of methods ($R^2 = .11, F(3, 92) = 3.68, p < .05$) in the overall models. Specifically, DSH Compulsivity was the only component to significantly predict frequency ($\beta = .24, t = 2.24, p < .05$) and density ($\beta = .27, t = 2.64, p < .01$) while DSH Impulsivity significantly predicted the number of methods of DSH ($\beta = .33, t = 3.24, p < .01$). This pattern of findings is similar to the findings relating to DSH-U components predicting DSH characteristics above, although in this case DSH Compulsivity did not significantly predict number of methods.

Residual statistics, scatterplots of residuals, and normal probability plots were examined for each analysis. As above, outliers were identified and these data were re-analyzed with the outliers omitted. After omission of outliers, the findings for duration, density, and number of methods did not change despite improved normality in the distribution of residuals. In the case of frequency, 10 outliers were omitted to eliminate all outlying cases; following this process, the significance of the overall model did not improve ($R^2 = .07, F(3, 82) = 1.89, p > .05$) and DSH Compulsivity no longer predicted frequency of DSH ($\beta = .21, t = 1.89, p = .06$). Given the relatively high number of cases omitted and the possibility that the extreme values could be meaningful in terms of reflecting impulsivity and compulsivity, this analysis was repeated with the value of outliers changed to reflect the value of the next closest value in the distribution. In this case, the overall model improved ($R^2 = .12, F(3, 92) = 4.07, p < .01$) and DSH Compulsivity significantly contributed to the prediction of frequency of DSH ($\beta = .31, t = 3.02, p < .01$). Using this method of modifying extreme values did not alter the predictive ability of the models for duration, density, or number of methods.

As above, logistic regression was used to predict severity outcome from the DSH Impulsivity and DSH Compulsivity scales. As noted, the predictor variables were centred prior to analysis to reduce multicollinearity. DSH Impulsivity, DSH Compulsivity, and the interaction of these two scales were entered simultaneously as predictors, and the

outcome variable was the severity of DSH as indicated by the presence or absence of a reported history of medical treatment for a DSH incident. There were 90 cases with no history of medical treatment for DSH, and 6 cases with a positive history. Table 41 presents selected statistics for this analysis.

Table 41:

Logistic Regression for DSH Impulsivity and DSH-Compulsivity Predicting DSH Severity (N = 96)

Predictors	X^2	*-2 Log likelihood*	*B*	SE (*B*)	Wald	Exp (*b*)
Step 1	3.68	41.21				
DSH Impulsivity			-0.15	.11	1.80	0.86
DSH Compulsivity			-0.11	.12	0.80	0.90
Interaction			0.03	.02	1.71	1.03

* $p < .05$; ** $p < .01$

As noted in Table 41, the model as a whole does not contribute to the ability to predict severity of DSH (X^2 (3, $N = 96$) = 3.68; $p > .05$) and it does not significantly improve the ability to predict outcome over the constant. Both the constant and the above model predicted 93.8% of cases correctly. Again, the high proportion of participants with an absence of medical treatment for DSH resulted in a high number of correct classifications in the initial model (constant only) and the DSH Impulsivity, DSH, Compulsivity, or interaction term did not increase the ability to predict severity.

Summary of Data Predicting DSH Characteristics from Impulsivity and Compulsivity

In addressing the question of whether DSH characteristics such as frequency, duration, density, number of methods, and severity can be predicted from various indicators of impulsivity and compulsivity, some findings are noteworthy. First, when considered collectively, commonly used measures of impulsivity and compulsivity predict the number of methods of DSH, with high levels of impulsivity and high levels of compulsivity being independently associated with a higher number of DSH methods. This held true at the level of DSH components, although at the level of DSH Impulsivity

and DSH Compulsivity scales only DSH Impulsivity contributed to the prediction of number of methods while DSH Compulsivity showed a non-significant trend in that direction. Thus, individuals who score higher on measures of either impulsive or compulsive tendencies (either general measures of these traits or behaviour patterns, or specific items relating to DSH) use more methods of DSH. This may be due to higher levels of impulsivity and compulsivity being similarly associated with more serious psychological or behavioural problems. It could reflect a more general underlying vulnerability or dysregulation (i.e., perhaps of impulse control, with impulses being over-controlled or under-controlled) that is associated with more varied methods.

Second, it is evident that established measures of impulsivity and compulsivity do not contribute to the prediction of the frequency of DSH, duration of DSH, density of DSH, or severity of DSH. In contrast, the DSH-U components and the DSH Impulsivity and Compulsivity scales were more successful in that regard. Specifically, the component reflecting DSH-Specific Compulsivity significantly predicted frequency, density, and number of methods, and the DSH Compulsivity scale (which is comprised of many of the same items) predicted frequency and density. These items reflect both a cautious, perfectionistic style and specific compulsivity features in reference to DSH (i.e., a compulsion to engage in DSH well in advance of acting; a sense of *needing* to engage in DSH; a substantial period of agonizing over and trying to avoid DSH; and shame and regret following DSH). Thus, individuals who tend to rate items such as these relatively highly tend to have higher overall frequency, density, and number of methods of DSH. This suggests that concrete DSH-specific questions (perhaps both on impulsivity and compulsivity, as well as other processes) may be needed to enhance the ability to predict DSH characteristics, rather than relying on general measures of impulsivity and compulsivity. It also speaks to the possibility that compulsive features may play an important role in the more frequent and intense experiences of DSH.

Third, severity of DSH was negatively predicted by the DSH-U Urge-driven/Impulsive component. This suggests that individuals who are impulsive, driven by urges and emotions, make decisions quickly without thinking them through, and show little control over thoughts, feelings and behaviour are also less likely to report a severe DSH incident. At first glance, it may seem as though individuals endorsing items

reflecting impulsivity and low control over behaviour might have more frequent severe DSH incidents due to a lack of forethought or inhibition of behaviour. However, this finding may be more related to the definition used for severity, which was the presence or absence of medical treatment for a DSH incident. It is possible that individuals who are highly urge-driven or impulsive in their DSH (and in general) would be less inclined to seek medical attention when a severe incident occurs.

Taken together, it appears that impulsivity and compulsivity are important considerations in attempting to predict DSH characteristics such as frequency, duration, density, number of methods, and severity. It seems clear that general measures of impulsivity and compulsivity such as those used in this study (i.e., the Y-BOCS, Padua Inventory, BIS-11, I.7, BIS/BAS, TPQ Harm Avoidance, TPQ Novelty Seeking) can predict the number of methods but with little specificity (i.e., the ability to predict is equivalent whether impulsivity or compulsivity scores are used). These measures are not informative in terms of predicting the frequency, density, or severity of DSH. In contrast, the DSH-Specific Compulsivity component from the DSH-U (and the DSH Compulsivity scale to a lesser extent) predicted frequency, density, and number of methods, and the Urge-driven/Impulsive component predicted number of methods and severity. These findings suggest that there is value in including DSH-specific items to delineate processes associated with DSH (i.e. impulsive, compulsive, excitement-seeking), and they highlight particular importance associated with the DSH-specific compulsive processes.

Qualitative Analyses of Undergraduate DSH Experience

Qualitative analyses were used to evaluate the written paragraph generated by participants, as well as the material provided in the semi-structured interview. The written paragraph was coded to identify features and processes of DSH. Participants were asked to include information about their experience before, during and after they engaged in DSH, but otherwise the format and content of the paragraph was left to the participant. This was considered to be more of a free-associative reflection on the aspects of the DSH experience that are most salient to participants, as they were permitted to write whatever came to mind in a relatively unstructured way. In contrast, the semi-structured interview was conducted with a subset of 20 participants engaging in persistent and repetitive DSH.

The semi-structured design of the interview allowed a more focused and systematic account of the phenomenology of DSH from the participant's perspective (Berg, 2007). The structure of the interview allowed data to be coded to represent the participant's experience before, during, and after DSH. It also permitted a more detailed examination of the phenomenon of DSH including specific impulsive and compulsive features.

Qualitative Analysis of Written Paragraph

Qualitative analyses were used to evaluate the 96 participants' written paragraphs. As noted in Chapter IV, care was taken to elicit sufficient detail yet preserve the spontaneous, personally meaningful disclosure of DSH experiences. The material generated in these paragraphs will be considered a reasonable representation of the most salient aspects of DSH according to the participant. However, in the absence of guided exploration it should be noted that there are likely aspects of DSH that were not captured by this medium. There may be aspects of the DSH experience that were not shared due to discomfort with disclosure, limited or selective recall, difficulty articulating certain experiences, or lack of awareness of some aspects of the experience. Further, participants were not specifically instructed to comment on impulsive or compulsive processes, so not all participants volunteered related information in the response. Thus, all relevant themes and processes may not have been identified using this method.

Using open coding procedures, the written paragraphs were initially coded for specific concepts or themes. This consisted of a careful, minute reading of each word, line and paragraph to allow the coding of all concepts, categories, themes, and processes that emerged (Strauss, 1987). Following the initial coding through which these themes and categories emerged, the coding process was repeated to ensure that all paragraphs were coded based on the entirety of the emergent concepts (Berg, 2007). A series of coding frames were then derived for each stage of the DSH experience (referred to as Before, During, and After). These coding frames consisted of the following broad categories or conditions: (1) Aversive State, characterized by the presence of an undesirable or unpleasant affective, cognitive, or physiological state; (2) Decrease Aversive State, characterized by the diminishing of intensity or elimination of an aversive state; (3) Induce Positive State, characterized by the induction of a pleasant or desirable

state; and (4) Process, which summarizes commentary regarding how DSH occurs (i.e., whether it is resisted, debated in advance, or occurs quickly without deliberation). After the paragraphs were coded for Before, During and After DSH, the paragraphs were re-coded to identify the themes or concepts that were judged to be most prominent in the participant's DSH experience.

Interrater reliability. In order to evaluate the reliability of this coding, an independent individual coded 25% of the paragraphs according to the coding frames provided. General instruction on the coding process was provided and specific training was conducted on two paragraphs. The training paragraphs were not included in reliability analysis. For the three coding frames (specific themes for Before, During and After DSH), the average Cronbach's alpha for the paragraphs was .86, ranging from .66 to 1.00. For the overall rating of the primary purpose or central experience of DSH, the average Cronbach's alpha was .82, ranging from .63 to 1.00. Overall, these reliability values are in the acceptable range.

Before DSH. Table 42 presents a summary of the coding frames and the specific themes that emerged from the descriptions of experiences leading up to DSH.

Table 42:

Experience Before DSH based on Written Paragraphs (N=96)

Category	Total *n* (%)
Aversive State	96 (100.00)
Aversive emotional experience (anger, sadness, anxiety, guilt)	77 (80.21)
Anger only	22 (22.92)
Sadness only	17 (17.71)
Anxiety only	9 (9.38)
Guilt / Shame only	1 (1.04)
Anger and Sadness (mixed)	14 (14.58)
Anxiety and Sadness (mixed)	6 (6.25)
Other (mixed)	8 (8.33)
Build up, intensification of distress	68 (70.83)
Self-critical, self-loathing	29 (30.21)
Lonely, isolated	24 (25.00)
Helpless, lack of control	21(21.88)
Bored, fidgety, restless	15 (15.63)
Need to punish self	11 (11.46)

Table 42 (continued):

Category	Total *n* (%)
Numb, detached (undesirable state)	4 (4.17)
Hollow, empty	3 (3.13)
Racing thoughts	2 (2.08)
Flashbacks	1 (1.04)
Process	48 (50.00)
Thinking in advance of DSH	38 (39.58)
Not thinking of DSH in advance	12 (12.50)

All of the participants (100%) described being in an aversive state before engaging in DSH. Most commonly, an aversive emotional experience was described (80.21%). Where a singular affective experience was noted, anger or frustration was the most common emotion (22.92%), followed by sadness or depression (17.71%), anxiety or worry (9.38%) and guilt or shame (1.04%). Mixed emotions consisting of a combination of these primary affective experiences were described in 29.17% of the sample. It is noteworthy that, of those identifying mixed emotions, half of these participants described a mixture of anger and sadness.

Many participants (70.83%) described experiencing a build up or intensification of overwhelming or intolerable emotions or distress prior to DSH.

> Sometimes I would feel so full of sadness and worry, guilt, pain, all of that, that I just couldn't handle it. I felt like I would explode or something. Then I would reach for the razor.

> The frustration would build...it was almost like the frustration would turn into rage...I would let it build. Then when I couldn't hold it in anymore (and didn't want to start a family fight) I would go to my bedroom and punch myself.

> Usually it was caused by INTENSE stress and a feeling of being overwhelmed. Hurting so much emotionally that it would drive me CRAZY. All I would do was scream, cry, and lose self-control.

Self-critical thoughts or self-dislike was also noted in 30.21% of participants' paragraphs. This included specific thoughts relating to themes such as academic performance, social competence, body image, and inadequacy, as well as more broad reference to self-hatred.

> It usually starts with a bad day. I would start to feel useless, unloved, annoying, a waste of everyone's time and most of all ugly.
>
> I felt insufficient as a daughter to my parents, as a friend, student and especially as a person. I thought I was dumb, ugly, and unwanted.
>
> I have some sort of depressive feelings that I'm not good enough and that I'm somewhat a failure, that I'm not pretty enough.

Feelings of loneliness or isolation were described in one quarter of participants (25.00%). This included themes of not fitting in, feeling left out, having no one to turn to for support, and feeling alone.

> My family life / home life is really stressful and hard to deal with, and I felt like I had no one to talk with.
>
> I felt excluded and weird, like I didn't fit in anywhere.

Nearly one quarter of participants noted feelings of helpless, powerlessness, or a lack of control (21.88%).

> Immediately before, I would always be 'panicked' and crying, thinking that nothing ever goes right and that I have no control over anything.
>
> I get frustrated because I'm not able to control my own feelings.
>
> When these feelings seemed to build up to the point at which I felt I had no control (both over my future, my decision making, my life, etc.) I would engage in DSH as a means to either 'cut' the pain out and as a means of control.

Boredom and restlessness were noted in 15.63% of participants. This included reference to physiological restlessness or fidgeting, as well as cognitive or affective reference to boredom.

> Sometimes I would just be bored and the thought would come into my head and I would hurt myself for no particular reason.
>
> I'll be bored or physically uncomfortable and I feel picking, feeling that bit of pain will distract me from the present moment, or bring my attention back.

An explicit need or drive for self-punishment was noted in 11.46% of participants, which included reference to needing for self-punishment, feeling deserving of pain or injury, and feeling a need to atone for "bad" thoughts or behaviours.

> I would start to feel sick and angry at myself and almost want to punish myself for being who and what I am.
>
> I hate myself and the only way to compensate for my failure as a person is to hurt myself.
>
> After a binge/purge session I would feel a sense of guilt following my purging behaviour, and feel a further need to punish myself...

The remaining themes were endorsed in less than 5% of participants. Experiences such as feeling numb or detached were endorsed in 4.17% of cases. This consisted of undesirable states such as numbness, "feeling nothing," or feeling detached and "not connected to my mind or body." Feeling hollow or empty was endorsed in 3.13% of participants. Racing thoughts were noted in 2.08%, while flashbacks of abuse were noted in 1.04% of participants.

In terms of the process of DSH, half of participants (52.08%) commented on process-related aspects of the DSH experience prior to engaging in DSH. The majority of these participants (39.58% of the undergraduate sample) indicated that they thought about DSH in advance of the behaviour.

> Before harming myself, all I can usually think about is how much better I'll feel afterwards.

> The idea (of DSH) will first enter my mind, sort of as a suggestion. If I do not engage in the DSH, then the suggestion becomes more present and takes over my mind until it is all I can think about and I want to do it. I get images in my mind of how relieving it would be to just do it – like scratching an itch.
>
> I struggle with the knowledge that DSH will calm me but that I should deal with it in a better way.
>
> I usually engage in internal self-commentary, in an attempt to rationalize with myself and stop myself from doing it, but it never works. I try not to even start picking, but I can't, and once I do start I can't stop until I'm either bleeding or there's nothing left to pick at.

A minority of participants (12.50%) indicated that they did not think of DSH in advance, acting quickly without thinking about the behaviour. It should be noted that these individuals maintained that DSH behaviour was conscious and deliberate, adhering to the definition of deliberate self-harm.

> First thing that came to mind was a razor. Grabbed it, just cut without thinking.
>
> I didn't plan it – it just happened.
>
> I did not plan it or consider any future implications. I had the impulsive thought of just wondering what it would feel like, and I acted on it.

During DSH. Table 43 presents a summary of the participants' descriptions of experiences during DSH.

Table 43:

Experience During DSH based on Written Paragraphs (N=96)

Category	Total *n* (%)
Aversive State	17 (17.71)
Initial aversive state persists (same or higher intensity)	12 (12.50)
Focus on self-punishment	4 (4.17)
Afraid	2 (2.08)

Table 43 (continued):

Category	Total *n* (%)
Decrease in Aversive State	73 (76.04)
Express or release emotions or tension	40 (41.67)
Focus on physical (visual, sensation, process) rather than initial aversive state	38 (39.58)
Detach, numb, "zone out" from initial aversive state	17 (17.71)
Feel grounded, real	4 (4.17)
Calm racing thoughts	1 (1.04)
Induce Positive State	39 (40.63)
Positive emotions (e.g., happy, satisfied, alive)	24 (25.00)
Powerful, in control	14 (14.58)
Rush, jolt of pleasant sensation	9 (9.38)
Fascination, interest	3 (3.13)
Process	22 (22.92)
Unable to stop DSH despite desire to stop	12 (12.5)
DSH occurs quickly without much thought	7 (7.29)
Task-oriented (i.e., remove imperfections)	7 (7.29)

In contrast to participants' descriptions of experiences before DSH, only 17.71% of participants described an aversive state during the act of DSH. Some described a specific focus on self-punishment during DSH (4.17%) or a sense of fear (2.08%) during DSH. Others described the same initial aversive state as either persisting or increasing in intensity (12.50%) during DSH.

