Toward a Better Understanding of Non-Suicidal Self-Injury in University Students: Examining Associations with Parent-Child Relationships, Emotion Regulation Difficulties, and Contextual Risk Factors

Camille Guérin-Marion

Thesis submitted to the University of Ottawa
in partial fulfillment of the requirements for the
for the PhD in Clinical Psychology

School of Psychology
Faculty of Social Sciences
University of Ottawa

Preface and Public Statement

The present thesis deals with sensitive topics relating to non-suicidal self-injury (NSSI) behaviors in university students. NSSI is a behavior that develops in the context of complex interactions between environmental, neurobiological, and psychological risk factors. In other terms, no single experience can "cause" NSSI behaviors in a vacuum. Among these possible risk factors, the current thesis places emphasis on elucidating the extent to which the emotional climate of a youth's relationship with their parents may relate to NSSI risk. This is critical in clarifying prevention and intervention targets that help to inform care for youth who self-injure and their families. However, it is equally as important to underscore that youth who self-injure can have vastly different relationships with their parents, including very supportive and positive ones. Even more importantly, parents often play a critical role in supporting youth's healing and recovery from NSSI. Although these perspectives extend beyond the scope of results discussed in the current thesis, they are foundational to guiding effective clinical work with youth who self-injure and their families.

Dissertation Abstract

Non-suicidal self-injury (NSSI) is increasingly understood as representing a public health concern and a behavioral marker of emotional and psychological distress among young people. NSSI is prevalent during the period of young adulthood, including among emerging adults pursuing a university education, yet the vulnerability factors associated with NSSI in this population merit more in-depth and contextualized investigation. The current dissertation's overarching objective was to better understand the risk context surrounding university students' engagement in NSSI. Using a sample of 2,579 students (75.2% female; M_{age}=18.97; SD_{age}=1.54), **Study 1** first explored the roles of parental (mother and father pressure) and intrapersonal (emotion dysregulation, academic coping, perfectionism subtypes) risk factors in university students' likelihood and frequency of engagement in NSSI in the past year. An integrated latent structural equation model revealed that higher levels of perceived mother and father pressure were associated with a greater likelihood of past-year NSSI engagement in the university student sample. Among intrapersonal risk factors, only emotion dysregulation was found to be associated with higher NSSI likelihood and frequency. Building upon these results, **Study 2** sought to narrow in further on understanding the emotion regulation profiles of university students with a past-year history of NSSI. Using a person-centered statistical approach, university students who reported having engaged in NSSI within the past year (n = 479; 83.8% female; M_{age} = 18.77; SD_{age} = 1.43) were classified into latent profiles based on their self-perceived difficulties in regulating both positive and negative emotions. Independent samples of students who had a past history of NSSI but had not self-injured within the previous year (n = 439; 82.9% females; M_{age} = 19.03, SD_{age} = 1.62) and who had no history of NSSI (n = 1551; 69.9% females; M_{age} = 19.02, SD_{age} = 1.55) were included as comparison groups. Latent cluster analyses uncovered three emotion regulation profiles within the NSSI sample—the Average Difficulties (47.4%), Dysregulated (33.0%), and Low Difficulties (19.6%) profiles—each

of which differed meaningfully from both comparison samples on mean levels of emotion regulation difficulties. Students across the three profiles also differed in their self-reported experiences with parents, particularly with fathers (perceived pressure, antipathy, unresolved attachment, psychological control), and in the extent to which they felt alienated from parents. Lastly, students across profiles differed in the frequency, methods, functions, and addictive properties of their NSSI. Taken together, findings from the current dissertation expanded our awareness of vulnerability factors for NSSI that have historically been understudied (e.g., parental pressure, father-child relationships, dysregulated positive emotions), while also bringing into focus the notion that even well-established NSSI risk factors (emotion regulation difficulties) can manifest quite heterogeneously amongst university students with a history of self-injurious behavior.

Keywords: Non-suicidal self-injury, Emotion regulation, Parent-child relationships, Father-child relationships, Parental pressure, Positive emotion regulation, Academic coping, Perfectionism, University students.

Acknowledgements

I have been profoundly fortunate to receive the support, mentorship, and friendship of numerous people as I produced this dissertation. Among my greatest fortunes by far was to have my "secure base" and supervisor, Dr. Jean-François Bureau (JF), guiding me through the full lengths of the journey with such unfailing wisdom, dependability, and confidence-inspiring trust. Je suis remplie de reconnaissance, JF, pour la confiance sans réserve que tu m'as accordée; pour ton assurance indéfectible à travers mes moments de doute et de remise en question; pour les nombreuses fois où ton bassin de connaissances, ta créativité, ta rigueur intellectuelle, et tes encouragements ont donné un second souffle à ma propre inspiration en tant que chercheuse; et, surtout, pour la générosité inégalée de ton écoute, humour, disponibilité, et flexibilité. Tu es un superviseur d'exception. Merci pour tout.

I wish to sincerely thank the members of my thesis committee, Drs. Marie-France Lafontaine, Fanny-Alexandra Guimond, and Cristina Atance, as well as my external examiner, Dr. Chloe Hamza, for their generous investment and insightful feedback on my dissertation. Many thanks also to Drs. Patrick Gaudreau and Jodi Martin for the insights they enthusiastically contributed to this project. Pour son expertise en matière de statistiques, je me dois d'amplement remercier Dr. Alexandre Gareau : ton appui dans les derniers milles de ce projet a été plus que précieuse. I also owe a warm thank you to Dr. Kristel Thomassin for welcoming me into this graduate program in 2016. Lastly, to other key professional mentors who, in big and small ways, have played a role in harnessing and orienting my sense of identity as a researcher and clinician: thank you for everything you have taught me.

I could not imagine having gone through the better part of my doctoral studies without the companionship of my colleagues and friends, both within and outside of the academia bubble. Thank you for the countless phone chats, girls' nights, pandemic picnics, lab get-togethers, and

virtual and 3-D hang-outs—you kept me grounded and balanced. Special thanks to Maude and Cass, both of whom I met on the very first day of grad school and who quickly became two of my most precious friends. Each of you, in your own special way, has been an irreplaceable source of understanding and support over these past few years.

Merci mille fois à ma famille et plus spécialement mes parents, André et Suzanne, pour leur écoute, empathie, et appui constant. En plus de ne jamais manquer à l'appel (littéralement), vous continuez de m'enseigner un système de valeurs qui me suit à travers tout ce que j'entreprends dans la vie. De dire que je m'en compte choyée serait à peine suffisant.

To my loving partner, Will, who came into my life in my third year of grad school and who has held my hand through every big and small moment since: I cannot express enough how grateful I am for the support, understanding, tenderness, and laughter you bring to me daily. Doing life with you is a gift. I cannot wait for our next chapter.

Thank you to the Social Sciences and Humanities Research Council's Canada Graduate Scholarship program, the Ontario Graduate Scholarship program, and Multi-Health Systems Assessments for funding my doctoral research.

Thank you, finally, to all the university students who shared their experiences with us in this research, without whom none of this could have been possible.

Statement of Co-Authorship

Data for this dissertation were collected as part of a large-scale online study led by Drs. Jean-François Bureau (principal investigator), Marie-France Lafontaine, and Patrick Gaudreau. The two articles that comprise this dissertation were prepared by myself under the supervision of Dr. Jean-François Bureau. Both studies also benefitted from the contributions of key collaborators, as further detailed here.

The first article (**Chapter 2**) has been submitted for publication in a peer-reviewed journal. Chapter 2 integrates additions made to the submitted version of the manuscript in the interest of comprehensiveness. As leading author, I managed the dataset, prepared and cleaned the raw data, conceptualized the research questions, planned and performed all statistical analyses, and wrote the complete manuscript. My supervisor, Dr. Bureau, appears as second author on the study. He provided conceptual oversight on the study and assisted with revising the manuscript. The third author, Dr. Alexandre Gareau, provided statistical consultation support with the data analyses and provided input on manuscript writing for the journal submission. My final two co-authors, Drs. Marie-France Lafontaine and Patrick Gaudreau, provided input on the larger research design and on manuscript writing for the journal submission.

The second article (**Chapter 3**) was published online in January of 2021 (accepted: December 2020) in the *Journal of Youth and Adolescence* (Guérin-Marion et al., 2021; DOI:10.1007/s10964-020-01378-9). Chapter 3 integrates minor modifications/additions made to the published version of the article in the interest of comprehensiveness. My role in conducting the study was in managing the dataset, preparing and cleaning the raw data, conceptualizing the research questions, planning and performing all statistical analyses, and writing the complete manuscript. My supervisor, Dr. Bureau, appears as second author and provided oversight on all

aforementioned steps. My co-authors on the study, Drs. Marie-France Lafontaine, Patrick Gaudreau, and Jodi Martin, provided input on the larger research design and on manuscript writing.

Table of Contents

List of Tables

List of Figures

CHAPTER 1: General Introduction

Understanding NSSI: Definition, Facts and Figures

Non-suicidal self-injury (NSSI) refers broadly to intentional and self-inflicted bodily harm performed without suicidal intent (Heath et al., 2009; Nock & Favazza, 2009). The behavior implicates primarily unsanctioned actions and methods (Heath et al., 2009; Nock & Favazza, 2009), meaning that it excludes body modifications performed for an aesthetic purpose and/or that are considered culturally or socially normative to a degree (e.g., body piercings, tattooing, self-injurious cultural practices). Also traditionally excluded from modern definitions of NSSI are forms of self-injury that reflect nervous compulsive habits (e.g., nail biting, picking at wounds), trichotillomania (e.g., hair-pulling), or stereotypic behaviors associated with autism or developmental delays (American Psychiatric Association, 2013). Within these parameters, NSSI behaviors are well known to manifest heterogeneously. Most frequently, youth engage in NSSI on more than one body part and using more than one method (Cipriano et al., 2017; Sornberger et al., 2012), such as by way of cutting, scratching, head-banging, hitting/punching the self, burning the skin, and/or biting the skin, among other methods (Cipriano et al., 2017; Lloyd-Richardson et al., 2007; Sornberger et al., 2012). Although some of these behaviors (e.g., cutting and scratching) are particularly common in girls, contrary to popular belief, NSSI has been shown to occur at high rates across both males and females (Bresin & Schoenleber, 2015; Swannell et al., 2014). At large, NSSI predominantly affects populations of young people, and is thus most common during adolescence and young adulthood (Swannell et al., 2014).

NSSI belongs to the broader class of self-harming behaviors, which encompasses all behaviors performed intentionally in spite of their known potential to cause physical or psychological harm to the self (Nock, 2010). Given the many possible manifestations of self-harm behavior and the multifaceted landscape of self-harm research, some important conceptual distinctions ought to be specified in order to operationalize NSSI behavior. The first of such

distinctions, as articulated by Nock (2010), lies in the primary intent of the self-harming behavior. Self-harming behaviours that are performed *without* the primary aim of causing direct tissue damage (e.g., purging behaviors, risky alcohol or drug use), despite often posing a contingent risk for injury, should be distinguished from NSSI and other self-injurious behaviours that are necessarily and intentionally aimed at causing injury. Within this subclass, one additional distinction is that of suicidal intent (Nock, 2010). Self-injurious thoughts and behaviors can be understood as suicidal when driven primarily by a conscious desire or intent to die (e.g., suicidal ideation, planning, attempts). NSSI, on the other hand, is performed *without* suicidal intent, meaning that the act of self-injury is not meant to be lethal in and of itself (Nock, 2010; Nock & Favazza, 2009).

The Physical and Psychosocial Outcomes Associated with NSSI

Despite the fact that NSSI is performed with the expectation that no lethal physical harm will occur, young people who self-injure—and particularly those who do so chronically—commonly suffer from significant psychological distress (Bentley et al., 2015; Liu, 2021; Lloyd-Richardson et al., 2007) and suicidal ideation (Griep & MacKinnon, 2020). While numerous factors are believed to contribute to the co-occurrence of NSSI and suicidality, researchers and theorists have proposed that repeated engagement in NSSI can, in some cases, confer a degree of risk for suicide by facilitating a desensitization to self-inflicted pain and/or to the fearful feelings associated with suicidal behavior (see Ammerman et al., 2016; Joiner et al., 2012). In line with this, most studies support a link between NSSI and suicidality (Griep & MacKinnon, 2020; Ribeiro et al., 2016), with some underscoring NSSI as a particularly robust predictor of suicide (Klonsky et al., 2013) and, accordingly, as a considerable health risk among young people.

While the downstream risk for a fatal outcome is heavily emphasized when discussing concerns around NSSI, a number of other negative—and far more common—outcomes can result

from one's engagement in the behavior. In addition to posing a risk for permanent scarring, which can bring about significant shame and regret for a young person (Burke et al., 2020; Lewis & Mehrabkhani, 2016), research suggests that approximately 20-30% of young people report that their NSSI behavior has at least once resulted in unintentionally severe physical injury (i.e., worse injury than intended; Ammerman et al., 2019; Buser et al., 2017; Whitlock et al., 2014). Moreover, while some studies show that few individuals ever present to the hospital for NSSI-related injuries (Ammerman et al., 2019), other research has shown that approximately one third of individuals report at least one severe incident of NSSI that reached the point of requiring medical attention (Liu, 2021; Whitlock et al., 2014). Such escalations in the severity of NSSI-related injuries are believed to arise as a result of the alteration in pain perception and overall psychological desensitization often observed as a result of young people's chronic use of NSSI (Koenig et al., 2017).

Beyond physical scarring and injury, research also supports the notion that NSSI predicts increases in psychosocial stress. For instance, prospective research has shown that NSSI is associated with increases in perceived stress (Boyne & Hamza, 2021; Ewing et al., 2019), decreases in school engagement (Baetens et al., 2021), as well as increases in interpersonal stressors (Burke, Hamilton, et al., 2015), such as romantic and parent-child conflict (Miller et al., 2018). While these trends are likely to be the result of a complex interaction of factors, the social consequences of NSSI may be partially attributable to the considerable stigma associated with the behavior (Burke et al., 2019; Lloyd et al., 2018). The stigma surrounding NSSI tends to be experienced by young people as more pronounced than the stigma around mental illness in general (Hamza et al., 2021) and is reflected, for instance, in the enduring depictions of self-cutting as an "attention-seeking" behavior in some areas of public discourse (Gratz, 2003; Heath et al., 2006; Klonsky et al., 2014). For this reason, young people who engage in NSSI may be at increased risk

of experiencing rejection, conflict, or be the subject of negative attitudes in their social environments (Burke et al., 2019; Lloyd et al., 2018), in addition to potentially feeling reluctant to disclose and/or seek help for their NSSI (Lloyd et al., 2018; Simone & Hamza, 2020). Alarmingly, in a study of 1,776 university students with a history of NSSI, only 16.9% of those who utilized mental health services reported having disclosed their NSSI behavior to their therapist (Whitlock et al., 2011). Although higher rates of NSSI disclosures have been reported in later studies, overall, young people generally appear less likely to disclose their NSSI to a professional than to informal sources, making friends and peers the most common recipients of such disclosures (Simone & Hamza, 2020).

Across the board, NSSI stands out as a particularly salient behavioral marker of emotional and psychological suffering in young people. This notion, in and of itself, has driven much of the empirical interest around the behavior historically and carries important implications for clinicians and researchers who seek to understand and prevent the behavior. Notably, the latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) listed NSSI as a condition necessitating further study, thereby setting an imperative for the research community to further investigate the manifestations, risk factors, and etiology of the behavior. From an applied perspective, such investigations are crucial in orienting clinicians towards a better understanding of NSSI and its underpinnings, which ultimately provides the foundation to more effective prevention and intervention efforts.

Incidence and Prevalence of NSSI Across Population Types

NSSI is increasingly understood to be a widespread phenomenon. The existing research supports the notion that NSSI can be found at broadly comparable rates across various cultural and ethnic groups (Gholamrezaei, Stefano, et al., 2017), countries (Gholamrezaei, Stefano, et al., 2017; Muehlenkamp et al., 2012; Swannell et al., 2014), and both males and females (with slightly higher

prevalence rates in females; Bresin & Schoenleber, 2015). Numerous nuances in prevalence rates nonetheless exist and are important to mention. For instance, a meta-analysis showed that binary gender differences in NSSI prevalence rates, while small in magnitude overall, are more pronounced in clinical samples than in community or university samples (Bresin & Schoenleber, 2015; see, also, Swannell et al., 2014). Likewise, as mentioned previously, some NSSI methods (e.g., cutting, scratching) tend to be more prevalent among females (Bresin & Schoenleber, 2015), whereas males have been shown to use self-battery methods more frequently in some research (e.g., punching self or body parts; Ammerman et al., 2019). A more recent meta-analysis also showed that gender diverse individuals (e.g., transgender), along with other members of the LGBTQ community, are at elevated risk of engaging in NSSI (Liu et al., 2019), which likely reflects the impact of the significant minority stress and marginalization facing these communities. On the whole, gender patterns in NSSI prevalence have often been inconsistent across studies and likely vary as a function of other factors, including country of origin and ethnic group (Gholamrezaei, Stefano, et al., 2017). The relationship between ethnicity and NSSI is, in itself, also remarkably complex and far from well understood. While rates of NSSI may appear comparable across Western and non-Western countries (Gholamrezaei, Stefano, et al., 2017; Muehlenkamp et al., 2012; Swannell et al., 2014), available prevalence rates continue to be heavily skewed toward White/Caucasian and Western samples, thereby limiting the robustness of cross-cultural comparisons. Contextual factors such as ethnic minority or immigrant status, socioeconomic status, and religiosity are also highly likely to moderate the influence of ethnicity on NSSI prevalence (Gholamrezaei, Stefano, et al., 2017; Haney, 2020), making the relationship between culture/ethnicity and NSSI a difficult one to portray accurately in broad strokes.

There is also substantial evidence that NSSI has generalized to populations with varying levels of psychosocial risk. Historically, research efforts focused largely on documenting the

prevalence of NSSI among clinical populations, such as females hospitalized in inpatient psychiatric units (e.g., Offer & Barglow, 1960; Rosenthal et al., 1972), and paid comparatively little attention to the behavior within non-clinical populations (Walsh & Rosen, 1988). This trend in research is attributable to early conceptualizations of NSSI, which predominantly classified it as a symptom of psychopathology (e.g., Borderline Personality Disorder; Favazza, 1998) and as a developmental sequalae of severe abuse and neglect (Gratz, 2003; Yates, 2004). Over the years, however, NSSI began to draw increased attention in mainstream culture and media (Favazza, 1998; Purington & Whitlock, 2010), and concurrently, both school staff (Heath et al., 2006) and college counsellors (Whitlock et al., 2009) reported perceiving a rise in NSSI disclosures from youth in the community. Accordingly, researchers began to more closely investigate the risk factors associated with NSSI in community-based populations, such as high school and university student samples (e.g., Gratz et al., 2002; Klonsky & Olino, 2008; Ross & Heath, 2002; Whitlock et al., 2006). This broadened research focus helped to substantiate progressions in our understanding of the behavior. NSSI is now more commonly understood as a collection of behaviors that can emerge outside of the more obvious risk parameters of psychiatric or clinical populations—in many cases, even, in the absence of significant psychopathology (Klonsky & Olino, 2008) or severe maltreatment (Martin, Bureau, Yurkowski, Lafontaine, et al., 2016).

In terms of developmental course, research has shown that the risk for NSSI onset increases in early adolescence (around the age of 12 years; Plener et al., 2015), with prevalence and onset then peaking in mid-adolescence (i.e., ages 14 and 15 years; Cipriano et al., 2017; Gandhi, Luyckx, Baetens, et al., 2018; Plener et al., 2015). Although longitudinal studies have documented that the rates of NSSI steadily decrease following adolescence (Daukantaitė et al., 2020; Plener et al., 2015), pooled estimates have found evidence of a second peak in the incidence (or onset) of NSSI in early adulthood, around the ages of 20-24 years old (Gandhi, Luyckx,

Baetens, et al., 2018). The research of Kiekens and colleagues (2019), which investigated NSSI incidence among university students, also supports the notion that young adults—specifically those attending university—may be at increased risk of beginning to self-injure. Specifically, the researchers found that up to 10.3% of college students self-injured for the first time in their first year of university, and 6.0% in their second year. It should be noted that more minor and/or impulsive forms of NSSI (e.g., smashing hand or foot against the wall) were included in these estimates and found to be the most common self-injurious methods reported, which may have led to an inflation in incidence estimates. Nevertheless, by and large, NSSI is well known to persist beyond adolescence and into young adulthood (Swannell et al., 2014), thus making it the subject of significant clinical and empirical attention in populations of emerging adults.

Despite recognition that NSSI is a widespread concern, the prevalence of NSSI has been found to vary widely across non-clinical populations of young people. A comprehensive review of research performed in non-clinical samples by Swannell and colleagues (2014) reported pooled lifetime rates of 17% adolescents (10-17 years), 13% in young adults (18-24 years), and 5% in adults (25 years and up), although prevalence rates reported across individual studies varied from 2% to as high as 55% (Heath et al., 2009; Muehlenkamp et al., 2012; Swannell et al., 2014). Some methodological factors have been found to skew prevalence rates towards the lower and upper limits of this range. For instance, the inclusion of trivial forms of NSSI in studies (e.g., interfering with wound healing) are likely to inflate NSSI prevalence rates in studies (Plener et al., 2009; Swannell et al., 2014; Yates et al., 2008). Conversely, when assessing for a history of NSSI, the use of single-item questions may result in lower rates than the use of more detailed checklists of NSSI methods (Muehlenkamp et al., 2012; Swannell et al., 2014). This may be because checklists effectively prompt respondents to reflect on a greater variety of self-injurious behaviors.

Interestingly, Swannell and colleagues' (2014) review of NSSI rates identified a higher lifetime prevalence of NSSI in university student samples (20.2%) than in community-based young adult samples at large (13%). More recent prevalence studies have also shown that between 3% and 8% of university students report engaging in NSSI within 12 months of their entry to university (Kiekens et al., 2021; Taliaferro & Muehlenkamp, 2015). Thus, while variations in estimates exist (and may be partially accounted for by methodological factors, such as recruitment methods), these data could indicate that specific vulnerability factors for NSSI may disproportionately affect university students, and/or may arise within the context of the university student experience.

Why Do People Engage in NSSI?

The reasons why individuals engage in NSSI, otherwise referred to as the *functions* of NSSI, have generated significant clinical and empirical interest over the past two decades. Following a number of earlier exploratory studies (for a review, see Gratz, 2003), Nock and Prinstein (2004, 2005) were the first to articulate a theoretical framework and research agenda for the study of NSSI functions. Their model organized NSSI functions according to four types of reinforcements: *Automatic-negative reinforcement* refers to one's use of NSSI for the purpose of reducing a negative emotional experience (e.g., "to stop feeling sad"); *Automatic-positive reinforcement* indexes one's desire to induce a desired affective state (e.g., "to feel relaxed"); *Social-negative reinforcement* refers to an effort to escape a social demand or context (e.g., "to avoid punishment"); and *Social-positive reinforcement* refers to an effort to achieve a social gain or change (e.g., "for people to notice my suffering"). Nock and Prinstein's four-part model gained initial empirical support (Lloyd-Richardson et al., 2007) and is often credited for stimulating an increase in the research on NSSI functions (Martin et al., 2013; Whitlock et al., 2014). Later research expanded upon Nock and Prinstein's model, notably, and found that individuals

sometimes engage in NSSI at the service of self-punishment functions (e.g., “to punish myself”) and anti-dissociation functions (e.g., “to feel something when I feel numb or unreal”) (Klonsky, 2007). Studies have also found that a subset of individuals who self-injure endorse sensation-seeking functions, or a desire to achieve sensations of exhilaration or excitement through the use of NSSI (e.g., “to get a drug-like high”; Guérin-Marion et al., 2018; Martin et al., 2013; Whitlock et al., 2014). Factor analytic evidence has also demonstrated that NSSI functions can be collapsed into two broader categories of functions (i.e., intrapersonal and interpersonal; Klonsky et al., 2015; Zetterqvist et al., 2013) for a more parsimonious classification.

While NSSI functions can range broadly from intrapersonal to interpersonal motives, much evidence suggests that the most frequently reported reason as to why people self-injure is to alleviate distressing and overwhelming negative emotions (Klonsky, 2007, 2009; Nock & Prinstein, 2004; Taylor et al., 2018). This conclusion first arose out of early research data, pulled mainly from clinical and forensic populations (Klonsky, 2007), and then continued to hold true across community-based, high school, and university samples in later research (Taylor et al., 2018). In a meta-analysis by Taylor and colleagues (2018), pooled prevalence estimates drawn from 53 independent samples found that the majority of individuals who engage in NSSI (70-71%) do so to regulate their negative emotions. Other functions, including to induce a positive affect state (50%), to communicate distress to others (42%), and to influence a change in interpersonal relationships (28%) were also endorsed by sizeable, albeit smaller, subsets of individuals who engage in NSSI. In addition to being reported explicitly through checklists, the regulatory functions of NSSI have been evidenced through the use of ecological momentary assessments, such as daily diary studies (for reviews, see Hepp et al., 2020; Rodríguez-Blanco et al., 2018), as well as experimentally, through measurements of emotional responses to evocative NSSI scripts/images (Hamza & Willoughby, 2015). It should be noted that research on NSSI functions

has been skewed toward female-dominant samples (Taylor et al., 2018), and the emotion regulation functions of NSSI may be less prominent in males (Victor et al., 2018; Whitlock et al., 2011). In any case, the fact that a desire to escape overwhelming emotional experiences drives engagement in NSSI in such a widespread proportion of individuals provided a strong rationale for researchers to investigate the role of emotion regulation difficulties as a risk factor for NSSI.

The Role of Emotion Regulation Difficulties in NSSI

Etiological models of NSSI behavior have placed much focus on emotion regulation difficulties as playing a central role in NSSI engagement. The following section offers a definition of emotion regulation, reviews etiological models of NSSI that focus on emotion regulation mechanisms, and provides an overview of the research supporting the role of emotion regulation difficulties in NSSI.

What is Emotion Regulation?

Emotion regulation encompasses the various processes by which we monitor, evaluate, and manage intense emotional arousal (Eisenberg et al., 2010; Gratz & Roemer, 2004; Gross, 1998; Thompson, 1994). Theorists and researchers have proposed various conceptualizations and models of emotion regulation. Gross's (1998) process model, for instance, stipulates that emotion regulation strategies can be antecedent-focused (e.g., situation selection, attention orientation) or response-focused (e.g., modulation of emotional expression, relaxation) depending on when they are deployed along the emotion generative process. Thompson's (1994) definition emphasizes the interplay of multiple subprocesses of emotion regulation (e.g., monitoring of emotions, evaluation of emotions) and draws particular attention to the notion that individuals can upregulate or downregulate emotions—particularly in terms of how intense they are and how long they last—both internally and via the influence of social others. In close parallel with these theories, Gratz and Roemer (2004) then proposed a multidimensional and skills-based model of emotion

regulation, emphasizing the notion that regulatory processes encompass abilities beyond the modulation of emotional reactions. More specifically, the model conceptualizes emotion regulation as encompassing the ability to monitor and understand emotions within the self; to accept emotions; to control emotion-driven impulses and goal-directed behavior in the context of an emotional stressor in accordance with external demands and goals; as well as to flexibly apply different regulation strategies that can achieve one's desired changes in emotional responses (Gratz & Roemer, 2004). This model has generated much empirical support over the years and is frequently applied to NSSI research more specifically (Wolff et al., 2019; You et al., 2018). This is perhaps because its companion measure, the *Difficulties in Emotion Regulation Scale* (Gratz & Roemer, 2004), offers a highly explicit and comprehensive breakdown of emotion regulation skills for researchers to utilize.

Notwithstanding some differences in conceptualizations, all theorists would agree that emotion regulation involves a diversified rubric of interrelated skills and processes (Eisenberg et al., 2010; Gross, 2011; Thompson, 1994) that, together, play an instrumental role in promoting social and emotional adaptation outcomes (Compas et al., 2017; Eisenberg et al., 2010). Emotion *dysregulation*, on the flip side, may be viewed as representing marked difficulties with one (but more likely multiple) regulatory process or skill (Gratz & Roemer, 2004), most often manifesting outwardly as an inability to effectively modulate intense emotional responses (Linehan, 1993). Some authors have also described emotion dysregulation in behavioral terms, as involving a tendency to experience heightened emotional reactivity to environmental stimuli and more sustained activation (i.e., a slowed return to baseline) in the aftermath of emotional reactions (Crowell et al., 2009; Linehan, 1993; see, also, Nock et al., 2008).

Etiological Models of NSSI Behavior

Etiological models of NSSI, which aim to explicate the factors that precipitate or contribute to one's engagement in self-injury, have converged on the notion that emotion regulation difficulties are intimately involved in the initiation of NSSI behavior. Among the most widely researched models of NSSI behavior is the experiential avoidance model (Chapman et al., 2006), which emphasizes the avoidance of internal experiences (e.g., distressing emotions, thoughts, physical sensations) as the main causative process underlying NSSI. Dovetailing with Nock and Prinstein's (2004) functions framework, the experiential avoidance model stipulates that NSSI is primarily a negatively-reinforced avoidance behavior that is performed for the purpose of escaping aversive or uncomfortable emotional experiences. Parsing this idea out further, the model emphasizes that key emotion regulation difficulties underpin experiential avoidance patterns (e.g., difficulties with distress tolerance, non-acceptance of emotions, difficulty implementing skillful strategies in response to emotional arousal) and drive engagement in NSSI (Chapman et al., 2006). Arguably, several other emotion regulation difficulties (e.g., difficulty understanding and identifying emotions; see Anderson & Crowther, 2012) could also contribute to increased experiential avoidance and, in turn, NSSI.

The emotional cascades model (Selby & Joiner, 2009) is another empirically supported model that places emphasis on the role of rumination in NSSI (as well as in other dysregulated behaviors often observed in individuals with Borderline Personality Disorder). In this model, rumination is defined as the tendency to think repetitively about negative emotional experiences and their contingencies. When an individual engages in ruminative thinking, this is thought to amplify and escalate negative affect, which in turn biases the individual's thinking further toward negative affective experiences and beliefs. In this way, rumination locks the individual into a self-perpetuating cycle (or an "emotional cascade") that quickly becomes overwhelming and

distressing. Dysregulated coping behaviors, such as NSSI, are then conceptualized as providing a distraction from the emotional cascade because they interrupt the "rumination-negative affect" cycle. This relief from the emotional cascade is, however, temporary at best.

Each of these two models, along with other theoretical elaborations (McKenzie & Gross, 2014) and the previously reviewed literature on NSSI functions (Gratz, 2003; Klonsky, 2007; Nock & Prinstein, 2004), provided foundation for a sizable body of research investigating associations between emotion regulation difficulties and NSSI. An overview of this research is presented next.

Research on Emotion Regulation and NSSI

Consistent with the theoretical models reviewed above, research has consistently demonstrated that individuals with a history of NSSI exhibit greater mean levels of emotion dysregulation than their peers who do not self-injure. This finding has held true in clinical samples of youth (e.g., Adrian et al., 2011; Thomassin, Guérin Marion, et al., 2017; Thomassin, Quint, et al., 2017; Vieira et al., 2021), in community-based samples (e.g., Brausch et al., 2021; Fraser et al., 2018), and in university students populations more specifically (e.g., Ewing et al., 2019; Greene et al., 2021; Midkiff et al., 2018; Silva et al., 2017; Wallace et al., 2021; Yurkowski et al., 2015). Drawing from Gratz and Roemer's (2004) multidimensional conceptualization of emotion regulation difficulties, university students who self-injure have been shown to struggle more than their non-self-injuring peers with emotional awareness (Anderson & Crowther, 2012; Gholamrezaei, Heath, et al., 2017), emotional clarity (Bresin, 2014; Gratz & Roemer, 2008; Liu et al., 2021), and emotional acceptance (Anderson et al., 2018; Anderson & Crowther, 2012; Tatnell, Hasking, & Newman, 2017), which suggests that they are less attuned to their emotional experiences and tend to hold negative beliefs about their negative emotions. When distressed or emotionally activated, university students who engage in NSSI have also been found to have more

difficulty than their non-self-injuring peers with managing impulses (Hasking & Claes, 2020; Riley et al., 2015; Tatnell, Hasking, & Newman, 2017), engaging in goal-directed behavior (Tatnell, Hasking, & Newman, 2017), and in feeling capable to generate strategies to feel better (Anderson & Crowther, 2012; Emery et al., 2016; Gratz & Roemer, 2008; Kiekens et al., 2017; Tatnell, Hasking, & Newman, 2017), suggesting they struggle more with modulating the intensity and duration of emotions. Likewise, consistent with the emotional cascades theory (Selby & Joiner, 2009), university students with a history of NSSI have been found to ruminate more frequently on negative experiences and emotions (Burke et al., 2018; Hasking et al., 2018; Nicolai et al., 2016), which likely escalates their experience of negative emotions further.

Recent meta-analyses by You and colleagues (2018) and Wolff and colleagues (2019) have provided the most comprehensive accounts of the research on emotion dysregulation and NSSI across all population types (including university students) up to this point. Focusing on the most recent of the two meta-analyses, findings from Wolff and colleagues (2019) suggest that the overall effect of emotion dysregulation on NSSI is of medium magnitude (pooled odds ratio: 2.4) based on 49 independent samples. The type of sample (clinical vs. non-clinical) and age/age groups (e.g., adolescent vs. adults) did not significantly moderate the association between overall emotion dysregulation and NSSI. The magnitude of associations, however, varied based on which specific emotion regulation deficit was under analysis. Specifically, limited access to regulation strategies, non-acceptance of emotions, impulse control difficulties, and difficulties engaging goal-directed behavior exhibited the strongest relationships with NSSI. This heterogeneity in findings reinforces the importance of investigating how specific emotion regulation deficits relate to NSSI.

Beyond indicating that emotion skills deficits may be associated with NSSI, the body of research reviewed here arguably points toward a broader developmental and systemic picture. From a developmental perspective, this research can be interpreted to suggest that disruptions in

normative emotional development may be related to individuals' susceptibility for NSSI. From a systemic or relational perspective, it is also useful to consider that emotion (dys)regulation often occurs within an interpersonal context (Barthel et al., 2018; Thompson, 1994), seeing as social others so frequently function as "external regulators" of emotional experiences (e.g., help soothe distress, meet emotional needs, organize emotional experiences through verbal and non-verbal feedback). The availability and quality of close relationships, therefore, cannot be ignored as potential contributors to the emotion regulation difficulties believed to underpin NSSI behavior (Peel-Wainwright et al., 2021).

Among the most influential of such relationships is the parent-child relationship, which functions as a central developmental and social vehicle by which children learn to label, understand, accept, and manage their emotions from a young age (Brumariu, 2015), and from which they build capacity for emotion regulation later in life (Girme et al., 2021). Accordingly, the parent-child relationship has been recognized as an important factor that may be associated with young people's susceptibility to NSSI behavior. An overview of theory and empirical findings that corroborate this perspective are presented next.

The Role of Parent-Child Relationships in NSSI

Developmental Theories of NSSI

Developmental models of NSSI behavior propose hypotheses as to which factors can influence the onset and maintenance of NSSI (Linehan, 1993; Nock, 2009; Yates, 2004). They differ from etiological models in that they take account of developmental risk factors that are hypothesized to play a role in increasing one's vulnerability for NSSI, but distally to the act of self-injury itself (e.g., early childhood risk factors). While these models integrate several biological, psychological, and environmental risk factors, they all have informed a central research focus on the role of parent-child relationships in NSSI. For instance, developmental models of

NSSI behavior have highlighted the roles of maltreatment (Nock, 2009; Yates, 2004), family hostility, and parental criticism (Nock, 2009) as risk factors that can predispose individuals to dysregulation across both emotional and interpersonal experiences (e.g., difficulties managing stressful emotions, difficulty communicating one's emotional needs with others) and that, in turn, increase the risk for NSSI.

Among the most prominent of such models is Linehan's (1993) biosocial theory. This model was originally elaborated as a theory of Borderline Personality Disorder, but is now more broadly accepted by researchers as a developmental theory of NSSI behavior (Buckholdt et al., 2009; Martin, Bureau, Yurkowski, Lafontaine, et al., 2016; Sim et al., 2009; Thomassin, Quint, et al., 2017; Yurkowski et al., 2015). The biosocial theory takes account of the various transactions between biologically susceptible individuals and their environments in the development of self-injurious behaviors. Among these environmental influences, Linehan (1993) emphasized the role of invalidating relationships with one's parents, characterized by instances of parental rejection, dismissal, and/or intolerance of the child's private and/or expressed emotions. In the face of such parental responses, Linehan proposed that the child receives the message that their emotional experiences are invalid—that is, unwanted and unwarranted—and does not receive the necessary parental support to learn ways to effectively label, understand, accept, and modulate these emotions. These voids and disruptions in the child's emotional development are then believed to carry forward into the adolescent and adult years as a generalized deficit of emotion dysregulation (e.g., reduced access to healthy regulatory processes). As a result of this state of vulnerability and reduced emotion regulation capacity, Linehan (1993) suggested that children and youth who grow up in such environments find themselves at increased risk of turning to compensatory and self-destructive strategies, such as NSSI, to regulate distressing emotions.

These theoretical tenets fall in close continuity with the interpersonal functions of NSSI (Nock, 2008; Taylor et al., 2018), as well as the interpersonal dynamics that tend to surround the use of NSSI in youth (Peel-Wainwright et al., 2021). In particular, individuals sometimes describe NSSI as a regulatory strategy used in the context of distressing emotional-relational states, including feelings of disempowerment in relationships (Peel-Wainwright et al., 2021), or as a response to unmet interpersonal and emotional needs in relationships (Nock, 2008; Peel-Wainwright et al., 2021; Taylor et al., 2018). Accordingly, parent-child relationships that are experienced by youth as disempowering (e.g., controlling, pressuring), rejecting, or emotionally dismissing and invalidating may play an important role not only in increasing developmental susceptibility for NSSI via poor emotion regulation skills development, but also in catalyzing dysregulated emotional states (e.g., heightening distress) in a concurrent fashion.

Linehan's (1993) theory, along with related theoretical literature on the role of parent-child relationships in NSSI, has provided foundation for a sizeable body of developmentally-informed NSSI research (see, as examples, Buckholdt et al., 2009; Martin, Bureau, Yurkowski, Lafontaine, et al., 2016; Sim et al., 2009; Yurkowski et al., 2015). This research has converged on substantial agreement that invalidating parent-child relationships are associated with a higher risk for NSSI. This body of empirical research is reviewed next.

Research on Parent-Child Relationships and NSSI

Research exploring the association between parent-child relational risk factors and NSSI has devoted a great deal of attention to abuse as a predictor (Liu et al., 2018; Serafini et al., 2017). Emotionally abusive parental behavior, in particular, has been found to be the maltreatment subtype with the strongest (odd ratio = 3.03; large effect) links to NSSI in adolescent and young adult samples, based on a meta-analysis of 29 independent samples (n = 27 768; Liu et al., 2018). Emotional abuse is characterized by instances of caregiving behavior in which the child is made

to feel worthless, flawed, or unloved, among other possible descriptors (APSAC, 1995). Accordingly, the climate of interactions that predominates in emotionally abusive caregiving environments is, in many cases, one of antipathy, hostility, and rejection, which heavily disrupts the development of healthy emotion regulation processes. In a sample of 125 adolescent inpatients, using subscales from the Childhood Experience of Care and Abuse questionnaire (CECA-Q), researchers found that parental antipathy (which captures hostile and rejecting caregiving behavior) as well as perceived neglect (which captures a disinterest and negligence toward the child) both predicted NSSI, over and above other forms of abuse (Kaess et al., 2013).

Whereas antipathetic and overtly rejecting parental behaviors may be among the more evident markers of an invalidating parent-child relationship, quieter relational dynamics also align with Linehan's (1993) conceptualization. One such relational dimension is a high degree of perceived emotional and psychological distance within the parent-child relationship. Among the earliest manifestations of this relational dynamic is maternal withdrawal in infancy (i.e., parent creating physical and verbal distance in response to attachment cues from their infant; Lyons-Ruth, Bureau, Easterbrooks, et al., 2013), which has been found to prospectively predict higher levels of NSSI/suicidality in early adulthood (Khoury et al., 2019; Lyons-Ruth, Bureau, Holmes, et al., 2013). Carried forward into the adolescent and early adult years, emotional distance in the parent-child relationship may then be reflected in a sense of "aloneness" in the parent-child relationship, or in especially adverse feelings of alienation from the parent (e.g., feeling misunderstood by the parent and/or unable to approach them with emotional needs). These experiences of aloneness and alienation within the parent-child relationship have been found to be more frequent among those who engage in NSSI than those who do not (Santangelo et al., 2017). Such experiences have also been found to be directly associated with NSSI in a handful of studies (Bureau et al., 2010; Gandhi, Luyckx, Goossens, et al., 2018; Giletta et al., 2012; Yates et al., 2008). For instance, in a sample

of 1133 university students, Bureau and colleagues (2010) found that feelings of alienation in the parent-child relationship (along with attachment-related fears) had the strongest associations with NSSI, after accounting for multiple other relational and parenting dimensions. Conversely, feelings of closeness and connectedness with parents—to a more significant degree than connectedness with friends—have been found to be associated with reduced risk for NSSI (Jiang et al., 2017; Taliaferro et al., 2020).

In a similar vein, there is an accumulating body of evidence supporting an association between attachment insecurity and NSSI (for a review, see Woo et al., 2020). Attachment insecurity is, in a broad sense, indicative of feelings of mistrust, anxiety, and/or patterns of intimacy avoidance within the parent-child relationship (Mikulincer & Shaver, 2007). At the more negative and disrupted end of the insecurity continuum, notably, is the presence of preoccupied and unresolved affect toward the parent (e.g., fluctuating perceptions of the parent as "good" and "bad", unresolved anger, fear of losing the parent's love), as assessed through the use of the Adult Attachment Interview (George et al., 1985) or via self-report measures of attachment (West et al., 2000). Preoccupied and/or unresolved states of mind about attachment are often traceable to significant disruption and/or unresolved trauma in caregiving relationships (Thomson & Jaque, 2017). They are also associated with high levels of negative affect and emotional volatility in individuals (Shaver & Mikulincer, 2007), consistent with the theoretically-posited effects of invalidating parent-child experiences on emotional development (Linehan, 1993). Accordingly, research has demonstrated that the quality of attachment to parents, and most especially unresolved/preoccupied states of mind about attachment, are associated with NSSI engagement in adolescent and young adult samples, both cross-sectionally (Martin, Bureau, et al., 2017; Martin, Bureau, Yurkowski, Fournier, et al., 2016; Pallini et al., 2020), and longitudinally (Martin, Raby, et al., 2017; Tatnell, Hasking, Newman, et al., 2017; Victor et al., 2019).

Consistent with the biosocial theory (Linehan, 1993) and other developmental models of NSSI behavior (Nock, 2009; Yates, 2004), the link between parent-child relational risk and NSSI has consistently been found to be mediated by emotion regulation difficulties. This has been demonstrated across both clinical (Adrian et al., 2011; Chaplo et al., 2015; Sim et al., 2009; Thomassin et al., 2016) and community-based (Buckholdt et al., 2009; Cerutti et al., 2018; Gratz & Roemer, 2008; Paivio & McCulloch, 2004; Tao et al., 2020; Tatnell, Hasking, & Newman, 2017; Yurkowski et al., 2015) samples, including university populations (Gratz & Roemer, 2008; Tatnell, Hasking, & Newman, 2017; Yurkowski et al., 2015). It should be noted that the majority of these studies were conducted using cross-sections (rather than longitudinal waves) of data, which precludes assumptions regarding the temporal sequencing of parent-child relational variables as they relate to emotion regulation and NSSI outcomes. Nevertheless, by and large, this body of research lends support to Linehan's (1993) biosocial theory as a general risk framework for NSSI. That is to say, studies can be interpreted to suggest that invalidating experiences within the parent-child relationship are associated with NSSI indirectly, as a possible result of disruptions in the development of healthy emotion regulation skills.

The robustness of this risk framework in explaining variance in NSSI outcomes represents one of its clear strengths. With such consistent patterns arising from the data, however, comes an increasing need to qualify and contextualize what we know about NSSI risk to distinct populations, contexts, and sources of vulnerability. Further contextualization and specificity in NSSI research is essential in order to move the field forward—that is, toward an increasingly more nuanced and discriminating understanding of which risk factors can influence NSSI behavior in different individuals. In particular, there is a growing need to investigate the vulnerability context that surrounds the use of NSSI among university student populations. Indeed, university students are frequently used as study samples in NSSI research (Swannell et al., 2014), but arguably for

convenience reasons in many instances (e.g., population size, accessibility) rather than because of their unique psychosocial characteristics or contexts. As part of a contextualized risk perspective on NSSI, it is worth considering that distinct markers of risk and profiles of vulnerability could play a role in university students' engagement in NSSI. Some of these markers of risk may, in fact, be exacerbated by the very experience of being a student in a postsecondary setting.

The University Experience: Unique Challenges and Developmental Transitions

While the university period brings about momentous opportunities for personal growth (Arnett, 2016), numerous factors can make one's postsecondary education pursuits a uniquely challenging experience. Most university students first undergo a stressful shift in their usual environments, day-to-day routines, and support networks—including in their access to mental health services (Cleary et al., 2011)—as they enter university (Acharya et al., 2018; Beiter et al., 2015). According to Karyotaki and colleagues (2020), approximately three quarters of university students experience significant, compounding stressors in at least three of six major life areas (e.g., finances, relationships at work/school), with just over half (56.7%) reporting challenges in their relationships with parents and family (see, also, Hurst et al., 2013; Xiao et al., 2017). Simultaneously with these general stressors, throughout their studies, university students face considerable challenges with respect to managing increasingly voluminous and consequential academic demands. Pressures related to academic performance and achievement are, in fact, among the top concerns and sources of stress cited by university students (Beiter et al., 2015) and only appear to be intensifying. Indeed, the levels of academic distress observed among university students appear to be on the rise in recent years (Xiao et al., 2017). Achievement-related pressure may partially stem from the fact that academic performance during university is key to accessing desirable academic and professional outcomes, including obtaining high grades and distinctions, receiving and maintaining scholarships/financial aid, and qualifying for graduate school.

Importantly, though, the degree to which parents value and uphold expectations around academic achievement may also play a large role in determining the extent of the achievement-related pressure that a student may feel throughout their studies (Agliata & Renk, 2009; Peleg et al., 2016).

The salience of achievement pursuits during university is interesting to consider within the broader context of the developmental tasks associated with emerging adulthood. Indeed, as they move out of adolescence and begin to navigate their early to mid-twenties, emerging adults often seek to further define who they are and find a sense of purpose in life (Arnett, 2015). In the context of these purpose-seeking and identity exploration goals, high levels of achievement pressure may take a particularly heavy emotional toll on some students, potentially exacerbating students' pre-existing vulnerabilities (e.g., perfectionism, emotion dysregulation) and increasing the use of maladaptive coping strategies. Moreover, it is well known that young adults seek to renegotiate their sense of autonomy during the emerging adulthood period, which often manifests as a desire to achieve increased independence from parental figures (Arnett, 2015). This may mean that parental behaviors that interfere with autonomy, confidence-building, and self-actualization pursuits (e.g., criticism about underachievement, overprotection, controlling behaviors) may be especially dysregulating for young adults in university. Equally important to consider is the fact that, while young adults do become more self-sufficient during their early to mid-twenties, parents continue to exert a substantial influence on their young adult children in numerous ways (Lowe & Dotterer, 2018), even for those students residing away from home (Mattanah et al., 2011). Young adults pursuing a university education, in particular, frequently depend on their parents for financial and practical help (Lowe & Dotterer, 2018), for making important decisions (Pizzolato & Hicklen, 2011), for providing encouragement and support with their studies (Roksa et al., 2021), and for emotional support (Lowe & Dotterer, 2018) during university. Accordingly, the parent-child relationship lives on as a prominent relational environment for young adults in university

(Mattanah et al., 2011), with the potential to significantly influence students' emotion regulation capacity and ability to manage university-related challenges and stressors. Indeed, research has shown that the quality of the parent-child relationship is predictive of psychological adjustment during university (Lindell et al., 2020; Mattanah et al., 2011), with more conflictual and negative interactions with parents predicting higher levels of negative emotions and distress (Agliata & Renk, 2009; Rogers et al., 2018).

To summarize, university students find themselves in a uniquely challenging educational and developmental context, rendering them potentially vulnerable to psychosocial challenges that may fall along an important continuum of risk toward NSSI engagement. Previously reviewed estimates of NSSI prevalence also support the notion that the university years enclose a period of substantial risk for the onset and maintenance of NSSI behavior. With this said, several gaps in the research currently limit our understanding of the risk context that may underpin the use of NSSI in university student populations. In an effort to situate the goals of the present dissertation, key areas for growth in the current research are discussed next, with particular emphasis on the need to *broaden* the lens on NSSI vulnerability to consider risk factors pertinent to the university student experience, and to *deepen* our understanding of well-established risk models for a more nuanced and differentiated account of vulnerability profiles in university student populations.

