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Identity, self-blame, and body regard in NSSI: A test of moderated-mediation

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Abstract

Background: Prior work suggests that an unstable identity is an important developmental factor impacting risk for non-suicidal self-injury (NSSI), partly because it can foster lowered self-esteem and self-blame coping styles. Theoretical models suggest that how one regards the self, including experiences of and reactions to one's body (e. g., body regard), impact how factors such as identity instability and coping styles influence NSSI behavior. This study tested whether body regard moderated the mediational effect of self-blame coping on the relationship between poor self-concept clarity and past-year NSSI.

Methods: A sample of 1906 university students had complete data from an anonymous online questionnaires measuring self-concept clarity, self-blame coping, and past-year NSSI behaviors.

Results: Past-year NSSI was reported by 23.5% of the sample. Moderated mediational regression analyses using the PROCESS macro for SPSS were run. Body regard significantly moderated the effects of self-blame coping and poor self-concept clarity on NSSI such that neither risk factor was associated with NSSI when body regard was high. Poor self-concept clarity also retained a significant, although weakened, direct relationship with NSSI in the full model.

Conclusions: Positive body regard is protective and appears to mitigate the strength of the relationships between poor self-concept clarity and self-blame coping on past year NSSI. When body regard is low or average, poor self-concept clarity is associated with increased NSSI, partly

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through the effect of self-blame coping. Treatments that address body- and self-perceptions related to self-concept may enhance the effectiveness of interventions used to reduce NSSI behavior.

Keywords

NSSI; Body regard; Identity; Self-concept clarity; Self-blame; Self-punishment

1. Introduction

Nonsuicidal self-injury (NSSI; intentional damage of body tissue without suicidal intent) is a problem worldwide, affecting around 18% of adolescents and young adults during the lifetime, with past year rates estimated to range from 8% to 18% [21,46,34]. Despite knowledge that NSSI commonly begins in adolescence (12–14 years-of-age; [51,62]) attention to how developmental phenomena, like identity and self-concept, may contribute to NSSI risk, are understudied [11,18,72]. Identity formation is a core developmental task during adolescence and into young adulthood [1], wherein adolescents grow to understand themselves through their interactions with others and their environment [16]. Erikson believed that successful navigation of adolescence results in the development of a clear and coherent sense of self. In contrast, difficulties reconciling conflicting self-presentations results in identity instability and possible mental health challenges [16,35,72].

In line with this, a growing body of literature links identity difficulties to mental health conditions including eating disorders [70,71], compulsive hoarding [13], and NSSI [11,19]. High self-concept clarity (SCC), an index of identity stability has been associated with psychological adjustment and well-being [55]; whereas low SCC has been related to poorer overall well-being, and body dissatisfaction [67-69]. While SCC refers to the stability and coherency of self-beliefs, it is often related to self-concept content like self-esteem and positive self-perceptions. An unstable sense of self may contribute to more negative self-perceptions as studies have found associations between poor SCC and lower self-esteem (an affective evaluation of self) and reduced self-certainty [75,76], which are theorized to leave individuals vulnerable to negative self-appraisals. Recent work has also shown connections between poor SCC and NSSI [57,65,66]. In a sample of 147 college students, Lear and Pepper [39] found that NSSI engagement and severity was associated with lower SCC. SCC also fully mediated the relationship between emotion dysregulation and NSSI versatility, suggesting that a stable sense of self plays a protective role in the context of emotion regulation challenges [39]. Furthermore, Scala et al. [57] found that SCC moderated the effects of negative affect on NSSI urges within a 21-day EMA study, with negative affect no longer predicting NSSI urges when SCC was high. These studies provide preliminary evidence that SCC may be an important factor to consider in the development of NSSI, possibly through its effect on other risk factors like negative affect, emotion regulation processes, and self-perception.

The potential salience of self-concept for understanding NSSI risk is further highlighted by the Benefits and Barriers Model [29]. This model centers the protective role of self-regard, and by contrast, the risk conferred through negative self-perceptions such as self-criticism. It describes that low self-regard decreases natural barriers to NSSI because it increases

vulnerability to self-criticism, self-blame, and self-hate. This self-criticism, in turn, makes it easier to direct harm towards the body. Empirical evidence supports this proposition, with multiple studies showing a strong relationship between self-criticism and NSSI [22,30,77]. The model further proposes that the self-criticism fuels self-punishment motivations driving NSSI behavior. Self-punishment is one of the most commonly endorsed functions of NSSI and research has shown a strong relationship between self-criticism, self-punishment, and NSSI [8,40]. As such, self-blame coping, the attribution that the self is at fault and merits punishment, may exacerbate risk for NSSI when individuals experience poor SCC because it accounts for the gratification of self-punishment motivations. In line with this, self-blame coping has been directly associated with greater risk of NSSI engagement [25,32,33]. While several studies have shown that self-blame mediates the relationship between risk factors (e.g., negative life events, childhood neglect) and mental health conditions (e.g., internalizing conditions, depression) [60,64] including the relationship between child maltreatment and NSSI [61], few studies have examined the potential mediating role of self-blame on the relationship between identity factors (like poor SCC) and NSSI behaviors.

Attitudes and experiences of the body are also central in the process of identity development [36,54] and negative body attitudes may both contribute to, and be exacerbated by, identity difficulties [31,74]. Indeed, Erikson referred to identity synthesis as a "feeling of being home in one's body" ([16], p. 165). Negative body experiences have been shown to mediate the effects of identity and self-concept difficulties on psychopathology including disorders that co-occur at high rates with NSSI like bulimia nervosa [54]. In addition, some individuals have proposed that negative body attitudes and experiences moderate the effects of known risk factors to help explain why some people choose the body as a target when coping with identity confusion or self-blame/punishment thoughts [53,73]. Muehlenkamp and Brausch [47] has described the concept of body regard, a multifaceted construct consisting of attitudes towards and experiences with the body including subjective satisfaction, perceptions of athleticism, respect for, and sense of connection to or ownership of the body; suggesting that poor body regard may represent a necessary but not sufficient factor for NSSI to occur.

