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The Relationship Between Parental Expressed Emotions and Non-suicidal Self-injury: The Mediating Roles of Self-criticism and Depression

Imke Baetens · Laurence Claes · Penelope Hasking · Dirk Smits · Hans Grietens · Patrick Onghena · Graham Martin

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Abstract Perceived parental expressed emotions have a substantial effect on adolescents' well-being and non-suicidal self-injury (NSSI). The present study examines the mediating effects of self-criticism and depression in the relationship between perceived parental expressed emotions and NSSI. In total, 358 adolescents between the ages of twelve and twenty were examined. The brief NSSI assessment tool was used to assess NSSI. Depressive symptoms and self-criticism were examined with the Children's Depression Inventory (CDI-NL) and the Self Rating Scale. Finally, the self-report questionnaire of the level of expressed emotions was used to assess perceived parental expressed emotions. The lifetime prevalence of NSSI in the current study was 13.41 %. Results of a mediation analysis show the relationship between self-criticism and NSSI is mediated by depressive symptoms. Furthermore, results of a path model analysis, explaining 20 % of the variance in NSSI frequency, show a direct effect of perceived parental environment (perceived lack of

emotional support and perceived parental criticism) on NSSI frequency, as well as indirect paths via adolescent risk factors (depressive symptoms and self-criticism). Perceived lack of parental emotional support had a direct effect on frequency of NSSI, as well as an indirect effect via depressive symptoms. Perceived parental criticism on the other hand, had no direct effect on frequency of NSSI, but showed an indirect effect through self-criticism. This study improves our understanding of the underlying mechanisms involved in NSSI by interrelating significant family and adolescent risk factors. Limitations and clinical implications of these findings are discussed.

Keywords Non-suicidal self-injury · Self-criticism · Perceived parental expressed emotions · Depression · Adolescence

Introduction

Non-suicidal self-injury (NSSI) refers to the direct and deliberate injury of one's own body tissue in the absence of suicidal intent (Nock and Favazza 2009). International research consistently reports prevalence rates of NSSI in community samples of adolescents between 10 and 25 % (Baetens et al. 2011a; Muehlenkamp et al. 2012), revealing NSSI as a prominent health concern among adolescents (Yates et al. 2008). The existing literature on NSSI primarily focuses on individual risk factors, with only a paucity of studies focusing on potential associations with family factors, as well as on the interrelation between individual and family risk factors. The present study examines the role of perceived expressed emotions (perceived parental criticism and perceived parental emotional support), as well as the mediating effect of both self-criticism and depression on NSSI.

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Associations Between NSSI and Individual Risk Factors in Adolescence

Researchers agree that in non-clinical samples of adolescents NSSI is primarily an emotion regulation strategy (e.g., Nock 2009), and is associated with a wide variety of psychological symptoms, including suicidal thoughts and behaviors, depressed mood, feelings of anxiety, aggression, loneliness, social isolation, and hopelessness (e.g., Andover et al. 2005; Baetens et al. 2012; Nock and Cha 2009). In longitudinal studies, researchers have found that depressive symptoms predict the occurrence and severity of NSSI (Guerry and Prinstein 2009; Hankin and Abela 2011; Wilcox et al. 2011). Previous research with adolescents has also documented negative correlations between self-esteem and NSSI (e.g., Andrews et al. 2013; Hawton et al. 2002). More specifically, results show that adolescents who engaged in NSSI reported more self-criticism than non-injurious adolescents (e.g., Claes et al. 2012; Hoff and Muehlenkamp 2009).

The underlying mechanisms of the associations between NSSI, depressive symptoms and self-criticism remain unclear. Linehan (1993) suggests that emotional dysregulation (often manifest as depressive symptoms) and self-invalidation (i.e., self-criticism), are interrelated and work together to predict NSSI. Linehan (1993) also suggests that both self-invalidation and emotion dysregulation are associated with an invalidating family environment. Arguably the combination of invalidating family environment, self-criticism and depressive symptoms heighten risk for NSSI.

