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EMPIRICAL RESEARCH

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

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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 and Favazza 2009). While the highest rates of NSSI are observed during adolescence, the behavior is also a common concern among university students (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 cumulative 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 a focus on 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

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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 aimed 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 (or non-acceptance) 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 and Joiner 2009) highlights the role of ruminative thinking as a key factor escalating emotional reactions to events and subsequent engagement in dysregulated behaviors, including NSSI, in Borderline Personality Disorder. Consistent with these models, an extensive theoretical (Nock et al. 2009) and empirical (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. The regulatory effects of NSSI on negative emotions have also been demonstrated through experimental methods and ecological momentary assessments (see Hamza and Willoughby 2015 for a review). It should be noted, though, that NSSI can serve a number of other—often secondary—functions for individuals (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., Thomassin, Guérin Marion et al. 2017), emotional clarity, or the ability to understand one's emotions (e.g., Miller and Racine 2020), acceptance of emotions (e.g., Anderson et al. 2018), the self-perceived ability to access regulation strategies (e.g., Kiekens et al. 2017), impulse-control difficulties (with mixed results; Hamza et al. 2015), and difficulty engaging in goal-directed behavior, such as school work, in the context of an emotional stressor (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., 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 and Roemer 2004), was the most powerful 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 feelings of relaxation, excitement, or exhilaration (Klonsky 2007) and a drug-like "high" (Guérin-Marion et al. 2018). 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 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 and Chun 2019), 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 (Liu et al. 2018), insecure attachment (Tao et al. 2020), and feeling alienated from, or rejected by, parental figures (Bureau et al. 2010) are associated with NSSI behavior. A number of studies have also demonstrated the indirect effects of such experiences on NSSI through emotion dysregulation (e.g., Guérin-Marion et al. 2019; Tatnell et al. 2017), thereby corroborating the notion that an invalidating emotional climate within the parent–child relationship may confer vulnerability for NSSI by compromising the development of adaptive emotion regulation skills, as posited by the biosocial theory (Linehan 1993).

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 driving NSSI behavior during the university years. While some research has explored the link between NSSI and some of these perceived parental behaviors (e.g., criticism) in young adult/university populations (Daly and Willoughby 2019), little is known about how 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 and 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; that is, one study has uncovered unique indirect effects from fathers (Tao et al. 2020), while others observed unique indirect effects for mothers (e.g., Guérin-Marion et al. 2019), 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, on average, in student populations. 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 display similarities on multiple variables of interest, within heterogeneous samples (Berlin et al. 2014; Nylund-Gibson and 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., relative strengths and weaknesses on a series of indicators) that more holistically define an individual's vulnerability profile for NSSI. Moreover, person-centered approaches can help to parse out the heterogeneity in vulnerability characteristics among students who have a history of NSSI.

Several studies have focused on identifying characteristically distinct profiles of NSSI engagement in university populations using person-centered approaches. One consistent finding across these studies has been the identification of a profile of 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 and 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 high levels of emotion dysregulation (see Chen and Chun 2019; Shahwan et al. 2020), and to most closely align with dominant conceptualizations of NSSI etiology and functions. Indeed, two additional person-centered studies to date have demonstrated that individuals who display more dysregulated profiles of emotional functioning (e.g., higher levels of negative affect, higher levels of rumination) are more likely to engage in NSSI (Burke et al. 2018; Thomassin et al. 2017) and tend to do so more frequently (Thomassin et al. 2017).

Beyond a focus on the severe end of the risk continuum for NSSI, however, much remains to be understood about the vulnerability profiles that may underpin other, less severe presentations. Indeed, the majority of university students who self-injure have been shown to display more moderate and mild/experimental profiles of engagement in NSSI (Klonsky and Olino 2008), which suggests they may display less severe or otherwise distinctive patterns of vulnerability for the behavior. Some studies have begun to more closely attend to the full spectrum of NSSI risk 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 ($n = 264$; Martin 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 (e.g., more suppression and minimization of emotions; Shaver and Mikulincer 2007).