There is growing evidence that poor body regard is associated with NSSI [7,28,56] and longitudinally predicts NSSI behavior [3,15]. Furthermore, body regard mediates, and moderates, relationships between NSSI and well-established risk factors. For example, in a study of 284 clinical and non-clinical adolescents, body image (a facet of body regard) significantly mediated the relationship between negative affect and NSSI [47]. Similarly, within a sample of 422 women seeking treatment for eating disorders, Muehlenkamp et al. [49] found that body dissatisfaction was a mediator of the effect of low self-esteem on NSSI after accounting for effects of trauma and psychopathology within a complex model of risk [49]. Finally, within a sample of undergraduate students, body regard moderated the relationship between emotion dysregulation and NSSI frequency [50] such that emotion dysregulation was only associated with NSSI when body regard was low. This work suggests that body *disregard* may be a critical factor explaining the occurrence of NSSI by impacting the effect of other known risk factors, whereas positive body regard may be protective. However, the moderating effect of body regard on risk factors for NSSI represents an understudied area.

The present study aims to integrate the literature regarding the role of identity instability (e.g., poor self-concept) and self-criticism/self-blame coping on NSSI and extend it to examine the potential moderating effects of body regard within a model of risk (see Fig. 1). Consistent with the Benefits and Barriers framework [29], we tested a hypothesis specifying that self-blame coping would *partially* mediate the relationship between poor SCC and past year NSSI frequency (H1), and that body regard would moderate the mediational effect of self-blame coping between SCC and NSSI frequency (H2), as well as the direct effect of SCC on NSSI (H3). Given the well-established connections between poor SCC, self-blame, and emotional distress [60,64], we included a single variable measuring symptoms of depression and anxiety as a covariate in the model.

2. Methods and materials

2.1. Participants

Participants included 2058 young adults ($M_{age} = 19.52$, SD = 2.31) attending an undergraduate university in the Midwest region of the United States, recruited from a random sample of 5500 enrolled students (37.4% response rate). Approximately half the sample (52%) consisted of 1st-year (freshman) students, followed by 23% who were sophomores, 13.2% juniors, and 11.7% were in their senior year. Within the sample, 78.2% identified as female and 92.3% as White, reflecting the demographic composition of the university from which the sample was obtained. Five percent of participants endorsed Hispanic/Latinx ethnicity, 4.4% identified as Asian/Pacific Islander, 2.3% as multi-racial, 0.5% as Native American, and another 0.5% identified as Black. Just under a quarter of the sample (24.3%) reported being prescribed medication for an emotional/psychiatric disorder and 8% reported having been hospitalized overnight for psychiatric reasons at least once. Past year NSSI was reported by 23.5% (n = 448) of the sample, with a mean frequency of 3.69 (SD = 2.58) which corresponds with injuring oneself approximately once a month on the NSSI scale used (see below; range 5.8% = every day to 19.7% = once in past year). Of those reporting past year NSSI, cutting was the most endorsed method (51.5%), followed by banging/self-hitting (46.5%), skin abrasion/severe scratching/carving (38.2%), and burning (19.5%).

2.2. Procedure

An email inviting potential participants to complete a psychology study about "mental health and behaviors" was sent to a random sample of 5500 enrolled student email addresses obtained from the university registrar. A link to the anonymous study survey was provided within the email. Upon clicking the study link, interested participants saw an informed consent document/screen where they had to indicate consent to access the study questionnaires. Participants completed a series of questionnaires assessing the study variables using Qualtrics software. All measures were randomly presented across participants to control for ordering effects and study fatigue. All questionnaires were completed anonymously, and participants were provided with national mental health support resources on the final screen of the survey. Participants who completed the study could enter their contact information in a separate survey document for 1 of 100, \$5 amazon gift cards. All study procedures received ethics approval form the IRB affiliated with the second author.

2.3. Measures

2.3.1. Self-concept/identity—We used the 12-item Self-concept Clarity Scale [9] as our measure of identity. Items evaluate individuals' sense of self and stability of identity (e.g., *I have a clear sense of who I am and what I am*; *Even if I wanted to, I don't think I could tell someone what I'm really like (reversed)*). Participants indicate how much they agree with each statement using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A total scale score is calculated by averaging item response values. To ease interpretation of the data, items in the current study were scored so that high scores indicated *poor* SCC. The Self-concept Clarity Scale has demonstrated strong validity and reliability across a variety of samples [9,10]. Internal consistency of the scale within the current sample was strong, $\alpha = 0.875$ and McDonald's Omega (ϖ) = 0.955.

2.3.2. Self-blame coping style—The four items comprising the self-blame subscale of the Cognitive Emotion Regulation Questionnaire (CERQ; [20]) were used. The full CERQ is a 36-item measure of adaptive and maladaptive cognitive-emotion regulation strategies, with each item being rated on a 5-point scale ranging from 1 (almost never) to 6 (almost always). The self-blame subscale is comprised of four items evaluating the tendency to engage in self-blame coping (e.g., *I think that basically the cause must lie within myself*). The CERQ is widely used and has well-established validity and reliability [20]. Within the current sample, an internal consistency of $\alpha = 0.841$; McDonald $\varpi = 0.844$ was observed indicating strong reliability.

