Relationships between outcome expectancies and non-suicidal self-injury: Moderating roles of emotion regulation difficulties and self-efficacy to resist self-injury

Kirsty Hird, Penelope Hasking, & Mark Boyes

School of Population Health, Curtin University, Perth, Australia

Correspondence concerning this article should be addressed to Penelope Hasking, School of Population Health, Curtin University, Perth, Australia. Email: Penelope.Hasking@curtin.edu.au.

ORCID

Kirsty Hird https://orcid.org/0000-0001-7677-2128

Penelope Hasking http://orcid.org/0000-0002-0172-9288

Mark Boyes http://orcid.org/0000-0001-5420-8606

Biographical notes

Kirsty Hird is undertaking a PhD in Psychology at Curtin University. Her research interests lie in the wellbeing and mental health of diverse minority populations.

Penelope Hasking is a Professor in the School of Population Health at Curtin University. The focus of her research is on high-risk behaviours, particularly alcohol abuse and non-suicidal self-injury (NSSI), exhibited by young people.

Mark Boyes is an Associate Professor in the School of Population Health at Curtin University. His research interests span health, developmental, and clinical psychology, with the overarching aim of understanding how both individual differences, as well as social and community-related variables, are related to psychological, social, educational, and health-related outcomes across the lifespan.

Funding

Word Count: 3954

Abstract

Background: Non-suicidal self-injury (NSSI) is the deliberate damage of one's own body tissue in the absence of suicidal intent. Research suggests that individuals engage in NSSI as a means of regulating their emotions, and that NSSI is associated with emotion regulation difficulties. There is also evidence supporting the role of outcome expectancies and self-efficacy to resist NSSI. However, it is unclear how these factors work together to explain NSSI. **Objective:** To explore whether the relationships between five NSSI-specific outcome expectancies and NSSI history are moderated by emotion regulation difficulties and self-efficacy to resist NSSI. **Method:** 1002 participants (Mage=20.51, 72.5% female, 39.7% lifetime history of NSSI) completed an online survey including measures of NSSI history, outcome expectancies, self-efficacy to resist NSSI and emotion regulation difficulties. **Results**: Emotion regulation difficulties were associated with NSSI, as was expecting NSSI to regulate affect. Conversely, expectations of communication and/or pain, as well as self-efficacy to resist NSSI were negatively associated with NSSI. Expectancies also interacted with both difficulties in emotion regulation and self-efficacy to resist NSSI in predicting self-injury. For example, the association between expectations of affect regulation and self-injury was weaker when associated with greater self-efficacy to resist NSSI. **Conclusion**: These findings provide support for considering NSSI-specific cognitions in concert with emotion regulation when understanding NSSI.

Keywords: NSSI, self-injury, emotion regulation difficulties, self-efficacy, outcome expectancies

Highlights

- Outcome expectancies can differentiate people based on NSSI history

- Emotion regulation difficulties and self-efficacy to resist NSSI moderate the relationships between outcome expectancies and NSSI history

- Emotion regulation difficulties and low self-efficacy to resist NSSI work together to predict NSSI history

Introduction

Non-suicidal self-injury (NSSI) is the deliberate damage of one's own body tissue in the absence of suicidal intent (International Society for the Study of Self-injury, 2020). This definition encompasses behaviours such as cutting, biting, or burning the skin, but excludes behaviours that are culturally or socially sanctioned (e.g. tattooing, body piercing). NSSI can be comorbid with various psychological disorders (Bentley et al., 2015); but can also occur in the absence of a diagnosed condition (Kiekens et al., 2018). The behaviour is associated with a number of negative outcomes including poor academic performance (Kiekens et al., 2016), and increased suicide risk (Whitlock et al., 2013). Given these severe outcomes, the Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition (DSM-5; American Psychiatric Association, 2013) has recommended NSSI Disorder (NSSI-D) as a condition requiring further investigation. One of the proposed diagnostic criteria for NSSI-D is that the individual has engaged in NSSI on five or more days in the past year.

Emotion regulation is the most commonly reported function of NSSI (Taylor et al., 2018) and it is widely accepted that emotion regulation plays a fundamental role in the behaviour (McKenzie & Gross, 2014). Leading emotion regulation models of NSSI share the premise that individuals are motivated to self-injure by the desire to avoid, reduce, or distract from intense emotional experiences (Andover & Morris, 2014), and there is a common assumption that individuals who self-injure have emotion regulation difficulties. This assumption is supported by extensive literature documenting a relationship between emotion regulation difficulties and NSSI; a recent meta-analysis estimated that people with emotion regulation difficulties are 2.4 times more likely to report a history of NSSI than those who do not experience similar difficulties (Wolff et al., 2019).

