

Perceived Dimensions of Parenting and Non-suicidal Self-injury in Young Adults

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Abstract Family experiences are influential in the development of non-suicidal self-injury (NSSI). The current study aimed to identify specific dimensions underlying early parent–child relationships in association with NSSI. It was hypothesized that all relationship dimensions would be related with NSSI, with some dimensions being stronger predictors when accounting for shared variance. Gender differences were also assessed. Participants were grouped according to the endorsement of NSSI in the past 6 months, resulting in a Non-NSSI group ($n = 1133$) and a NSSI group ($n = 105$). Significant differences were found for the relationship dimensions between the two groups. When shared variance was accounted for, fear and alienation were the only dimensions predicting NSSI. Similar results were found for females ($n = 887$), while no analyses using males ($n = 351$) were significant. These results emphasize the need to acknowledge the role of parent–child relationships in prevention programs and intervention models for NSSI.

Keywords Non-suicidal self-injury · Parent–child relationships · Family experiences · Young adulthood

Introduction

Non-suicidal self-injury (NSSI) is defined as the deliberate, direct destruction or alteration of body tissue severe enough for tissue damage to occur, performed without a conscious suicidal intent (Favazza 1989; International Society for the Study of Self-Injury 2007). Adolescents endorsing NSSI most commonly describe using the behaviour as a method for coping with negative emotions and emotional experiences (Favazza 1998; Gratz 2003; Nixon et al. 2002). Over the last decade, NSSI has gained renewed research attention due to an emphasis from researchers and clinicians concerning the increased magnitude of NSSI as a psychological and physiological health risk for young adults. Although clinical populations of adolescents and young adults are at increased risk for engaging in NSSI (prevalence rates ranging from 38 to 67%; see Heath et al. 2009 for a review), recent studies have identified prevalence rates of NSSI as ranging between 10 and 44% in Canadian and American normative adolescent and college student samples (Gratz 2006; Gratz and Chapman 2007; Gratz et al. 2002; Nixon et al. 2008; Ross and Heath 2002; Heath et al. 2008; Whitlock et al. 2006). Thus, there is a need for more research to better understand this phenomenon in normative populations of young adults.

NSSI and the Quality of Family Relationships

Previous theory and research have suggested that interpersonal relationships may influence the development of NSSI in adolescence (e.g., Suyemoto 1998), with particular importance placed on the family context. For example, Linehan's (1993) theoretical model for the development of borderline personality disorder, self-harming and suicidal

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behaviours stipulates that an invalidating environment during childhood, characterized by inadequate parenting, is a substantial risk factor in the etiology of NSSI. Research has repeatedly demonstrated links between NSSI and childhood physical, emotional and sexual abuse, emotional neglect (Boudewyn and Liem 1995; Briere and Gil 1998; Dubo et al. 1997; Gratz 2006; van der Kolk et al. 1991). However, based on the theoretical framework laid out by Tantam and Whittaker (1992), it may be the dysfunctional family environment in which abusive and neglectful experiences occur that increases risks for later self-harm, rather than abuse and neglect alone. Further, it is suggested that the overall quality of attachment relationships with parents in childhood, disruptions in parent–child bonds, and experiences of separation and loss may contribute to later NSSI (Conterio and Lader 1998; Suyemoto 1998; van der Kolk 1996; Walsh 2006; Walsh and Rosen 1988). Existing empirical research in this area has identified numerous associations between dimensions of early relationships with parents and NSSI in adolescence and young adulthood.

The limited existing research has demonstrated with some consistency that various underlying dimensions of the parent–child relationship are associated with the development of NSSI. Gratz et al. (2002) assessed maternal and paternal emotional neglect (e.g., lack of care; measured by the *Parental Bonding Index*; Parker et al. 1979), physical neglect, separation and loss experiences (measured by the *Disruptions in Attachment Survey*; Gratz et al. 2002), affective quality of attachment, parental fostering of autonomy, and parental role in providing emotional support (measured by the *Parental Attachment Questionnaire*; Kenny 1985; lower total scores for the scale indicated an increasingly insecure attachment relationship) all in relation to NSSI behaviours using a co-ed university student sample. Results showed that maternal emotional neglect (e.g., lack of maternal care), and paternal insecure attachment significantly predicted NSSI. Additional research by this research group (Gratz 2006; Gratz and Chapman 2007) has identified similar patterns of association. In one such investigation (Gratz 2006), the dimensions of overall parental emotional neglect (e.g., lack of care) and overall parental overprotection (both indicated by averaging maternal and paternal subscale scores on the *Parental Bonding Index* to yield an overall score for each dimension) were significantly related to frequency of NSSI behaviours in a sample of 249 female undergraduate university students. Overall parental emotional neglect (e.g., lack of care; measured by averaging maternal and paternal subscale scores on the *Parental Bonding Index* to yield an overall score for each dimension) was also related to frequent NSSI in a subsequent sample of 97 male undergraduate students, though parental overprotection was not a

significant risk factor for this group (Gratz and Chapman 2007). These findings suggest that some dimensions of parent–child relationships are influential in the development of NSSI.