2.3.3. Body regard—The Body Regard Scale (BRS; [51]) consists of 21 items assessing four domains: body acceptance, body disconnection, body care, and athleticism. Participants indicate the extent to which they agree with each item on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Factor analyses support the 4-factor model as well as a unified, single-factor total scale score that demonstrated invariance across male and female participants supporting validity [51]. In the current study, a total scale score was calculated by averaging response values to each item, so higher scores indicated positive body regard. Internal consistency was $\alpha = 0.868$; McDonald $\varpi = 0.879$ in the current sample.

2.3.4. Non-suicidal self-injury—Past year frequency of NSSI and the specific methods engaged in were assessed with two items from section I of the Inventory of Statements About Self-Injury [37]. The frequency item inquired about number of NSSI acts in the prior 12-months with eleven categorical response items ranging from "every day" (11) to "2–3 times per month" (5) to "once in past year" (1). Those who reported no NSSI in the past year were coded zero (0). A second item inquired about whether the individual had engaged in any of 12 common methods of NSSI including cutting, burning, banging/hitting self, and severe skin scratching/abrading during the past year.

2.3.5. Depression, anxiety, stress—We used the Depression, Anxiety, Stress-short form [27,42] to assess our covariates. The DASS consists of 21 statements measuring symptoms of depression, anxiety, and stress. Participants indicated how much each symptom applied to them in the past month on a 4-point scale ranging from 1 (did not apply to me

at all) to 4 (applied to me very much, or most of the time). A total scale score is calculated by averaging the response values so that higher values indicate greater distress. The internal consistency of items in the current sample was strong ($\alpha = 0.939$; McDonald $\varpi = 0.939$).

3. Data analysis plan

Data quality was checked prior to any study analyses. Validity check items were embedded within the study questionnaires resulting in 81 participants being removed and another 71 participants had over 60% incomplete data so were removed, leaving a final sample size of 1906 used in analyses. Inspection of the study variables revealed low amounts of missing data across variables (1–4.9%) and Little's MCAR test indicated data was missing at random, $\chi^2_{(97)} = 116.55$, p > .08. Missing data was replaced with the mean value within each variable. Each variable showed acceptable distributions (skew = 0.11 to 2.78; kurtosis = -0.41 to 7.78). Bivariate correlations were calculated among the study variables.

A moderated mediation regression analysis with 5000 bootstrapped bias corrected sampling was run using [26] PROCESS macro (model 15) for SPSS to evaluate the study hypotheses. Following convention, we first tested whether the mediated effect was different from zero using bootstrapping and 95% confidence intervals where a significant effect is indicated by confidence intervals that do not cross zero [26]. Next, we tested a moderated mediational model specifying body regard as a moderator of both the indirect effect of self-blame and the direct effect of poor SCC on past year frequency of NSSI. The total scale score of the DASS was included as a covariate in all analyses.

4. Results

Means, standard deviations and correlations are presented in Table 1. All study variables were significantly correlated with each other in the expected directions (r = -0.205 to 0.529).

As hypothesized, self-blame coping partially mediated the effect of poor SCC on past year NSSI frequency (indirect effect: $\beta = 0.056$, SE = 0.02, 95% CI = 0.026, 0.089) explaining 10.7% of the variance in NSSI. Poor SCC retained a significant, albeit reduced, main effect on past year NSSI frequency (path C' $\beta = 0.225$, SE = 0.06, t = -3.82, p < .001, 95% CI = 0.110, 0.341) with the mediator self-blame in the model. Self-blame also had a significant direct relationship with NSSI ($\beta = 0.167$, SE = 0.04, t = 3.83, p < .001, 95% CI = 0.079, 0.245).

Next, we investigated whether body regard moderated the mediational effect of self-blame as well as the direct effect of poor SCC on past year NSSI frequency. The results indicated that the full model was significant, $F_{(6, 1899)} = 43.19$, p < .001, explaining 12.01% of variance in NSSI. The interaction of body regard and self-blame was significant ($\beta = -0.163$, SE = 0.07, p < .02, 95% CI: -0.291, -0.034) and is depicted in Fig. 2. The indirect effect of poor SCC on past year NSSI frequency through self-blame coping was conditional at different levels of body regard (index of moderated mediation, $\beta = -0.056$, SE = 0.03, 95% CI: -0.109, -0.007). Specifically, the indirect effect of poor SCC through self-blame on NSSI

was strongest when body regard was low ($\beta = 0.086$, SE = 0.024, 95% CI: 0.040, 0.137), moderate at average levels of body regard ($\beta = 0.053$, SE = 0.015, 95% CI: 0.025, 0.086), and non-significant at high body regard ($\beta = 0.021$, SE = 0.018, 95% CI: -0.015, 0.057), suggesting that high body regard buffers the mediational effects of self-blame coping on NSSI.

In addition, the interaction between poor SCC and body regard in predicting past year NSSI frequency was also significant ($\beta = -0.274$, SE = 0.09, t = -3.018, p < .01, 95% CI: -0.452, 0.096). As depicted in Fig. 3, poor self-concept was associated with higher past year NSSI frequency when body regard was low ($\beta = 0.384$, SE = 0.084, 95% CI: 0.218, 0.549) or average ($\beta = 0.225$, SE = 0.063, 95% CI: 0.102, 0.348) but not when body regard was high ($\beta = 0.066$, SE = 0.080, 95% CI: -0.090, 0.222), suggesting that high body regard protects against the negative effects of poor SCC on NSSI. The DASS covariate also contributed a unique, significant effect on NSSI (b = 0.234, SE = 0.04, 95% CI: 0.161, 0.307) within the full model.