While the role of emotion regulation difficulties in NSSI is well documented, less is known about the cognitive processes underpinning self-injury. The Cognitive-Emotional

Model of NSSI (Hasking et al., 2017) articulates a role for NSSI-specific cognitions (i.e. outcome expectancies and self-efficacy to resist NSSI) in explaining why a person might self-injure rather than engage in other emotion regulatory behaviours. Outcome expectancies are the consequences that a person anticipates will occur if they were to engage in a behaviour (Bandura, 1989). In relation to NSSI, a person may be more likely to self-injure if they expect it will yield a desirable outcome (e.g. reduction of negative affect) as opposed to an undesirable outcome (e.g. negative reactions from loved ones). Common NSSI-related outcome expectancies include affect regulation, negative social outcomes, interpersonal communication, physical pain, and negative self-beliefs (Hasking & Boyes, 2018). Self-efficacy refers to a person's perceived ability to engage in a behaviour (Bandura, 1997), and in the case of NSSI it can also refer to a person's perceived ability to resist self-injury (Hasking & Rose, 2016). Hasking et al. (2017) posit that a person who expects that NSSI will yield a desirable outcome and has low self-efficacy to resist NSSI will be at greater risk of engaging in NSSI compared to others.

Research into the Cognitive-Emotional Model has found that outcome expectancies can differentiate between individuals with a history of self-injury and those without. Specifically, individuals who expect NSSI to assist with affect regulation are more likely to have a history of self-injury than individuals who do not hold this belief, whereas those who expect NSSI to facilitate communication, be painful, or result in negative self-beliefs are less likely to have a history of the behaviour (Hasking & Boyes, 2018). Self-efficacy to resist NSSI has also been consistently linked to self-injury, such that people with lower self-efficacy to resist NSSI are more likely to have a history of self-injury than those with a greater belief in their ability to resist the behaviour (Hasking & Rose, 2016).

Dawkins et al. (2019a) found that self-efficacy to resist NSSI also moderated the relationships between outcome expectancies and NSSI history. Specifically, individuals who

expected NSSI to result in affect regulation, negative social outcomes, or pain were more likely to have a history of self-injury if their self-efficacy to resist NSSI was low, which implicates a lack of self-efficacy to resist NSSI as a risk factor for the behaviour. Consistent with the predictions of the Cognitive-Emotional Model of NSSI, these findings suggest that outcome expectancies and self-efficacy to resist NSSI work in concert to govern whether an individual will self-injure.

It is clear that emotion regulation difficulties are an important factor to consider in any conceptualisation of NSSI, and there is increasing evidence for the role of NSSI-specific cognitions in understanding the behaviour. However, despite evidence supporting the role of both factors, it is still unclear how they may work together to explain self-injury. In line with emotion regulation theories and the Cognitive-Emotional Model, it is plausible that both emotion regulation difficulties and self-efficacy to resist NSSI act to strengthen or weaken the associations between outcome expectancies and self-injury. For example, a person who expects that NSSI will yield a desirable outcome (e.g. affect regulation), has emotion regulation difficulties, and low self-efficacy to resist NSSI may engage in self-injury; but if they had high self-efficacy to resist NSSI and/or good emotion regulation abilities they may not engage in the behaviour.

As such, the aim of the current study was to explore the moderating effects of emotion regulation difficulties and self-efficacy to resist NSSI on the associations between NSSI-related outcome expectancies and NSSI history among young adults. It was hypothesised that each of the five outcome expectancies, as well as emotion regulation difficulties and self-efficacy to resist NSSI, would differentiate individuals who have never self-injured, those who self-injure less frequently (i.e. less than five times in the past year), and those who self-injure more frequently (i.e. five or more times in the past year). It was also predicted that both self-efficacy to resist NSSI and emotion regulation difficulties would moderate the

relationships between each of the five outcome expectancies and NSSI history. Finally, it was predicted that there would be a three-way interaction between each of the five outcome expectancies, self-efficacy to resist NSSI, and emotion regulation difficulties.