Associations Between NSSI and Family Factors in Adolescence

The core components of an invalidating environment, according to Linehan (1993), are maladaptive forms of parental expressed emotions, including parental criticism and lack of parental support. Previous studies exploring this relationship (e.g., Wedig and Nock 2007; Yates et al. 2008) suggest that parental criticism is an important risk factor for the development of NSSI. Specifically, Wedig and Nock (2007) found that observed parental criticism was strongly associated with NSSI, whereas observed parental emotional involvement was not. Similarly, Yates et al. (2008) reported that perceived parental criticism was associated with an increased risk of NSSI, where perceived alienation from parents emerged as a relevant process underlying this pathway. In several studies (e.g., Baetens et al. 2013; Bureau et al. 2010; Martin and Waite 1994), researchers report perceived lack of emotional support as a risk factor for NSSI in community-based samples of youth. You et al. (2012) found that the perception of family invalidation (i.e., how children's emotional experience was

invalidated by their parents) predicts the occurrence of NSSI 1 year later. Summarizing these results, international studies confirm the role of an invalidating environment in the development of NSSI. However, it is less clear how this environmental factor may work together with individual factors to increase the risk of NSSI.

Associations Between Individual and Family Factors in Relation to NSSI in Adolescence

With regard to depressive symptoms, research has shown that high levels of rejection and low levels of emotional warmth, are positively associated with depression (Muris et al. 2001; see for a review, Rapee 1997). Given that an invalidating environment may not allow adolescents to learn how to regulate intense emotions in an adaptive way, depressive symptoms are common among adolescents raised in this type of environment (Linehan 1993).

With regard to self-criticism, Blatt (1974) suggested that self-criticism is an internalization of a highly critical family environment: being raised in a more disregarding, criticizing and punitive environment heightens the risk for maladaptive self-criticism. McCranie and Bass (1984) also related self-criticism to lack of parental emotional support. More recently, Campos et al. (2010) reported that a highly self-critical cognitive style is correlated with both the perception of lack of emotional support and a highly critical parenting style; however, self-criticism mediates the relationship between perceived lack of emotional support and depression.

In NSSI research, some evidence for the combined impact of environmental factors and individual factors exists. It seems plausible that an invalidating environment fosters self-criticism and depressive symptoms which in turn heighten the risk for NSSI as a means of coping: NSSI is seen as a way of coping with self-invalidation and/or emotional dysregulation. For example, Martin and Waite (1994) found that the relationship between low perceived parental support and deliberate self-harm (both NSSI as suicide attempts) is mediated by adolescent depression (without controlling for self-criticism). Gratz (2006) found a 3-way-interaction between child maltreatment, greater inexpressivity and higher levels of affect intensity/reactivity related to presence of NSSI in a female college sample. Adrian et al. (2011) found in a clinical sample of adolescent girls that in addition to direct influences of perceived family conflict and perceived lack of parental support on frequency and severity of NSSI, the relationship between perceived negative family relationships and NSSI was mediated by emotional dysregulation.

Likewise, international research has found an association between child maltreatment and NSSI, with a mediating role of self-criticism and self-blame (Glassman et al.

2007; Swannell et al. 2012). Even after controlling for depression, the mediating role of self-criticism remained significant. Finally, Wedig and Nock (2007) reported that a self-critical cognitive style is related to both observed parental criticism and NSSI.

Research conducted to date suggests that both self-criticism and depressive symptoms are associated with NSSI in adolescence (Baetens et al. 2012; Claes et al. 2012). Furthermore, research suggests that perceived expressed emotions (specifically parental criticism and lack of emotional support) are associated with NSSI (e.g., Martin and Waite 1994; Yates et al. 2008), and that the combined impact of environmental factors and individual factors is an important avenue in understanding NSSI in adolescence. However, an integrative empirical model—combining theoretical insights of Linehan (1993) and previous empirical results in the NSSI and depression research field—is absent.