5. Discussion

Our study hypotheses were supported, contributing empirical evidence that body regard acts as a moderator of the effect of self-blame coping on the relationship between poor SCC and past year NSSI frequency. Specifically, we found that high levels of body regard were protective, mitigating the strength of the relationships between poor SCC *and* self-blame coping on past year NSSI frequency. In contrast, increased frequency of past year NSSI frequency was significantly associated with poor SCC and self-blame coping only when body regard was average or low. These results are consistent with prior studies also reporting that risk factors such as negative affect and emotion dysregulation related to NSSI only when there was lowered body regard [47,50]. Furthermore, in the current study, the mediational effect of self-blame coping was not significant when high levels of body regard were endorsed, suggesting that positive body perceptions can reduce the impact of risk factors for NSSI. Together these findings provide additional evidence for the protective effect of positive body regard, and support theoretical notions that body perceptions are critical components to consider in risk and treatment models of NSSI [47,53].

These findings also provide support for, and extend, the theoretical explanations of risk for NSSI outlined by the Benefits and Barriers Model [29]. Consistent with this model, our results support the idea that compromised self-perceptions, in this case low SCC, are associated with increased NSSI behavior [29]. Further, this risk may be especially heightened when individual barriers (positive self-regard) are not intact, and benefits of the behavior are recognized (fulfilling self-punishment gratifications through self-blame coping). The mediational role of self-blame coping observed in our study supports this theoretical explanation of NSSI risk. As described in the literature, poor SCC is associated with lower self-regard/self-esteem, possibly due to a lack of self-understanding [4,76], that may perpetuates the self-directed frustrations that can manifest as self-criticism or self-blame coping. The aversive internal experiences caused by the self-blame coping or self-criticism motivates the NSSI urges, and results in the behavior when protective barriers

like body regard are weak. All of these theorized relationships were supported within our current findings, suggesting the Benefits and Barriers model of NSSI has merit.

This work also contributes to the growing literature emphasizing the importance of developmental factors such as identity/SCC in explanations of NSSI etiology and onset. While self-blame coping may partially explain the relationship between poor SCC and NSSI, SCC retained a direct, unique effect on past year NSSI frequency in our sample. This is consistent with recent work finding that poor SCC plays a significant role in understanding NSSI engagement and severity [39,57], suggesting it is an important construct to consider in the assessment of risk. The fact that NSSI emerges around the same time as the developmental tasks related to identity formation, also underscores the potential salience of SCC in the trajectory of NSSI behaviors. As documented, self-concept is one of many components of identity influencing self-perceptions which are seen as integral to healthy psychological functioning. When there is instability, pathology such as NSSI is more likely [35]. Though a number of studies have shown that identity instability is linked to NSSI [11,18,19], a more nuanced understanding of how different facets of identity, including one's sexuality, physical appearance, an gender expression, are related to risk during, and beyond adolescence is needed. Such an understanding may provide further insight into the disproportionately high rates of NSSI seen in young people who report questioning their sexual identity and those in the LGBTQ community [12,18,59,63]. Future work should also explore the robustness of the association between NSSI and other identity-related variables, including cultural identity, among diverse samples.

The results from our study also have implications for clinical work. First, the growing consistency of findings showing positive body regard buffers risk conferred by other factors suggests the potential clinical utility of adding body acceptance practices and interventions to traditional treatments for NSSI. Since NSSI is a body-based behavior, therapies that are also body-focused and concentrated on mindful movement and body appreciation may strengthen body regard and subsequently reduce NSSI risk [73]. Ancillary therapies that involve the body, such as yoga, have been associated with improved symptoms for a variety of other conditions commonly comorbid with NSSI, such as depression and disordered eating [6,43]. In support of this recommendation, Muehlenkamp and Wagner [48] found that yoga practice was associated with decreased NSSI acts because of its effect on body acceptance, suggesting that body-acceptance focused practices may help reduce risk for NSSI. Additional research is needed to fully evaluate the potential of body-focused interventions for treating or preventing NSSI.

In addition to supporting the inclusion of innovative therapeutics focusing on improved body relationships, the current data further support the potential clinical utility of interventions aimed at strengthening self-concept and identity, reducing negative self-perceptions, and decreasing self-blame coping styles. Strengths-based therapies focusing on individual values and goals may have promise in identifying relatively stable dimensions of self-concept to build a more coherent and holistic sense of self. Moreover, meaning-focused therapies may be a useful complement to orient young people towards goals that foster meaningful lives that are consistent with their self-concept. Indeed, recent research supports the protective role of meaning in life on NSSI frequency in populations with eating disorders [44,45].

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Clinicians working with adolescents who engage in NSSI should explore identity early on in therapeutic encounters and consider activities and interventions that can assist young people in exploring and solidifying both self-concept content and clarity. Negative cognitive distortions are often a targeted in existing treatments for NSSI (e.g., CBT, DBT) and our findings, like others [17,30], suggest that focusing on coping with negative self-cognitions may reduce downstream effects of these targets on NSSI. There may be particular value in interventions aimed at reducing self-blame tendencies given the strong links between self-blame coping, self-punishment, and NSSI [8,40]. Compassion-oriented therapies – which maintain a focus on non-judgement and self-kindness [41,52] – may have promise in both reducing NSSI risk, and risk conferred through self-blame coping tendencies. Indeed, self-compassion has been implicated as an independent protective factor for NSSI in a number of studies [14,24]. Prior work has also shown that self-compassion has an inverse relationship to self-blame [23,58], and that self-blame is responsive to self-compassion treatment [2].