Areas for Growth in the Existing Research

The first area for growth that informed the goals of the current dissertation relates to the fact that vulnerability factors for NSSI are seldom contextualized to the psychosocial experiences of university students. As mentioned here above, university students face momentous academic challenges and developmental shifts as they learn to navigate the university environment, and these tasks and challenges can play a central role in their ability to function adaptively and self-actualize as young adults. Young adults also continue to be influenced by their relationships with parents

during university. By extension, parents who induce pressure about achievements during university and undermine their youth's feelings of competence and autonomy through criticism and control could be experienced as particularly invalidating and dysregulating by university students (Agliata & Renk, 2009; Peleg et al., 2016). Despite this, little research has explored the extent to which parental behaviors such as overprotection, psychological control, unrealistic achievement expectations, and criticism about under-achievement are associated with NSSI and/or could play a role in exacerbating the vulnerable states driving NSSI (e.g., emotion dysregulation). In addition to this context-informed rationale, such an investigation would align with theoretical models of NSSI that emphasize the deleterious effects of invalidating parent-child relational experiences as predictors of NSSI (Linehan, 1993; Nock, 2009). Importantly, it would provide critical information to advance a more developmentally tailored conceptualization of the parent-child relational context that confers risk for NSSI during the university period.

Beyond lacking an understanding of parent-child relational risk factors associated with NSSI among university students, much remains to be understood about the role of intrapersonal risk factors relevant to the university experience. For instance, there is little known regarding the extent to which one's ability to cope effectively with academic demands is associated with increased risk of engaging in NSSI (Kiekens et al., 2016), despite the fact that the link between coping and NSSI is well established (Guerreiro et al., 2013) and academic stressors represent considerable sources of concern and stress during the university years (Beiter et al., 2015). Students who are more likely to engage in maladaptive academic coping strategies (e.g., avoidance, self-depreciation, procrastination) may thus suffer from heightened stress and decreased feelings of competence, which could put them at higher risk of engaging in NSSI. The same could be said about one's ability to appraise achievement expectations adaptively and set realistic goals during university. Indeed, the pursuit of academic flawlessness could bring about

much anxiety, distress, overwhelm for a student (Xie et al., 2019), especially if parents play a role in setting and upholding such unrealistic standards of achievement. While research on the link between perfectionism and NSSI exists (e.g., see Chang et al., 2019; Hoff & Muehlenkamp, 2009), much remains to be understood about which subtypes of perfectionism are associated with NSSI among university students. Indeed, seeing as perfectionism is a multifaceted construct (Gaudreau, 2021; Hewitt et al., 1991), specific flavours of this dispositional characteristic may be associated with a higher risk of NSSI than others. In addition, links between perfectionism and NSSI have rarely been explored in models that take into account other salient and well-established NSSI risk factors (e.g., emotion dysregulation), thereby limiting our understanding of the true association between perfectionism and NSSI. Seeing as both academic coping and perfectionism are intimately linked with the achievement-focused context of the university student experience, these intrapersonal vulnerability characteristics would merit further exploration as risk factors for NSSI among university students.

In addition to knowing which factors are associated with NSSI broadly across student populations, further specificity and person-centeredness is also urgently needed to round out a better understanding of NSSI risk among university students. In particular, little is known about the extent to which university students with a history of NSSI present with distinct profiles of vulnerability, including different profiles of emotion regulation difficulties. Put differently, under an assumption of equifinality of outcome, there is value in understanding whether university students who share a *similar* history of NSSI behavior could be impaired by *distinct* constellations of emotion regulation difficulties. Insofar as meaningful differences in emotion regulation patterns can be assumed to exist across students who engage in NSSI, one could posit that NSSI outcomes (e.g., severity, functions) could vary substantially as a function of such profiles of vulnerability. In line with developmental models of NSSI (Linehan, 1993; Nock, 2009) and the interpersonal

contexts that can drive dysregulated emotional states (Nock, 2008, 2009; Peel-Wainwright et al., 2021), it would also seem important to explore the extent to which different emotion regulation profiles among self-injuring students may be traceable to specific experiences within the parent-child relationship (e.g., alienation, unresolved attachment, antipathy, control, pressure). Each of these research goals would contribute essential information to the building of more differentiated profiles of risk among university students who engage in NSSI, thereby allowing for further fine-tuning of intervention efforts. While some studies have begun to explore links among emotion regulation profiles and NSSI in university students (Burke et al., 2018; Peterson et al., 2019), no study to date has focused on uncovering such profiles of vulnerability in university students with a recent (past-year) history of NSSI, or with consideration of parent-child relational dynamics as predictors of profile membership.

Additional areas for growth have informed the design of the current dissertation. First, as the field moves toward increased specificity in the identification of developmental risk factors for NSSI, there is a growing need to understand the extent to which NSSI risk varies as a function of experiences with mothers versus fathers. Indeed, despite the fact that parental caretaking roles are becoming less gendered (e.g., with women increasingly assuming provider functions within the family), mothers and fathers do show enduring differences in their general approaches to parenting (with fathers being more likely to adopt authoritarian styles; McKinney & Renk, 2008) and emotion socialization practices (Brand & Klimes-Dougan, 2010). Accordingly, maternal and paternal experiences may exhibit differential relationships to NSSI vulnerability. The research to date, however, has been equivocal in this respect. Some studies have found unique associations between the quality of the father-youth relationship and NSSI (Gratz et al., 2002; Hallab & Covic, 2010; Martin, Bureau, Yurkowski, Fournier, et al., 2016; Perez et al., 2020; Tao et al., 2020), whereas others suggest that the quality of relationships with mothers exhibits more pronounced

associations with youth's NSSI, both directly (Pearson et al., 2018) and indirectly through emotion regulation difficulties (Guérin-Marion et al., 2019; Tao et al., 2020; Tatnell, Hasking, & Newman, 2017). Delineating parent-specific effects on NSSI vulnerability is important in order to arrive at a clearer developmental risk account for the behavior.

Lastly, the current dissertation sought to expand the focus beyond the dysregulation of *negative* emotional states as risk factors for NSSI (McKenzie & Gross, 2014; Wolff et al., 2019) to explore the possible role of dysregulated *positive* emotion in NSSI. Indeed, some individuals engage in NSSI for the purpose of augmenting positive affective states, as mentioned previously (Guérin-Marion et al., 2018; Taylor et al., 2018), and such increases in positive states following NSSI have been found to be associated with more frequent NSSI, independent of reductions in negative affect (Jenkins & Schmitz, 2012). Dysregulated positive emotions could therefore play a role in increasing one's vulnerability for NSSI. While this question has been brought into focus by researchers (Perini et al., 2021) and aligns with recent empirical findings on positive emotion processing and NSSI (Boyes et al., 2020; Hasking et al., 2018; Mayo et al., 2021; Tatnell et al., 2018), more research on the role of dysregulated positive emotion in NSSI is clearly needed.

The Current Studies

The current dissertation's overarching objective was to better understand the risk context surrounding university students' engagement in NSSI. This objective, along with the aforementioned areas for growth identified in the research literature, informed the design and goals of the following two complementary studies.

First, using the university student experience as a broad educational and developmental risk context, Study 1 sought to identify the extent to which specific risk factors were related to NSSI in a large and diverse population of young adults pursuing their university education at the University of Ottawa. Using latent structural equation modelling, we focused on exploring the

association between perceived parental pressure from both mothers and fathers (i.e., high levels of criticism, unrealistic achievement expectations, and psychological control) and past-year NSSI engagement and frequency. Moreover, the model also tested the possibility that perceived mother and father pressure would be related to intrapersonal markers of maladjustment to the university setting (i.e., forms of perfectionism, poor academic coping, and emotion dysregulation) which, in turn, were expected to also be associated with a greater likelihood of engaging in NSSI and a higher NSSI frequency in the university student sample.

Building upon the latter, Study 2 aimed to derive a more differentiated, person-centred representation of the different vulnerability profiles of university students who engage in NSSI. Using a subsample of university students with a recent (past-year) NSSI history, this study focused on identifying areas of relative strength and weakness in students' emotion regulation patterns, and on then classifying these university students into more homogenous profiles (or subgroups) based on their emotion regulation patterns. This investigation placed emphasis on measuring dysregulation across multiple processes (e.g., emotion awareness, acceptance, rumination), and across both negative and positive emotional states. Moreover, individuals classified into different emotion regulation profiles were compared in terms of their relative degree of (perceived) exposure to negative experiences with mothers and fathers (e.g., overprotection, pressure, alienation, unresolved attachment) and in terms of their NSSI characteristics (e.g., frequency, methods, functions) in order to further understand the relational backgrounds and outcomes associated with each vulnerability profile.

CHAPTER 2 (Study 1):

Parental Pressure, Emotion Dysregulation, Academic Coping and Perfectionism in Relation to Non-Suicidal Self-Injury Outcomes in University Students

Abstract

Objective: This study explored the roles of parental (mother and father pressure) and intrapersonal (emotion dysregulation, academic coping, perfectionism) risk factors in university students' likelihood and frequency of engagement in NSSI. **Methods**: A sample of 2,579 students (75.2% female, M_{age}=18.97; SD_{age}=1.54) reported on experiences relating to perceived parental pressure, emotion dysregulation, academic coping, perfectionism (self-oriented, socially-prescribed), and past-year NSSI using questionnaires. Hypotheses were explored using structural equation modeling. **Results:** Results revealed that perceived mother and father pressure were associated with greater past-year NSSI likelihood amongst university students. Perceived mother and father pressure were also positively associated with intrapersonal markers of maladjustment (self-oriented perfectionism, socially-prescribed perfectionism, academic disengagement coping, emotion dysregulation). Lastly, emotion dysregulation was linked with higher NSSI likelihood and frequency. In contrast, university students higher in self-oriented perfectionism appeared less likely to engage in NSSI. Results from the model are also reported and discussed separately by female and male gender. **Conclusion:** Findings provide further insights into vulnerability factors related to NSSI among university students.

Keywords: Non-suicidal self-injury, Emotion regulation, Perfectionism, Coping, Parent-child relationships, Pressure.

Introduction

The university years can be a stressful experience for many young adults. In the context of a significant developmental transition (Arnett, 2015), young adults pursuing a university education must learn to manage increased academic demands and achievement expectations (Beiter et al., 2015) all while adjusting to alterations in their daily routines, environments, and support networks from the start of their studies. Non-suicidal self-injury (NSSI; i.e., purposeful and socially unsanctioned damage of bodily tissue not driven by suicidal intent; Nock, 2009) is a concerning behavior affecting a substantial subset of university students, often performed in the context of elevated stress levels (Hamza et al., 2021; Miller et al., 2019) in an effort to escape or alleviate distressing affective/cognitive states (Hasking et al., 2017). Approximately 8% of university students report engaging in NSSI within 12 months of entering university (Kiekens et al., 2021), with female students being more susceptible to self-injuring than male students (Bresin & Schoenleber, 2015; Whitlock et al., 2011). Irrespective of gender, rates of NSSI appear to be on a small yet significant upward trend across university campuses, concurrent with the increasing rates of academic distress documented in college counseling centers (Xiao et al., 2017). Despite these prevalence estimates pointing toward a significant cause for concern, little research has explored risk factors relevant to the university student experience in relation to NSSI. In an effort to address this area for growth, the current study sought to investigate risk factors for NSSI among university students. In doing so, we aimed to further contextualize existing risk frameworks to the experiences of university students, with a focus on parent-child dynamics and intrapersonal vulnerabilities likely to be heightened by the achievement-focused context of university.

Parental Pressure and NSSI

Developmental and relational models of NSSI behavior (Linehan, 1993; Nock, 2009) have informed an important research focus on the role of invalidating relational experiences with parents

in NSSI. Several studies have shown that negative parent-child relationships have the potential to disrupt core self-regulation processes in youth which, in turn, are associated with an increased risk of engaging in NSSI (Guérin-Marion et al., 2019; Tao et al., 2020; Tatnell et al., 2017; Woo et al., 2020; Yurkowski et al., 2015). While the developmental tasks of emerging adulthood and university-related transitions may shift the frequency and proximity of contacts with parents (e.g., moving out of the parental home; Arnett, 2016), the impact of parent-child relationships on psychological adjustment has been shown to be longstanding, carrying well into young adulthood (Mattanah et al., 2011). In addition, university and college students often remain largely dependent on parents financially, practically, and for emotional support throughout their studies (Lowe & Dotterer, 2018). Accordingly, it is important to consider that parent-child interactions can sustain a significant impact on the adjustment of young adults during university (Lindell et al., 2020; Mattanah et al., 2011; Rogers et al., 2018) and, relatedly, on students' potential vulnerability to NSSI (Hamza & Willoughby, 2014; Wilcox et al., 2012).

Keeping in mind these considerations, it is important to consider that particular parent-child relational dynamics may become more salient against the backdrop of achievement-related stressors in university. Indeed, academic demands are cited by undergraduate students as a top source of stress and preoccupation during university (Beiter et al., 2015). Parental pressure about performance and achievement, therefore, may be experienced by university students as especially undermining of their self-actualization and autonomy (Peleg et al., 2016) and, importantly, as a compromising factor to their psychological and emotional adjustment during university (Agliata & Renk, 2009; Peleg et al., 2016). While the concept of parental pressure is loosely defined in existing literature (Kaynak et al., 2021), available definitions have converged on three of its core proxies. In particular, parental expressions of rigid achievement expectations (Ciciolla et al., 2017; Kaynak et al., 2021; Stoeber et al., 2016), criticism of underachievement, failures, and mistakes

(Ciciolla et al., 2017; Stoeber et al., 2016) and psychological forms of pressure or control, such as manipulation, guilt induction, or efforts to control the youth's thoughts and feelings (Damian et al., 2021; Kaynak et al., 2021), have been emphasized as being important indicators of parental pressure. Such parental behaviors have consistently been shown to be associated with negative affective outcomes, including heightened concerns over failure (Deneault et al., 2020) and increased internalizing distress (Ciciolla et al., 2017; Peleg et al., 2016; Quach et al., 2015). Accordingly, one could hypothesize that parental pressure could be associated with an increased risk for NSSI among university students. In line with this proposition, a small subset of cross-sectional studies conducted with university students (Ammerman & Brown, 2018; Flett et al., 2012; Hoff & Muehlenkamp, 2009) as well as longitudinal studies with adolescent samples (Wang et al., 2017; Yates et al., 2008) support an association between parental criticism and NSSI. One prospective study with university students, however, found no significant association between maternal/paternal criticism and NSSI (Daly & Willoughby, 2019). Studies exploring parental psychological control as a risk factor for NSSI among university students are, to our knowledge, currently lacking (see Baetens et al., 2014 for a study with preadolescents). Moreover, by and large, research has yet to explore associations between parental pressure and NSSI using a multidimensional definition of parental pressure (involving indices of criticism, expectations, and psychological control). Using a more unified and comprehensive definition of the parental pressure construct, consistent with aforementioned definitions, is important in clarifying its associations with NSSI.

Distinctions between mother and father perceived pressure are also largely lacking in the literature, and researchers have suggested to incorporate this gender specificity in future research on parental pressure (Peleg et al., 2016). Emerging research has begun to demonstrate some gendered patterns in parental pressure and in its links with youth outcomes, for instance showing

higher levels of achievement-orientation in fathers than mothers (Ciciolla et al., 2017) as well as stronger links between father (vs. mother) pressure and internalizing distress in youth (Quach et al., 2015). There is also increasing recognition that NSSI outcomes can vary as a function of parent-specific experiences, although it remains unclear if mothers or fathers carry more weight in predicting NSSI outcomes (Guérin-Marion et al., 2019; Martin et al., 2016; Pearson et al., 2018; Tatnell et al., 2017). Taken together, the body of research reviewed here points to a need to further investigate the extent to which mother and father pressure are associated with NSSI among university students.

Parental Pressure, Intrapersonal Risk Factors, and NSSI

While a direct association between parental pressure and NSSI is consistent with theoretical and empirical research, intermediary factors may also help to explain the hypothesized relationship between parental pressure and NSSI in university populations. Inherent to the experience of pressure are parental expressions of negative affect states (e.g., criticism, disapproval) and disproportionate parental attention placed on extrinsic achievement pursuits (Ciciolla et al., 2017). This is likely to impede on students' emotion regulation and coping ability (e.g., anxiety regulation, failure resilience), consistent with robust theory underscoring the influence of parental emotion expression, modeling, and coaching on youth's own appraisal and management of stressors and emotions (Power, 2004). Theoretical models have also converged on widespread agreement that parental pressure plays a large role in determining the extent to which youth internalize unrealistic achievement expectations and rigid contingencies around their sense of competence (Flett et al., 2002; Stoeber et al., 2016). Parental pressure is, in fact, believed to be among the primary socialization vehicles through which adolescents develop perfectionistic preoccupations and behaviors, which may altogether develop into more stable personality dispositions over time (Flett et al., 2002; Stoeber et al., 2016).

Consistent with these theoretical tenets, previous research supports the notion that parental pressure, or its key constituents, is associated with worse emotion regulation ability (Goger et al., 2020; Turpyn et al., 2015), worse management of academic stressors (Boysan & Kiral, 2017; Filippello et al., 2015), and more unrealistic achievement pursuits and expectations (e.g., perfectionism; Damian et al., 2013, 2021; Smith et al., 2017). One could hypothesize that each of these vulnerabilities may fall along a continuum of risk toward NSSI engagement for a university student. Indeed, a compromised ability to regulate emotions, to cope with academic challenges and demands, and to appraise goal pursuits in balanced and realistic ways is likely to lead to experiences of increased distress and overwhelm during university, as well as a compromised psychosocial adjustment to the postsecondary environment as a whole. Accordingly, in the present study, perceived mother and father pressure were expected to be directly related to four intrapersonal risk factors (students' levels of emotion dysregulation, poor academic coping, and two subtypes of perfectionism). In turn, each of these four intrapersonal risk factors were expected to be associated with students' NSSI outcomes, as further explained below.

Emotion Dysregulation and NSSI

Given high levels of anxiety and stress associated with postsecondary education pursuits, one's vulnerability for NSSI during the university years is highly likely to be impacted by emotion regulation ability. Theoretical models have long emphasized the emotion regulation functions of NSSI (Hasking et al., 2017) and accordingly, a robust body of research supports the association between emotion dysregulation and NSSI in populations of university students (e.g., Emery et al., 2016; Ewing et al., 2019; Hasking & Claes, 2020; Wallace et al., 2021; Wolff et al., 2019; Yurkowski et al., 2015). Difficulties related to the modulation and tolerance of emotional states, in particular (i.e., perceived lack of regulation strategies, non-acceptance of emotions, impulse-control difficulties, difficulties engaging in goal-directed activities when upset) were found to be

most strongly related to NSSI in a recent meta-analysis (Wolff et al., 2019). An additional finding of this meta-analysis was that the pooled association between emotion dysregulation and NSSI did not vary significantly by gender; conversely, however, females have been found to endorse the emotion regulation functions of NSSI more frequently than males (Victor et al., 2018; Whitlock et al., 2011), leaving open the possibility that a gender difference in effects may exist. Importantly, as would suggest aforementioned developmental theories of NSSI (Linehan, 1993; Nock, 2009), emotion dysregulation has been found to act as an explanatory variable in the link between parent-child relational risk and NSSI among university students (Hasking et al., 2020; Tatnell et al., 2017; Yurkowski et al., 2015); however, research has yet to determine if this particular risk framework would hold in the context of elevated parental pressure more specifically.

Academic Disengagement Coping and NSSI

Despite the fact that academic challenges are a salient source of stress among university students (Beiter et al., 2015), to our knowledge, research has yet to explore if maladaptive forms of academic coping (i.e., the nature of strategies used to manage academic stressors) relate to NSSI engagement in this population. Academic disengagement coping, in particular, is a common form of maladaptive coping that involves the enactment of passive or avoidance-oriented strategies in response to academic stress (e.g., giving up hope, procrastination, social distancing, venting; Carver & Connor-Smith, 2010; Thompson, 2015). Emerging research has shown that this mode of academic coping may be detrimental to the affective and academic adjustment of university students (Gareau et al., 2019; Thompson, 2015). Moreover, a general association between avoidant coping and NSSI is well supported by research (Andover et al., 2007; Castro & Kirchner, 2018; Guerreiro et al., 2013; Kiekens et al., 2015; Wan et al., 2020). Following this logic, academic disengagement coping may be a worthwhile marker of risk to explore in relation to NSSI in the context of the university student experience. Indeed, it may play a role in compromising healthy

adaptation to stress and prevent students from building adequate self-efficacy in coping with academic demands (Gareau et al., 2019; Thompson, 2015), thereby potentially increasing the use of maladaptive coping behaviors, such as NSSI. Moreover, university students who engage in high levels of academic disengagement coping may be prone to developing feelings of ineptitude and shame related to their studies (e.g., feeling "not good enough"), and NSSI is more likely to occur in the context of self-derogative states (Xavier et al., 2016; Zelkowitz & Cole, 2019) and lowered feelings of competence (even after emotion regulation difficulties are taken into account; Emery et al., 2016). While this general hypothesis may apply to student populations at large, since gender differences have been found in associations between coping and NSSI (with more pronounced associations in girls; Andover et al., 2007; Wan et al., 2020), it would be worthwhile to explore if academic disengagement coping differentially relates to NSSI vulnerability in female and male students.

The general hypothesis that academic disengagement coping may influence NSSI outcomes in university students is also further substantiated by emerging research by Kiekens and colleagues, which underscored the co-occurrence of academic stress and NSSI in university. In their longitudinal study of 101 emerging adults with a history of NSSI, Kiekens and colleagues (2017) found that *both* academic and emotional distress (along with other psychosocial risk factors) differentiated adults who continued to engage in NSSI from those who had ceased the behavior. In a separate cross-sectional study using a large web-based sample of college freshmen, Kiekens and colleagues (2016) found that the mean academic performance scores of students with both lifetime and past-year histories of NSSI were lower by 3-6% when compared to students without an NSSI history. Notably, these reductions were found to be more pronounced in higher-performing universities, in which academic stressors are likely to be particularly elevated. From

this finding, one could hypothesize that higher levels of academic stressors, and difficulty *coping effectively* with these stressors, could contribute to NSSI risk among students.

Perfectionism and NSSI

Perfectionism is another risk factor highly relevant to the achievement context of university that is on the rise among new generations of students (Curran & Hill, 2019). Broadly defined as the dispositional tendency to set excessively high standards of achievement for oneself (Frost et al., 1990), perfectionism is typically measured along two dimensions; the first relates to one's high personal standards of achievement and strivings toward perfection (perfectionistic strivings), and the second to preoccupations with less-than-perfect performance (perfectionistic concerns). Falling under each of these dimensions, respectively, are *self-oriented perfectionism* (i.e., self-imposed standards of perfection; Hewitt et al., 1991) and *socially-prescribed perfectionism* (excessive concerns over others' expectations; Hewitt et al., 1991). Whereas socially-prescribed perfectionism is unequivocally associated with negative psychological outcomes (Limburg et al., 2017), a nuanced scholarly debate exists regarding the extent to which self-oriented perfectionism, or perfectionistic strivings more broadly, can be considered adaptative in some areas of functioning (see, for instance, its positive associations with academic and achievement outcomes; Osenk et al., 2020). Overall, however, meta-analytic work (Limburg et al., 2017; Xie et al., 2019) and recent theoretical advances (Gaudreau, 2021) do suggest that forms of perfectionistic strivings (such as the self-oriented subtype) are linked with negative psychological outcomes (e.g., depression, anxiety, rumination), albeit to a less pronounced degree than perfectionistic concerns (such as socially-prescribed perfectionism). Indeed, although the pursuit of *excellence* is adaptive (Gaudreau, 2019), the pursuit of *perfection* is linked with several cognitive (e.g., doubts), socio-cognitive (e.g., perceived social pressure), and socio-behavioral

expressions (e.g., self-presentation concerns) that tend to be problematic for psychological adjustment.

Beyond being susceptible to poorer psychological adjustment in a broad sense, university students high in perfectionism may find themselves at an elevated risk for NSSI due to increased levels of self-criticism and negative affect, both of which have been demonstrated to play a role in NSSI (Robillard et al., 2021; Zelkowitz & Cole, 2019). Consistent with this general proposition, research has shown that perfectionistic concerns are associated with NSSI in college and university samples (Chang et al., 2019; Chester et al., 2015; Flett et al., 2012; Hoff & Muehlenkamp, 2009; Lucas et al., 2019). One study also supported a more specific link between socially prescribed perfectionism and NSSI; however, this association held only for females, suggesting the presence of a possible gender effect (Flett et al., 2012). Results have been far less conclusive, however, for the perfectionistic strivings/self-oriented dimension. One study (Arthurs & Tan, 2017) found that unrelenting standards, defined as the tendency to hold unreasonably high standards for oneself, differentiated young adults with higher NSSI severity from age- and gender-matched peers with lower NSSI severity and no NSSI history. Other studies with university students, however, have found no relationship between perfectionistic personal standards and NSSI (Chang et al., 2019; Flett et al., 2012; Hoff & Muehlenkamp, 2009; Lucas et al., 2019), thus leaving this question up for debate. Moreover, to date, no research has clarified the extent to which perfectionism (self-oriented/socially-prescribed) is predicted by parental pressure and thereafter linked with NSSI in university students.

The Current Study

The current study aimed to expand our understanding of the risk context associated with NSSI in university student populations. The proposed model, which is illustrated in Figure 2.1, hypothesizes that NSSI is associated with a combination of parental and intrapersonal risk factors.

More specifically, it was hypothesized that mother and father pressure would be significantly associated with an increased likelihood and frequency of past-year NSSI among university students. No specific hypotheses are proposed with respect to differences between mother and father effects given the limited and mixed nature of existing research. It was also hypothesized that mother/father pressure would positively predict four intrapersonal risk factor variables (i.e., self-oriented perfectionism, socially prescribed perfectionism, academic disengagement coping, and emotion dysregulation) which, in turn, were expected to act as additional risk factors for NSSI. While these four intrapersonal risk factors were expected to be related to NSSI based on the theoretical and empirical rationales elaborated above, in light of the magnitude of associations found in recent meta-analytic research (Wolff et al., 2019; You et al., 2018), emotion dysregulation was expected to exhibit the strongest association with NSSI. Finally, given the possibility that patterns of associations between NSSI and risk factors may vary by gender (Andover et al., 2007; Bureau et al., 2010; Flett et al., 2012; Wan et al., 2020), we aimed to test for gender differences in the model as an exploratory goal.

Method

Procedure

Upon approval by the University Research Ethics Board, data collection for the study ran from September of 2016 to December 2019. Undergraduate students at the University of Ottawa who were proficient in English and aged 17-25 years were invited to participate in the study through a research participation program based out of the School of Psychology. The system enables students enrolled in an undergraduate psychology or behavioral science course (from any program of study) to participate in research in exchange of course credits. Participants have the opportunity to select which study they wish to participate in. Seeing as our goal was not to collect representative prevalence data on NSSI, the current study was presented to participants on the

online platform with an explicit focus on self-injury behaviors and psychological well-being; this was chosen as a strategy to help recruit a sufficiently large sample of students with a history of NSSI. Once they selected the study, participants provided their informed consent and were given a unique link to complete the online questionnaires at a time and location of their choice. At three random points while completing the questionnaire battery, participants were asked to answer validity screeners (e.g., "*if you read this question, please choose number 7*") designed to identify random responders. Participants were granted course credits for participating in the survey, regardless of full or partial completion.

Participants

An initial 2,811 young adults were eligible for inclusion in the study. Twenty-five of these participants were removed from the sample due to insufficient questionnaire completion. Subsequently, a combination of different data quality indicators was used to substantiate decisions to include/exclude participants from the study. Specifically, 137 participants were removed due to failing all three screeners. Those who failed two out of three screeners were then removed from the sample if they met one of two conditions: (1) if they also had an unusually short survey completion timeframe (n = 33); (2) if they were identified as having clearly unusual or random patterns of responses (n = 37) on the basis of a thorough visual inspection of scores (e.g., same answer on all items) and/or a broad initial screening of multivariate outliers using Mahalanobis distances. These data quality assurance procedures helped to mitigate noise in the data caused by any potential random responders.

The final sample was comprised of 2,579 university students (75.2% female; 24.3% male; .2% non-binary or other; .2% did not report on gender) aged between 17 and 25 years (M = 18.97; SD = 1.54). With freedom to select any applicable ethnocultural backgrounds, participants self-identified as White (62.8%), Asian (18.5%), Middle Eastern (11.4%), Black (9.4%),

Latino/Hispanic (2.2%), First Nations/Metis (2.1%), and other (0.7%) (note: percentages add up to more than 100% because participants could select as many ethnic identities as they identified with). Participants were mostly completing their first (62.1%), second (21.7%), and third (9.6%) years in university and were enrolled in a variety of programs across the Sciences (51.5%; e.g., Biomedical Science), Social Sciences (35.4%; e.g., Psychology, Criminology), Arts (8.9%; e.g., English, History), and other domains (2.7%; e.g., Civil Law, Finance). The majority of students (72.2%) answered "Never" when asked if they or their family ever had difficulty paying for basic necessities. Approximately half (48.9%) had full financial support from their parents for school, while others had partial (34.4%) or no such support (16.5%). Students lived either at home with their parents (41.9%), or in other accommodations (e.g., in a university residence).

From the total sample, 483 students (18.7% of overall sample; 11.8% of male students and 20.8% of female students) reported a history of NSSI within the past 12 months on the Ottawa Self-Injury Inventory (83.6% female; 15.3% male; .8% non-binary or other; .2% did not report gender; M_{age} = 18.77; SD_{age} = 1.42). In order to ascertain that university students' self-reported NSSI status was accurate and consistent with consensus-driven definitions of NSSI, we conducted a thorough verification of participant responses on the Ottawa Self-Injury Inventory (note: the Ottawa Self-Injury Inventory queries participants about a broad range of self-harm behaviors beyond NSSI). Consistent with tissue damage and severity criteria for NSSI (American Psychiatric Association, 2013; Nock, 2010), exclusive engagement in non-self-injurious forms of self-harm (i.e., excessive use of street drugs, excessive use of alcohol, taking too much or too little medication, eating or drinking things that are not food) and/or in more minor forms of self-injury that do not typically reflect true efforts to self-inflict pain or injury (e.g., interfering with wound healing, hair pulling, nail biting) were not considered to represent NSSI behavior. On average, students reported that they began to self-injure at the age of 14.92 years (*SD* = 2.41). Students

endorsed an average of 3.10 NSSI methods (*SD* = 1.57), which mainly included scratching (70.8%), cutting (68.7%), hitting (50.5%), biting (39.1%), piercing the skin with sharp objects (32.7%), headbanging (21.3%), burning (18.4%), and trying to break bones (5.8%). Over half of students (55.9%) had engaged in NSSI 1 to 3 times within the past year. Others reported doing so between 4-6 times (17.8%), more than 10 times (17.0%), and between 7-10 times (8.9%).

Measures

Mother and father pressure. Latent 'mother pressure' and 'father pressure' variables were measured using the mean scores of three distinct scales (observed indicators), as listed below. Both mother and father latent variables demonstrated good reliability (H_{mother} = .87; H_{father} = .88).

The Psychological Control Scale – Youth Self-Report (Barber, 1996) was used as a proxy of parental psychological control and as the first observed indicator of parental pressure. The scale is comprised of eight items (e.g., [*My mother/father is a person who*]… *would like to be able to tell me how to feel or think about things all the time*) which are scored along a 3-point scale from 1 (*not like him/her*) to 3 (*a lot like him/her*). The scale has demonstrated good psychometric properties (Barber, 1996) and showed good internal consistency for both mother (α = .86) and father (α = .85) counterpart versions in the current sample. A higher mean score indexed greater perceived psychological control. This mean score was used as an indicator of the latent (mother/father) parental pressure variable.

The parental expectations (five items; e.g., *My mother/father sets very high standards for me*) and criticism (four items; e.g., *My father/mother never tried to understand my mistakes*) subscales of the Multidimensional Perfectionism Scale (Frost et al., 1990) were also used as indicators of parental pressure. Although taken from a perfectionism scale, both subscales have been used as measures of parental criticism/expectations in previous research (Yates et al., 2008) and are considered to fall outside of the conceptual boundaries of dispositional perfectionism; that

is to say, they are considered correlates of perfectionism rather than inherent constituents of it (Stoeber, 2017). Items from these subscales were rated along a 7-point scale from 1 (*Not at all*) to 7 (*Totally*), with higher mean scores representing higher perceived criticism/expectations. In line with reliability and validity findings reported in previous work (Frost et al., 1990), both the expectations (father scale $\alpha = .87$; mother scale $\alpha = .88$) and criticism (father scale $\alpha = .87$; mother scale $\alpha = .89$) subscales demonstrated good internal consistency in the current sample. Mean subscale scores were used as indicators of the latent (mother/father) parental pressure variables.

Emotion dysregulation. Students' emotion dysregulation was assessed using the Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004). As mentioned previously, four of the six DERS subscales have been found to have the strongest links to NSSI based on a recent meta-analysis (Wolff et al., 2019), whereas the remaining two (emotional awareness and emotional clarity) have been found to be weaker predictors of NSSI. In order to optimize the configuration of the latent variable, only the four most relevant subscales were chosen as indicators of emotion dysregulation, as follows: Non-acceptance of emotions (six items; e.g., *When I'm upset, I feel like I am weak*); Difficulties engaging in goal-directed behavior (five items; e.g., *When I'm upset, I have difficulty concentrating*); Impulse control difficulties (six items; e.g., *When I'm upset, I become out of control*); and Limited access to regulation strategies (eight items; e.g., *When I'm upset, I believe there is nothing I can do to make myself feel better*). Items on the DERS are rated on a 5-point scale from 1 (*almost never*) to 5 (*almost always*), with higher subscale scores reflecting greater difficulties. All four subscales showed good internal consistency in the current sample (α's = .87-91). Using the four mean scores as indicators, the reliability of the latent 'emotion dysregulation' variable was good ($H = .94$).

Academic disengagement coping. Student's academic coping was measured using the disengagement-oriented coping dimension of Brief Coping Inventory for Academic Striving

(Thompson, 2015). The dimension (8 items; e.g., *I expressed my displeasure regarding school*) measures the extent to which four disengagement-oriented strategies (i.e., mental disengagement, mental distraction, venting, and social distancing) are used to cope with academic stress, using a 5-point scale ranging from 1 (*does not correspond at all*) to 5 (*corresponds totally*). The reliability and validity of the dimensional score have been demonstrated in previous research with university students (Thompson, 2015) and its internal consistency in the present sample was adequate (α = .77). Consistent with previous work (Blouin-Hudon et al., 2016; Gareau et al., 2019), the scale was broken down into two conceptually equivalent parcels, such that all four strategies were represented in each parcel (i.e., parcel 1 = items 2, 4, 6, and 11; parcel 2 = items 13, 15, 17, 22). With these parcels, the internal consistency of the latent variable was good (*H* = .82).

Perfectionism (self-oriented, socially-prescribed). The brief version of the Multidimensional Perfectionism Scale (Cox et al., 2002; Hewitt et al., 1991) was used as a measure of self-oriented perfectionism (6-item subscale; e.g., *One of my goals is to be perfect in everything I do*) and socially-prescribed perfectionism (5-item subscale; e.g., *Anything that I do that is less than excellent will be seen as poor work by those around me*). One item from the socially prescribed perfectionism subscale (*My family expects me to be perfect*) was omitted from the model given its clear conceptual redundancy with the parental expectations subscale. Both subscales have demonstrated evidence of reliability and validity in college samples (Cox et al., 2002; Hewitt & Flett, 1991) and were internally consistent within the current sample (self-oriented items α = .92; socially-prescribed items α = .87). Single items from each scale were used as indicators of the corresponding latent constructs in the model. Both the self-oriented (*H* = .93) and socially-prescribed (*H* = .89) latent variables showed good internal reliability.

Non-suicidal self-injury. The Ottawa Self-Injury Inventory (Cloutier & Nixon, 2003) was used to assess university students' engagement in NSSI behavior in the past year. The question

In the past year, have you purposefully injured yourself without the intention to kill yourself? is answered using a *yes*/*no* answer format ("no" responses are coded as 0). For those who answered yes, the frequency question "*If you answered yes, how frequently have you purposefully injured yourself in the past year?*" is then asked to participants in a choice-based format, namely: 1 to 3 times (coded as 1), 4 to 6 times (coded as 2), 7 to 10 times (coded as 3), or more than 10 times (coded as 4). Accordingly, NSSI frequency was measured on a five-point likert-type scale.

Socio-demographics. In addition to gender, age, and ethnicity, students reported on their academic performance (grade point average), on whether they or their family ever had difficulty paying for basic necessities, on whether they received financial support from parents for school, and on whether they lived with parents during university. These variables were explored as potential covariates in analyses. In order to explore differences between males and females more thoroughly, gender was also considered for use as a grouping variable in supplementary analyses.

Data Analytic Plan

Study hypotheses were tested by way of Structural Equation Modeling (SEM) in Mplus 8.6. All analyses were run using maximum likelihood robust estimation (MLR) and full information maximum likelihood (FIML) to handle missing data. As a first step, the fit of the measurement model was evaluated based on a combination of cut-off criteria. Specifically, values close to .06 for Root Mean Square Error of Approximation (RMSEA), close to .95 for Comparative Fit Index (CFI), and close to .08 for standardized root mean squared residual (SRMR) were considered to indicate good model fit, following guidelines proposed by Hu and Bentler (1999).

Following identification of the measurement model, the second step was to test the full conceptual (structural) model with past-year NSSI as the observed outcome variable. Non-normality problems with the NSSI variable, however, precluded the testing of a straight-forward linear regression model. Specifically, the NSSI variable featured an overabundance of "zero"

values (seeing as over 80% of the sample did not endorse past-year NSSI), resulting in a clear violation of multivariate normality assumptions. To adequately handle this data distribution, consistent with guidelines recently proposed by Gonzalez-Blanks and colleagues (2020), we opted to use a count regression approach, namely zero-inflated negative binomial (ZINB) regression, to estimate the effects of predictor variables on the NSSI outcome variable. It should be noted that other count regression approaches were also explored, but the ZINB regression model provided better model fit than all other approaches (see Table 2.1). In ZINB regression, two equations are simultaneously estimated; the first is a logistic regression that predicts the likelihood of non-occurrence of NSSI, or the odds of belonging to the "zero" group (*NSSI likelihood portion*), while the second is a log linear regression that estimates the frequency of the behavior among those who endorsed NSSI (*NSSI frequency portion*). Accordingly, two sets of regression coefficients are generated within the same analysis. Note that estimation of ZINB regression using the MLR estimator required the use of Monte Carlo numerical integration.

Another statistical issue relating to the latent structural equation model was indirect effects testing. The full conceptual model, as shown in Figure 2.1, was initially designed to account for indirect effects from parental pressure to NSSI via each of the four intrapersonal risk factors (i.e., multiple mediation). However, computational/statistical and interpretation considerations had to be weighed carefully in deciding whether to test for these indirect effects using ZINB regression (O'Rourke & Vazquez, 2019). The first of such considerations is that mediation effects with non-linear count outcomes necessitate the use of counterfactually defined effects in order to properly handle confounding/interaction effects and to minimize bias in coefficients (Muthén & Asparouhov, 2014). While the use of counterfactuals in simple mediation has become accessible to SEM researchers (Muthén & Asparouhov, 2014), their use in multiple mediation currently exceeds the functionalities of most statistical softwares, including that of Mplus 8.6. An additional

consideration is that indirect effects with (zero-inflated) count outcomes pose an inherent problem in terms of effect interpretation (O'Rourke & Vazquez, 2019), in part because they rely on the product of two regression coefficients (i.e., predictor-to-mediator and mediator-to-outcome) which are based on distinct distributions (i.e., normal and logarithmic, respectively). In light of these computational and interpretability problems, indirect effects were not estimated here. Instead, the paths proposed in the full conceptual model were more conservatively estimated using the following two distinct structural equation models: 1) a linear model first estimated the associations between mother/father pressure and the four intrapersonal risk factors (*Model 1: Linear SEM***)**: 2) a ZINB multiple regression model was then used to estimate the associations between all study variables and NSSI (*Model 2: ZINB SEM***).** In order to disentangle the unique vs. confounded effects of each of the risk factors on NSSI, variables were entered in the ZINB model using a hierarchical approach, where step 1 included the two parental variables, step 2 added the two perfectionism variables, step 3 added academic disengagement coping, and step 4 added the emotion dysregulation variable for simultaneous estimation of all predictors on NSSI (full model).

Finally, in a set of supplementary analyses, we aimed to retest the full model (i.e., step 4 of ZINB model) separately in female (n = 1940) and male (n = 627) students in order to explore gender differences in effects (note: seeing as only six students identified as non-binary, these participants could not be included in current analyses). As a prerequisite to this analysis, tests of measurement invariance across genders were conducted using recommended guidelines (Putnick & Bornstein, 2016) to evaluate the meaningfulness of such comparisons. Put more explicitly, paths can only be compared meaningfully across genders if the measurement properties of the model are sufficiently similar across females versus males. To do so, in addition to reporting invariance tests (χ^2 difference; Putnick & Bornstein, 2016), we also evaluated differences in CFI values, with

reductions of 0.01 or more in the CFI indicating worse model fit (Chen, 2007; Cheung & Rensvold, 2002; Putnick & Bornstein, 2016).

Results

Preliminary Analyses

Missing data was low (0.0 – 2.6%) and was missing completely at random in the current sample, Little's MCAR test: χ^2 (1206) = 1190.044, p = .623. The skewness and kurtosis of all latent variable indicators were well within acceptable limits (+/-1; Kline, 2015). Descriptive data on observed indicator variables are included in Table 2.2; variables were found to correlate in theoretically consistent directions and revealed no significant issues with multicollinearity. Table 2.3 presents the bivariate correlations between the six latent variables. As expected, mother and father pressure were both positively correlated with the four intrapersonal risk factors. In terms of covariates, bivariate correlations revealed that only age (r = 0.08; p < .001) and gender (r = 0.09; p < .001; i.e., females = 1, males = 0) were linked with past-year NSSI; accordingly, these variables were included as covariates in every step of the model (i.e., with paths linking age and gender to NSSI and all other latent variables). As mentioned previously, model results were also explored separately in female vs male students (see end of the Results section).

Measurement Model

Given that mother and father pressure used the same indicators (i.e., same subscales), errors of like indicators were set to be freely estimated, thus accounting for non-independence. We tested a fully saturated model, in which all correlations and direct paths were free to correlate between latent variables. The measurement model, which is shown in Figure 2.2, demonstrated an adequate fit to the data based on confirmatory factor analysis, χ^2 (191) = 2025.30, p < 0.001, RMSEA = .06 (95%CI = .06 - .06), CFI = .94, SRMR = .06. Observed indicators loaded

significantly on their respective latent factors, with standardized loadings ranging from .62 to .98 (see Figure 2.2 for all factor loadings).

Integrated Structural Model

Mother and father pressure predicting intrapersonal risk factors (*Model 1: Linear SEM*). Results from the linear SEM model, with age and gender as covariates, indicated that both mother and father pressure were significantly associated with self-oriented perfectionism (B_{mother} = 0.16, *SE* = .03, $p < .001$; B_{father} = 0.14, *SE* = .03, $p < .001$), socially prescribed perfectionism (B_{mother} = 0.40, *SE* = .03, $p < .001$; B_{father} = 0.31, *SE* = .03, $p < .001$), academic disengagement coping (B_{mother} = 0.25, *SE* = .03, $p < .001$; B_{father} = 0.11, *SE* = .03, $p < .001$), and emotion dysregulation (B_{mother} = 0.23, *SE* = .02, $p < .001$; B_{father} = 0.22, *SE* = .02, $p < .001$). Based on R^2, mother and father pressure accounted for 7.6% of the variance in self-oriented perfectionism, 38.0% of the variance in socially-prescribed perfectionism, 10.7% of the variance in academic disengagement coping, and 18.6% of the variance in emotion dysregulation. See Figure 2.3 for a visual illustration.

Full model predicting NSSI likelihood and frequency (*Model 2: ZINB SEM*). Full results from the latent ZINB regression model are presented in Table 2.4, and coefficients are also visually depicted in Figure 2.3. For ease of reading, results from the zero-inflation part of the ZINB model (NSSI likelihood) are described here as reflecting the likelihood of participants endorsing NSSI (vs. likelihood of belonging to the zero class; see Table 2.4 for more details).

In step 1 of the model (parental variables only), both mother and father pressure were found to be related to a higher likelihood of engaging in NSSI. Neither variable was related to NSSI frequency. In step 2 of the model (parental and perfectionism variables only), self-oriented perfectionism was associated with a lower likelihood of engaging in NSSI, whereas socially prescribed perfectionism was associated with higher odds of engaging in NSSI. The effects of

mother and father pressure on the likelihood of NSSI remained significant. Again, no effects were found on NSSI frequency. In step 3 of the model (parental, perfectionism, and academic disengagement variables), higher levels of academic disengagement coping were related to higher NSSI frequency. The effects of mother and father pressure and self-oriented perfectionism on NSSI likelihood remained significant, whereas socially prescribed perfectionism was no longer associated with NSSI likelihood. Lastly, in step 4 of the model (full model), emotion dysregulation was significantly associated with both a higher NSSI likelihood and NSSI frequency. The effects of mother pressure, father pressure, and self-oriented perfectionism on NSSI likelihood remained significant, whereas academic disengagement coping was no longer associated with NSSI frequency.

Retesting the Model in Female vs. Male Students

Measurement Invariance. The main steps and results of the invariance testing are summarized in Table 2.5. As a first step, a confirmatory factor analysis of the measurement model was tested in males versus females. The fit of both models was acceptable, although relatively better in the female-only sample. Following this, a multigroup confirmatory factor analysis was performed, starting from the least restrictive to the most restrictive model, to successively explore if (1) observed variables loaded on the same factors across males and females (configural invariance); (2) factor loadings were equivalent across males and females (metric invariance); and (3) item intercepts were equivalent across males and females (scalar invariance). Specifically, a baseline *configural* model was first tested with all parameters free to be estimated. As shown in Table 2.5, this model was deemed to be acceptable based on model fit indices. Then, a more restrictive *metrics* model was tested, adding the constraint of equal factor loadings across genders. This metrics model did not lead to significantly worse fit than the baseline configural model ($\Delta \chi^2_{(16)} = 11.195; p > 0.05;$ Δ CFI = 0.000; see Table 2.5). Finally, the more restrictive *scalar* model,

which constrained factor loadings and intercepts to be equal across females and males, was tested against the metric model. The scalar model led to significantly worse fit than the metrics model based on the chi-square difference test ($\Delta \chi^2_{(16)} = 102.53$; $p < 0.001$), but the difference in CFI values (along with other fit values) was negligible and supported the acceptability of the model (Δ CFI = 0.003). Seeing as χ^2 difference tests are sensitive to large sample sizes, differences in CFI and other fit values are usually a preferable index to rely upon for invariance testing (Putnick & Bornstein, 2016). In addition, while scalar invariance is especially important to establish when group differences in latent means are of interest (Cheung & Lau, 2012; Schmitt et al., 2011), we were only interested here in comparing males and females on the structural elements of the model (i.e., path coefficients, or associations among latent variables). Research has shown that partial scalar non-invariance does not substantially bias path coefficients (Byrne, 2012; Guenole & Brown, 2014; Schmitt et al., 2011). For these reasons, despite a slight worsening in the χ^2, we accepted the scalar model and proceeded to test the structural model in female-only and male-only samples for exploratory purposes. For the reader's information, further decomposition of the scalar model at the factor level is provided in Table 2.5.

Female-Only and Male-Only Model. Results from the full risk model for NSSI (i.e., step 4 of ZINB model) in female and male students are presented in Table 2.6. Overall, model results revealed the same effects in the female-only sample as those found in the full-sample model, namely that mother and father pressure, emotion dysregulation, and self-oriented perfectionism were all significantly associated with NSSI outcomes (in consistent directions). In contrast, no effects were significant in the male-only model (note that, in the male model, higher levels of mother pressure were marginally associated with a higher risk of NSSI engagement, at p =.06).

Discussion

Despite that university students have featured prominently in study samples used in NSSI research (Swannell et al., 2014), context-relevant risk factors associated with NSSI in university student populations are understudied. Therefore, in this study, we explored (1) whether perceived mother and father pressure were associated with NSSI likelihood and frequency; (2) whether mother and father pressure were linked with four intrapersonal risk factors relevant to the university experience that may be implicated in NSSI, and; (3) whether these intrapersonal risk factors were also associated with an elevated likelihood and frequency of engagement in NSSI amongst university students.