Aims of the Study

We proposed an interrelation between self-criticism and depressive symptoms, although the direction of effects is unclear. Based on the research reviewed above, self-criticism may increase the risk of depressive symptoms (Powers et al. 2004), which in turn increase risk of NSSI (Hankin and Abela 2011). Alternatively, depressive symptoms may confer an increased risk of self-criticism (i.e. negative cognitive interpretation of self; Beck 2008), which in turn could be directly related to NSSI.

In addition to direct effects of an invalidating environment on NSSI in adolescence (e.g., Bureau et al. 2010), relationships between environmental and individual factors are expected. In line with Martin and Waite (1994), we hypothesized that perceived lack of parental emotional support is related to depressive symptoms, which in turn heighten the risk for NSSI. In line with Campos et al. (2010), we expected both the perception of lack of emotional support and parental criticism to be related to self-criticism among adolescents.

The aims of the present study are therefore threefold: (1) to explore the nature and extent of NSSI (prevalence, method, functionality, and frequency) in a non-clinical sample of adolescents, (2) to explore whether the relationship between depressive symptoms and NSSI is mediated by self-criticism and/or whether the relationship between self-criticism and NSSI is mediated by depressive symptoms, and (3) to test a path model proposing that depressive symptoms and self-criticism mediate the relationship between perceived parental expressed emotions and NSSI.

This study provides a meaningful contribution to NSSI research, giving further insight into specific pathways

between perceived invalidating environmental risk factors, individual risk factors and NSSI. By understanding these specific pathways in heightened risk of NSSI both prevention and intervention can be more specifically tailored to target the underlying processes for NSSI in adolescence.

Method

Participants

In total, 367 adolescents aged 12–20 years old (*Mean* age = 16.07 years, *SD* = 1.12) recruited from three Belgian secondary schools (two catholic and one government) were invited to participate. Three-hundred fifty-eight adolescents (358) participated, of whom 48 % were girls. Reasons for not participating were not receiving parental permission ($n = 1$) or absence on the day of data collection ($n = 5$). Further, 3 respondents were excluded from analyses due to more than 10 % missing data. The sample was almost exclusively Caucasian (96 %).

Measures

To assess NSSI we made use of the brief NSSI assessment tool (BNSSI-AT; Whitlock and Purington 2007). The BNSSI-AT starts with an initial screening question for NSSI “Have you ever done any of the following *with the purpose of intentionally hurting yourself, without suicidal intent?*” and is followed by a list of 9 NSSI behaviors. If a participant answers positive on one of the 9 listed NSSI behaviors, a supplementary series of questions follow, which assess NSSI characteristics: age of onset and cessation, lifetime frequency, psychological function (e.g., stress relief, self-punishment), body areas affected (e.g., arms, legs), routines and habits (e.g., self-injure in private setting only), addictive qualities (e.g., inability to control urge to self-injure), unintended severity (e.g., self-injured more severely than expected), and help-seeking and disclosure (e.g., seen a mental health professional). In our sample, none of the adolescents who reported NSSI endorsed suicidal intent as the primary reason for engaging in NSSI.

Perceived expressed emotions of parents were measured by the level of expressed emotions (LEE) scale (Dutch version: Hale et al. 2007). The LEE is a 38-item questionnaire consisting of four-factors: Lack of emotional support (LES), perceived intrusiveness (INTR), perceived irritation (IRR), and parental criticism (C). Each item is scored on a scale ranging from 1 (untrue) to 4 (true). Due to indication of multicollinearity between INTR and C ($VIF = 3.51$), INTR and LES ($VIF = 3.20$) and between IRR and C ($VIF = 3.46$), only the lack of emotional

support and parental criticism subscales were used in the current study. Internal consistency of both scales was good: Lack of emotional support ($\alpha = 0.94$) and parental criticism ($\alpha = 0.83$).