Method

Measures

Self-Injury

To assess NSSI history we asked participants whether they had ever self-injured, and if so, how many times they had self-injured in the past year. We then used section I of the Inventory of Statements about Self Injury (ISAS; Klonsky & Glenn, 2009) to determine the nature of NSSI in the sample, including the methods used, age of onset, and whether they have a main form of self-injury. Section I of the ISAS has demonstrated good test-retest reliability ($r = .85$) across 1-4 weeks (Klonsky & Olino, 2008).

NSSI-Specific Outcome Expectancies

We used the Non-Suicidal Self-Injury Expectancy Questionnaire (NEQ; Hasking & Boyes, 2018) to assess five NSSI-related outcome expectancies: affect regulation, negative social outcomes, communication, pain, and negative self-beliefs. Each of the five subscales has demonstrated adequate internal consistency, with Cronbach's α scores ranging from .71 (communication) to .86 (affect regulation), as well as convergent and discriminant validity in correlations with measures of NSSI functions, emotion regulation, and general self-efficacy (Hasking & Boyes, 2018). Internal consistency was acceptable for each subscale in the current sample, ranging from $\alpha = .73$ (negative self-beliefs) to $\alpha = .87$ (affect regulation).

Self-Efficacy to Resist NSSI

We used a version of the Self-Efficacy to Avoid Suicidal Action Scale (Czyz et al., 2014) which has been adapted to assess participants' self-efficacy to resist NSSI (Hasking & Rose, 2016). The original version of this scale demonstrated good internal consistency ($\alpha =$

.96), as well as convergent validity in its correlation with a measure of suicide ideation severity (r = - .59, p < .001; Czyz et al., 2014). The adapted version of the scale has also demonstrated excellent internal consistency (α = .92; Hasking & Rose, 2016), and predictive validity in its ability to differentiate individuals with a history of self-injury from those without (Dawkins et al., 2019a). Internal consistency was excellent in the current sample (α = .94).

Emotion Regulation Difficulties

We used the total score yielded by the 18-item Difficulties in Emotion Regulation Scale Short Form (DERS-SF; Kaufman et al., 2015) to measure the extent of participants' emotion regulation difficulties. The DERS-SF total score has demonstrated good internal consistency (α = .89), as well as acceptable concurrent validity in its correlations with measures of NSSI, depression, and overall psychopathology (Kaufman et al., 2015). Internal consistency was excellent in the current sample (α = .91).

Procedure

Ethical approval for this study was obtained from the [blinded for review] Human Research Ethics Committee. The data used in this project came from two larger studies. In Study 1 (*n* = 505), participants from 17 Australian universities were invited to participate through university guilds and participants entered a draw to win a prize voucher as reimbursement for their participation. In Study 2 (*n* = 499), participants were recruited through one Australian university where participants could self-select into the study in exchange for course credit. Both studies were also advertised on social media platforms, and participants recruited via social media were not reimbursed for their time.

In both studies, interested participants were presented with an information sheet outlining the purpose of the research and participation requirements. They were then asked to tick a box to indicate that they consented to participate. After providing consent, participants

were given access to the questionnaire, which took approximately one hour to complete. After completing the questionnaire participants were provided with mental health resources and information about NSSI.

Data Analysis

We tested our hypotheses using multinomial logistic regression. Gender and recruitment method (i.e. which study the data came from) were entered as a covariates at Step 1 of the analysis; the five outcome expectancies were entered at Step 2; self-efficacy to resist NSSI and emotion regulation difficulties were entered at Step 3; all two-way interactions between variables were entered at Step 4; and all three-way interactions between variables were entered at Step 5. We then probed any significant interactions using simple slopes analysis at +/- 1 standard deviations from the mean and plotted the findings graphically (Aiken & West, 1996).

Results

Preliminary Analysis

The final sample comprised 1002 participants aged 18-25 ($M = 20.51$, $SD = 1.90$, 72.5% female). Of these, 60.4% had never self-injured, 30.1% had self-injured in the past year, but not more than five times, and 9.6% had self-injured five or more times in the past year. The mean age of NSSI onset was 14.2 years ($SD = 3.01$). Cutting was the most commonly endorsed form of self-injury (49.5%) followed by banging or hitting oneself (14.6%) and severe scratching (13.8%). Age was not correlated with NSSI history. Gender, χ^2 ($df = 2$) = 16.94, $p < .001$, and recruitment method, χ^2 ($df = 2$) = 8.14, $p = .017$, were associated with NSSI history so were statistically controlled in the regression. Specifically, females (43.2%) were more likely to have a history of self-injury than males (30.1%) and rates of self-injury were higher in Study 2 (41.5%) than Study 1 (37.8%). Descriptive statistics and correlations between the key variables are presented in Table 1.