5.1. Limitations

While this work contributes a more nuanced understanding of NSSI risk and protection, there are some important limitations to note. First, the data for this study are cross-sectional and correlational, and therefore cannot provide insight into the causal role of SCC, selfblame, and body regard on NSSI risk. Additionally, self-report measures, which are subject to recall and social desirability biases, were used to assess key variables so they should be interpreted with this in mind and may have increased associations due to shared method variance. Third, while the study sample is large, it is relatively homogenous due to the population demographics sampled. Future work should seek to test these relationships in more racially and ethnically heterogeneous samples of young people, as well as within clinical and gender-identity diverse samples. Lastly, the model tested in this study was a preliminary step and did not include other widely supported correlates of NSSI risk such as the experience of childhood trauma, emotion dysregulation, or co-occurring psychopathology. Given prior work establishing connections between these risk factors, it would be worthwhile to test more complex models capable of discerning possible multiple mediation and/or moderation effects in future work. For example, recent work demonstrates that theory of mind deficits, which regard the ability of an individual to identify and attribute mental states to oneself or others, are connected to both NSSI and eating disorders [5,38]. Given the mounting evidence for risk correlates across NSSI and eating disorders, this would be another promising, and malleable, variable to explore in future work.

6. Conclusion

Attitudes towards, and experiences of, the body are not routinely considered in etiological or intervention models for NSSI, despite emerging evidence for their role in NSSI risk. The current study adds to a small, but growing literature supporting the importance, and protective effect, of positive body regard in understanding NSSI vulnerability. Consistent with the Benefits and Barriers Model, we found that poor self-perceptions related to increased NSSI through self-blame coping, but only when body regard was low or average. With high body regard, these robust risk factors no longer significantly related to NSSI frequency signaling the need to further consider how body-related variables fit into current

models of NSSI risk. In addition, there is a need for further work on identity-related developmental risk factors in studies of NSSI, as well as consideration of the interactive effects across identity, emotional-cognitive processes, and body regard in prevention and intervention strategies for NSSI.

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References

- Arnett JJ. Emerging adulthood: a theory of development from the late teens through the twenties. Am Psychol 2000;55(5):469–80. 10.1037/0003-066X.55.5.469. [PubMed: 10842426]
- [2]. Au TM, Sauer-Zavala S, King MW, Petrocchi N, Barlow DH, Litz BT. Compassion-based therapy for trauma-related shame and posttraumatic stress: initial evaluation using a multiple baseline design. Behav Ther 2017;48(2):207–21. 10.1016/j.beth.2016.11.012. [PubMed: 28270331]
- [3]. Black EB, Garratt M, Beccaria G, Mildred H, Kwan M. Body image as a predictor of nonsuicidal self-injury in women: a longitudinal study. Compr Psychiatry 2019;88: 83–9. 10.1016/j.comppsych.2018.11.010. [PubMed: 30529911]
- [4]. Boccagno C, Hooley JM. Understanding the "self" in nonsuicidal self-injury: a conceptual framework for future research. 2022.
- [5]. Bora E, Köse S. Meta-analysis of theory of mind in anorexia nervosa and bulimia nervosa: a specific impairment of cognitive perspective taking in anorexia nervosa? Int J Eat Disord 2016;49(8):739–40. 10.1002/eat.22572. [PubMed: 27425037]
- [6]. Borden A, Cook-Cottone C. Yoga and eating disorder prevention and treatment: a comprehensive review and meta-analysis 2020;28(4):400–37. 10.1080/10640266.2020.1798172.
- [7]. Brausch AM, Muehlenkamp JJ. Experience of the body. In: Non-suicidal self-injury in eating disorders. Berlin, Heidelberg: Springer; 2014. p. 237–53.
- [8]. Burke TA, Fox K, Kautz MM, Rodriguez-Seijas C, Bettis AH, Alloy LB. Self-critical and self-punishment cognitions differentiate those with and without a history of nonsuicidal selfinjury: an ecological momentary assessment study. Behav Ther 2021;52(3):686–97. 10.1016/ j.beth.2020.08.006. [PubMed: 33990242]
- [9]. Campbell JD, Trapnell PD, Heine SJ, Katz IM, Lavallee LF, Lehman DR. Self-concept clarity: measurement, personality correlates, and cultural boundaries. J Pers Soc Psychol 1996;70(1):141–56.
- [10]. Cicero DC. Measurement invariance of the self-concept clarity scale across race and sex. J Psychopathol Behav Assess 2020;42(2):296–305. 10.1007/s10862-019-09770-x.
- [11]. Claes L, Luyckx K, Bijttebier P. Non-suicidal self-injury in adolescents: prevalence and associations with identity formation above and beyond depression. Personal Individ Differ 2014;61–62:101–4. 10.1016/j.paid.2013.12.019.
- [12]. Claes L, Bouman WP, Witcomb G, Thurston M, Fernandez-Aranda F, Arcelus J. Nonsuicidal self-injury in trans people: associations with psychological symptoms, victimization, interpersonal functioning, and perceived social support. J Sex Med 2015;12(1):168–79. 10.1111/ jsm.12711. [PubMed: 25283073]
- [13]. Claes L, Müller A, Luyckx K. Compulsive buying and hoarding as identity substitutes: the role of materialistic value endorsement and depression. Compr Psychiatry 2016;68:65–71. 10.1016/ j.comppsych.2016.04.005. [PubMed: 27234185]
- [14]. Cleare S, Gumley A, O'Connor RC. Self-compassion, self-forgiveness, suicidal ideation, and self-harm: a systematic review. Clin Psychol Psychother 2019;26(5): 511–30. 10.1002/cpp.2372.
 [PubMed: 31046164]