With a similar design, one recent study explored the emotion regulation profiles of university students with a lifetime history of NSSI ($n = 326$; Peterson et al. 2019). These researchers created latent classes on the basis of NSSI methods (e.g., frequency of cutting, burning, etc.) and emotion regulation difficulties (i.e., based on the six subscales of the DERS; i.e., awareness, clarity, acceptance, goal-directed behavior, impulse-control, and strategies). The study identified four profiles, which were further differentiated by some behavioral health risks; specifically, the profile with the greatest self-reported emotion regulation difficulties (along with the highest rate of scratching/skin piercing; 20.6% of the sample) was found to have the highest rates of suicide attempts, disordered eating, and impulsivity. In contrast, the largest profile of students (70.9% of sample) was characterized by relatively low emotion regulation difficulties, few NSSI methods, and few behavioral health risks. 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 and Choi 2018 for cluster size guidelines). Likewise, because both an NSSI outcome (i.e., methods) and risk factor (i.e., emotion regulation difficulties) were used as indicators of profile membership, the conceptual interpretation of vulnerability profiles as it relates to emotion dysregulation is more challenging. Lastly, the study's use of lifetime (vs. more recent) estimates of NSSI may have introduced memory biases (Hamza and 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 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 developmentally informed understanding of emotion regulation patterns.

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 (profiles) based on their self-reported difficulties with emotion regulation, spanning both positive and negative emotional experiences. Similarly to previous research (Martin 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 a broad benchmark (i.e., population mean) against which to compare the characteristics of each profile, in order to ascertain that they differed meaningfully from the average student who does not engage in NSSI. In line with existing research (e.g., Burke et al. 2018), 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 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 emotion regulation profiles on (1) self-reported quality of maternal and paternal relational experiences, and (2) the frequency, time elapsed since onset, methods, functions, and addictive properties of NSSI. Consistent with past

research, the most emotionally dysregulated profile of students was expected to report the most negative parent–child relationships, and a use of NSSI 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), as well as in the severity/functions of their NSSI. For comparison purposes, profiles were also compared with (1) both comparison samples on parent–child relational measures, and (2) with the comparison sample with a lifetime NSSI history on NSSI characteristics, with the expectation that significant differences would emerge. Other study aims, such as to examine of the role of positive emotions 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 an Eastern Canadian university 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 2811 young adults responded to the survey. Participants were excluded at the outset due to insufficient questionnaire completion ($n = 25$), if they failed all 3 validity screeners ($n = 155$), or if they had an unusually short survey completion time and failed 2 out of 3 screeners ($n = 52$). 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 479 undergraduate students (83.8% female; 0.8% non-binary) aged 17–25 years ($M = 18.77$; $SD = 1.42$). With freedom to select any relevant ethnocultural background, 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 (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. 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 (0.8%). Forty-three percent reported currently living with their parents, 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 (70.9%), 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 and 6 times (18.1%), more than 10 times (17%), and between 7 and 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 an 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, $p < 0.001$), age (F [2, 2470] = 5.48, $p = 0.004$) and ethnicity (χ^2 [2] = 43.16, $p < 0.001$), these sociodemographic factors were controlled for in relevant analyses.

Measures

Emotion regulation difficulties

The 36-item *Difficulties in Emotion Regulation Scale* (DERS; Gratz and 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 = 0.84–0.90). 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 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 = 0.84–0.93). 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 and 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: 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, preserved more variance in scores than a dichotomization approach, and best reflected the natural distribution of scores.

The 20-item *Ruminative Thought Style Questionnaire* (RTSQ; Brinker and 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 and Dozois 2009), and showed excellent internal consistency in the current sample ($\alpha = 0.93$). 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) 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 = 0.87–0.88) and mother (αs = 0.82–0.89) 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 parents 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 unlike*) to 4 (*Very like*). Both the father ($\alpha = 0.87$) and mother ($\alpha = 0.87$) 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 disagree*) to 5 (*Strongly agree*). The scale demonstrated good internal consistency for fathers ($\alpha = 0.90$) and mothers ($\alpha = 0.88$). 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 and 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 [>0.5]; Tabachnick and Fidell 2013) revealed multicollinearity problems with the mother and father parallel scales ($r = 0.71$), so the mother and father scores were collapsed into one total "parental alienation" score ($\alpha = 0.93$). Higher mean scores (range: 1–5) indicated stronger feelings of alienation.

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 ($\alpha = 0.87$) and father ($\alpha = 0.87$) 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.

Pressure (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 [>0.5]; Tabachnick and Fidell 2013) revealed multicollinearity problems with the two subscales, for both parents (two father scales, $r = 0.73$; two mother scales, $r = 0.75$), reflecting conflation of constructs. Thus, the expectations and criticism scores were collapsed into a single "parental pressure" variable for mothers ($\alpha = 0.93$) and fathers ($\alpha = 0.92$). Higher scores (range: 1–7) reflected greater perceived pressure.