Multinomial Logistic Regression

The full model differentiating NSSI history was significant χ^2 (*48*, $N = 1002$) = 609.55, $p < .001$, and accounted for between 34% (McFadden R^2) and 55% (Nagelkerke R^2) of the variance in NSSI history (Table 2). Affect regulation expectancies were stronger among those who had a history of self-injury, particularly those who had self-injured five or more times in the past year. Communication expectancies were weaker among those with a history of self-injury compared to those who had never self-injured; however, there was no difference between those who had self-injured more or less than five times in the past year. Pain expectancies were weaker among those who had self-injured less than five times in the past year compared to those who had never self-injured. Participants with a history of self-injury also had greater emotion regulation difficulties and weaker self-efficacy to resist NSSI than those who had never self-injured, especially those who had self-injured five or more times in the past year.

Simple slopes analysis revealed a positive relationship between emotion regulation difficulties and NSSI at low levels of self-efficacy to resist NSSI when comparing those who had self-injured less than five times ($b = 0.63$, $z = 4.62$, $p < .001$) or five or more times ($b = 1.18$, $z = 4.64$, $p < .001$) in the past year to those who had never self-injured. There was no relationship at high levels of self-efficacy to resist NSSI when comparing those who had self-injured less than five times ($b = 0.20$, $z = 1.31$, $p = .19$) or five or more times ($b = -0.07$, $z = -0.15$, $p = .88$), to those who had never self-injured (Figure 1).

When comparing those who had self-injured five or more times in the past year to those who had never self-injured, there was a positive relationship between affect regulation expectancies and NSSI at low levels of emotion regulation difficulties ($b = 2.25$, $z = 4.46$, $p < .001$), but not at high levels ($b = 0.30$, $z = 0.99$, $p = .32$; Figure 2). The same relationship was found at low levels of self-efficacy to resist NSSI ($b = 2.10$, $z = 5.75$, $p < .001$), but not at

high levels ($b = 0.01$, $z = 0.01$, $p = .99$; Figure 1). There was also a negative relationship between communication expectancies and NSSI at both low ($b = -1.33$, $z = -7.00$, $p < .001$) and high levels ($b = -0.83$, $z = -6.53$, $p < .001$) of emotion regulation difficulties, when comparing those who had self-injured less than five times in the past year to those who had never self-injured (Figure 2).

The relationship between pain expectancies and NSSI was moderated by self-efficacy to resist NSSI in all three groups. When comparing those who had self-injured less than five times in the past year to those who had never self-injured, there was a negative relationship between pain expectancies and NSSI at high levels of self-efficacy to resist NSSI ($b = -0.78$, $z = -4.59$, $p < .001$), but not at low levels ($b = 0.17$, $z = 1.17$, $p = .24$;). When comparing those who had self-injured five or more times in the past year to those who had never self-injured the relationship between pain expectancies and NSSI was positive at low levels of self-efficacy to resist NSSI ($b = 0.50$, $z = 2.07$, $p = .04$) and negative at high levels ($b = -2.03$, $z = -4.07$, $p < .001$;). When comparing those who had self-injured five or more times in the past year to those who had self-injured less than five times, there was a negative relationship between pain expectancies and NSSI at high levels of self-efficacy to resist NSSI ($b = -0.67$, $z = -2.28$, $p = .02$), but not at low levels ($b = 0.27$, $z = 1.12$, $p = .26$; Figure 1). There were no three-way interactions between predictors.

Discussion

The aim of the current study was to explore the moderating effects of emotion regulation difficulties and self-efficacy to resist NSSI on the relationship between outcome expectancies and NSSI history. The findings partially supported our hypotheses and reinforce the premise that emotional and cognitive factors can differentiate between those who have never self-injured, those who self-injure less frequently (i.e. less than five times in the past

year) and those who self-injure more frequently (i.e. five or more times in the past year; in line with the DSM-5 frequency criteria for NSSI-D).

Consistent with prior literature (Wolff et al., 2019), people with greater emotion regulation difficulties were more likely to have a history of self-injury, and greater difficulties were associated with more frequent NSSI. Conversely, people who had greater belief in their ability to resist NSSI were less likely to have a history of self-injury than those who believed their ability to resist the behaviour was low. Among those with a history of self-injury, weaker self-efficacy to resist NSSI was associated with more frequent self-injury, which implicates self-efficacy as a protective factor against the behaviour.