Self-criticism was assessed using the Self Rating Scale (SRS; Hooley et al. 2010). This eight-item measure assesses the extent to which an individual endorses self-critical statements (e.g., “Others are justified in criticizing me”, “Sometimes I feel completely worthless”). Participants judge how strongly they agree with these statements, responding on a 7-point scale. In the current sample the measure demonstrates good internal consistency, given the small number of items ($\alpha = 0.73$).

The Child Depression Inventory-Dutch version is a well-known tool to measure the severity of depressive symptoms in children (CDI-NL; Timbremont and Braet 2002). Respondents are asked to select the statement that best describes his or her feelings in the past 2 weeks (e.g., “I feel sometimes sad”; “I feel often sad”; “I feel sad all the time”). The Cronbach α in the present study for the 27 item questionnaire is 0.87.

Procedure

School approval, adolescents’ willingness to participate and parental passive informed consent were obtained before participation in the study. Adolescents’ participation was voluntary and no incentives were given for participation. Adolescents completed questionnaires in their classroom during regular school hours. One or two research assistants were available to provide support if necessary and to ensure independent responding. The average time needed to complete questionnaires was 45 min. Efforts were made to safeguard the welfare of the adolescents (e.g., informing schools about NSSI, participants receiving a letter with phone numbers and e-mail addresses of professional and informal help centers). The study was approved by the ethical board of the first author’s university.

Analyses

Data were analyzed using SPSS 19 and LISREL 8.8. Means, standard deviations, and frequency of all NSSI-related variables were calculated. To examine whether categorical variables (e.g., gender) were significantly associated with engagement in NSSI, Pearson Chi Square statistics were used. To assess differences between the adolescents with and without NSSI with respect to continuous variables (e.g., age), *t* tests were used. Using Little’s (1988) Missing Completely At Random (MCAR) test, participants with and without complete data were compared in terms of gender, age, NSSI frequency, depressive

symptoms, self-criticism, lack of parental support and parental criticism. The MCAR test resulted in a non-significant Chi square value, $\chi^2 (57) = 50.41$, *ns*, which suggests that missing values are at random. Mediation analyses were performed in order to examine whether the relationship between depressive symptoms and NSSI was mediated by self-criticism and/or whether the path between self-criticism and NSSI was mediated by depressive symptoms. To test mediation models, we followed the procedure described by Preacher and Hayes (2004), implemented using their SPSS SOBEL macro. This macro estimates the path coefficients in a mediation model and generates bootstrap (5,000) confidence intervals for total and specific indirect effects of *X* on *Y* through the mediator. The confidence interval for the indirect effect based on the bootstrap is reported. When zero is not included in the confidence interval for indirect effect, we can conclude that the indirect effect is significantly different from zero at $p < .05$, and thus that the relationship between *X* on *Y* is mediated. In line with van Fritz and MacKinnon (2007), post hoc power analyses for the Sobel tests were performed.

Path model analysis (LISREL 8.8) was used to analyze the relationships between family risk factors (perception of lack of emotional support and parental criticism), adolescent risk factors (self-criticism and depressive symptoms), and frequency of NSSI. Path analyses were conducted on the correlation matrix and the estimated asymptotic variance matrix. Model parameters were estimated using the diagonal weighted least square method because the dependent variable is ordinal and positively skewed (Flora and Curran 2004). Non-significant paths were omitted in the final model. In the path model analysis, we focused on explaining the frequency of NSSI, therefore percentage of explained variance was used as an indicator of model fit.

Results

Rates and Correlates of NSSI

Of the 358 adolescents included in the analyses, 48 adolescents reported having engaged in at least one method of NSSI at some point in their lives (13.41 %; 48/358). Among all respondents, the prevalence rate for NSSI in the previous 12 months was 9.78 % (35/358).