> While I was doing it, thoughts usually ran through my mind about how angry I was about what had just happened, and how mad I was at myself.
>
> As I would do it, I hated myself for doing it, which made me more angry and made me want to do it more…I was never satisfied until I was crying with pain or bleeding enough.
>
> I would call myself a jackass, tell me I was dumb, and before I knew it I'd cut deeper than I meant to and I would be bleeding everywhere.

More than three-quarters of participants described a decrease or elimination of aversive states during DSH (76.04%). In terms of specific means of decreasing aversive states, a general reference to expressing, releasing, or "letting out" emotions or tension was noted in 41.67% of participants.

> I cut just enough to satisfy my need to release the overwhelming feelings I have at the time, which I know will make me feel better.
>
> I felt cutting was the simplest way to express and release all of the tension inside of me...it felt like all the pain and anger would go to that part of me and escape.

Distraction or detachment from aversive experiences was also a common theme. Focusing on the physical act of DSH (such as the visual elements, the physical sensation, or the logistics of carrying out the act safely) rather than the initial aversive state was frequently described (39.58%).

> I often felt like cutting as a way to turn the emotional pain into physical pain, so I would have something else to focus on. I wanted to FEEL pain physically as opposed to emotionally.
>
> As much as I was hurting emotionally, I knew no physical pain could be worse. See, that was the attraction. Physical pain was so much better and easier than the emotional pain.
>
> I liked to use a serrated knife because I liked to hear the flesh being cut...I would hold my arm up in the air and squeeze the blood out. I found watching the blood run down my arm very soothing.

General detaching, numbing, or "zoning out" from the initial aversive state was noted in 17.71% of participants.

> I blanked out, didn't think about anything, and then I'd realize I was bleeding so I would stop.
>
> I didn't really think about anything. I would just cut over and over as if I wasn't able to stop myself. I felt almost...as if it wasn't really me doing it.

In addition, participants described decreases in specific aversive states such as feeling grounded or real when previously feeling numb or detached (4.17%), or calming racing thoughts (1.04%).

> As soon as the blade hit my skin, it was like everything was all better. This feeling swept through my body and I could feel again.
>
> It's like I feel nothing. I need to feel reattached somehow so I engage in hitting etc. until I feel it. Until I start to feel something.

Inducing a positive or desirable state or sensation during DSH was noted in 40.63% of participants. One quarter of participants (25.00%) noted the induction of positive emotions during DSH, such as feeling happy, satisfied, or alive. Specific mention of feeling powerful or in control was noted in 14.58%. Some participants described a rush or jolt of pleasant physical sensation during the act of DSH (9.38%), as well as a fascination or interest in the act itself (3.13%)

> It was a pleasant feeling, warm and comforting.
>
> During (DSH), it felt the same as when someone hugs you, a big sigh of relief.
>
> The physical pain made sense to me – I had control over it – I knew how it started, I knew how to end it, I understood why it hurt, when the cut healed I knew the pain was gone.
>
> While actually harming myself, it feels good. Physically, the stimulation of it is somewhat therapeutic.
>
> I had a strong fascination with it, with watching the blood flow.

In terms of the process during DSH, 12.50% of participants indicated that they felt unable to stop DSH despite efforts to resist or stop the behaviour. In contrast, 7.29% described the act of DSH as quick and without much thought or attention. An equal number (7.29%) described a concentrated, task-oriented process whereby they were focused on the task at hand (i.e., to remove imperfections).

After DSH. Table 44 presents a summary of participants' descriptions of experiences in the moments and hours following DSH.

Table 44:

Experience After DSH based on Written Paragraphs (N=96)

Category	Total *n* (%)
Aversive State	47 (48.96)
Guilt, shame, regret, self-critical for DSH	45 (46.88)
Initial aversive state persists (same or higher intensity)	12 (12.50)
Confused about DSH	4 (4.17)
Decrease in Aversive State	73 (76.04)
Decrease in or elimination of tension	49 (51.04)
Decrease in or elimination of negative affect	48 (50.00)
Feel numb	5 (5.21)
Feel grounded, real	2 (2.08)
Induce Positive State	41 (42.71)
Positive affect (i.e., comforted, happy, satisfied, proud)	35 (36.46)
Powerful, in control	10 (10.42)
Euphoric, gratifying sensation	7 (7.29)

Considering the participants' descriptions of experiences following DSH, nearly half (48.96%) described being in an aversive state following the act of DSH. Guilt, shame, regret, or a self-critical reaction to DSH was the most commonly described aversive state, noted in 46.96% of cases.

> Afterwards, I felt guilty and embarrassed that I had done something so immature and irresponsible.
>
> Afterwards, I get angry and promise myself I'll stop because it either looks ugly, it bleeds, or it hurts…I feel others are judging me because it's gross.
>
> There is often a sense of failure as I have 'given in' to DSH instead of 'being strong.'
>
> I would become overwhelmed with grief and shame. I would feel so stupid about what I had done and found the bruises to be a constant reminder of my own stupidity. Each time I saw them I would feel ashamed at myself and think that I must be insane to do such a thing to myself.

As was the case during DSH, 12.50% of participants described the initial aversive state as persisting at the same level of intensity or higher. Feeling confused or puzzled regarding DSH was also noted in 4.17%.

Again, more than three-quarters of participants (76.04%) described a decrease in the aversive state that was present before and/or during DSH. Most commonly, participants described a decrease in or elimination of general tension or stress (51.04%) or a decrease in specific negative affect (50.00%).

> Afterwards I definitely felt better, ten times better. I wasn't angry anymore and I didn't feel bad...I felt relieved and it was a good relaxing feeling afterwards.
>
> After cutting, I feel less stressed – whatever was bothering me and building up has disappeared...Usually I am calm and don't care that I have done it since it makes the 'bad feelings' go away and I know it works.
>
> I would feel relief and would be able to move on from whatever the situation was that had occurred. I would not feel bad for doing it or regretful, I would just feel better, cover up the damage, and go on with my life.

Less frequently, 5.21% of participants described feeling numb (when previously experiencing a negative feeling state). An additional 2.08% described feeling grounded or real (when previously feeling detached or numb).

Following DSH, 42.71% of participants described having induced a positive state. Positive affect such as feeling comforted, happy, satisfied or proud was noted in 36.46% of cases.

> I felt really good that I could do something on my own that no one really knew about and something that I could hide.
>
> I guess it feels like I accomplished something; like I got rid of whatever was causing me to feel like I'm about to burst open.
>
> I feel relieved, a sense of accomplishment that I was able to focus on something else and have some control over it. I would say it is a feeling of satisfaction.
>
> It really gave me a sense of purifying my mind and soul...I usually fell asleep, feeling much better, almost like I was centered again.

Specific mention of feeling powerful or in control was reported in 10.42% of cases, and a euphoric, gratifying, or pleasant physical sensation was described in 7.29%.

Overall Experience of DSH. Considering the paragraphs in their entirety, each paragraph was coded for central themes that described the overall purpose, experience, or process of DSH. Only those themes that were judged to be central to the individual's experience were included. This determination was based on a holistic review of the paragraph including the context of the above themes as presented by each individual, the prominence of the theme in the paragraph, the emphasis and wording of the paragraph, and explicit identification of prominent themes by the participant. All relevant themes were coded, and therefore each paragraph was permitted multiple codes. These data are presented in Table 45.

Table 45:

Overall Experience of DSH based on Written Paragraphs (N=96)

Overall Experience of DSH	
Category	Total *n* (%)
Focus on or Intensify Aversive State	12 (12.50)
Initial aversive state persists	11 (11.46)
Initial aversive state intensifies	1 (1.04)
Decrease Aversive State	84 (87.50)
Release or express affect	56 (58.33)
Reduce or relieve tension	31 (32.29)
Self-punishment, atonement	17 (17.71)
Focus on removing imperfections	6 (6.25)
Reduce boredom, restlessness	5 (5.21)
Feel grounded, real (when initially feeling detached)	3 (3.13)
Calm racing thoughts	2 (2.08)
End flashbacks	1 (1.04)
Gain sense of identity	1 (1.04)
Avoid Aversive State	30 (31.25)
Focus on physical (visual, sensation, process) rather than initial aversive state	14 (14.58)
Distraction	16 (16.67)
Induce numbness	4 (4.17)
Escape	3 (3.13)

Table 45 (continued):

Category	Total *n* (%)
Induce Positive State	28 (29.17)
To feel powerful, in control	20 (20.83)
Self-soothing, comforting	6 (6.25)
Euphoric rush, high, pleasure in sensation	5 (5.21)
Other-Oriented	13 (13.54)
Obtain support, attention, sympathy	9 (9.38)
Communicate to others	4 (4.17)
Punish others	2 (2.08)
Fit in with peers	1 (1.04)
Process	21 (21.88)
Compulsive	12 (12.50)
Impulsive	9 (9.38)

A focusing on or intensification of an aversive state (such as guilt, anger, depression, boredom) was noted in 12.50% of cases. This was the least frequently endorsed category.

The vast majority of individuals described a decrease in aversive states (87.50%). Most commonly, participants described releasing or expressing affect (58.33%) and reducing or relieving general tension (32.29%). Self-punishment or atonement for "bad" thoughts and behaviour was a central theme in 17.71% of cases. The remaining functions of DSH were less frequently endorsed. Specifically, few participants described DSH as a way to focus on removing imperfections or blemishes (6.25%), to reduce boredom and restlessness (5.21%), to feel grounded or real when initially feeling detached (3.13%), to calm racing thoughts (2.08%), to end flashbacks (1.04%), and to gain a sense of identity (1.04%).

Close to one third of participants (31.25%) described avoidance of an aversive state. This included general distraction (16.67%) as well as a tendency to shift focus to the act of DSH (visual or physical aspects, the DSH process) rather than the initial aversive state (14.58%). Inducing numbness (3.13%) and a general reference to escaping aversive experiences (3.13%) were also noted.

A similar proportion of participants (29.17%) described the induction of a positive state as an objective of DSH. Most commonly emphasized was the desire to feel

powerful or in control (20.83%). Self-soothing or comforting was also noted (6.25%). A desire to experience a euphoric rush, high, or pleasure associated with the physical sensation of DSH was noted in 5.21% of cases.

Reasons relating to significant others were described in a minority of participants (13.54%). These included a desire to obtain support, attention or sympathy (9.38%), a desire to communicate something to others (4.17%), a desire to punish others (2.08%), and a desire to fit in with peers (1.04%).

Only 21.88% of participants described a process of DSH that presented a picture that represented the constructs of impulsivity or compulsivity as defined above. Compulsive processes were present in 12.50% of cases; these denoted a building of tension and a clear sense of deliberating DSH well in advance of the behaviour; this was accompanied by a clear desire or effort to resist DSH. Impulsive processes were present in 9.38% of cases, with these individuals acting quickly on the urge to engage in DSH, with little or no deliberation.

Process of DSH. Taking an even more general perspective, each individual paragraph was coded to identify the individual's state before, during, and after DSH. This was intended to provide a broad description of the nature of the DSH experience for these individuals in terms of the addition or removal of aversive or positive states. As above, an aversive state is defined as an unpleasant or undesirable cognitive, affective, or physiological state. A positive state refers to either the removal of an aversive state, or the induction of a positive state. A mixed state is a state in which the individual experiences a combination of positive and negative states simultaneously (i.e. feeling both relieved and ashamed). Each paragraph was coded as to the state before, during, and after DSH. Table 46 presents a summary of these data for the 96 participants.

Table 46:

DSH Process based on Written Paragraphs (N=96)

State Before DSH	State During DSH	State After DSH	Total *n* (%)
Aversive	Positive	Positive	37 (38.54)
Aversive	Positive	Mixed	23 (23.96)
Aversive	Mixed	Positive	11 (11.46)
Aversive	Mixed	Mixed	8 (8.33)
Aversive	Aversive	Aversive	7 (7.29)
Aversive	Positive	Aversive	3 (3.13)
Aversive	Mixed	Aversive	3 (3.13)
Aversive	Aversive	Positive	2 (2.08)
Aversive	Aversive	Mixed	2 (2.08)

As noted above, all participants described an entirely aversive state prior to engaging in DSH. Thus, at least this undergraduate sample, it appears that states of positive mood or excitement were not present at the onset of DSH. It is evident that the DSH experiences described frequently involved a shift from an aversive state to a positive state both during and after DSH (38.54%), essentially representing a clear relief from negative states and/or pleasant states. Indeed, 88.54% of participants indicated that they experienced a positive or mixed state during DSH, and 86.46% described a positive or mixed state following DSH. This positive state during or after DSH, reflecting the removal of an aversive state or induction of a positive state, may represent an important reinforcing factor, making the behaviour more likely to recur (or more difficult to resist) in future. This is similar to the clinician respondents' prominent themes (Chapter III) and the review of empirical literature on the functions of DSH (Klonsky, 2007) identifying affect regulation including reduction or avoidance of negative affect and induction of positive affect as commonly endorsed functions. Only 7.29% of participants described an entirely aversive experience, with exclusively negative experiences occurring before, during and after DSH (i.e., "getting into" or elevating feelings of anger or sadness). An additional 10.42% described a mainly aversive experience, with aversive experiences occurring in two of the three phases (i.e. before and during DSH, or before and after DSH).

Qualitative Analysis of Semi-Structured Interviews

Qualitative analyses were used to evaluate the semi-structured interviews conducted with 20 participants. As noted above, in contrast to the written paragraph, liberal use was made of probes and questions to explore the possible impulsive and compulsive features of the DSH experience. As with the paragraphs above, there may be aspects of DSH that were not captured by these interviews. Specifically, there may have been limited disclosure, difficulty articulating certain experiences, or lack of awareness of some aspects of the experience. Further, a number of individuals were recalling experiences they had had weeks, months, or sometimes more than a year prior and so the experiences reported may be distorted by biases in recall. However, the semi-structured interviews offer a distinct advantage over the paragraphs in that participants were asked to comment on specific aspects of the DSH experience that may be related to impulsive or compulsive processes. It was expected that this would augment the findings from the quantitative data regarding the impulsive and compulsive features of DSH.

Using open coding procedures as described above, the interviews were initially coded for specific concepts or themes based on the sections or categories that structured the interview. Coding was completed manually using coding cards. The main categories consisted of (1) Before, (2) During, and (3) After DSH. These categories were further subdivided in order to consistently evaluate relevant details. For the category of Before DSH, participant data was coded for thought content, thought process, triggers, circumstances (i.e., location, alone / with others, time of day), amount of time spent thinking about DSH beforehand, feelings towards DSH beforehand (i.e., drawn to/want to DSH versus wish to avoid/need to DSH), emotions, and physical sensations. For both During and After DSH, data was coded for circumstances, thought content and process, emotions, physical sensations. Following the interview, the participant was asked to provide an overall summary of the most poignant aspect of his or her experience of DSH. Following the initial coding, this coding procedure was repeated to ensure that all data were coded consistently.

Validity and reliability in semi-structured interviews. One criticism that is often raised in response to qualitative research, particularly that which is semi-structured or

unstructured, is the amount of subjectivity involved (Kazdin, 1998). Two important considerations are bias and reactivity (Maxwell, 1998). Bias refers to the biases or preconceptions the interviewer brings that may in turn influence the findings. Reactivity refers to how the researcher and interview context may influence the material offered by the participant. Efforts were made to minimize the influence of these factors on the participant, with questions being phrased in a non-leading, open manner. When additional probes were needed, care was taken to avoid leading the participant in a particular direction. Further, the interviewer checked in with participants frequently, reflecting and summarizing to ensure that the individual's experience was adequately captured. Participants were encouraged to correct or clarify any misperceptions or inaccuracies in the interviewer's reflections or summaries. Feedback was obtained throughout the interview and following the interview, which was intended to further ensure that the data gathered was an accurate reflection of the individual's experience.

As a final effort to strengthen the reliability and validity of the interview analyses, the results are presented in detail to allow the reader to directly view the data being coded or analyzed (Merrick, 1999). Examples are offered to illustrate the concepts and rationale for coding in a particular way. This also limits the amount of interpretations being made, and relies most heavily on the participants' actual words for analysis. To be prudent, these data are presented as exploratory and they are intended primarily to augment or qualify the quantitative data obtained on impulsive and compulsive features of DSH.

Interrater reliability was not completed for the interview data for three primary reasons. First, the interviewer has substantial background in the areas examined, and it would be quite labour intensive to adequately train a second rater to detect or distinguish between the nuances examined. Second, while the subtle exchanges that took place during the interview including gestures, emotional tone, and other non-verbal methods of communication were recorded in field notes, the meaning of these might not be apparent to someone who was not present during the interview. While this is indeed a form of subjectivity and requires some interpretation, these communications are considered an important source of information for these interviews. Finally, and perhaps most importantly, the goal of collecting these data was to help explain the results obtained in the quantitative analyses. Therefore, these data are not being used to generalize from this

sample or generate a theory. Instead, they are being used to enhance understanding of results obtained on quantitative analyses and offer suggestions for future research. Thus, interrater reliability is not necessary for the responsible use of these data.

Qualitative analysis. Given the large quantity of qualitative data gathered and the purpose of these interview data, namely to contribute to the interpretability of quantitative data on impulsive and compulsive features of DSH, the specific aspects of these data that relate to these constructs are examined here. Specifically, impulsivity has been operationalized as involving the following: a powerful impulse or urge to DSH; a draw or attraction to the act itself (i.e., it is ego-syntonic); a tendency to give in quickly to the urge without much deliberation; relatively little resistance to acting on the impulse; reward associated with the act itself; and any regret experienced being associated primarily with external consequences (i.e. reactions of others) as opposed to internal consequences (i.e. shame or guilt). In contrast, compulsivity was operationalized as being characterized by an initial experience of increasing anxiety, tension or dread (i.e. from obsessive thoughts, fears of losing control or "going crazy," or fear of a dreaded event); obsessive or intrusive thoughts about DSH and/or the associated fears or anxiety; a sense of compulsion (i.e., having to or needing to engage in DSH) well in advance of the behaviour; a drive to reduce anxiety or tension rather than a draw to the act itself; a sense of the act of DSH as senseless or distressing (i.e. it is ego-dystonic); efforts to resist or avoid DSH; relief of tension following DSH due to the removal of a negative experience; and regret associated primarily with internal consequences such as guilt or shame following DSH.