Individuals who believed that NSSI would assist with affect regulation were more likely to have a history of self-injury than those who did not endorse the same belief. This belief was also stronger amongst those who had self-injured five or more times in the past year compared to those who had self-injured less frequently. Given the established association between emotion regulation and NSSI, it is likely that this finding captures individuals who have engaged in NSSI and found it to be an effective emotion regulation strategy (McKenzie & Gross, 2014). Further to this, those who believed NSSI would facilitate emotion regulation and also had low emotion regulation difficulties were likely to have self-injured five or more times in the past year (as opposed to having no history of the behaviour). It is possible that these individuals report less emotion regulation difficulties because their self-injurious behaviour proved effective in regulating their emotions, in turn strengthening their belief in NSSI as an emotion regulatory strategy. In addition, those who believed that NSSI would assist with emotion regulation and had low self-efficacy to resist NSSI were likely to have self-injured more than five times in the past year (as opposed to having no history of the behaviour). This may capture those who have found self-injury to be effective at emotion regulation and therefore have less belief in their ability to resist engaging in the behaviour.

People who expected NSSI to enable communication were less likely to have a history of self-injury than those who did not, which may suggest that those who report a history of NSSI have not found the behaviour to facilitate effective communication. This finding might also capture the stigma surrounding NSSI in which self-injurious behaviour is thought to be manipulative or attention seeking (Park et al., 2020). For instance, those without a history of self-injury may endorse communication expectancies if they believe that people self-injure in an attempt to influence others. In reality, NSSI is often a private behaviour (Klonsky et al., 2014), and it is estimated that less than half of those who have engaged in NSSI have sought help for the behaviour (Martin et al., 2010). Those who expected NSSI to facilitate communication were less likely to have self-injured less than five times in the past year (as opposed to having no history of the behaviour), and this effect was stronger among those with fewer emotion regulation difficulties. This is in line with prior research which demonstrates that individuals who have never self-injured are more likely to expect communication from the behaviour (Dawkins et al., 2019a; Hasking & Boyes, 2018), and are less likely to have emotion regulation difficulties (Wolff et al., 2019), than those who have a history of self-injury.

Individuals who had self-injured less than five times in the past year were less likely to expect pain from NSSI compared to those who had no history of the behaviour, consistent with reports that some individuals do not experience physical pain during NSSI (Selby et al., 2019). Conversely, those who held stronger expectations of pain were more likely to have a history of self-injury, and more likely to self-injure frequently, if they also had little belief in their ability to resist the behaviour. This interaction may suggest that some people self-injure with the intention of inflicting pain, consistent with theories of NSSI which suggest that the experience of physical pain serves to reduce or distract from emotional pain (Selby & Joiner,

2009). However, as we did not ask participants to evaluate their experience of pain during NSSI these interpretations are purely speculative.

That outcome expectancies are associated with NSSI history may highlight their potential as targets for treatment and prevention/intervention programs for self-injurious behaviour. It has previously been suggested that NSSI-specific outcome expectancies could be targets for intervention programs (Dawkins et al., 2019a) similar to expectancy challenges targeting risky drinking (Labbe & Maisto, 2011). For example, informing individuals of the negative outcomes associated with NSSI, such as feelings of shame (Mahtani et al., 2019), self-stigmatisation (Piccirillo et al., 2020), and long-term decreases in emotion regulation ability (Robinson et al., 2019), could serve to counter the belief that self-injury is an effective emotion regulation strategy by highlighting the ways in which the behaviour can contribute to negative affect over time, despite being an effective strategy in the short term. Challenging outcome expectancies in this way may assist those who currently self-injure to resist the behaviour in future or prevent at-risk individuals from engaging in the behaviour in the first instance.

Although not the key focus of this study, the finding that emotion regulation difficulties interacted with self-efficacy to resist NSSI in explaining NSSI history is noteworthy. Prior research has established that people with greater emotion regulation difficulties are more likely to have a history of NSSI; however, the current findings suggest that this is only true for those who have little belief in their ability to resist self-injury. One explanation may lie in the use of alternate emotion regulation strategies. Prior research has shown that the use of emotion regulation strategies can differentiate individuals based on their NSSI history (Dawkins et al., 2019b; Hasking et al., 2008; Williams & Hasking, 2010). As such, individuals with high emotion regulation difficulties, and high self-efficacy to resist

NSSI, may be less likely to self-injure because they are using in alternative strategies w to regulate unwanted emotions.