- [15]. Duggan J, Heath N, Hu T. Non-suicidal self-injury maintenance and cessation among adolescents: a one-year longitudinal investigation of the role of objectified body consciousness, depression and emotion dysregulation. Child Adolesc Psychiatry Ment Health 2015;9(1):21. 10.1186/s13034-015-0052-9. [PubMed: 26157480]
- [16]. Erikson EH. Identity: youth and crisis. W. W. Norton & Company, Inc; 1968.
- [17]. Fox KR, Ribeiro JD, Kleiman EM, Hooley JM, Nock MK, Franklin JC. Affect toward the self and self-injury stimuli as potential risk factors for nonsuicidal self-injury. Psychiatry Res 2018;260:279–85. 10.1016/j.psychres.2017.11.083. [PubMed: 29223043]
- [18]. Gandhi A, Luyckx K, Maitra S, Claes L. Non-suicidal self-injury and identity distress in Flemish adolescents: exploring gender differences and mediational pathways. Personal Individ Differ 2015;82:215–20. 10.1016/j.paid.2015.03.031.
- [19]. Gandhi A, Luyckx K, Maitra S, Kiekens G, Verschueren M, Claes L. Directionality of effects between non-suicidal self-injury and identity formation: a prospective study in adolescents. Personal Individ Differ 2017;109:124–9. 10.1016/j.paid.2017.01.003.
- [20]. Garnefski N, Kraaij V, Spinhoven P. Negative life events, cognitive emotion regulation and emotional problems. Personal Individ Differ 2001;30(8):1311–27. 10.1016/ S0191-8869(00)00113-6.
- [21]. Gillies D, Christou MA, Dixon AC, Featherston OJ, Rapti I, Garcia-Anguita A, et al. Prevalence and characteristics of self-harm in adolescents: meta-analyses of community-based studies 1990– 2015. J Am Acad Child Adolesc Psychiatry 2018;57 (10):733–41. 10.1016/j.jaac.2018.06.018. [PubMed: 30274648]
- [22]. Glassman LH, Weierich MR, Hooley JM, Deliberto TL, Nock MK. Child maltreatment, nonsuicidal self-injury, and the mediating role of self-criticism. Behav Res Ther 2007;45(10):2483– 90. 10.1016/j.brat.2007.04.002. [PubMed: 17531192]
- [23]. Hamrick LA, Owens GP. Exploring the mediating role of self-blame and coping in the relationships between self-compassion and distress in females following the sexual assault. J Clin Psychol 2018. 10.1002/jclp.22730.jclp.22730.
- [24]. Hasking P, Boyes ME, Finlay-Jones A, McEvoy PM, Rees CS. Common pathways to NSSI and suicide ideation: the roles of rumination and self-compassion. Arch Suicide Res 2019;23(2):247– 60. 10.1080/13811118.2018.1468836. [PubMed: 29791304]
- [25]. Hauber K, Boon A, Vermeiren R. Non-suicidal self-injury in clinical practice. Front Psychol 2019;10:502. 10.3389/fpsyg.2019.00502. [PubMed: 30930814]
- [26]. Hayes AF. Introduction to mediation, moderation, and conditional process analysis: A regressionbased approach. Guilford publications; 2017.
- [27]. Henry JD, Crawford JR. The short-form version of the depression anxiety stress scales (DASS-21): construct validity and normative data in a large non-clinical sample. Br J Clin Psychol 2005;44(2):227–39. 10.1348/014466505X29657. [PubMed: 16004657]
- [28]. Hielscher E, Whitford TJ, Scott JG, Zopf R. When the body is the target—representations of one's own body and bodily sensations in self-harm: a systematic review. Neurosci Biobehav Rev 2019;101:85–112. 10.1016/j.neubiorev.2019.03.007. [PubMed: 30878499]
- [29]. Hooley JM, Franklin JC. Why do people hurt themselves? A new conceptual model of nonsuicidal self-injury. Clin Psychol Sci 2018;6(3):428–51. 10.1177/2167702617745641.
- [30]. Hooley JM St. Germain SA. Nonsuicidal self-injury, pain, and self-criticism: does changing self-worth change pain endurance in people who engage in self-injury? Clin Psychol Sci 2014;2(3):297–305. 10.1177/2167702613509372.
- [31]. Kamps CL, Berman SL. Body image and identity formation: the role of identity distress. Rev Latinoamericana Psicol 2011;43(2):267–77.
- [32]. Kelada L, Hasking P, Melvin G. Adolescent NSSI and recovery: the role of family functioning and emotion regulation. Youth Soc 2018;50(8):1056–77. 10.1177/0044118X16653153.
- [33]. Kiekens G, Hasking P, Boyes M. Measurement invariance of three brief emotion regulation questionnaires in people with and without a history of non-suicidal self-injury. Europ J Psychol Assessm 2019;35(6):835–41. 10.1027/1015-5759/a000464.
- [34]. Kiekens G, Hasking P, Bruffaerts R, Alonso J, Auerbach RP, Bantjes J, et al. Non-suicidal self-injury among first-year college students and its association with mental disorders: results

from the world mental health international college student (WMH-ICS) initiative. Psychol Med 2021:1–12.