Other researchers have used additional dimensions of the parent–child relationship in association with NSSI. Recent research from Hilt and colleagues (Hilt et al. 2008) assessed the associations between the current quality of the parent–child relationship and NSSI in a pre-adolescence normative sample. The quality of the parent–child relationship was indicated by total scores from parent related items of the *Inventory of Parent and Peer Attachment* (IPPA; Armsden and Greenberg 1987), calculated by summing the three subscale scores of trust, communication and alienation; thus, poorer relationship quality was reflective of poor trust, poor communication and increased alienation originating from the parent–child relationship. Results from this study indicated that participants endorsing NSSI behaviours also reported poorer quality of the parent–child relationship compared to participants who did not engage in NSSI.

These pioneer studies shed an interesting light on the association between the quality of parent–child relationships and NSSI, and the present study aims at deepening our understanding by comparing the respective contributions of different parent–child relationship dimensions to NSSI. In fact, with the exception of Gratz et al. (2002), each of the previous investigations have utilized only one assessment of parent–child relationship dimensions. As such, there was no opportunity for these authors to address the relative contribution of various parent–child relationship dimensions in association with NSSI. Because the relationship between parent and child is multifaceted, consisting of numerous dimensions that would likely augment the perceived quality of this relationship, it is important to conduct additional research assessing a number of these dimensions simultaneously to ascertain which dimensions are most influential in relation to NSSI in young adulthood. Furthermore, the majority of these studies have used composite scores on their respective measures of parent–child relationship dimensions (e.g., Gratz et al. 2002; Hilt et al. 2008) or combinations of subscale scores (e.g., Gratz 2006; Gratz and Chapman 2007) rather than assessing the influence of specific relationship dimensions. Similarly, previous research has focused upon dimensions of parenting, which may reflect a general lack of intimacy within the parent–child relationship (e.g., Gratz et al. 2002; Heath et al. 2008), rather than on assessing the aspects of parenting which may be more detrimental and likely to underlie attachment classifications of disorganization/disorientation, which have been shown to relate with the most negative outcomes later in life such as dissociation, depression and behaviour problems (Carlson

1998; Ogawa et al. 1997; van IJzendoorn et al. 1999). In sum, additional research should explore a more inclusive model, which encompasses multiple dimensions of the parent–child relationship and their interrelation in the prediction of NSSI.

NSSI and Specific Parent–Child Relationship Dimensions

To date, only two studies have directly investigated the role of individual parent–child relationship dimensions. Yates et al. (2008) found that feelings of alienation towards parents (as measured by the IPPA) were related to NSSI for both females and males in a normative high school sample. Furthermore, feelings of alienation towards parents, in males, was related to engaging in NSSI at a higher frequency than in those who endorsed NSSI but who did not have feelings of alienation towards their parents. Following Yates and colleagues' (2008) hypotheses, one may expect that a feeling of alienation within the parent–child relationship would be closely associated to NSSI, as the perceived alienation is likely a reflection of an invalidating and rejecting caregiving environment marked by parental criticism (Fonagy et al. 2000). This study provides support for the notion that specific parent–child relationship dimensions are influential in the development of NSSI.

In contrast, Heath et al. (2008) presented results suggesting that individual parent–child relationship dimensions may not be influential in the development of NSSI. In their co-ed community sample of 728 undergraduate students, these authors assessed the association between NSSI and parent–child relationship dimensions of availability and responsiveness of the parent, feared loss of the parent, proximity seeking, protest upon separation from the parent, and use of the parent as an attachment figure (measured by the *Reciprocal Attachment Questionnaire*; RAQ; West and Sheldon-Keller 1992, 1994). In this study, the selected parent–child relationship dimensions failed to differentiate between a sub-group of participants who endorsed NSSI and a sub-group who did not engage in these behaviours. However, these dimensions may reflect a more general lack of intimacy within the relationship, rather than dimensions that may be more associated with “relational trauma” (Schuder and Lyons-Ruth 2004), and which may be more likely linked with NSSI later in life.