Non-suicidal self-injury

The *Ottawa Self-Injury Inventory* (OSI; Cloutier and 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?*"), 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: "4–6 times", "7–10 times", and "more than 10 times") so as to facilitate analysis and minimize 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 selected methods were summed into a total count score. 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*; $\alpha = 0.83$); External Emotion Regulation ("External ER") functions indicated attempts to regulate externalizing emotions (three items; e.g., *To release anger*; $\alpha = 0.71$); 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*; $\alpha = 0.72$); and Sensation Seeking functions reflected efforts to achieve feelings of exhilaration (four items; e.g., *To experience a "high" like a drug high*; $\alpha = 0.65$). 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. 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*; $\alpha = 0.87$).

Socio-demographics

In addition to gender, age, and ethnicity (dichotomized as white vs. non-white), 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.) were explored 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 (i.e., socio-economic disparity index; yes/no) and if they received financial support from parents for school (yes/no). These sociodemographics were explored as potential covariates in analyses.

Results

Analyses were performed in two broad steps. First, person-centered analyses (i.e., identification of profiles) were performed using the Latent GOLD 5.1 software (Vermunt and Magidson 2016). Second, once profiles were extracted, all remaining between-group analyses were completed in SPSS Version 26. These between-group analyses were conducted with the goals of (1) describing profile characteristics; (2) comparing profiles on parent–child relational variables and NSSI characteristics, and (3) comparing profiles with the two comparison groups on all study variables ("complementary analyses"). A conservative threshold for statistical significance of $p < 0.01$ 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 and 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 and 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 and 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 and Magidson 2016), thus helping to determine the extent to which the emotion regulation variables were successful in capturing differences between clusters.

Table 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

Table 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	0.80	10.11	0.06
3-cluster	**10,747.40**	**10,803.40**	**10911.82**	**11425.43**	**0.83**	**41.36**	**0.07**
4-cluster	10,747.74	10,821.74	10976.41	11655.12	0.82	23.11	0.09
5-cluster	10,734.18	10,826.18	11004.01	11847.80	0.82	18.57	0.11
6-cluster	10,739.66	10,849.66	11047.78	12056.67	0.80	44.91	0.13
7-cluster	10,765.67	10,893.67	11090.01	12263.99	0.81	59.49	0.13

Best fitting solution is bolded

BIC Bayesian Information Criterion, *CAIC* Consistent Akaike Information Criterion, *ICL-BIC* Integrated Classification Likelihood, *AWE* Approximate Weight of Evidence

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 and Magidson 2016). In addition, guidelines have recommended for profiles to include over 5–8% of participants to avoid retention of "rare" clusters (Nylund-Gibson and 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 and Magidson 2016).

Description of Profiles

Profile characteristics are detailed in Table 2. 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 = 0.92, F [14, 942.00] = 57.139, $p < 0.001$). 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 groups differed significantly from one another on each of the continuous indicators of emotion regulation (all results significant at the $p < 0.001$ 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). Therefore, 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 ($z = -0.5$ to 0.4 for "high" difficulties). Therefore, this subgroup was named the "Average Difficulties" profile.

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

Preliminary analyses

All variables, along with covariates of interest, were screened for missing data, outliers, and parametric test assumptions (Tabachnick and Fidell 2013). Data on relational variables were missing completely at random across Profile 1 (Little's MCAR test: $\chi^2 = 449.33$, df = 445, $p = 0.434$), Profile 2 ($\chi^2 = 278.05$, df = 272, $p = 0.39$), and Profile 3 ($\chi^2 = 206.88$, df = 192, $p = 0.22$) at a 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 ($\chi^2 = 163.53$, df = 153, $p = 0.27$), Profile 2 ($\chi^2 = 93.13$, df = 83, $p = 0.21$), and Profile 3 ($\chi^2 = 80.74$, df = 79, $p = 0.43$). 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 Profile 2 and 3). Problems with univariate normality and multicollinearity were addressed for specific variables (as previously detailed in "Measures"). There were no problems with linearity. Lastly, Pillai's Trace was used as a multivariate criterion for the MANCOVA to alleviate problems with heterogeneity of variance-covariances and unequal group sizes.

Correlations between study variables and potential covariates were explored. Only correlations significant at the at the $p < 0.01$ level are reported here. Multiple parent–child relational variables were found to correlate with gender (0.06–0.12), ethnicity ($r = 0.07$–0.25), financial support ($r = 0.07$–0.22), socioeconomic disparity ($r = 0.08$–0.24), and past and present living arrangements ($r = 0.06$–0.07). In terms of NSSI variables, NSSI methods, addictive properties, and internal ER functions correlated significantly with gender ($r = 0.13$–0.14). Likewise, participant age correlated with the amount of time elapsed since NSSI onset and internal ER functions ($r = 0.45$ and 0.07, respectively); living with parents with the amount of time elapsed since NSSI onset ($r = 0.11$); socioeconomic disparity with the amount of time elapsed since NSSI onset and NSSI methods count ($r = 0.08$–0.15); and parental financial support with the amount of time elapsed since NSSI onset ($r = -0.15$).