That the relationship between emotion regulation difficulties and NSSI history is weakened with greater self-efficacy to resist NSSI again highlights self-efficacy as a potential protective factor against self-injury, which could have implications for treatments and interventions targeting the behaviour. Many interventions used in the treatment of self-injury focus on improving emotion regulation ability, such as cognitive behavioural therapy and dialectical behaviour therapy (Hawton et al., 2016). Future interventions might be strengthened by looking to improve self-efficacy to resist NSSI alongside the promotion of emotion regulation ability, although more research into the nature of the relationship between these constructs is needed.

Limitations and Directions for Future Research

The findings of this study should be considered with some limitations in mind. Firstly, the data comes from a self-selected, convenience sample which may limit the generalisability of the findings. Secondly, though the current study has served to confirm an association between the variables of interest, the use of cross-sectional data does not allow conclusions regarding the temporal sequencing of these relationships. Longitudinal methods could be utilised to investigate whether changes in emotion regulation difficulties and self-efficacy are associated with changes in the frequency or severity of NSSI. It is plausible that a decrease in emotion regulation difficulties might bolster an individual's belief in their ability to resist self-injury as an emotion regulatory strategy, thus seeing a reduction in the behaviour. Conversely, if a person strengthens their self-efficacy to resist NSSI, and in turn reduces the frequency with which they engage in the behaviour as an emotion regulatory strategy, this might strengthen their evaluation of their overall emotion regulation ability. In addition, ecological momentary assessment (EMA) studies could be used to investigate whether

outcome expectancies and/or levels of self-efficacy to resist NSSI differ before and after an

NSSI session.

Conclusion

In investigating the relationships between NSSI-specific outcome expectancies and

NSSI history, and the moderating roles of emotion regulation difficulties and self-efficacy to

resist NSSI, this study has provided support for the premise that these factors work in concert

to explain self-injurious behaviour. Overall, these findings support the combined

consideration of emotion regulation and NSSI-specific cognitions in understanding NSSI and

allow us to offer suggestions for future research that might be used to inform treatments and

interventions targeting self-injurious behaviour.

References

Aiken, L. S., & West, S. G. (1996). *Multiple regression: testing and interpreting interactions*. Sage Publications.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.).

Andover, M. S., & Morris, B. W. (2014). Expanding and Clarifying the Role of Emotion Regulation in Nonsuicidal Self-Injury. *The Canadian Journal of Psychiatry, 59*(11), 569-575. https://doi.org/10.1177/070674371405901102

Bandura, A. (1989). Human Agency in Social Cognitive Theory. *American Psychologist, 44*(9), 1175-1184. https://doi.org/10.1037/0003-066X.44.9.1175

Bandura, A. (1997). *Self-efficacy: the exercise of control.* W. H. Freeman.

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*, 72-88. https://doi.org/10.1016/j.cpr.2015.02.006

Czyz, E. K., Bohnert, A. S. B., King, C. A., Price, A. M., Kleinberg, F., & Ilgen, M. A. (2014). Self-Efficacy to Avoid Suicidal Action: Factor Structure and Convergent Validity among Adults in Substance Use Disorder Treatment. *Suicide and Life-Threatening Behavior, 44*(6), 698-709. https://doi.org/10.1111/sltb.12101

Dawkins, J. C., Hasking, P. A., & Boyes, M. E. (2019a). Thoughts and beliefs about nonsuicidal self-injury: An application of social cognitive theory. *Journal of American College Health*, 1-7. https://doi.org/10.1080/07448481.2019.1679817

Dawkins, J. C., Hasking, P. A., Boyes, M. E., Greene, D., & Passchier, C. (2019b). Applying a cognitive-emotional model to nonsuicidal self-injury. *Stress Health, 35*(1), 39-48. https://doi.org/10.1002/smi.2837

Hasking, P., & Boyes, M. (2018). The Non-Suicidal Self-Injury Expectancy Questionnaire: Factor structure and initial validation. *Clinical Psychologist, 22*(2), 251-261. https://doi.org/10.1111/cp.12127

Hasking, P., Momeni, R., Swannell, S., & Chia, S. (2008). The Nature and Extent of Non-Suicidal Self-Injury in a Non-Clinical Sample of Young Adults. *Archives of Suicide Research, 12*(3), 208-218. https://doi.org/10.1080/13811110802100957

Hasking, P., & Rose, A. (2016). A Preliminary Application of Social Cognitive Theory to Nonsuicidal Self-Injury. *Journal of Youth and Adolescence, 45*(8), 1560-1574. https://doi.org/10.1007/s10964-016-0449-7

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

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

International Society for the Study of Self-injury. (2020). *What is self-injury?* https://itriples.org/about-self-injury/what-is-self-injury.