Parental Pressure as a Risk Factor for NSSI

Hypotheses for the study were partially supported. First, consistent with previous work on parental criticism and NSSI (Ammerman & Brown, 2018; Flett et al., 2012; Hoff & Muehlenkamp, 2009), higher levels of mother and father pressure were linked with greater odds of engaging in NSSI in the past year within the university sample in our final multivariate model (i.e., step 4 of ZINB model). While parental pressure has been found to be linked with negative affective outcomes in youth more generally (Agliata & Renk, 2009; Ciciolla et al., 2017; Peleg et al., 2016; Quach et al., 2015), little empirical attention has been paid to exploring its association with NSSI among university students. Our results thus add to a growing body of literature on the role of negative parent-child experiences in NSSI (Woo et al., 2020) by showing that, among young adults pursuing their university education, those who feel a sense of undue pressure to achieve from parents may bear a higher risk of engaging in NSSI. Interestingly, both mother and father pressure were significantly related to NSSI engagement, consistent with some studies showing evidence of broadly consistent risk/protective pathways tied to both parents (e.g., Jiang et al., 2017). However, other studies have also found predominant effects of mothers on NSSI (Guérin-Marion et al., 2019;

Pearson et al., 2018; Tatnell et al., 2017), while others have emphasized the fathers' role to a greater extent (Hallab & Covic, 2010; Martin et al., 2016) or differential mother and father processes on NSSI (Tao et al., 2020; Zetterqvist et al., 2018). One study also found that neither maternal or paternal criticism predicted NSSI engagement over time (Daly & Willoughby, 2019). We thus currently lack a clear account of the relative influences of mother and father-specific experiences on NSSI, particularly when it comes to criticizing and controlling parental behaviors in university. While the present study suggests an association between NSSI and higher perceived pressure in relationships with *both* mothers and fathers, future research is needed to clarify the extent of parental gender specificity in similar NSSI risk models.

It should be also noted that our hypothesis that mother and father pressure would relate to NSSI *frequency* was not supported. This may be because our NSSI variable, which collapsed frequency counts into categories, was not sensitive enough to detect a relationship between frequency of NSSI and levels of parental pressure. Of course, our result could also reflect the true nature of risk mechanisms influencing NSSI behavior. That is to say, it may be that parental pressure contributes to one's vulnerability to engage in NSSI, but that beyond this risk threshold, a more dynamic interplay between vulnerability factors and external stressors influences the number of times the behavior is repeated.

Mother and Father Pressure as Predictors of Intrapersonal Risk Factors

The current study also provided insight into the extent to which parental pressure is associated with elevations in four intrapersonal markers of maladjustment among university students. Consistent with hypotheses, mother and father pressure were both positively associated with self-oriented perfectionism, socially prescribed perfectionism, academic disengagement coping, and emotion dysregulation, thereby aligning with previous work. Indeed, proxies of parental pressure (i.e., criticism, expectations, and/or psychological control) have been found to

be associated with emotion dysregulation (Goger et al., 2020; Turpyn et al., 2015); with self-oriented/socially-prescribed perfectionism, both cross-sectionally (Smith et al., 2017) and prospectively (Damian et al., 2013, 2021); and with forms of academic disengagement coping such as academic procrastination (Boysan & Kiral, 2017) and overall lower academic self-efficacy (Filippello et al., 2015). Consistent with this work, our results suggest that parental pressure may be related to a compromised ability to appraise goal pursuits in realistic manners, to manage academic demands effectively, and to regulate negative emotions amongst university students.

Intrapersonal Risk Factors as Predictors of NSSI

Of all four intrapersonal risk variables, only emotion dysregulation was linked with *greater* odds of engaging in NSSI and higher NSSI frequency in the final multivariate model (ZINB model step 4). The association between emotion dysregulation and NSSI aligns with a robust body of research (Wolff et al., 2019) and theoretical literature (for reviews, see Hasking et al., 2017; McKenzie & Gross, 2014) documenting that those who struggle to manage and tolerate negative emotions are more likely to engage in NSSI. Taken together with the finding that emotion dysregulation covaries with levels of parental pressure, our results could be interpreted to suggest a combined distal and proximal risk trajectory toward NSSI. More explicitly, parental pressure in earlier developmental periods could confer risk for NSSI distally, by undermining the development of healthy emotion regulation skills throughout childhood and adolescence (Linehan, 1993; Nock, 2009) as well as more proximally, by failing to meet students' emotional needs and provoking experiences of disempowerment, anxiety, self-doubt, and shame during the university experience (Peel-Wainwright et al., 2021) which, in themselves, may render students more susceptible to emotion regulation difficulties. Since our cross-sectional design precludes the verifications of these interpretations, future longitudinal research will be needed in order to investigate the proposed temporal contingencies of associations between parental pressure, emotion

dysregulation, and NSSI. Indeed, more dynamic (and possibly bidirectional) relationships among parental pressure, emotion dysregulation, and NSSI may exist and unfold over time (see Waals et al., 2018).

Other important findings relate to the relationship between perfectionism and NSSI. First, self-oriented perfectionism was found to be related to *lower* odds of engaging in NSSI in the final model, which could be taken to suggest a protective effect at face value. Previous research on the link between self-oriented perfectionism/perfectionistic strivings and NSSI has led to mixed findings, with one study finding a positive association (Arthurs & Tan, 2017), and a number of studies finding no significant association (Chang et al., 2019; Flett et al., 2012; Hoff & Muehlenkamp, 2009; Lucas et al., 2019). While inconsistent with initial hypotheses, our finding may be understood in light of emerging conceptual nuances in the field of perfectionism research. Indeed, in previous work, perfectionistic strivings have been proposed to reflect a mixed construct, comprised of both adaptive (e.g., positive strivings) and maladaptive (e.g., self-critical) features that differentially relate to negative outcomes (e.g., anxiety; O'Connor et al., 2010). Likewise, in a recent theoretical model proposed by Gaudreau (2019, 2021; see also Osenk et al., 2020), perfectionistic strivings were conceptualized as reflecting an excessive and likely deleterious case of *excellencism* (i.e., defined as the pursuit of excellence *but not* perfection). While Gaudreau (2019) defines perfectionistic strivings and excellencism as distinct constructs, our measure of self-oriented perfectionism likely conflated the two, where items such as "*One of my goals is to be perfect in everything I do*" reflected the maladaptive cognitions underlying perfectionism, and items such as "*I set very high standards for myself*" reflected the more adaptive dimension of excellencism. It is possible, therefore, that university students high in self-oriented perfectionism benefit from increased protection against NSSI not because of their perfectionism, but rather because of their excellencism tendencies. Indeed, striving toward excellence may be conducive to

positive affective outcomes (e.g., positive self-concept, self-efficacy) that could protect against the vulnerable psychological states underpinning NSSI (e.g., self-criticism; Zelkowitz & Cole, 2019). Alternatively, another explanation for our finding may be that students high in self-oriented perfectionism are less likely to engage in NSSI because they perceive the behavior to be dissonant with their personal standards of achievement. Regardless of which explanation holds true, future research on perfectionism and NSSI is clearly needed. This work would benefit from measuring perfectionism using new instruments that capture excellencism features (Gaudreau, 2019) in order to arrive at theoretically sound conclusions.

Lastly, consistent with hypotheses and some existing research (Flett et al., 2012; O'Connor et al., 2010), both socially-prescribed perfectionism (step 2 of ZINB model) and academic disengagement coping (step 3 of ZINB model) were found to be associated with a higher likelihood of NSSI engagement and higher NSSI frequency, respectively. However, once other variables were entered in the model, these effects were rendered non-significant. It seems particularly relevant to consider that the effects of academic disengagement coping on NSSI frequency were eclipsed by those of emotion dysregulation, seeing as a conceptual overlap (r = .47) exists between the two variables (e.g., both variables relate to one's capacity for self-regulation; Compas et al., 2014). This pattern of results demonstrates that emotion dysregulation is, overall, more strongly related to NSSI frequency than academic disengagement coping at a between-person level. With this said, an alternative explanation may be that the link between academic disengagement coping and NSSI is moderated by unmeasured variables (e.g., levels of academic anxiety, discrepancies between actual and expected academic performance). This would be worthwhile to explore in future research. It may also be particularly useful for future research to explore academic disengagement coping in a within-person fashion (see Boileau et al., 2021; Thompson, 2015) as a means of better understanding how one's ability to cope with daily academic

stressors influences NSSI. For instance, it may be that NSSI frequency increases when levels of disengagement-oriented coping reach a higher-than-normal level for a student, relative to their "average" levels. Such a hypothesis would align with Miller and colleagues' (2019) results, which found that higher-than-usual stress, relative to one's mean stress levels, predicted NSSI prospectively among young adult females (see, however, Boyne & Hamza, 2021 for a similar analysis leading to a different pattern of results).

Results Across Male and Female Students

One final and exploratory goal of our study was to test if the same pattern of association in the full model (step 4 of ZINB model) would hold across genders. When the model was re-run with female and male students separately, associations between NSSI and parental pressure, emotion dysregulation, and self-oriented perfectionism remained significant only in females. Therefore, despite the fact that model effects in the overall sample were robust to the inclusion of gender as a control variable, this may indicate that female participants drove the majority of associations with NSSI in the present sample. Some previous research, albeit mixed (e.g., Ewing et al., 2019), has similarly found that links among NSSI and parent-child (Bureau et al., 2010; Flett et al., 2012), perfectionism (Flett et al., 2012), and coping-related (Andover et al., 2007; Wan et al., 2020) risk factors are stronger or uniquely found in females. Females may also be more likely than males to endorse the emotion regulation functions of NSSI (Victor et al., 2018; Whitlock et al., 2011). With this said, the lack of significant findings in the male sample should be interpreted within the context of the inherent limitations of the sample, which consisted of far fewer males than females. Importantly, only 11.8% of male students reported engaging in NSSI, relative to 20.8% of females, which further restricts the generalizability of findings in the male sample. For these reasons, while results are informative in contextualizing results from the overall risk model,

we caution against inferring that a true gender *difference* in NSSI vulnerability may exist between females and males on the basis of these results.

Limitations

Results should be interpreted bearing the following limitations in mind. First, as just mentioned, the generalizability of findings across genders is limited by the preponderance of females in our sample. It will be important for future research to make efforts to recruit more gender balanced samples in order to explore potential differences between males and females on NSSI risk factors (e.g., emotion dysregulation, perfectionism, coping, parent-child relationships). Likewise, seeing as the sample was primarily White/Caucasian, results may not generalize to more ethnically diverse university student populations. Second, our cross-sectional design is an important study limitation because it precludes the drawing of temporally contingent conclusions between variables. In particular, despite the fact that result interpretation was carried from sound theoretical rationale, we could not exclude the possibility that parental pressure could come as a *consequence* (rather than as a predictor) of NSSI, or that a reciprocal relationship between parental pressure and NSSI may exist. The use of multi-wave longitudinal designs are thus essential to incorporate in future research to investigate these possibilities. Moreover, as with all correlational research, associations among variables do not reflect cause-and-effect relationships. Third, our data were collected using the method of electronic self-report. This implicates the possibility of respondent bias (e.g., social desirability bias, retrospective bias), random responding, and the issue of shared method variance (seeing as the same participant answered all measures). Each of these limitations implicates the possibility that unmeasured individual factors and noise could have systematically influenced any one participant's responses to questionnaires. It should be noted, however, that the issue of random responding was partially mitigated by our use of validity screeners and careful screening of participants. Lastly, despite the fact that covariates of interest

were explored prior to performing analyses, unmeasured psychosocial factors (e.g., psychopathology, abuse) could have influenced current results. Replication is thus necessary to further ascertain findings.

Conclusion

Vulnerability factors that may be particularly salient during the university period tend to be overlooked in NSSI research. Findings from the present study suggest that university students who feel a sense of excessive pressure from mothers and fathers during university are more emotionally dysregulated, and find themselves at higher risk of engaging in NSSI overall. Although not necessarily indicative of a straight-forward protective effect, results also suggested that students may be less likely to engage in NSSI when the pressure they felt from parents was internalized as perfectionistic standards toward the self. Overall, findings add to our understanding of which risk factors may be related to NSSI engagement during the university years by highlighting the understudied role of parental pressure, along with the well-established role of emotion dysregulation. In the interest of addressing NSSI among university students, in addition to promoting intervention models that facilitate a therapeutic focus on emotion regulation (e.g., dialectical behavior therapy), clinicians and researchers may want to devote more attention to exploring students' internalization of achievement-focused pressure from parents.

References

Agliata, A. K., & Renk, K. (2009). College Students' Affective Distress: The Role of Expectation Discrepancies and Communication. *Journal of Child and Family Studies*, *4*(18), 396–411. https://doi.org/10.1007/s10826-008-9244-8

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (5th ed.)*. American Psychiatric Publishing.

Ammerman, B. A., & Brown, S. (2018). The Mediating Role of Self-Criticism in the Relationship between Parental Expressed Emotion and NSSI. *Current Psychology*, *37*(1), 325–333. https://doi.org/10.1007/s12144-016-9516-1

Andover, M. S., Pepper, C. M., & Gibb, B. E. (2007). Self-Mutilation and Coping Strategies in a College Sample. *Suicide and Life-Threatening Behavior*, *37*(2), 238–243. https://doi.org/10.1521/suli.2007.37.2.238

Arnett, J. J. (2015). *Emerging Adulthood: The Winding Road from the Late Teens Through the Twenties - Second Edition*. Oxford University Press.

Arnett, J. J. (2016). College Students as Emerging Adults: The Developmental Implications of the College Context. *Emerging Adulthood*, *4*(3), 219–222. https://doi.org/10.1177/2167696815587422

Arthurs, S. D., & Tan, J. C. H. (2017). Personality Traits, Early Maladaptive Schemas, and Severity of Nonsuicidal Self-Injury. *Psi Chi Journal of Psychological Research*, *22*(3), 181–192. https://doi.org/10.24839/2325-7342.JN22.3.181

Baetens, I., Claes, L., Martin, G., Onghena, P., Grietens, H., Van Leeuwen, K., Pieters, C., Wiersema, J. R., & Griffith, J. W. (2014). Is Nonsuicidal Self-Injury Associated With Parenting and Family Factors? *The Journal of Early Adolescence*, *34*(3), 387–405. https://doi.org/10.1177/0272431613494006

Barber, B. K. (1996). Parental psychological control: Revisiting a neglected construct. *Child Development*, *67*(6), 3296–3319. https://doi.org/10.1111/j.1467-8624.1996.tb01915.x

Beaujean, A., & Grant, M. (2019). Tutorial on Using Regression Models with Count Outcomes using R. *Practical Assessment, Research, and Evaluation*, *21*(1). https://doi.org/10.7275/pj8c-h254

Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of Affective Disorders*, *173*, 90–96. https://doi.org/10.1016/j.jad.2014.10.054

Blouin-Hudon, E.-M. C., Gaudreau, P., & Gareau, A. (2016). Coping as a building mechanism to explain the unique association of affect and goal motivation with changes in affective states. *Anxiety, Stress, & Coping*, *29*(5), 519–532. https://doi.org/10.1080/10615806.2015.1100298

Boysan, M., & Kiral, E. (2017). Associations between procrastination, personality, perfectionism, self-esteem and locus of control. *British Journal of Guidance & Counselling*, *45*(3), 284–296. https://doi.org/10.1080/03069885.2016.1213374

Bresin, K., & Schoenleber, M. (2015). Gender differences in the prevalence of nonsuicidal self-injury: A meta-analysis. *Clinical Psychology Review*, *38*, 55–64. https://doi.org/10.1016/j.cpr.2015.02.009

Bureau, J.-F., Martin, J., Freynet, N., Poirier, A. A., Lafontaine, M.-F., & Cloutier, P. (2010). Perceived dimensions of parenting and non-suicidal self-injury in young adults. *Journal of Youth and Adolescence*, *39*(5), 484–494. https://doi.org/10.1007/s10964-009-9470-4

Byrne, B. (2012). *Structural Equation Modeling with Mplus: Basic Concepts, Applications, and Programming*. Routledge. https://www.routledge.com/Structural-Equation-Modeling-with-Mplus-Basic-Concepts-Applications-and/Byrne/p/book/9781848728394

Carver, C. S., & Connor-Smith, J. (2010). Personality and Coping. *Annual Review of Psychology*, *61*(1), 679–704. https://doi.org/10.1146/annurev.psych.093008.100352

Castro, K., & Kirchner, T. (2018). Coping and Psychopathological Profile in Nonsuicidal Self-Injurious Chilean Adolescents. *Journal of Clinical Psychology*, *74*(1), 147–160. https://doi.org/10.1002/jclp.22493

Chang, E. C., Schaffer, M. R., Novak, C. J., Ablow, D. B., Gregory, A. E., Chang, O. D., Lucas, A. G., & Hirsch, J. K. (2019). Sexual assault history and self-destructive behaviors in women college students: Testing the perniciousness of perfectionism in predicting non-suicidal self-injury and suicidal behaviors. *Personality and Individual Differences, 149,* 186–191. https://doi.org/10.1016/j.paid.2019.05.021

Chen, F. F. (2007). Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, *14*(3), 464–504. https://doi.org/10.1080/10705510701301834

Chester, D. S., Merwin, L. M., & DeWall, C. N. (2015). Maladaptive perfectionism's link to aggression and self-harm: Emotion regulation as a mechanism. *Aggressive Behavior, 41*(5), 443–454. https://doi.org/10.1002/ab.21578

Cheung, G. W., & Lau, R. S. (2012). A Direct Comparison Approach for Testing Measurement Invariance. *Organizational Research Methods*, *15*(2), 167–198. https://doi.org/10.1177/1094428111421987

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, *9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Ciciolla, L., Curlee, A. S., Karageorge, J., & Luthar, S. S. (2017). When Mothers and Fathers Are Seen as Disproportionately Valuing Achievements: Implications for Adjustment Among Upper Middle Class Youth. *Journal of Youth and Adolescence*, *46*(5), 1057–1075. https://doi.org/10.1007/s10964-016-0596-x

Cloutier, P., & Nixon, M. K. (2003). The Ottawa Self-Injury Inventory: A preliminary evaluation. *European Child & Adolescent Psychiatry*, *12*, 1–94.

Compas, B. E., Jaser, S. S., Dunbar, J. P., Watson, K. H., Bettis, A. H., Gruhn, M. A., & Williams, E. K. (2014). Coping and Emotion Regulation from Childhood to Early Adulthood: Points of Convergence and Divergence. *Australian Journal of Psychology*, *66*(2), 71–81. https://doi.org/10.1111/ajpy.12043

Cox, B. J., Enns, M. W., & Clara, I. P. (2002). The multidimensional structure of perfectionism in clinically distressed and college student samples. *Psychological Assessment*, *14*(3), 365–373. https://doi.org/10.1037/1040-3590.14.3.365

Curran, T., & Hill, A. P. (2019). Perfectionism is increasing over time: A meta-analysis of birth cohort differences from 1989 to 2016. *Psychological Bulletin*, *145*(4), 410–429. https://doi.org/10.1037/bul0000138

Daly, O., & Willoughby, T. (2019). A longitudinal study investigating bidirectionality among nonsuicidal self-injury, self-criticism, and parental criticism. *Psychiatry Research*, 678–683. https://doi.org/10.1016/j.psychres.2018.12.056

Damian, L. E., Negru-Subtirica, O., Pop, E. I., & Stoeber, J. (2021). Becoming a perfectionistic adolescent: Perceived parental behaviors involved in developmental trajectories of

perfectionism. *European Journal of Personality*, 08902070211012902. https://doi.org/10.1177/08902070211012902

Damian, L. E., Stoeber, J., Negru, O., & Băban, A. (2013). On the development of perfectionism in adolescence: Perceived parental expectations predict longitudinal increases in socially prescribed perfectionism. *Personality and Individual Differences*, *55*(6), 688–693. https://doi.org/10.1016/j.paid.2013.05.021

Deneault, A.-A., Gareau, A., Bureau, J.-F., Gaudreau, P., & Lafontaine, M.-F. (2020). Fear of Failure Mediates the Relation Between Parental Psychological Control and Academic Outcomes: A Latent Mediated-Moderation Model of Parents' and Children's Genders. *Journal of Youth and Adolescence*, *49*(8), 1567–1582. https://doi.org/10.1007/s10964-020-01209-x

Emery, A. A., Heath, N. L., & Mills, D. J. (2016). Basic psychological need satisfaction, emotion dysregulation, and non-suicidal self-injury engagement in young adults: An application of self-determination theory. *Journal of Youth and Adolescence*, *45*(3), 612–623. https://doi.org/10.1007/s10964-015-0405-y

Ewing, L., Hamza, C. A., & Willoughby, T. (2019). Stressful Experiences, Emotion Dysregulation, and Nonsuicidal Self-Injury among University Students. *Journal of Youth and Adolescence*, *48*(7), 1379–1389. https://doi.org/10.1007/s10964-019-01025-y

Filippello, P., Sorrenti, L., Buzzai, C., & Costa, S. (2015). Perceived Parental Psychological Control and Learned Helplessness: The Role of School Self-efficacy. *School Mental Health*, *7*(4), 298–310. https://doi.org/10.1007/s12310-015-9151-2

Flett, G. L., Goldstein, A. L., Hewitt, P. L., & Wekerle, C. (2012). Predictors of Deliberate Self-Harm Behavior Among Emerging Adolescents: An Initial Test of a Self-Punitiveness Model. *Current Psychology*, *31*(1), 49–64. https://doi.org/10.1007/s12144-012-9130-9

Flett, G. L., Hewitt, P. L., Oliver, J. M., & Macdonald, S. (2002). Perfectionism in children and their parents: A developmental analysis. In *Perfectionism: Theory, research, and treatment* (pp. 89–132). American Psychological Association. https://doi.org/10.1037/10458-004

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, *14*(5), 449–468. https://doi.org/10.1007/BF01172967

Gareau, A., Chamandy, M., Kljajic, K., & Gaudreau, P. (2019). The detrimental effect of academic procrastination on subsequent grades: The mediating role of coping over and above past achievement and working memory capacity. *Anxiety, Stress, & Coping*, *32*(2), 141–154. https://doi.org/10.1080/10615806.2018.1543763

Gaudreau, P. (2019). On the Distinction Between Personal Standards Perfectionism and Excellencism: A Theory Elaboration and Research Agenda. *Perspectives on Psychological Science*, *14*(2), 197–215. https://doi.org/10.1177/1745691618797940

Gaudreau, P. (2021). Separating the core definitional feature and the signature expressions of dispositional perfectionism: Implications for theory, research, and practice. *Personality and Individual Differences*, *181*, 110975. https://doi.org/10.1016/j.paid.2021.110975

Goger, P., Rozenman, M., & Gonzalez, A. (2020). The association between current maternal psychological control, anxiety symptoms, and emotional regulatory processes in emerging adults. *Journal of Behavior Therapy and Experimental Psychiatry*. https://doi.org/10.1016/j.jbtep.2020.101563

Gonzalez-Blanks, A., Bridgewater, J. M., & Yates, T. M. (2020). Statistical Approaches for Highly Skewed Data: Evaluating Relations between Maltreatment and Young Adults' Non-Suicidal Self-injury. *Journal of Clinical Child & Adolescent Psychology*, *49*(2), 147–161. https://doi.org/10.1080/15374416.2020.1724543

Gratz, K. L., & Roemer, L. (2004). Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, *26*(1), 41–54. https://doi.org/10.1023/B:JOBA.0000007455.08539.94

Guenole, N., & Brown, A. (2014). The consequences of ignoring measurement invariance for path coefficients in structural equation models. *Frontiers in Psychology*, *5*. https://www.frontiersin.org/article/10.3389/fpsyg.2014.00980

Guérin-Marion, C., Martin, J., Lafontaine, M.-F., & Bureau, J.-F. (2019). Invalidating Caregiving Environments, Specific Emotion Regulation Deficits, and Non-suicidal Self-injury. *Child Psychiatry & Human Development*. https://doi.org/10.1007/s10578-019-00908-2

Guerreiro, D. F., Cruz, D., Frasquilho, D., Santos, J. C., Figueira, M. L., & Sampaio, D. (2013). Association Between Deliberate Self-Harm and Coping in Adolescents: A Critical Review of the Last 10 Years' Literature. *Archives of Suicide Research*, *17*(2), 91–105. https://doi.org/10.1080/13811118.2013.776439

Hallab, L., & Covic, T. (2010). Deliberate Self-Harm: The Interplay Between Attachment and Stress. *Behaviour Change*, *27*(2), 93–103. https://doi.org/10.1375/bech.27.2.93

Hamza, C. A., Goldstein, A. L., Heath, N. L., & Ewing, L. (2021). Stressful Experiences in University Predict Non-suicidal Self-Injury Through Emotional Reactivity. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.610670

Hamza, C., & Willoughby, T. (2014). A longitudinal person-centered examination of nonsuicidal self-injury among university students. *Journal of Youth and Adolescence*, *43*(4), 671–685. https://doi.org/10.1007/s10964-013-9991-8

Hasking, P., & Claes, L. (2020). Transdiagnostic mechanisms involved in nonsuicidal self-injury, risky drinking and disordered eating: Impulsivity, emotion regulation and alexithymia. *Journal of American College Health*, *68*(6), 603–609. https://doi.org/10.1080/07448481.2019.1583661

Hasking, P., Dawkins, J., Gray, N., Wijeratne, P., & Boyes, M. (2020). Indirect Effects of Family Functioning on Non-Suicidal Self-Injury and Risky Drinking: The Roles of Emotion Reactivity and Emotion Regulation. *Journal of Child and Family Studies*, *29*(7), 2070–2079. https://doi.org/10.1007/s10826-020-01722-4

Hasking, P., Whitlock, J., Voon, D., & Rose, A. (2017). A cognitive-emotional model of NSSI: Using emotion regulation and cognitive processes to explain why people self-injure. *Cognition and Emotion*, *31*(8), 1543–1556. https://doi.org/10.1080/02699931.2016.1241219

Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology*, *60*(3), 456–470.

Hewitt, P. L., Flett, G. L., Turnbull-Donovan, W., & Mikail, S. F. (1991). The Multidimensional Perfectionism Scale: Reliability, validity, and psychometric properties in psychiatric samples. *Psychological Assessment*, *3*(3), 464–468. http://dx.doi.org/10.1037/1040-3590.3.3.464

Hoff, E. R., & Muehlenkamp, J. J. (2009). Nonsuicidal self-injury in college students: The role of perfectionism and rumination. *Suicide and Life-Threatening Behavior*, *39*(6), 576–587. https://doi.org/10.1521/suli.2009.39.6.576

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Jiang, Y., You, J., Zheng, X., & Lin, M.-P. (2017). The qualities of attachment with significant others and self-compassion protect adolescents from non suicidal self-injury. *School Psychology Quarterly*, *32*(2), 143–155. https://doi.org/10.1037/spq0000187

Kaynak, S., Sevgili Koçak, S., & Kaynak, Ü. (2021). Measuring adolescents' perceived parental academic pressure: A scale development study. *Current Psychology*. https://doi.org/10.1007/s12144-021-01347-w

Kiekens, G., Bruffaerts, R., Nock, M. K., Ven, M. V. de, Witteman, C., Mortier, P., Demyttenaere, K., & Claes, L. (2015). Non-Suicidal Self-Injury Among Dutch and Belgian Adolescents: Personality, Stress and Coping. *European Psychiatry*, *30*(6), 743–749. https://doi.org/10.1016/j.eurpsy.2015.06.007

Kiekens, G., Claes, L., Demyttenaere, K., Auerbach, R. P., Green, J. G., Kessler, R. C., Mortier, P., Nock, M. K., & Bruffaerts, R. (2016). Lifetime and 12-Month Nonsuicidal Self-Injury and Academic Performance in College Freshmen. *Suicide and Life-Threatening Behavior*, *46*(5), 563–576. https://doi.org/10.1111/sltb.12237

Kiekens, G., Hasking, P., Bruffaerts, R., Alonso, J., Auerbach, R. P., Bantjes, J., Benjet, C., Boyes, M., Chiu, W. T., Claes, L., Cuijpers, P., Ebert, D. D., Mak, A., Mortier, P., O'Neill, S., Sampson, N. A., Stein, D. J., Vilagut, G., Nock, M. K., & Kessler, R. C. (2021). Non-suicidal self-injury among first-year college students and its association with mental disorders: Results from the World Mental Health International College Student (WMH-ICS) initiative. *Psychological Medicine*, 1–12. https://doi.org/10.1017/S0033291721002245

Kiekens, G., Hasking, P., Bruffaerts, R., Claes, L., Baetens, I., Boyes, M., Mortier, P., Demyttenaere, K., & Whitlock, J. (2017). What Predicts Ongoing Nonsuicidal Self-Injury?: A Comparison Between Persistent and Ceased Self-Injury in Emerging Adults. *The Journal of Nervous and Mental Disease*, *205*(10), 762. https://doi.org/10.1097/NMD.0000000000000726

Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling, Fourth Edition*. Guilford Publications.

Limburg, K., Watson, H. J., Hagger, M. S., & Egan, S. J. (2017). The relationship between perfectionism and psychopathology: A meta-analysis. *Journal of Clinical Psychology*, *73*(10), 1301–1326. https://doi.org/10.1002/jclp.22435

Lindell, A. K., Killoren, S. E., & Campione-Barr, N. (2020). Parent-child relationship quality and emotional adjustment among college students: The role of parental financial support. *Journal of Social and Personal Relationships*, 0265407520964870. https://doi.org/10.1177/0265407520964870

Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. Guilford Press.

Lowe, K., & Dotterer, A. M. (2018). Parental Involvement During the College Transition: A Review and Suggestion for its Conceptual Definition. *Adolescent Research Review*, *3*(1), 29–42. https://doi.org/10.1007/s40894-017-0058-z

Lucas, A. G., Chang, E. C., Li, M., Chang, O. D., & Hirsch, J. K. (2019). Perfectionism and social problem solving as predictors of nonsuicidal self-injury in ethnoracially diverse college students: Findings controlling for concomitant suicide risk. *Social Work*, *64*(2), 165–174. https://doi.org/10.1093/sw/swz005

Martin, J., Bureau, J.-F., Yurkowski, K., Fournier, T. R., Lafontaine, M.-F., & Cloutier, P. (2016). Family-based risk factors for non-suicidal self-injury: Considering influences of maltreatment, adverse family-life experiences, and parent–child relational risk. *Journal of Adolescence*, *49*(Supplement C), 170–180. https://doi.org/10.1016/j.adolescence.2016.03.015

Mattanah, J. F., Lopez, F. G., & Govern, J. M. (2011). The contributions of parental attachment bonds to college student development and adjustment: A meta-analytic review. *Journal of Counseling Psychology*, *58*(4), 565–596. https://doi.org/10.1037/a0024635

McKenzie, K. C., & Gross, J. J. (2014). Nonsuicidal self-injury: An emotion regulation perspective. *Psychopathology*, *47*(4), 207–219. https://doi.org/10.1159/000358097

Miller, A. B., Eisenlohr-Moul, T., Glenn, C. R., Turner, B. J., Chapman, A. L., Nock, M. K., & Prinstein, M. J. (2019). Does higher-than-usual stress predict nonsuicidal self-injury? Evidence from two prospective studies in adolescent and emerging adult females. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *60*(10), 1076–1084. https://doi.org/10.1111/jcpp.13072

Muthén, B., & Asparouhov, T. (2014). Causal Effects in Mediation Modeling: An Introduction With Applications to Latent Variables. *Structural Equation Modeling: A Multidisciplinary Journal*. https://www.tandfonline.com/doi/full/10.1080/10705511.2014.935843

Nock, M. K. (2009). Why Do People Hurt Themselves?: New Insights Into the Nature and Functions of Self-Injury. *Current Directions in Psychological Science*, *18*(2), 78–83. https://doi.org/10.1111/j.1467-8721.2009.01613.x

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

O'Connor, R. C., Rasmussen, S., & Hawton, K. (2010). Predicting depression, anxiety and self-harm in adolescents: The role of perfectionism and acute life stress. *Behaviour Research and Therapy*, *48*(1), 52–59. https://doi.org/10.1016/j.brat.2009.09.008

O'Rourke, H. P., & Vazquez, E. (2019). Mediation analysis with zero-inflated substance use outcomes: Challenges and recommendations. *Addictive Behaviors*, *94*, 16–25. https://doi.org/10.1016/j.addbeh.2019.01.034

Osenk, I., Williamson, P., & Wade, T. D. (2020). Does perfectionism or pursuit of excellence contribute to successful learning? A meta-analytic review. *Psychological Assessment*, *32*(10), 972–983. https://doi.org/10.1037/pas0000942

Pearson, R. M., Campbell, A., Howard, L. M., Bornstein, M. H., O'Mahen, H., Mars, B., & Moran, P. (2018). Impact of dysfunctional maternal personality traits on risk of offspring depression, anxiety and self-harm at age 18 years: A population-based longitudinal study. *Psychological Medicine*, *48*(1), 50–60. https://doi.org/10.1017/S0033291717001246

Peel-Wainwright, K.-M., Hartley, S., Boland, A., Rocca, E., Langer, S., & Taylor, P. J. (2021). The interpersonal processes of non-suicidal self-injury: A systematic review and meta-synthesis. *Psychology and Psychotherapy: Theory, Research and Practice*, *n/a*(n/a). https://doi.org/10.1111/papt.12352

Peleg, O., Deutch, C., & Dan, O. (2016). Test anxiety among female college students and its relation to perceived parental academic expectations and differentiation of self. *Learning and Individual Differences*, *49*, 428–436. https://doi.org/10.1016/j.lindif.2016.06.010

Power, T. G. (2004). Stress and Coping in Childhood: The Parents' Role. *Parenting*, *4*(4), 271–317. https://doi.org/10.1207/s15327922par0404_1

Putnick, D. L., & Bornstein, M. H. (2016). Measurement Invariance Conventions and Reporting: The State of the Art and Future Directions for Psychological Research. *Developmental Review : DR*, *41*, 71–90. https://doi.org/10.1016/j.dr.2016.06.004

Quach, A. S., Epstein, N. B., Riley, P. J., Falconier, M. K., & Fang, X. (2015). Effects of Parental Warmth and Academic Pressure on Anxiety and Depression Symptoms in Chinese Adolescents. *Journal of Child and Family Studies*, *24*(1), 106–116. https://doi.org/10.1007/s10826-013-9818-y

Robillard, C. L., Turner, B. J., & Helps, C. E. (2021). Testing a diathesis-stress model during the transition to university: Associations between self-criticism, stress, and internalizing problems. *Journal of American College Health*, *0*(0), 1–11. https://doi.org/10.1080/07448481.2021.1947837

Rogers, A. A., Updegraff, K. A., Iida, M., Link to external site, this link will open in a new window, Dishion, T. J., Doane, L. D., Link to external site, this link will open in a new window, Corbin, W. C., Van Lenten, S. A., Ha, T., & Link to external site, this link will open in a new window. (2018). Trajectories of positive and negative affect across the transition to college: The role of daily interactions with parents and friends. *Developmental Psychology*, *54*(11), 2181–2192. http://dx.doi.org/10.1037/dev0000598

Schmitt, N., Golubovich, J., & Leong, F. T. L. (2011). Impact of Measurement Invariance on Construct Correlations, Mean Differences, and Relations With External Correlates: An Illustrative Example Using Big Five and RIASEC Measures. *Assessment*, *18*(4), 412–427. https://doi.org/10.1177/1073191110373223

Smith, M. M., Sherry, S. B., Gautreau, C. M., Mushquash, A. R., Saklofske, D. H., & Snow, S. L. (2017). The intergenerational transmission of perfectionism: Fathers' other-oriented perfectionism and daughters' perceived psychological control uniquely predict daughters'

self-critical and personal standards perfectionism. *Personality and Individual Differences*, 242–248. https://doi.org/10.1016/j.paid.2017.07.030

Some days are more satisfying than others: A daily-diary study on optimism, pessimism, coping, and academic satisfaction. (n.d.). https://doi.org/10.1111/bjep.12346

Stoeber, J. (2017). The Psychology of Perfectionism: An Introduction. In *The Psychology of Perfectionism*. Routledge.

Stoeber, J., Edbrooke-Childs, J. H., & Damian, L. E. (2016). Perfectionism. In R. J. R. Levesque (Ed.), *Encyclopedia of Adolescence* (pp. 1–7). Springer International Publishing. https://doi.org/10.1007/978-3-319-32132-5_279-2

Swannell, S., Martin, G., Page, A., Hasking, P., & St John, N. J. (2014). Prevalence of nonsuicidal self-injury in nonclinical samples: Systematic review, meta-analysis and meta-regression. *Suicide and Life-Threatening Behavior*, *44*(3), 273–303. https://doi.org/10.1111/sltb.12070

Tao, Y., Bi, X.-Y., & Deng, M. (2020). The Impact of Parent–Child Attachment on Self-Injury Behavior: Negative Emotion and Emotional Coping Style as Serial Mediators. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.01477

Tatnell, R., Hasking, P., & Newman, L. (2017). Multiple mediation modelling exploring relationships between specific aspects of attachment, emotion regulation, and non-suicidal self-injury. *Australian Journal of Psychology*, 1–9. https://doi.org/10.1111/ajpy.12166

Thompson, A. (2015). Coping with Stress in Undergraduate University Students: Development and Validation of the Coping Inventory for Academic Striving (CIAS) to Examine Key Educational Outcomes in Correlational and Experimental Studies. *Doctoral Dissertation, University of Ottawa*.

Turpyn, C. C., Chaplin, T. M., Cook, E. C., & Martelli, A. M. (2015). A person-centered approach to adolescent emotion regulation: Associations with psychopathology and parenting. *Journal of Experimental Child Psychology*, *136*, 1–16. https://doi.org/10.1016/j.jecp.2015.02.009

Victor, S. E., Muehlenkamp, J. J., Hayes, N. A., Lengel, G. J., Styer, D. M., & Washburn, J. J. (2018). Characterizing gender differences in nonsuicidal self-injury: Evidence from a large clinical sample of adolescents and adults. *Comprehensive Psychiatry*, *82*, 53–60. https://doi.org/10.1016/j.comppsych.2018.01.009

Waals, L., Baetens, I., Rober, P., Lewis, S., Van Parys, H., Goethals, E. R., & Whitlock, J. (2018). The NSSI family distress cascade theory. *Child and adolescent psychiatry and mental health*, *12*(1), 1-6. https://doi.org/10.1186/s13034-018-0259-7

Wallace, G. T., Henry, K. L., Barrett, K. C., & Conner, B. T. (2021). Personality and emotion dysregulation profiles predict differential engagement in a wide range of health-risk behaviors. *Journal of American College Health*, *0*(0), 1–13. https://doi.org/10.1080/07448481.2021.1947302

Wan, Y., Chen, R., Wang, S., Clifford, A., Zhang, S., Orton, S., & Tao, F. (2020). Associations of coping styles with nonsuicidal self-injury in adolescents: Do they vary with gender and adverse childhood experiences? *Child Abuse & Neglect*. https://doi.org/10.1016/j.chiabu.2020.104470

Wang, B., You, J., Lin, M.-P., Xu, S., & Leung, F. (2017). Developmental Trajectories of Nonsuicidal Self-Injury in Adolescence and Intrapersonal/Interpersonal Risk Factors. *Journal of Research on Adolescence*, *27*(2), 392–406. https://doi.org/10.1111/jora.12273

Whitlock, J., Purington, A., Eckenrode, J., Barreira, P., Baral Abrams, G., PhD, T. M., PhD, V. K., MD, K. G., PhD, C. C., & PhD, K. K. (2011). Nonsuicidal Self-injury in a College

Population: General Trends and Sex Differences. *Journal of American College Health, 59*(8), 691–698. https://doi.org/10.1080/07448481.2010.529626

Wilcox, H. C., Arria, A. M., Caldeira, K. M., Vincent, K. B., Pinchevsky, G. M., & O'Grady, K. E. (2012). Longitudinal predictors of past-year non-suicidal self-injury and motives among college students. *Psychological Medicine, 42*(4), 717–726. https://doi.org/10.1017/S0033291711001814

Wolff, J. C., Thompson, E., Thomas, S. A., Nesi, J., Bettis, A. H., Ransford, B., Scopelliti, K., Frazier, E. A., & Liu, R. T. (2019). Emotion dysregulation and non-suicidal self-injury: A systematic review and meta-analysis. *European Psychiatry, 59*, 25–36. https://doi.org/10.1016/j.eurpsy.2019.03.004

Woo, J., Wrath, A. J., & Adams, G. C. (2020). The Relationship Between Attachment and Self-Injurious Behaviors in the Child and Adolescent Population: A Systematic Review of the Literature. *Archives of Suicide Research, 0*(0), 1–22. https://doi.org/10.1080/13811118.2020.1804024

Xavier, A., Pinto-Gouveia, J., & Cunha, M. (2016). Non-suicidal Self-Injury in Adolescence: The Role of Shame, Self-Criticism and Fear of Self-Compassion. *Child & Youth Care Forum, 45*(4), 571–586. https://doi.org/10.1007/s10566-016-9346-1

Xiao, H., Carney, D. M., Youn, S. J., Link to external site, this link will open in a new window, Janis, R. A., Castonguay, L. G., Hayes, J. A., & Locke, B. D. (2017). Are we in crisis? National mental health and treatment trends in college counseling centers. *Psychological Services, 14*(4), 407–415. http://dx.doi.org/10.1037/ser0000130

Xie, Y., Kong, Y., Yang, J., & Chen, F. (2019). Perfectionism, worry, rumination, and distress: A meta-analysis of the evidence for the perfectionism cognition theory. *Personality and Individual Differences, 139,* 301–312. https://doi.org/10.1016/j.paid.2018.11.028

Yates, T. M., Tracy, A. J., & Luthar, S. S. (2008). Nonsuicidal self-injury among "privileged" youths: Longitudinal and cross-sectional approaches to developmental process. *Journal of Consulting and Clinical Psychology*, *76*(1), 52–62. https://doi.org/10.1037/0022-006X.76.1.52

You, J., Ren, Y., Zhang, X., Wu, Z., Xu, S., & Lin2, M.-P. (2018). *Emotional Dysregulation and Nonsuicidal Self-Injury: A Meta-Analytic Review*. *8*(2), 733–748. https://doi.org/10.4172/Neuropsychiatry.1000399

Yurkowski, K., Martin, J., Levesque, C., Bureau, J.-F., Lafontaine, M.-F., & Cloutier, P. (2015). Emotion dysregulation mediates the influence of relationship difficulties on non-suicidal self-injury behavior in young adults. *Psychiatry Research*, *228*(3), 871–878. https://doi.org/10.1016/j.psychres.2015.05.006

Zelkowitz, R. L., & Cole, D. A. (2019). Self-Criticism as a Transdiagnostic Process in Nonsuicidal Self-Injury and Disordered Eating: Systematic Review and Meta-Analysis. *Suicide and Life-Threatening Behavior*, *49*(1), 310–327. https://doi.org/10.1111/sltb.12436

Zetterqvist, M., Svedin, C. G., Fredlund, C., Priebe, G., Wadsby, M., & Jonsson, L. S. (2018). Self-reported nonsuicidal self-injury (NSSI) and sex as self-injury (SASI): Relationship to abuse, risk behaviors, trauma symptoms, self-esteem and attachment. *Psychiatry Research*, *265*, 309–316. https://doi.org/10.1016/j.psychres.2018.05.013

Table 2.1 ***Relative Fit of Regression Approaches Explored for the Prediction of NSSI in the Structural Equation Model***

	BIC	AIC
Multiple linear regression	163055.99	162517.32
Poisson regression	161623.88	161091.06
Negative binomial regression	161235.16	160696.49
Zero-inflated poisson regression	161214.26	160640.46
Zero-inflated negative binomial regression	**161205.99**	**160626.33**

Note. Best fitting solution is bolded. BIC = Bayesian Information Criterion, AIC = Akaike Information Criterion. All models were estimated using robust maximum likelihood parameter estimates (MLR) and full information maximum likelihood (FIML).

Table 2.2 ***Descriptive Statistics and Bivariate Correlations Among Observed Variable Indicators***

Indicators	*M*	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
Mother/Father Pressure Indicators																							
1. Criticism-M	2.50	1.57	-																				
2. Expectations-M	3.88	1.63	.68*	-																			
3. Psych. Control-M	1.48	0.48	.63*	.44*	-																		
4. Criticism-F	2.67	1.62	.49*	.41*	.32*	-																	
5. Expectations-F	3.90	1.62	.36*	.60*	.21*	.70*	-																
6. Psych. Control-F	1.50	0.49	.29*	.27*	.38*	.61*	.41*	-															
Self-Oriented/Socially Prescribed Perfectionism Indicators																							
7. SPP-1	3.30	1.76	.38*	.37*	.26*	.36*	.36*	.23*	-														
8. SPP-2	3.19	1.73	.43*	.40*	.29*	.40*	.38*	.28*	.57*	-													
9. SPP-3	3.20	1.84	.40*	.38*	.28*	.38*	.36*	.24*	.65*	.58*	-												
10. SPP-4	3.28	1.87	.43*	.52*	.27*	.42*	.48*	.26*	.64*	.61*	.63*	-											
11. SOP-1	4.37	1.77	.19*	.30*	.13*	.19*	.30*	.14*	.53*	.33*	.35*	.46*	-										
12. SOP-2	4.45	1.70	.14*	.26*	.10*	.16*	.25*	.12*	.44*	.31*	.32*	.43*	.69*	-									
13. SOP-3	4.72	1.77	.13*	.27*	.10*	.13*	.26*	.11*	.44*	.26*	.33*	.42*	.73*	.72*	-								
14. SOP-4	5.24	1.62	.11*	.25*	.09*	.13*	.25*	.08*	.36*	.21*	.26*	.35*	.55*	.57*	.67*	-							
15. SOP-5	4.87	1.73	.23*	.38*	.15*	.24*	.37*	.16*	.44*	.31*	.36*	.53*	.56*	.53*	.59*	.63*	-						
16. SOP-6	4.49	1.85	.21*	.35*	.13*	.21*	.34*	.15*	.52*	.36*	.39*	.57*	.73*	.67*	.72*	.65*	.52*	-					
Academic Disengagement Coping Indicators																							
17. Parcel 1	2.45	0.75	.23*	.16*	.15*	.17*	.11*	.13*	.20*	.26*	.22*	.18*	.07*	-.02	.01	-.01	.05	.07*	-				
18. Parcel 2	2.60	0.85	.28*	.21*	.21*	.22*	.14*	.16*	.25*	.33*	.27*	.21*	.08*	-.01	.01	.04	.09*	.09*	.70*	-			

Note. Missing data on indicator variables (0.0 – 2.6%) was handled using full information maximum likelihood.

SPP = socially prescribed perfectionism subscale; SOP = self-oriented perfectionism subscale; M = mother; F = father; *$p < .01$

Table 2.2 con't

Indicators	*M*	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
Emotion Dysregulation Indicators																							
19. Impulse control	2.36	0.93	.28*	.16*	.25*	.28*	.15*	.24*	.31*	.34*	.28*	.22*	.15*	.12*	.09*	.05*	.10*	.15*	.28*	.35*	-		
20. Non-acceptance	2.61	1.07	.27*	.18*	.22*	.28*	.18*	.22*	.36*	.32*	.33*	.25*	.19*	.15*	.14*	.16*	.16*	.20*	.22*	.33*	.57*	-	
21. Strategies	2.56	0.96	.30*	.17*	.25*	.29*	.15*	.24*	.34*	.38*	.33*	.25*	.17*	.11*	.10*	.10*	.14*	.18*	.30*	.42*	.74*	.69*	-
22. Goal-directed	3.36	0.94	.16*	.09*	.17*	.18*	.08*	.17*	.18*	.20*	.17*	.13*	.12*	.10*	.11*	.15*	.13*	.12*	.18*	.30*	.54*	.45*	.64*

Note. Missing data on indicator variables (0.0 – 2.6%) was handled using full information maximum likelihood.

*$p < .01$.

Table 2.3 ***Bivariate Correlations Between Latent Variables***

Variable	1.	2.	3.	4.	5.	6.
1. Mother pressure	-					
2. Father pressure	.51**	-				
3. Self-oriented perfectionism	.24**	.23**	-			
4. Socially prescribed perfectionism	.56**	.51**	.63**	-		
5. Academic disengagement coping	.31**	.23**	.06*	.34**	-	
6. Emotion dysregulation	.34**	.32**	.19**	.43**	.47**	-

Note. *$p < .01$, ** $p < .001$

Table 2.4 ***Step-by-Step Prediction of Non-Suicidal Self-Injury (NSSI) Likelihood and Frequency Using Zero-Inflated Negative Binomial Regression***

Predictor variables	NSSI likelihood[†] (*prediction of zeroes*)		NSSI frequency[‡] (*prediction of counts*)	
	B (*SE*)	Odds ratio[§]	*B* (*SE*)	% Δ in expected count[¶]
Step 1				
Mother pressure	-.46 (.11) ***	0.63	-.02 (.06)	-
Father pressure	-.34 (.10) ***	0.71	-.04 (.06)	-
Step 2				
Mother pressure	-.41 (.13) ***	0.66	-.06 (.07)	-
Father pressure	-.30 (.11) **	0.74	-.06 (.08)	-
Self-oriented perfectionism	.43 (.12) ***	1.54	.09 (.09)	-
Socially-prescribed perfectionism	-.34 (.17) *	0.71	.07 (.12)	-
Step 3				
Mother pressure	-.39 (.13) **	0.68	-.11 (.08)	-
Father pressure	-.26 (.12) *	0.77	-.07 (.08)	-
Self-oriented perfectionism	.45 (.14) **	1.57	.12 (.10)	-
Socially-prescribed perfectionism	-.34 (.20)	-	.02 (.14)	-
Academic disengagement coping	-.12 (.10)	-	.18 (.06) **	19.7%
Step 4 (full model)				
Mother pressure	-.50 (.20) *	0.61	-.07 (.09)	-
Father pressure	-.32 (.14) *	0.73	-.13 (.08)	-
Self-oriented perfectionism	.38 (.16) *	1.47	.11 (.10)	-
Socially-prescribed perfectionism	.11 (.24)	-	-.02 (.13)	-
Academic disengagement coping	.20 (.14)	-	.08 (.07)	-
Emotion dysregulation	-1.03 (.21) ***	0.36	.32 (.10) ***	37.7%

Note. Results are presented for the full sample (n = 2,579) using full information maximum likelihood and robust estimation. All predictor variables were modeled as latent variables using structural equation modeling. Gender and age were included as covariates. *$p < .05$; **$p < .01$; ***$p < .001$.