It is important to recognize that, as is usually the case when attempting to identify distinct processes in human experience, these distinctions may be somewhat artificial and some overlap may exist. However, these constructs are operationalized in this way to highlight areas where these processes may be distinct or coexist to varying degrees. Table 47 summarizes the proportion of participants who demonstrated the impulsive and compulsive features of DSH according to this definition. For each feature, the number of participants who evidenced that feature exclusively (i.e., "pure" impulsive versus "pure" compulsive) are noted. Participants who described the presence of both features in a particular category are recorded under "combination of above" to reflect the presence of both impulsive and compulsive components. Participants who offered descriptions that

were not clearly impulsive or compulsive, or did not describe the clear presence of features of both impulsivity and compulsivity, are denoted under "unclear."

Table 47:

Impulsive and Compulsive Features of DSH based on Semi-Structured Interviews (N=20)

Feature	Impulsive vs. Compulsive	*n* (%)
Urge or drive to DSH		
Strong, clear impulse or urge to DSH	Impulsive	0
Increasing anxiety, tension, fear, dread	Compulsive	15 (75.00)
Combination of above		5 (25.00)
Orientation towards DSH		
Want to or look forward to DSH, ego-syntonic	Impulsive	2 (10.00)
Do not want to DSH but feel compelled to, ego-dystonic	Compulsive	7 (35.00)
Combination of above		10 (50.00)
Unclear		1 (10.00)
Deliberation or efforts to resist DSH		
Little or no deliberation or efforts to resist before acting	Impulsive	6 (30.00)
Much deliberation or efforts to resist before acting	Compulsive	4 (20.00)
Combination of above		10 (50.00)
Primary reward following DSH		
Rewarded by the act of DSH itself	Impulsive	0
Rewarded by the reduction of tension	Compulsive	13 (65.00)
Combination of above		7 (35.00)
Regret following DSH		
Primary regrets are due to external consequences	Impulsive	2 (10.00)
Primary regrets are due to guilt, shame over act itself	Compulsive	2 (10.00)
Combination of above		10 (50.00)
No regrets reported		3 (15.00)
Unclear		3 (15.00)

Urge or drive to DSH. It is apparent from Table 47 that none of the participants reported a clear impulse or urge specifically tied to the act of DSH, in the absence of the more compulsive feature of mounting anxiety, fear, or dread. Therefore, all participants identified some degree of mounting tension, anxiety, dread, or fear associated with their self-harm experience. The majority of participants interviewed (75.00%) described mounting anxiety, tension, fear or dread experience in the absence of a strong, clear impulse to engage in DSH. In these cases, it appeared that the act of DSH was not initially very central in the individual's thought process, with thoughts being more generally associated with a strong desire or need to "do something" to reduce the anxiety,

dread, intensifying distress, or fear. For example, many participants described mounting tension and dread associated with negative emotional experiences, including a fear or anxiety over of being unable to "handle it" or "control it." This also included reports of fears of losing control, "going crazy" or being "unable to keep in the emotions."

> Usually it'd be like a lot of things were getting out of control, as far as I thought they were. Be it at home or at school or whatever. So usually, I would feel a lot of anger – anger wasn't very cool in my house. I guess overwhelming anger, and just feeling that I couldn't do anything else. Just overwhelming rage...my blood would just be boiling and there was nothing I could do about it...it would be like, oh man, I'm getting antsy. I'm getting really mad. I'm getting really, it would just be like right before (engaging in DSH) it would just be a persistent thought like 'I need to do something.'

Mounting anxiety or tension specifically relating to repeated intrusive or unwanted thoughts about DSH was observed in 11 of the 20 participants (55.00%). An argument could be made to consider these experiences as impulses, since an impulse can be experienced as intrusive, persistent, and anxiety-provoking or distressing. However, these participants were included under the compulsive category since the thoughts were judged to be to be intrusive, unwanted, and obsessive or ruminative, which defines the traditional obsessive-compulsive experience. They were also in the context of harm avoidance or the desire to decrease distress, as opposed to novelty seeking or a draw to DSH, suggesting that these are more strongly associated with compulsivity according to the definition used. As one participant explained,

> When there's something going on in my mind...racing thoughts, like that my mind is starting to obsess over, that I don't understand and I'm not happy with...My thoughts will just start racing... I'm worthless, I'm going to do horrible in school, this person hates me...just bad thoughts. Usually just like that subject (DSH) will sneak in every once in a while. Like as a suggestion...like 'just cut yourself' and then (the thought) will keep on going and it'll just get more frequent as time goes on. And if I try not to think about it, it comes up more...the more I try to push it away, the more it's something in the back of my mind that needs to be taken care of.

The remaining five participants (25.00%) reported a combination of these features, either being simultaneously present or in association with a variable experience at different times or under different circumstances. For example, one participant

indicated that early on, DSH occurred in response to mounting anxiety and distress, but over time an impulse to engage in DSH gradually developed in the absence of perceived anxiety. Another commented that DSH was initially out of curiosity and excitement which was associated with an impulse to DSH without mounting tension, but gradually became a response to intense stress or pressure. Others noted a variable experience without specifying a specific developmental progression.

Orientation towards DSH and ego-syntonic versus ego-dystonic nature of DSH. Referencing table 47, the individual's orientation or feelings towards the act of DSH were coded, along with whether the individual views DSH as ego-syntonic or ego-dystonic. These two categories appear quite similar and might be expected to be parallel (i.e., with individuals who report wanting to or being drawn to DSH describing it as ego-syntonic or sensible, and individuals who do not want or like DSH describing it as ego-dystonic or alien). These categories were initially coded separately in the event that an individual might have a contrary experience, such as enjoying DSH but simultaneously seeing it as senseless or alien. The results were identical for the two categories so these were combined for clarity.

Two participants (10.00%) reported a sense of wanting to or desiring DSH in the absence of feelings of dislike or a desire to avoid DSH, and described DSH as ego-syntonic. For example:

> I liked it. I liked the way it looked after. And I liked the way it felt to take care of it and watch it go away. I thought it looked cool...I would be feeling excited about cutting myself...I wanted to (engage in DSH) and I had to. I had to because I really wanted to. (*Q: Which was the strongest part, the "had to" or the "wanted to?"*) The "wanted to" was definitely the strongest part...I really wanted to do it.

Seven participants (35.00%) described a clear sense of feeling compelled to or having to engage in DSH, in the absence of any acknowledged desire or draw to the behaviour itself. They also described DSH as ego-dystonic or senseless. For example,

> Like if I could just do that (engage in DSH), I'd be okay. *(Q: Would you say that it was something you kind of wanted to do, that you were sort of drawn to it? Or more like you had to do it?)* I just had to...I'd feel like really tense, kind of felt like someone was sitting on you, like you just needed to get it out. Really heavy on your chest...It was like when you sit down to get something done, it was like,

> it had to be done, I just had to get it done and then once it was done it would be okay. I didn't want to do it, but I had to.
>
> I don't really have very positive feelings towards self-injury. Like if I hear of people doing it, I'm like "Wow, why would you do that?" It's like I feel very strongly against it. But it's like at the time, that's what I need to do...usually, I feel like it's my last resort.

Ten participants (50.00%) described a combination of both wanting to engage in DSH and not wanting to do so; both a draw towards the behaviour and a dislike for the behaviour. Examination of these data showed a range of circumstances under which this paradoxical presentation occurred. In many cases, the individual reported a simultaneous draw towards and dislike of DSH, essentially highlighting a conflicted or approach-avoidance experience. One participant articulated that logically she did not like or understand her DSH, but on an emotional level she wanted to engage in DSH and it felt "right" to her. In another such example,

> Well, I didn't like that I did (DSH). I knew that it was, I mean, not a good thing, not a normal thing and whatever. But like to me, it was what worked, to me that was what I did. I liked that it worked.

Others described a progression over time. Some individuals indicated that DSH started out as something they were drawn to or desired, and over time it became more of a need or compulsion that they no longer desired but felt compelled to do. This was often described in the context of "trying to quit" after the reinforcing effects of DSH were established. For example,

> At first it was the exciting part about it, and like the rush of it. I liked it. But then later on, in the middle of all of it, it was like I was compelled to do it every time I got upset or something like that. It was like the first thing I did, I would return to my room and (DSH). But towards the end, it kind of slowed down and I would try to prevent myself from doing that because I didn't like that I was doing it anymore.

Some described the opposite progression, whereby they felt that DSH began as a compulsion or need that was not desired but instead was required for a specific purpose (i.e. to decrease tension, avoid a dreaded experience), but over time a desire for the behaviour itself developed and the individual was drawn to DSH in its own right. Thus,

while it may have begun as ego-dystonic or ego-syntonic, over time the reinforcing effects of DSH and perhaps developmental factors influenced the individual's orientation towards DSH.

Deliberation or efforts to resist DSH. While two categories were initially coded separately, deliberation or thought prior to acting and efforts to resist DSH prior to acting, the pattern of responses was identical and these categories were therefore combined. Six participants (30.00%) reported that they engaged in little or no deliberation about DSH in advance of acting, and they made little or no effort to resist DSH. For example,

> I just got so angry, and then there was just a pop in my head – 'I am gonna cut' – and then that was it. Just that was it. I didn't even think. I just started cutting.

> I really didn't think about it too much. I didn't think it through, like weigh out the pros and cons and the consequences...most of the time it just happens and I don't think twice about it. I just do it.

Four participants (20.00%) described a period prior to DSH during which they deliberated or thought about the behaviour and made efforts to resist acting.

> I would try to put it off because I knew it wasn't good...so I would try to do other things. You know, put an elastic band around my wrist, after that I'd try reading, I'd try writing, I'd try and distract myself because I knew it wasn't good to (DSH). But eventually it would win out, you know? I would eventually just get the compulsion to do it.

Half the participants (50.00%) reported a combination of these two features, with both a tendency to act quickly without deliberation and resistance, and a tendency to deliberate about DSH and attempt to resist acting on the urge. These individuals described both of these features being present at different times over the course of their DSH history, or across different settings and circumstances. Some described a pattern where they deliberated and resisted early in their DSH history, gradually acting more quickly and deliberating less, or vice versa.

> In the beginning, I didn't resist it at all because I didn't have a problem with it. But once I started seeing somebody (professionally) and once other people like my family and some of my friends knew, it was kind of like "Yeah, I have to resist it" because if they saw it, I would get to go and deal with more stuff.

Others described a varied experience where on some occasions they would act quickly, while on other occasions they would deliberate and try to resist DSH. Factors identified included whether they were at home or at school, whether they had an upcoming social event that would reveal scars, or the nature or intensity of the distress leading up to DSH. For example,

> Once the thought pops in (to DSH), I'm occupied with it until I carry it out...there are times when I try to stop. If it's just because I want to (DSH), I resist it. I'm like, "Okay, it's not that important." If I'm having flashbacks or something and I need to (DSH), then I do it. There's no question.

Primary reward following DSH. In terms of the reinforcing experience following DSH, none of the participants identified exclusively positive rewards following DSH. That is, positive reward experiences such as feeling excitement, intrigue, stimulation, 'endorphins,' or a rush of pleasure associated with the act of DSH were not endorsed as the primary reward in the participants interviewed. Negative reward experiences involving the removal of an unpleasant experience such as the reduction or elimination of anxiety, tension, or emotional distress were identified as the primary reward in 13 participants (65.00%). These individuals described a range of experiences as noted in the analysis of written paragraphs above, including a reduction in negative emotions, tension, and feelings of being 'out of control.'

> It's like a relief feeling...I was calmed down, like I was able to come down from that crazy state and just kind of, calm down and be able to go to sleep...just lay down and put everything away and then go to sleep. It was like a warm, comforting, kind of like a security blanket you put on, you know like your favourite sweater, like it was like putting that on and feeling so much better. Like it was this warm, comforting, nice, pleasant feeling.

> It's a little bit like jumping into cold water. At first it's like a bit of a shock, but not too much. It's not painful, just a bit of a shock...and then as it goes on, I become more relaxed and more calm. (*Q: Can you tell me a little bit more about the relaxed and calm feeling? Maybe describe it a little bit more?*) It's like, if my mind is an exercise bike and it's pedaling very fast, it's just like slowing down, eventually, and it becomes very rhythmic. Just sort of, the thoughts, everything

> that was turning around in my head slows down...the thoughts aren't even there anymore. It's just kind of like, "Alright, I'm relaxed now."

A combination of these two reward experiences were identified in 7 participants (35.00%). These participants described both positive experiences associated with the act of DSH itself, as well as tension reducing effects or removal of an aversive state. For example,

> I enjoyed the act of it, the feeling...I liked the sight of the blood, I liked being able to see what I looked like on the inside. It was definitely a fascination with it, wanting to see what was underneath. So it was definitely enjoyable...the racing thoughts tend to stop immediately...any thoughts with depression, school, friends, or peers they were just out the window...I'd be a lot calmer for a few hours and then I'd fall asleep.

Thus while tension-reduction or removal of a negative or unpleasant state was endorsed by all participants, approximately one-third of participants noted that they also experienced a positive reward associated with the act of DSH itself.

Regret following DSH. The coding of regrets following DSH revealed that 2 participants (10.00%) endorsed regret exclusively due to actual or anticipated external consequences. This included reference to wanting to hide evidence of DSH, feeling embarrassed when others commented on DSH, or fearing negative reactions from friends and family.

> I knew it wasn't something to really be doing, but that didn't really matter. Society says I shouldn't do this, so I felt like I shouldn't do this. But then I was just like, "It works, and it makes me happy." It works every single time...I never really felt any shame about it or anything. I was just kind of like "Oh, that was lucky that my mom didn't come upstairs" or anything like that.

Two participants (10.00%) described regret exclusively associated with internal consequences such as a negative self-appraisal, disgust, guilt, or shame following DSH.

> Right after, I usually got upset. I was like, "You're stupid. Why did you do that?" And then I usually would sit in my room and like cry after and just kind of be upset. I just needed to be by myself...Just kind of mad at myself for maybe giving in.

Half of participants endorsed regret due to a combination of real or anticipated external consequences and internal consequences (50.00%).

> In the moments right after...I'd clean it, bandage it, make sure it wouldn't get infected... that part was very controlled. But as I was doing that, these overwhelming feelings of guilt came on and I would cry for hours and hours after...I remember also worrying that my parents would find out and what they would say and what they would blame it on. I remember there was that worry, and like I said, later on feeling worried about losing my boyfriend.

Three participants (15.00%) reported having no regrets following DSH. In two cases, they denied any particular regret or concerns following DSH and reported just "moving on" or "not thinking about it" afterwards. One participant specifically identified an absence of regret, which appeared to be associated with her perception of DSH as desirable, sensible, pleasant, and effective overall.

Pattern of impulsive and compulsive features. The semi-structured interview data were examined to evaluate whether there were recognizable patterns in the impulsive and compulsive features that were coded. Based on a review of the coding, it is apparent that all of the participants interviewed were coded as being "a combination" of impulsive and compulsive features on at least one of the five different features examined, or demonstrated a mixture of impulsive and compulsive characteristics according to the definition used. In other words, on at least one of the five features evaluated, every participant described a mixed or variable experience that included both impulsive and compulsive presentations. No participants demonstrated a "pure" impulsive or "pure" compulsive profile, where all features were rated as exclusively impulsive or compulsive in nature. Four participants demonstrated a tendency towards impulsivity, describing either "pure" impulsive features or mixed features and showing an absence of "pure" compulsivity features. Eight participants demonstrated a tendency towards compulsivity, describing either "pure" compulsive features or mixed features combined with an absence of "pure" impulsivity. Eight participants demonstrated both "pure" impulsivity features, "pure" compulsivity features, along with mixed features.

While these patterns and differences in presentation may be in part related to the individual's style of reporting, level of self-awareness, willingness to disclose, or

accuracy in recall, the interview data highlight that the distinction between impulsive and compulsive features can be difficult to make in a clear, dichotomous way. Indeed, decisions in some areas, for example whether an urge would be considered an impulsive urge or an intrusive obsessive-compulsive thought, were not easily made at times. Further, these data suggest that it may be inappropriate to label self-harm as impulsive or compulsive in nature (either in general, or for a given individual) and both impulsive and compulsive features can, and most often do, coexist. These interview data also highlight the importance of considering DSH from a developmental perspective, a consideration that was not systematically integrated into the interview format. A number of individuals commented that their DSH experience changed over time, noting different modes of progression (i.e. beginning as quick with little resistance and ego-syntonic in nature, and progressing to resisted and ego-dystonic in nature). Similarly, different experiences were described for different methods or functions of DSH (i.e., quick and no resistance when DSH was to end flashbacks, and slow with much resistance when DSH was purely for excitement-seeking). Thus, factors such as the individual's place in the course of DSH, variable methods or functions of DSH, and different circumstances may influence whether DSH is carried out in a manner that is impulsive, compulsive, or both.

CHAPTER VI

Discussion

The present study consists of two sub-studies that were conducted to provide an in-depth examination of the impulsive and compulsive features of DSH. Given that DSH is frequently referred to as "impulsive behaviour" in the literature and has been hypothetically classified into "compulsive" DSH (i.e., hair pulling, nail biting, skin picking) and "impulsive DSH" (i.e., cutting, burning, hitting) by some authors (Simeon & Favazza, 2001), an empirical evaluation of the impulsive and compulsive features of DSH was needed. Indeed, previous studies on impulsivity and compulsivity in DSH have been infrequent and have had some important limitations. Specifically, apart from the general absence of studies in this area, previous studies have used small samples from a specific clinical population (particularly eating disorders and Borderline Personality Disorder), applied overly inclusive definitions of DSH (i.e. including suicide attempts or risk taking behaviour), included of single episodes of DSH, used single measures of impulsivity or compulsivity, failed to include measures of both constructs, and at times made assumptions about the "impulsive" nature of some forms of DSH. In addition, studies of DSH (and in particular relating to impulsivity and DSH) have often neglected non-clinical samples despite evidence that DSH is relevant in these populations (Briere & Gil, 1998; Whitlock et al., 2006).