In total, 43.75 % (21/48) of the NSSI sample reported a frequency of 6 or more episodes of NSSI over their lifetime. The mean number of acts was 1.64 ($SD = 9.48$), with a maximum of 107 acts. Of those who self-injured, 41.67 % (20/48) reported using one method of NSSI. The most prevalent methods of NSSI were scratching to the point of bleeding or until marks remained on the skin

(50 %; 24/48) and punching or hitting objects to the point of bruising or bleeding (47.92 %; 23/48).

The most frequently reported psychological functions of NSSI were to cope with negative feelings (44.9 %) and to change emotional pain into physical pain (46.9 %). In addition, dealing with frustration (32.7 %), with anger (34.7 %), and reducing stress and pressure (32.7 %) were also frequently described as reasons for NSSI.

Socio-Demographic Factors

No significant gender ($\chi^2(1) = 2.29, p = .13$) or age differences ($t(339) = -.91, p = .36$) were observed between adolescents with and without NSSI. However, two gender differences in terms of NSSI method were observed: Girls reported significantly more cutting than boys ($\chi^2(1) = 4.48, p = .03$), whereas boys reported significantly more head-banging than girls ($\chi^2(1) = 14.14, p < .001$).

Mediation Depressive Symptoms, Self-criticism and NSSI

Prior to conducting path analysis, the nature of the relationships between self-criticism, depression and NSSI frequency were explored. In a first step, the mediation model examining the total and indirect effect of self-criticism on NSSI frequency through depressive symptoms (mediator) was tested. Results confirmed that depressive symptoms mediated the relationship between self-criticism and NSSI (95 % CI 0.38–4.18). Self-criticism was significantly correlated with NSSI, though this effect was mediated by depressive symptoms. Adolescents who reported higher levels of self-criticism were more likely to engage in NSSI, via higher levels of depressive symptoms.

In the second regression, we explored whether the relationship between depression and NSSI was mediated by self-criticism. The direct path from depressive symptoms to NSSI frequency was significant, however self-criticism did not mediate this relationship (95 % CI -0.46 – 0.09).

Results of the post hoc power analyses indicate that our first model has sufficient power (0.80), nonetheless the

model with self-criticism as mediator lacks 100 respondents to reach the threshold for a power of 0.80, due to the low effect of the association between self-criticism and NSSI.

Path Model Analysis

Based on the literature and initial mediation analyses, we proposed direct relationships between perceived parental criticism and lack of emotional support and NSSI (see Fig. 1). Additionally, we suggested that this relationship was mediated by self-criticism and depressive symptoms. Based on results of our mediation analyses we hypothesized the relationship between self-criticism and NSSI was mediated by depressive symptoms. The result of the path analysis showed that the hypothesized model accounted for 27 % of the variance in NSSI frequency (see Fig. 1 for standardized path regression weights).

Figure 2 shows the standardized path regression weights of the final model, with non-significant paths removed. Based on the final model, the frequency of NSSI seems to be determined by both direct and indirect paths. Perceived lack of emotional support has a direct effect on frequency of NSSI, as well as an indirect effect via depressive symptoms. Perceived parental criticism has only an indirect effect on NSSI, through self-criticism. As shown in Fig. 2, the relationship between self-criticism and NSSI is fully mediated by depressive symptoms, whereby the path between self-criticism and NSSI becomes non-significant when taking into account depressive symptoms. For NSSI, the final path model explains 20 % of the variance of NSSI frequency. In total, the model accounts for 11 % variance of self-criticism and 40 % explained variance of depressive symptoms.