[†] In this portion of the analysis, coefficients reflect the prediction of the latent "zero" class (i.e., no NSSI in past year); thus, negative coefficients indicate a *lesser* likelihood of belonging to the class of individuals who denied a past-year history of NSSI (or, alternatively, a *higher* likelihood of having endorsed past-year NSSI).

[‡] In this portion of the analysis, participants with a score of zero (i.e., no NSSI in past year) are assigned a lesser weight, consistent with their latent probability of having an NSSI count >0.

[§] Indicates the increase (>1) or decrease (< 1) in the odds of belonging to "zero" class for every 1 unit increase in the predictor.

[¶] Indicates the percentage change in the expected counts for every 1 unit increase in the predictor (see Beaujean & Grant, 2019)

Table 2.5 ***Fit Values From Measurement Invariance Testing Across Female and Male Students***

Model	*df*	χ^2	CFI	SRMR	RMSEA (90% CI)
Overall model (*n* = 2,579)	191	2025.30	.937	.057	.061 (.059 - .063)
Model in females only (*n* = 1,940)	191	1587.93	.938	.056	.061 (.059 - .064)
Model in males only (*n* = 627)	191	647.57	.929	.063	.062 (.057 - .067)
Configural model	382	2228.46	.936	.058	.061 (.059 - .064)
Metric model	398	2241.55	.936	.058	.060 (.058 - .063)
Scalar model	414	2342.86	.933	.059	.060 (.058 - .063)
Only *Father pressure* intercepts constrained	385	2271.11	.934	.059	.062 (.059 - .064)
Only *Mother pressure* intercepts constrained	385	2263.31	.935	.059	.062 (.059 - .064)
Only *Emotion dysregulation* intercepts constrained	386	2300.97	.933	.061	.062 (.060 - .065)
Only *Socially prescribed perfectionism* intercepts constrained	386	2254.91	.935	.058	.061 (.059 - .064)
Only *Self-oriented perfectionism* intercepts constrained	388	2264.99	.935	.059	.061 (.059 - .064)
Only *Academic disengagement coping* intercepts constrained	384	2241.86	.935	.058	.061 (.059 - .064)

Note. *df* = degrees of freedom, CFI = Comparative Fit Index, SRMR = Standardized Root Mean Square Residual, RMSEA = Root Mean Square Error of Approximation.

Table 2.6 ***Full Model Re-Tested in Female vs Male Students***

Predictor variables	Female Sample (n = 1940)		Male Sample (n = 627)	
	NSSI likelihood[†] (B, SE)	NSSI frequency[‡] (B, SE)	NSSI likelihood[†] (B, SE)	NSSI frequency[‡] (B, SE)
Mother pressure	-.62 (.28) *	-.15 (.11)	-.60 (.32)	-.19 (.28)
Father pressure	-.34 (.16) *	-.16 (.08)	.19 (.42)	.38 (.32)
Self-oriented perfectionism	.48 (.17) **	.08 (.10)	.35 (.67)	.24 (.56)
Socially-prescribed perfectionism	.18 (.28)	.10 (.14)	-.47 (.92)	-.46 (.81)
Academic disengagement coping	.31 (.19)	.11 (.09)	.48 (.40)	.36 (.25)
Emotion dysregulation	-1.19 (.29) ***	.30 (.12)*	-.57 (.43)	.19 (.33)

Note. *p < .05; *p < .01; ***p < .001. All predictor variables were modeled as latent variables using structural equation modeling. Age was included as a covariate.

[†] In this portion of the analysis, coefficients reflect the prediction of the latent "zero" class (i.e., no NSSI in past year); thus, negative coefficients indicate a *lesser* likelihood of belonging to the class of individuals who denied a past-year history of NSSI (or, alternatively, a *higher* likelihood of having endorsed past-year NSSI).

[‡] In this portion of the analysis, coefficients reflect the prediction of NSSI counts (i.e., frequency). Participants with a score of zero (i.e., no NSSI in past year) are assigned a lesser weight, consistent with their latent probability of having an NSSI count >0.

Figure 2.1 ***Conceptual Model with NSSI Engagement in University Students Regressed on Indices of Parental Pressure, Perfectionism, Emotion Dysregulation, and Academic Coping***

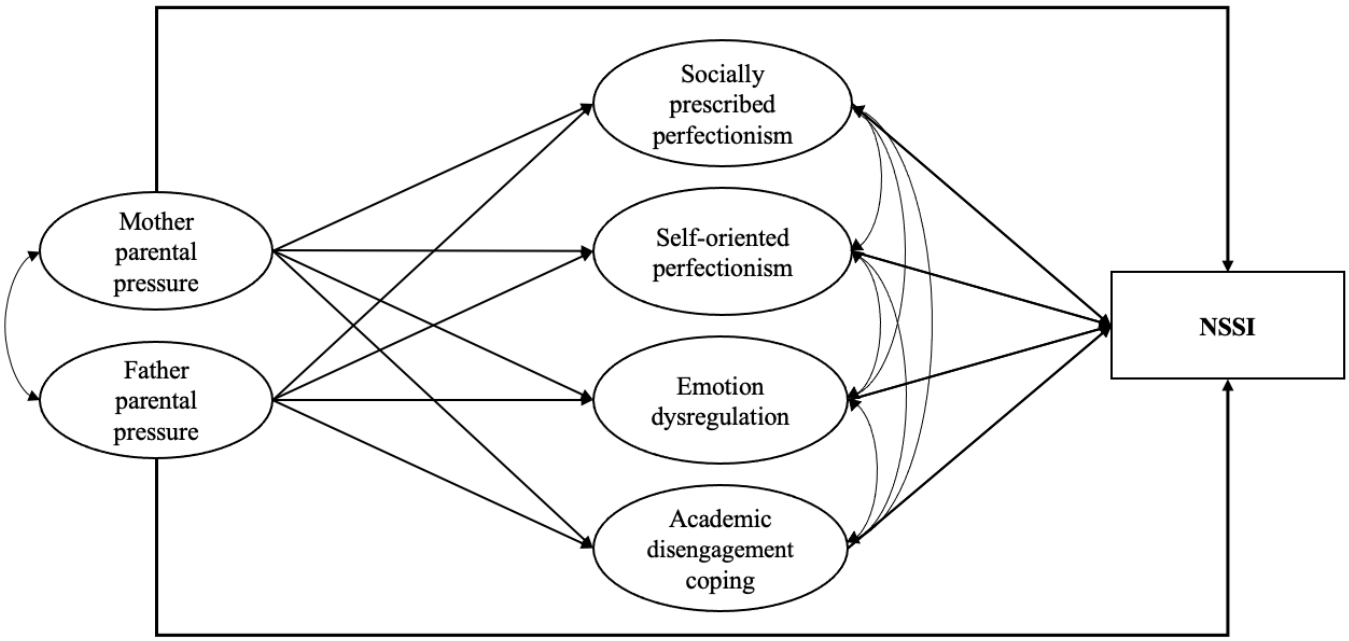
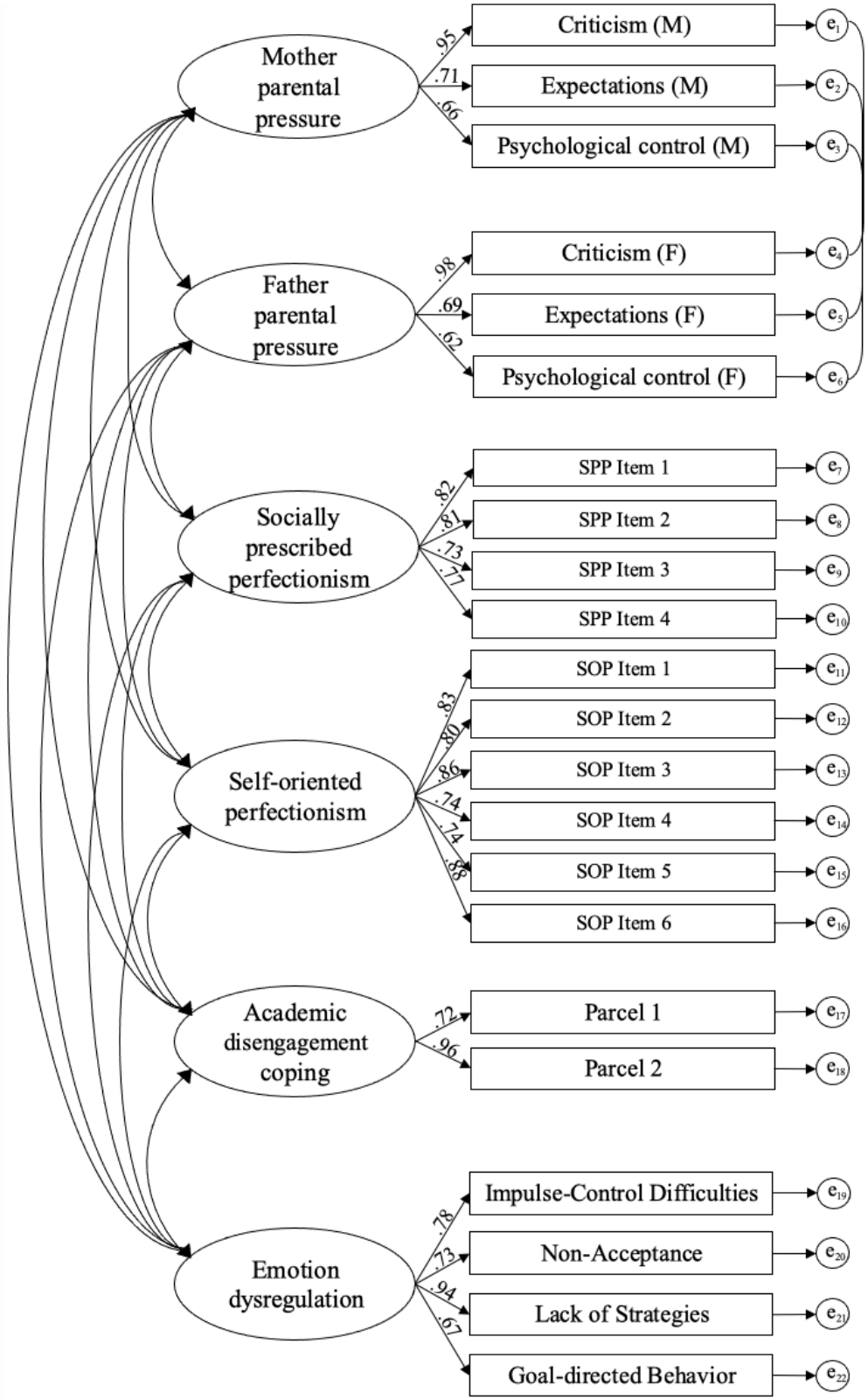
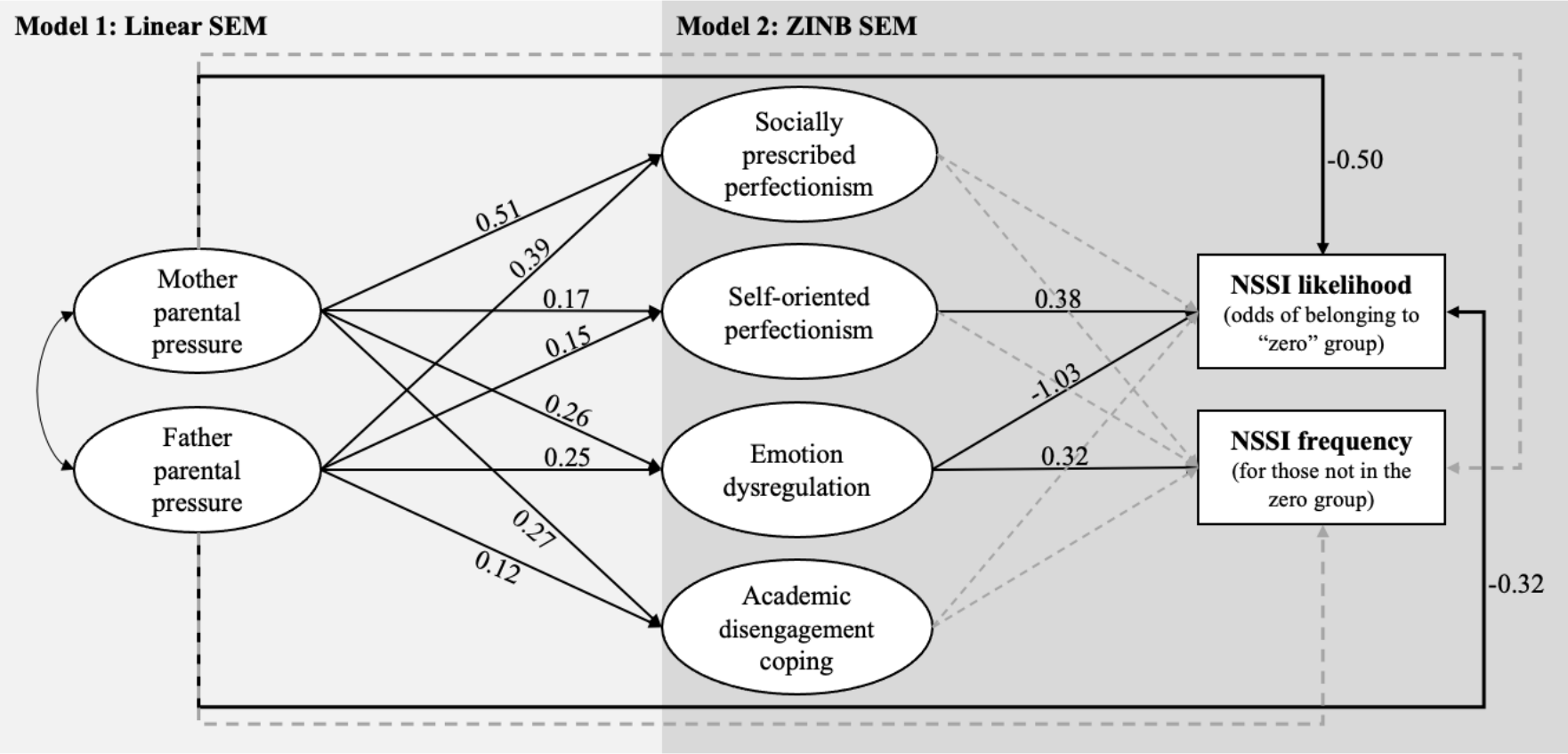


Figure 2.2 ***Measurement Model with Standardized Factor Loadings***



Note. Errors were free to correlate between analogous mother and father items (i.e., e_1 with e_4; e_2 with e_5; e_3 with e_6). SPP = socially prescribed perfectionism; SOP = self-oriented perfectionism; M = mother; F = father

Figure 2.3 ***Integrated Structural Equation Model (SEM) with Unstandardized Path Coefficients***



Note. Significant unstandardized paths from two separate structural models are presented, namely: a linear regression model (Linear SEM) and zero-inflated negative binomial regression model (ZINB SEM). Non-significant paths are represented with dotted lines. Gender and age were included as covariates. Please note that intercorrelations among latent variables were freely estimated but are not pictured here in the interest of visual clarity; please see Table 2.3 for more details on intercorrelations. NSSI = non-suicidal self-injury.

CHAPTER 3 (Study 2):

Profiles of Emotion Dysregulation Among University Students Who Self-Injure: Associations with Parent-Child Relationships and Non-Suicidal Self-Injury Characteristics

Based on the article published in 2021 in the 50th volume of the *Journal of Youth and Adolescence*:

Guérin-Marion, C., Bureau, J.-F., Lafontaine, M.-F., Gaudreau, P., & Martin, J.;

DOI:10.1007/s10964-020-01378-9.

Abstract

More research is needed to understand the different vulnerability profiles of university students who engage in non-suicidal self-injury (NSSI). This study sought to classify university students (n = 479; 83.8% female) aged 17-25 years (M = 18.77; SD = 1.42) who had engaged in NSSI within the past year into latent profiles based on their self-perceived difficulties in regulating both positive and negative emotions. Independent samples of students who had a past history of NSSI but had not self-injured within the previous year (n = 439; 82.9% females; M_{age} = 19.03, SD = 1.62) and who had no history of NSSI (n = 1551; 69.9% females; M_{age} = 19.02, SD = 1.55) were recruited for comparison purposes. Latent cluster analyses revealed three emotion regulation profiles within the NSSI sample—the Average Difficulties (47.4%), Dysregulated (33.0%), and Low Difficulties (19.6%) profiles—each of which differed meaningfully from both comparison samples on mean emotion regulation difficulties. Students across profiles also differed in their self-reported experiences with parents, particularly with fathers (pressure, antipathy, unresolved attachment, psychological control), and in the extent to which they felt alienated from parents. Lastly, students across profiles differed in the frequency, methods, functions, and addictive properties of their NSSI. Findings highlight that university students who self-injure experience distinct patterns of difficulties with emotion regulation, which are associated with variation in parent-child relational risk factors and NSSI outcomes.

Keywords: Non-suicidal self-injury, Emotion regulation, Parent-child relationships, Parents, Latent profile analysis, Latent class analysis.

Introduction

Non-suicidal self-injury (NSSI) encompasses a range of deliberate, self-inflicted, and socially unsanctioned behaviors that are specifically aimed at causing damage to bodily tissue, but are not motivated by suicidal intent (e.g., cutting, burning, hitting oneself; Nock & Favazza, 2009). While the highest rates of NSSI are observed during adolescence, the behavior is also a common concern among university students (lifetime prevalence of 20.2%; Swannell et al., 2014). The university years encompass a unique period of developmental transition for young people (i.e., emerging adulthood; Arnett, 2015) that can be marked by exposure to significant psychosocial and performance-related stressors (e.g., pressure to succeed academically; post-graduation career plans; Beiter et al., 2015). Vulnerability for maladaptive coping behaviors, such as NSSI, can therefore be heightened during this period among a substantial subset of at-risk students (Kiekens et al., 2019).

With the aim of identifying the specific vulnerability factors associated with NSSI during this period, much research has focused on the concept of emotion dysregulation. This research has converged on the notion that young adults who self-injure experience greater difficulty regulating their emotions than their peers who do not self-injure (note: this finding also generalizes to adolescents and older adults; see meta-analysis; Wolff et al., 2019). However, beyond establishing that emotion regulation difficulties can broadly discriminate *between* university students who do and do not self-injure, existing research has yet to provide a more nuanced account of the different emotion regulation profiles that can co-exist *within* populations of university students who engage in NSSI. With this objective, the current study sought to classify university students with a recent history of NSSI (i.e., within the past year) into vulnerability profiles based on their self-reported difficulties in regulating both positive and negative emotions. The typology of risk characterizing

each emotion regulation profile was further examined by comparing profiles on 1) a series of parent-child relational risk factors, theorized to play a role in increasing developmental vulnerability for emotion dysregulation and NSSI, and; 2) the severity, functions, and addictive features of students' NSSI behavior.

Emotion Regulation and NSSI

Theoretical models have long underscored impairments in emotion regulation as central to one's risk of engaging in NSSI. The experiential avoidance model (Chapman et al., 2006), for instance, places emphasis on avoidance of emotions as a key culprit, and postulates that individuals engage in NSSI in an effort to suppress or escape aversive emotional experiences. The emotional cascade model (Selby & Joiner, 2009) highlights the role of ruminative thinking as a key mechanism that escalates emotional reactions to events and subsequent engagement in dysregulated behaviors, including NSSI, in Borderline Personality Disorder. Consistent with these models, an extensive theoretical (McKenzie & Gross, 2014; Nock, 2009; Nock & Prinstein, 2005) and empirical (Klonsky, 2007; Rodríguez-Blanco et al., 2018; Taylor et al., 2018) literature on the functions of NSSI highlights that the most commonly reported reason for self-injuring is to downregulate negative emotions, often taking precedence over socially-motivated and/or sensation-seeking functions (e.g., to communicate hurt to others; to elicit caregiving or support; to upregulate positive sensations; Klonsky, 2007). Cutting across this body of literature is the notion that NSSI is most often negatively reinforced through temporary relief from negative emotions.

Aligning with these theoretical models, researchers have demonstrated that adolescents and young adults who self-injure struggle more than their peers, on average, to engage in a number of emotion regulation processes. Drawing heavily from Gratz and Roemer's (2004) multidimensional conceptualization of emotion regulation difficulties, such differences have been

observed on measures of emotional awareness (e.g., Cerutti et al., 2018; Gholamrezaei et al., 2017; Palmer et al., 2019; Thomassin, Guérin Marion, et al., 2017), emotional clarity, or the ability to understand one's emotions (e.g., Bresin, 2014; Palmer et al., 2019; Turner et al., 2015), acceptance of emotions (Anderson et al., 2018; Anderson & Crowther, 2012; Tatnell et al., 2017), the self-perceived ability to access regulation strategies (e.g., Emery et al., 2016; Kiekens et al., 2017; Tatnell et al., 2017) impulse-control difficulties when upset (e.g., Anderson & Crowther, 2012; Palmer et al., 2019; Tatnell et al., 2017), and difficulty engaging in goal-directed behavior, such as school work, in the context of an emotional stressor (e.g., Tatnell et al., 2017). High levels of rumination (i.e., tendency to ruminate on negative experiences) have also been found to relate to NSSI, consistent with the emotional cascade model (e.g., Nicolai et al., 2016; Zhou et al., 2020). Pulling data from 49 samples, a recent meta-analysis found the overall association between emotion dysregulation and lifetime NSSI to be significant, and of medium magnitude overall (Wolff et al., 2019). The meta-analysis also found that the self-perceived inability to access effective emotion regulation strategies, as captured by a subscale from the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), was the most powerful emotion-regulation predictor of NSSI, yielding a medium-to-large effect size. Participant gender, age, or sample type (i.e., clinical vs. community-based) did not moderate these effects.

Notwithstanding the robustness of this body of literature, it is worth noting that empirical attention has almost exclusively been paid to the regulation of *negative* emotional states. While NSSI functions primarily as a strategy to downregulate negative emotions (e.g., anger, sadness), there is a subset of individuals who report engaging in NSSI to achieve a positive affective state (Taylor et al., 2018), such as feelings of relaxation, excitement, or exhilaration (Klonsky, 2007; Nock, 2009; Whitlock et al., 2014) and a drug-like "high" (Guérin-Marion et al., 2018; Martin et

al., 2013). As these motivations all reflect maladapted efforts to upregulate positive sensations, there is reason to believe that dysregulation within *positive* emotional systems could also account for variation in NSSI behavior. Consistent with this hypothesis, engagement in other self-harmful behaviors, such as risky alcohol and drug use, have been linked with difficulties regulating impulses in the context of positive moods (Weiss, Sullivan, et al., 2015). Moreover, individuals who engage in NSSI have been found to display patterns of cognitive dampening of positive moods (Burke et al., 2015), lower responsivity to positive emotional images/clips (Boyes et al., 2020; Tatnell et al., 2018) and lower levels/intensity of positive affect overall (e.g., Chen & Chun, 2019; Hasking et al., 2018), potentially indexing a difficulty *accepting* positive emotions.

Parent-Child Relationships as Developmental Precursors to Emotion Dysregulation and NSSI

Problems with emotion dysregulation and NSSI can develop within the context of an invalidating parent-child relationship throughout childhood and adolescence. Linehan's (1993) biosocial theory of Borderline Personality Disorder is one of the dominant theoretical lenses through which we understand this developmental risk pathway. The theory stipulates that, among other biological risk factors, growing up in a family environment in which emotions are invalidated (e.g., punished, dismissed, minimized) interferes with the development of healthy emotion regulation skills. This then contributes to dysregulated emotional functioning (e.g., inability to self-regulate when upset) and drives the use of compensatory strategies, like NSSI, to regulate emotions. Lending the biosocial theory significant empirical support, research has found that experiences of abuse (for a review, see Liu et al., 2018), insecure attachment (for a review, Woo et al., 2020), and feeling emotionally alienated from parental figures (Bureau et al., 2010; Yates et al., 2008) are associated with NSSI behavior in university students. A number of studies have also

demonstrated the indirect effects of such experiences on NSSI through emotion dysregulation in both adolescents (Adrian et al., 2011; Emery et al., 2017; Sim et al., 2009; Tao et al., 2020; Thomassin et al., 2016) and young adults (Buckholdt et al., 2009; Guérin-Marion et al., 2019; Hasking et al., 2020; Tatnell et al., 2017; Yurkowski et al., 2015), thereby converging on the tentative conclusion that an invalidating emotional climate within the parent-child relationship could potentially confer vulnerability for NSSI by compromising the development of adaptive emotion regulation skills, as posited by the biosocial theory.

Beyond these particularly salient experiences of invalidation, however, a wider spectrum of parent-child relational dynamics could conceivably impact a young adult's capacity to regulate their emotions. In light of the developmental transitions (Arnett, 2015) and academic pressures (Beiter et al., 2015) facing university students, parental behaviors that have the potential to interfere with young adults' sense of autonomy and competence may be particularly dysregulating during this period. For this reason, it would seem important to explore whether parental overprotection, psychological control, criticism, and achievement-focused expectations could contribute to the emotion-related vulnerabilities underlying NSSI behavior during the university years. Limited research has explored the link between NSSI and these perceived parental behaviors (e.g., criticism) in young adult/university populations (Daly & Willoughby, 2019; Flett et al., 2012; Hoff & Muehlenkamp, 2009), and no research to date has explored whether these parental behaviors relate to differences in emotion regulation difficulties among students who self-injure. In addition, existing research has tended to survey individuals with NSSI histories about their caregiving experiences without specificity to either mothers or fathers. Assuming that relational risk can be "averaged" across the mother-child and father-child relationships, however, may reflect an oversimplification of the respective (and possibly interacting) influences of these relationships

(see Dagan & Sagi-Schwartz, 2018). In support of this, some studies have found that relationships with mothers and fathers are differentially related to NSSI behavior through emotion dysregulation, albeit without a clear pattern to date; for instance, one study has uncovered unique indirect effects from fathers through emotion regulation difficulties (Tao et al., 2020), while others observed these same indirect effects for mothers (e.g., Guérin-Marion et al., 2019; Tatnell et al., 2017), thereby highlighting a need for further investigation.

Despite the growing breadth of our understanding of the vulnerability patterns associated with NSSI, much of this research has been conducted from a *variable-centric* perspective. This has lent a focus on the extent to which NSSI covaries with specific vulnerability characteristics (e.g., emotion regulation difficulties) in student populations at large, thereby helping determine what differentiates individuals who do versus those who do not self-injure. Although informative, a downfall to this variable-centered approach is that it offers scarce information about the different vulnerability profiles that may co-exist within populations of students with a history of NSSI. Person-centered statistical approaches, as further discussed below, are particularly useful for their ability to uncover such heterogeneity in a given at-risk population.

Person-Centered Perspectives on NSSI Vulnerability

Person-centered approaches to statistical analysis (e.g., latent class/profile analyses) are designed to identify clusters of alike individuals, who share similarities on multiple variables of interest, within heterogeneous samples (Berlin et al., 2014; Nylund-Gibson & Choi, 2018). Person-centered approaches can help to complement our variable-centered understanding of NSSI risk (i.e., how single risk factors covary with NSSI) by extracting different mosaics of individual characteristics (i.e., patterns of relative strengths and weaknesses on multiple indicators) that more holistically define an individual's vulnerability profile for NSSI. Accordingly, these approaches

can help us move beyond the identification of dominant patterns of risk for NSSI and allow us to parse out further heterogeneity in the vulnerability characteristics found among students with a history of NSSI. Put differently, while we know that emotion dysregulation is a risk factor associated with NSSI, it is unlikely that university students who self-injure all experience the same patterns of difficulties with emotion regulation.

NSSI researchers have begun to integrate person-centered approaches in their work (Burke et al., 2018; Hamza & Willoughby, 2014; Peterson et al., 2019; Shahwan et al., 2020; Somer et al., 2015; Thomassin, Quint, et al., 2017). A subset of these studies has focused on identifying characteristically distinct profiles of NSSI engagement in university populations using person-centered approaches (Case et al., 2019; Klonsky & Olino, 2008; Whitlock et al., 2008). One finding that has emerged from these studies has been the identification of a profile of university students with particularly severe and entrenched self-injurious behavior, characterized by higher frequency/severity of NSSI (e.g., Case et al., 2019; Whitlock et al., 2008), higher endorsement of NSSI's emotion regulatory functions (Klonsky & Olino, 2008), and higher endorsement of NSSI's addictive properties (i.e., extent to which NSSI is perceived as addictive and intensifies over time; Whitlock et al., 2008), among other features. This subgroup seems most likely to exhibit a profile of vulnerability marked by high levels of difficulty across all aspects of emotion regulation (Burke et al., 2018; see, also, Chen & Chun, 2019; Shahwan et al., 2020), and to most closely align with aforementioned models of NSSI etiology and functions.

Beyond this, much remains to be understood about the vulnerability profiles of other university students who engage in NSSI. Indeed, another key finding from person-centered research is that a significant portion of university students who self-injure display more moderate and mild/experimental profiles of engagement in NSSI (e.g., lower frequency, fewer methods;

Case et al., 2019; Klonsky & Olino, 2008). This suggests they may display less severe or otherwise distinctive patterns of vulnerability for the behavior, including potential differences in their emotional regulation patterns. Some studies have begun to more closely attend to the full spectrum of NSSI vulnerability profiles, bringing interesting findings into focus. For instance, in one study that explored the relational risk profiles of university students with a recent history of NSSI (Martin, Bureau, Yurkowski, Lafontaine, et al., 2016), 13% of the sample was characterized by a self-reported history of exceptionally *positive* experiences with parents—far more positive, even, than the average student without an NSSI history (e.g., higher levels of trust and care, less trauma). These researchers hypothesized that this profile, labeled "Positive-Idealizing", may reflect a pattern of idealization of parental figures, which has been shown to be associated with a deactivated style of emotion regulation (Shaver & Mikulincer, 2007). Using a similar design, one additional study explored the emotion regulation profiles of university students with a lifetime history of NSSI (n = 326; Peterson et al., 2019). These researchers found that the largest profile of self-injuring students (70.9% of sample) was characterized by relatively low emotion regulation difficulties, few NSSI methods, and was associated with relatively few behavioral health risks (e.g., lower disordered eating, lower negative/positive urgency). Some study limitations, however, arguably restrict the generalizability and interpretability of these findings. For instance, two of the four latent profiles were comprised of less than 5% of study participants (i.e., n = 8 and n = 12), making them potentially unstable and unlikely to generalize to other samples (see Berlin et al., 2014; Nylund-Gibson & Choi, 2018). Likewise, these researchers used emotion regulation *and* NSSI methods as indicators of profile membership, which renders the interpretation of vulnerability profiles as they relate to emotion dysregulation patterns more conceptually challenging. Lastly, the study's use of lifetime (vs. more recent) estimates of NSSI may have

introduced memory biases (Hamza & Willoughby, 2015), which could help explain the low NSSI severity observed in the sample. It should be noted that this study also did not explore positive emotion regulation patterns, or the parent-child relational risk factors that may be associated with emotion regulation profiles. Such an exploration would be in line with existing theory (Linehan, 1993) and would help advance a more complete and developmentally informed understanding of the emotion regulation profiles of university students who self-injure.

The Current Study

More research is needed to clarify the different profiles of emotion regulation difficulties that may underpin university students' engagement in NSSI, and the extent to which these profiles relate to differences in parent-child relational dynamics and specific NSSI outcomes. To this end, the current study's first objective was to classify university students with a recent history of NSSI into homogeneous subgroups (latent profiles) based on their self-reported difficulties with emotion regulation, spanning both positive and negative emotional experiences. Similarly to previous research (Martin, Bureau, Yurkowski, Lafontaine, et al., 2016), each profile's emotion regulation mean scores were compared to those of two independent comparison samples, namely (1) a group of students with a past history of NSSI but who had ceased engaging in the behavior at least one year ago, and (2) a group of students who had never self-injured. Comparison samples thus provided broad benchmarks (i.e., population means) against which to compare the characteristics of each profile, in order to ascertain that they differed meaningfully from the average student without a recent history of NSSI. In line with existing research (Burke et al., 2018; Peterson et al., 2019), it was anticipated that person-centered analyses would uncover one particularly vulnerable profile of students with high levels of emotion dysregulation, whereas the remaining profiles were expected to reflect overall lesser impairment in emotion regulation (e.g., "mild" to "moderate"

severity groups). While the specific configuration of profiles was unknown, one profile was expected to be characterized by particularly low scores on all emotion regulation measures, consistent with a possible trend toward minimization and/or underreporting of experiences, as observed in previous research (Martin, Bureau, Yurkowski, Lafontaine, et al., 2016). All profiles were expected to differ meaningfully from the two comparison samples on measures of emotion regulation.

The study's remaining objectives were to compare the emotion regulation profiles of students with a past-year NSSI history on 1) the perceived quality of their maternal and paternal relational experiences, and 2) the frequency, time elapsed since onset, methods, functions, and addictive properties of their NSSI. Consistent with past research, the most emotionally dysregulated profile of students was expected to report the most negative parent-child relationships and the NSSI behaviors characterized by the greatest severity. Beyond this, it was hypothesized that other profiles would also differ meaningfully on other types of parent-child relational experiences, including those of a less extreme nature (e.g., higher endorsement of parental expectations, criticism, overprotection), as well as in the severity/functions of their NSSI. Other study aims, such as to examine of the role of positive emotion regulation and mother- vs. father-specific effects, were exploratory.

Method

Procedure

Data collection ran from September of 2016 to December 2019. Undergraduate students (aged 17-25 years) at the University of Ottawa were invited to participate in the study through an online research participation pool. The system allowed students from any program of study enrolled in an introductory psychology or behavioral science course to participate. In order to help

attract a sufficiently large and representative sample of students with a history of NSSI, the study was advertised to students as addressing the topics of self-injury and psychological well-being. Informed consent was collected before starting the questionnaire package. At three random points throughout the survey, participants were asked to answer screening questions (e.g., "*if you read this question, please leave it blank*") designed to help identify those engaging in random responding. Participants were granted course credits for participating in the survey, regardless of completion percentage. All procedures were approved by the university's Research Ethics Board (H06-16-03) in keeping with the ethical standards set out by the 1964 Helsinki declaration and its later amendments.

Participants

NSSI sample. An initial 2,811 young adults were eligible. Participants were excluded at the outset due to insufficient questionnaire completion (n = 25), if they failed all 3 validity screeners (n = 137), or if they had an unusually short survey completion time/had unusual patterns of responses *and* failed 2 out of 3 screeners (n = 70). From there, those with a self-reported history of NSSI within the past 12 months were selected for inclusion in the NSSI sample. Participants were not retained in the NSSI sample if they reported engaging only in non-self-injurious self-harm (e.g., excessive drug use) and/or exclusively in trivial/minor forms of self-injury that are more likely to reflect nervous compulsive habits or trichotillomania (i.e., interfering with wound healing, hair pulling, and/or nail biting/nail injuries; American Psychiatric Association, 2013). The final NSSI sample was comprised of 483 university students, of which 479 had sufficient data on emotion regulation variables (83.8% female; .8% non-binary or other). These students were aged between 17 and 25 years (M = 18.77; SD = 1.43). With freedom to select any relevant/multiple ethnocultural background(s), NSSI participants self-identified as White (65.6%), Asian (20.7%),

Middle Eastern (10.9%), Black (6.1%), First Nations/Metis (2.9%), Latino/Hispanic (2.1%), and other (1.2%). The majority of the NSSI sample (65.6%) reported that they or their family never had problems paying for basic necessities. Seventy-two percent of participants reported living with both parents as a child/adolescent, while others grew up living primarily with one parent (18.8%), with two parents but in separate homes (5.6%), with adoptive parents (1.9%), and relatives (.8%). Forty-three percent reported currently living with their parents during university, and most had either full (50.5%) or partial (31.7%) financial support from their parents for school. On average, students reported that they began to self-injure 3.84 years ago (*SD* = 2.56) and engaged in NSSI by way of scratching (70.8%), cutting (69.2%), hitting (50.5%), biting (39.9%), piercing the skin with sharp objects (32.8%), headbanging (21.4%), burning (18.6%), and trying to break bones (5.7%). The average number of NSSI methods endorsed by students was 3.07 (*SD* = 1.58). Most students had engaged in NSSI only 1 to 3 times (56.1%) within the past year, while others reported doing so between 4-6 times (18.1%), more than 10 times (17%), and between 7-10 times (8.8%).

Comparison samples. Drawing from the larger student sample, two independent samples of participants without recent NSSI behavior were selected for comparison purposes: (1) a "Past NSSI History" group (n = 439; 82.9% females; M_{age} = 19.03, SD = 1.62) comprised of students with a lifetime NSSI history but who had not self-injured within the past 12 months; (2) a "No NSSI History" group (n = 1551; 69.9% females; M_{age} = 19.02, SD = 1.55) comprised of students with no self-reported history of NSSI behavior. Given significant differences between the NSSI sample and comparison groups on gender (χ^2 [4] = 66.67, $p < .001$), age (F [2, 2470] = 5.48, p = .004) and ethnicity (χ^2 [2] = 43.16, $p < .001$), these sociodemographic factors were controlled for in relevant analyses.

Measures

Emotion regulation difficulties. University students' emotion regulation difficulties were assessed using the following self-report measures, allowing for a total of 10 variables to be entered as profile membership indicators in person-centered analyses.

The 36-item Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) was used to assess the following six emotion regulation difficulties: Non-acceptance of emotions (six items; e.g., *When I'm upset, I become angry with myself for feeling that way*); Difficulties engaging in goal-directed behavior (five items; e.g., *When I'm upset, I have difficulty focusing on other things*); Impulse control difficulties (six items; e.g., *When I'm upset, I experience my emotions as overwhelming and out of control*); Lack of emotional awareness (six items [reverse scored]; e.g., *I acknowledge my emotions*); Self-perceived limited access to strategies (eight items; e.g., *When I'm upset, I believe I will remain that way for a long time*); and Lack of emotional clarity (five items; e.g., *I am confused about how I feel*). All 36 items are scored along a five-point scale from 1 (*Almost never*) to 5 (*Almost always*). Each subscale demonstrated good-to-excellent internal consistency (αs = .84-.90). Higher mean subscale scores (range: 1-5) indicated greater difficulties regulating negative emotions.

The 13-item Difficulties in Emotion Regulation Scale-Positive (DERS-positive; Weiss, Gratz, et al., 2015) measured difficulties regulating positive emotional states (i.e., "happy") based on three subscales: Non-acceptance (four items; e.g., *When I'm happy, I become scared and fearful of those feelings*); Difficulties engaging in goal-oriented behavior (four items; e.g., *When I'm happy, I have difficulty getting work done*); and Impulse control difficulties (five items; e.g., *When I'm happy, I have difficulty controlling my behaviors*). The scale's 13 items are rated along a five-point scale from 1 (*Almost never*) to 5 (*Almost always*). Internal consistency on subscale scores

was good/excellent (αs = .84-.93). However, all three subscales were found to be highly positively skewed. In light of research indicating that non-normality can compromise the accuracy of model fit indicators in latent cluster analyses (Morgan et al., 2016; Sen et al., 2016), attempts to normalize the distributions of these variables were explored (Tabachnick & Fidell, 2013). Logarithm and Square root transformations were unsuccessful in correcting the positive skew. Therefore, for each of the three DERS-positive variables, mean scores were normalized using a three-level categorization of positive emotion regulation difficulties: 1-1.50 (low), 1.51-2.5 (medium), 2.51-5 (high). This categorization strategy corrected both skewness and kurtosis to be within acceptable limits (+/-1.5). This approach also preserved more variance in scores than a dichotomization approach and best reflected the natural distribution of scores in the NSSI sample. Both of these are important conditions in maintaining the integrity and meaningfulness of person-centered analyses.

The 20-item Ruminative Thought Style Questionnaire (RTSQ; Brinker & Dozois, 2009) measured individuals' tendency to ruminate over personal experiences. The scale is comprised of 20 items (e.g., *I tend to replay past events as I would have liked them to happen*), each of which are rated along a seven-point scale from 1 (*Not at all descriptive of me*) to 7 (*Describes me very well*). The RTSQ's original single factor solution has shown excellent psychometric properties in past research with undergraduate students (Brinker & Dozois, 2009), and showed excellent internal consistency in the current sample (α = .93). The total mean score (range: 1-7) was thus used herein as a measure one's overall inclination toward rumination.

Neglect, antipathy. The Childhood Experiences of Care and Abuse-Questionnaire (CECA-Q; Bifulco et al., 2005; Smith et al., 2002) is a self-report measure of maltreatment experiences by primary caregivers prior to the age of 17 years. The Neglect subscale (eight items; e.g., *He/She neglected my basic needs [e.g., food and clothes.]*) was used to measure perceptions

of neglectful behavior from parents, as characterized by generalized disinterest in the young adult's former material care, health, school and peer experiences throughout childhood. The Antipathy subscale (eight items; e.g., *He/She often picked on me unfairly*; *He/She made me feel unwanted*) was used to measure emotionally cold, hostile, and rejecting parental behavior. All items are rated along a five-point scale from 1 (*No, not at all*) to 5 (*Yes, definitely*). Internal consistency was high for both father (αs = .87, .88) and mother (αs = .82, .89) scales. Neglect (mother and father) variables, however, were found to be positively skewed and kurtotic, and not responsive to transformations. Thus, mother and father neglect variables were dichotomized, such that mean scores higher than 1.5 (up to 5) indicated neglect. Higher mean scores on antipathy (1-5) reflected more antipathetic parenting.

Overprotection. The 13-item Overprotection subscale of the Parental Bonding Instrument (PBI; Parker et al., 1979) measured the degree to which young adults perceived their mothers and fathers to have interfered with their autonomy up to age 16 years. The subscale is made up of 13 items (e.g., *[My father/mother] Let me decide things for myself; Did not want me to grow up*), which are scored along a four-point scale from 1 (*Very like*) to 4 (*Very unlike*). Both the father (α = .87) and mother (α = .87) scales were internally consistent. Higher mean scores (range: 1-4) reflected greater perceived overprotection.

Unresolved attachment. The Adolescent Unresolved Attachment Questionnaire (AUAQ; West et al., 2000) is a 10-item measure of unresolved attachment to caregivers, with emphasis on ongoing fearful and angry feelings in response to a perceived lack of care from caregivers (e.g., *I have a terrible fear that my relationship with my father/mother will end*). Items on this measure are rated along a five-point scale from 1 (*Strongly agree*) to 5 (*Strongly disagree*). The scale

demonstrated good internal consistency for fathers (α = .90) and mothers (α = .88). Higher mean scores (range: 1-5) reflected greater unresolved attachment.

Alienation. The 8-item Alienation subscale of the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) was used to assess the extent to which students felt alienated, misunderstood, and emotionally distant from their parents (e.g., *My father/mother doesn't understand what I'm going through these days*). Items are scored on a five-point scale from 1 (*Almost never or never true*) to 5 (*Almost always or always true*). Collinearity diagnostics (condition index [>30], variance proportions [>.5]; Tabachnick & Fidell, 2013) revealed multicollinearity problems with the mother and father parallel scales (*r* = .71), so the mother and father scores were collapsed into one total "parental alienation" score (α = .93). Higher mean scores (range: 1-5) indicated stronger feelings of alienation toward parents.

Psychological control. The Psychological Control Scale – Youth Self-Report (PCS-YSR; Barber, 1996) was used to measure the extent to which young adults perceive parents to be psychologically controlling. The scale contains eight items (e.g., [*My mother/father is a person who*]… *would like to be able to tell me how to feel or think about things all the time*) which are scored on a three-point scale from 1 (*not like him/her*) to 3 (*a lot like him/her*). Mother (α = .87) and father (α = .87) scores in the current sample demonstrated good internal consistency. Higher mean scores (range: 1-3) indicated that young adults perceived their parents to be more psychologically controlling.

Expectations, criticism. Parental expectations and criticism were assessed using subscales of the Multidimensional Perfectionism Scale (MPS; Frost et al., 1990). The Expectations subscale includes five items (e.g., *Only outstanding performance is good enough for my father/mother*), whereas the Criticism subscale includes four items (e.g., *My father/mother never*

tried to understand my mistakes), all rated along a seven-point scale from 1 (*Not at all*) to 7 (*Totally*). Exploration of collinearity diagnostics (based on the condition index [>30] and variance proportions [>.5]; Tabachnick & Fidell, 2013) revealed multicollinearity problems with the two subscales for both parents (two father scales, r = .73; two mother scales, r = .75), reflecting conflation of the two constructs within the sample. For this reason, the expectations and criticism scores were collapsed into a single "parental pressure[1]" variable for mothers (α = .93) and fathers (α = .92). Higher scores (range: 1-7) reflected greater perceived pressure.

Non-suicidal self-injury. The Ottawa Self-Injury Inventory (OSI; Cloutier & Nixon, 2003) was used as a measure of NSSI behavior. The instrument has demonstrated good psychometric properties across clinical (Nixon et al., 2015) and non-clinical (Guérin-Marion et al., 2018; Martin et al., 2013) samples of youth and young adults. Following initial queries about NSSI engagement ("*In the past year, have you purposefully injured yourself without the intention of killing yourself?*"), past-year NSSI frequency was determined based on choice-based responses to the question "*how frequently have you purposefully injured yourself in the past year?*" As in previous research (Martin et al., 2016), we dichotomized participant responses (Lower frequency: "1-3 times"; Higher frequency: "4 to 6 times", "7 to 10 times", and "more than 10 times") so as to facilitate analysis and minimize issues with positive skewness. Respondents also indicated how old they were when they started to self-injure (age of onset). The amount of time elapsed since NSSI onset was then determined by subtracting age of onset from the respondent's age. Ten lifetime NSSI methods were queried (i.e., cutting, scratching, burning, biting, hitting, piercing skin with sharp objects, trying to break bones, and head-banging), and endorsed methods were summed

[1] Please note that the "parental pressure" variable in the current Chapter was strictly created as a way to mitigate multicollinearity problems across the criticism and expectations variables in the NSSI sample. Therefore, it reflects a slightly different construct from the latent parental pressure variable discussed in Study 1 (Chapter 2).

into a total count score for each participant. NSSI's functions were assessed from a list of 30 possible reasons. All 30 items are score on five-point scales from 0 (*Never*) to 4 (*Always*) and yield four broader categories of functions: Internal Emotion Regulation ("Internal ER") functions reflected attempts to regulate internalizing emotions (six items; e.g., *To relieve feelings of sadness or feeling down*; α = .83); External Emotion Regulation ("External ER") functions indicated attempts to regulate externalizing emotions (three items; e.g., *To release anger*; α = .71); Social Influence functions reflected efforts to elicit a response or change in social contexts (seven items; e.g., *To get care and attention from others*; α = .72); and Sensation Seeking functions reflected efforts to achieve feelings of exhilaration (four items; e.g., *To experience a "high" like a drug high*; α = .65). Note that both Social Influence and Sensation Seeking functions were found to be positively skewed, so their log-transformed scores were used for in relevant analyses (Tabachnick & Fidell, 2013). Lastly, the addictive features of NSSI, which are markers suggesting that the individual has intensified and/or feels increasingly reliant on their NSSI behavior (Nixon et al., 2002), were evaluated via seven summed items (e.g., *The severity in which the self-injurious behavior occurs has increased (e.g., deeper cuts, more extensive parts of your body)?*; *Despite a desire to cut down or control this behavior, you are unable to do so*; α = .87).

Socio-demographics. University students also completed a general sociodemographic questionnaire, first asking about gender, age, and ethnicity. Given that ethnic backgrounds resulted in multiple small and overlapping groups, the ethnicity variable was dichotomized (white vs. non-white) to facilitate analysis. The questionnaire also inquired about students' past living arrangements (e.g., both biological parents in same or separate homes, with a single parent, etc.) and present living arrangement (e.g., with roommates, parents, etc.) from a list of seven options. We dichotomized past living arrangements to reflect "with both parents" or "other", and present

living arrangements to reflect those "with" or "without" parents. Furthermore, students identified whether they or their family ever had difficulty paying for basic necessities, which served as a developmentally appropriate socio-economic disparity index (dichotomized as yes/no) and if they received financial support from parents for school (dichotomized as yes/no). These sociodemographics were explored as potential covariates in analyses, as further detailed below.