The present study improves upon the current literature base as it corrects some of the problems identified in previous studies and expands the focus of these studies by emphasizing impulsivity and compulsivity in DSH. DSH was defined concretely as the deliberate and direct destruction or alteration of one's own body tissue, without conscious suicidal intent, but resulting in injury severe enough for tissue damage to occur. More than one instance of DSH was required. Individual using indirect methods of DSH (i.e., risk taking), engaging in stereotypic DSH, or engaging in DSH occurring exclusively while suicidal, psychotic, or intoxicated were excluded. This definition is sufficiently broad to permit variation in the forms and experiences of DSH, but it is sufficiently specific to ensure a reasonably cohesive group of individuals engaging in multiple episodes of non-suicidal DSH. Since this definition has been used in many of the more recent publications on DSH, its use facilitates the integration of findings across studies.

Two perspectives are considered: the perspective of clinicians describing the "most typical" DSH client with whom they have worked in a clinical setting, and the perspective of non-clinical undergraduates with a history of multiple episodes of DSH. Inclusion of these two perspectives is important as there may be similarities and differences between the features of DSH in clinical and non-clinical samples. It also allows a comparison of impulsive and compulsive features within and between these two groups, providing added insight into the research questions posed.

Multiple measures of impulsivity and compulsivity were included to capture the multidimensional nature of these two constructs in the undergraduate sample. Thus, there were several established measures of general impulsivity and compulsivity included in this study. In addition, the literature review was used to concretely operationalize the constructs of impulsivity and compulsivity, and these were applied to DSH behaviour. This in turn informed the development of a series of questionnaire items that were designed to reflect some potentially impulsive and compulsive features of DSH (in the DSH-C and the DSH-U). Currently there is no measure of impulsivity and compulsivity with specific reference to DSH, so this represents a preliminary effort to concretely apply the constructs of impulsivity and compulsivity in this area. It was anticipated that, if it were possible to demonstrate that these items reflected the constructs in question and if psychometric properties supported doing so, these items could be used to examine the impulsive and compulsive features of DSH within and between the two samples. Thus, both general impulsivity and compulsivity measures and an index including impulsive and compulsive aspects of DSH more specifically were used. This is important as it allows an examination of general traits or styles as well as an evaluation of the impulsive and compulsive features of DSH behaviour itself.

In addition, qualitative and quantitative methods were used in both sub-studies to allow a more in-depth examination of the phenomenon being examined. Since the constructs of impulsivity and compulsivity are complex and intertwined, the inclusion of qualitative data is particularly important to clarify any ambiguous or contradictory findings. In addition to an open-ended opportunity for both samples to describe salient aspects of DSH, a subset of 20 undergraduate participants completed a semi-structured interview to examine possible impulsive and compulsive features in DSH. This was

aimed to elaborate upon the relationship between impulsive and compulsive features of DSH in this sample. It was hoped that these quantitative methods would generate insights into some of the more complex or subtle features of DSH.

This study has practical clinical implications, as it provides an empirically sound basis for assessing, conceptualizing, and treating DSH with a particular focus on impulsive or compulsive features. It also provides a basis for comparison of DSH in clinical and non-clinical samples, which might inform education and prevention in non-clinical settings (i.e. school environments). Interventions would likely vary depending on impulsive and compulsive features, and having an empirical basis for evaluating such features of DSH would facilitate this clinical work. In addition, using impulsivity and compulsivity measures to predict characteristics of DSH (such as frequency, duration, density, number of methods, and severity) could also have implications for understanding and treating DSH, as knowledge about possible associations could inform clinical decision making and risk assessment. This study also contributes to the theoretical debate on the nature of the relationship between impulsivity and compulsivity, and the growing body of research on the timely topic of DSH.

Summary of Findings

Study 1: Clinician survey. Clinician respondents were largely Ph.D.-level psychologists registered in Ontario, Canada who represented a wide range of professionals in terms of age, professional orientation, setting, and years in professional practice. The majority of respondents declared 15 years of experience or more in autonomous professional practice, and half of respondents reported having treated 10 or more clients who engaged in DSH. Thus, respondents represent relatively experienced professionals overall, both in general and specifically in relation to DSH.

In describing the *"most typical or salient"* DSH client with whom they worked, clinicians described predominantly females who engaged in DSH during adolescent to young adult years. The reported age of onset and duration of DSH ranged widely, with a mean of 16 years at onset and an average duration of nearly 8 years (94.95 months). Half of the respondents described clients engaging in DSH for 4 years or longer. Clinicians described these clients as typically engaging in multiple methods of DSH, with cutting,

scratching, carving, and burning most frequently reported. Diagnostically, clinicians identified a very wide range of diagnoses in these clients. Half of the clients were given only Axis I disorders, with mood disorders, anxiety disorders, trauma and dissociation, and eating disorders being identified most frequently, although the diagnoses offered essentially covered most of the major diagnostic groups. For those clients with an Axis II disorder, clinicians identified Borderline Personality Disorder or traits in the majority of cases, although a range of other personality disorders were also noted.

Based on clinicians' reports of client and DSH characteristics, over 98% of clients were identified as engaging in what Simeon and Favazza (2001) would classify as "impulsive DSH" (as opposed to "compulsive DSH" which involves skin picking, hair pulling, and nail biting). Apart from being predominantly female which is a somewhat inconsistent finding in the literature to date, the prototypical clients that were described by clinicians appear to be within the limits of what is characterized in the literature as repetitive or episodic DSH (in terms of age of onset, duration, and type of DSH). They represent a relatively heterogeneous group diagnostically, attesting to the relevance of DSH across many diagnostic groups.

Clinicians' qualitative descriptions of the prototypical client's DSH experience were examined. Most typically, clinicians described DSH as being related to an internally driven effort to regulate intense or negative affect, either by increasing positive states or decreasing or avoiding negative states. Managing dissociative experiences or other aversive internal experiences (i.e., self-punishment, to feel in control) were also commonly identified. Other-oriented or interpersonal reasons were relatively less commonly identified in this sample, such as DSH to communicate something to others, to get a response from others, or to fit in. A minority of clinicians identified themes relating to a draw or attraction to DSH itself, such as exhilaration, interest, or stimulation associated with DSH. These findings are similar to the findings discussed in a recent review of empirical evidence relating to functions of DSH, where affect regulation was found to have strong support as a function of DSH, self-punishment had some strong support, and anti-dissociation, interpersonal-influence, and sensation-seeking functions were more modestly supported (Klonsky, 2007). As is often reported to be the case, multiple functions of DSH were identified in relation to a given individual.

The clinician respondents' description of impulsive and compulsive features of the prototypical client's DSH was evaluated using items designed to reflect impulsive and compulsive aspects of DSH (the DSH-C questionnaire). Principal components analysis revealed that this 21-item questionnaire could be reduced to four components, referred to as DSH-C Impulsivity, DSH-C Excitement, DSH-C Compulsivity, and DSH-C Shame and Delay. The internal consistency of these components was adequate, and expert ratings of items supported the interpretation of impulsive (DSH-C Impulsivity) and compulsive (DSH-C Compulsivity and DSH-C Shame and Delay) components as representing these constructs. Experts did not view the DSH-C Excitement items as being reflective of impulsivity, although they did view these items as being non-representative of (or negatively correlated with) compulsivity.

Within the clinician sample, an inverse relationship between impulsivity and compulsivity was found, which is contrary to some reports of positive correlations or no correlation between the two constructs (i.e., Engel et al., 2005; Li & Chen, 2007; Skitch & Hodgins, 2004; Stein et al., 1994). First, expert ratings of item content as impulsive versus compulsive resulted in a significant negative correlation, suggesting that the experts view high levels of impulsivity as simultaneously representing low levels of compulsivity and vice versa. Second, considering the PCA generated by the clinicians' descriptions of prototypical DSH clients, the loadings on the four components demonstrated a similar pattern. That is, items with high loadings on DSH-C Impulsivity (essentially the items defining that component) were associated with low loadings on DSH-C Compulsivity. A non-significant trend was also noted to this effect with other components, as DSH-C Impulsivity was positively associated with DSH-C Excitement, and negatively associated with DSH-C Shame and Delay. Thus, items that are considered high on impulsivity (by experts or by virtue of having a high loading on an impulsivity component derived from clinician responses) were found to be associated with low compulsivity and vice versa.

The items from the DSH-C were evaluated and compared with the items of the undergraduate version of this questionnaire (DSH-U) to develop a scale of impulsivity and compulsivity, which is discussed below. This facilitated an examination of impulsive

and compulsive features within the two samples, as well as a comparison of clinicians' descriptions of the prototypical DSH client with the undergraduate self-report data.

Study 2: Undergraduate sample. Of the 3460 undergraduates who completed the research selection question, 12.14% endorsed a history of multiple episodes of DSH and met criteria for the study. This is comparable to some estimates for undergraduate samples (i.e., Favazza, 1989 and 1992; Whitlock et al., 2006), although these estimates include single-episode DSH as well. Had single episodes been included, it seems likely that the proportion of students endorsing DSH in this study would have been much higher. Participants were predominantly single Caucasian female undergraduate students at the University of Windsor in Ontario, Canada. The average age of participants at the time of the study was 21 years.

In terms of their self-reported DSH experiences, participants described a history of engaging in DSH during young adolescent to young adult years. On average, onset of DSH was reported to be around 13 years of age, and the duration of DSH was variable with an average of nearly 6.5 years. Half of participants reported having engaged in DSH for 4 years or longer, which is comparable to the clinical sample from Study 1. The frequency of DSH episodes ranged widely, with an average of approximately 160 episodes and a median of 62 episodes. Also comparable to the clinical sample, the undergraduates typically described having employed multiple methods of DSH. Cutting and scratching were most commonly reported although hitting, carving, and interfering with wound healing were also frequently noted. In terms of severity of incidents, 10.42% of participants reported having sought medical treatment for a DSH incident. At the time of the study, 32.29% reported that DSH was ongoing, 30.21% indicated that they had last engaged in DSH within the past year, and 37.50% had discontinued DSH more than 1 year prior. Thus, participants placed themselves at various points along the course of DSH, with the majority having engaged in DSH within the past 12 months.

Half of undergraduate participants described a history of mental health treatment, and a small minority admitted to having mental health hospitalization for DSH-related problems (4.17%). A history of suicide attempts were reported in 15.63%, most often by overdosing. In terms of diagnoses, 40.63% of participants reported having been made aware of a diagnosis, with 18.75% reporting more than one diagnosis. Although a range

of diagnoses were reported, participants most frequently identified unipolar mood disorders, anxiety disorders (particularly generalized anxiety disorder and obsessive compulsive disorder), and eating disorders.

Qualitative analysis of a written paragraph regarding participants' self-described cognitive, affective, or physiological states before, during and after DSH revealed that all participants described an entirely aversive state prior to engaging in DSH. A minority (12.50%) described an experience of focusing on or intensifying this aversive state (such as guilt, anger, depression) during and after DSH. More typically, the paragraphs described a shift from an often intense aversive state to a positive or mixed state (with simultaneous positive and aversive features, as in feeling in calm or comforted and ashamed at the same time). A positive state reflected either the removal of an aversive state or the induction of a positive state. Indeed, 88.54% of participants indicated that they experienced a positive or mixed state during DSH, and 86.46% described a positive or mixed state following DSH. The presence of a positive state during or after DSH may represent an important reinforcing factor, making the behaviour more likely to recur (or more difficult to resist) in future. These data also highlight the apparently important role of harm avoidance in DSH, as the reduction or removal of harm or an aversive state appears to be a key factor in the DSH process.

In terms of specific themes that were present, the vast majority of individuals described a decrease in aversive states associated with DSH (87.50%). Participants frequently reported releasing or expressing affect (58.33%) and reducing or relieving general tension (32.29%). Some (31.25%) described avoidance of an aversive state by using distraction or shifting of attention. Self-punishment was a central theme in 17.71% of cases. The remaining functions of DSH were less frequently endorsed. Specifically, few participants described DSH as a way to focus on removing imperfections or blemishes (6.25%), to reduce boredom and restlessness (5.21%), to feel grounded or real when initially feeling detached (3.13%), to calm racing thoughts (2.08%), to end flashbacks (1.04%), and to gain a sense of identity (1.04%).

Induction of a positive state was described as an objective or desirable outcome of DSH (29.17%). Most commonly, participants emphasized the desire to feel powerful or in control (20.83%), to self-soothe (6.25%), or to experience a euphoric rush, high, or

pleasure associated with the physical sensation of DSH (5.21%). Reasons relating to significant others (i.e., to communicate something to someone, to elicit sympathy) were described in a minority of participants (13.54%). Overall, these findings are similar to the clinician respondents' prominent themes (Chapter III) and the review of empirical literature on the functions of DSH (Klonsky, 2007) identifying affect regulation including reduction or avoidance of negative affect and induction of positive affect as commonly endorsed functions.

In order to examine the impulsive and compulsive features of DSH, the undergraduates completed a 20-item questionnaire, the DSH-U, which was nearly identical to the DSH-C completed by clinicians. This was intended to identify possible impulsive and compulsive features relating to DSH experiences. A PCA of the DSH-U extracted 4 components, DSH-U DSH-Specific Excitement, DSH-U DSH-Specific Compulsivity, DSH-U Cautious/Perfectionist, and DSH-U Urge-driven / Impulsive. Thus, this PCA revealed components relating to general impulsivity and general compulsivity, as well as DSH-specific components relating to excitement-seeking and compulsivity. The internal consistency of these components was adequate. As was the case with the DSH-C, expert ratings supported the interpretation of these components as impulsive (DSH-U Urge-driven/Impulsive) and compulsive (DSH-U DSH-Specific Compulsivity and DSH-U Cautious/Perfectionist) with expert ratings and item loadings on the relevant components being significantly positively correlated. As was the case with the clinician sample, experts did not view DSH-U DSH-Specific Excitement items as being reflective of impulsivity.

As noted above, expert ratings of individual items as reflecting impulsivity versus compulsivity showing a significant negative correlation, with items rated as highly indicative of impulsivity being simultaneously rated as being unrepresentative of compulsivity, and vice versa. Similarly, expert ratings of items as impulsive versus compulsive showed a similar pattern in relation to the item loadings on the identified components; high loadings on the impulsivity component (DSH-U Urge-driven/ Impulsive) were negatively correlated with expert ratings on compulsivity, and high loadings on a compulsivity component (DSH-U Cautious/Perfectionism) were negatively

correlated with expert ratings on impulsivity. However, unlike the DSH-C, the item loadings on the four components of the DSH-U did not show significant correlations.

As an added step in evaluating the components extracted from the DSH-U, participants completed several established measures of impulsivity and compulsivity. These data were reduced to two components, Impulsivity/Sensation-seeking and Anxious Compulsivity. Regression analyses showed that the DSH-U Urge-driven Impulsive component significantly predicted Impulsivity/Sensation-seeking, while DSH-U Cautious/Perfectionism was a significant negative predictor. In contrast, the two compulsivity components (DSH-U DSH-Specific Compulsivity and Cautious / Perfectionism) were significant positive predictors of Anxious Compulsivity. In addition, the DSH-U Urge-driven/Impulsive component somewhat unexpectedly emerged as a positive predictor of Anxious Compulsivity. Individual questionnaires were examined and it was revealed that the Padua Inventory subscales and the Harm Avoidance subscales correlated positively with components relating to both compulsivity and impulsive or urge-driven tendencies. Thus, there may be some overlap in the constructs captured by the DSH-U components as they relate to measures of compulsivity, with DSH-U Urge-driven/Impulsive correlating with both impulsivity and compulsivity measures. As noted in the literature review, some overlap across these constructs is not surprising, as the concepts of impulsivity and compulsivity are complex and intertwined to an extent.

Integration of Study I and Study 2: Comparison of impulsive and compulsive features. Considering the clinician version (DSH-C) and undergraduate version (DSH-U) of the DSH questionnaire, these items were reduced to four components in each sample. In each sample, there were two components relating to compulsivity and two relating to impulsivity / excitement-seeking. In an effort to compare DSH-related impulsivity and compulsivity between and within samples, a two-scale version of the DSH questionnaires was constructed. This resulted in a 7 item DSH Impulsivity scale and a 7 item DSH Compulsivity scale. The development of these scales was supported by expert ratings of items and component loadings of items on the appropriate (impulsive/excitement-seeking versus compulsive) components. The reliability of the scales was adequate, and the two scales were generally found to correlate with corresponding established measures of impulsivity/excitement-seeking and compulsivity.

The DSH Compulsivity scale contained items relating to a general cautious, perfectionistic style and DSH-specific items identifying compulsive features such as having a compulsion to engage in DSH well in advance of acting, feeling a *need* to engage in DSH, agonizing over and trying to avoid DSH for a substantial period before acting, and shame and regret following DSH. In contrast, the DSH Impulsivity scale contained items relating to a general impulsive style and DSH-specific items relating to impulsivity and excitement-seeking such as engaging in DSH on an impulse without thinking much about the behaviour, a sense of *wanting* to engage in DSH, feeling excitement in relation to DSH, and regretting DSH only because of external consequences. Taken together, these two scales provided an indication of DSH-related impulsivity and excitement seeking on one hand, and DSH-related compulsivity on the other.