Discussion

In this study we aimed to explore the complex interplay between family environment and individual factors in explaining frequency of NSSI among adolescents. Previous

Fig. 1 Hypothesized path model of the relationship between lack of parental support, parental criticism, self-criticism and depressive symptoms in relation to frequency of NSSI in adolescence. Path values represent standardized path regression weights. * $p < .05$, ** $p < .001$, *** $p < .001$

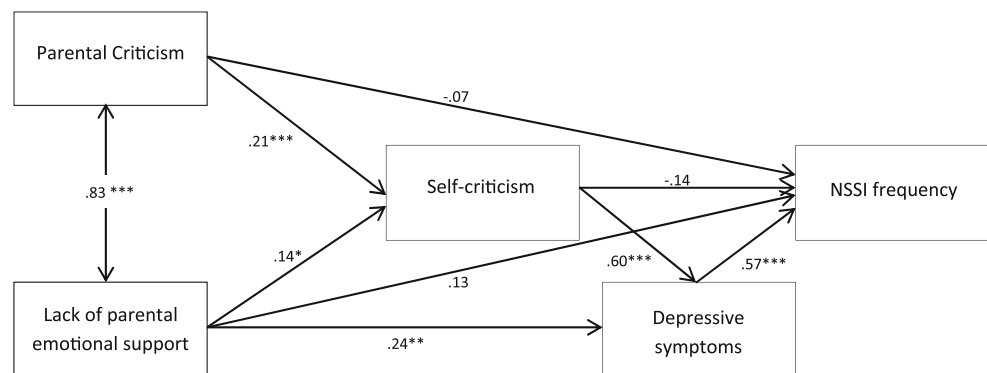
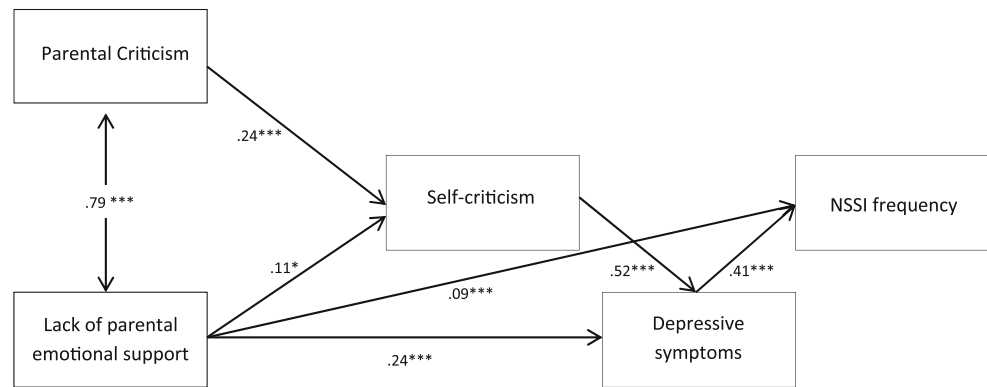


Fig. 2 Final path model of the relationship between lack of parental support, parental criticism, self-criticism and depressive symptoms in relation to frequency of NSSI in adolescence. Path values represent standardized path regression weights. * $p < .05$, ** $p < .001$, *** $p < .001$



research has identified both depressive symptoms and self-criticism as significant risk factors for NSSI in adolescence, however, to-date no research has explored the complex relationship between both self-criticism and depressive symptoms, nor the link between depressive symptoms and self-criticism, in relation to NSSI. Furthermore, the current study expands on previous work to emphasize the importance of examining both family and individual risk factors in the NSSI research field.

Results confirm that NSSI is a prominent problem in European adolescents, with a lifetime prevalence of 13.41 %, and a yearly prevalence of 9.78 %. In line with Heath et al. (2009), we found no gender differences in the prevalence of NSSI although, consistent with earlier research (e.g., Baetens et al. 2011b; Heath et al. 2008), the method of self-injury appears to differ by gender, with girls being more likely to cut and boys to bang/hit themselves.