Table 2 Descriptive information about latent 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 (0.05)	3.78 (0.06)	1.79 (0.08)	185.03**	0.44
Difficulties w/ goal-directed behavior	3.65 (0.04)	4.42 (0.05)	2.90 (0.07)	176.10**	0.42
Impulse control difficulties	2.77 (0.04)	3.82 (0.05)	1.78 (0.07)	283.57**	0.54
Lack of awareness	2.97 (0.06)	2.84 (0.07)	2.70 (0.9)	3.08	0.01
Lack of strategies	3.00 (0.03)	4.10 (0.04)	2.10 (0.05)	525.18**	0.69
Lack of clarity	3.06 (0.06)	3.41 (0.07)	2.36 (0.09)	47.69**	0.16
Rumination	5.04 (0.06)	5.98 (0.07)	4.39 (0.09)	106.38**	0.31
	%	%	%	Pearson χ^2	Somers' *d*
Non-acceptance of emotions (positive)					
Low	69.2	51.9[b]	94.7[b]	50.86**	0.25
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**	0.19
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**	0.18
Medium	16.3	22.2[a]	9.6[a]		
High	10.6	17.7[b]	2.1[b]		

Results from the MANOVA (univariate *F*) and chi-square (χ^2) are displayed. A $p < 0.01$ was used as the threshold for statistical significance
*$p < 0.01$, **$p < 0.001$

[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

Therefore, each of these variables were included as covariates in the relevant models.

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 = 0.32, F (36, 892.00) = 4.79, $p < 0.001$, 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. Results are detailed under Table 3.

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 $\eta^2_{\text{partial}} = 0.04$ 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,

Table 3 Comparing emotion regulation profiles on relational risk factors and NSSI characteristics

Parent–Child Relational Risk Factors	Profiles						Test		Effect size	Pairwise[a] Comparisons
	1 Average Difficulties		2 Dysregulated		3 Low Difficulties					
	M (*SE*)	%	*M* (*SE*)	%	*M* (*SE*)	%	Uni. *F*	χ^2	η^2_{part}	
Father unresolved attachment	2.23 (0.06)		2.56 (0.07)		1.89 (0.09)		16.55**		0.07	2 > 1* > 3*, 2 > 3**
Mother unresolved attachment	1.95 (0.05)		2.10 (0.06)		1.74 (0.08)		6.31*		0.03	2 > 3*
Father overprotection	2.12 (0.04)		2.26 (0.05)		2.02 (0.06)		4.98*		0.02	2 > 3*
Mother overprotection	2.31 (0.04)		2.33 (0.05)		2.09 (0.07)		4.40		0.02	
Father antipathy	2.39 (0.06)		2.77 (0.08)		2.03 (0.10)		16.60**		0.07	2 > 1*,3** 1 > 3*
Mother antipathy	2.16 (0.06)		2.29 (0.08)		2.04 (0.10)		1.97		0.01	–
Father psychological control	1.65 (0.04)		1.79 (0.04)		1.39 (0.06)		16.72**		0.07	2, 1 > 3**
Mother psychological control	1.66 (0.04)		1.74 (0.04)		1.53 (0.06)		4.30		0.02	–
Father pressure	3.52 (0.10)		4.31 (0.12)		2.96 (0.16)		26.97**		0.10	2 > 1, 3** 1 > 3*
Mother pressure	3.60 (0.10)		3.99 (0.12)		3.19 (0.16)		8.14*		0.03	2 > 3**
Parental alienation	2.75 (0.06)		3.18 (0.07)		2.19 (0.09)		35.30**		0.13	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										
External ER functions	3.18 (0.07)		3.61 (0.08)		3.07 (0.11)		10.61**		0.04	2 > 1, 3**
Internal ER functions	2.68 (0.06)		3.30 (0.07)		2.24 (0.09)		45.37**		0.16	2 > 1** > 3**
Social influence functions[b]	0.12 (0.01)		0.17 (0.01)		0.11 (0.01)		8.51**		0.04	2 > 1, 3*
Sensation seeking functions[b]	0.16 (0.01)		0.22 (0.02)		0.09 (0.02)		11.71**		0.05	2 > 3**, 1 > 3*
Addictive features	2.21 (0.06)		2.78 (0.07)		1.80 (0.10)		35.44**		0.13	2 > 1, 3**, 1 > 3*
Number of methods	3.04 (0.10)		3.44 (0.12)		2.51 (0.16)		10.46**		0.04	2 > 3**
Time elapsed since NSSI onset	3.81 (0.15)		4.12 (0.18)		3.60 (0.24)		1.88		0.01	–
Frequency (*higher*)		40.5		57.3[d]		30.1[c]		19.71**	–	–