- [35]. Klimstra TA, Denissen JJA. A theoretical framework for the associations between identity and psychopathology. Dev Psychol 2017;53(11):2052–65. 10.1037/dev0000356. [PubMed: 29094969]
- [36]. Kling J Being at home in one's body. In: Body image in light of identity development; 2019. http://hdl.handle.net/2077/60176.
- [37]. Klonsky ED, Glenn CR. Assessing the functions of non-suicidal self-injury: psychometric properties of the inventory of statements about self-injury (ISAS). J Psychopathol Behav Assess 2009;31(3):215–9. 10.1007/s10862-008-9107-z. [PubMed: 29269992]
- [38]. Laghi F, Terrinoni A, Cerutti R, Fantini F, Galosi S, Ferrara M, et al. Theory of mind in non-suicidal self-injury (NSSI) adolescents. Conscious Cogn 2016;43:38–47. 10.1016/ j.concog.2016.05.004. [PubMed: 27236355]
- [39]. Lear MK, Pepper CM. Self-concept clarity and emotion dysregulation in nonsuicidal self-injury. J Pers Disord 2016;30(6):813–27. 10.1521/pedi_2015_29_232. [PubMed: 26623533]
- [40]. Lear MK, Wilkowski BM, Pepper CM. A daily diary investigation of the defective self model among college students with recent self-injury. Behav Ther 2019;50(5): 1002–12. 10.1016/ j.beth.2019.03.005. [PubMed: 31422842]
- [41]. Leary MR, Tate EB, Adams CE, Batts Allen A, Hancock J. Self-compassion and reactions to unpleasant self-relevant events: the implications of treating oneself kindly. J Pers Soc Psychol 2007;92(5):887–904. 10.1037/0022-3514.92.5.887. [PubMed: 17484611]
- [42]. Lovibond SH, Lovibond PF. Manual for the depression anxiety stress scale. The Psychological Foundation of Australia; 1995.
- [43]. Macy RJ, Jones E, Graham LM, Roach L. Yoga for trauma and related mental health problems: a Meta-review with clinical and service recommendations. Trauma Violence Abuse 2018;19(1):35– 57. 10.1177/1524838015620834. [PubMed: 26656487]
- [44]. Marco JH, García-Alandete J, Pérez S. Meaning in life in eating disorders patients with nonsuicidal self injuries. Rev Argent Clín Psicol 2020;29(5):468. 10.24205/03276716.2020.1044.
- [45]. Marco JH, Gallego-Hernández de Tejada B, Guil en V, Baños RM, Pérez S. Meaning in life buffers the association between perceived burdensomeness, thwarted belongingness, and frequency of non-suicidal self-injuries in Spanish adolescents. J Clin Med 2021;10(21):4867. 10.3390/jcm10214867. [PubMed: 34768387]
- [46]. Monto MA, McRee N, Deryck FS. Nonsuicidal self-injury among a representative sample of US adolescents, 2015. Am J Public Health 2018;108(8):1042–8. 10.2105/AJPH.2018.304470. [PubMed: 29927642]
- [47]. Muehlenkamp JJ, Brausch AM. Body image as a mediator of non-suicidal self-injury in adolescents. J Adolesc 2012;35(1):1–9. 10.1016/j.adolescence.2011.06.010. [PubMed: 21777971]
- [48]. Muehlenkamp JJ, Wagner E. Yoga and self-injury: protective mediators. Body Image 2022. Submitted for publication.
- [49]. Muehlenkamp JJ, Claes L, Smits D, Peat CM, Vandereycken W. Non-suicidal self-injury in eating disordered patients: a test of a conceptual model. Psychiatry Res 2011;188(1):102–8. 10.1016/j.psychres.2010.12.023. [PubMed: 21216476]
- [50]. Muehlenkamp JJ, Bagge CL, Tull MT, Gratz KL. Body regard as a moderator of the relation between emotion dysregulation and nonsuicidal self-injury. Suicide Life Threat Behav 2013;43(5):479–93. 10.1111/sltb.12032. [PubMed: 23611413]
- [51]. Muehlenkamp JJ, Xhunga N, Brausch AM. Self-injury age of onset: a risk factor for NSSI severity and suicidal behavior. Arch Suicide Res 2019;23(4):551–63. 10.1080/13811118.2018.1486252. [PubMed: 29952739]
- [52]. Neff KD. The development and validation of a scale to measure self-compassion. Self Identity 2003;2(3):223–50. 10.1080/15298860309027.
- [53]. Orbach I, Lotem-Peleg M, Kedem P. Attitudes toward the body in suicidal, depressed, and normal adolescents. Suicide Life Threat Behav 1995;25(2):211–21. 10.1111/ j.1943-278X.1995.tb00920.x. [PubMed: 7570782]