Our results provide empirical support for prior clinical and theoretical models which suggest invalidating family environments can lead to self-criticism and depressive symptoms, which in turn increase risk of NSSI (Blatt 1974; Campos et al. 2010; Linehan 1993). Specifically, we show that perceived lack of parental emotional support is both directly associated with NSSI and indirectly associated through depressive symptoms. Furthermore, results show that perceived parental criticism has no direct relationship to NSSI but rather is indirectly related to NSSI through self-criticism. The relationship between self-criticism and NSSI is then fully mediated by depressive symptoms.

Perception of parental support might be an important protective factor in reducing risk for NSSI, while a non-supportive family system may heighten risk of NSSI in adolescence. Yet our results suggest that in addition to a direct effect, perceived lack of parental support is also related to depression which in turn predicts NSSI. As direction of effect is not clear from our correlational work, this result can be interpreted in two ways: lack of parental emotional support may lead to depressive symptoms, with NSSI being used to cope with these feelings. However, depressed adolescents are more likely to perceive their

environment as less supportive and more negative due to a negative cognitive bias (Beck 2008). Similarly, the perception of both a highly critical and low supportive family environment fosters highly critical standards for self. That achievements should be flawless to avoid parental criticism, disappointment and rejection, leads to an internalized self-critical cognitive style. Maladaptive self-criticism then heightens depressive symptoms, and NSSI becomes a method of coping with negative feelings. Reversely, depressed adolescents are at risk for a negative interpretation of self and others (Beck 2008). In reality, the relationships are likely to be bi-directional.

Although the current study offers additional insights into family and adolescent risk factors for NSSI within a sample of Flemish adolescents, a number of limitations need to be addressed. First, as results of the current study are based on cross-sectional data, our suggested model needs to be further examined in a longitudinal study to clarify the direction of relationships. Secondly, we relied on self-report measures to assess adolescent and family risk variables, which might result in biases in the data through social desirability and memory biases of the respondent. The model we describe is based on the adolescent's perception of parental expressed emotions, and might differ in an observational setting or if assessed through parent report. Similarly we assessed perceived emotional support which may not be an accurate reflection of the level of support offered by parents (Demo et al. 1987). While this may be a limitation, it could be argued that the way an adolescent views their world is more salient to mental health than the reality (McCaskill and Lakey 2000). Self-report methodology may partially explain the high correlation between perceived lack of emotional support and parental criticism; adolescents may struggle to conceptually differentiate the two constructs. Unfortunately this overlap diminishes the ability to establish the unique contribution of each variable to the model. To tackle these limitations, future studies should examine expressed emotion as reported by parents (e.g., parent report LEE), or by interview (e.g., Five Minute Speech Sample; Magaña et al. 1986). Furthermore, due to insufficient power

of our second mediation with self-criticism as mediator, results should be replicated in a larger sample. Finally, the study was conducted in a non-clinical sample, and as such the results may not generalize to clinical samples.

Nonetheless, our findings present a meaningful contribution to the field, and generate a new model which can be tested in longitudinal research with clinical and non-clinical samples. It presents a way of understanding the complex interaction between adolescent and family risk factors in the prediction of more severe NSSI. The present study confirms that the process by which family and adolescent risk factors are associated with NSSI is, of course, complex. Assuming that psychological problems of an adolescent have an impact on the family system, which in turn impacts the individual, dual path interventions are warranted. On the one hand, results show the importance of focusing individual treatment on teaching emotion regulation strategies to cope with depressive symptoms as well as intervention targeting maladaptive self-criticism through cognitive restructuring (Slee et al. 2008). On the other hand, results of the present study emphasize the importance of involving family members in treatment of NSSI and point to the potential utility of family therapy. Family members as well as the adolescent can be encouraged to search for alternative ways of coping with distress and work on family emotional support and connectedness.

In summary, our study presents a conceptual framework to understand direct and indirect pathways for heightened risk of NSSI in adolescence. It integrates Linehan's theory with findings from depression research, and gives insight into the complex processes which underpin direct effects of family environment and the indirect effect of bi-directional processes between child and family.

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