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 $p < 0.01$ was used as the threshold for statistical significance

*$p < 0.01$, **$p < 0.001$

[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 (±)

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 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

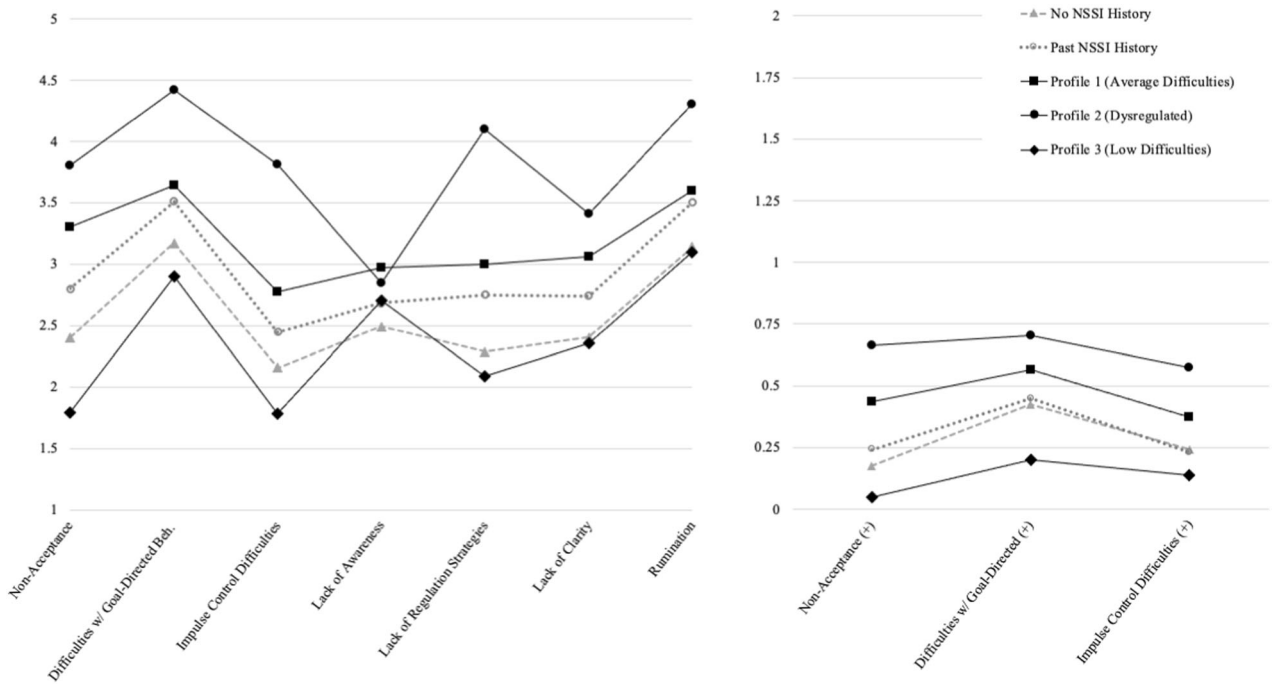

Fig. 1 Three profiles and comparison groups on self-reported emotion regulation difficulties. (+) = Difficulties with regulating positive emotion

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 for more details.

Complementary Analyses: Profiles vs. Comparison Groups

Emotion regulation variables

Figure 1 illustrates differences between profiles and comparison groups on all 10 emotion regulation indicators. Differences on continuous emotion regulation variables (DERS subscales and RTSQ) were examined using a MANCOVA, controlling for age, gender, and ethnicity, which was significant (Pillai's Trace = 0.32, F (28, 9748.00) = 29.83, $p < 0.001$). All univariate tests were also significant at the $p < 0.001$ 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 4. By and large, results indicated that both the Dysregulated and Average Difficulties profiles reported higher levels of difficulties with emotion regulation than comparison groups. By contrast, compared to both comparison samples, the Low Difficulties profile reported either the same level or fewer emotion regulation difficulties.

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). Chi-square tests 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 (see Table 4 for full results). 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, $p < 0.001$), goal-directed behavior ($\chi^2 = 23.16$, df = 4, $p < 0.001$), and impulse-control ($\chi^2 = 50.82$, df = 4, $p < 0.001$) 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, $p < 0.001$), and with regulating impulses in the context of positive emotions ($\chi^2 = 14.01$, df = 4, $p = 0.007$). 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, $p = 0.001$) and goal-directed behavior ($\chi^2 = 9.73$, df = 4, $p = 0.04$) in the context of positive emotions.