Results

Analyses were performed in two broad steps. In the first step, person-centered analyses were performed using the Latent GOLD 5.1 software (Vermunt & Magidson, 2016) with the goal of classifying university students into latent profiles of emotion regulation difficulties. Once profiles were extracted, the second broad step involved performing all remaining between-group analyses in SPSS Version 26. These between-group analyses were conducted with the goals of 1) describing the latent profiles found in the NSSI sample (which included comparing the latent profiles with the Past NSSI History and No NSSI History comparison samples on emotion regulation scores) and 2) comparing the latent profiles on parent-child relational variables and NSSI characteristics. In Appendix 3.1, complementary analyses comparing the latent profiles with the two comparison samples on all parent-child and NSSI variables were included for reference. A conservative threshold for statistical significance of $p < .01$ was used in all analyses to reduce the risk of Type 1 error.

Person-Centered Analyses: Identification of Profiles

The identification of emotion regulation profiles within the NSSI sample was performed by way of a latent cluster analysis. An assessment of solutions comprised of 1-7 profiles was performed using a combination of evaluative criteria (Berlin et al., 2014; Nylund-Gibson & Choi, 2018): 1) indicators of model fit; 2) case classification accuracy; and 3) the interpretability of the

clustering solution, including its parsimony, cluster size, and the meaningfulness of differences between clusters. Model fit was explored using multiple information criteria, namely the Bayesian Information Criterion (BIC), the Integrated Classification Likelihood (ICL-BIC), the Consistent Akaike Information Criterion (CAIC), and the Approximate Weight of Evidence (AWE), on which lower values indicate better relative fit (Vermunt & Magidson, 2016). Subsequently, the accuracy with which models classified individuals into clusters was examined using entropy values, on which higher values (between 0 and 1) indicate better accuracy (Vermunt & Magidson, 2016). The percentage of classification errors was also considered complementarily. Lastly, in addition to visual inspection of the solution plots provided by Latent GOLD, Wald statistics were examined as a relative indicator of the significance of indicators (Vermunt & Magidson, 2016), thus helping to determine the extent to which the emotion regulation variables were successful in capturing differences between clusters.

Table 3.1 summarizes the results of the latent cluster analysis. Overall, the 3-profile solution was supported by the CAIC, ICL-BIC, AWE, and entropy, whereas the 5-profile solution was supported by the BIC index. Further comparison of these two models revealed that the 3-profile solution maximized the Wald statistic and minimized classification errors (7% vs. 11%). Upon visual inspection of solution plots, the 5-profile solution was found to be conceptually similar to the 3-profile solution, with the exception of its identification of a small (8%) cluster of participants with higher scores on DERS-positive variables; however, this profile was no longer identifiable once locally dependent effects across the DERS-positive variables were accounted for (Vermunt & Magidson, 2016). In addition, guidelines have recommended for profiles to include over 5-8% of participants to avoid retention of “rare” and unstable clusters (Nylund-Gibson & Choi, 2018). On the basis of these considerations, the 3-profile solution was deemed the most

optimal in profiling the data. Locally dependent effects were accounted for in the final model (Vermunt & Magidson, 2016).

Description of Profiles

Preliminary analyses. All emotion regulation variables were screened for parametric test assumptions (Tabachnick & Fidell, 2013). Problems with the non-normality of the DERS-positive variables were addressed through a categorization strategy, as previously indicated in the corresponding Measures section. There were no problems with linearity or with multicollinearity. Potential problems with uneven group sizes and heterogeneity of the variance-covariance matrix were addressed through the use of robust tests (Field, 2013; Tabachnick & Fidell, 2013), as further detailed below. Table 3.2 summarizes descriptive statistics and intercorrelations among emotion regulation variables in both the NSSI and comparison samples.

Between-profile analyses. Profile characteristics are detailed in Table 3.3 and further illustrated in Figure 3.1. First, between-profile differences on the seven continuous indicators of emotion regulation difficulties (DERS subscales and RTSQ) were investigated using a MANOVA (Pillai's Trace = .92, F [14, 942.00] = 57.139, $p < .001$). Significant univariate effects were probed further using the Games-Howell post-hoc test, which is robust to heterogeneity in the variance-covariance matrix (Field, 2013). Second, between-profile differences on the three categorical indicators of emotion regulation difficulties (DERS-positive subscales) were explored using chi-square tests of independence. Chi-square cell comparisons were explored using adjusted standardized residuals (z-scores > 1.96 indicate a result that is different from what would be expected based on chance alone).

Results indicated that the three latent profiles found within the NSSI sample differed significantly from one another on each of the continuous indicators of emotion regulation (all

results significant at the $p < .001$ level), except on lack of emotional awareness. More specifically, students in Profile 2 ($n = 158$; 89.2% female) consistently had the highest self-reported difficulties in regulating negative emotions and the highest tendency toward rumination. They were also significantly more likely than expected to endorse difficulties in regulating positive emotions (z = 2.9 – 3.1 for "high" difficulties). This subgroup was therefore labeled the "Dysregulated" profile. By contrast, Profile 3 ($n = 94$; 72.8% female) reported the lowest difficulties in regulating negative emotions, the lowest tendency toward rumination, and a lower-than-expected rate of difficulties managing positive emotions (z = -4.0 to -3.1 for "high" difficulties). Accordingly, this profile was labeled "Low Difficulties". Lastly, Profile 1, which was comprised of the largest proportion of students ($n = 227$; 85.0% female), reported lower overall difficulties than Profile 2 but higher difficulties than Profile 3 in regulating negative emotions and rumination. This profile's difficulties in regulating positive emotions were not significantly different from expected rates (z = -0.5 - 0.4 for "high" difficulties). Therefore, this subgroup was named the "Average Difficulties" profile.

Profiles vs. Comparison Samples. The three latent profiles were compared with the Past NSSI History and No NSSI History comparison samples on all 10 emotion regulation indicators (see Figure 3.2). Differences on continuous emotion regulation variables (DERS subscales and RTSQ) were first examined using a MANCOVA, controlling for age, gender, and ethnicity. The omnibus test was significant (Pillai's Trace = .32, F (28, 9748.00) = 29.83, $p < .001$). All univariate tests were also significant at the $p < .001$ level (F_{range} [4, 2440] = 21.24 - 188.41) and were thus explored further using post-hoc tests. Full univariate results are displayed under Table 3.4. Overall, results indicated that both the Dysregulated and Average Difficulties profiles reported higher levels of difficulties with emotion regulation than the Past NSSI History and No NSSI History comparison groups across the vast majority of measures. The only exceptions were that the

Dysregulated profile was not significantly different from the Past NSSI History group on emotional awareness, and the Average Difficulties profile was not significantly different from the Past NSSI History group on difficulties with goal-directed behavior or rumination. By contrast, relative to both comparison samples, the Low Difficulties profile reported either lower or comparable levels of emotion regulation difficulties on the majority of measures. Specifically, the Low Difficulties profile reported fewer difficulties than the Past NSSI History sample on all measures except emotional awareness, and fewer difficulties than the No NSSI History sample on non-acceptance and impulse-control.

Differences between profiles and comparison groups on positive emotion regulation (DERS-positive) variables were explored using chi-square tests and subsequent examination of adjusted residuals (i.e., *z* values > 1.96). Results from these chi-square tests, as summarized in Table 3.4, indicated significant differences between the three profiles and the two comparison groups on rates of difficulties with non-acceptance, impulse-control, and goal-directedness in the context of positive emotions. Parsing this out further, compared to both comparison groups, the Dysregulated profile had higher-than-expected difficulties with non-acceptance ($\chi^2 = 133.85$, df = 4, $p < .001$), goal-directed behavior ($\chi^2 = 23.16$, df = 4, $p < .001$), and impulse-control ($\chi^2 = 50.82$, df = 4, $p < .001$) in the context of positive emotions. Similarly, compared to both comparison groups, the Average Difficulties profile had higher-than-expected difficulties with non-acceptance of positive affect ($\chi^2 = 56.00$, df = 4, $p < .001$), and with regulating impulses in the context of positive emotions ($\chi^2 = 14.01$, df = 4, $p = .007$). By contrast, relative to the two comparison groups, the Low Difficulties profile had *lower*-than-expected difficulties with non-acceptance ($\chi^2 = 18.47$, df = 4, $p = .001$) and goal-directed behavior ($\chi^2 = 9.73$, df = 4, $p = .04$) in the context of positive emotions.

Comparing Profiles on Parent-Child Relational Risk Factors and NSSI Characteristics

Preliminary analyses. All parent-child and NSSI variables, along with covariates of interest, were screened for missing data, outliers, and parametric test assumptions (Tabachnick & Fidell, 2013). Data on parent-child relational variables were missing completely at random across Profile 1 (Little's MCAR test: χ^2= 449.33, df = 445, p = .434), Profile 2 (χ^2 = 278.05, df = 272, p = .39), and Profile 3 (χ^2 = 206.88, df = 192, p = .22) at an overall rate of 1.2 - 3.5%, with one exception (father overprotection; 4.1%). Similarly, data on NSSI variables were missing at a rate of 0% - 2.9%, and completely at random across Profile 1 (χ^2= 163.53, df = 153, p = .27), Profile 2 (χ^2= 93.13, df = 83, p = .21), and Profile 3 (χ^2= 80.74, df = 79, p = .43). Given the low rate of non-responses, we used mean scores permitting one missing item per scale and imputed the remaining missing data (0.0 – 1.9% missing) using the Expectation Maximization (EM) algorithm. Based on examination of Mahalanobis' distances, four relational multivariate outliers were removed from Profile 1 (n = 1), Profile 2 (n = 1) and Profile 3 (n = 2), while two NSSI multivariate outliers were removed (one each from Profiles 2 and 3). Problems with univariate normality (based on examination of absolute skewness and kurtosis values; Tabachnick & Fidell, 2013) and multicollinearity (based on examination of intercorrelations and collinearity diagnostics; Tabachnick & Fidell, 2013) were addressed for the mother/father neglect, criticism/expectations, and alienation variables, as previously detailed in the Measures section. There were no problems with linearity based on examination of bivariate plots. Pillai's Trace was used as a multivariate criterion for the MANCOVA to alleviate potential problems with heterogeneity of variance-covariances and unequal group sizes (Tabachnick & Fidell, 2013). Please see Tables 3.5 and 3.6 for a summary of descriptive statistics and intercorrelations among parent-child and NSSI study variables, respectively.

Correlations between study variables and potential covariates were explored. Only correlations significant at the at the $p < .01$ level are reported here. Multiple parent-child relational variables were found to correlate with gender (.06 - .12), ethnicity ($r = .07$ - .25), financial support ($r = .07$ - .22), socioeconomic disparity ($r = .08$ - .24), and past and present living arrangements ($r = .06$ - .07). In terms of NSSI variables, NSSI methods, addictive properties, and internal ER functions correlated significantly with gender ($r = .13 – .14$). Likewise, participant age correlated with the amount of time elapsed since NSSI onset and internal ER functions ($r = .45$ and .07, respectively); living with parents with the amount of time elapsed since NSSI onset ($r = .11$); socioeconomic disparity with the amount of time elapsed since NSSI onset and NSSI methods count ($r = .08$ - .15); and parental financial support with the amount of time elapsed since NSSI onset ($r =$ - .15). Therefore, each of these variables were included as covariates in the between-profile analyses that follow.

Between-profile analyses. One MANCOVA was used to compare the three profiles on 1) parent-child relational variables and 2) NSSI variables, controlling for age, gender, ethnicity, financial support, socioeconomic disparity, and present and past living arrangements. The multivariate test for the MANCOVA was significant, Pillai's Trace = .32, F (36, 892.00) = 4.79, $p < .001$, allowing exploration of univariate effects. Chi-square tests were also used to examine rates of 1) father and mother neglect, and 2) NSSI frequency across profiles. Complete results are detailed under Table 3.7.

With respect to parent-child relational risk factors, results indicated that participants in the Dysregulated profile reported the highest relational difficulties with parents overall. Compared to *both* the Average Difficulties and Low Difficulties profiles, they reported higher unresolved attachment to fathers, higher perceived pressure from fathers, greater feelings of alienation from

parents, and more pronounced histories of father antipathy during childhood/adolescence. The Dysregulated profile also had higher levels of father psychological control, father overprotection, maternal unresolved attachment, and maternal pressure than the Low Difficulties profile; however, while statistically significant, the magnitude of effects related to father overprotection, maternal unresolved attachment, and maternal pressure were very small, falling below the recommended minimum threshold of $\eta^2_{partial}$ = .04 for meaningful effects (Ferguson, 2009). The Average Difficulties profile differed from the Low Difficulties profile on the basis of higher reported father psychological control, father antipathy, father pressure, unresolved attachment to fathers, and general feelings of alienation from parents. Chi-square tests indicated there were no significant differences in the rates of father or mother neglect across profiles (see Table 3.7 for more details).

With respect to NSSI characteristics, results indicated that the Dysregulated profile could be differentiated from *both* the Average Difficulties and Low Difficulties profile on the basis of: higher endorsement of external ER, internal ER, social influence, and sensation-seeking functions, as well as a higher endorsement of addictive features. The Dysregulated profile also reported a higher number of NSSI methods than the Low Difficulties profile. Individuals classified in the Average Difficulties profile reported higher internal ER functions, sensation-seeking functions, and addictive features than those in the Low Difficulties profile. The chi-square test (and subsequent examination of adjusted residuals; $z > 1.96$) also showed that the Dysregulated profile reported higher-than-expected NSSI frequency (z = 4.0), whereas the Low Difficulties profile reported significantly lower-than-expected NSSI frequency (z = - 3.0). The Average Difficulties profile's NSSI frequency did not differ from expected rates (z = -1.5). The three profiles did not differ on the amount of time elapsed since NSSI onset. See Table 3.7 for more details.

Sensitivity Analyses

Alternative models were explored as part of sensitivity analyses (see Table 3.8 for a summary of results). In an effort to explore whether emotion regulation profiles could similarly be extracted from the larger population of students, the latent cluster analysis was performed in a combined sample (*n* = 1368) comprised of all individuals from the NSSI sample (n = 479), all individuals from the Past NSSI History comparison group (*n* = 439), and a closely-matched number of individuals with no NSSI history (*n* = 450; selected at random). Model indices were inconsistent but favoured a 9-profile solution (i.e., BIC = 28,107.04; CAIC = 28,271.04; classification errors = 16.6%; entropy = .79), which was deemed unpalatable for further analysis given poor theoretical interpretability, poor classification accuracy, and high potential for overextraction problems (see Berlin et al., 2014; Nylund-Gibson & Choi, 2018). A second set of sensitivity analyses aimed to determine if emotion regulation profiles extracted from the NSSI sample were at all specific to individuals who self-injure. To this end, the latent cluster analysis was run in both comparison groups (separately) to extract emotion regulation profiles in each. In both comparison samples, the 3-profile solution was not well supported by model fit indices. In the Past NSSI History group (*n* = 439), the BIC, CAIC, ICL-BIC, and entropy favoured a 6-profile solution (BIC = 9063.32; CAIC = 9173.32; ICL-BIC = 9267.72; classification errors = 9.0%; entropy = .86). In the No NSSI History group (*n* = 1551), the BIC and CAIC favoured a 7-profile solution (BIC = 29,088.55; CAIC = 29,216.55; classification errors = 12.5%; entropy = .82), and some support was also found for the 4-profile solution. The latent structures in both comparison samples were thus different from that in the NSSI sample and reflected the presence of substantially more heterogeneity in emotion regulation patterns. Taken together, sensitivity analyses supported the specificity of the 3-profile solution extracted from the NSSI sample, in that

the same profiles did not generalize indiscriminately to a larger population of students without recent NSSI behavior.

Discussion

Previous work has focused heavily on identifying which emotion regulation difficulties are associated with engagement in NSSI among young people, including university students. There have been comparatively few efforts to explore emotion regulation difficulties in a more holistic and person-centered fashion, with the understanding that university students who self-injure may not all experience the same constellations or patterns of difficulties with emotion regulation. From an etiological perspective, there is value in understanding whether different profiles of emotion regulation difficulties are related to distinct parent-child relational experiences, and whether they may influence the nature, severity, and motivations underlying NSSI behavior. The current study addressed this gap in knowledge by exploring profiles of emotion dysregulation among university students with a history of past-year NSSI, and by identifying the relational and NSSI characteristics that further differentiated these profiles.

Profiles of Emotion Regulation Difficulties

Person-centered analyses found evidence of three emotion regulation profiles in the NSSI sample. As anticipated based on previous person-centered work (Burke et al., 2018; Case et al., 2019; Klonsky & Olino, 2008), analyses first uncovered one particularly vulnerable profile of students (33.0%; “Dysregulated” profile). This profile was distinguished from others on the basis of the pervasiveness and relative severity of their emotion regulation difficulties, including the fact that these difficulties were present across both negative and positive emotional experiences. The high degree of dysregulation characterizing this profile was further reaffirmed by significant differences distinguishing it from both comparison samples across all indicators of emotion

regulation (with the exception of similar emotion awareness to the Past NSSI History group). Similarly, the Average Difficulties profile was comprised of students (47.4%) who identified a range of difficulties with emotion regulation. While less impaired than the Dysregulated profile, on average, these students reported greater difficulties with emotion regulation than the third profile of students (Low Difficulties profile) and both comparison samples on the large majority of indicators. Therefore, both profiles exist in coherence with the extant empirical (Wolff et al., 2019) and theoretical (e.g., Chapman et al., 2006; Linehan, 1993) literature underscoring the core role of emotion regulation difficulties in NSSI engagement.

In apparent discontinuity with this literature, however, were the relatively minor emotion regulation difficulties reported by the Low Difficulties profile (19.6%) compared to the other two profiles *and* both comparison groups. Indeed, relative to those who had not self-injured in at least one year (Past NSSI History group), students in the Low Difficulties profile reported fewer difficulties across all domains of emotion regulation, except emotional awareness. When compared to students who had never self-injured (No NSSI History group), they reported lesser overall difficulties with impulse-control and emotional acceptance, and comparable levels of other difficulties. These findings mirror the somewhat paradoxical features of one profile identified in a previous study (i.e., “Positive-Idealistic profile”; Martin et al., 2016), which was comprised of individuals with recent NSSI histories who, on average, rated their relational histories with parents as significantly more positive than students without NSSI histories. The replication of this broad pattern in findings across two independent student samples points to the presence of a trend in the data, which we propose may be interpreted to reflect two different—but not mutually exclusive—conclusions. On the one hand, the Low Difficulties profile’s self-ratings may represent a genuine lack of severe difficulties regulating emotions. In keeping with this perspective, for individuals in

this profile, NSSI may serve the purpose of relieving momentary distress or discomfort in rare, isolated instances, and in the context of otherwise relatively low levels of dysregulation or impairment. Lending support to this interpretation is Peterson and colleagues' (2019) recent study, which also found a latent profile of students with a history of NSSI behavior characterized by few concerns with emotion regulation or other indicators of impairment.

Alternatively, it is possible that these results reflect a pattern of underreporting of emotion regulation challenges. While underreporting on self-report instruments can result from a number of factors (e.g., social desirability effect, lack of self-awareness), one could posit it may also reflect a regulatory strategy in itself (see Allen & Miga, 2010). In other terms, it is possible that the Low Difficulties profile's low self-ratings reflect an attempt to minimize or deny personal hardship, and that this indexes an emotion coping style. Such a hypothesis would be in line with past theoretical work. Indeed, researchers have conceptualized the minimization/suppression of emotion as a distinct emotion regulation style (John & Gross, 2007; Shaver & Mikulincer, 2007), which tends to be more common among men than women (Flynn et al., 2010; note that the Low Difficulties profile was comprised of proportionally more male students than the other two profiles; 27.2% versus 10.8% and 15.0%). A tenet of attachment theory, in particular, stipulates that experiences of emotional disengagement from parents throughout childhood can result in a portion of individuals learning to inhibit their expression of distress to significant others (i.e., deactivate their attachment system; Kobak et al., 1993). Interestingly, past research has found that university students who present with this particular regulatory pattern (i.e., "dismissing attachments") tend not to report high levels of distress on self-report measures (Turan et al., 2016), but display deeper underlying signs of dysregulation on physiological (Kungl et al., 2016) and observational (Kobak et al., 1993) assessments. In past variable-centered research, individuals with these patterns have

not typically shown distinctive vulnerability for NSSI (Martin, Bureau, et al., 2017; Martin, Raby, et al., 2017), perhaps because only a minority of them do engage in NSSI. It is possible that person-centered analyses, as they are designed to parse out more heterogeneity in scores, allowed for this minority subgroup to be uncovered. This hypothesis would merit exploration in future research.

The current study also adds to the limited research on the role of dysregulated positive emotion in NSSI vulnerability profiles. Here, analyses did not find evidence of a subgroup of students with a uniquely elevated difficulty to accept or modulate positive affect. Instead, and consistent with one other study (Burke et al., 2018), those who struggled most to regulate their negative emotions (Dysregulated profile) were also most likely to show difficulties regulating positive emotions. Notably, differences in levels of *acceptance* of positive emotions, which were particularly pronounced across the three profiles and most elevated in the Dysregulated profile, seem consistent with the positive mood dampening strategy (Burke et al., 2015, 2018), lowered responsivity to positive stimuli (Boyes et al., 2020) and lower intensity/overall frequency of positive affect (Bresin, 2014; Chen & Chun, 2019; Hasking et al., 2018; Santangelo et al., 2017) observed in individuals who engage in NSSI. It is possible that the blunting/avoidance of positive emotions could compound the intensity and chronicity of negative states (e.g., depressed, numb, self-hostile), and increase NSSI risk in this way. Consistent with this hypothesis, in their university sample, Hasking and colleagues (2018) found that levels of negative affect were associated with NSSI *only* in the context of low levels of positive affect, indexing an interaction between positive and negative emotion regulation. Likewise, difficulties accepting and modulating positive emotions (as they occur organically, day-to-day) could lead a young person to engage in NSSI as a means of upregulating positive sensations in more superficial and controlled fashion, consistent

with a sensation-seeking function. However, as they remain preliminary, these hypotheses will require future empirical testing.

Do Profiles Differ in their Relational Experiences with Parents?

Parent-child relational experiences were found to differ meaningfully across latent emotion regulation profiles[2]. Consistent with hypotheses, students in the Dysregulated profile rated their experiences with parents as most negative overall (i.e., highest levels of perceived parental alienation, unresolved attachment to fathers, father pressure, and father antipathy; and higher levels of father psychological control than the Low Difficulties profile). These results were expected on the basis of research conducted within community samples showing that adverse parent-child relational experiences are associated with greater emotion dysregulation, which in turn is associated with NSSI (Gratz & Roemer, 2008; Guérin-Marion et al., 2019; Swannell et al., 2012; Tao et al., 2020; Yurkowski et al., 2015). Moreover, in a broad stroke, the remaining results showed that students' self-rated exposure to relational risk was proportional to the degree of their difficulties with emotion regulation. Accordingly, those in the Average Difficulties profile had slightly *better* perceptions of their relationships with parents than the Dysregulated profile, and slightly *worse* relational experiences than the Low Difficulties profile (i.e., higher unresolved attachment to fathers, father antipathy, father pressure, father psychological control, and parental alienation). Though not indicative of a causative effect, these results do seem to align with a dose-response relationship between relational risk and emotion dysregulation, consistent with prior work (e.g., see Peh et al., 2017).

[2] Findings discussed here focus on results that reached the recommended threshold for meaningful/ clinically significant effects, as previously detailed in the Results section.

An important nuance that arose out of this general trend in findings is that the three profiles differed more significantly in their experiences with fathers than mothers. While some research has begun to draw attention to the role of the father in shaping risk trajectories toward NSSI (Hallab & Covic, 2010; Martin, Bureau, Yurkowski, Fournier, et al., 2016; Perez et al., 2020; Tao et al., 2020), the current study is the first, to our knowledge, to underscore the salience of father-specific experiences in relation to the emotion regulation profiles of university students with a past-year history of NSSI. A possible explanation for our results may relate to our society's gendered socialization of emotions and gender differences in emotion regulation (e.g., men being more likely to mask emotionality; Nolen-Hoeksema, 2012). Due to these differences in gender roles, fathers may be more likely than mothers to feel uncomfortable, disempowered, or poorly equipped in their parental role when met with high levels of emotion dysregulation in their youth. This, in itself, could set forth a higher risk for reactionary criticism, control, or antipathy in fathers. Our emphasis on experiences closely associated with authoritarian styles of parenting (e.g., antipathy, control, criticism, expectations; Baumrind, 1991) may also offer an explanation for this finding. Indeed, as these parenting behaviors have been found to be more common among fathers than mothers (McKinney & Renk, 2008), they may have more closely captured the dynamics amongst participants and their fathers. From a broader societal standpoint, fathers are also increasingly expected to assume more involved roles in children and youth's socioemotional development (Cabrera et al., 2018), and thus may have a particularly profound impact on young people's emotional development nowadays. Overall, this finding emphasizes the need to consider the potential influence of fathers against that of mothers in the developmental trajectories toward NSSI, and to pay particular attention to fathers' potential effects on the emotional functioning of university students who engage in NSSI. More research is certainly needed to better understand

the roles of mothers and fathers in the prediction of NSSI behavior as a sequelae of emotion dysregulation, seeing as their respective direct and/or indirect effects on NSSI behaviors have not been straight-forward in prior research (see Guérin-Marion et al., 2019; Pearson et al., 2018; Tao et al., 2020; Tatnell et al., 2017).

Results also informed an understanding of the specific parent-child experiences associated with the emotion regulation profiles of university students who self-injure. Consistent with Linehan's (1993) conceptualization of invalidating family environments as developmental precursors to emotion dysregulation, the extent to which students experienced their parents—particularly fathers—as hostile, rejecting, and emotionally distant (i.e., antipathy, alienation), as controlling and pressuring (i.e., psychological control, criticism/expectations), and as representing a source of unresolved anger, anxiety, and resentment (i.e., unresolved attachment) differentiated emotion regulation profiles in the NSSI sample. While it was not the goal of the present study to replicate links between parent-child relationships and NSSI, these findings do align with research highlighting the salience of experiences related to antipathy/invalidation (Cipriano et al., 2020; Kaess et al., 2013; Mahtani et al., 2019; Wang & Qin, 2016; You & Leung, 2012), parental alienation (Bureau et al., 2010; Yates et al., 2008), and insecure attachments (Gandhi et al., 2019; Martin, Bureau, Yurkowski, Lafontaine, et al., 2016; Martin, Raby, et al., 2017; Pallini et al., 2020; Santangelo et al., 2017; Tao et al., 2020) among community samples of youth and young adults who self-injure. With respect to how parental pressure and psychological control may play into NSSI vulnerability, however, studies with university students have been relatively more scarce and mixed. Some have found parental criticism (Flett et al., 2012; Hoff & Muehlenkamp, 2009), but not achievement-focused expectations (Hoff & Muehlenkamp, 2009), to be related to NSSI. Moreover, a more recent longitudinal study of 1132 students did not replicate links between

mother/father criticism and NSSI (Daly & Willoughby, 2019). Therefore, while our results suggest that psychological control and pressure (criticism/expectations) may be related to the emotion dysregulation patterns of university students who self-injure, more research may be needed to parse out the effects of these particular parent-child dynamics on NSSI vulnerability. Parental behaviors that actively interfere with young adults' autonomy and sense of self-efficacy (e.g., pressure, psychological control) may be particularly relevant to explore in relation to emotion dysregulation and NSSI during the university years, during which students face considerable pressures to perform academically (Beiter et al., 2015), as well as social expectations to achieve self-sufficiency and independence as young adults (Arnett, 2015).

Do Profiles Differ in their NSSI Behavior?

As part of this study's final objective, findings indicated that NSSI characteristics differed significantly across profiles. Consistent with hypotheses, the profile with the greatest impairment in emotion regulation (Dysregulated profile) exhibited the most frequent and diverse methods of NSSI, as well as the highest endorsement of functions and addictive properties. These findings align with past research linking greater emotion dysregulation with more severe NSSI (Wolff et al., 2019, see also Chen & Chun, 2019), and with endorsement of multiple functions (Shahwan et al., 2020), suggesting greater generalization of the use of NSSI across states and contexts. Higher emotion dysregulation has also been linked with NSSI's addictive features (Nixon et al., 2002), indexing an intensification of the use of NSSI over time. Notably, the Dysregulated profile was best distinguished from other profiles by high motivations to downregulate internalizing states (e.g., suicidality, sadness, loneliness), which are affective states that tend to be associated with higher levels of depression, anxiety, and borderline personality traits (see Klonsky & Olino, 2008).

Second to the Dysregulated group, the Average Difficulties profile reported more severe engagement in NSSI than the Low Difficulties profile (i.e., higher NSSI frequency, internal ER functions, sensation-seeking functions, and addictive features). The extraction of a "moderate severity" profile of NSSI behavior is a finding that has emerged from past person-centered research on university students (Case et al., 2019; Klonsky & Olino, 2008). Based on current findings, one could infer that the moderate levels of emotion dysregulation characterizing the Average Difficulties profile may be driving a proportionally severe reliance on NSSI as a coping behavior (e.g., moderate endorsement of addictive features of NSSI; moderate endorsement of most functions). From a strengths-based point of view, compared to the Dysregulated subgroup, these students' relatively better access to emotion regulation skills (e.g., greater acceptance of emotions, greater perceived access to alternate regulation strategies) may have prevented more ubiquitous reliance on NSSI.

Finally, the Low Difficulties profile had the lowest scores on most NSSI characteristics, with the exception of a similar number of NSSI methods and similar endorsement of external ER and social influence functions to the Average Difficulties profile. Overall, this indicates a use of NSSI that is less strongly reinforced and generalized than in other profiles, potentially indicating that students from this profile experimented with NSSI without relying heavily on it for regulation (Klonsky & Olino, 2008). Alternatively, it is possible they were closer to achieving recovery from NSSI (see Kiekens et al., 2017). The lower endorsement of functions may also indicate a lack of clarity around motives underlying the use of NSSI, perhaps due to the low frequency of the behavior (making it more difficult to assimilate or recall a clear reason for self-injuring) or due to underreporting of behavior. In any case, it is interesting to note that the NSSI function most heavily endorsed in this profile is the downregulation of physiological tension, frustration, and anger (i.e.,

external ER). One could speculate that this may reflect the presence of unprocessed or suppressed emotions, seeing as anger is often a secondary emotional response to deeper underlying emotions (Shaver & Mikulincer, 2007).

Limitations

A number of study limitations ought to be acknowledged. First, the use of electronic self-report measures brings about the possibility that various reporting biases (e.g., desirability biases), as well as random responding, could have introduced noise in the results. Particularly vulnerable to reporting biases are retrospective relational measures (e.g., CECA-Q, PBI), which are likely to be influenced by young adults' *current* feelings about parents. While these represent study limitations, these methodological factors were partially mitigated by decisions to 1) rely on recent accounts of NSSI behavior, limited to the past year; 2) include measures of young people's current experiences with their parents (e.g., AUAQ, PCS, IPPA); and 3) embed screeners in the questionnaire package to identify random responders. Another limitation related to the use of self-report measures is that the relational variables under study reflect young adults' *subjective* perceptions of the parent-child relationship, rather than an objective account of parental behavior. Thus, when interpreting findings, it is important to keep in mind that the different ways in which young adults may have internalized their experiences with parents (along with other unmeasured factors; e.g., state affect, insight) could be a key contributor to results, representing one among many other factors influencing the complex and bidirectional interpersonal dynamics in a family. Another key limitation is inherent to our use of a correlational and cross-sectional design. With the use of such a design, any inferences with respect to associations between parent-child/emotion regulation variables and NSSI behavior should not be taken as evidence of temporally sequenced, cause-and-effect relationships. Longitudinal designs will be especially crucial in clarifying

developmental risk trajectories toward NSSI. Given our focus on emotion regulation profiles, the current study also did not explore the extent to which parent-child relational risk factors were related to NSSI characteristics specifically. Of course, this continues to be a worthwhile focus for future work, particularly with the use of prospective designs and with a differentiation between mother- and father-specific experiences across a broad array of relational risk factors (e.g., control, pressure). Lastly, the study sample was comprised of a majority of females and White/Caucasian students, which significantly decreases the generalizability of our findings to young men and more ethnically diverse student populations.

Conclusion

An extensive body of research shows that university students who engage in NSSI tend to struggle to regulate their emotions; however, limited research has aimed to parse out any further heterogeneity in emotion regulation patterns in this population. The present study sought to address this gap in knowledge by exploring the emotion regulation profiles of university students who had recently engaged in NSSI, and by comparing these profiles further on relational risk factors and NSSI outcomes. Findings showed that the majority of students reported moderate ("Average Difficulties" profile) to high ("Dysregulated" profile) difficulties with emotion regulation; however, a contrasting pattern was found among the remaining students ("Low Difficulties" profile; 19.6%), who reported quite low levels of dysregulation, even when compared to independent samples of students who had never/not recently engaged in NSSI. Students in the Dysregulated profile also attributed particularly negative experiences to fathers, felt generally alienated from parents, and engaged in the most severe and cognitively-inclined forms of NSSI. In contrast, in addition to reporting the least negative experiences with parents overall, students in the Low Difficulties profile engaged in the least severe forms of NSSI. The present study

underscores the notion that not all university students who engage in NSSI will present with a classical profile of hyperactivated, dysregulated emotional functioning. A significant number of them may, in fact, report minimal problems with emotion regulation and/or display other, quieter forms of dysregulation. This is an important guiding point for both researchers and clinicians, as it emphasizes the need to inject more nuance into the dominant conceptualizations of NSSI etiology and to consider that NSSI may occur across a broader continuum of emotion regulation styles. Moreover, the current study contributes to a growing body of research highlighting the link between negative parent-child dynamics and emotion dysregulation among young people who self-injure, with an added emphasis on the potential influence of fathers. Prevention and intervention efforts aimed at reducing NSSI across university student populations should continue to address parent-child relational stressors to help deescalate emotion dysregulation and support the development of healthier coping adaptations.

References

Adrian, M., Zeman, J., Erdley, C., Lisa, L., & Sim, L. (2011). Emotional dysregulation and interpersonal difficulties as risk factors for nonsuicidal self-injury in adolescent girls. *Journal of Abnormal Child Psychology*, *39*(3), 389–400. https://doi.org/10.1007/s10802-010-9465-3

Allen, J. P., & Miga, E. M. (2010). Attachment in adolescence: A move to the level of emotion regulation. *Journal of Social and Personal Relationships*, *27*(2), 181–190. https://doi.org/10.1177/0265407509360898

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (5th ed.)*. American Psychiatric Publishing.

Anderson, N. L., & Crowther, J. H. (2012). Using the experiential avoidance model of non-suicidal self-injury: Understanding who stops and who continues. *Archives of Suicide Research*, *16*(2), 124–134. https://doi.org/10.1080/13811118.2012.667329

Anderson, N. L., Smith, K. E., Mason, T. B., & Crowther, J. H. (2018). Testing an Integrative Model of Affect Regulation and Avoidance in Non-Suicidal Self-Injury and Disordered Eating. *Archives of Suicide Research*, *22*(2), 295–310. https://doi.org/10.1080/13811118.2017.1340854

Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*, *16*(5), 427–454. https://doi.org/10.1007/BF02202939

Arnett, J. J. (2015). *Emerging Adulthood: The Winding Road from the Late Teens Through the Twenties - Second Edition*. Oxford University Press.

Barber, B. K. (1996). Parental psychological control: Revisiting a neglected construct. *Child Development*, *67*(6), 3296–3319. https://doi.org/10.1111/j.1467-8624.1996.tb01915.x

Baumrind, D. (1991). Effective parenting during the early adolescent transition. In P. A. Cowan & E. M. Hetherington (Eds.), *Family Transitions* (pp. 111–163). Lawrence Erlbaum.

Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of Affective Disorders*, *173*, 90–96. https://doi.org/10.1016/j.jad.2014.10.054

Berlin, K. S., Williams, N. A., & Parra, G. R. (2014). An introduction to latent variable mixture modeling (part 1): Overview and cross-sectional latent class and latent profile analyses. *Journal of Pediatric Psychology*, *39*(2), 174–187. https://doi.org/10.1093/jpepsy/jst084

Bifulco, A., Bernazzani, O., Moran, P. M., & Jacobs, C. (2005). The childhood experience of care and abuse questionnaire (CECA.Q): Validation in a community series. *British Journal of Clinical Psychology*, *44*(4), 563–581. https://doi.org/10.1348/014466505X35344

Boyes, M. E., Wilmot, A., & Hasking, P. A. (2020). Nonsuicidal Self-Injury-Related Differences in the Experience of Negative and Positive Emotion. *Suicide and Life-Threatening Behavior*, *50*(2), 437–448. https://doi.org/10.1111/sltb.12599

Bresin, K. (2014). Five indices of emotion regulation in participants with a history of nonsuicidal self-Injury: A daily diary study. *Behavior Therapy*, *45*(1), 56–66. https://doi.org/10.1016/j.beth.2013.09.005

Brinker, J. K., & Dozois, D. J. A. (2009). Ruminative thought style and depressed mood. *Journal of Clinical Psychology*, *65*(1), 1–19. https://doi.org/10.1002/jclp.20542

Buckholdt, K. E., Parra, G., & Jobe-Shields, L. (2009). Emotion regulation as a mediator of the relation between emotion socialization and deliberate self-harm. *American Journal of Orthopsychiatry, 79*(4), 482–490. https://doi.org/10.1037/a0016735

Bureau, J.-F., Martin, J., Freynet, N., Poirier, A. A., Lafontaine, M.-F., & Cloutier, P. (2010). Perceived dimensions of parenting and non-suicidal self-injury in young adults. *Journal of Youth and Adolescence*, *39*(5), 484–494. https://doi.org/10.1007/s10964-009-9470-4

Burke, T. A., Anne McArthur, B., Daryanani, I., Abramson, L. Y., & Alloy, L. B. (2018). Latent classes of trait affect and cognitive affective regulation strategies are associated with depression, non-suicidal self-injury, and well-being. *Journal of Affective Disorders*, *225*, 180–187. https://doi.org/10.1016/j.jad.2017.08.015

Burke, T. A., Stange, J. P., Hamilton, J. L., Cohen, J. N., O'Garro-Moore, J., Daryanani, I., Abramson, L. Y., & Alloy, L. B. (2015). Cognitive and Emotion-Regulatory Mediators of the Relationship Between Behavioral Approach System Sensitivity and Nonsuicidal Self-Injury Frequency. *Suicide and Life-Threatening Behavior*, *45*(4), 495–504. https://doi.org/10.1111/sltb.12145

Cabrera, N. J., Volling, B. L., & Barr, R. (2018). Fathers Are Parents, Too! Widening the Lens on Parenting for Children's Development. *Child Development Perspectives*, *12*(3), 152–157. https://doi.org/10.1111/cdep.12275

Case, J. A. C., Burke, T. A., Siegel, D. M., Piccirillo, M. L., Alloy, L. B., & Olino, T. M. (2019). Functions of Non-Suicidal Self-Injury in Late Adolescence: A Latent Class Analysis. *Archives of Suicide Research*, *0*(0), 1–22. https://doi.org/10.1080/13811118.2019.1586607

Cerutti, R., Zuffiano, A., & Spensieri, V. (2018). The role of difficulty in identifying and describing feelings in non-suicidal self-injury behavior (NSSI): Associations with perceived attachment quality, stressful life events, and suicidal ideation. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2018.00318

Chapman, A. L., Gratz, K. L., & Brown, M. Z. (2006). Solving the puzzle of deliberate self-harm: The experiential avoidance model. *Behaviour Research and Therapy*, *44*(3), 371–394. https://doi.org/10.1016/j.brat.2005.03.005

Chen, W.-L., & Chun, C.-C. (2019). Association between Emotion Dysregulation and Distinct Groups of Non-Suicidal Self-Injury in Taiwanese Female Adolescents. *International Journal of Environmental Research and Public Health*, *16*(18), 3361. https://doi.org/10.3390/ijerph16183361

Cipriano, A., Claes, L., Gandhi, A., Cella, S., & Cotrufo, P. (2020). Does anger expression mediate the relationship between parental rejection and direct and indirect forms of non-suicidal self-injury? *Journal of Child and Family Studies*, No Pagination Specified. https://doi.org/10.1007/s10826-020-01844-9

Dagan, O., & Sagi-Schwartz, A. (2018). Early Attachment Network with Mother and Father: An Unsettled Issue. *Child Development Perspectives*, *12*(2), 115–121. https://doi.org/10.1111/cdep.12272

Daly, O., & Willoughby, T. (2019). A longitudinal study investigating bidirectionality among nonsuicidal self-injury, self-criticism, and parental criticism. *Psychiatry Research*, 678–683. https://doi.org/10.1016/j.psychres.2018.12.056

Emery, A. A., Heath, N. L., & Mills, D. J. (2016). Basic psychological need satisfaction, emotion dysregulation, and non-suicidal self-injury engagement in young adults: An application

of self-determination theory. *Journal of Youth and Adolescence*, *45*(3), 612–623. https://doi.org/10.1007/s10964-015-0405-y

Emery, A. A., Heath, N. L., & Rogers, M. (2017). Parents' role in early adolescent self-injury: An application of self-determination theory. *School Psychology Quarterly*, *32*(2), 199–211. https://doi.org/10.1037/spq0000204

Ferguson, C. J. (2009). An effect size primer: A guide for clinicians and researchers. *Professional Psychology: Research and Practice*, *40*(5), 532–538. https://doi.org/10.1037/a0015808

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. SAGE.

Flett, G. L., Goldstein, A. L., Hewitt, P. L., & Wekerle, C. (2012). Predictors of Deliberate Self-Harm Behavior Among Emerging Adolescents: An Initial Test of a Self-Punitiveness Model. *Current Psychology*, *31*(1), 49–64. https://doi.org/10.1007/s12144-012-9130-9

Flynn, J. J., Hollenstein, T., & Mackey, A. (2010). The effect of suppressing and not accepting emotions on depressive symptoms: Is suppression different for men and women? *Personality and Individual Differences*, *49*(6), 582–586. https://doi.org/10.1016/j.paid.2010.05.022

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, *14*(5), 449–468. https://doi.org/10.1007/BF01172967

Gandhi, A., Luyckx, K., Molenberghs, G., Baetens, I., Goossens, L., Maitra, S., & Claes, L. (2019). Maternal and peer attachment, identity formation, and non-suicidal self-injury: A longitudinal mediation study. *Child and Adolescent Psychiatry and Mental Health*.

Gholamrezaei, M., Heath, N., & Panaghi, L. (2017). Non-suicidal self-injury in a sample of university students in Tehran, Iran: Prevalence, characteristics and risk factors.

International Journal of Culture and Mental Health, *10*(2), 136–149. https://doi.org/10.1080/17542863.2016.1265999

Gratz, K. L., & Roemer, L. (2004). Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, *26*(1), 41–54. https://doi.org/10.1023/B:JOBA.0000007455.08539.94

Gratz, K. L., & Roemer, L. (2008). The relationship between emotion dysregulation and deliberate self-harm among female undergraduate students at an urban commuter university. *Cognitive Behaviour Therapy*, *37*(1), 14–25. https://doi.org/10.1080/16506070701819524

Guérin-Marion, C., Martin, J., Deneault, A.-A., Lafontaine, M.-F., & Bureau, J.-F. (2018). The functions and addictive features of non-suicidal self-injury: A confirmatory factor analysis of the Ottawa Self-Injury Inventory in a community sample of young adults. *Psychiatry Research*, *264*, 316–321. https://doi.org/10.1016/j.psychres.2018.04.019

Guérin-Marion, C., Martin, J., Lafontaine, M.-F., & Bureau, J.-F. (2019). Invalidating Caregiving Environments, Specific Emotion Regulation Deficits, and Non-suicidal Self-injury. *Child Psychiatry & Human Development*. https://doi.org/10.1007/s10578-019-00908-2

Hallab, L., & Covic, T. (2010). Deliberate Self-Harm: The Interplay Between Attachment and Stress. *Behaviour Change*, *27*(2), 93–103. https://doi.org/10.1375/bech.27.2.93

Hamza, C., & Willoughby, T. (2014). A longitudinal person-centered examination of nonsuicidal self-injury among university students. *Journal of Youth and Adolescence*, *43*(4), 671–685. https://doi.org/10.1007/s10964-013-9991-8

Hamza, C., & Willoughby, T. (2015). Nonsuicidal self-injury and affect regulation: Recent findings from experimental and ecological momentary assessment studies and future directions. *Journal of Clinical Psychology*, *71*(6), 561–574. https://doi.org/10.1002/jclp.22174

Hasking, P., Dawkins, J., Gray, N., Wijeratne, P., & Boyes, M. (2020). Indirect Effects of Family Functioning on Non-Suicidal Self-Injury and Risky Drinking: The Roles of Emotion Reactivity and Emotion Regulation. *Journal of Child and Family Studies*, *29*(7), 2070–2079. https://doi.org/10.1007/s10826-020-01722-4

Hasking, P., Simplicio, M. D., McEvoy, P. M., & Rees, C. S. (2018). Emotional cascade theory and non-suicidal self-injury: The importance of imagery and positive affect. *Cognition and Emotion*, *32*(5), 941–952. https://doi.org/10.1080/02699931.2017.1368456

Hoff, E. R., & Muehlenkamp, J. J. (2009). Nonsuicidal self-injury in college students: The role of perfectionism and rumination. *Suicide and Life-Threatening Behavior*, *39*(6), 576–587. https://doi.org/10.1521/suli.2009.39.6.576

John, O. P., & Gross, J. J. (2007). Individual Differences in Emotion Regulation. In J. J. Gross (Ed.), *Handbook of Emotion Regulation, First Edition* (pp. 351–372). Guilford Press.

Kaess, M., Parzer, P., Mattern, M., Plener, P. L., Bifulco, A., Resch, F., & Brunner, R. (2013). Adverse childhood experiences and their impact on frequency, severity, and the individual function of nonsuicidal self-injury in youth. *Psychiatry Research*, *206*(2), 265–272. https://doi.org/10.1016/j.psychres.2012.10.012

Kiekens, G., Hasking, P., Bruffaerts, R., Claes, L., Baetens, I., Boyes, M., Mortier, P., Demyttenaere, K., & Whitlock, J. (2017). What Predicts Ongoing Nonsuicidal Self-Injury?: A Comparison Between Persistent and Ceased Self-Injury in Emerging Adults.

The Journal of Nervous and Mental Disease, *205*(10), 762. https://doi.org/10.1097/NMD.0000000000000726

Kiekens, G., Hasking, P., Claes, L., Boyes, M. E., Mortier, P., Auerbach, R. P., Cuijpers, P., Demyttenaere, K., Green, J. G., Kessler, R. C., Myin-Germeys, I., Nock, M. K., & Bruffaerts, R. (2019). Predicting the incidence of non-suicidal self-injury in college students. *European Psychiatry*, *59*, 44–51. https://doi.org/10.1016/j.eurpsy.2019.04.002

Klonsky, E. D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review*, *27*(2), 226–239. https://doi.org/10.1016/j.cpr.2006.08.002

Klonsky, E. D., & Olino, T. (2008). Identifying clinically distinct subgroups of self-injurers among young adults: A latent class analysis. *Journal of Consulting and Clinical Psychology*, *76*(1), 22–27. https://doi.org/10.1037/0022-006X.76.1.22

Kobak, R. R., Cole, H. E., Ferenz-Gillies, R., Fleming, W. S., & Gamble, W. (1993). Attachment and emotion regulation during mother-teen problem solving: A control theory analysis. *Child Development*, *64*(1), 231–245. https://doi.org/10.2307/1131448

Kungl, M. T., Leyh, R., & Spangler, G. (2016). Attachment representations and brain asymmetry during the processing of autobiographical emotional memories in late adolescence. *Frontiers in Human Neuroscience*, *10,* 1–13.

Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. Guilford Press.