Kaufman, E. A., Xia, M., Fosco, G., Yaptangco, M., Skidmore, C. R., & Crowell, S. E. (2015). The Difficulties in Emotion Regulation Scale Short Form (DERS-SF): Validation and Replication in Adolescent and Adult Samples. *Journal of psychopathology and behavioral assessment, 38*(3), 443-455. https://doi.org/10.1007/s10862-015-9529-3

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., Claes, L., Mortier, P., Auerbach, R. P., Boyes, M., Cuijpers, P.,

    Demyttenaere, K., Green, J. G., Kessler, R. C., Nock, M. K., & Bruffaerts, R. (2018).

    The DSM-5 nonsuicidal self-injury disorder among incoming college students:

    Prevalence and associations with 12-month mental disorders and suicidal thoughts and

    behaviors. *Depression and Anxiety, 35*(7), 629-637. https://doi.org/10.1002/da.22754

Klonsky, E. D., & Glenn, C. R. (2009). Assessing the Functions of Non-suicidal Self-injury:

    Psychometric Properties of the Inventory of Statements About Self-injury (ISAS).

    Journal of Psychopathology and Behavioral Assessment, 31(3), 215-219.

    https://doi.org/10.1007/s10862-008-9107-z

Klonsky, E. D., & Olino, T. M. (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

Labbe, A. K., & Maisto, S. A. (2011). Alcohol expectancy challenges for college students: A

    narrative review. *Clinical Psychology Review, 31*(4), 673-683.

    https://doi.org/10.1016/j.cpr.2011.02.007

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, G., Swannell, S., Harrison, J., Hazell, P., & Taylor, A. (2010). *The Australian National Epidemiological Study of Self-Injury (ANESSI)*. Centre for Suicide Prevention Studies. https://doi.org/10.13140/RG.2.2.18687.30887

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

Park, Y., Mahdy, J. C., & Ammerman, B. A. (2020). How others respond to non-suicidal self-injury disclosure: A systematic review. *Journal of Community & Applied Social Psychology*. https://doi.org/10.1002/casp.2478

Piccirillo, M. L., Burke, T. A., Moore-Berg, S. L., Alloy, L. B., & Heimberg, R. G. (2020). Self-Stigma Toward Nonsuicidal Self-Injury: An Examination of Implicit and Explicit Attitudes. *Suicide and Life-Threatening Behavior*. https://doi.org/10.1111/sltb.12640

Robinson, K., Garisch, J. A., Kingi, T., Brocklesby, M., O'Connell, A., Langlands, R. L., Russell, L., & Wilson, M. S. (2019). Reciprocal Risk: the Longitudinal Relationship between Emotion Regulation and Non-suicidal Self-Injury in Adolescents. *Journal of Abnormal Child Psychology, 47*(2), 325-332. https://doi.org/10.1007/s10802-018-0450-6

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, 13*(3), 219-229. https://doi.org/10.1037/a0015687

Selby, E. A., Kranzler, A., Lindqvist, J., Fehling, K. B., Brillante, J., Yuan, F., Gao, X., & Miller, A. L. (2019). The Dynamics of Pain During Nonsuicidal Self-Injury. *Clinical Psychological Science, 7*(2), 302-320. https://doi.org/10.1177/2167702618807147

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

Whitlock, J., Muehlenkamp, J., Eckenrode, J., Purington, A., Baral Abrams, G., Barreira, P.,

    & Kress, V. (2013). Nonsuicidal Self-Injury as a Gateway to Suicide in Young Adults.