- [54]. Palmeroni N, Claes L, Verschueren M, Bogaerts A, Buelens T, Luyckx K. Identity distress throughout adolescence and emerging adulthood: age trends and associations with exploration and commitment processes. Emerg Adulthood 2020;8 (5):333–43. 10.1177/2167696818821803.
- [55]. Parise M, Canzi E, Olivari MG, Ferrari L. Self-concept clarity and psychological adjustment in adolescence: the mediating role of emotion regulation. Personal Individ Differ 2019;138:363–5. 10.1016/j.paid.2018.10.023.
- [56]. Pérez S, Marco JH, Cañabate M. Non-suicidal self-injury in patients with eating disorders: prevalence, forms, functions, and body image correlates. Compr Psychiatry 2018;84:32–8. 10.1016/j.comppsych.2018.04.003. [PubMed: 29679850]
- [57]. Scala JW, Levy KN, Johnson BN, Kivity Y, Ellison WD, Pincus AL, et al. The role of negative affect and self-concept clarity in predicting self-injurious urges in borderline personality disorder using ecological momentary assessment. J Pers Disord 2018;32(Supplement):36–57. 10.1521/ pedi.2018.32.supp.36. [PubMed: 29388895]
- [58]. Sirois FM, Molnar DS, Hirsch JK. Self-compassion, stress, and coping in the context of chronic illness. Self Identity 2015;14(3):334–47. 10.1080/15298868.2014.996249.
- [59]. Sornberger MJ, Smith NG, Toste JR, Heath NL. Nonsuicidal self-injury, coping strategies, and sexual orientation: NSSI, coping, and, sexual orientation. J Clin Psychol 2013;69(6):571–83. 10.1002/jclp.21947. [PubMed: 23382055]
- [60]. Stikkelbroek Y, Bodden DHM, Kleinjan M, Reijnders M, van Baar AL. Adolescent depression and negative life events, the mediating role of cognitive emotion regulation. PLoS One 2016;11(8):e0161062. 10.1371/journal.pone.0161062. [PubMed: 27571274]
- [61]. Swannell S, Martin G, Page A, Hasking P, Hazell P, Taylor A, et al. Child maltreatment, subsequent non-suicidal self-injury and the mediating roles of dissociation, alexithymia and self-blame. Child Abuse Negl 2012;36(7–8):572–84. 10.1016/j.chiabu.2012.05.005. [PubMed: 22858062]
- [62]. Swannell SV, Martin GE, Page A, Hasking P, St John NJ. Prevalence of nonsuicidal self-injury in nonclinical samples: systematic review, meta-analysis and meta-regression. Suicide Life Threat Behav 2014;44(3):273–303. 10.1111/sltb.12070. [PubMed: 24422986]
- [63]. Taliaferro LA, Muehlenkamp JJ. Nonsuicidal self-injury and suicidality among sexual minority youth: risk factors and protective connectedness factors. Acad Pediatr 2017;17(7):715–22. 10.1016/j.acap.2016.11.002. [PubMed: 28865597]
- [64]. Tanzer M, Salaminios G, Morosan L, Campbell C, Debbané M. Self-blame mediates the link between childhood neglect experiences and internalizing symptoms in low-risk adolescents. J Child Adolesc Trauma 2021;14(1):73–83. 10.1007/s40653-020-00307-z. [PubMed: 33692873]
- [65]. Taylor PJ, McDonald J, Smith M, Nicholson H, Forrester R. Distinguishing people with current, past, and no history of non-suicidal self-injury: shame, social comparison, and self-concept integration. J Affect Disord 2019;246:182–8. 10.1016/j.jad.2018.12.033. [PubMed: 30583143]
- [66]. Taylor PJ, Usher S, Jomar K, Forrester R. Investigating self-concept in self-harm: a repertory grid study. Psychol Psychother Theory Res Pract 2021;94(S2):171–87. 10.1111/papt.12269.
- [67]. Van Dijk MPA, Branje S, Keijsers L, Hawk ST, Hale WW, Meeus W. Self-concept clarity across adolescence: longitudinal associations with open communication with parents and internalizing symptoms. J Youth Adolesc 2014;43(11):1861–76. 10.1007/s10964-013-0055-x. [PubMed: 24272819]
- [68]. Vartanian LR. When the body defines the self: self-concept clarity, internalization, and body image. J Soc Clin Psychol 2009;28(1):94–126.
- [69]. Vartanian LR, Hayward LE, Smyth JM, Paxton SJ, Touyz SW. Risk and resiliency factors related to body dissatisfaction and disordered eating: the identity disruption model. Int J Eat Disord 2018;51(4):322–30. 10.1002/eat.22835. [PubMed: 29394457]
- [70]. Verschueren M, Luyckx K, Kaufman EA, Vansteenkiste M, Moons P, Sleuwaegen E, et al. Identity processes and statuses in patients with and without eating disorders: identity in eating disorders. Eur Eat Disord Rev 2017;25(1):26–35. 10.1002/erv.2487. [PubMed: 27790863]
- [71]. Verschueren M, Claes L, Bogaerts A, Palmeroni N, Gandhi A, Moons P, et al. Eating disorder symptomatology and identity formation in adolescence: a cross-lagged longitudinal approach. Front Psychol 2018;9:816. 10.3389/fpsyg.2018.00816. [PubMed: 29915548]

- [72]. Verschueren M, Claes L, Gandhi A, Luyckx K. Identity and psychopathology: bridging developmental and clinical research. Emerg Adulthood 2020;8(5): 319–32. 10.1177/2167696819870021.
- [73]. Walsh B Treating self-injury: a practical guide. 2nd ed. Guilford Press; 2013.
- [74]. Wängqvist M, Frisén A. Swedish 18-year-olds' identity formation: associations with feelings about appearance and internalization of body ideals. J Adolesc 2013;36 (3):485–93. 10.1016/ j.adolescence.2013.02.002. [PubMed: 23518285]
- [75]. Wu C The relationship between attachment style and self-concept clarity: the mediation effect of self-esteem. Personal Individ Differ 2009;47(1):42–6. 10.1016/j.paid.2009.01.043.
- [76]. Wu J, Watkins D, Hattie J. Self-concept clarity: a longitudinal study of Hong Kong adolescents. Personal Individ Differ 2010;48(3):277–82. 10.1016/j.paid.2009.10.011.
- [77]. Zelkowitz RL, Cole DA. Self-criticism as a transdiagnostic process in nonsuicidal self-injury and disordered eating: systematic review and Meta-analysis. Suicide Life Threat Behav 2019;49(1):310–27. 10.1111/sltb.12436. [PubMed: 29504147]





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Interaction effect of body regard and self-blame on past year NSSI frequency. *Note*: s-blame = self-blame coping, BR = body regard. Lo = Low, Av = Average, Hi = High.

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Interaction effect of body regard and self-concept clarity on NSSI frequency. *Note.* Poor SSC = poor self-concept clarity, BR = body regard. Lo = Low, Av = Average, Hi = High.

Table 1

Correlations, means, standard deviations of study variables.

	1	2	3	4	5
1 Self-Concept Clarity	1				
2 Self-Blame Coping	0.395*	1			
3 Body Regard	-0.527*	- 0.296*	1		
4 Past Year NSSI Freq	0.248*	0.212*	-0.205 *	1	
5 DASS Total	0.529*	0.381*	-0.474*	0.298*	1
Mean (SD)	2.64 (<i>0.89</i>)	3.34 (<i>1.14</i>)	3.64 (<i>0.58</i>)	0.88 (<i>2.00</i>)	4.77 (<i>1.55</i>)

Note.

* p<.001.