Liu, R. T., Scopelliti, K. M., Pittman, S. K., & Zamora, A. S. (2018). Childhood maltreatment and non-suicidal self-injury: A systematic review and meta-analysis. *The Lancet. Psychiatry*, *5*(1), 51–64. https://doi.org/10.1016/S2215-0366(17)30469-8

Mahtani, S., Hasking, P., & Melvin, G. A. (2019). Shame and Non-suicidal Self-injury: Conceptualization and Preliminary Test of a Novel Developmental Model among Emerging Adults. *Journal of Youth and Adolescence*, *48*(4), 753–770. https://doi.org/10.1007/s10964-018-0944-0

Martin, J., Bureau, J.-F., Lafontaine, M.-F., Cloutier, P., Hsiao, C., Pallanca, D., & Meinz, P. (2017). Preoccupied but not dismissing attachment states of mind are associated with nonsuicidal self-injury. *Development and Psychopathology*, *29*(2), 379–388. https://doi.org/10.1017/S0954579417000050

Martin, J., Bureau, J.-F., Yurkowski, K., Fournier, T. R., Lafontaine, M.-F., & Cloutier, P. (2016). Family-based risk factors for non-suicidal self-injury: Considering influences of maltreatment, adverse family-life experiences, and parent–child relational risk. *Journal of Adolescence*, *49*(Supplement C), 170–180. https://doi.org/10.1016/j.adolescence.2016.03.015

Martin, J., Bureau, J.-F., Yurkowski, K., Lafontaine, M.-F., & Cloutier, P. (2016). Heterogeneity of relational backgrounds is associated with variation in non-suicidal self-injurious behavior. *Journal of Abnormal Child Psychology*, *44*(3), 511–522. https://doi.org/10.1007/s10802-015-0048-1

Martin, J., Cloutier, P., Levesque, C., Bureau, J.-F., Lafontaine, M.-F., & Nixon, M. K. (2013). Psychometric properties of the functions and addictive features scales of the Ottawa Self-Injury Inventory: A preliminary investigation using a university sample. *Psychological Assessment*, *25*(3), 1013–1018. https://doi.org/10.1037/a0032575

Martin, J., Raby, K. L., Labella, M. H., & Roisman, G. I. (2017). Childhood abuse and neglect, attachment states of mind, and non-suicidal self-injury. *Attachment & Human Development*, *19*(5), 425–446. https://doi.org/10.1080/14616734.2017.1330832

McKenzie, K. C., & Gross, J. J. (2014). Nonsuicidal self-injury: An emotion regulation perspective. *Psychopathology*, *47*(4), 207–219. https://doi.org/10.1159/000358097

McKinney, C., & Renk, K. (2008). Differential Parenting Between Mothers and Fathers: Implications for Late Adolescents. *Journal of Family Issues*, *29*(6), 806–827. https://doi.org/10.1177/0192513X07311222

Morgan, G. B., Hodge, K. J., & Baggett, A. R. (2016). Latent profile analysis with nonnormal mixtures: A Monte Carlo examination of model selection using fit indices. *Computational Statistics & Data Analysis*, *93*, 146–161. https://doi.org/10.1016/j.csda.2015.02.019

Nicolai, K. A., Wielgus, M. D., & Mezulis, A. (2016). Identifying risk for self-harm: Rumination and negative affectivity in the prospective prediction of nonsuicidal self-injury. *Suicide and Life-Threatening Behavior*, *46*(2), 223–233. https://doi.org/10.1111/sltb.12186

Nixon, M. K., Cloutier, P., & Aggarwal, S. (2002). Affect regulation and addictive aspects of repetitive self-Injury in hospitalized adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *41*(11), 1333–1341. https://doi.org/10.1097/00004583-200211000-00015

Nixon, M. K., Levesque, C., Preyde, M., Vanderkooy, J., & Cloutier, P. F. (2015). The Ottawa Self-Injury Inventory: Evaluation of an assessment measure of nonsuicidal self-injury in an inpatient sample of adolescents. *Child and Adolescent Psychiatry and Mental Health*, *9*, 26. https://doi.org/10.1186/s13034-015-0056-5

Nock, M. K. (2009). Why Do People Hurt Themselves?: New Insights Into the Nature and Functions of Self-Injury. *Current Directions in Psychological Science, 18*(2), 78–83. https://doi.org/10.1111/j.1467-8721.2009.01613.x

Nock, M. K., & Favazza, A. R. (2009). Nonsuicidal self-injury: Definition and classification. In M. K. Nock (Ed.), *Understanding non-suicidal self-injury: Origins, assessment and treatment* (pp. 9–18). American Psychological Association.

Nock, M. K., & Prinstein, M. J. (2005). Contextual Features and Behavioral Functions of Self-Mutilation Among Adolescents. *Journal of Abnormal Psychology*, *114*(1), 140–146. https://doi.org/10.1037/0021-843X.114.1.140

Nolen-Hoeksema, S. (2012). Emotion regulation and psychopathology: The role of gender. *Annual review of clinical psychology, 8*, 161-187.

Nylund-Gibson, K., & Choi, A. Y. (2018). Ten frequently asked questions about latent class analysis. *Translational Issues in Psychological Science, 4*(4), 440–461. https://doi.org/10.1037/tps0000176

Pallini, S., Terrinoni, A., Iannello, S., Cerutti, R., Ferrara, M., Fantini, F., & Laghi, F. (2020). Attachment-Related Representations and Suicidal Ideations in Nonsuicidal Self-Injury Adolescents with and without Suicide Attempts: A Pilot Study. *Suicide and Life-Threatening Behavior, Early view*. https://doi.org/10.1111/sltb.12633

Palmer, C., Connor, C., Channa, S., Lavis, A., Leung, N., Parsons, N., & Birchwood, M. (2019). The Development of First-Episode Direct Self-Injurious Behavior and Association with Difficulties in Emotional Regulation in Adolescence. *Suicide and Life-Threatening Behavior, 49*(5), 1266–1280. https://doi.org/10.1111/sltb.12512

Parker, G., Tupling, H., & Brown, L. B. (1979). A parental bonding instrument. *British Journal of Medical Psychology, 52*(1), 1–10. https://doi.org/10.1111/j.2044-8341.1979.tb02487.x

Pearson, R. M., Campbell, A., Howard, L. M., Bornstein, M. H., O'Mahen, H., Mars, B., & Moran, P. (2018). Impact of dysfunctional maternal personality traits on risk of offspring depression, anxiety and self-harm at age 18 years: A population-based longitudinal study. *Psychological Medicine, 48*(1), 50–60. https://doi.org/10.1017/S0033291717001246

Peh, C. X., Shahwan, S., Fauziana, R., Mahesh, M. V., Sambasivam, R., Zhang, Y., Ong, S. H., Chong, S. A., & Subramaniam, M. (2017). Emotion dysregulation as a mechanism linking child maltreatment exposure and self-harm behaviors in adolescents. *Child Abuse & Neglect, 67*, 383–390. https://doi.org/10.1016/j.chiabu.2017.03.013

Perez, S., Lorca, F., & Marco, J. H. (2020). "Dissociation, posttraumatic stress symptoms, emotional dysregulation, and invalidating environments as correlates of NSSI in borderline personality disorder patients." *Journal of Trauma & Dissociation, 21*(5), 520–535. https://doi.org/10.1080/15299732.2020.1719262

Peterson, A. L., Chen, J. I., Karver, M. S., & Labouliere, C. D. (2019). Frustration with feeling: Latent classes of non-suicidal self-injury and emotion regulation difficulties. *Psychiatry Research, 275*, 61–70. https://doi.org/10.1016/j.psychres.2019.03.014

Rodríguez-Blanco, L., Carballo, J. J., & Baca-García, E. (2018). Use of Ecological Momentary Assessment (EMA) in Non-Suicidal Self-Injury (NSSI): A systematic review. *Psychiatry Research, 263*, 212–219. https://doi.org/10.1016/j.psychres.2018.02.051

Santangelo, P. S., Koenig, J., Funke, V., Parzer, P., Resch, F., Ebner-Priemer, U. W., & Kaess, M. (2017). Ecological Momentary Assessment of Affective and Interpersonal Instability

in Adolescent Non-Suicidal Self-Injury. *Journal of Abnormal Child Psychology*, *45*(7), 1429–1438. https://doi.org/10.1007/s10802-016-0249-2

Selby, E. A., & Joiner, T. E. (2009). Cascades of Emotion: The Emergence of Borderline Personality Disorder from Emotional and Behavioral Dysregulation. *Review of General Psychology: Journal of Division 1, of the American Psychological Association*, *13*(3), 219. https://doi.org/10.1037/a0015687

Sen, S., Cohen, A. S., & Kim, S.-H. (2016). The Impact of Non-Normality on Extraction of Spurious Latent Classes in Mixture IRT Models. *Applied Psychological Measurement*, *40*(2), 98–113. https://doi.org/10.1177/0146621615605080

Shahwan, S., Lau, J. H., Abdin, E., Zhang, Y., Sambasivam, R., Teh, W. L., Gupta, B., Ong, S. H., Chong, S. A., & Subramaniam, M. (2020). A typology of nonsuicidal self-injury in a clinical sample: A latent class analysis. *Clinical Psychology & Psychotherapy*, *Early view*. https://doi.org/10.1002/cpp.2463

Shaver, P. R., & Mikulincer, M. (2007). Adult attachment strategies and the regulation of emotion. In J. J. Gross (Ed.), *The handbook of emotion regulation* (pp. 446–465). Guilford Press.

Sim, L., Adrian, M., Zeman, J., Cassano, M., & Friedrich, W. N. (2009). Adolescent deliberate self-harm: Linkages to emotion regulation and family emotional climate. *Journal of Research on Adolescence*, *19*(1), 75–91. https://doi.org/10.1111/j.1532-7795.2009.00582.x

Smith, N., Lam, D., Bifulco, A., & Checkley, S. (2002). Childhood experience of care and abuse questionnaire (CECA.Q). *Social Psychiatry and Psychiatric Epidemiology*, *37*(12), 572–579. https://doi.org/10.1007/s00127-002-0589-9

Somer, O., Bildik, T., Kabukçu-Başay, B., Güngör, D., Başay, Ö., & Farmer, R. F. (2015). Prevalence of non-suicidal self-injury and distinct groups of self-injurers in a community sample of adolescents. *Social Psychiatry and Psychiatric Epidemiology*, *50*(7), 1163–1171. https://doi.org/10.1007/s00127-015-1060-z

Swannell, S., Martin, G., Page, A., Hasking, P., Hazell, P., Taylor, A., & Protani, M. (2012). Child maltreatment, subsequent non-suicidal self-injury and the mediating roles of dissociation, alexithymia and self-blame. *Child Abuse & Neglect*, *36*(7), 572–584. https://doi.org/10.1016/j.chiabu.2012.05.005

Swannell, S., Martin, G., Page, A., Hasking, P., & St John, N. J. (2014). Prevalence of nonsuicidal self-injury in nonclinical samples: Systematic review, meta-analysis and meta-regression. *Suicide and Life-Threatening Behavior*, *44*(3), 273–303. https://doi.org/10.1111/sltb.12070

Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics, 6th Edition*. Pearson.

Tao, Y., Bi, X.-Y., & Deng, M. (2020). The Impact of Parent–Child Attachment on Self-Injury Behavior: Negative Emotion and Emotional Coping Style as Serial Mediators. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.01477

Tatnell, R., Hasking, P., Lipp, O. V., Boyes, M., & Dawkins, J. (2018). Emotional responding in NSSI: Examinations of appraisals of positive and negative emotional stimuli, with and without acute stress. *Cognition and Emotion*, *32*(6), 1304–1316. https://doi.org/10.1080/02699931.2017.1411785

Tatnell, R., Hasking, P., & Newman, L. (2017). Multiple mediation modelling exploring relationships between specific aspects of attachment, emotion regulation, and non-

suicidal self-injury. *Australian Journal of Psychology*, 1–9. https://doi.org/10.1111/ajpy.12166

Taylor, P. J., Jomar, K., Dhingra, K., Forrester, R., Shahmalak, U., & Dickson, J. M. (2018). A meta-analysis of the prevalence of different functions of non-suicidal self-injury. *Journal of Affective Disorders*, *227*, 759–769. https://doi.org/10.1016/j.jad.2017.11.073

Thomassin, K., Guérin Marion, C., Venasse, M., & Shaffer, A. (2017). Specific coping strategies moderate the link between emotion expression deficits and nonsuicidal self-injury in an inpatient sample of adolescents. *Child and Adolescent Psychiatry and Mental Health*, *11*, 21. https://doi.org/10.1186/s13034-017-0158-3

Thomassin, K., Quint, E., Sezlik, S., & Shaffer, A. (2017). Profiles of emotion deficits and adolescent nonsuicidal self-injury in an inpatient sample. *Journal of Research on Adolescence*, 1–13. https://doi.org/10.1111/jora.12312

Thomassin, K., Shaffer, A., Madden, A., & Londino, D. L. (2016). Specificity of childhood maltreatment and emotion deficit in nonsuicidal self-injury in an inpatient sample of youth. *Psychiatry Research*, *244*, 103–108. https://doi.org/10.1016/j.psychres.2016.07.050

Turan, N., Hoyt, W. T., & Erdur-Baker, O. (2016). Gender, attachment orientations, rumination, and symptomatic distress: Test of a moderated mediation model. *Personality and Individual Differences*, *102*, 234–239. https://doi.org/10.1016/j.paid.2016.07.007

Turner, B. J., Arya, S., & Chapman, A. L. (2015). Nonsuicidal Self-injury in Asian Versus Caucasian University Students: Who, How, and Why? *Suicide and Life-Threatening Behavior*, *45*(2), 199–216. https://doi.org/10.1111/sltb.12113

Vermunt, J. K., & Magidson, J. (2016). *Technical Guide for Latent GOLD 5.1: Basic, Advanced, and Syntax*. Statistical Innovations.

Wang, Y., & Qin, Y. (2016). Family invalidation and self-injury in adolescents: A moderate mediation model. [Chinese]. *Chinese Journal of Clinical Psychology*, *24*(4), 734–737.

Weiss, N. H., Gratz, K. L., & Lavender, J. M. (2015). Factor structure and initial validation of a multidimensional measure of difficulties in the regulation of positive emotions: The DERS-Positive. *Behavior Modification*, *39*(3), 431–453. https://doi.org/10.1177/0145445514566504

Weiss, N. H., Sullivan, T. P., & Tull, M. T. (2015). Explicating the role of emotion dysregulation in risky behaviors: A review and synthesis of the literature with directions for future research and clinical practice. *Current Opinion in Psychology*, *3*, 22–29. https://doi.org/10.1016/j.copsyc.2015.01.013

West, M., Rose, S., Spreng, S., & Adam, K. (2000). The Adolescent Unresolved Attachment Questionnaire: The assessment of perceptions of parental abdication of caregiving behavior. *The Journal of Genetic Psychology*, *161*(4), 493–503. https://doi.org/10.1080/00221320009596727

Whitlock, J., Exner-Cortens, D., & Purington, A. (2014). Assessment of nonsuicidal self-injury: Development and initial validation of the Non-Suicidal Self-Injury–Assessment Tool (NSSI-AT). *Psychological Assessment*, *26*(3), 935–946. https://doi.org/10.1037/a0036611

Whitlock, J., Muehlenkamp, J., & Eckenrode, J. (2008). Variation in Nonsuicidal Self-Injury: Identification and Features of Latent Classes in a College Population of Emerging Adults.

Journal of Clinical Child & Adolescent Psychology, *37*(4), 725–735. https://doi.org/10.1080/15374410802359734

Wolff, J. C., Thompson, E., Thomas, S. A., Nesi, J., Bettis, A. H., Ransford, B., Scopelliti, K., Frazier, E. A., & Liu, R. T. (2019). Emotion dysregulation and non-suicidal self-injury: A systematic review and meta-analysis. *European Psychiatry*, *59*, 25–36. https://doi.org/10.1016/j.eurpsy.2019.03.004

Woo, J., Wrath, A. J., & Adams, G. C. (2020). The Relationship Between Attachment and Self-Injurious Behaviors in the Child and Adolescent Population: A Systematic Review of the Literature. *Archives of Suicide Research*, *0*(0), 1–22. https://doi.org/10.1080/13811118.2020.1804024

Yates, T. M., Tracy, A. J., & Luthar, S. S. (2008). Nonsuicidal self-injury among "privileged" youths: Longitudinal and cross-sectional approaches to developmental process. *Journal of Consulting and Clinical Psychology*, *76*(1), 52–62. https://doi.org/10.1037/0022-006X.76.1.52

You, J., & Leung, F. (2012). The role of depressive symptoms, family invalidation and behavioral impulsivity in the occurrence and repetition of non-suicidal self-injury in Chinese adolescents: A 2-year follow-up study. *Journal of Adolescence*, *35*(2), 389–395. https://doi.org/10.1016/j.adolescence.2011.07.020

Yurkowski, K., Martin, J., Levesque, C., Bureau, J.-F., Lafontaine, M.-F., & Cloutier, P. (2015). Emotion dysregulation mediates the influence of relationship difficulties on non-suicidal self-injury behavior in young adults. *Psychiatry Research*, *228*(3), 871–878. https://doi.org/10.1016/j.psychres.2015.05.006

Zhou, Y., Daukantaitė, D., Lundh, L.-G., Wångby-Lundh, M., & Ryde, A. (2020). Adolescents' Emotion Regulation Strategies Questionnaire: Initial Validation and Prospective Associations With Nonsuicidal Self-Injury and Other Mental Health Problems in Adolescence and Young Adulthood in a Swedish Youth Cohort. *Frontiers in Psychiatry, 11*. https://doi.org/10.3389/fpsyt.2020.00462

Table 3.1 ***Model Fit Statistics for Latent Cluster Solutions***

	BIC	CAIC	ICL-BIC	AWE	Entropy	Wald	Class. Error.
1-cluster	11,678.93	11,698.93	11678.93	11862.36	1.00	-	0.00
2-cluster	10,975.56	11,013.56	11100.92	11449.44	.80	10.11	.06
3-cluster	**10,747.40**	**10,803.40**	**10911.82**	**11425.43**	**.83**	**41.36**	**.07**
4-cluster	10,747.74	10,821.74	10976.41	11655.12	.82	23.11	.09
5-cluster	10,734.18	10,826.18	11004.01	11847.80	.82	18.57	.11
6-cluster	10,739.66	10,849.66	11047.78	12056.67	.80	44.91	.13
7-cluster	10,765.67	10,893.67	11090.01	12263.99	.81	59.49	.13

Note. Best fitting solution is bolded. BIC = Bayesian Information Criterion, CAIC = Consistent Akaike Information Criterion, ICL-BIC = Integrated Classification Likelihood, AWE = Approximate Weight of Evidence.

Table 3.2 ***Bivariate Correlations Between Emotion Regulation Variables in NSSI Subsample and Comparison Samples***

Variable	NSSI sample		Comparison samples (combined)											
	M, *SD*	%	*M*, *SD*	%	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Non-acceptance of emotions	3.15, 1.07		2.47, 1.03		-	.43*	.57*	.21*	.69*	.43*	.47*	.29*	.19*	.22*
2. Difficulties w/ goal-directed behavior	3.75, .83		3.24, .94		.41*	-	.51*	.01	.62*	.28*	.49*	.09*	.11*	.06*
3. Impulse control difficulties	2.92, .99		2.22, .87		.46*	.55*	-	.15*	.72*	.41*	.43*	.30*	.25*	.32*
4. Lack of awareness	2.88, .90		2.53, .81		.11	-.09	-.01	-	.23*	.55*	.11*	.15*	.11*	.08*
5. Lack of strategies	3.18, .87		2.38, .92		.58*	.62*	.69*	.09	-	.52*	.57*	.32*	.23*	.27*
6. Lack of clarity	3.04, .90		2.48, .85		.41*	.20*	.36*	.52*	.43*	-	.38*	.23*	.21*	.17*
7. Rumination	5.23, 1.05		4.54, 1.27		.34*	.35*	.34*	.02	.46*	.28*	-	.14*	.15*	.13*
8. Non-acceptance of emotions (positive)[a]		12.1		5.1	.28*	.10	.21*	.12	.30*	.22*	.16*	-	.42*	.58*
9. Difficulties w/ goal-directed behavior (positive)[a]		14.2		10.5	.15*	.10	.22*	.03	.19*	.14*	.13*	.32*	-	.58*
10. Impulse control difficulties (positive)[a]		11.3		7.0	.15*	.09	.26*	-.01	.23*	.14*	.02	.40*	.53*	-

Note. Values below the diagonal are for the NSSI subsample (n = 479), and values above the diagonal are for both comparison samples combined (i.e., Past NSSI History and No NSSI History; n = 1,990).

[a] Variables are categorized (low = 0, moderate = 1, high difficulties = 2); percentage presented refers to the proportion of participants who endorsed a high degree of difficulties.

*p < .01.

Table 3.3 ***Descriptive Information about Latent Emotion Regulation Profiles Found Within the NSSI Sample***

Emotion Regulation Difficulties		Profiles			Test	Effect size
		1 Average Difficulties *n*=227	2 Dysregulated *n*=158	3 Low Difficulties *n*=94		
		Adj. M (*SE*)	*Ajd. M* (*SE*)	*Ajd. M* (*SE*)	Uni. *F*	Adj.R^2
Non-acceptance of emotions		3.27 (.05)	3.78 (.06)	1.79 (.08)	185.03**	.44
Difficulties w/ goal-directed behavior		3.65 (.04)	4.42 (.05)	2.90 (.07)	176.10**	.42
Impulse control difficulties		2.77 (.04)	3.82 (.05)	1.78 (.07)	283.57**	.54
Lack of awareness		2.97 (.06)	2.84 (.07)	2.70 (0.9)	3.08	.01
Lack of strategies		3.00 (.03)	4.10 (.04)	2.10 (.05)	525.18**	.69
Lack of clarity		3.06 (.06)	3.41 (.07)	2.36 (.09)	47.69**	.16
Rumination		5.04 (.06)	5.98 (.07)	4.39 (.09)	106.38**	.31
		%	%	%	Pearson χ^2	Somers' *d*
Non-acceptance of emotions (positive)	*Low*	69.2	51.9[b]	94.7[b]	50.86**	.25
	Medium	18.1	29.7[b]	5.3[b]		
	High	12.8	18.4[a]	0.0[b]		
Difficulties w/ goal-directed behavior (positive)	*Low*	57.7	50.6[b]	83.0[b]	29.94**	.19
	Medium	28.2	28.5[a]	13.8[a]		
	High	14.1	20.9[b]	3.2[b]		
Lack of impulse control (positive)	*Low*	73.1	60.1[b]	88.3[b]	25.125**	.18
	Medium	16.3	22.2[a]	9.6[a]		
	High	10.6	17.7[b]	2.1[b]		

Note. Results from the MANOVA (univariate *F*) and chi-square (χ^2) are displayed. A $p < .01$ was used as the threshold for statistical significance.

[a]Significant deviation from the expected percentage of participants as indicated by *z*-score > 2.0. [b]Significant deviation from the expected percentage of participants as indicated by *z*-score > 3.0.

*$p < .01$, **$p < .001$

Table 3.4 ***Comparing Profiles with Comparison Groups on Emotion Regulation Difficulties***

Emotion regulation difficulties	Comparison Groups				Profiles						Test		Pairwise Comparisons[a] (*Comparison Groups vs. Profiles*)
	A No NSSI History		B Past NSSI History		1 Average Difficulties		2 Dysregulated		3 Low Difficulties				
	M, SE	%	*M, SE*	%	*M, SE*	%	*M, SE*	%	*M, SE*	%	Uni. *F*	χ^2	
Non-acceptance	2.40, .03		2.76, .05		3.24, .07		3.76, .08		1.78, .10		112.86**		*A, B < 1**,2**; A, B > 3**
Goal-directed behavior	3.19, .02		3.50, .04		3.62, .06		4.39, .07		2.89, .09		81.68**		*A < 1**,2**; B < 2**; B > 3**
Impulse-control	2.17, .02		2.44, .04		2.75, .06		3.79, .07		1.78, .09		162.01**		*A, B < 1**,2**; A, B > 3**
Lack of awareness	2.50, .02		2.68, .04		2.96, .06		2.84, .07		2.71, .09		21.24**		*A < 1**,2**; B < 1**
Lack of strategies	2.30, .02		2.68, .04		2.97, .06		4.06, .07		2.09, .09		188.41**		*A, B < 1**,2**; B > 3**
Lack of clarity	2.43, .02		2.73, .04		3.03, .06		3.37, .07		2.34, .09		70.35**		*A, B < 1**,2**; B > 3**
Rumination	4.46, .03		4.89, .06		4.99, .08		5.95, .09		4.36, .12		67.36**		*A < 1**,2**; B < 2**; B > 3**
(+) Non-acceptance (*high*)	5.0		5.5		12.8		18.4		1.0		167.09**		-
(+) Goal-directed (*high*)	10.2		11.2		14.1		20.9		3.1		40.53**		-
(+) Impulse control (*high*)	7.3		6.0		10.6		17.7		2.1		63.40**		-

Note. Results from the MANCOVA (univariate *F*) and chi-square (χ^2) are displayed. The MANCOVA controlled for age, gender, and ethnicity. A $p < .01$ was used as the threshold for statistical significance.

[a]Based on Bonferroni-corrected post-hoc tests. (+) = positive emotion regulation difficulties.

*$p < .01$, **$p < .001$.

Table 3.5 ***Descriptive Statistics and Bivariate Correlations for Parent-Child Relational Variables Within the NSSI Sample***

Variable	*M*, *SD*	%	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Father unresolved attachment	2.27, 0.98		-											
2. Mother unresolved attachment	1.95, 0.80		.46*	-										
3. Father overprotection	2.14, 0.62		.43*	.25*	-									
4. Mother overprotection	2.27, 0.64		.21*	.41*	.42*	-								
5. Father antipathy	2.44, 1.04		.78*	.37*	.46*	.22*	-							
6. Mother antipathy	2.18, 0.98		.35*	.74*	.23*	.49*	.38*	-						
7. Father psychological control	1.65, 0.55		.58*	.22*	.41*	.17*	.70*	.19*	-					
8. Mother psychological control	1.65, 0.54		.30*	.60*	.27*	.51*	.32*	.69*	.29*	-				
9. Father pressure	3.66, 1.59		.45*	.27*	.50*	25*	.59*	.26*	.55*	.25*	-			
10. Mother pressure	3.64, 1.57		.27*	.43*	.25*	49*	.27*	.58*	.19*	.55*	.49*	-		
11. Parental alienation	2.77, 0.99		.67*	.64*	.39*	.37*	.65*	.56*	.51*	.53*	.46*	.39*	-	
12. Father neglect[a]		64.1	.49*	.29*	.14*	.10	.50*	.24*	.29*	.16*	.24*	.14*	.41*	-
13. Mother neglect[a]		30.2	.25*	.59*	.05	.15*	.25*	.56*	.08	.35*	.12*	.19*	.35*	.34*

Note. Values are presented for the NSSI sample after Expectation Maximization data imputation, and after exclusion of 6 multivariate outliers.

[a]Father and mother neglect variables are dichotomized (0, 1); percentage presented refers to the proportion of participants who endorsed some degree of perceived neglect (value of 1).

*$p < .01$.

Table 3.6 ***Descriptive Statistics and Bivariate Correlations for NSSI Characteristics Variables Within the NSSI Sample***

Variable	*M*, *SD*	%	1.	2.	3.	4.	5.	6.	7.
1. External ER functions	3.29, 1.08		-						
2. Internal ER functions	2.80, .96		.46*	-					
3. Social influence functions[a]	.13, .13		.15*	.30*	-				
4. Sensation seeking functions[a]	.16, .19		.30*	.45*	.19*	-			
5. Addictive features	2.32, .98		.36*	.66*	.22*	.43*	-		
6. Number of methods	3.08, 1.58		.23*	.37*	.06	.25*	.37*	-	
7. Time elapsed since NSSI onset	3.87, 2.51		.09	.16*	-.04	.17*	.14*	.31*	-
8. Frequency past-year[b]		44	.15*	.32*	.12*	.23*	.39*	.17*	.08

Note. Values are presented for the NSSI sample after Expectation Maximization data imputation, and after exclusion of 6 multivariate outliers.

[a]Log-transformed variable. Descriptive information for the untransformed variables is as follows: Social influence functions, $M = 1.43$, $SD = .48$; Sensation seeking functions, $M = 1.63$, $SD = .83$.

[b]Frequency variable is dichotomized (0,1); percentage presented refers to the proportion of participants who endorsed a higher frequency of NSSI (value of 1).

*$p < .01$.

Table 3.7 ***Comparing Emotion Regulation Profiles on Parent-Child Relational Risk Factors and NSSI Characteristics***

	Profiles						Test		Effect size	Pairwise[a] Comparisons
	1 Average Difficulties		2 Dysregulated		3 Low Difficulties					
Parent-Child Relational Risk Factors	*Adj.M* (*SE*)	%	*Adj.M* (*SE*)	%	*Adj.M* (*SE*)	%	Uni. *F*	χ^2	η^2_{part}	
Father unresolved attachment	2.23 (.06)		2.56 (.07)		1.89 (.09)		16.55**		.07	2 >1* > 3*, 2 > 3**
Mother unresolved attachment	1.95 (.05)		2.10 (.06)		1.74 (.08)		6.31*		.03	2 > 3*
Father overprotection	2.12 (.04)		2.26 (.05)		2.02 (.06)		4.98*		.02	2 > 3*
Mother overprotection	2.31 (.04)		2.33 (.05)		2.09 (.07)		4.40		.02	-
Father antipathy	2.39 (.06)		2.77 (.08)		2.03 (.10)		16.60**		.07	2 > 1*,3** 1 > 3*
Mother antipathy	2.16 (.06)		2.29 (.08)		2.04 (.10)		1.97		.01	-
Father psychological control	1.65 (.04)		1.79 (.04)		1.39 (.06)		16.72**		.07	2, 1 > 3**
Mother psychological control	1.66 (.04)		1.74 (.04)		1.53 (.06)		4.30		.02	-
Father pressure	3.52 (.10)		4.31 (.12)		2.96 (.16)		26.97**		.10	2 > 1, 3** 1 > 3*
Mother pressure	3.60 (.10)		3.99 (.12)		3.19 (.16)		8.14*		.03	2 > 3**
Parental alienation	2.75 (.06)		3.18 (.07)		2.19 (.09)		35.30**		.13	2 >1** > 3**
Father neglect (*Yes*)		62.8		68.2		59.8		2.02	-	-
Mother neglect (*Yes*)		31.0		29.3		30.4		0.12	-	-
NSSI Characteristics	*Adj.M* (*SE*)	%	*Adj.M* (*SE*)	%	*Adj.M* (*SE*)	%	Uni. *F*	χ^2	η^2_{part}	
External ER functions	3.18 (.07)		3.61 (.08)		3.07 (.11)		10.61**		.04	2 > 1, 3**
Internal ER functions	2.68 (.06)		3.30 (.07)		2.24 (.09)		45.37**		.16	2 > 1** > 3**
Social influence functions[b]	.12 (.01)		.17 (.01)		.11 (.01)		8.51**		.04	2 > 1, 3*
Sensation seeking functions[b]	.16 (.01)		.22 (.02)		.09 (.02)		11.71**		.05	2 > 3**, 1 > 3*
Addictive features	2.21 (.06)		2.78 (.07)		1.80 (.10)		35.44**		.13	2 > 1, 3**, 1 > 3*
Number of methods	3.04 (.10)		3.44 (.12)		2.51 (.16)		10.46**		.04	2 > 3**
Time elapsed since NSSI onset	3.81 (.15)		4.12 (.18)		3.60 (.24)		1.88		.01	-
Frequency (*higher*)		40.5		57.3[d]		30.1[c]		19.71**	-	-

Note. Results from the MANCOVA (univariate *F*) and chi-square tests (χ^2) are displayed. The MANCOVA controlled for age, gender, and ethnicity, socioeconomic disparity, financial support from parents, and past and current living arrangements. A $p < .01$ was used as the threshold for statistical significance.

[a]As indicated by Bonferroni-corrected values. [b]Log-transformed variable. [c]Significant deviation from the expected percentage of participants as indicated by *z*-score > 3.0 (+/-). [d]Significant deviation from the expected percentage of participants as indicated by *z*-score > 4.0 (+/-).

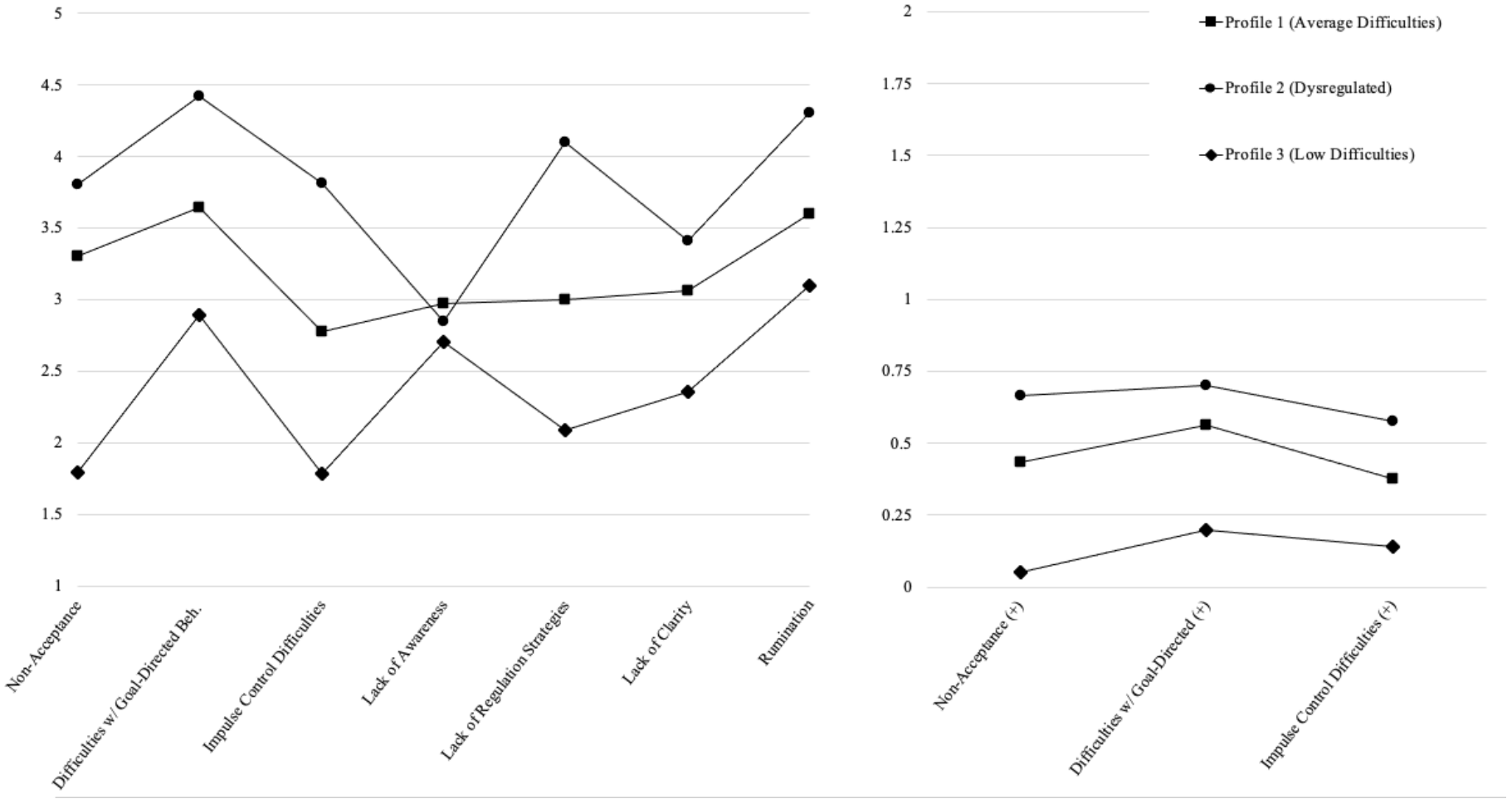
*$p < .01$, **$p < .001$

Table 3.8 ***Results from Sensitivity Analyses (Latent Cluster Solutions)***

	BIC	CAIC	ICL-BIC	AWE	Entropy	Wald	Class. Error.
Latent Cluster Analysis conducted within combined mixed sample (n = 1368)							
1-cluster	32494.83	32514.83	32494.83	32699.14	1.00	-	-
2-cluster	29585.30	29623.30	29844.54	30232.72	***0.86***	13.76	.04
3-cluster	28827.50	28883.50	29299.29	29871.35	0.84	52.93	.07
4-cluster	28516.88	28590.88	29101.30	***29857.23***	0.83	96.76	.09
5-cluster	28308.77	28400.77	***29020.66***	29960.46	0.82	***164.65***	.11
6-cluster	28190.94	28300.94	29026.14	30149.82	0.81	143.35	.12
7-cluster	28154.77	28282.77	29202.59	30510.14	0.79	96.39	.15
8-cluster	28146.24	28292.24	29266.35	30757.77	0.79	81.67	.16
9-cluster	***28107.04***	***28271.04***	29277.63	30952.93	0.79	131.50	.17
Latent Cluster Analysis conducted within Past NSSI History sample (n = 439)							
1-cluster	10145.38	10165.38	10145.38	10326.88	1.00	-	-
2-cluster	9322.18	9360.18	9412.58	9757.44	0.85	4.88	.04
3-cluster	9147.77	9203.77	9303.10	9811.32	0.83	19.08	.07
4-cluster	9108.05	9182.05	9270.10	***9941.67***	0.85	***64.46***	.07
5-cluster	9082.93	9174.93	9277.02	10111.95	0.85	33.42	.09
6-cluster	***9063.32***	***9173.32***	***9267.72***	10266.01	***0.86***	53.88	.09
7-cluster	9119.69	9247.69	9343.06	10504.70	***0.86***	60.59	.10
8-cluster	9181.75	9327.75	9447.96	10772.96	0.84	62.69	.11
Latent Cluster Analysis conducted within No NSSI History sample (n = 1551)							
1-cluster	34988.76	35008.76	34988.76	35195.57	1.00	-	.00
2-cluster	31254.54	31292.54	31540.16	31933.09	***.87***	0.08	.04
3-cluster	30324.75	30380.75	30857.66	31436.71	.84	62.99	.07
4-cluster	29703.85	29777.85	30188.26	***30953.43***	***.87***	***331.52***	.06
5-cluster	29350.98	29442.98	***30011.15***	30962.44	.85	327.22	.09
6-cluster	29186.34	29296.34	30075.98	31213.40	.83	213.64	.12
7-cluster	***29088.55***	***29216.55***	30060.43	31383.98	.82	261.92	.13
8-cluster	29129.11	29275.11	30323.81	31833.48	.80	192.76	.15

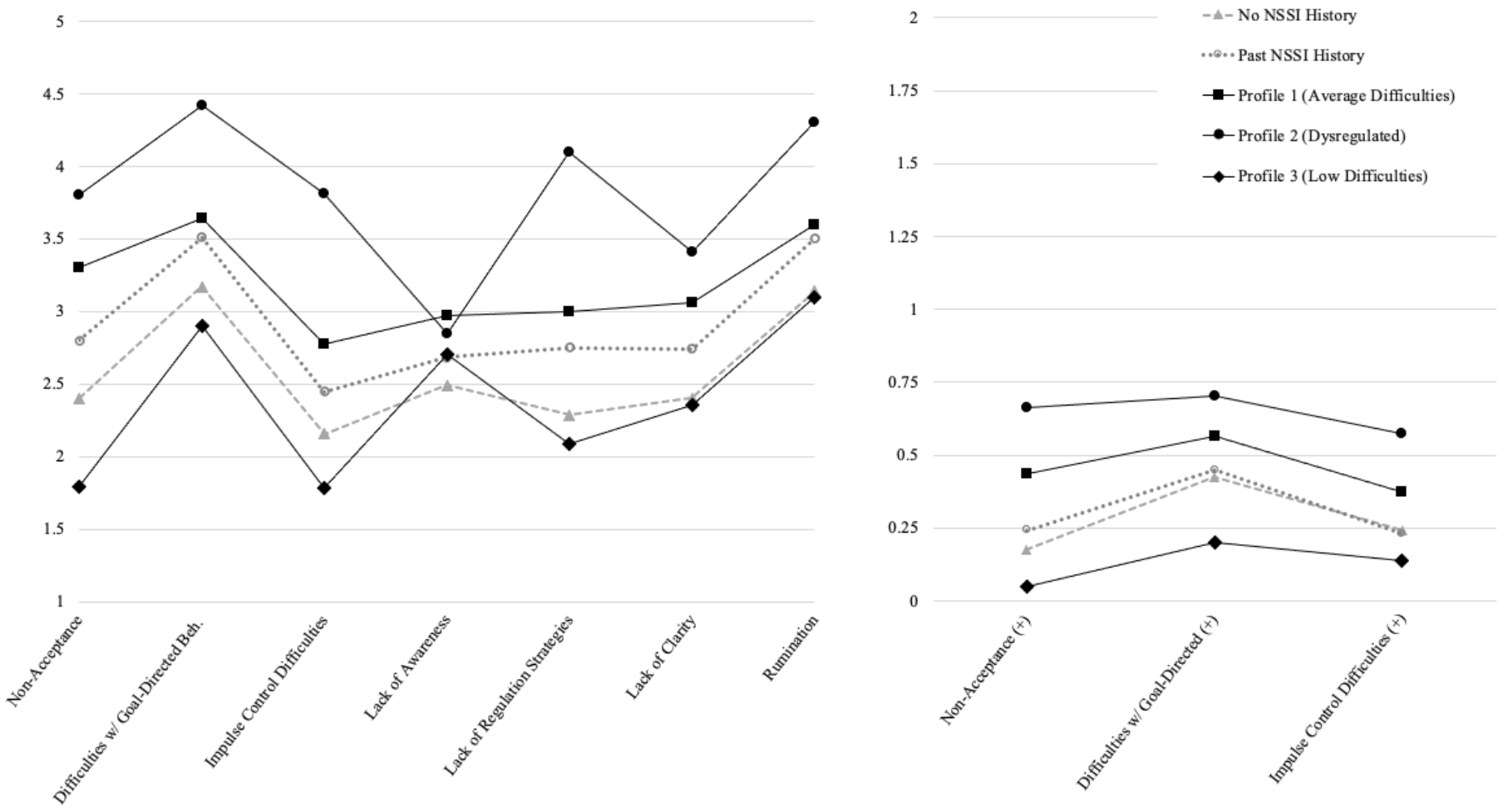
Note. BIC = Bayesian Information Criterion, CAIC = Consistent Akaike Information Criterion, ICL-BIC = Integrated Classification Likelihood, AWE = Approximate Weight of Evidence.
The optimal relative values of model fit indicators (minimized BIC, CAIC, ICL-BIC, AWE values; maximized entropy and Wald values) are bolded and italicized.

Figure 3.1 ***Three Latent Emotion Regulation Profiles Within the NSSI Sample***



Note. (+) = difficulties with regulating positive emotion.

Figure 3.2 ***Three Profiles versus Comparison Groups on Self-Reported Emotion Regulation Difficulties***



Note. (+) = difficulties with regulating positive emotions

Appendix 3.1. Supplementary Analyses

Table i ***Comparing Profiles with Comparison Samples on Parent-Child Relationships and NSSI Characteristics***

	Comparison Groups				Profiles						Test		Pairwise Comparisons[b]
	A No NSSI History		B Past NSSI History		1 Average Difficulties		2 Dysregulated		3 Low Difficulties				
	M, *SE*	%	*M* (*SE*)	%	*M* (*SE*)	%	*M* (*SE*)	%	*M* (*SE*)	%	Uni. *F*	χ^2	(*Comparison Groups vs. Profiles*)
Parent-child relationships[a]													
F - unresolved attachment	1.89, .02		2.09, .04		2.19, .05		2.49, .06		1.80, .08		25.48**		*A < 1**,*2**; B < 2**
M - unresolved attachment	1.56, .02		1.79, .03		1.92, .05		2.07, .06		1.67, .07		31.79**		*A < 1**,*2**; B < 2**
F - overprotection	1.99, .02		2.07, .03		2.11, .04		2.20, .05		2.00, .06		6.67**		*A < 2**
M - overprotection	2.05, .02		2.17, .03		2.31, .04		2.31, .05		2.09, .06		15.26**		*A < 1**,*2**
F - antipathy	1.95, .02		2.28, .04		2.37, .06		2.72, .07		1.99, .09		39.01**		*A < 1**,*2**; B < 2**
M - antipathy	1.65, .02		2.01, .04		2.15, .05		2.28, .06		1.97, .08		44.90**		*A < 1**,*2**,*3*; B < 2**
F - psychological control	1.44, .01		1.51, .02		1.64, .03		1.77, .04		1.39, .05		24.36**		*A < 1**,*2**; B < 1**, 2**
M - psychological control	1.41, .01		1.51, .02		1.65, .03		1.71, .03		1.53, .05		26.59**		*A < 1**,*2**; B < 1**, 2**
F - pressure	3.22, .04		3.43, .07		3.56, .10		4.26, .12		3.07, .15		20.75**		*A < 1*,*2**; B < 2**
M - pressure	3.09, .04		3.31, .07		3.61, .09		3.97, .11		3.23, .15		18.17**		*A < 1**,*2**; B < 2**
Parental alienation	1.95, .02		2.40, .04		2.73, .06		3.13, .07		2.10, .09		102.66**		*A < 1**,*2**; B < 1*, 2**
F - neglect (*Yes*)		50.1		62.8		62.8		68.2		59.4		42.93**	-
M - neglect (*Yes*)		16.3		26.4		31.0		29.3		30.2		53.56**	-
NSSI characteristics[a]													
External ER functions	-		2.80, .05		3.17, .07		3.59, .09		3.07, .11		20.73**		*B < 1**, 2**
Internal ER functions	-		2.41, .04		2.68, .06		3.30, .07		2.24, .09		44.84**		*B < 1*, 2**
Social influence functions[b]	-		.12, .01		.12, .01		.17, .01		.11, .01		7.30**		*B < 2**
Sensation seeking functions[b]	-		.13, .01		.17, .01		.22, .01		.09, .02		12.36**		*B < 2**
Addictive features	-		1.81, .04		2.20, .06		2.78, .07		1.80, .09		48.97**		*B < 1*, 2**
Number of methods	-		2.66, .07		3.04, .10		3.45, .12		2.49, .15		13.75**		*B < 2**
Time elapsed since NSSI onset	-		4.78, .11		3.91, .14		4.22, .17		3.61, .23		11.94**		*B > 1**, 3**

Note. Results from two MANOVAs (univariate *F*) and chi-squares (χ^2) are shown. Adjusted means (*M*) and standard errors (*SE*) are presented. $p < .01$ was the threshold for statistical significance. F- = father, M- = mother.

[a]MANCOVAs controlled for age, gender, and ethnicity, socioeconomic disparity, financial support from parents, and past and current living arrangements. [b]Based on Bonferroni-corrected post-hoc tests.

*$p < .01$, **$p < .001$

CHAPTER 4: General Discussion

NSSI is a concerning behavior that affects far more young people than historically conceived. The fact that NSSI typically emerges in adolescence but remains prevalent during the period of young adulthood (Gandhi, Luyckx, Baetens, et al., 2018), including among emerging adults pursuing a university education (Kiekens et al., 2019; Whitlock et al., 2011; Swannell et al., 2014), raises important questions with respect to the vulnerability factors associated with engagement in NSSI among university students. To date, a body of rapidly accumulating research on NSSI has lent support to etiological and developmental theories of NSSI behavior, emphasizing the key role of emotion dysregulation (Chapman et al., 2006; Nock, 2009; Selby & Joiner, 2009; for reviews, see Wolff et al., 2019; You et al., 2018) and parent-child relationship dysfunction (Linehan, 1993; Nock, 2009; Woo et al., 2020) as risk factors. Ascribing to this broad risk framework, the current dissertation sought to further clarify the risk factors associated with NSSI among university students by 1) dedicating more attention to the context of achievement pressure as a potential vulnerability lens for NSSI, and 2) by narrowing in further on a person-centered classification of university students' vulnerability profiles for NSSI.

More specifically, in Study 1, an integrated model explored the extent to which perceived pressure from mother and fathers, perfectionism subtypes, academic disengagement coping, and emotion dysregulation were associated with the likelihood and frequency of engagement in NSSI in a large sample of university students. Building upon this exploration of broader risk patterns, in Study 2, the goal was to better understand how those with an NSSI history may differ from each other on emotion regulation difficulties, with the aim of gaining further information about the differences in their vulnerability profiles for NSSI. A person-centered statistical approach was employed to classify a subsample of university students with a past-year NSSI history into latent emotion regulation profiles. We then explored whether profiles differed from one another on a

broad array of parent-child relational risk factors and on the severity, functions, and addictive features of their NSSI. The major findings from Study 1 and Study 2 are summarized below.

Summary of Major Findings

Study 1 Findings

In Study 1, findings first indicated that mother and father pressure were both related to a higher likelihood of engaging in NSSI among students. This study was the first, to our knowledge, to explore the role of parental pressure in NSSI using a multidimensional definition of parental pressure comprised of criticism, expectations, and psychological control indices, and using both mother and father-specific indicators.

With respect to our exploration of intrapersonal factors within the NSSI risk model, we found that higher emotion dysregulation was related to both past-year NSSI likelihood and frequency. Socially prescribed perfectionism and academic disengagement coping were both associated with higher risk for NSSI (i.e., likelihood and frequency of NSSI engagement, respectively), but their effects were rendered non-significant once other variables were entered in the hierarchical analyses. More explicitly, results suggested that students who face greater emotion regulation challenges are more likely to engage in NSSI (and do so at a higher frequency), and that this effect overpowers those of academic coping challenges or preoccupations with social standards of achievement on NSSI outcomes. With this said, as further discussed below, future replications of this work with variations in design and methods (e.g., within-person models) may be worthwhile in achieving a more fullsome understanding of the role of academic coping and perfectionism in NSSI engagement.

One final finding from the study is that self-oriented perfectionism was associated with a reduced likelihood of engaging in NSSI among university students. As previously justified in the

Study 1 discussion, one should be cautious not to think about this association as reflecting a straightforward protective effect. Self-oriented perfectionism is a nuanced and evolving concept in social psychology, often considered to reflect a mix of adaptive and maladaptive features (Gaudreau, 2021; O'Connor et al., 2010; Osenk et al., 2020). Although impossible to verify in current analyses, it is likely that students who self-impose perfectionistic standards of achievement are less likely to engage in NSSI because of other unmeasured protective factors (e.g., excellencism features, higher self-esteem). Indeed, the negative association between self-oriented perfectionism and psychological adjustment outcomes, while nuanced, is generally well-established (Limburg et al., 2017; Xie et al., 2019).