    Journal of Adolescent Health, 52(4), 486-492.

    https://doi.org/10.1016/j.jadohealth.2012.09.010

Williams, F., & Hasking, P. (2010). Emotion Regulation, Coping and Alcohol Use as

    Moderators in the Relationship Between Non-Suicidal Self-Injury and Psychological

    Distress. *11*(1), 33-41. https://doi.org/10.1007/s11121-009-0147-8

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

Table 1

Descriptive Statistics and Correlations for All Variables

Variable	M(SD)			Correlations									
	Never (n = 606)	<5 Times (n = 302)	≥5 Times (n = 96)	1	2	3	4	5	6	7	8	9	10
1. Recruitment method[a]	-	-	-	-									
2. Age	20.46(1.81)	20.66(1.99)	20.38(2.10)	.05	-								
3. Gender[a]	-	-	-	.10**	-.08*	-							
4. Affect regulation expectancies	8.74(3.46)	11.69(3.35)	12.70(3.38)	-.07*	.04	.09**	-						
5. Negative social outcomes expectancies	13.19(3.78)	13.21(3.79)	13.85(3.95)	-.07*	.07*	-.09**	.17***	-					
6. Communication expectancies	10.82(3.02)	8.98(3.12)	8.73(3.04)	-.01	.00	-.10**	.15***	.17***	-				
7. Pain expectancies	16.93(2.99)	15.10(2.54)	15.41(3.11)	-.05	-.01	-.10**	-.41***	.14***	.07*	-			
8. Negative self-beliefs expectancies	14.55(3.24)	14.16(3.08)	14.47(3.33)	-.05	.03	.04	.01	.46***	.22***	.30***	-		
9. Self-efficacy to resist NSSI	29.03(7.84)	23.76(8.22)	14.78(6.77)	.06	-.03	-.07*	-.41***	-.10**	.10**	.21***	-.03	-	
10. Emotion regulation difficulties	41.93(11.93)	49.34(12.48)	57.05(12.62)	-.08*	.01	.076*	.28***	.17***	-.07*	-.19***	.15***	-.42***	-

[a] = Point-biserial correlations.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 2

Multinomial Logistic Regression Results Predicting NSSI Frequency

	<5 Times[a]		≥5 Times[a]		≥5 Times[b]	
	B	OR	B	OR	B	OR
Control Variables						
Gender	-.70[***]	.50	-.31	.74	.40	1.49
Recruitment Method	.07	1.07	.65[**]	1.92	.58[*]	1.79
Main Effects						
Affect regulation expectancies	1.14[***]	3.11	1.52[***]	4.55	.38[**]	1.46
Negative social outcomes expectancies	-.06	.95	-.01	.99	.04	1.04
Communication expectancies	-1.04[***]	.36	-1.24[***]	.29	-.20	.82
Pain expectancies	-.34[***]	.71	-.23	.80	.12	1.12
Negative self-beliefs expectancies	.16	1.17	.24	1.28	.08	1.09
Emotion regulation difficulties	.39[***]	1.48	.74[***]	2.10	.35[*]	1.42
Self-efficacy to resist NSSI	-.25[*]	.78	-1.48[***]	.23	-1.23[***]	.29
Two-way Interactions						
Emotion regulation difficulties x Self-efficacy to resist NSSI	-.24[*]	.79	-.37[*]	.69	-.13	.88

	<5 Times[a]		≥5 Times[a]		≥5 Times[b]	
	B	OR	B	B	OR	B
Affect regulation x Emotion regulation difficulties	-.24	.79	-.48**	.62	-.25	.78
Negative social outcomes x Emotion regulation difficulties	-.06	.95	-.08	.92	-.02	.98
Communication x Emotion regulation difficulties	.28*	1.32	.20	1.22	-.08	.92
Pain x Emotion regulation difficulties	.10	1.11	-.01	.99	-.11	.90
Negative self-beliefs x Emotion regulation difficulties	.17	1.19	.32	1.38	.15	1.17
Affect regulation x Self-efficacy to resist NSSI	-.20	.82	-.49*	.61	-.29	.75
Negative social outcomes x Self-efficacy to resist NSSI	.25	1.29	.27	1.31	.02	1.02
Communication x Self-efficacy to resist NSSI	.06	1.07	-.17	.84	-.24	.79
Pain x Self-efficacy to resist NSSI	-.53***	.59	-.93***	.39	-.41*	.67
Negative self-beliefs x Self-efficacy to resist NSSI	-.02	.98	.35	1.43	.37	1.45

[a]Reference = never; [b]Reference = <5 Times

* $p < .05$, ** $p < .01$, *** $p < .001$

Figure 1. Self-efficacy to resist NSSI moderated the relationships between emotion regulation difficulties, affect regulation expectancies, pain expectancies, and NSSI history.

Figure 2. Emotion regulation difficulties moderated the relationships between affect regulation expectancies, pain expectancies, and NSSI history