Relevance of Findings to Hypotheses

Hypothesis 1 and hypothesis 2. The first hypothesis predicted that the component structure of a set of items designed to survey both compulsive and impulsive components of prototypical DSH clients will reveal at least two such distinct factors, one indicating compulsivity, the other indicating impulsivity. The second hypothesis predicted that the component structure of a similar set of items designed to survey both compulsive and impulsive components of undergraduates with a history of multiple DSH episodes will reveal at least two such distinct factors, one indicating compulsivity, the other indicating impulsivity. The DSH-C and the DSH-U were nearly identical sets of items designed to reflect these constructs, both as general traits or styles and as DSH-specific features. Indeed, both the DSH-C and the DSH-U revealed four relevant components. In each sample, two components relating to impulsivity and excitement-seeking were found, and two components relating to compulsivity were found. In both samples, the internal consistency of the four components was adequate (in the range of .64 to .85). As noted, efforts to establish the validity of these constructs were generally successful using expert ratings and correlations with established measures of impulsivity and compulsivity.

As a further step to establish the validity of these constructs, in the undergraduate sample the DSH-U components were shown to be significantly correlated with

established measures of impulsivity and compulsivity respectively. Specifically, the component relating to a cautious perfectionist style was a significant negative predictor of impulsivity/sensation seeking on established measures, while an urge-driven impulsive style was a significant positive predictor. In contrast, both compulsivity components (general cautious perfectionist style and DSH-specific compulsivity features) predicted anxious compulsivity on established measures, as did the urge-driven impulsive component. Examination of individual questionnaires showed that the subscales of two compulsivity measures (the Padua Inventory and the TPQ Harm Avoidance scale) were correlated with impulsivity and compulsivity components. This suggests that there is some degree of overlap or similarity across the DSH-U compulsivity components, urge-driven impulsive component, and subscales of the Padua Inventory and TPQ Harm Avoidance. This may be due to the conceptual overlap in constructs discussed in the literature review, such that acting on an impulsive urge and giving in to a compulsion can appear quite similar. It may also be a cue to the presence of impulsive and compulsive features simultaneously.

Although the excitement-related items were designed to reflect aspects of DSH related to impulsivity (albeit peripherally in some cases), they were clearly found to be distinct in some respects. Expert ratings and the PCA loadings identified these items as distinct from impulsivity. The DSH-U DSH-Specific Excitement component was generally uncorrelated with established measures of impulsivity and compulsivity apart from a significant correlation with the BIS/BAS Reward Responsiveness. Thus, in that respect, although generally regarded as distinct from impulsivity, there is some evidence that the excitement items fit conceptually within the broad construct of behavioural activation. In addition, item loadings on the excitement component of the DSH-C showed a non-significant trend to positive correlation with the impulsivity component. Although this relationship is offered tentatively and the evidence suggests that impulsivity and excitement-seeking components of the DSH-U may be fairly distinct, there is some evidence of relatedness to the broader construct of impulsivity/sensation-seeking, or more broadly to behavioural activation. Taken together, these findings show that it is possible to identify specific facets of DSH behaviour as they relate to impulsive / excitement-seeking and compulsive tendencies in a clinical and a non-clinical sample.

Hypothesis 3 and hypothesis 4. Based on the literature review which suggests that repetitive and episodic DSH (self-cutting, burning, hitting etc.) is "impulsive" in nature, the third hypothesis predicted that the clinicians surveyed would judge the typical client's DSH as more impulsive and less compulsive. In addition, although it was expected that both impulsive and compulsive features would be present among undergraduates to a degree, the fourth hypothesis predicted that undergraduates' descriptions of DSH will share more features with a compulsive behaviour than with an impulsive act.

As noted, two scales were constructed to evaluate the impulsive and compulsive features of DSH in these samples (DSH Impulsivity and DSH Compulsivity). These scales showed adequate reliability and construct validity, as they correlated significantly with the expected measures of impulsivity and compulsivity overall and the items were largely supported by expert ratings of items as being representative of the constructs in question. DSH Compulsivity referred to a general cautious or perfectionistic style, a compulsion to engage in DSH well in advance, feeling a *need* to engage in DSH, agonizing over and trying to avoid DSH for a substantial period before acting, and shame and regret following DSH. In contrast, the DSH Impulsivity scale contained items relating to a general impulsive style, engaging in DSH on an impulse without thinking much about the behaviour, a sense of *wanting* to engage in DSH, feeling excitement in relation to DSH, and regretting DSH only because of external consequences.

The third and fourth hypotheses were tested using a mixed design ANVOA comparing DSH-Engagement Style (DSH-ES; impulsivity versus compulsivity) and Engagement Style Specificity (ES-Specificity; general items versus specific items) as the within subjects factors by Group (clinicians versus undergraduates) as the between subjects factor. The 3-way interaction showed that among clinicians, at the general item level impulsivity and compulsivity did not differ, but at the specific level compulsivity was much greater than impulsivity. Among undergraduates, for both general items and specific items, compulsivity was greater than impulsivity. Findings revealed that specific items were much higher than general items overall for both samples, which was the largest effect.

Most relevant to the hypotheses, this analysis showed that both clinicians' scores (referencing the prototypical DSH client) and undergraduates' scores (referencing self-reported DSH experiences) were significantly higher on compulsivity as compared to impulsivity. Thus, two independent samples with distinct perspectives and from different settings view compulsive DSH characteristics as more relevant to the typical DSH experience as compared to impulsive DSH characteristics, at least as represented in the DSH Impulsivity and DSH Compulsivity scales. Considering that both of these samples reference a DSH profile that would be considered "impulsive DSH" in the current literature (particularly in relation to Simeon and Favazza's [2001] model, and more broadly by convention), it is noteworthy that both groups describe DSH as having more compulsive features as compared to impulsive features. The similar finding across both samples strengthens the confidence in this finding.

It is particularly relevant that the clinician sample, which was expected to view DSH as impulsive in a manner more consistent with the current literature on DSH, rated prototypical DSH as having more compulsive features than impulsive features. This suggests that the individuals consuming the literature and practicing in this area may disagree to an extent with the predominant view of DSH as impulsive. This finding should strongly encourage a more balanced examination of impulsive and compulsive features of DSH, and discourage a tendency to refer to any form of DSH as impulsive or compulsive without conducting a formal examination of both constructs as potentially relevant.

In addition to these quantitative analyses, a subset of 20 undergraduates completed a semi-structured interview that was designed to explore the impulsive and compulsive features of DSH according to the operationalization used in this study. This was intended to offer an in-depth exploration of the phenomenology of DSH to provide a basis of understanding of the impulsive and compulsive features of DSH. This would in turn clarify and elaborate upon the quantitative findings. The interview data were examined to identify features that fit with the construct of impulsivity such as the presence or a clear, strong urge to DSH, wanting to engage in DSH and viewing DSH as ego-syntonic or sensible, little or no deliberation or resistance before engaging in DSH, being rewarded by the act of DSH itself, and regrets primarily due to external consequences (as opposed

to internally-fuelled regrets or shame). Features that fit with compulsivity were also identified, such as a period of mounting anxiety, tension, fear, or dread prior to DSH (possibly including persistent, intrusive thoughts regarding DSH), not wanting to engage in DSH and viewing DSH as senseless or ego-dystonic, much deliberation or efforts to resist acting on DSH, primary rewards associated with tension or harm reduction, and regrets due to guilt or shame over the act itself.

Overall, interview data showed that DSH was frequently precipitated by increasing anxiety, tension, fear or dread (at times associated with persistent intrusive thoughts about DSH, fears of "going crazy" or concern about being unable to "handle it" if the tension or emotional turmoil were to continue. Many participants described feeling as though they did not want to engage in DSH but felt they had to and identified DSH as clearly ego-dystonic. However, more commonly, participants described DSH as both ego-dystonic and ego-syntonic to a degree. Some noted that on one level DSH was desired and sensible but on another level it was viewed as senseless; others described different experiences over time or under different circumstances. Most individuals described a combination of deliberating and trying to resist DSH on one hand, and acting quickly with little resistance on the other. While some described the latter as an impulsive, quick decision, others indicated that there was little resistance because DSH was known to be effective (i.e. at reducing tension). The majority of participants described tension reduction as the sole primary reward following DSH, while the remaining participants described a combination of tension reduction and reinforcement associated with the act of DSH itself. Finally, in terms of regrets following DSH, half of participants described experiencing internally-driven regrets (i.e. guilt and shame) and externally-driven regrets (i.e. getting in trouble or being embarrassed). Of note, a few participants indicated that they had no regrets following DSH.

The phenomenology of DSH as gleaned by the collective interview data highlights the complex nature of human experience. It is not surprising that the distinction between impulsive and compulsive features can be difficult to make, particularly when a dichotomous approach is taken and a complex behaviour is explored. Indeed, decisions in some areas were not arrived at easily, for example whether an urge would be considered an impulsive urge or an intrusive obsessive-compulsive thought. Further, these data

suggest that it may be inappropriate to label DSH as impulsive or compulsive in nature (either in general, or for a given individual) as both impulsive and compulsive features can, and most often do, coexist or change over time. It is also clear that it is important to considering DSH from a developmental perspective, a consideration that was not systematically integrated into the interview format. A number of individuals commented that their DSH experience changed over time, noting different modes of progression (i.e. beginning as quick with little resistance and ego-syntonic in nature, and progressing to resisted and ego-dystonic in nature or vice versa). Similarly, different experiences were described for different methods or functions of DSH (i.e., quick and no resistance when DSH was to end flashbacks, and slow with much resistance when DSH was purely for excitement-seeking). Thus, factors such as the individual's place in the course of DSH, variable methods or functions of DSH, and different circumstances may influence whether DSH is carried out in a manner that is impulsive, compulsive, or both.

Predicting DSH characteristics from impulsivity and compulsivity. No specific hypotheses were made regarding the ability to predict DSH characteristics from various indices of impulsivity and compulsivity, since there is no empirical basis on which to do so. Specifically, the ability to predict the frequency, duration, density (number of episodes per year), number of methods, and severity of DSH from various indicators of impulsivity and compulsivity was evaluated in the undergraduate sample. Several established measures of impulsivity and compulsivity were reduced to two components reflecting impulsivity/sensation-seeking and anxious compulsivity. Both impulsivity/sensation seeking and anxious compulsivity were significant positive predictors of the number of methods used. Similarly, when the DSH-U components were used as predictors, both impulsive and compulsive components (DSH-Specific Compulsivity and Urge-driven/Impulsive, as well as the DSH Impulsivity scale) were significant predictors of number of methods. Thus, high levels of either impulsivity or compulsivity were associated with more varied methods of DSH. This may reflect a common element of increased distress, dysfunction, or dysregulation being associated with more varied methods.

Apart from predicting number of methods, the general measures of impulsivity and compulsivity did not contribute significantly to the prediction of DSH characteristics.

However considering the DSH-U components, DSH-Specific Compulsivity significantly predicted frequency and density of DSH. In addition, the DSH Compulsivity scale (which was constructed using a combination of general and specific compulsivity items from the DSH-U) was a significant positive predictor of DSH frequency and density. Thus, higher ratings on items describing compulsive DSH features (i.e., feeling compelled to engage in DSH in advance, agonizing and trying to avoid DSH prior to acting, feeling a *need* to engage in DSH, and shame or regret associated with DSH) were associated with higher frequency overall and more frequent episodes per year. Other components reflecting general impulsivity, compulsivity, and DSH-specific excitement were not significant predictors. These DSH-specific compulsive features might collectively signify a strong negative reinforcement scenario in which a compulsion to engage in DSH in response to anxiety or tension is reinforced by tension reduction. However, the view of DSH as ego-dystonic, the failure to resist DSH despite efforts to do, and the ensuing guilt and shame may in fact become precipitating factors, resulting in more frequent episodes (overall, and per year). Anecdotally, this cycle was described by some participants over the course of the study.

In contrast, DSH-related impulsivity (DSH-U Urge-driven/Impulsive) was found to be the only significant negative predictor of severity as measured by the presence of a history of seeking medical treatment following a DSH incident. Thus, individuals with high endorsement of items reflecting tendencies towards impulsivity in many areas of life, acting quickly on urges or emotions, quick decision making, and low control over thoughts and feelings were less likely to be classified as having a severe DSH. It is possible that this finding may reflect an association between impulsive, urge-driven tendencies and low severity of DSH. However, it seems plausible that this association may also be related to treatment-seeking tendencies. For example, an impulsive, urge-driven individual may be less likely to seek medical treatment for a DSH incident, even if the incident warranted treatment.

Considering the ability of these various measures to predict DSH characteristics, it is interesting to note that DSH-specific items, components, or scales were found to be significant positive predictors where more general measures of impulsivity and compulsivity did not contribute to prediction of DSH features. This suggests that there

may be specific DSH-related information that is relevant to predicting DSH features, and that is not adequately captured by more general measures of impulsivity and compulsivity. Thus, it would appear that continuing to develop psychometrically sound and reliable measures of DSH-specific impulsive and compulsive processes would be fruitful in enhancing the ability to predict some important characteristics of DSH.

Practical Implications

These findings have some important implications on a practical clinical level. In terms of assessment, an evaluation of DSH should include specific examination of impulsive and compulsive features, with a particular emphasis on DSH-specific experiences. Asking questions about experiences before, during, and after DSH that emphasize these processes could improve the accuracy of such an assessment. If DSH were considered to be impulsive in nature, treatment interventions might focus on developing self-control, learning to inhibit responses, balancing internal desires with external responsibilities, and finding adaptive means of gratification (Stone, 1996). However, given that these findings show higher levels of compulsivity in both clinical and non-clinical samples, clinicians might be more inclined to consider treatment interventions focusing more on anxiety management, distress tolerance skills, and exposure and response prevention strategies (Barlow, 2008; Stone, 1996). As discussed in the literature review, some recent work has found DBT (Linehan et al., 2006) and acceptance-based emotion regulation group therapy (Gratz & Gunerson, 2006) to be effective in decreasing DSH, which could be a reflection of its ability to target some of these areas.

In addition, this study has implications for non-clinical populations. Clearly, the experiences of DSH in non-clinical populations merit additional attention. The finding that 12.14% of university undergraduates endorsed multiple episodes of DSH is significant. Further, given the qualitative information gathered from participants, it seems likely that this represents an underestimation of the actual proportion of individuals engaging in repetitive DSH. If a more broad definition were used (i.e. including single episodes), the proportion would likely be higher still. Thus, this study confirms that DSH is indeed an important concern for consideration in undergraduates and that this is a

population that is well-suited for empirical studies in this area. Findings highlighted in this study could be used to address DSH in education and prevention programs, particularly in school, family or community settings. This might promote a more accurate and empathic understanding of DSH, and reduce the stigma that is often reported to be associated with this behaviour (i.e. that it is reckless, attention-seeking, or impulsive). In addition, teaching skills for managing anxiety and general emotional distress in an adaptive way would be a useful preventive measure and could be introduced prior to the development of DSH-related problems.

Theoretical Implications

This study's finding that impulsivity and compulsivity are inversely related is noteworthy. This inverse relationship was noted in the expert ratings of DSH-C items and in the loadings from the PCA of the DSH-C. Similarly, the DSH Impulsivity and DSH Compulsivity scales that were developed showed a significant negative relationship across the two samples. These findings challenge research that suggests these two constructs are orthogonal or unrelated. The inverse correlation is more consistent with a bi-polar spectrum or continuum model where impulsivity and compulsivity are situated at opposite poles, and high levels of one are associated with low levels of the other. Although this would require replication and additional exploration, this finding is particularly salient because it was found in independent groups (i.e. expert ratings, clinician descriptions of clients' DSH).

This study also has some important implications regarding the characterization of DSH. Based on these findings, it would appear that it is indeed erroneous to refer to DSH (even specific forms, such as cutting, burning, and hitting) as impulsive in nature, as suggested in the theoretical model proposed by Simeon and Favazza (2001). Those theorizing or researching DSH should avoid including DSH as an example of impulsive behaviour without taking steps to validate assumptions about the impulsive quality of DSH (or the compulsive quality, for that matter given that this is a relatively under-researched area in need of replication). Clearly, the findings from both the clinician survey and the undergraduate sample suggest that DSH has more in common with a compulsive act than with an impulsive behaviour, at least as measured by selected items

reflecting impulsive and compulsive styles of engagement in DSH. However, the qualitative data are less clear, presenting a more variable experience of DSH across participants. This is not entirely unexpected, as quantitative methods of data collection necessarily reduce or summarize human experience in a manner that can obscure the more idiosyncratic or complex aspects of this experience. The qualitative data are valuable in that they highlight the complexities involved in making distinctions between impulsive and compulsive features, and suggest that additional factors must be considered when describing the phenomenon of DSH. For example, some individuals described both impulsive and compulsive features simultaneously, while others described impulsive and compulsive features changing over time, with different methods, or under various circumstances. Thus, it would be important to carefully examine impulsive and compulsive features within these contexts. This is certainly true on an individual level, but also more broadly in trying to make generalizations about the DSH experience.

Finally, in considering the theoretical framework from which DSH is understood, researched, and treated in clinical settings should be re-examined. As discussed above, previous frameworks have used the method of DSH as a basis for categorizing and understanding DSH. The complexity of the DSH experience that is evident from the qualitative data calls for a framework of DSH that captures not only the impulsive and compulsive features of the behaviour, but that also captures various dimensions of DSH. For example, a more complete framework might include an examination of the cognitive, emotional, physiological and behavioural components of DSH before, during and after DSH occurs, as well as the specific motivations and functions associated with DSH. A developmental perspective could also be beneficial, with DSH being considered at the various stages of development of DSH behaviour. Finally, examining empirical support for the role of DSH method or triggers and circumstances surrounding DSH could further develop a theoretical framework for this complex behaviour. While additional research is required to develop and empirically support such a multidimensional framework, it would provide a basis on which to conceptualize and explain the complex and multidetermined nature of DSH.