Study 2 Findings

In Study 2, findings first indicated that the emotion dysregulation patterns of university students with a past-year history of NSSI were best represented into three profiles: the Average Difficulties (47.4%), Dysregulated (33.0%), and Low Difficulties (19.6%) profiles. Overall, students in both the Average Difficulties and Dysregulated profiles exhibited greater struggles with emotion regulation than students who had never self-injured or had not self-injured in at least a year. Students in the Low Difficulties profile, in contrast, were unique in that they reported either lower or similar levels of emotion regulation difficulties relative to students who has never self-injured/not self-injured in a year. While these results could simply indicate that these students struggle minimally with emotion regulation, an alternative interpretation may be that students in the Low Difficulties profile underreported their emotion regulation challenges due to a general tendency to minimize their expression of distress to others. This interpretation, albeit speculative, is cohesive with literature on emotion regulation styles (John & Gross, 2007; Shaver & Mikulincer, 2007) and attachment system deactivation (Kobak et al., 1993). Lastly, findings indicated that

students' difficulties in regulating *negative* emotions followed the same pattern as their difficulties in regulating *positive* emotions, meaning that the Dysregulated profile exhibited the highest levels of positive emotion dysregulation, followed by the Average Difficulties profile.

Other findings relate to the parent-child relational risk factors associated with profile membership. Results showed that the severity of negative experiences with parents was, overall, proportional to students' self-reported degree of difficulties with emotion regulation. Accordingly, those in the Dysregulated profile had the worst overall perceptions of their relationships with parents (e.g., greatest unresolved attachment, pressure, alienation), whereas the Low Difficulties profile had the least negative perceptions of their relationship with parents. Unlike Study 1 results, a particularly interesting finding was that the three profiles differed far more substantially in the extent of negative experiences with fathers, as compared to that with mothers. Although not indicative of a causal effect, this finding suggests that, among university students who self-injure, those who struggle with high levels of emotion dysregulation perceive their relationships with fathers to be uniquely strained or conflictual.

Lastly, we found that the profile with the greatest difficulties in emotion regulation (Dysregulated profile) also engaged in NSSI the most frequently, using the greatest number of methods, at the service of multiple functions and with the highest level of addictive properties. The Dysregulated profile was best differentiated from other profiles by high levels of Internal Emotion Regulation functions, indexing motivations to downregulate internalizing affective states (e.g., sadness). Students in the Low Difficulties profile endorsed a use of NSSI that was less severe and generalized than other profiles overall, and appeared to engage in NSSI primarily for External Emotion Regulation functions (i.e., to downregulate physiological tension, frustration, or anger).

Collective Interpretation of Findings Across Studies 1 and 2

While the two studies from the current dissertation addressed different goals and used distinct analytic methods, they offered complementary findings in many respects. First, both studies were clear in demonstrating a link between emotion regulation difficulties and NSSI among university students. Emotion dysregulation was first considered as a broad, population-level risk factor for NSSI in Study 1. As a follow-up to these variable-centered analyses, the association between emotion dysregulation and NSSI was parsed out further and considered within a person-centered framework in Study 2. Across both investigations, university students who reported the greatest difficulties regulating their emotions were most vulnerable to NSSI overall, consistent with core tenets of theoretical models of NSSI (Chapman et al., 2006; Linehan, 1993; Nock, 2009; Selby & Joiner, 2009). Perhaps most interestingly, however, Study 2 opened a window onto a more nuanced understanding of emotion dysregulation as it relates to NSSI, highlighting the importance of considering emotion regulation patterns holistically within and across individuals. Indeed, the Low Difficulties profile identified in Study 2 challenges the "blanket" notion that university students who engage in NSSI universally perceive themselves to have difficulty regulating their feelings. As students who "fit" such a profile account for a minority of individuals who self-injure (19.6% in the current study), they may have traditionally gone unnoticed in the variable-centered analyses that make up the bulk of existing research on NSSI (including those conducted in Study 1). Study 2 also pushed beyond the traditional parameters of emotion regulation research to find that difficulties in regulating *positive* emotions could differ meaningfully across students with a past-year history of NSSI. Accordingly, when considered as a whole, findings from the current dissertation served a two-fold purpose. They first identified emotion dysregulation as the dominant pattern of risk for NSSI in a university population, and also as a multidimensional and

heterogeneous vulnerability factor that can vary substantially from person to person even within samples of university students with recent NSSI behavior. The clinical implications of these findings are discussed further below.

Both studies also supported existing developmental models of NSSI (Linehan, 1993; Nock, 2009) in demonstrating that forms of invalidating parenting, including harsh forms of parental pressure, are associated with a greater likelihood of engaging in NSSI (Study 1) and with the most emotionally dysregulated profiles of students who self-injure (Study 2). Although more heavily underscored in Study 1, this dissertation as a whole added emphasis on experiences of parental pressure (i.e., criticism, unrealistic expectations, psychological control) in relation to NSSI risk among university students. These findings are important to consider within the broader historical context of NSSI research. While researchers and theorists once predominantly conceptualized NSSI as a developmental sequelae of severe childhood abuse and neglect (Gratz, 2003; Yates, 2004), research has since evolved toward a more inclusive developmental account of the behavior, emphasizing the potential roles of parental criticism, control, and invalidation, among other behaviors (Baetens et al., 2014, 2015; Bureau et al., 2010; Tao et al., 2020; Wang et al., 2017; Wang & Qin, 2016). Accordingly, the fact that parental pressure emerged as a significant NSSI risk factor in the present dissertation aligns with more modern conceptualizations of NSSI, which understand the behavior as occurring across varying contexts of developmental and relational risk (Martin, Bureau, Yurkowski, Fournier, et al., 2016; Martin, Bureau, Yurkowski, Lafontaine, et al., 2016; Tatnell, Hasking, & Newman, 2017). Still, more research is needed to help parse out the relative influences of different developmental/relational risk factors on NSSI, as proposed in the later sections of the present discussion.

Lastly, here again, findings from Study 2 about parent-child relationships and NSSI served to complement and inject further nuance into the interpretation of findings from Study 1. Specifically, in Study 1, mother and father experiences (i.e., perceived parental pressure) were both linked to a greater likelihood of engaging in NSSI, in addition to exhibiting close-to-identical magnitudes of association with emotion dysregulation. In Study 2, however, perceived experiences with fathers were more powerful than that with mothers in discriminating between the emotion regulation profiles of students with a past-year NSSI history. Accordingly, findings from this dissertation could collectively be interpreted to suggest that, while one's *overall* susceptibility for NSSI could be partially traceable to negative experiences with either or both parents (such as parental pressure), experiences with fathers may represent a particularly sensitive relational space for students with a recent history of NSSI. Seeing as past studies have yielded mixed findings with respect to differential associations between parent-specific experiences (paternal and maternal) and NSSI (Guérin-Marion et al., 2019; Hallab & Covic, 2010; Martin, Bureau, Yurkowski, Fournier, et al., 2016; Pearson et al., 2018; Tao et al., 2020; Tatnell, Hasking, & Newman, 2017), these interpretations merit further empirical testing.

Practical and Clinical Implications

Current study results provide a preliminary basis for several practical and clinical applications. First, findings align with existing research (Wolff et al., 2019; You et al., 2018) in highlighting emotion regulation skills as a crucial target for intervention among university students who engage in NSSI behavior. The NSSI treatment literature corroborates this proposition. Dialectical behavior therapy, for instance, is an evidence-based treatment model that focuses on building emotion regulation skills (Neacsiu et al., 2014) and that has showed promising efficacy for reducing NSSI behavior based on meta-analyzed data (Cook & Gorraiz, 2016; see, also,

Hawton et al., 2016). Likewise, cognitive behavioral therapies, which aim to support emotion regulation processes through relaxation, cognitive reframing, and behavioral interventions, have shown efficacy in reducing NSSI (Hawton et al., 2016). Other emotion-focused interventions (Bjureberg et al., 2018), including mindfulness-based techniques (Argento et al., 2020; Bentley et al., 2017), have also gained recent attention as potential intervention vehicles for addressing NSSI urges and behaviors.

Beyond aligning with the goals of such therapies, findings from the current dissertation can also inform further reflections about emotion regulation-focused intervention for university students with NSSI behavior. First, as briefly mentioned in Study 2, clinicians should be aware that not all university students who engage in NSSI will present with a classical profile of hyperactivated, dysregulated emotional functioning, or with a self-perceived sense of vulnerability and helplessness in the face of emotional distress. An assumption to that effect may prevent clinicians from accurately screening for NSSI behavior when working with individuals who come into mental health services asserting few emotion regulation challenges. In addition, such blanket presumptions may be received as misattuned by many self-injuring young adults (such as students found to populate the Low Difficulties profile in Study 2) in the context of a therapeutic relationship, which hinges on a collaborative understanding of symptoms and difficulties. Just as this is true, however, it would be equally as misguided to trivialise a university student's NSSI behavior if they asserted few difficulties with managing emotions. Many university students who self-injure may, in fact, present with little expressed distress and manage to maintain a high level of overall functioning despite their coping challenges (e.g., attend classes, engage in part-time employment, enjoy an active social life). Even in such cases, NSSI should be understood by clinicians as representing a maladaptive pattern of turning against the self, rather than toward

healthier ways to self-regulate, to cope with uncomfortable feelings. Accordingly, drawing on this dissertation's findings, an important guiding point for clinicians who work with university students who self-injure may be to strike a careful balance between knowing what the research says and attuning to the person sitting in front of them. The importance of applying an unassuming, attuned, and client-centered therapeutic response in the context of NSSI intervention may be especially important in light of the fact that effective therapeutic supports can play an important role in NSSI recovery (Cook & Gorraiz, 2016; Whitlock et al., 2015), yet few adolescents and university students who engage in NSSI seek mental health support for their self-injury to begin with (Heath et al., 2010; Whitlock et al., 2006, 2011).

Findings on positive emotion dysregulation in Study 2 also carry clinical implications. As proposed in prior emerging research (Burke, Stange, et al., 2015; Perini et al., 2021), clinicians may want to pay closer attention to how young people with NSSI behavior—particularly those who exhibit more generalized and severe forms of dysregulation—regulate their *positive* emotions. Given the high levels of non-acceptance of positive feelings reported by students clustered within the Dysregulated profile, understanding barriers to emotional acceptance may be particularly valuable (e.g., fears that something bad may quickly follow a positive emotional experience; beliefs that one is undeserving of happiness). Such an intervention may then be followed by focusing on fostering mindful acceptance of/decreasing fears around positive emotional experiences (Farb et al., 2014). Likewise, introducing behavioral activation, self-soothing, mindfulness-based, or self-compassion-based emotion regulation strategies may be framed as ways to regulate and better appraise the experience of positive feelings, rather than only to cope with distress.

Findings from both studies also resonate with developmental models of NSSI (Linehan, 1993; Nock, 2009), as well as interpersonal perspectives on emotion regulation (Barthel et al., 2018; Thompson, 1994) and NSSI (Peel-Wainwright et al., 2021), by bringing forth the notion that caregiving relationships are associated with both the emotion regulation patterns and NSSI susceptibility of university students. Although emerging adults entering university may strive to assert autonomy from parental figures in a general sense, the influence of parental figures as emotion socialization agents does not stop at the brink of young adulthood or university entry (Mattanah et al., 2011; Rogers et al., 2018). The coregulatory functions of early attachment relationships, in fact, are well known to play a role in determining trajectories of emotion regulation capacity across the life span (Girme et al., 2021). Interventions for NSSI should therefore be guided by these attachment-informed principles and, at a minimum, embed a theoretical awareness of the potential impact of caregiving relationships on the emotion regulation and NSSI behaviors of young adults. Parenting programs for caregivers of infants/preschool children that focus on increasing coregulation and attachment security may thus play an important role in preventing some degree of risk for NSSI in later development. Attachment-based family treatment approaches, such as Emotion(ally)-Focused Family Therapy, may also be promising not only in addressing NSSI but also in empowering parents as therapeutic agents in intervention (see Schade, 2013). Relatedly, the fact that fathers in Study 2 stood out in the extent to which they were related to emotion regulation profile membership is informative. Fathers have long been regarded as fulfilling a "secondary" role as attachment figures and emotion socialization agents within the family (Lamb, 2010). Albeit strictly cross-sectionally and correlationally, our findings align with the more modern viewpoint that fathers may play an important role in the emotional development of youth and should, importantly, be regarded as important agents of therapeutic change in NSSI

intervention. Accordingly, whenever possible, clinicians should aim to engage fathers (in addition to mothers) in therapeutic intervention with at-risk youth. When working with emotionally dysregulated youth who engage in NSSI, it may be helpful for clinicians to pay particular attention to the relational dynamics between fathers and their youth—including the possibility that youth may perceive/experience high levels of unresolved feelings, pressure, antipathy, and control in their relationships with fathers. This can help to inform a number of practices in the context of clinical care, including clinical case conceptualization and family interventions.

Furthermore, findings from Study 1, as well as complementary findings from Study 2, may provide a preliminary empirical basis for clinicians to pay increased attention to the potential link between parental pressure and NSSI in the context of treatment. This may be especially critical nowadays as both distress related to academic demands and NSSI appear to be on the rise across college counselling centers (Xiao et al., 2017). With this said, from an intervention perspective, it is important to keep in mind that while the present dissertation emphasizes experiences of perceived parental pressure in the context of the university period, such experiences are likely to reflect a more longstanding pattern of parenting behavior and beliefs. Therefore, the potential effects of parental pressure on NSSI behaviors may be most effectively addressed within the context of early intervention during childhood or adolescence. Within a family-centered intervention framework, for instance, educating parents about the counterproductive effects of overvaluing youth's achievements (Ciciolla et al., 2017; Kaynak et al., 2021), all while encouraging youth to express their feelings and reactions to parents about this sense of undue pressure, could be a helping factor in preventing (potential) downstream negative effects on emotion dysregulation and NSSI. During the university period, addressing the negative effects of parental pressure may necessitate more developmentally tailored intervention, involving the

nurturing of students' differentiation from parent-driven expectations (Peleg et al., 2016). The de-escalation of emotional reactions to parental pressure may also be facilitated through emotion-regulation focused intervention, for instance incorporating self-compassion and acceptance-based techniques (see Inwood & Ferrari, 2018).

Lastly, the current dissertation was produced, in part, in the hopes of raising awareness around some of the dispositional and contextual challenges of university students (e.g., academic coping, perfectionism) and their potential associations with NSSI engagement. While not all results aligned with initially proposed hypotheses, it is our hope that findings nevertheless encourage increased sensitivity around the issue of NSSI among university students. Despite a growing awareness of the occurrence of NSSI in postsecondary settings, a significant portion of university staff (Hamza et al., 2021) and campus mental health staff (Whitlock et al., 2009) still report misinformed or potentially stigmatizing beliefs about NSSI, and overall low levels of knowledge about how to intervene when NSSI is present. Similar findings on high-school staff have also been reported (Heath et al., 2011), suggesting these knowledge gaps may be generalized across students' full educational trajectories. In light of the prevalence of NSSI in university settings (Kiekens et al., 2019; Swannell et al., 2014), it is crucial that psychoeducation about NSSI be thoughtfully integrated into mental health programming in universities (e.g., mental health first aid trainings). Students who struggle to develop effective emotion regulation strategies in the face of university-related stressors, in particular, ought to be identified readily by university staff (e.g., residence fellows, administrative staff, professors) and connected with a safety net of supports (e.g., mental health services, peer mentors, academic support centers) within a responsive, student-centered system of care. This is all the more relevant now as university students continue to adjust to the significant alterations in their social supports and increased psychosocial stressors related to

COVID-19 pandemic (Li et al., 2021; Zetterqvist et al., 2021). Leveraging the use of virtual platforms for the provision of mental health supports, including dissemination of psychoeducational resources on NSSI, may be among those early solutions that can be implemented widely within university campuses (Hasking et al., 2021).

Limitations and Directions for Future Research

While the present dissertation adds to the body of research on NSSI among university students, several limitations and knowledge gaps remain crucial to address in future research. With the aim of replicating and expanding current findings, future research would benefit from further investigating the role of parental pressure in NSSI among university students, as well as the role of father-child and mother-child relational risk factors more generally. This research would greatly benefit from adopting longitudinal designs. In general, prospective data on the role of parent-child relationships in NSSI is critically needed in order to further ascertain developmental risk trajectories toward NSSI. Indeed, the present dissertation's cross-sectional design, which was previously underscored as a primary methodological limitation, makes it impossible to ascertain whether parent-child relational experiences (including experiences of parental pressure) actually predated challenges with emotion dysregulation and/or NSSI, or if a reciprocal relationship between risk factors and NSSI might exist (see Ewing et al., 2019; You et al., 2017). As such, multi-wave longitudinal work will be crucial in clarifying the directionality of the proposed associations between parent-child relationships/emotion regulation and the initiation and/or maintenance of university students' NSSI engagement. A multi-wave prospective design with short-term follow-ups (e.g., monthly, every 3 months) would also help mitigate the influence of retrospective biases when reporting on NSSI, emotion regulation challenges, and parenting behavior (e.g., young adults rating parents as having been highly controlling in childhood in light

of *current* feelings about parents). Eventually, such investigations will help to bring further clarity around sensitive developmental periods for exposures to parent-child relational risk factors in risk trajectories toward NSSI.

Further research is also needed on the role of positive emotion dysregulation and NSSI. A number of hypotheses would benefit from being explored. As mentioned in Study 2, it is possible that dysregulation within positive emotional systems (e.g., suppression of positive feelings) could have effects on NSSI over and above the influence of dysregulated negative emotion. It is also possible that a heightened reactivity to positive experiences, coupled with heightened sensitivity to negative experiences, drives specific forms of engagement in NSSI (e.g., sensation-seeking functions). While self-report methods—such as those used in the present dissertation—can be informative in exploring the role of positive emotions in NSSI, future research would benefit from integrating additional methodologies to populate a more fulsome and objective empirical account of these questions. For instance, using neuroimaging methods to explore neural pathways for positive affect regulation (e.g., sensitivity to reward; Cummings et al., 2021; Perini et al., 2021), physiological measurement of emotion regulation processes in the lab setting, and/or using "real-time", ecological momentary assessments of positive emotion regulation (e.g., Santangelo et al., 2017; Victor & Klonsky, 2014) would be valuable. The use of these same methods would also enhance current knowledge on negative emotion regulation and NSSI and address some of the common limitations of self-report data on emotion regulation, including shared method variance along with other sources of bias (e.g., insight-related limitations, desirability/retrospective biases).

With respect to the link between emotion regulation and NSSI more broadly, moving beyond variable-centered approaches and integrating increasingly more person-centered perspectives is important to move the field forward. It would be worthwhile to first replicate Study

2 across additional samples of self-injuring university students in order to see if the same emotion regulation profiles would hold. In doing so, using a combination of psychophysiological indicators of emotional regulation, including physiological (e.g., vagal response), behavioral (e.g., expressed affect), and self-report methods, may be particularly promising. Research may also benefit from incorporating other emotion regulation deficits as indicators of profile membership (e.g., emotion suppression, emotional reactivity) and seek to investigate relational-emotional profiles of NSSI vulnerability. Echoing the hypotheses proposed in the Study 2 discussion, in keeping with an attachment theory framework, there is evidence that individuals who hyperactivate their attachment signals (such as their expression of emotions to significant others) show higher rates of NSSI (Martin, Bureau, et al., 2017; Martin, Raby, et al., 2017). Less is known, though, about the NSSI behaviors of individuals who fall along the attachment *deactivation* spectrum (i.e., who have a tendency to suppress their expression of emotions to attachment figures). Therefore, exploring associations among emotion regulation profiles and these attachment patterns in NSSI samples may be a promising terrain of future inquiry for researchers.

Person-centered approaches could also help to shed further light on the role of academic disengagement coping and perfectionism in NSSI engagement during the university period. Seeing as university students' experiences of academic stress, along with their ability to cope effectively with these stressors, may vary substantially from one day to the next and at various points throughout the year (e.g., midterm season), our use of one average score for academic disengagement coping in Study 1 may have been less than ideal. The use of within-person models, which are designed to account for daily fluctuations in behaviors against the individual's "average" baseline of behavior, may be helpful to incorporate in future longitudinal work in order to gain insight into the role of academic stressors and/or academic coping in NSSI. It is also possible that

academic disengagement coping represents a regulatory deficit that becomes especially detrimental to adjustment when paired with other adverse states (e.g., academic anxiety). Similarly, while perfectionism represents a stable personality disposition, the extent to which it triggers negative cognitions and affective states has been shown to depend upon situational and state contexts (e.g., low self-confidence, failure feedback; Besser et al., 2008). Accordingly, thorough explorations of variables that may moderate associations between achievement-related risk factors and NSSI will also be important to incorporate in future replications of this work. Lastly, whereas as this dissertation only included students from one single university, future research may benefit from investigating the effects of achievement-related risk factors (e.g., perfectionism, academic coping, parental pressure) on NSSI across different postsecondary environments, such as universities with more versus less competitive admission standards or with varying levels of student fee burden. This would help to clarify whether the association between NSSI and achievement-related risk factors varies as a function of the university environment, or the systemic and social pressures within it (e.g., levels of performance-orientation; Kiekens et al., 2016).

More general limitations of the present dissertation relate to some of the constraints of the sample limiting the generalizability of findings. First, seeing as students who participated in our study did so knowing they would be answering questionnaires on self-injury and psychological well-being, it is likely that some degree of self-selection bias affected the characteristics of the sample. Moreover, our sample included a preponderance of females and White/Caucasian students. While gender differences in NSSI risk were nevertheless explored in Study 1, more meaningful exploration of gender effects will necessitate more gender-balanced samples in future research. Likewise, although not a primary goal of the study, our sample and design also precluded

exploration of ethnicity differences in NSSI risk. Respondents were indeed queried in such a manner that allowed them to endorse multiple ethnic identities, which favoured a more relaxed and inclusive categorization of ethnicity but methodologically precluded sound comparisons across ethnic groups (note: most groups were also very small in size). Overall, the roles of gender, ethnicity, and other sociodemographic factors in NSSI are complex, and deserving of more in-depth and carefully designed research. In addition to recruiting more diverse samples of university students whenever possible to increase the generalizability of findings, important directions for future work will be to examine cross-cultural differences in NSSI risk factors (accounting for relevant contextual variables, such as ethnic minority stress and racialization), as well as gender differences in NSSI prevalence, characteristics (e.g., functions, methods, severity), and risk factors.

Conclusion

The present dissertation aimed to add both breadth and depth to our understanding of university students' engagement in NSSI. Using a large university student sample, findings expanded our awareness of vulnerability factors for NSSI that have historically been understudied (e.g., parental pressure, father-child relationships, dysregulated positive emotions), while also bringing into focus the notion that even well-established NSSI risk factors (emotion regulation difficulties) can manifest heterogeneously amongst university students with a history of self-injurious behavior. Taken together, findings add to a growing knowledge base on NSSI vulnerability, which plays a central role in informing approaches to address NSSI as a public health risk among young people. At the forefront of such intervention and prevention efforts should be an emphasis on the promotion of healthy emotion regulation skills and on reinforcing the importance of emotional support and nurturance within the parent-child relationship. These factors

may be among the most robust and powerful ways to prevent and address NSSI behavior, even among young adults moving into the more self-reliant phase of emerging adulthood and university education pursuits.

References

(General Introduction and General Discussion)

Acharya, L., Jin, L., & Collins, W. (2018). College life is stressful today – Emerging stressors and depressive symptoms in college students. *Journal of American College Health*, *66*(7), 655–664. https://doi.org/10.1080/07448481.2018.1451869

Adrian, M., Zeman, J., Erdley, C., Lisa, L., & Sim, L. (2011). Emotional dysregulation and interpersonal difficulties as risk factors for nonsuicidal self-injury in adolescent girls. *Journal of Abnormal Child Psychology*, *39*(3), 389–400. https://doi.org/10.1007/s10802-010-9465-3

Agliata, A. K., & Renk, K. (2009). College Students' Affective Distress: The Role of Expectation Discrepancies and Communication. *Journal of Child and Family Studies*, *4*(18), 396–411. https://doi.org/10.1007/s10826-008-9244-8

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (5th ed.)*. American Psychiatric Publishing.

Ammerman, B. A., Burke, T. A., Alloy, L. B., & McCloskey, M. S. (2016). Subjective pain during NSSI as an active agent in suicide risk. *Psychiatry Research*, *236*, 80–85. https://doi.org/10.1016/j.psychres.2015.12.028

Ammmerman, B. A., Hong, M., Sorgi, K., Park, Y., Jacobucci, R., & McCloskey, M. S. (2019). An examination of individual forms of nonsuicidal self-injury. *Psychiatry Research*, *278*, 268–274. https://doi.org/10.1016/j.psychres.2019.06.029

Anderson, N. L., & Crowther, J. H. (2012). Using the experiential avoidance model of non-suicidal self-injury: Understanding who stops and who continues. *Archives of Suicide Research*, *16*(2), 124–134. https://doi.org/10.1080/13811118.2012.667329

Anderson, N. L., Smith, K. E., Mason, T. B., & Crowther, J. H. (2018). Testing an Integrative Model of Affect Regulation and Avoidance in Non-Suicidal Self-Injury and Disordered Eating. *Archives of Suicide Research*, *22*(2), 295–310. https://doi.org/10.1080/13811118.2017.1340854

APSAC. (1995). *Psychosocial Evaluation of Suspected Psychological Maltreatment in Children and Adolescents: Practice Guidelines*. https://apsac.memberclicks.net/practice-guidelines

Argento, A., Simundic, A., Mettler, J., Mills, D. J., & Heath, N. L. (2020). Evaluating the Effectiveness of a Brief Mindfulness Activity in University Students With Non-Suicidal Self-Injury Engagement. *Archives of Suicide Research*, *0*(0), 1–15. https://doi.org/10.1080/13811118.2020.1841052

Arnett, J. J. (2015). *Emerging Adulthood: The Winding Road from the Late Teens Through the Twenties - Second Edition*. Oxford University Press.

Arnett, J. J. (2016). College Students as Emerging Adults: The Developmental Implications of the College Context. *Emerging Adulthood*, *4*(3), 219–222. https://doi.org/10.1177/2167696815587422

Baetens, I., Claes, L., Hasking, P., Smits, D., Grietens, H., Onghena, P., & Martin, G. (2015). The Relationship Between Parental Expressed Emotions and Non-suicidal Self-injury: The Mediating Roles of Self-criticism and Depression. *Journal of Child and Family Studies*, *24*(2), 491–498. https://doi.org/10.1007/s10826-013-9861-8

Baetens, I., Claes, L., Martin, G., Onghena, P., Grietens, H., Van Leeuwen, K., Pieters, C., Wiersema, J. R., & Griffith, J. W. (2014). Is Nonsuicidal Self-Injury Associated With Parenting and Family Factors? *The Journal of Early Adolescence*, *34*(3), 387–405. https://doi.org/10.1177/0272431613494006

Baetens, I., Greene, D., Van Hove, L., Van Leeuwen, K., Wiersema, J. R., Desoete, A., & Roelants, M. (2021). Predictors and consequences of non-suicidal self-injury in relation to life, peer, and school factors. *Journal of Adolescence, 90*, 100–108. https://doi.org/10.1016/j.adolescence.2021.06.005

Barthel, A. L., Hay, A., Doan, S. N., & Hofmann, S. G. (2018). Interpersonal Emotion Regulation: A Review of Social and Developmental Components. *Behaviour Change, 35*(4), 203–216. https://doi.org/10.1017/bec.2018.19

Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of Affective Disorders*, *173*, 90–96. https://doi.org/10.1016/j.jad.2014.10.054

Bentley, K. H., Cassiello-Robbins, C. F., Vittorio, L., Sauer-Zavala, S., & Barlow, D. H. (2015). The association between nonsuicidal self-injury and the emotional disorders: A meta-analytic review. *Clinical Psychology Review, 37*(Supplement C), 72–88. https://doi.org/10.1016/j.cpr.2015.02.006

Bentley, K. H., Nock, M. K., Sauer-Zavala, S., Gorman, B. S., & Barlow, D. H. (2017). A functional analysis of two transdiagnostic, emotion-focused interventions on nonsuicidal self-injury. *Journal of Consulting and Clinical Psychology, 85*(6), 632–646. https://doi.org/10.1037/ccp0000205

Besser, A., Flett, G. L., Hewitt, P. L., & Guez, J. (2008). Perfectionism, and Cognitions, Affect, Self-esteem, and Physiological Reactions in a Performance Situation. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, *26*(3), 206–228. https://doi.org/10.1007/s10942-007-0067-0

Bjureberg, J., Sahlin, H., Hedman-Lagerlöf, E., Gratz, K. L., Tull, M. T., Jokinen, J., Hellner, C., & Ljótsson, B. (2018). Extending research on Emotion Regulation Individual Therapy for Adolescents (ERITA) with nonsuicidal self-injury disorder: Open pilot trial and mediation analysis of a novel online version. *BMC Psychiatry*, *18*(1), 326. https://doi.org/10.1186/s12888-018-1885-6

Boyes, M. E., Wilmot, A., & Hasking, P. A. (2020). Nonsuicidal Self-Injury-Related Differences in the Experience of Negative and Positive Emotion. *Suicide and Life-Threatening Behavior*, *50*(2), 437–448. https://doi.org/10.1111/sltb.12599

Boyne, H., & Hamza, C. A. (2021). Depressive Symptoms, Perceived Stress, Self-Compassion and Nonsuicidal Self-Injury Among Emerging Adults: An Examination of the Between and Within-Person Associations Over Time. *Emerging Adulthood*, 21676968211029770. https://doi.org/10.1177/21676968211029768

Brand, A. E., & Klimes-Dougan, B. (2010). Emotion socialization in adolescence: The roles of mothers and fathers. *New Directions for Child and Adolescent Development*, *2010*(128), 85–100. https://doi.org/10.1002/cd.270

Brausch, A. M., Clapham, R. B., & Littlefield, A. K. (2021). Identifying Specific Emotion Regulation Deficits that Associate with Nonsuicidal Self-injury and Suicide Ideation in Adolescents. *Journal of Youth and Adolescence*. https://doi.org/10.1007/s10964-021-01525-w

Bresin, K. (2014). Five indices of emotion regulation in participants with a history of nonsuicidal self-Injury: A daily diary study. *Behavior Therapy*, *45*(1), 56–66. https://doi.org/10.1016/j.beth.2013.09.005

Bresin, K., & Schoenleber, M. (2015). Gender differences in the prevalence of nonsuicidal self-injury: A meta-analysis. *Clinical Psychology Review*, *38*, 55–64. https://doi.org/10.1016/j.cpr.2015.02.009

Brumariu, L. E. (2015). Parent–Child Attachment and Emotion Regulation. *New Directions for Child and Adolescent Development*, *2015*(148), 31–45. https://doi.org/10.1002/cad.20098

Buckholdt, K. E., Parra, G., & Jobe-Shields, L. (2009). Emotion regulation as a mediator of the relation between emotion socialization and deliberate self-harm. *American Journal of Orthopsychiatry*, *79*(4), 482–490. https://doi.org/10.1037/a0016735

Bureau, J.-F., Martin, J., Freynet, N., Poirier, A. A., Lafontaine, M.-F., & Cloutier, P. (2010). Perceived dimensions of parenting and non-suicidal self-injury in young adults. *Journal of Youth and Adolescence*, *39*(5), 484–494. https://doi.org/10.1007/s10964-009-9470-4

Burke, T. A., Ammerman, B. A., Hamilton, J. L., Stange, J. P., & Piccirillo, M. (2020). Nonsuicidal self-injury scar concealment from the self and others. *Journal of Psychiatric Research*, *130*, 313–320. https://doi.org/10.1016/j.jpsychires.2020.07.040

Burke, T. A., Anne McArthur, B., Daryanani, I., Abramson, L. Y., & Alloy, L. B. (2018). Latent classes of trait affect and cognitive affective regulation strategies are associated with depression, non-suicidal self-injury, and well-being. *Journal of Affective Disorders*, *225*, 180–187. https://doi.org/10.1016/j.jad.2017.08.015

Burke, T. A., Hamilton, J. L., Abramson, L. Y., & Alloy, L. B. (2015). Non-suicidal self-injury prospectively predicts interpersonal stressful life events and depressive symptoms among adolescent girls. *Psychiatry Research*, *228*(3), 416–424. https://doi.org/10.1016/j.psychres.2015.06.021

Burke, T. A., Piccirillo, M. L., Moore-Berg, S. L., Alloy, L. B., & Heimberg, R. G. (2019). The stigmatization of nonsuicidal self-injury. *Journal of Clinical Psychology*, *75*(3), 481–498. https://doi.org/10.1002/jclp.22713

Burke, T. A., Stange, J. P., Hamilton, J. L., Cohen, J. N., O'Garro-Moore, J., Daryanani, I., Abramson, L. Y., & Alloy, L. B. (2015). Cognitive and Emotion-Regulatory Mediators of the Relationship Between Behavioral Approach System Sensitivity and Nonsuicidal Self-Injury Frequency. *Suicide and Life-Threatening Behavior*, *45*(4), 495–504. https://doi.org/10.1111/sltb.12145

Buser, T. J., Buser, J. K., & Rutt, C. C. (2017). Predictors of unintentionally severe harm during nonsuicidal self-injury. *Journal of Counseling & Development*, *95*(1), 14–23. https://doi.org/10.1002/jcad.12113

Cerutti, R., Zuffiano, A., & Spensieri, V. (2018). The role of difficulty in identifying and describing feelings in non-suicidal self-injury behavior (NSSI): Associations with perceived attachment quality, stressful life events, and suicidal ideation. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2018.00318

Chang, E. C., Schaffer, M. R., Novak, C. J., Ablow, D. B., Gregory, A. E., Chang, O. D., Lucas, A. G., & Hirsch, J. K. (2019). Sexual assault history and self-destructive behaviors in women college students: Testing the perniciousness of perfectionism in predicting non-suicidal self-injury and suicidal behaviors. *Personality and Individual Differences*, *149*, 186–191. https://doi.org/10.1016/j.paid.2019.05.021

Chaplo, S. D., Kerig, P. K., Bennett, D. C., & Modrowski, C. A. (2015). The roles of emotion dysregulation and dissociation in the association between sexual abuse and self-injury

among juvenile justice–involved youth. *Journal of Trauma & Dissociation*, *16*(3), 272–285. https://doi.org/10.1080/15299732.2015.989647

Chapman, A. L., Gratz, K. L., & Brown, M. Z. (2006). Solving the puzzle of deliberate self-harm: The experiential avoidance model. *Behaviour Research and Therapy*, *44*(3), 371–394. https://doi.org/10.1016/j.brat.2005.03.005

Ciciolla, L., Curlee, A. S., Karageorge, J., & Luthar, S. S. (2017). When Mothers and Fathers Are Seen as Disproportionately Valuing Achievements: Implications for Adjustment Among Upper Middle Class Youth. *Journal of Youth and Adolescence*, *46*(5), 1057–1075. https://doi.org/10.1007/s10964-016-0596-x

Cipriano, A., Cella, S., & Cotrufo, P. (2017). Nonsuicidal Self-injury: A Systematic Review. *Frontiers in Psychology*, *8*. https://doi.org/10.3389/fpsyg.2017.01946

Cleary, M., Walter, G., & Jackson, D. (2011). "Not Always Smooth Sailing": Mental Health Issues Associated with the Transition from High School to College. *Issues in Mental Health Nursing*, *32*(4), 250–254. https://doi.org/10.3109/01612840.2010.548906

Compas, B., Jaser, S., Bettis, A., Watson, K., Gruhn, M., Dunbar, J., Williams, E., & Thigpen, J. (2017). Coping, Emotion Regulation, and Psychopathology in Childhood and Adolescence: A Meta-Analysis and Narrative Review. *Psychological Bulletin*, *143*. https://doi.org/10.1037/bul0000110

Cook, N. E., & Gorraiz, M. (2016). Dialectical behavior therapy for nonsuicidal self-injury and depression among adolescents: Preliminary meta-analytic evidence. *Child and Adolescent Mental Health*, *21*(2), 81–89. https://doi.org/10.1111/camh.12112

Crowell, S. E., Beauchaine, T. P., & Linehan, M. (2009). A Biosocial Developmental Model of Borderline Personality: Elaborating and Extending Linehan's Theory. *Psychological Bulletin, 135*(3), 495–510. https://doi.org/10.1037/a0015616

Cummings, L. R., Mattfeld, A. T., Pettit, J. W., & McMakin, D. L. (2021). Viewing Nonsuicidal Self-Injury in Adolescence Through a Developmental Neuroscience Lens: The Impact of Neural Sensitivity to Socioaffective Pain and Reward. *Clinical Psychological Science, 9*(5), 767–790. https://doi.org/10.1177/2167702621989323

Daukantaitė, D., Lundh, L.-G., Wångby-Lundh, M., Claréus, B., Bjärehed, J., Zhou, Y., & Liljedahl, S. I. (2020). What happens to young adults who have engaged in self-injurious behavior as adolescents? A 10-year follow-up. *European Child & Adolescent Psychiatry*. https://doi.org/10.1007/s00787-020-01533-4

Eisenberg, N., Spinrad, T. L., & Eggum, N. D. (2010). Emotion-Related Self-Regulation and Its Relation to Children's Maladjustment. *Annual Review of Clinical Psychology, 6*(1), 495–525. https://doi.org/10.1146/annurev.clinpsy.121208.131208

Emery, A. A., Heath, N. L., & Mills, D. J. (2016). Basic psychological need satisfaction, emotion dysregulation, and non-suicidal self-injury engagement in young adults: An application of self-determination theory. *Journal of Youth and Adolescence, 45*(3), 612–623. https://doi.org/10.1007/s10964-015-0405-y

Ewing, L., Hamza, C. A., & Willoughby, T. (2019). Stressful Experiences, Emotion Dysregulation, and Nonsuicidal Self-Injury among University Students. *Journal of Youth and Adolescence, 48*(7), 1379–1389. https://doi.org/10.1007/s10964-019-01025-y

Farb, N. A. S., Anderson, A. K., Irving, J. A., & Segal, Z. V. (2014). Mindfulness interventions and emotion regulation. In *Handbook of emotion regulation, 2nd ed* (pp. 548–567). The Guilford Press.

Favazza, A. R. (1998). The Coming of Age of Self-Mutilation. *The Journal of Nervous and Mental Disease*, *186*(5), 259.

Fraser, G., Wilson, M. S., Garisch, J. A., Robinson, K., Brocklesby, M., Kingi, T., O'Connell, A., & Russell, L. (2018). Non-suicidal self-injury, sexuality concerns, and emotion regulation among sexually diverse adolescents: A multiple mediation analysis. *Archives of Suicide Research*, *22*(3), 432–452. https://doi.org/10.1080/13811118.2017.1358224

Gandhi, A., Luyckx, K., Baetens, I., Kiekens, G., Sleuwaegen, E., Berens, A., Maitra, S., & Claes, L. (2018). Age of onset of non-suicidal self-injury in Dutch-speaking adolescents and emerging adults: An event history analysis of pooled data. *Comprehensive Psychiatry*, *80*, 170–178. https://doi.org/10.1016/j.comppsych.2017.10.007

Gandhi, A., Luyckx, K., Goossens, L., Maitra, S., & Claes, L. (2018). Association between non-suicidal self-injury, parents and peers related loneliness, and attitude towards aloneness in Flemish adolescents: An empirical note. *Psychologica Belgica*, *58*(1).

Gaudreau, P. (2021). Separating the core definitional feature and the signature expressions of dispositional perfectionism: Implications for theory, research, and practice. *Personality and Individual Differences*, *181*, 110975. https://doi.org/10.1016/j.paid.2021.110975

George, C., Kaplan, N., & Main, M. (1985). Attachment interview for adults. *Unpublished Manuscript, University of California, Berkeley.*

Gholamrezaei, M., Heath, N., & Panaghi, L. (2017). Non-suicidal self-injury in a sample of university students in Tehran, Iran: Prevalence, characteristics and risk factors.

International Journal of Culture and Mental Health, *10*(2), 136–149. https://doi.org/10.1080/17542863.2016.1265999

Gholamrezaei, M., Stefano, J. D., & Heath, N. L. (2017). Nonsuicidal self-injury across cultures and ethnic and racial minorities: A review. *International Journal of Psychology*, *52*(4), 316–326. https://doi.org/10.1002/ijop.12230

Giletta, M., Scholte, R. H. J., Engels, R. C. M. E., Ciairano, S., & Prinstein, M. J. (2012). Adolescent non-suicidal self-injury: A cross-national study of community samples from Italy, the Netherlands and the United States. *Psychiatry Research*, *197*(1), 66–72. https://doi.org/10.1016/j.psychres.2012.02.009

Girme, Y. U., Jones, R. E., Fleck, C., Simpson, J. A., & Overall, N. C. (2021). Infants' attachment insecurity predicts attachment-relevant emotion regulation strategies in adulthood. *Emotion*, *21*(2), 260–272. https://doi.org/10.1037/emo0000721

Gratz, K. L. (2003). Risk Factors for and Functions of Deliberate Self-Harm: An Empirical and Conceptual Review. *Clinical Psychology: Science and Practice*, *10*(2), 192–205. https://doi.org/10.1093/clipsy.bpg022

Gratz, K. L., Conrad, S. D., & Roemer, L. (2002). Risk Factors for Deliberate Self-Harm Among College Students. *American Journal of Orthopsychiatry*, *72*(1), 128–140. https://doi.org/10.1037/0002-9432.72.1.128

Gratz, K. L., & Roemer, L. (2004). Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, *26*(1), 41–54. https://doi.org/10.1023/B:JOBA.0000007455.08539.94

Gratz, K. L., & Roemer, L. (2008). The relationship between emotion dysregulation and deliberate self-harm among female undergraduate students at an urban commuter university. *Cognitive Behaviour Therapy*, *37*(1), 14–25. https://doi.org/10.1080/16506070701819524

Greene, D., Hasking, P., & Boyes, M. (2021). A comparison of the associations between alexithymia and both non-suicidal self-injury and risky drinking: The roles of explicit outcome expectancies and refusal self-efficacy. *Stress and Health*, *37*(2), 272–284. https://doi.org/10.1002/smi.2991

Griep, S. K., & MacKinnon, D. F. (2020). Does Nonsuicidal Self-Injury Predict Later Suicidal Attempts? A Review of Studies. *Archives of Suicide Research*, *0*(0), 1–19. https://doi.org/10.1080/13811118.2020.1822244

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, *2*(3), 271–299. https://doi.org/10.1037/1089-2680.2.3.271

Gross, J. J. (2011). *Handbook of Emotion Regulation, First Edition*. Guilford Press.

Guérin-Marion, C., Martin, J., Deneault, A.-A., Lafontaine, M.-F., & Bureau, J.-F. (2018). The functions and addictive features of non-suicidal self-injury: A confirmatory factor analysis of the Ottawa Self-Injury Inventory in a community sample of young adults. *Psychiatry Research*, *264*, 316–321. https://doi.org/10.1016/j.psychres.2018.04.019

Guérin-Marion, C., Martin, J., Lafontaine, M.-F., & Bureau, J.-F. (2019). Invalidating Caregiving Environments, Specific Emotion Regulation Deficits, and Non-suicidal Self-injury. *Child Psychiatry & Human Development*. https://doi.org/10.1007/s10578-019-00908-2

Guerreiro, D. F., Cruz, D., Frasquilho, D., Santos, J. C., Figueira, M. L., & Sampaio, D. (2013). Association Between Deliberate Self-Harm and Coping in Adolescents: A Critical Review of the Last 10 Years' Literature. *Archives of Suicide Research*, *17*(2), 91–105. https://doi.org/10.1080/13811118.2013.776439

Hallab, L., & Covic, T. (2010). Deliberate Self-Harm: The Interplay Between Attachment and Stress. *Behaviour Change*, *27*(2), 93–103. https://doi.org/10.1375/bech.27.2.93

Hamza, C. A., Robinson, K., Hasking, P. A., Heath, N. L., Lewis, S. P., Lloyd-Richardson, E., Whitlock, J., & Wilson, M. S. (2021). Educational stakeholders' attitudes and knowledge about nonsuicidal self-injury among university students: A cross-national study. *Journal of American College Health*. https://www.tandfonline.com/doi/full/10.1080/07448481.2021.1961782

Hamza, C., & Willoughby, T. (2015). Nonsuicidal self-injury and affect regulation: Recent findings from experimental and ecological momentary assessment studies and future directions. *Journal of Clinical Psychology*, *71*(6), 561–574. https://doi.org/10.1002/jclp.22174

Haney, A. M. (2020). Nonsuicidal self-injury and religiosity: A meta-analytic investigation. *American Journal of Orthopsychiatry*, *90*(1), 78–89. https://doi.org/10.1037/ort0000395

Hasking, P., & Claes, L. (2020). Transdiagnostic mechanisms involved in nonsuicidal self-injury, risky drinking and disordered eating: Impulsivity, emotion regulation and alexithymia. *Journal of American College Health*, *68*(6), 603–609. https://doi.org/10.1080/07448481.2019.1583661

Hasking, P., Lewis, S. P., Bloom, E., Brausch, A., Kaess, M., & Robinson, K. (2021). Impact of the COVID-19 pandemic on students at elevated risk of self-injury: The importance of

virtual and online resources. *School Psychology International*, *42*(1), 57–78. https://doi.org/10.1177/0143034320974414

Hasking, P., Simplicio, M. D., McEvoy, P. M., & Rees, C. S. (2018). Emotional cascade theory and non-suicidal self-injury: The importance of imagery and positive affect. *Cognition and Emotion*, *32*(5), 941–952. https://doi.org/10.1080/02699931.2017.1368456

Hawton, K., Witt, K. G., Salisbury, T. L. T., Arensman, E., Gunnell, D., Hazell, P., Townsend, E., & van Heeringen, K. (2016). Psychosocial interventions following self-harm in adults: A systematic review and meta-analysis. *The Lancet Psychiatry*, *3*(8), 740–750. https://doi.org/10.1016/S2215-0366(16)30070-0

Heath, N. L., Baxter, A., Toste, J., & McLouth, R. (2010). Adolescents' Willingness to Access School-Based Support for Nonsuicidal Self-Injury. *Canadian Journal of School Psychology*, *25*, 260–276. https://doi.org/10.1177/0829573510377979

Heath, N. L., Schaub, K., Holly, S., & Nixon, M. K. (2009). Self-injury today: Review of population and clinical studies in adolescence. In M. K. Nixon & N. L. Heath (Eds.), *Self-injury in youth: The essential guide to assessment and intervention* (pp. 9–26). Routledge Press.

Heath, N. L., Toste, J. R., & Beettam, E. L. (2006). "I Am Not Well-Equipped": High School Teachers' Perceptions of Self-Injury. *Canadian Journal of School Psychology*, *21*(1–2), 73–92. https://doi.org/10.1177/0829573506298471

Heath, N. L., Toste, J. R., Sornberger, M. J., & Wagner, C. (2011). Teachers' Perceptions of Non-Suicidal Self-Injury in the Schools. *School Mental Health*, *1*(3), 35–43. https://doi.org/10.1007/s12310-010-9043-4

Hepp, J., Carpenter, R. W., Störkel, L. M., Schmitz, S. E., Schmahl, C., & Niedtfeld, I. (2020). A systematic review of daily life studies on non-suicidal self-injury based on the four-function model. *Clinical Psychology Review*, *82*, 101888. https://doi.org/10.1016/j.cpr.2020.101888

Hewitt, P. L., Flett, G. L., Turnbull-Donovan, W., & Mikail, S. F. (1991). The Multidimensional Perfectionism Scale: Reliability, validity, and psychometric properties in psychiatric samples. *Psychological Assessment*, *3*(3), 464–468. http://dx.doi.org/10.1037/1040-3590.3.3.464

Hoff, E. R., & Muehlenkamp, J. J. (2009). Nonsuicidal self-injury in college students: The role of perfectionism and rumination. *Suicide and Life-Threatening Behavior*, *39*(6), 576–587. https://doi.org/10.1521/suli.2009.39.6.576

Hurst, C. S., Baranik, L. E., & Daniel, F. (2013). College Student Stressors: A Review of the Qualitative Research. *Stress and Health*, *29*(4), 275–285. https://doi.org/10.1002/smi.2465

Inwood, E., & Ferrari, M. (2018). Mechanisms of Change in the Relationship between Self-Compassion, Emotion Regulation, and Mental Health: A Systematic Review. *Applied Psychology: Health and Well-Being*, *10*(2), 215–235. https://doi.org/10.1111/aphw.12127

Jenkins, A. L., & Schmitz, M. F. (2012). The Roles of Affect Dysregulation and Positive Affect in Non-Suicidal Self-Injury. *Archives of Suicide Research*, *16*(3), 212–225. https://doi.org/10.1080/13811118.2012.695270

Jiang, Y., You, J., Zheng, X., & Lin, M.-P. (2017). The qualities of attachment with significant others and self-compassion protect adolescents from non suicidal self-injury. *School Psychology Quarterly*, *32*(2), 143–155. https://doi.org/10.1037/spq0000187

John, O. P., & Gross, J. J. (2007). Individual Differences in Emotion Regulation. In J. J. Gross (Ed.), *Handbook of Emotion Regulation, First Edition* (pp. 351–372). Guilford Press.