Parent–child relational variables

Differences between profiles and comparison groups on parent–child relational variables were explored using a MANCOVA, controlling for age, gender, ethnicity, financial support, socioeconomic disparity, and past and present living arrangements. The multivariate test was significant, Pillai's Trace = 0.19, F (44, 9592.00) = 10.74, $p < 0.001$, allowing examination of univariate results and post-hoc

Table 4 Comparing profiles with comparison samples on emotion regulation, relational, and NSSI variables

	Comparison Groups				Profiles						Test		Pairwise Comparisons (*Comparison Groups vs. Profiles*)
	A No NSSI History		B Past NSSI History		1 Average Difficulties		2 Dysregulated		3 Low Difficulties				
Emotion regulation difficulties[a]	*M, SE*	%	*M, SE*	%	*M, SE*	%	*M, SE*	%	*M, SE*	%	Uni. *F*	χ^2	
Non-acceptance	2.40, 0.03		2.76, 0.05		3.24, 0.07		3.76, 0.08		1.78, 0.10		112.86**		*A, B* < 1**, 2**; *A, B* > 3**
Goal-directed behavior	3.19, 0.02		3.50, 0.04		3.62, 0.06		4.39, 0.07		2.89, 0.09		81.68**		*A* < 1**, 2**; *B* < 2**; *B* > 3**
Impulse-control	2.17, 0.02		2.44, 0.04		2.75, 0.06		3.79, 0.07		1.78, 0.09		162.01**		*A, B* < 1**, 2**; *A, B* > 3**
Lack of awareness	2.50, 0.02		2.68, 0.04		2.96, 0.06		2.84, 0.07		2.71, 0.09		21.24**		*A* < 1**, 2**; *B* < 1**
Lack of strategies	2.30, 0.02		2.68, 0.04		2.97, 0.06		4.06, 0.07		2.09, 0.09		188.41**		*A, B* < 1**, 2**; *B* > 3**
Lack of clarity	2.43, 0.02		2.73, 0.04		3.03, 0.06		3.37, 0.07		2.34, 0.09		70.35**		*A, B* < 1**, 2**; *B* > 3**
Rumination	4.46, 0.03		4.89, 0.06		4.99, 0.08		5.95, 0.09		4.36, 0.12		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**	–
Parent–child relationships[b]													
F- unresolved attachment	1.89, 0.02		2.09, 0.04		2.19, 0.05		2.49, 0.06		1.80, 0.08		25.48**		*A* < 1**, 2**; *B* < 2**
M- unresolved attachment	1.56, 0.02		1.79, 0.03		1.92, 0.05		2.07, 0.06		1.67, 0.07		31.79**		*A* < 1**, 2**; *B* < 2**
F- overprotection	1.99, 0.02		2.07, 0.03		2.11, 0.04		2.20, 0.05		2.00, 0.06		6.67**		*A* < 2**
M- overprotection	2.05, 0.02		2.17, 0.03		2.31, 0.04		2.31, 0.05		2.09, 0.06		15.26**		*A* < 1**, 2**
F- antipathy	1.95, 0.02		2.28, 0.04		2.37, 0.06		2.72, 0.07		1.99, 0.09		39.01**		*A* < 1**, 2**; *B* < 2**
M- antipathy	1.65, 0.02		2.01, 0.04		2.15, 0.05		2.28, 0.06		1.97, 0.08		44.90**		*A* < 1**, 2**, 3*; *B* < 2*
F- psychological control	1.44, 0.01		1.51, 0.02		1.64, 0.03		1.77, 0.04		1.39, 0.05		24.36**		*A* < 1**, 2**; *B* < 1**, 2**
M- psychological control	1.41, 0.01		1.51, 0.02		1.65, 0.03		1.71, 0.03		1.53, 0.05		26.59**		*A* < 1**, 2**; *B* < 1**, 2**
F- pressure	3.22, 0.04		3.43, 0.07		3.56, 0.10		4.26, 0.12		3.07, 0.15		20.75**		*A* < 1*, 2**; *B* < 2**
M- pressure	3.09, 0.04		3.31, 0.07		3.61, 0.09		3.97, 0.11		3.23, 0.15		18.17**		*A* < 1**, 2**; *B* < 2**
Parental alienation	1.95, 0.02		2.40, 0.04		2.73, 0.06		3.13, 0.07		2.10, 0.09		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[b]													
External ER functions	–		2.80, 0.05		3.17, 0.07		3.59, 0.09		3.07, 0.11		20.73**		*B* < 1**, 2**
Internal ER functions	–		2.41, 0.04		2.68, 0.06		3.30, 0.07		2.24, 0.09		44.84**		*B* < 1*, 2**
ocial influence functions[b]	–		0.12, 0.01		0.12, 0.01		0.17, 0.01		0.11, 0.01		7.30**		*B* < 2**
Sensation seeking functions[b]	–		0.13, 0.01		0.17, 0.01		0.22, 0.01		0.09, 0.02		12.36**		*B* < 2**
Addictive features	–		1.81, 0.04		2.20, 0.06		2.78, 0.07		1.80, 0.09		48.97**		*B* < 1*, 2**
Number of methods	–		2.66, 0.07		3.04, 0.10		3.45, 0.12		2.49, 0.15		13.75**		*B* < 2**
Time elapsed since NSSI onset	–		4.78, 0.11		3.91, 0.14		4.22, 0.17		3.61, 0.23		11.94**		*B* > 1**, 3**