Limitations and Directions for Future Research

Despite the advantages of this study and some significant findings relating to the research questions, the present study has some important limitations. First, the vast majority of both samples (approximately 95 to 98%) represent individuals who would fall under the "impulsive DSH" category proposed by Simeon and Favazza (2001) which includes self-cutting, burning, and hitting; very few individuals engaged in the proposed "compulsive DSH" including exclusive skin picking, hair pulling, and nail biting. On one hand, this is advantageous as it offers a more homogeneous sample and affords an in-depth examination of the putative "impulsive DSH" typology which is commonly endorsed in clinical and non-clinical settings (Favazza & Conterio, 1998; Whitlock et al., 2006). However, on the other hand, it is not possible to generalize or compare these findings to individuals who engage in these hypothetical "compulsive" forms of DSH. Thus, these findings are generally restricted to individuals who tend to engage in DSH involving multiple methods with a predominance of self-cutting, scratching, burning, and hitting. Unfortunately, this does not permit an examination of the impulsive and compulsive characteristics of some forms of DSH, specifically hair-pulling, nail biting, and skin picking. Future studies may need to actively recruit the varied forms of DSH to allow for a direct comparison of impulsive and compulsive features.

Second, given that half of the "non-clinical" sample of undergraduates reported a history of mental health treatment, the comparison between the clinical sample and the non-clinical sample was not as clear-cut as originally designed. This is not surprising given the selection criteria for the undergraduate sample (i.e., the presence of multiple episodes of DSH). However, future studies should be aware of this and identify clinical variables within undergraduate samples. It would perhaps be useful to consider these samples to be more akin to a community sample (rather than a non-clinical sample). In addition, comparing various characteristics of treatment seeking and non-treatment seeking individuals engaging in DSH could be another area of research worth pursuing.

Third, the use of the DSH-C and DSH-U in the development of the DSH Impulsivity scale and DSH Compulsivity scale was supported in terms of statistical properties and validity with respect to expert ratings and independent measures of the constructs examined. As noted, the scale included both general and DSH-specific items

relating to impulsivity and compulsivity. While this scale was adequate in terms of reliability and construct validity, it was apparent that including DSH-specific excitement-seeking or novelty seeking items broadened the focus of the DSH Impulsivity scale that was initially intended to reflect impulsivity. Instead of being a reflection of impulsivity per se, the DSH Impulsivity scale represented impulsive and excitement-seeking engagement styles. It would be interesting and perhaps more informative to compare a more pure representation of an impulsive engagement style with compulsivity to further strengthen these conclusions. In future efforts to examine such a measure, it would be advantageous to evaluate the measure psychometrically and refine its properties prior to use. For example, the inclusion of focus groups or polling additional experts (i.e., those with explicit expertise in the areas of DSH or impulsivity and compulsivity) could enhance item selection and enhance the scale's profile as a measure of impulsive and compulsive features of DSH. It would be particularly important to ensure that DSH-specific items representing impulsive versus compulsive features of DSH were included. However, this study has provided some compelling preliminary data and it appears that this would be a worthwhile endeavour.

Fourth, there may be some limitation in asking clinicians to use the most typical example of DSH, as opposed to the most recent example. While the most typical example is desirable from a generalizability standpoint, referencing the most recent example might be less susceptible to distortions based on the retrospective nature of data collection. More generally, while clinicians may have particular insights or theories about the clients' DSH behaviour, the data they offered required some inference and clinical judgment (i.e., perhaps identifying aspects of the DSH behaviour that would not be identified by the client in a self-report form, possibly in part due to lack of awareness or insight on the part of the client). This could present an advantage in that it offers an "expert" view, presumably informed by a strong knowledge base of theory, research, and clinical practice and would offer insights that would not be accessible were clients approached regarding self-reported DSH experiences. However, it could be considered a disadvantage in that there is a degree of interpretation (and therefore potential for error, distortion, and unreliability) that may vary by clinician, orientation, population/diagnosis,

and setting. Future studies might consider gathering clinician data on both the clinician's perspective and the client's perspective, and comparing the two.

Fifth, using self-reported DSH experiences in the undergraduate sample presents problems inherent in most forms of self-reporting including forgetting, conscious or unconscious overreporting or underreporting, and the lack of corroborating evidence. In addition, for many participants the self-reported data on DSH was retrospective, as some participants had not engaged in DSH for several months or even a few years. Clearly, biases may exist when individuals are asked to recall the details of an emotionally salient experience like DSH. There may have been tendencies to overestimate or underestimate characteristics such as frequency and duration of DSH, or to distort reasons based on new knowledge or a different perspective at the time of reporting. While having some distance from DSH (in time, in personal development, or in perspective) might enhance reporting in that it may allow for more accurate or mature insights, it may also distort the actual experience and misrepresent what was actually occurring at the time of DSH. Indeed, some inconsistencies were noted across measures, suggesting that there was some overreporting or underreporting of some aspects of DSH. Examination of these data (and consultation with the participants in most cases) suggested that these errors were generally inadvertent or due to varied estimates based on recall. Of note, for evaluating frequency and duration, the DSHI (Gratz, 2001) was deemed more accurate than the open-ended or categorical (i.e. checking the box that applies) method. In all cases the DSHI showed higher frequency and longer duration and was judged to be more accurate following consultation with participants and examination of data. Thus, relying on the DSHI and other such measures that might increase the likelihood of systematic and accurate reporting should be considered.

The inclusion of a sub-study that used event sampling methods would have been advantageous to the study of undergraduates as it would have allowed a means of evaluating and perhaps correcting for some of these potential retrospective biases. While a sub-study was in fact designed to address these issues, all of the participants approached to participate declined the invitation and the sub-study was therefore omitted. The inclusion of an event sampling condition where DSH behaviour (including impulsive and compulsive features before, during and after DSH) could be evaluated as it occurs would

greatly enhance a study of this nature. However, there are clearly some barriers to doing so, and this remains a challenging research problem both pragmatically and ethically. Future studies could address how to facilitate participation in such studies. It would be worthwhile to compare individuals who consent to participate in such studies and disclose DSH information with those who decline participation or deny DSH (when it in fact is occurring) to elucidate any sample selection bias that may occur during recruitment.

Finally, given the overlap in the constructs of impulsivity and compulsivity, it was important to operationalize impulsivity and compulsivity in a concrete manner that distinguishes the two constructs. However, this may have created somewhat of an artificial distinction. The two constructs appear to share some overlapping features and their complex relationship is not well delineated in the literature to date. Therefore, efforts to qualify data (i.e. self-reported experiences of DSH, items on the DSH-C and DSH-U, qualitative data) as impulsive versus compulsive were challenging. In some cases, it seemed virtually impossible to distinguish between an impulse to act and a compulsion to act, even within the context of lengthy interview data. Although the operationalized constructs were employed conscientiously and every effort was made to offer evidence of validation of these constructs, it was clear that some overlap exists. As was evident in the interview data, sometimes impulsive and compulsive features exist simultaneously, or change over time, or vary depending on the circumstances or the method of DSH used. It is clear that distinguishing between impulsive and compulsive processes is not a straightforward task, and applying these constructs to DSH increases the complexity. For this reason, it is recommended that future studies consider inclusion of qualitative methods as these provide a rich source of valuable insights into this phenomenon.

Additional research and replication is needed to further clarify the relationship between impulsivity and compulsivity in general, and in particular as these constructs may relate to DSH. This study's finding that DSH experiences show more features of compulsivity than of impulsivity in both clinical and undergraduate samples suggests that compulsive processes are highly relevant to DSH. However, it is clear that exploring the impulsive and compulsive features of DSH in these populations is an area of research that should receive additional attention in the research community.

UNIVERSITY OF
WINDSOR

APPENDIX A1: **LETTER OF INFORMATION**

Title of Study: The Experience of Deliberate Self-Harm

You are being asked to participate in a research study conducted by **Sarah Bertrim, MA and Dr. Stephen Hibbard** from the **Psychology Department** at the **University of Windsor** for a dissertation project. If you have any questions or concerns about the research, please feel to contact **Dr. Hibbard, XXXX or Sarah Bertrim, XXX.**

PURPOSE OF THE STUDY: The purpose of the study is to develop a better understanding of what it is like for people in a university sample who have deliberately injured or harmed themselves. We also intend to develop an understanding of how psychologists and psychiatrists conceptualize deliberate self-harm by surveying professionals on the subject.

PROCEDURES: If you volunteer to participate in this study, we would ask you to do the following things (approximately 7-10 minutes):

- Provide some basic information about yourself as a professional and your experience with individuals who have engaged in deliberate self-harm (DSH) according to the definition provided;
- Think of a client you saw professionally who engaged in DSH and describe your understanding their DSH behaviour (in a sentence or two);
- Answer a series of brief questions (likert rating scales) about your understanding of that client's DSH behaviour.

POTENTIAL RISKS AND DISCOMFORTS: If you have questions or concerns about this study, you are encouraged to contact the researcher (Sarah Bertrim), or the supervising psychologist (Dr. Hibbard).

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY: The number of people who deliberately hurt or injure themselves appears to be increasing, and DSH is becoming more common in college and university samples. This research will increase our understanding of professionals' conceptualizations of DSH and what it is like for individuals who engage in this behaviour. This research will provide important information to help the professional community provide better services to people in need.

PAYMENT FOR PARTICIPATION: Participants will not receive payment or compensation for completing this survey.

CONFIDENTIALITY: You will not write your name on any of the questionnaires, and you will be asked to refrain from writing your name along with any return address. This will maintain anonymity and make all responses confidential. You will not be asked to reveal any specific information about any client, and questions will be sufficiently general to avoid compromising your ethical obligation to protect your clients' privacy. Although the results of this study may be published at a later date, individual results will not be available and therefore participants will not be identifiable.

PARTICIPATION AND WITHDRAWAL: You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don=t want to answer and still remain in the study.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS: Upon request, a written summary of the results will be e-mailed to participants. These results should be available by August 2006. A website will be made available, which participants may access as they are interested.

SUBSEQUENT USE OF DATA: The data from this study may be used in subsequent studies, and may be presented at professional conferences or published in professional journals.

RIGHTS OF RESEARCH SUBJECTS: You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact:

Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4
Telephone: 519-253-3000, ext. 3916; E-mail: ethics@uwindsor.ca

SIGNATURE OF INVESTIGATOR
These are the terms under which I will conduct research.

_____ _____

Signature of Investigator Date

APPENDIX A2: **CLINICIANS DEMOGRAPHIC INFORMATION**

ID#

To help us describe the group of clinicians that participated in this study, please answer the following questions. You may omit questions that you do not wish to answer. You are, however, encouraged to answer as many questions as possible.

1. Your age: _____

2. Your sex:
   [ ] Female
   [ ] Male

3. Your profession:
   [ ] Psychologist
   [ ] Psychiatrist
   [ ] Other (specify:_____)

4. Highest degree or level of education:
   [ ] M.A.
   [ ] Ph.D.
   [ ] M.D.
   [ ] Other (specify:_____)

5. Setting of your clinical work (if you work in more than one setting, please indicate the proportion of time spent in each setting; i.e. 60% hospital inpatient & 40% private outpatient practice):
   [ ] Hospital Inpatient
   [ ] Non-hospital Inpatient (i.e. rehabilitation facility)
   [ ] Hospital-based Outpatient
   [ ] Non-hospital Outpatient (i.e. private practice)
   [ ] Other (specify: _____)

6. How would you describe your primary orientation? If you wish to select more than one orientation, please rank up to three choices in order (1=most predominant; 2=second most predominant; 3=third most predominant):

   [ ] Psychodynamic/Psychoanalytic
   [ ] Cognitive Behavioural
   [ ] Behavioural
   [ ] Experiential
   (specify:_____)
   [ ] Family Systems
   [ ] Integrative
   [ ] Eclectic
   [ ] Other

7. Number of years in autonomous practice:
   [ ] Less than 5 years
   [ ] 5 to 9 years
   [ ] 10 to 14 years
   [ ] 15 to 20 years
   [ ] More than 20 years

APPENDIX A3: **CLINICIANS - UNDERSTANDING OF DSH**

ID#

To help us describe certain aspects of your experience with the group of interest for this study, please answer the following questions. We respect your ethical obligation to protect the privacy of your clients, and we acknowledge that you must refrain from revealing any information that would compromise confidentiality in any way. You are therefore encouraged to answer, as necessary, any questions in a sufficiently general manner to ensure the protection of confidentiality. You may omit questions that you do not wish to answer. If you wish, you may elaborate or clarify your responses with additional comments.

For the following questions, please use the definition below:

Deliberate Self-Harm (DSH) involves the deliberate and direct destruction or alteration of one's own body tissue (cutting, scratching, burning, hitting, or other intentional injury to one's own body) without conscious suicidal intent, but resulting in injury severe enough for tissue damage to occur (i.e. scarring, bruising).

*This **does not include** culturally sanctioned destruction of tissue (i.e. piercings and tattoos) unless these are considered excessive or outside of the cultural norm; it also **does not include** self-poisoning (i.e. taking pills, ingesting poison), or indirect methods of self harm (i.e. risky behaviours, inadequate self-care)*

8. To the best of your recollection, how many clients have you treated who have engaged in DSH as defined above? _____

For the following questions, please think of the *most typical or salient* client you have treated in recent memory who engaged in DSH behaviour according to the above definition. (If you have never treated someone who has engaged in DSH, please do not respond to the remaining questions and complete the attached response card).

9. What was the client's age? _____

10. What was the client's sex? [ ] Female [ ] Male

11. In what setting did you treat this client?
    - [ ] Hospital Inpatient
    - [ ] Non-hospital Inpatient Treatment Facility
    - [ ] Hospital-based Outpatient
    - [ ] Non-hospital Outpatient (i.e. private practice)
    - [ ] Other (specify:_____)

12. How old was the client when he/she began engaging in DSH? _____

13. When you last saw the client, how long had he/she been engaging in DSH (approximately how many years/months)? _____years and _____months

14. For approximately how many sessions did you treat this client? _____sessions

15. What was the client's DSH behaviour? (If more than one DSH behaviour applies to your client, please rank them in order (1=most predominant; 2=second most, etc):

[ ] Cutting self	[ ] Sticking pins/needles into skin	[ ] Biting self
[ ] Burning self	[ ] Interfering with wound healing	[ ] Punching/hitting self
[ ] Carving into skin	[ ] Rubbing glass into skin	[ ] Banging head
[ ] Scratching self	[ ] Rubbing sandpaper on skin	[ ] Breaking bones
[ ] Other (specify:_____)		

16. What was the client's primary diagnosis or central clinical problem in your view? (please include Axis I and Axis II diagnoses if applicable)

_____

_____

_____

17. In your view, was DSH a central part of this client's presentation, or a central focus of your work with him/her?

[ ] Yes [ ] It was an issue, but it not a central one [ ] No

18. In terms of your clinical work with this client, how would you qualify the client's response to treatment? (How successful do you view your treatment of this client?)

[ ] Not at all successful; virtually no progress was made
[ ] Not very successful, but some progress was made
[ ] Somewhat successful; some progress was made in important areas
[ ] Very successful; the client made substantial progress

In the space provided below, please describe in a few short sentences *how you understand this client's DSH behaviour, and DSH in general.* We are interested in the essence of how you understand the role of DSH and what you believe it is like for clients.

_____

_____

_____

_____

_____

_____

_____

APPENDIX A4: **DSH QUESTIONNAIRE FOR CLINICIANS**

ID#

In reference to the same client you have considered in the above two sections, please indicate how much you agree with each statements listed below. We are interested in learning about how you view your client's DSH behaviour. Items are presented in the present tense. However, if you are no longer in professional contact with this client, please respond according to what your view was of the client when you were working with him/her. **Please use the following scale:**

Strongly Disagree (SD) 1	Disagree (D) 2	Neutral (N) 3	Agree (A) 4	Strongly Agree (SA) 5

	In my view, this client...	**SD**	**D**	**N**	**A**	**SA**
1.	...is impulsive in many areas of life	1	2	3	4	5
2.	...is a perfectionist in many areas of life, working hard to make sure he/she does everything "just right"	1	2	3	4	5
3.	...engages in DSH on impulse or on a whim, without thinking about his/her behaviour	1	2	3	4	5
4.	...engages in DSH because he/she becomes overwhelmed with generalized anxiety and does not know how to cope	1	2	3	4	5
5.	...engages in DSH because something about the behaviour itself is rewarding or gratifying	1	2	3	4	5
6.	...engages in DSH only after having agonized over or trying to avoid the behaviour for a substantial period	1	2	3	4	5
7.	...has a compulsion to engage in DSH well before acting, rather than just doing it on a whim	1	2	3	4	5
8.	...desires excitement and enjoys new or risky situations	1	2	3	4	5
9.	...seems to exert little or no control over his/her thoughts, feelings or behaviour	1	2	3	4	5
10.	...is a cautious individual who prefers to "play it safe" and avoid new or risky situations	1	2	3	4	5
11.	...lets his/her urges and emotions dictate what he/she does	1	2	3	4	5
12.	...is more influenced by what he/she "should" do than by what he/she actually wants	1	2	3	4	5
13.	...is typically ashamed or regretful after he/she engages in DSH behaviour	1	2	3	4	5
14.	...only regrets his/her DSH behaviour because he/she gets in trouble (i.e. by family, friends, physician)	1	2	3	4	5
15.	...experiences DSH as ego-dystonic or alien, rather than ego-syntonic	1	2	3	4	5
16.	...tends to make decisions quickly without thinking them through	1	2	3	4	5
17.	...tends to consider all aspects of a problem or situation before deciding how to approach it	1	2	3	4	5
18.	...feels excited by his/her DSH	1	2	3	4	5
19.	...understands DSH as something he/she *wants* to do	1	2	3	4	5
20.	...understands DSH as something he/she *needs* to do	1	2	3	4	5
21.	...feels *compelled* to engage in DSH	1	2	3	4	5

APPENDIX A5: **RESPONSE CARD**

ID#

If you have reviewed and signed the consent from to participate in this study, please read the following options and check the appropriate box.

☐ I have consented to participate in this research, and I have seen at least one client who engaged in DSH according to the definition provided. (In this case, please complete the demographics form, the DSH survey, and return it along with a signed consent form to the researcher. A postage-paid envelope has been provided).

☐ I have consented to participate in this research, but I have never seen a client who engaged in Deliberate Self-Harm. (In this case, please complete the demographics form and return it along with a signed consent form to the researcher. You will be unable to respond to the questions about DSH, but you may return the blank forms to the researcher as well. A postage-paid envelope has been provided).