Joiner, T. E., Ribeiro, J. D., & Silva, C. (2012). Nonsuicidal Self-Injury, Suicidal Behavior, and Their Co-occurrence as Viewed Through the Lens of the Interpersonal Theory of Suicide. *Current Directions in Psychological Science*, *21*(5), 342–347. https://doi.org/10.1177/0963721412454873

Kaess, M., Parzer, P., Mattern, M., Plener, P. L., Bifulco, A., Resch, F., & Brunner, R. (2013). Adverse childhood experiences and their impact on frequency, severity, and the individual function of nonsuicidal self-injury in youth. *Psychiatry Research*, *206*(2), 265–272. https://doi.org/10.1016/j.psychres.2012.10.012

Karyotaki, E., Cuijpers, P., Albor, Y., Alonso, J., Auerbach, R. P., Bantjes, J., Bruffaerts, R., Ebert, D. D., Hasking, P., Kiekens, G., Lee, S., McLafferty, M., Mak, A., Mortier, P., Sampson, N. A., Stein, D. J., Vilagut, G., & Kessler, R. C. (2020). *Sources of Stress and Their Associations With Mental Disorders Among College Students: Results of the World Health Organization World Mental Health Surveys International College Student Initiative*. https://opus4.kobv.de/opus4-fau/frontdoor/index/index/docId/14218

Kaynak, S., Sevgili Koçak, S., & Kaynak, Ü. (2021). Measuring adolescents' perceived parental academic pressure: A scale development study. *Current Psychology*. https://doi.org/10.1007/s12144-021-01347-w

Khoury, J. E., Pechtel, P., Andersen, C. M., Teicher, M. H., & Lyons-Ruth, K. (2019). Relations among maternal withdrawal in infancy, borderline features, suicidality/self-injury, and adult hippocampal volume: A 30-year longitudinal study. *Behavioural Brain Research*. https://doi.org/10.1016/j.bbr.2019.112139

Kiekens, G., Claes, L., Demyttenaere, K., Auerbach, R. P., Green, J. G., Kessler, R. C., Mortier, P., Nock, M. K., & Bruffaerts, R. (2016). Lifetime and 12-Month Nonsuicidal Self-Injury and Academic Performance in College Freshmen. *Suicide and Life-Threatening Behavior*, *46*(5), 563–576. https://doi.org/10.1111/sltb.12237

Kiekens, G., Hasking, P., Bruffaerts, R., Alonso, J., Auerbach, R. P., Bantjes, J., Benjet, C., Boyes, M., Chiu, W. T., Claes, L., Cuijpers, P., Ebert, D. D., Mak, A., Mortier, P., O'Neill, S., Sampson, N. A., Stein, D. J., Vilagut, G., Nock, M. K., & Kessler, R. C. (2021). Non-suicidal self-injury among first-year college students and its association with mental disorders: Results from the World Mental Health International College Student (WMH-ICS) initiative. *Psychological Medicine*, 1–12. https://doi.org/10.1017/S0033291721002245

Kiekens, G., Hasking, P., Bruffaerts, R., Claes, L., Baetens, I., Boyes, M., Mortier, P., Demyttenaere, K., & Whitlock, J. (2017). What Predicts Ongoing Nonsuicidal Self-Injury?: A Comparison Between Persistent and Ceased Self-Injury in Emerging Adults. *The Journal of Nervous and Mental Disease*, *205*(10), 762. https://doi.org/10.1097/NMD.0000000000000726

Kiekens, G., Hasking, P., Claes, L., Boyes, M. E., Mortier, P., Auerbach, R. P., Cuijpers, P., Demyttenaere, K., Green, J. G., Kessler, R. C., Myin-Germeys, I., Nock, M. K., & Bruffaerts, R. (2019). Predicting the incidence of non-suicidal self-injury in college students. *European Psychiatry*, *59*, 44–51. https://doi.org/10.1016/j.eurpsy.2019.04.002

Klonsky, E. D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review*, *27*(2), 226–239. https://doi.org/10.1016/j.cpr.2006.08.002

Klonsky, E. D. (2009). The functions of self-injury in young adults who cut themselves: Clarifying the evidence for affect-regulation. *Psychiatry Research*, *166*(2), 260–268. https://doi.org/10.1016/j.psychres.2008.02.008

Klonsky, E. D., Glenn, C. R., Styer, D. M., Olino, T. M., & Washburn, J. J. (2015). The functions of nonsuicidal self-injury: Converging evidence for a two-factor structure. *Child and Adolescent Psychiatry and Mental Health*, *9*(1), 44. https://doi.org/10.1186/s13034-015-0073-4

Klonsky, E. D., May, A. M., & Glenn, C. R. (2013). The relationship between nonsuicidal self-injury and attempted suicide: Converging evidence from four samples. *Journal of Abnormal Psychology*, *122*(1), 231–237. https://doi.org/10.1037/a0030278

Klonsky, E. D., & Olino, T. (2008). Identifying clinically distinct subgroups of self-injurers among young adults: A latent class analysis. *Journal of Consulting and Clinical Psychology*, *76*(1), 22–27. https://doi.org/10.1037/0022-006X.76.1.22

Klonsky, E. D., Victor, S. E., & Saffer, B. Y. (2014). Nonsuicidal Self-Injury: What We Know, and What We Need to Know. *The Canadian Journal of Psychiatry*, *59*(11), 565–568. https://doi.org/10.1177/070674371405901101

Kobak, R. R., Cole, H. E., Ferenz-Gillies, R., Fleming, W. S., & Gamble, W. (1993). Attachment and emotion regulation during mother-teen problem solving: A control theory analysis. *Child Development*, *64*(1), 231–245. https://doi.org/10.2307/1131448

Koenig, J., Rinnewitz, L., Niederbäumer, M., Strozyk, T., Parzer, P., Resch, F., & Kaess, M. (2017). Longitudinal development of pain sensitivity in adolescent non-suicidal self-injury. *Journal of Psychiatric Research*, *89*, 81–84. https://doi.org/10.1016/j.jpsychires.2017.02.001

Lamb, M. (2010). How do fathers influence children's development? Let me count the ways. In *The role of the father in child development* (5th ed., pp. 1–26). Wiley.

Lewis, S. P., & Mehrabkhani, S. (2016). Every scar tells a story: Insight into people's self-injury scar experiences. *Counselling Psychology Quarterly, 29*(3), 296–310. https://doi.org/10.1080/09515070.2015.1088431

Li, Y., Zhao, J., Ma, Z., McReynolds, L. S., Lin, D., Chen, Z., Wang, T., Wang, D., Zhang, Y., Zhang, J., Fan, F., & Liu, X. (2021). Mental Health Among College Students During the COVID-19 Pandemic in China: A 2-Wave Longitudinal Survey. *Journal of Affective Disorders*, *281*, 597–604. https://doi.org/10.1016/j.jad.2020.11.109

Limburg, K., Watson, H. J., Hagger, M. S., & Egan, S. J. (2017). The relationship between perfectionism and psychopathology: A meta-analysis. *Journal of Clinical Psychology*, *73*(10), 1301–1326. https://doi.org/10.1002/jclp.22435

Lindell, A. K., Killoren, S. E., & Campione-Barr, N. (2020). Parent-child relationship quality and emotional adjustment among college students: The role of parental financial support. *Journal of Social and Personal Relationships*, 0265407520964870. https://doi.org/10.1177/0265407520964870

Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. Guilford Press.

Liu, H., Wang, W., Yang, J., Guo, F., & Yin, Z. (2021). The effects of alexithymia, experiential avoidance, and childhood sexual abuse on non-suicidal self-injury and suicidal ideation among Chinese college students with a history of childhood sexual abuse. *Journal of Affective Disorders*, *282*, 272–279. https://doi.org/10.1016/j.jad.2020.12.181

Liu, R. T. (2021). The epidemiology of non-suicidal self-injury: Lifetime prevalence, sociodemographic and clinical correlates, and treatment use in a nationally representative sample of adults in England. *Psychological Medicine*, 1–9. https://doi.org/10.1017/S003329172100146X

Liu, R. T., Scopelliti, K. M., Pittman, S. K., & Zamora, A. S. (2018). Childhood maltreatment and non-suicidal self-injury: A systematic review and meta-analysis. *The Lancet. Psychiatry*, *5*(1), 51–64. https://doi.org/10.1016/S2215-0366(17)30469-8

Liu, R. T., Sheehan, A. E., Walsh, R. F. L., Sanzari, C. M., Cheek, S. M., & Hernandez, E. M. (2019). Prevalence and correlates of non-suicidal self-injury among lesbian, gay, bisexual, and transgender individuals: A systematic review and meta-analysis. *Clinical Psychology Review*, *74*, 101783. https://doi.org/10.1016/j.cpr.2019.101783

Lloyd, B., Blazely, A., & Phillips, L. (2018). Stigma towards individuals who self harm: Impact of gender and disclosure. *Journal of Public Mental Health*, *17*(4), 184–194. https://doi.org/10.1108/JPMH-02-2018-0016

Lloyd-Richardson, E. E., Perrine, N., Dierker, L., & Kelley, M. L. (2007). Characteristics and functions of non-suicidal self-injury in a community sample of adolescents. *Psychological Medicine*, *37*(8), 1183–1192. https://doi.org/10.1017/S003329170700027X

Lowe, K., & Dotterer, A. M. (2018). Parental Involvement During the College Transition: A Review and Suggestion for its Conceptual Definition. *Adolescent Research Review*, *3*(1), 29–42. https://doi.org/10.1007/s40894-017-0058-z

Lyons-Ruth, K., Bureau, J.-F., Easterbrooks, M. A., Obsuth, I., Hennighausen, K., & Vulliez-Coady, L. (2013). Parsing the construct of maternal insensitivity: Distinct longitudinal

pathways associated with early maternal withdrawal. *Attachment & Human Development*, *15*(5–6), 562–582. https://doi.org/10.1080/14616734.2013.841051

Lyons-Ruth, K., Bureau, J.-F., Holmes, B., Easterbrooks, A., & Brooks, N. H. (2013). Borderline symptoms and suicidality/self-injury in late adolescence: Prospectively observed relationship correlates in infancy and childhood. *Psychiatry Research*, *206*(2–3), 273–281. https://doi.org/10.1016/j.psychres.2012.09.030

Martin, J., Bureau, J.-F., Lafontaine, M.-F., Cloutier, P., Hsiao, C., Pallanca, D., & Meinz, P. (2017). Preoccupied but not dismissing attachment states of mind are associated with nonsuicidal self-injury. *Development and Psychopathology*, *29*(2), 379–388. https://doi.org/10.1017/S0954579417000050

Martin, J., Bureau, J.-F., Yurkowski, K., Fournier, T. R., Lafontaine, M.-F., & Cloutier, P. (2016). Family-based risk factors for non-suicidal self-injury: Considering influences of maltreatment, adverse family-life experiences, and parent–child relational risk. *Journal of Adolescence*, *49*(Supplement C), 170–180. https://doi.org/10.1016/j.adolescence.2016.03.015

Martin, J., Bureau, J.-F., Yurkowski, K., Lafontaine, M.-F., & Cloutier, P. (2016). Heterogeneity of relational backgrounds is associated with variation in non-suicidal self-injurious behavior. *Journal of Abnormal Child Psychology*, *44*(3), 511–522. https://doi.org/10.1007/s10802-015-0048-1

Martin, J., Cloutier, P., Levesque, C., Bureau, J.-F., Lafontaine, M.-F., & Nixon, M. K. (2013). Psychometric properties of the functions and addictive features scales of the Ottawa Self-Injury Inventory: A preliminary investigation using a university sample. *Psychological Assessment*, *25*(3), 1013–1018. https://doi.org/10.1037/a0032575

Martin, J., Raby, K. L., Labella, M. H., & Roisman, G. I. (2017). Childhood abuse and neglect, attachment states of mind, and non-suicidal self-injury. *Attachment & Human Development*, *19*(5), 425–446. https://doi.org/10.1080/14616734.2017.1330832

Mattanah, J. F., Lopez, F. G., & Govern, J. M. (2011). The contributions of parental attachment bonds to college student development and adjustment: A meta-analytic review. *Journal of Counseling Psychology*, *58*(4), 565–596. https://doi.org/10.1037/a0024635

Mayo, L. M., Perini, I., Gustafsson, P. A., Hamilton, J. P., Kämpe, R., Heilig, M., & Zetterqvist, M. (2021). Psychophysiological and Neural Support for Enhanced Emotional Reactivity in Female Adolescents With Nonsuicidal Self-injury. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, *6*(7), 682–691. https://doi.org/10.1016/j.bpsc.2020.11.004

McKenzie, K. C., & Gross, J. J. (2014). Nonsuicidal self-injury: An emotion regulation perspective. *Psychopathology*, *47*(4), 207–219. https://doi.org/10.1159/000358097

McKinney, C., & Renk, K. (2008). Differential Parenting Between Mothers and Fathers: Implications for Late Adolescents. *Journal of Family Issues*, *29*(6), 806–827. https://doi.org/10.1177/0192513X07311222

Midkiff, M. F., Lindsey, C. R., & Meadows, E. A. (2018). The role of coping self-efficacy in emotion regulation and frequency of NSSI in young adult college students. *Cogent Psychology*, *5*(1), 1520437. https://doi.org/10.1080/23311908.2018.1520437

Mikulincer, M., & Shaver, P. R. (2007). *Attachment in Adulthood: Structure, Dynamics, and Change*. Guilford Press.

Miller, A. B., Linthicum, K. P., Helms, S. W., Giletta, M., Rudolph, K. D., Hastings, P. D., Nock, M. K., & Prinstein, M. J. (2018). Reciprocal Associations Between Adolescent

Girls' Chronic Interpersonal Stress and Nonsuicidal Self-Injury: A Multi-wave Prospective Investigation. *Journal of Adolescent Health*, *63*(6), 694–700. https://doi.org/10.1016/j.jadohealth.2018.06.033

Muehlenkamp, J. J., Claes, L., Havertape, L., & Plener, P. (2012). International prevalence of adolescent non-suicidal self-injury and deliberate self-harm. *Child and Adolescent Psychiatry and Mental Health*, *6*(10). https://doi.org/10.1186/1753-2000-6-10

Neacsiu, A. D., Bohus, M., & Linehan, M. M. (2014). Dialectical behavior therapy: An intervention for emotion dysregulation. In *Handbook of emotion regulation, 2nd ed* (pp. 491–507). The Guilford Press.

Nicolai, K. A., Wielgus, M. D., & Mezulis, A. (2016). Identifying risk for self-harm: Rumination and negative affectivity in the prospective prediction of nonsuicidal self-injury. *Suicide and Life-Threatening Behavior*, *46*(2), 223–233. https://doi.org/10.1111/sltb.12186

Nock, M. K. (2008). Actions speak louder than words: An elaborated theoretical model of the social functions of self-injury and other harmful behaviors. *Applied and Preventive Psychology*, *12*(4), 159–168. https://doi.org/10.1016/j.appsy.2008.05.002

Nock, M. K. (2009). Why Do People Hurt Themselves?: New Insights Into the Nature and Functions of Self-Injury. *Current Directions in Psychological Science*, *18*(2), 78–83. https://doi.org/10.1111/j.1467-8721.2009.01613.x

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

Nock, M. K., & Favazza, A. R. (2009). Nonsuicidal self-injury: Definition and classification. In M. K. Nock (Ed.), *Understanding non-suicidal self-injury: Origins, assessment and treatment* (pp. 9–18). American Psychological Association.

Nock, M. K., & Prinstein, M. J. (2004). A Functional Approach to the Assessment of Self-Mutilative Behavior. *Journal of Consulting and Clinical Psychology, 72*(5), 885–890. https://doi.org/10.1037/0022-006X.72.5.885

Nock, M. K., & Prinstein, M. J. (2005). Contextual Features and Behavioral Functions of Self-Mutilation Among Adolescents. *Journal of Abnormal Psychology*, *114*(1), 140–146. https://doi.org/10.1037/0021-843X.114.1.140

Nock, M. K., Wedig, M. M., Holmberg, E. B., & Hooley, J. M. (2008). The Emotion Reactivity Scale: Development, Evaluation, and Relation to Self-Injurious Thoughts and Behaviors. *Behavior Therapy*, *39*(2), 107–116. https://doi.org/10.1016/j.beth.2007.05.005

O'Connor, R. C., Rasmussen, S., & Hawton, K. (2010). Predicting depression, anxiety and self-harm in adolescents: The role of perfectionism and acute life stress. *Behaviour Research and Therapy*, *48*(1), 52–59. https://doi.org/10.1016/j.brat.2009.09.008

Offer, D., & Barglow, P. (1960). Adolescent and Young Adult Self-Mutilation Incidents in a General Psychiatric Hospital. *Archives of General Psychiatry*, *3*(2), 194–204. https://doi.org/10.1001/archpsyc.1960.01710020078010

Osenk, I., Williamson, P., & Wade, T. D. (2020). Does perfectionism or pursuit of excellence contribute to successful learning? A meta-analytic review. *Psychological Assessment*, *32*(10), 972–983. https://doi.org/10.1037/pas0000942

Paivio, S. C., & McCulloch, C. R. (2004). Alexithymia as a mediator between childhood trauma and self-injurious behaviors. *Child Abuse & Neglect*, *28*(3), 339–354. https://doi.org/10.1016/j.chiabu.2003.11.018

Pallini, S., Terrinoni, A., Iannello, S., Cerutti, R., Ferrara, M., Fantini, F., & Laghi, F. (2020). Attachment-Related Representations and Suicidal Ideations in Nonsuicidal Self-Injury

Adolescents with and without Suicide Attempts: A Pilot Study. *Suicide and Life-Threatening Behavior, Early view*. https://doi.org/10.1111/sltb.12633

Pearson, R. M., Campbell, A., Howard, L. M., Bornstein, M. H., O'Mahen, H., Mars, B., & Moran, P. (2018). Impact of dysfunctional maternal personality traits on risk of offspring depression, anxiety and self-harm at age 18 years: A population-based longitudinal study. *Psychological Medicine, 48*(1), 50–60. https://doi.org/10.1017/S0033291717001246

Peel-Wainwright, K.-M., Hartley, S., Boland, A., Rocca, E., Langer, S., & Taylor, P. J. (2021). The interpersonal processes of non-suicidal self-injury: A systematic review and meta-synthesis. *Psychology and Psychotherapy: Theory, Research and Practice, n/a*(n/a). https://doi.org/10.1111/papt.12352

Peleg, O., Deutch, C., & Dan, O. (2016). Test anxiety among female college students and its relation to perceived parental academic expectations and differentiation of self. *Learning and Individual Differences, 49*, 428–436. https://doi.org/10.1016/j.lindif.2016.06.010

Perez, S., Lorca, F., & Marco, J. H. (2020). "Dissociation, posttraumatic stress symptoms, emotional dysregulation, and invalidating environments as correlates of NSSI in borderline personality disorder patients." *Journal of Trauma & Dissociation, 21*(5), 520–535. https://doi.org/10.1080/15299732.2020.1719262

Perini, I., Zetterqvist, M., & Mayo, L. M. (2021). Beyond distress: A role for positive affect in nonsuicidal self-injury. *Current Opinion in Behavioral Sciences, 39*, 209–215. https://doi.org/10.1016/j.cobeha.2021.04.012

Peterson, A. L., Chen, J. I., Karver, M. S., & Labouliere, C. D. (2019). Frustration with feeling: Latent classes of non-suicidal self-injury and emotion regulation difficulties. *Psychiatry Research, 275*, 61–70. https://doi.org/10.1016/j.psychres.2019.03.014

Pizzolato, J. E., & Hicklen, S. (2011). Parent Involvement: Investigating the Parent-Child Relationship in Millennial College Students. *Journal of College Student Development, 52*(6), 671–686. https://doi.org/10.1353/csd.2011.0081

Plener, P. L., Libal, G., Keller, F., Fegert, J. M., & Muehlenkamp, J. J. (2009). An international comparison of adolescent non-suicidal self-injury (NSSI) and suicide attempts: Germany and the USA. *Psychological Medicine, 39*(9), 1549–1558. https://doi.org/10.1017/S0033291708005114

Plener, P. L., Schumacher, T. S., Munz, L. M., & Groschwitz, R. C. (2015). The longitudinal course of non-suicidal self-injury and deliberate self-harm: A systematic review of the literature. *Borderline Personality Disorder and Emotion Dysregulation*, *2*(1), 2. https://doi.org/10.1186/s40479-014-0024-3

Purington, A., & Whitlock, J. (2010). Non-Suicidal Self-Injury In the Media. *The Prevention Researcher*, *17*(1), 11–13.

Ribeiro, J. D., Franklin, J. C., Fox, K. R., Bentley, K. H., Kleiman, E. M., Chang, B. P., & Nock, M. K. (2016). Self-injurious thoughts and behaviors as risk factors for future suicide ideation, attempts, and death: A meta-analysis of longitudinal studies. *Psychological Medicine*, *46*(2), 225–236. https://doi.org/10.1017/S0033291715001804

Riley, E. N., Combs, J. L., Jordan, C. E., & Smith, G. T. (2015). Negative Urgency and Lack of Perseverance: Identification of Differential Pathways of Onset and Maintenance Risk in the Longitudinal Prediction of Nonsuicidal Self-Injury. *Behavior Therapy*, *46*(4), 439–448. https://doi.org/10.1016/j.beth.2015.03.002

Rodríguez-Blanco, L., Carballo, J. J., & Baca-García, E. (2018). Use of Ecological Momentary Assessment (EMA) in Non-Suicidal Self-Injury (NSSI): A systematic review. *Psychiatry Research*, *263*, 212–219. https://doi.org/10.1016/j.psychres.2018.02.051

Rogers, A. A., Updegraff, K. A., Iida, M., Link to external site, this link will open in a new window, Dishion, T. J., Doane, L. D., Link to external site, this link will open in a new window, Corbin, W. C., Van Lenten, S. A., Ha, T., & Link to external site, this link will open in a new window. (2018). Trajectories of positive and negative affect across the transition to college: The role of daily interactions with parents and friends. *Developmental Psychology*, *54*(11), 2181–2192. http://dx.doi.org/10.1037/dev0000598

Roksa, J., Deutschlander, D., & Whitley, S. E. (2021). Parental Validation, College Experiences, and Institutional Commitment of First-Generation and Low-Income Students. *Journal of Student Affairs Research and Practice*, *58*(3), 295–309. https://doi.org/10.1080/19496591.2019.1699105

Rosenthal, R. J., Rinzler, C., Wallsh, R., & Klausner, E. (1972). Wrist-Cutting Syndrome: The Meaning of a Gesture. *American Journal of Psychiatry*, *128*(11), 1363–1368. https://doi.org/10.1176/ajp.128.11.1363

Ross, S., & Heath, N. L. (2002). A Study of the Frequency of Self-Mutilation in a Community Sample of Adolescents. *Journal of Youth and Adolescence*, *31*(1), 67–77. https://doi.org/10.1023/A:1014089117419

Santangelo, P. S., Koenig, J., Funke, V., Parzer, P., Resch, F., Ebner-Priemer, U. W., & Kaess, M. (2017). Ecological Momentary Assessment of Affective and Interpersonal Instability in Adolescent Non-Suicidal Self-Injury. *Journal of Abnormal Child Psychology*, *45*(7), 1429–1438. https://doi.org/10.1007/s10802-016-0249-2

Schade, L. C. (2013). Non-suicidal Self-Injury (NSSI): A Case for Using Emotionally Focused Family Therapy. *Contemporary Family Therapy*, *35*(3), 568–582. https://doi.org/10.1007/s10591-013-9236-8

Selby, E. A., & Joiner, T. E. (2009). Cascades of Emotion: The Emergence of Borderline Personality Disorder from Emotional and Behavioral Dysregulation. *Review of General Psychology: Journal of Division 1, of the American Psychological Association*, *13*(3), 219. https://doi.org/10.1037/a0015687

Serafini, G., Canepa, G., Adavastro, G., Nebbia, J., Belvederi Murri, M., Erbuto, D., Pocai, B., Fiorillo, A., Pompili, M., Flouri, E., & Amore, M. (2017). The relationship between childhood maltreatment and non-suicidal self-injury: A systematic review. *Frontiers in Psychiatry*, *8*. https://doi.org/10.3389/fpsyt.2017.00149

Shaver, P. R., & Mikulincer, M. (2007). Adult attachment strategies and the regulation of emotion. In J. J. Gross (Ed.), *The handbook of emotion regulation* (pp. 446–465). Guilford Press.

Silva, E., Machado, B. C., Moreira, C. S., Ramalho, S., & Goncalves, S. (2017). Romantic relationships and nonsuicidal self-injury among college students: The mediating role of emotion regulation. *Journal of Applied Developmental Psychology*, 36–44. https://doi.org/10.1016/j.appdev.2017.04.001

Sim, L., Adrian, M., Zeman, J., Cassano, M., & Friedrich, W. N. (2009). Adolescent deliberate self-harm: Linkages to emotion regulation and family emotional climate. *Journal of Research on Adolescence*, *19*(1), 75–91. https://doi.org/10.1111/j.1532-7795.2009.00582.x

Simone, A. C., & Hamza, C. A. (2020). Examining the disclosure of nonsuicidal self-injury to informal and formal sources: A review of the literature. *Clinical Psychology Review*, *82*, 101907. https://doi.org/10.1016/j.cpr.2020.101907

Sornberger, M. J., Heath, N. L., Toste, J. R., & McLouth, R. (2012). Nonsuicidal Self-Injury and Gender: Patterns of Prevalence, Methods, and Locations among Adolescents. *Suicide and Life-Threatening Behavior*, *42*(3), 266–278. https://doi.org/10.1111/j.1943-278X.2012.0088.x

Swannell, S., Martin, G., Page, A., Hasking, P., & St John, N. J. (2014). Prevalence of nonsuicidal self-injury in nonclinical samples: Systematic review, meta-analysis and meta-regression. *Suicide and Life-Threatening Behavior*, *44*(3), 273–303. https://doi.org/10.1111/sltb.12070

Taliaferro, L. A., Jang, S. T., Westers, N. J., Muehlenkamp, J. J., Whitlock, J. L., & McMorris, B. J. (2020). Associations between connections to parents and friends and non-suicidal self-injury among adolescents: The mediating role of developmental assets. *Clinical Child Psychology and Psychiatry*, *25*(2), 359–371. https://doi.org/10.1177/1359104519868493

Taliaferro, L. A., & Muehlenkamp, J. J. (2015). Risk Factors Associated With Self-injurious Behavior Among a National Sample of Undergraduate College Students. *Journal of American College Health*, *63*(1), 40–48. https://doi.org/10.1080/07448481.2014.953166

Tao, Y., Bi, X.-Y., & Deng, M. (2020). The Impact of Parent–Child Attachment on Self-Injury Behavior: Negative Emotion and Emotional Coping Style as Serial Mediators. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.01477

Tatnell, R., Hasking, P., Lipp, O. V., Boyes, M., & Dawkins, J. (2018). Emotional responding in NSSI: Examinations of appraisals of positive and negative emotional stimuli, with and without acute stress. *Cognition and Emotion*, *32*(6), 1304–1316. https://doi.org/10.1080/02699931.2017.1411785

Tatnell, R., Hasking, P., & Newman, L. (2017). Multiple mediation modelling exploring relationships between specific aspects of attachment, emotion regulation, and non-suicidal self-injury. *Australian Journal of Psychology*, 1–9. https://doi.org/10.1111/ajpy.12166

Tatnell, R., Hasking, P., Newman, L., Taffe, J., & Martin, G. (2017). Attachment, Emotion Regulation, Childhood Abuse and Assault: Examining Predictors of NSSI Among Adolescents. *Archives of Suicide Research*, *21*(4), 610–620. https://doi.org/10.1080/13811118.2016.1246267

Taylor, P. J., Jomar, K., Dhingra, K., Forrester, R., Shahmalak, U., & Dickson, J. M. (2018). A meta-analysis of the prevalence of different functions of non-suicidal self-injury. *Journal of Affective Disorders*, *227*, 759–769. https://doi.org/10.1016/j.jad.2017.11.073

Thomassin, K., Guérin Marion, C., Venasse, M., & Shaffer, A. (2017). Specific coping strategies moderate the link between emotion expression deficits and nonsuicidal self-injury in an inpatient sample of adolescents. *Child and Adolescent Psychiatry and Mental Health*, *11*, 21. https://doi.org/10.1186/s13034-017-0158-3

Thomassin, K., Quint, E., Sezlik, S., & Shaffer, A. (2017). Profiles of emotion deficits and adolescent nonsuicidal self-injury in an inpatient sample. *Journal of Research on Adolescence*, 1–13. https://doi.org/10.1111/jora.12312

Thomassin, K., Shaffer, A., Madden, A., & Londino, D. L. (2016). Specificity of childhood maltreatment and emotion deficit in nonsuicidal self-injury in an inpatient sample of youth. *Psychiatry Research*, *244*, 103–108. https://doi.org/10.1016/j.psychres.2016.07.050

Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*, *59*(2/3), 25–52. https://doi.org/10.2307/1166137

Thomson, P., & Jaque, S. V. (2017). Adverse childhood experiences (ACE) and adult attachment interview (AAI) in a non-clinical population. *Child Abuse & Neglect*, *70*, 255–263. https://doi.org/10.1016/j.chiabu.2017.06.001

Victor, S. E., Hipwell, A. E., Stepp, S. D., & Scott, L. N. (2019). Parent and peer relationships as longitudinal predictors of adolescent non-suicidal self-injury onset. *Child and Adolescent Psychiatry and Mental Health*, *13*(1), 1. https://doi.org/10.1186/s13034-018-0261-0

Victor, S. E., & Klonsky, E. D. (2014). Daily Emotion in Non-Suicidal Self-Injury. *Journal of Clinical Psychology*, *70*(4), 364–375. https://doi.org/10.1002/jclp.22037

Victor, S. E., Muehlenkamp, J. J., Hayes, N. A., Lengel, G. J., Styer, D. M., & Washburn, J. J. (2018). Characterizing gender differences in nonsuicidal self-injury: Evidence from a large clinical sample of adolescents and adults. *Comprehensive Psychiatry*, *82*, 53–60. https://doi.org/10.1016/j.comppsych.2018.01.009

Vieira, A. I., Moreira, C. S., Rodrigues, T. F., Brandao, I., Timoteo, S., Nunes, P., & Goncalves, S. (2021). Nonsuicidal self-injury, difficulties in emotion regulation, negative urgency, and childhood invalidation: A study with outpatients with eating disorders. *Journal of Clinical Psychology*, *77*(3), 607–628. https://doi.org/10.1002/jclp.23038

Wallace, G. T., Henry, K. L., Barrett, K. C., & Conner, B. T. (2021). Personality and emotion dysregulation profiles predict differential engagement in a wide range of health-risk behaviors. *Journal of American College Health*, *0*(0), 1–13. https://doi.org/10.1080/07448481.2021.1947302

Walsh, B. W., & Rosen, P. M. (1988). *Self-mutilation: Theory, research, and treatment*. Guilford Press.

Wang, B., You, J., Lin, M.-P., Xu, S., & Leung, F. (2017). Developmental Trajectories of Nonsuicidal Self-Injury in Adolescence and Intrapersonal/Interpersonal Risk Factors. *Journal of Research on Adolescence*, *27*(2), 392–406. https://doi.org/10.1111/jora.12273

Wang, Y., & Qin, Y. (2016). Family invalidation and self-injury in adolescents: A moderate mediation model. [Chinese]. *Chinese Journal of Clinical Psychology*, *24*(4), 734–737.

West, M., Rose, S., Spreng, S., & Adam, K. (2000). The Adolescent Unresolved Attachment Questionnaire: The assessment of perceptions of parental abdication of caregiving behavior. *The Journal of Genetic Psychology*, *161*(4), 493–503. https://doi.org/10.1080/00221320009596727

Whitlock, J., Eckenrode, J., & Silverman, D. (2006). Self-injurious Behaviors in a College Population. *Pediatrics*, *117*(6), 1939–1948. https://doi.org/10.1542/peds.2005-2543

Whitlock, J., Eells, G., Cummings, N., & Purington, A. (2009). Nonsuicidal Self-Injury in College Populations: Mental Health Provider Assessment of Prevalence and Need. *Journal of College Student Psychotherapy*, *23*(3), 172–183. https://doi.org/10.1080/87568220902794366

Whitlock, J., Exner-Cortens, D., & Purington, A. (2014). Assessment of nonsuicidal self-injury: Development and initial validation of the Non-Suicidal Self-Injury–Assessment Tool

(NSSI-AT). *Psychological Assessment*, *26*(3), 935–946. https://doi.org/10.1037/a0036611

Whitlock, J., Prussien, K., & Pietrusza, C. (2015). Predictors of self-injury cessation and subsequent psychological growth: Results of a probability sample survey of students in eight universities and colleges. *Child and Adolescent Psychiatry and Mental Health*, *9*(1), 19. https://doi.org/10.1186/s13034-015-0048-5

Whitlock, J., Purington, A., Eckenrode, J., Barreira, P., Baral Abrams, G., PhD, T. M., PhD, V. K., MD, K. G., PhD, C. C., & PhD, K. K. (2011). Nonsuicidal Self-injury in a College Population: General Trends and Sex Differences. *Journal of American College Health*, *59*(8), 691–698. https://doi.org/10.1080/07448481.2010.529626

Wolff, J. C., Thompson, E., Thomas, S. A., Nesi, J., Bettis, A. H., Ransford, B., Scopelliti, K., Frazier, E. A., & Liu, R. T. (2019). Emotion dysregulation and non-suicidal self-injury: A systematic review and meta-analysis. *European Psychiatry*, *59*, 25–36. https://doi.org/10.1016/j.eurpsy.2019.03.004

Woo, J., Wrath, A. J., & Adams, G. C. (2020). The Relationship Between Attachment and Self-Injurious Behaviors in the Child and Adolescent Population: A Systematic Review of the Literature. *Archives of Suicide Research*, *0*(0), 1–22. https://doi.org/10.1080/13811118.2020.1804024

Xiao, H., Carney, D. M., Youn, S. J., Link to external site, this link will open in a new window, Janis, R. A., Castonguay, L. G., Hayes, J. A., & Locke, B. D. (2017). Are we in crisis? National mental health and treatment trends in college counseling centers. *Psychological Services*, *14*(4), 407–415. http://dx.doi.org/10.1037/ser0000130

Xie, Y., Kong, Y., Yang, J., & Chen, F. (2019). Perfectionism, worry, rumination, and distress: A meta-analysis of the evidence for the perfectionism cognition theory. *Personality and Individual Differences*, *139*, 301–312. https://doi.org/10.1016/j.paid.2018.11.028

Yates, T. M. (2004). The developmental psychopathology of self-injurious behavior: Compensatory regulation in posttraumatic adaptation. *Clinical Psychology Review*, *24*(1), 35–74. https://doi.org/10.1016/j.cpr.2003.10.001

Yates, T. M., Tracy, A. J., & Luthar, S. S. (2008). Nonsuicidal self-injury among "privileged" youths: Longitudinal and cross-sectional approaches to developmental process. *Journal of Consulting and Clinical Psychology*, *76*(1), 52–62. https://doi.org/10.1037/0022-006X.76.1.52

You, J., Jiang, Y., Zhang, M., Du, C., Lin, M.-P., & Leung, F. (2017). Perceived Parental Control, Self-Criticism, and Nonsuicidal Self-Injury Among Adolescents: Testing the Reciprocal Relationships by a Three-Wave Cross-Lag Model. *Archives of Suicide Research*, *21*(3), 379–391. https://doi.org/10.1080/13811118.2016.1199989

You, J., Ren, Y., Zhang, X., Wu, Z., Xu, S., & Lin2, M.-P. (2018). *Emotional Dysregulation and Nonsuicidal Self-Injury: A Meta-Analytic Review*. *8*(2), 733–748. https://doi.org/10.4172/Neuropsychiatry.1000399

Yurkowski, K., Martin, J., Levesque, C., Bureau, J.-F., Lafontaine, M.-F., & Cloutier, P. (2015). Emotion dysregulation mediates the influence of relationship difficulties on non-suicidal self-injury behavior in young adults. *Psychiatry Research*, *228*(3), 871–878. https://doi.org/10.1016/j.psychres.2015.05.006

Zetterqvist, M., Jonsson, L. S., Landberg, Å., & Svedin, C. G. (2021). A potential increase in adolescent nonsuicidal self-injury during covid-19: A comparison of data from three

different time points during 2011 – 2021. *Psychiatry Research*, *305*, 114208. https://doi.org/10.1016/j.psychres.2021.114208

Zetterqvist, M., Lundh, L.-G., Dahlström, Ö., & Svedin, C. (2013). Prevalence and function of non-suicidal self-injury (NSSI) in a community sample of adolescents, using suggested DSM-5 criteria for a potential NSSI disorder. *Journal of Abnormal Child Psychology*, *41*(5), 759–773. https://doi.org/10.1007/s10802-013-9712-5

Appendix A. Supplemental Materials

1. How do perceived control and pressure interact with academic stress to predict non-suicidal self-injury and psychological well-being?

Brief abstract: This study concerns young adults and entails the completion of an online questionnaire.

Description: This study will contribute to our knowledge of the influences of parental, peers, and intimate relationships in predicting different maladaptive coping strategies such self-injurious behaviors in university students. Your participation entails that you complete a questionnaire package which covers different topics such as your perception of your relationship with your parents, peers and romantic partner, your academic experience, your emotion regulation skills, your perfectionism, your past and/or current self-injuring behaviours, your psychological adjustment, and your satisfaction with life. Completing the questionnaire should take between 60 and 90 minutes. To compensate you for your time, you will be given 1 point applicable to your course grade.

Eligibility requirements: Participants MUST (a) be aged between 17 and 25 years; and (b) speak English.

Dear Participant,

Thank you for choosing to participate in our research. This project is being conducted by Dr. Jean-François Bureau, Dr. Marie-France Lafontaine, and Dr. Patrick Gaudreau at the University of Ottawa, and has been approved by the University of Ottawa Research Ethics Board.

Your participation will contribute to our knowledge of the influences of parental, peers, and intimate relationships in predicting different maladaptive coping strategies such self-injurious behaviors in university students.

Participation in the study will include the completion of these online questionnaires. Topics addressed by the questionnaires include your background information, your perception of victimization and maltreatment by parents, peers and romantic partner, your perception of control and pressures from parents, peers and romantic partner, your academic experience, your emotion regulation skills, your perfectionism, your past and/or current self-injuring behaviors, your psychological as well as couple adjustment, your satisfaction with life, and your romantic attachment. It is important that these questionnaires express only your opinion; please respond independently, without assistance from others.

Completion of the questionnaires will take approximately one and a half hour. Note that you do not have to answer some questionnaires if you are not currently in a romantic relationship. When responding to the questions it is important to answer as honestly and accurately as possible. We also encourage you to not leave items unanswered; instead we ask that you select the response that most closely describes your thoughts and feelings about the particular question. However, you are not required to answer any items with which you are uncomfortable. Your participation in this research is entirely voluntary, and you are free to withdraw from answering the questionnaires at any time during completion. Once your responses to all questionnaires have been submitted, you will be unable to withdraw from the study, as your responses are anonymous.

Responses on all questionnaires will be kept both confidential and anonymous.

As compensation for your time, you will be awarded two credits toward your final course grade after completion of the online questionnaires (PSY 1101 and PSY 1501).

Should any questions or concerns regarding the study arise, please feel free to contact us at the emails and/or phone numbers listed below. **Should you wish to obtain assistance regarding any issues addressed in the questionnaires you may contact the Ottawa Distress Center (613-238-3311) or the Centre for Psychological Services at the University of Ottawa (613-562-5289). You may also refer to** www.ementalhealth.ca **for a comprehensive list of mental health resources available in the Ottawa region.** For any further information regarding your rights as a research participant please contact the Protocol Officer for Ethics in Research, 550 Cumberland Street, Room 160, (613) 562-5841 or ethics@uottawa.ca.

Please print a copy of this letter for your records before proceeding.

Thank you for your participation in our research.

Sincerely,

Jean-François Bureau, Ph.D.
CARE Research Lab, University of Ottawa
136 Jean-Jacques Lussier, Ottawa, ON, K1N 6N5
Phone: 613 562-5800 ext. 4495
E-Mail: lreecare@uOttawa.ca
Website : http://socialsciences.uottawa.ca/care/

Marie-France Lafontaine, Ph.D., C. Psych.
Couple Research Lab, University of Ottawa
136 Jean-Jacques Lussier, Ottawa, ON, K1N 6N5
Phone: 613 562-5800 ext. 4471
E-Mail: couple@uottawa.ca
Website: www.socialsciences.uottawa.ca/lrc-crl/

Patrick Gaudreau, Ph.D.
Laboratory for research on Achievement, Motivation, and the Regulation of Action (LAMRA)
136 Jean-Jacques Lussier, Ottawa, ON, K1N 6N5
Phone: 613 562-5800 ext. 4308
E-Mail: pgaudrea@uOttawa.ca
Website: http://socialsciences.uottawa.ca/lamra/

Crisis Call Centers

Ottawa Distress Centre (www.dcottawa.on.ca)	613-238-3311 (Ottawa/Gatineau) 1-866-676-1080 (Rural)	24-hr general crisis intervention.
Mental Health Crisis Line (www.crisisline.ca)	613-722-6914 (Ottawa) 1-866-996-0991 (Rural Ottawa)	24-hr bilingual mental health crisis line serving individuals 16 years and older.
Ottawa Rape Crisis Centre Crisis Line (www.orcc.net)	613-562-2333	24-hr crisis line for women experiencing current or past sexual abuse and/or assault, including childhood sexual abuse.
Tel-Aide Outaouais (www.tel-aide-outaouais.org)	613-741-6433 (Ottawa) 819-775-3223 (Gatineau) 1-800-567-9699 (Rural)	8am - 12pm crisis line for Francophones living in Ottawa/Gatineau region.

Mental Health & Social Service Resources

www.ementalhealth.ca		A comprehensive online list of mental health resources available in the Ottawa-Carleton region.
Ottawa Academy of Psychologists (www.ottawa-psychologists.org)	613-235-2529	Comprehensive list of registered psychologists and their specialties in the Ottawa area.
Centre for Psychological Services (University of Ottawa)	613-562-5289	Offers individual therapy, couple therapy and family services with possible fee adjustments based on income.
Student Academic Success Counselling Services University of Ottawa (www.sass.uottawa.ca/personal)	613-562-5200	Offers counselling regarding topics such as depression, stress, self-esteem, relationships, harassment, etc. to students registered at the University of Ottawa.

Sandy Hill Community Health Centre (www.shchc.ca)	613-789-1500	Offers free crisis intervention and counselling for immediate needs and addiction to residents of Sandy Hill.
Somerset West Community Health Centre (www.swchc.on.ca)	613-238-8210	Offers free crisis intervention and individual counselling in various Asian languages to residents of Somerset West.
Centretown Community Health Centre (www.centretownchc.org)	613-233-4443	Offers free counselling and social support services to residents of Old Ottawa South, the Glebe, and Centretown.
Eastern Ottawa Resource Centre (www.eorc-creo.ca)	613-741-6025	Offers free crisis intervention and individual counselling to residents of Gloucester area.
Family Services Ottawa (www.familyservicesottawa.org)	613-725-3601	Offers individual, family and couples counselling, parenting services as well as support groups for women survivors of abuse.

Physical/Partner Abuse Support & Counselling Resources

Eastern Ottawa Resource Centre (www.eorc-creo.ca)	613-745-4818 (Crisis) 613-741-6025 (Information)	24-h crisis line, counselling, support groups and referrals for women who are or have experienced partner abuse.
Assaulted Women's Help Line (www.awhl.org)	1-866-863-0511	24-hour English crisis line for women in abusive situations.
Fem'aide (www.femaide.ca)	613-745-3665 (Ottawa) 1-877-336-2433 (Rural)	24h French crisis line for women in abusive situations.

File Number: H06-16-03 **Date (mm/dd/yyyy)**: 08/11/2016

Université d'Ottawa University of Ottawa
Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Ethics Approval Notice

Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

First Name	Last Name	Affiliation	Role
Jean-François	Bureau	Social Sciences / Psychology	Principal Investigator
Patrick	Gaudreau	Social Sciences / Psychology	Co-investigator
Marie-France	Lafontaine	Social Sciences / Psychology	Co-investigator

File Number: H06-16-03

Type of Project: Professor

Title: How do perceived control and pressure interact with academic stress to predict non-suicidal self injury and psychological well-being?

Approval Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
08/11/2016	08/10/2017	Approved

Special Conditions / Comments:
N/A

File Number: H06-16-03 **Date (mm/dd/yyyy):** 08/11/2016

Université d'Ottawa University of Ottawa
Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

This is to confirm that the University of Ottawa Research Ethics Board identified above, which operates in accordance with the Tri-Council Policy Statement (2010) and other applicable laws and regulations in Ontario, has examined and approved the ethics application for the above named research project. Ethics approval is valid for the period indicated above and subject to the conditions listed in the section entitled "Special Conditions / Comments".

During the course of the project, the protocol may not be modified without prior written approval from the REB except when necessary to remove participants from immediate endangerment or when the modification(s) pertain to only administrative or logistical components of the project (e.g., change of telephone number). Investigators must also promptly alert the REB of any changes which increase the risk to participant(s), any changes which considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project and safety of the participant(s). Modifications to the project, including consent and recruitment documentation, should be submitted to the Ethics Office for approval using the "Modification to research project" form available at: http://www.research.uottawa.ca/ethics/forms.html

Please submit an annual report to the Ethics Office four weeks before the above-referenced expiry date to request a renewal of this ethics approval. To close the file, a final report must be submitted. These documents can be found at: http://www.research.uottawa.ca/ethics/forms.html

If you have any questions, please do not hesitate to contact the Ethics Office at extension 5387 or by e-mail at: ethics@uOttawa.ca.

Signature:

[redacted]

Germain Zongo
Protocol Officer for Ethics in Research
For Daniel Lagarec, Chair of the Health Sciences and Sciences REB

Appendix B. List of Measures and Original Sources

Measure	Peer-Reviewed Source
Adolescent Unresolved Attachment Questionnaire	West, M., Rose, S., Spreng, S., & Adam, K. (2000). The Adolescent Unresolved Attachment Questionnaire: The assessment of perceptions of parental abdication of caregiving behavior. *The Journal of Genetic Psychology, 161*(4), 493-503.
Brief Coping Inventory for Academic Striving	Thompson, A. (2015). Coping with stress in undergraduate university students: Development and validation of the coping inventory for academic striving (CIAS) to examine key educational outcomes in correlational and experimental studies. *Doctoral dissertation*, University of Ottawa.
Childhood Experiences of Care and Abuse Questionnaire	Smith, N., Lam, D., Bifulco, A., & Checkley, S. (2002). Childhood experience of care and abuse questionnaire (CECA. Q). *Social Psychiatry and Psychiatric Epidemiology, 37*(12), 572-579.
Difficulties in Emotion Regulation Scale	Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of psychopathology and behavioral assessment, 26*(1), 41-54.
Difficulties in Emotion Regulation Scale-Positive	Weiss, N. H., Gratz, K. L., & Lavender, J. M. (2015). Factor structure and initial validation of a multidimensional measure of difficulties in the regulation of positive emotions: The DERS-Positive. *Behavior modification, 39*(3), 431-453.
Inventory of Parent and Peer Attachment	Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of youth and adolescence, 16*(5), 427-454.
Multidimensional Perfectionism Scale	Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive therapy and research, 14*(5), 449-468.
Multidimensional Perfectionism Scale	Hewitt, P. L., Flett, G. L., Turnbull-Donovan, W., & Mikail, S. F. (1991). The Multidimensional Perfectionism Scale: Reliability, validity, and psychometric properties in psychiatric samples. *Psychological Assessment: A Journal of Consulting and Clinical Psychology, 3*(3), 464.
Ottawa Self-Injury Inventory	Cloutier, P. F., & Nixon, M. K. (2003). The Ottawa self-injury inventory: A preliminary evaluation. In Abstracts to the 12th International Congress European Society for Child and Adolescent Psychiatry. *European Child & Adolescent Psychiatry* (Vol. 12, No. suppl 1, 1-94).
Parental Bonding Instrument	Parker, G., Tupling, H., & Brown, L. B. (1979). A parental bonding instrument. *British journal of medical psychology, 52*(1), 1-10.
Psychological Control Scale – Youth Self-Report	Barber, B. K. (1996). Parental psychological control: Revisiting a neglected construct. *Child development, 67*(6), 3296-3319.
Ruminative Thought Style Questionnaire	Brinker, J. K., & Dozois, D. J. (2009). Ruminative thought style and depressed mood. *Journal of clinical psychology, 65*(1), 1-19.