Results from the MANOVAs (univariate *F*) and chi-squares (χ^2) are shown

(+) positive emotion, *F*- father, *M*- mother. $p < 0.01$ was the threshold for statistical significance

*$p < 0.01$, **$p < 0.001$

[a]MANCOVA controlled for age, gender, and ethnicity

[b]MANCOVAs controlled for age, gender, and ethnicity, socioeconomic disparity, financial support from parents, and past and current living arrangements

tests (fully detailed in Table 4). Overall, results indicated that students within the Dysregulated and Average Difficulties profiles rated their relationships with parents as more negative on average than students in comparison samples (note: with some exceptions for the Average Difficulties profile). In contrast, overall, the Low Difficulties profile had similar mean scores to students who had never self-injured (No NSSI History group), and to those who had not self-injured within a year (Past NSSI History group), on relational variables.

Chi-square tests and subsequent examination of adjusted residuals (z values > 1.96) also identified differences in the rates of neglect between profiles and comparison groups (see Table 4). Compared to both comparison groups, the rates of paternal neglect were found to be higher than expected in the Dysregulated ($z = 3.4$) and Average Difficulties profiles ($z = 2.5$), but not in the Low Difficulties profile ($z = 0.9$). The rates of maternal neglect were found to be higher than expected across all three profiles of students from the NSSI sample ($z = 2.3$–3.9).

NSSI variables

Differences between profiles and the Past NSSI History group on NSSI variables were explored using a MANCOVA, controlling for age, gender, ethnicity, financial support, socioeconomic disparity, and past and present living arrangements. The multivariate test was significant, Pillai's Trace = 0.25, F (21, 2580.00) = 11.14, $p < 0.001$. Subsequent univariate results and post-hoc test results are detailed in Table 4. The broad pattern of results showed that, compared to students who had not self-injured in a year (Past NSSI History group), the Dysregulated profile has higher mean scores on all NSSI characteristics, and the Average Difficulties profile had higher scores on external ER functions, internal ER functions, and addictive properties. In contrast, no differences at the $p < 0.01$ level were found between the Low Difficulties profile and the Past NSSI History group, except on the amount of time elapsed since onset (i.e., Past NSSI History group began to self-injure earlier than all three profiles on average).

Sensitivity Analyses

Alternative models were explored as part of sensitivity analyses. In an effort to explore whether emotion regulation profiles could 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 favored a 9-profile solution (i.e., $BIC_{min} = 28{,}107.04$; $CAIC_{min} = 28{,}271.04$; classification errors = 16.6%; entropy = 0.79), 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 and 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, and entropy favored a 6-profile solution ($BIC_{min} = 9063.32$; $CAIC_{min} = 9173.32$; classification errors = 9.7%; entropy = 0.86). In the No NSSI History group ($n = 1551$), the BIC and CAIC favored a 7-profile solution ($BIC_{min} = 29{,}088.55$; $CAIC_{min} = 29{,}216.55$; classification errors = 12.5%; entropy = 0.82). 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 underlie 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, acknowledging 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 recent NSSI, and by identifying the relational and NSSI characteristics that further relate to these profiles.