☐ I am not interested in participating in this research. (In this case, please return the blank materials to the researcher in the postage-paid envelope provided).

APPENDIX A6: **DEBRIEFING FORM**

UNIVERSITY OF WINDSOR

Title of Study: The Experience of Deliberate Self-Harm

You have just participated in a research study conducted by **Sarah Bertrim, MA and Dr. Stephen Hibbard**, from the **Psychology Department** at the **University of Windsor** for a dissertation project. Your contribution to this project is very much appreciated.

PURPOSE OF THE STUDY: As stated in the information form, the purpose of the study is to develop a better understanding of what it is like for people in a university sample who have deliberately injured or harmed themselves. We would also like to develop an understanding of how psychologists and psychiatrists conceptualise deliberate self-harm by surveying professionals on the subject. Recent research suggests that the prevalence of Deliberate Self-Harm has increased, and that 14% of college and university samples engage in this behaviour (Favazza, 1992). Traditionally, this behaviour has been viewed as the result of impulsivity, and these individuals are viewed primarily as having difficulty in impulse control. However, if one considers more concretely operationalized definitions of impulsive and compulsive acts, we believe that this behaviour may share more features with a compulsive act than previously considered. Therefore, we are investigating the impulsive and compulsive aspects of DSH behaviour in an undergraduate sample. We included the survey of mental health professionals to evaluate how they conceptualise DSH in the populations with whom they work, and hope to make a comparison of the responses of undergraduates and professionals.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS: Upon request, a written summary of the results will be e-mailed to participants. These results should be available by August 2006. A website will also be made available, which participants may access as they are interested.

If you have any questions or concerns, you may contact the student investigator **(Sarah Bertrim; XXX)** or the faculty supervisor **(Dr. Stephen Hibbard; XXX)**. You may also direct questions to:

Research Ethics Coordinator
University of Windsor
Windsor, Ontario N9B 3P4
Telephone: 519-253-3000, ext. 3916
E-mail: ethics@uwindsor.ca

Again, your contribution to this research project is greatly appreciated.

APPENDIX A7: **REMINDER LETTER**

UNIVERSITY OF WINDSOR

RE: The Experience of Deliberate Self-Harm

Dear Clinican,

You recently received a request to participate in a research study conducted by **Sarah Bertrim, MA and Dr. Stephen Hibbard,** from the **Psychology Department** at the **University of Windsor** for a dissertation project entitled The Experience of Deliberate Self-Harm. The purpose of the study is to develop a better understanding of what deliberate self-harm is like for undergraduates who engage in this behaviour, as well as the manner in which mental health professionals conceptualize deliberate self-harm.

We have not yet received your response, and we would like to remind you that your participation in this brief survey would be very much appreciated. Deliberate self-harm is a relatively prevalent but under-researched phenomenon, and this project will contribute to a much needed empirical basis for our understanding of individuals who engage in self-harm. Perhaps you were busy and set aside our request. Won't you please take time now to look at it again?

If you have any questions or concerns about this research, please feel to contact **Dr. Stephen Hibbard, XXX** or **Sarah Bertrim, XXX**. If you require another survey package, please contact the researcher, Sarah Bertrim.

Thank you in advance for supporting this doctoral research, and for offering your time to assist in this important contribution to the professional literature.

Sincerely,

Sarah Bertrim, M.A.
Doctoral Candidate in Clinical Psychology
University of Windsor

UNIVERSITY OF
WINDSOR

APPENDIX A8: **EXPERT RATING LETTER AND FORMS**

May 10, 2006

RE: The Experience of Deliberate Self-Harm: Impulsive and Compulsive Features

Dear Faculty Member,

You are being asked to complete this brief questionnaire as part of a research project conducted by **Sarah Bertrim, MA** and **Stephen Hibbard, PhD** from the Psychology Department at the University of Windsor for a dissertation project entitled *The Experience of Deliberate Self-Harm: Impulsive and Compulsive Features*. This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. The purpose of the study is to develop a better understanding of the nature of Deliberate Self-Harm (DSH) in undergraduates who engage in this behaviour, as well as the manner in which mental health professionals conceptualize DSH.

Since there is limited consensus on the meaning of the constructs of impulsivity and compulsivity (and there are no questionnaires regarding these constructs as they relate to DSH), you are being asked to rate a series of questions regarding the nature of DSH. We are gathering ratings of the same set of characteristics on two different concepts, impulsivity and compulsivity, to try and ascertain the extent to which experts believe these concepts are similar and to what extent different. Specifically, you are asked to provide a rating on a scale from 1 to 10 for each item to indicate how descriptive or representative you believe each item to be of impulsivity or of compulsivity. This should take only a few minutes of your time. The ratings of faculty members will be used to determine how consistent professionals believe each item to be of impulsivity and compulsivity, which will be an important aspect of this dissertation project. Once you have completed the questionnaire, you may return it via internal mail to Sarah Bertrim, M.A. of the Department of Psychology at the University of Windsor. You may also return it via e-mail to Sarah Bertrim at XXX. You will not record your name or identifying information on these forms, and all responses are anonymous and confidential.

If you have any questions or concerns about this research, please feel to contact **Dr. Hibbard, XXX** or **Sarah Bertrim, XXX**. Thank you in advance for supporting this doctoral research.

Sincerely,

Sarah Bertrim, M.A.
Doctoral Candidate in Clinical Psychology
University of Windsor

Please rate the following items using the scale below (circle a number from 1 to 10 for each item). We are interested in how descriptive or representative you believe each questionnaire item is of **impulsivity** as you understand this construct. For example, a rating of **1** would indicate that you believe the item is not at all representative or completely inconsistent with your understanding of impulsivity, while a rating of **10** would indicate that you believe the item is a very good representation or entirely consistent with your understanding of impulsivity.

1 2 3 4 5 6 7 8 9 10

Not at all descriptive of **impulsivity**

Very descriptive of **impulsivity**

	The person in question...	
1.	...is impulsive in many areas of life	1 2 3 4 5 6 7 8 9 10
2.	...is a perfectionist in many areas of life, working hard to make sure he/she does everything "just right"	1 2 3 4 5 6 7 8 9 10
3.	...engages in DSH on impulse or on a whim, without thinking about his/her behaviour	1 2 3 4 5 6 7 8 9 10
4.	...engages in DSH because he/she becomes overwhelmed with generalized anxiety and does not know how to cope	1 2 3 4 5 6 7 8 9 10
5.	...engages in DSH because something about the behaviour itself is rewarding or gratifying	1 2 3 4 5 6 7 8 9 10
6.	...engages in DSH only after having agonized over or trying to avoid the behaviour for a substantial period	1 2 3 4 5 6 7 8 9 10
7.	...has a compulsion to engage in DSH well before acting, rather than just doing it on a whim	1 2 3 4 5 6 7 8 9 10
8.	...desires excitement and enjoys new or risky situations	1 2 3 4 5 6 7 8 9 10
9.	...seems to exert little or no control over his/her thoughts, feelings or behaviour	1 2 3 4 5 6 7 8 9 10
10.	...is a cautious individual who prefers to "play it safe" and avoid new or risky situations	1 2 3 4 5 6 7 8 9 10
11.	...lets his/her urges and emotions dictate what he/she does	1 2 3 4 5 6 7 8 9 10
12.	...is more influenced by what he/she "should" do than by what he/she actually wants	1 2 3 4 5 6 7 8 9 10
13.	...is typically ashamed or regretful after he/she engages in DSH behaviour	1 2 3 4 5 6 7 8 9 10
14.	...only regrets his/her DSH behaviour because he/she gets in trouble (i.e. by family, friends, physician)	1 2 3 4 5 6 7 8 9 10
15.	...experiences DSH as ego-dystonic or alien, rather than ego-syntonic	1 2 3 4 5 6 7 8 9 10
16.	...tends to make decisions quickly without thinking them through	1 2 3 4 5 6 7 8 9 10
17.	...tends to consider all aspects of a problem or situation before deciding how to approach it	1 2 3 4 5 6 7 8 9 10
18.	...feels excited by his/her DSH	1 2 3 4 5 6 7 8 9 10
19.	...understands DSH as something he/she *wants* to do	1 2 3 4 5 6 7 8 9 10
20.	...understands DSH as something he/she *needs* to do	1 2 3 4 5 6 7 8 9 10
21.	...feels *compelled* to engage in DSH	1 2 3 4 5 6 7 8 9 10

Please rate the following items using the scale below (circle a number from 1 to 10 for each item). We are interested in how descriptive or representative you believe each item is of **compulsivity** as you understand this construct. For example, a rating of **1** would indicate that you believe the item is not at all representative or completely inconsistent with your understanding of compulsivity, while a rating of **10** would indicate that you believe the item is a very good representation or entirely consistent with your understanding of compulsivity.

1 2 3 4 5 6 7 8 9 10

Not at all descriptive of **compulsivity**

Very descriptive of **compulsivity**

	The person in question…	
1.	…is impulsive in many areas of life	1 2 3 4 5 6 7 8 9 10
2.	…is a perfectionist in many areas of life, working hard to make sure he/she does everything "just right"	1 2 3 4 5 6 7 8 9 10
3.	…engages in DSH on impulse or on a whim, without thinking about his/her behaviour	1 2 3 4 5 6 7 8 9 10
4.	…engages in DSH because he/she becomes overwhelmed with generalized anxiety and does not know how to cope	1 2 3 4 5 6 7 8 9 10
5.	…engages in DSH because something about the behaviour itself is rewarding or gratifying	1 2 3 4 5 6 7 8 9 10
6.	…engages in DSH only after having agonized over or trying to avoid the behaviour for a substantial period	1 2 3 4 5 6 7 8 9 10
7.	…has a compulsion to engage in DSH well before acting, rather than just doing it on a whim	1 2 3 4 5 6 7 8 9 10
8.	…desires excitement and enjoys new or risky situations	1 2 3 4 5 6 7 8 9 10
9.	…seems to exert little or no control over his/her thoughts, feelings or behaviour	1 2 3 4 5 6 7 8 9 10
10.	…is a cautious individual who prefers to "play it safe" and avoid new or risky situations	1 2 3 4 5 6 7 8 9 10
11.	…lets his/her urges and emotions dictate what he/she does	1 2 3 4 5 6 7 8 9 10
12.	…is more influenced by what he/she "should" do than by what he/she actually wants	1 2 3 4 5 6 7 8 9 10
13.	…is typically ashamed or regretful after he/she engages in DSH behaviour	1 2 3 4 5 6 7 8 9 10
14.	…only regrets his/her DSH behaviour because he/she gets in trouble (i.e. by family, friends, physician)	1 2 3 4 5 6 7 8 9 10
15.	…experiences DSH as ego-dystonic or alien, rather than ego-syntonic	1 2 3 4 5 6 7 8 9 10
16.	…tends to make decisions quickly without thinking them through	1 2 3 4 5 6 7 8 9 10
17.	…tends to consider all aspects of a problem or situation before deciding how to approach it	1 2 3 4 5 6 7 8 9 10
18.	…feels excited by his/her DSH	1 2 3 4 5 6 7 8 9 10
19.	…understands DSH as something he/she *wants* to do	1 2 3 4 5 6 7 8 9 10
20.	…understands DSH as something he/she *needs* to do	1 2 3 4 5 6 7 8 9 10
21.	…feels *compelled* to engage in DSH	1 2 3 4 5 6 7 8 9 10

APPENDIX B1: **UNDERGRADUATE TELEPHONE SCREEN** | ID# |

Researcher introduces self by name and states purpose of calling:
I am a graduate student in the psychology department at the University of Windsor. I am conducting a study for my dissertation, and your name was on a list I received from the participant pool as someone who might meet criteria for this study. If you are eligible and want to participate, you can earn 3 bonus points towards your undergraduate psychology courses. Would you be interested in hearing about it?

→If yes, briefly describe the purpose of the study.
→ If no, thank the student and end the call.

The purpose of this study is to help us learn more about what it is like for people who engage in certain types of behaviour. In particular, we are interested in looking at how people sometimes hurt themselves physically on purpose, and what that experience is like. In order for me to determine if you would be eligible for this study, I first must ask you a few questions. Is now an okay time to do this?

→If yes, proceed with screening questions.
→ If no, set up an alternative time and call back.

1. How old are you?_____(must be age 18 or older for inclusion)

2. There was a participant pool question that said: "At one time or more often, I hit, cut, burned, or otherwise injured myself on purpose". You responded "TRUE" to that question. Can you tell me a bit about what you were referring to?
(if they can't remember, ask them: Please think about it now – was there one or more times where you hit, cut, burned or otherwise injured yourself on purpose?)

_____

_____

_____

In the course of discussing this, clarify the following:
a) What was the act? (exclude poisoning, ingesting toxic substances, or other acts that do not involve direct tissue damage)
b) Was it an accident, or did you do it on purpose? (if accidental, exclude)
c) Did you do it to yourself? (if someone else harmed participant, exclude)
d) Was it direct – did you directly harm yourself? (if it was indirect exclude- indirect would include not taking good care of self, engaging in high risk behaviour)
e) When it happened, were you intoxicated or hearing voices or seeing things that others could not see? (if DSH occurs exclusively while intoxicated or psychotic, exclude; participant may be included if there was at least one instance in which they engaged in DSH where they were not psychotic or intoxicated)
f) Were you attempting suicide at the time? (if the act was part of a suicide attempt, clarify whether they have engaged in DSH where it was not part of a suicide attempt; they may be included if there was at least one instance in which they engaged in DSH where they were not attempting suicide. If DSH occurred exclusively in the course of a suicide attempt, exclude)

3. Have you thought seriously about suicide in the past six months (that is, have you thought about it to the point where you had a plan, or you seriously considered acting on the thoughts of suicide?)

→If no, the participant may be included.

→If yes, the participant is excluded. Assess safety and offer resources.

Have you had those thoughts recently? Are you having thoughts about suicide right now? Do you intend to act on them / do you have a plan / do you have the means to carry out the plan? Is there someone you feel comfortable talking to about these thoughts (do you see someone professionally, have a friend you trust, talk to parents/roommate?) Do you feel safe being alone right now? (If imminent threat, suggest we call to get a trusted friend, police officer or ambulance to escort to safety; if not imminent threat, offer resources)

A lot of people have those kinds of thoughts when they are struggling. I can give you some resources where you could go and talk to someone confidentially about what's going on. If you feel like you need help right away, or if you're afraid for your safety, you can go to any hospital emergency room, or you can call the Community Crisis Centre emergency line (c/o Hotel Dieu Grace Hospital, 519-973-4435). If it's not an emergency, you can go to any psychologist or psychiatrist (yellow pages will show one close to you) to talk about what's going on and get some help. The university provides free services for students. You can go to the Student Counselling Centre in room 293 of the CAW Student Centre (253-3000 ext. 4616), or to the Psychological Services Centre at 326 Sunset Ave, (973-7012). Do you have any questions for me? (if yes, respond as possible).

4. In the past six months, have you had any problems with drugs or alcohol? Can you tell me about it?

---

a. Have you felt the need to cut down?
b. Has someone who cares about you told you to cut down?
c. Have your use of (drugs or alcohol) caused you problems in school, work, or relationships?

→If participant endorses current substance abuse problems, exclude. Offer resources (see resources specified in question 3).
→If there are no reported substance abuse problems, include.

If screening questions are completed and participant meets all inclusion criteria, say:

Thank you for sharing that information. You do meet criteria for this study, and I would like to invite you to participate. To participate in this study, you would be asked to provide some more details about this behaviour and what it is like for you. You would also be asked to participate in a 10 to 15 minute interview and to fill out some questionnaires. The entire process should take between 75 and 90 minutes, and you would receive three bonus points. Would you be interested in participating?

→ if yes, arrange time for interview and data collection

→ if no, thank participant for their time and end call.

If screening questions are completed and participant does not meet inclusion criteria, say:

Thank you for sharing that information. We are looking for some very specific characteristics, and you do not meet criteria for this study. Your name will remain available to other researchers who are offering bonus points in exchange for your participation, and someone may contact you later this semester about participating in other studies. Thank you for your time. End call.

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APPENDIX B2: **CONSENT TO PARTICIPATE IN RESEARCH**

Title of Study: The Experience of Deliberate Self-Harm

You are asked to participate in a research study conducted by **Sarah Bertrim, MA and Dr. Stephen Hibbard**, from the **Psychology Department** at the **University of Windsor** for a dissertation project. If you have any questions or concerns about the research, please contact **Dr. Hibbard, XXX or Sarah Bertrim, XXX**.

PURPOSE OF THE STUDY: The purpose of the study is to develop a better understanding of what it is like for people in a university sample who have deliberately injured or harmed themselves.

PROCEDURES: If you volunteer to participate in this study, we would ask you to do the following:

- Participate in a brief interview regarding certain harmful behaviours (approximately 10-15 minutes); this will be audiotaped, and you will be asked to sign a separate consent form for audiotaping;
- Respond to a series of questionnaires (paper and pencil format) (approximately 1 hour 15 minutes)

POTENTIAL RISKS AND DISCOMFORTS: It is possible that some participants may find the content of interview or of some of the questionnaires upsetting. If this occurs you are encouraged to share your concerns with the researcher (Sarah Bertrim), the supervising psychologist (Dr. Hibbard), or one of the community resources from the list that you will be given.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY: The number of people who deliberately hurt or injure themselves is increasing, and is becoming more common in colleges and universities. This research will increase our understanding of what it is like for individuals who deliberately hurt or injure themselves. Participating in this research might provide you with an opportunity to think about and understand this behaviour, and it will provide important information that will help the professional community provide better services to people in need.

PAYMENT FOR PARTICIPATION: Participants who have registered in the Psychology Participant Pool and are enrolled in a qualifying psychology course will receive 3 bonus marks toward their final grade in that course.

CONFIDENTIALITY: You will not write your name on any of the questionnaires, which will maintain anonymity and make all responses confidential. Although the results of this study may be published at a later date, individual results will not be available and therefore participants will not be identifiable.

PARTICIPATION AND WITHDRAWAL: You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don=t want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS: Upon request, a written summary of the results will be e-mailed to participants. These results should be available by August 2006. A website will also be made available, which participants may access as they are interested.

SUBSEQUENT USE OF DATA: The data from this study may be used in subsequent studies, and may be presented at professional conferences or published in professional journals.

RIGHTS OF RESEARCH SUBJECTS: You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact:

Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4
Telephone: 519-253-3000, ext. 3916; E-mail: ethics@uwindsor.ca

SIGNATURE OF RESEARCH SUBJECT & SIGNATURE OF INVESTIGATOR: I understand the information provided for the study Understanding Harmful Behaviour as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Participant	Date
Signature of Investigator	Date

UNIVERSITY OF
WINDSOR

APPENDIX B2 (Continued): **CONSENT FOR AUDIO TAPING**

Participant's Name: _____

Title of the Project: The Experience of Deliberate Self-Harm

ID# Number: _____

Birth date: _____

I consent to the audio-taping of the interview described in the consent form.

I understand these are voluntary procedures and that I am free to withdraw at any time by requesting that either the taping be stopped or the interview be discontinued. I also understand that my name will not be revealed to anyone and that taping will be kept confidential. Tapes are coded with a random identification number, and are filed by number only. All materials will be stored in a locked cabinet contained in a locked office.

I understand that confidentiality will be respected and the use of these materials will be for the purposes outlined in the consent form for this research project only.

_____ _____

(Signature of Research Participant) (Date)

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APPENDIX B3: **LETTER OF INFORMATION**

Title of Study: The Experience of Deliberate Self-Harm

You are asked to participate in a research study conducted by **Sarah Bertrim, MA and Dr. Stephen Hibbard**, from the **Psychology Department** at the **University of Windsor** for a dissertation project. If you have any questions or concerns about the research, please feel to contact **Dr. Hibbard, XXX or Sarah Bertrim, XXX**.

PURPOSE OF THE STUDY: The purpose of the study is to develop a better understanding of what it is like for people in a university sample who have deliberately injured or harmed themselves.

PROCEDURES: If you volunteer to participate in this study, we would ask you to do the following things:

- Participate in a brief interview regarding certain harmful behaviours (approximately 20 minutes)
- Respond to a series of questionnaires (paper and pencil format) (approximately 1 hour 15 minutes)

POTENTIAL RISKS AND DISCOMFORTS: It is possible that some participants may find the content of interview or of some of the questionnaires upsetting. If this occurs you are encouraged to share your concerns with the researcher (Sarah Bertrim), the supervising psychologist (Dr. Hibbard), or one of the community resources from the list that you will be given.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY: The number of people who deliberately hurt or injure themselves is increasing, and is becoming more common in colleges and universities. This research will increase our understanding of what it is like for individuals who deliberately hurt or injure themselves. Participating in this research might provide you with an opportunity to better understand of this behaviour, and it will provide important information that will help the professional community provide better services to people in need.

PAYMENT FOR PARTICIPATION: Participants who have registered in the Psychology Participant Pool and are enrolled in a qualifying psychology course will receive 3 bonus marks toward their final grade in that course.

CONFIDENTIALITY: You will not write your name on any of the questionnaires, which will maintain anonymity and make all responses confidential. Although the results of this study may be published at a later date, individual results will not be available and therefore participants will not be identifiable.

PARTICIPATION AND WITHDRAWAL: You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don=t want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS: Upon request, a written summary of the results will be e-mailed to participants. These results should be available by April 2006. A website will also be available, which participants may access as they are interested.

SUBSEQUENT USE OF DATA: The data from this study may be used in subsequent studies, and may be presented at professional conferences or published in professional journals.

RIGHTS OF RESEARCH SUBJECTS: You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact:

Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4
Telephone: 519-253-3000, ext. 3916; E-mail: ethics@uwindsor.ca

SIGNATURE OF INVESTIGATOR These are the terms under which I will conduct research.

_____ _____

Signature of Investigator Date

ID#

APPENDIX B4: **UNDERGRADUATE DEMOGRAPHIC INFORMATION**

To help us describe the group of undergraduates that participated in this study, please answer the following questions by filling in the blanks or checking the appropriate box. You may omit questions that you do not wish to answer. You are, however, encouraged to answer as many questions as possible.

1. Your age: _____

2. Your sex: [ ] Female [ ] Male

3. Your marital status: [ ] Single [ ] Married [ ] Separated/Divorced
   [ ] Commonlaw [ ] Other (specify_____)

4. With which ethnicity do you most closely identify? _____

5. Your year in university: _____

6. Your major: _____

7. How would you describe your family of origin's level of income (the family with which you grew up)?
   [ ] Very comfortable, did not worry about money at all
   [ ] Fairly comfortable, did not worry much about money
   [ ] Somewhat comfortable, but had to be careful with our day-to-day spending
   [ ] Moderately low, we had to do without some things
   [ ] Very low, we had to do without a lot of things

8. Have you ever sought help or counseling from a mental health professional (i.e. a psychologist, psychiatrist)? [ ] Yes [ ] No

   If yes: for how long did you seek help?
   _____years and _____months

9. Have you ever been diagnosed with any of the following (by a mental health professional, family physician etc)? Please check any / all that apply. If you are unsure, please specify your response under "other":

[ ] Depression
[ ] Bipolar disorder
[ ] Tourette's Disorder
[ ] Obsessive Compulsive Disorder
[ ] Posttraumatic Stress Disorder
[ ] Generalized Anxiety Disorder
[ ] Anorexia Nervosa
[ ] Bulemia Nervosa
[ ] A Dissociative Disorder
[ ] Learning Disability
[ ] Attention Deficit/Hyperactivity Disorder
[ ] Conduct / Oppositional Defiant Disorder
[ ] Pathological Gambling
[ ] Kleptomania
[ ] Pyromania
[ ] Intermittent Explosive Disorder
[ ] A Personality Disorder
[ ] Schizophrenia/Another Psychotic Disorder
[ ] A substance-related disorder (substance abuse or dependence)
[ ] Other (please specify:_____)

ID#

To help us describe certain aspects of your experience, please answer the following questions. We respect your privacy, and remind you that all of the information you provide will be coded numerically and carefully stored to ensure that anonymity and confidentiality are maintained. You are therefore encouraged to answer these questions as openly and honestly as possible, which will help us understand the experiences of people who engage in Deliberate Self-Harm. If you have questions or concerns, please discuss them with the researcher. You may omit questions that you do not wish to answer. If you wish, you may elaborate or clarify your responses with additional comments.

For the following questions, please use the definition below:

Deliberate Self-Harm (DSH) involves the deliberate and direct destruction or alteration of one's own body tissue (cutting, scratching, burning, hitting, or other intentional injury to one's own body) without conscious suicidal intent, but resulting in injury severe enough for tissue damage to occur (i.e. scarring, bruising). *This does not include culturally sanctioned destruction of tissue (i.e. piercings and tattoos) unless these are excessive or outside of the cultural norm; it also does not include self-poisoning (i.e. taking pills ingesting poison), or indirect methods of self harm (i.e. risky behaviours, inadequate self-care)*

10. How old were you when you first engaged in DSH?
(if you can't remember, please make your best guess at how old you were) _____

11. Do you currently engage in DSH? [ ] Yes [ ] No

If no, how old were you when you stopped engaging in DSH?_____

12. For how many years/months did you engage in DSH (from the time you started, until the last time you engaged in the behaviour)

_____years and _____months

13. How many times in your life have you engaged in DSH behaviour?

[ ] Once	[ ] 11 to 15 times	[ ] 31 to 40 times
[ ] 2 or 3 times	[ ] 16 to 20 times	[ ] 41 to 50 times
[ ] 4 to 5 times	[ ] 21 to 25 times	[ ] more than 50 times
[ ] 6 to 10 times	[ ] 26 to 30 times	

14. Have you ever received medical treatment as a result of your DSH behaviour?
[ ] Yes [ ] No

ID#

15. Have you ever received mental health treatment as a result of your DSH behaviour?

[ ] Yes [ ] No

If yes, please specify what type of professional provided this treatment:

[ ] Psychologist [ ] Psychiatrist
[ ] Social worker [ ] Other (specify:_____)

If yes, please specify how many sessions you attended: _____sessions

If yes, please specify the type of treatment (check all that apply):

[ ] Individual Therapy [ ] Group Therapy
[ ] Family Therapy [ ] Other (specify:_____)

If yes, did you find this treatment to be helpful?

[ ] It was very helpful
[ ] It was partially helpful
[ ] It was not helpful

16. Have you ever been hospitalized in a mental health facility as a result of your DSH or associated problems?

[ ] Yes [ ] No

17. Do you consider your DSH to be a problem for you at this time? (That is, is your DSH bothersome to you, does it cause you emotional distress, or does it interfere with your ability to function in school, work, or relationships?)

[ ] Yes [ ] No

APPENDIX B5: **DSH QUESTIONNAIRE FOR UNDERGRADUATES**

ID#

<u>In reference to the DSH described above,</u> please indicate how much you agree with each statement listed below. We are interested in learning about how you view your DSH behaviour. Items are presented in the present tense. However, if you are no longer engaging in DSH, please respond according to what it was like for you when you did engage in DSH. **Please use the following scale:**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
(SD)	**(D)**	**(N)**	**(A)**	**(SA)**
1	2	3	4	5

	In my view, I...	**SD**	**D**	**N**	**A**	**SA**
1.	...am impulsive in many areas of life	1	2	3	4	5
2.	...am a perfectionist in many areas of life, working hard to make sure I do everything "just right"	1	2	3	4	5
3.	...engage in DSH on impulse or on a whim, without thinking about my behaviour	1	2	3	4	5
4.	...engage in DSH because I become overwhelmed with generalized anxiety and do not know how to cope	1	2	3	4	5
5.	...engage in DSH because something about the behaviour itself is rewarding or gratifying	1	2	3	4	5
6.	...engage in DSH only after having agonized over or trying to avoid the behaviour for a substantial period	1	2	3	4	5
7.	...have a compulsion to engage in DSH well before acting, rather than just doing it on a whim	1	2	3	4	5
8.	...desire excitement and enjoy new or risky situations	1	2	3	4	5
9.	...seem to exert little or no control over my thoughts, feelings or behaviour	1	2	3	4	5
10.	...am a cautious individual who prefers to "play it safe" and avoid new or risky situations	1	2	3	4	5
11.	...let my urges and emotions dictate what I do	1	2	3	4	5
12.	...am more influenced by what I "should" do than by what I actually want	1	2	3	4	5
13.	...am typically ashamed or regretful after I engage in DSH behaviour	1	2	3	4	5
14.	...only regret my DSH behaviour because I gets in trouble (i.e. by family, friends, physician)	1	2	3	4	5
15.	...experience DSH as alien or senseless	1	2	3	4	5
16.	...tend to make decisions quickly without thinking them through	1	2	3	4	5
17.	...engage in DSH because I feel that it makes up for bad or wrong things I have done	1	2	3	4	5
18.	...feel excited by my DSH	1	2	3	4	5
19.	...understand DSH as something I *want* to do	1	2	3	4	5
20.	...understand DSH as something I *need* to do	1	2	3	4	5

ID#

APPENDIX B6: **UNDERGRADUATES: THE EXPERIENCE OF DSH**

People engage in behaviour that is harmful to themselves for a variety of reasons. In the space provided below, please describe in a few sentences *how you understand your DSH behaviour*. We are interested in the essence of what purpose you believe DSH serves for you, and what it is like for you when you engage in DSH.

As you are writing, please try to address what it is like for you through each step of DSH; what are you thinking and feeling immediately before you engage in DSH, while you are actually engaging in the behaviour, and afterwards.

Please write just what comes to mind – do not spend too much time trying to think of what to write. There are no right or wrong answers, and your response will be kept strictly confidential and anonymous. If you are having trouble getting started, you may want to think of the most recent time you engaged in DSH. This might help you remember what the experience was like for you.

When you have finished, please advise the researcher.

ID#

APPENDIX B7: **SEMI-STRUCTURED INTERVIEW**

"Do you have any questions about the paragraph you wrote, or about anything so far? (if yes, address questions / concerns). Now I'd like to spend a little time getting to understand what this behaviour is like for you. How would you like me to refer to it?" _____(Throughout interview, the interviewer will refer to the behaviour with the participants' preferred term). The interviewer will obtain informed consent for audiotaping, and remind the participant that he/she may take a break or discontinue the interview at any time if he/she feels uncomfortable.

The interviewer will use the questions below to probe for these aspects of the participant's experience. The interviewer will respond empathically and endeavour to evoke elaborations as appropriate (e.g., "What was that like for you?" "Can you tell me more about that"). The interviewer will be sensitive to the participant's comfort level, and will check with the participant periodically to ensure that he/she is comfortable and willing to continue.

EXPERIENCE LEADING UP TO DSH

First, I would like to get to know a bit about what it is like for you before you _____.

Try to think of the most typical scenario for you, what it is usually like for you in the moments or hours leading up to when you _____. Can you tell me a bit about what it's like for you?

_____

_____

_____

_____

Can you identify any triggers that seem to make you likely to _____? What kinds of things might be going on around you, what is your experience inside (thoughts, feelings)?

_____

_____

_____

_____

What do you typically do before you _____? Where do you go, who do you talk to (if anyone), what do you do?

How much time do you spend thinking about _____ before you do it? What kinds of things go through your mind (if anything)? {Do you do it more on a whim, without really thinking about it; or do you spend some time thinking about it beforehand? Do you do it as soon as you are able to, or do you try to avoid it or resist it?}

Before you _____, how do you feel about _____? Can you tell me more about what kinds of feelings you have before you _____, in your own words? {Is it something you are drawn to do? If you are drawn to it, do you feel like you want to do it (like it's exciting or feels good), or is it more like you feel like you have to do it (like you are compelled to or need to do it)? Do you look forward to it because it will be enjoyable or exciting, or is it something you would rather not have to do but feel like you need to?}

What do you feel physically, if anything, in the hours and moments before you _____?

EXPERIENCE DURING DSH

Now I'd like to learn a bit about what it is like for you while you are actually_____.

Think about what it is like for you as you are _____. Can you tell me what that is like for you? (Think about when you first _____, and as you continue to _____.)

Where do you typically ____, what are the circumstances? (i.e. where does it happen, are there people around, what time of day/night, do you prepare ahead of time, or does it just happen?)

What are you thinking about as you _____, if anything? (anything or anyone on your mind? What kinds of things do you think about or worry about)

What do you feel physically, if anything?

What emotions do you feel most strongly, if any?

EXPERIENCE FOLLOWING DSH

Now I'd like to learn a bit about what it is like for you after you have_____.

Think about what it is like for you immediately after you finish _____, and in the moments and hours following your _____. Can you tell me what that is like for you?

What typically happens after you have finished (what do you do, where do you go, who do you see/talk to)

What are you thinking about after you _____, if anything? (anything or anyone on your mind? What kinds of things do you think about or worry about)

What do you feel physically, if anything? (if states vague idea of "relief" or "calm", ask participant to elaborate; can you explain what you mean by ___?)

What emotions do you feel most strongly, if any?

Thank you for sharing that experience with me. Now that we have gone through your experience step-by-step, if you had to sum up your experience of _____, what would you say? How do you understand it, what purpose do you think it serves for you?

Do you have any questions or concerns, or is there anything we have not covered that you think would be important for me to know? Address questions / concerns.

APPENDIX B8: **DEBRIEFING FORM**

UNIVERSITY OF WINDSOR

Title of Study: **The Experience of Deliberate Self-Harm**

You have just participated in a research study conducted by **Sarah Bertrim, MA, and Dr. Stephen Hibbard**, from the **Psychology Department** at the **University of Windsor** for a dissertation project. Your contribution to this research project is very much appreciated.

PURPOSE OF THE STUDY: As stated in the information form, the purpose of the study is to develop a better understanding of what it is like for people in a university sample who have deliberately injured or harmed themselves. We would also like to develop an understanding of how psychologists and psychiatrists conceptualise deliberate self-harm by surveying professionals on the subject, and are conducting a survey of professionals in the area. Recent research suggests that the prevalence of Deliberate Self-Harm (DSH) has increased, and that 14% of college and university samples engage in this behaviour (Favazza, 1992). Traditionally, this behaviour has been viewed as the result of impulsivity, and these individuals are viewed primarily as having difficulty in controlling their impulses or urges to act. However, if one considers more detailed definitions of impulsive and compulsive acts, we believe that this behaviour may share more features with a compulsive act than previously considered. That is, we believe that DSH may reduce anxiety for people, but that it is not particularly rewarding or gratifying in its own right. Therefore, we are investigating the impulsive and compulsive aspects of DSH behaviour in an undergraduate sample. We included the survey of mental health professionals to evaluate how they conceptualise DSH in the populations with whom they work, and hope to make a comparison of the responses of undergraduates and professionals.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS: Upon request, a written summary of the results will be e-mailed to participants. These results should be available by August 2006. A website will be made available, which participants may access if interested.

If you have any questions or concerns, you may contact the student investigator **(Sarah Bertrim; XXX)** or the faculty supervisor **(Dr. Hibbard; XXX)**. You may also direct questions to:

Research Ethics Coordinator, University of Windsor
Windsor, Ontario N9B 3P4
Telephone: 519-253-3000, ext. 3916; E-mail: ethics@uwindsor.ca

RESOURCES: If you would like to seek professional help to address the behaviour you discussed as part of this study (or associated problems), free services are available on campus through the **Student Counselling Centre, Room 293 of the CAW Student Centre (253-3000 ext. 4616)** or the **Psychological Services Centre, 326 Sunset Ave. (973-7012).** You may also seek services with community-based mental health professionals, listed in the yellow pages under "psychologists and psychiatrists". In the case of an emergency, you may go directly to any hospital emergency department, or call the Hotel Dieu Grace Crisis Centre (519-973-4435).

Again, your contribution to this research project is greatly appreciated.

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