Profiles of Emotion Regulation Difficulties

Consistent with the latent classes of NSSI uncovered in previous research (e.g., Whitlock et al. 2008), person-

centered analyses found evidence of three emotion regulation profiles in the NSSI sample. As anticipated based on previous work (Burke et al. 2018), 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 emotion regulation difficulties, with both negative and positive emotions. 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 most 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 has 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 pattern in findings across these 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. First, 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 discomfort in rare, isolated instances, in the context of otherwise relatively low distress or impairment. Lending support to this interpretation is Peterson et al. (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 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 (see Allen and 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 a more generalized emotion coping style. Such a hypothesis would be in line with past theoretical work, which has conceptualized the minimization/suppression of emotion as a distinct emotion regulation style (John and Gross 2007; Shaver and Mikulincer 2007). A tenet of attachment theory, for instance, 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 much vulnerability for NSSI (Martin et al. 2017; Martin 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 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, seem consistent with the positive mood dampening strategy (Burke et al. 2015), lowered responsivity to positive stimuli (e.g., Boyes et al. 2020) and lower intensity/overall frequency of positive affect (e.g., Hasking et al. 2018) observed in individuals who engage in NSSI. It is likely 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 (see Hasking et al. 2018). Likewise, difficulties accepting and modulating positive

emotions (as they occur organically, day-to-day) may 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?

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 much research showing that adverse parent–child relational experiences predict greater emotion dysregulation, which in turn is associated with NSSI (e.g., Guérin-Marion et al. 2019). 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 reflect a dose-response relationship between relational risk and emotion dysregulation, which aligns with prior work (e.g., see Peh et al. 2017). In addition, while students in the Dysregulated and Average Difficulties profiles rated their relationships with parents as more negative on average than students in comparison samples, those in the Low Difficulties profile did not. While this could again denote a pattern of slight underreporting, it may also be that other risk factors, unaccounted for by the current study (e.g., history of dating violence; Kiekens et al. 2019), are related to these individuals' emotion dysregulation.

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. A possible explanation for this may relate to our emphasis on experiences closely associated with authoritarian styles of parenting (e.g., antipathy, control, criticism, expectations; Baumrind 1991). As these parenting behaviors tend to be more common among fathers than mothers (McKinney and Renk 2008), they may have more closely captured the dynamics amongst participants and their fathers. This could explain why problems in relationships with fathers drove the lion share of associations with emotion regulation profile membership here. In addition, fathers are 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. This emphasizes the need to consider the influence of fathers in the developmental trajectories toward NSSI. Nevertheless, more research is needed to better understand the respective roles of mothers and fathers in the prediction of NSSI behavior as a sequelae of emotion dysregulation.

Results also informed an understanding of which relational dynamics may be most dysregulating for 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 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 direct links between parent–child relationships and NSSI were not investigated in the present study, these findings do align with past research that has highlighted the salience of experiences related to parental alienation (e.g., Bureau et al. 2010) and preoccupied attachment (e.g., Martin et al. 2017) among 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 and Muehlenkamp 2009), but not achievement-focused expectations (Hoff and 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 and Willoughby 2019). More research is 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., overprotection, pressure, psychological control) may be particularly relevant to explore 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, NSSI characteristics were found to differ 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 all four 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 and Chun 2019), and 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 mental health difficulties such as depression, anxiety, and borderline personality traits.

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 (e.g., see Case et al. 2019). Based on current findings, one could infer that the moderate levels of 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), though this remains up for debate. Similarly, 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. In addition, on average, these students' NSSI behaviors were quite similar to those of students who had not self-injured in one year or longer (past NSSI history group), which could indicate they are moving toward 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), which one could speculate may be a manifestation of unprocessed (i.e., suppressed) emotions (Shaver and 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 (i.e., 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 could be a key contributor to results, representing one among many other factors influencing the complex and bidirectional interpersonal dynamics in a family. Another limitation is inherent to the use of a correlational and cross-sectional design. With the use of such a design, any inferences with respect to associations between relational/emotion regulation variables and NSSI behavior should not be taken as evidence of cause-and-effect relationships. Given the 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. Lastly, the study sample was comprised of a majority of females, which decreases the generalizability of our findings to young men.

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 non-NSSI comparison groups. 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, less obvious 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 coping 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 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.

Authors' Contributions CGM conceived the study, performed the statistical analyses, and drafted the manuscript; J.F.B. led the larger project's conception, provided oversight on study conception, and revised the manuscript; M.F.L. contributed to the project's conception and revised the manuscript; P.G. contributed to the project's conception and revised the manuscript; J.M. contributed to the project's conception and revised the manuscript. All authors read and approved the final manuscript.

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Data Sharing and Declaration This manuscript's data will not be deposited as the consent form did not include data sharing consent.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval The University of Ottawa's Research Ethics Boards approved all procedures and measures used in this study. The approval number for the project was H06-16-03.

Informed Consent Participants received study information and consent forms prior to the beginning of the study. Only participants who provided informed consent participated in the study.

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