As previously mentioned, existing literature in this area has focused on aspects of the parent–child relationship reflecting a general lack of intimacy, but have not addressed increasingly negative dimensions that may be associated with more disorganized/disoriented classifications and thus more negative outcomes. A study by West and colleagues (West et al. 2000) suggests a need for research using these types of dimensions. This study was

conducted as part of the development of the *Adolescent Unresolved Attachment Questionnaire* (AUAQ; West et al. 2000). The AUAQ was created to measure the degree to which current perceptions of childhood experiences are resolved by the individual, assessing the subscales of *failed protection*, *anger*, and *fear*. This questionnaire was developed in an attempt to retrospectively assess aspects of attachment beyond the dichotomous classification of secure or insecure offered by existing measures of attachment. Additionally authors of the AUAQ aimed at measuring relationship qualities similar to those described by adults classified with Unresolved states of mind with respect to childhood attachment relationships by the *Adult Attachment Interview* (AAI; George et al. 1986), which have frequently been linked with negative psychological and interpersonal outcomes (see Hesse 2008 for a review). During conception of the AUAQ, West and colleagues demonstrated that the measure differentiated between a community group of 691 normative adolescents and a clinical group of 133 adolescents who had demonstrated suicidal behaviours, such that the clinical sample scored higher on all three subscales. The assessment of suicidal behaviours in this study can be related to the context of NSSI research for two reasons: First, the construct of suicidal behaviours is not clearly defined in the article, and may likely have been comprised of any number of self-harming behaviours; Second, recent literature has demonstrated a moderate level of co-occurrence of NSSI and suicide attempts (e.g., Cloutier et al. [this volume](#); Loft-house and Yager-Schweller 2009), indicating that a number of suicidal adolescents also endorse NSSI. Thus, it is possible that similar results will be found with respect to NSSI as were identified by West and colleagues regarding suicidal behaviours, and additional research in this area is highly warranted.

It should be noted at this point that all research discussed previously, as well as the present study, utilized retrospective self-report measures in the assessment of quality of early parent–child relationships. Although these instruments are designed to assess perceptions of the relationship during childhood, it is likely that the individual's current contextual experiences will influence their perceptions of the past. Thus responses to these questionnaires may instead reflect the individual's current state of mind regarding the parent–child relationship rather than being purely indicative of the relationship during the childhood years.

Gender Differences and NSSI

To date, studies on NSSI have primarily focused on women in a clinical setting (Gratz 2003). Nevertheless, an abundance of empirical evidence attests to the presence of NSSI

beyond this specific population, extending to women and men in non-clinical settings (ex. Heath et al. 2008; Gratz et al. 2002), as well as men in a clinical setting (Hawton et al. 2004). Consequently, as suggested by Gratz (2003), there is a need for additional research examining the development of NSSI among different populations of individuals. Though rates of NSSI in community samples are similar between males and females, there may be gender differences in risk factors of NSSI and in methods used to engage in NSSI (Gratz et al. 2002; Laye-Gindhu and Shonert-Reichl 2005; Yates et al. 2008). As these findings appear to suggest the importance of accounting for gender differences when studying the etiology of NSSI, more research is necessary to further understand these effects.

Objectives and Hypotheses

The present research proposed three objectives in order to build upon the existing literature. The first objective was to investigate whether different parent–child relationship dimensions were related to the presence or absence of NSSI behaviours; the specific dimensions implemented in this study were adapted from those used in the prior research discussed above. It was hypothesized that higher scores on the dimensions of failed protection, anger, fear, overcontrol, and feelings of alienation would be associated with the presence of NSSI behaviours. In contrast, lower scores on the dimensions of trust, communication and care would be related to the presence of NSSI behaviours.

Second, the present study explored the relative contributions of each individual parent–child relationship dimension in the prediction of NSSI behaviours. Based on previous studies (e.g., West et al. 2000; Yates et al. 2008), it was hypothesized that the dimensions of failed protection, anger, fear, and feelings of alienation would be stronger predictors of NSSI behaviours when the shared variance of multiple dimensions is accounted for.

The final objective was to examine whether the patterns of association between NSSI behaviours and the parent–child relationship dimensions differ according to gender. As this question was exploratory, no specific hypotheses were made.

Method

Participants

Students enrolled in both English and French introductory psychology courses in an Eastern Canadian University volunteered to participate in this ongoing study. A sample

of 1,238 students was obtained between the ages of 17 and 26 years ($M = 19.4$, $SD = 1.5$; 887 females). The majority ($n = 893$) identified themselves as of Caucasian background, followed by Black ($n = 83$) or Asian ($n = 81$) backgrounds and other ethnicity ($n = 181$). The majority of participants identified themselves as English speaking (78%) and 22% as French speaking.

From these students, two subgroups were formed: (1) the non-NSSI group ($n = 1133$; 810 females; 246 French speaking) and (2) the NSSI group ($n = 105$; 77 females; 24 French speaking). The criterion unique to the NSSI group was an endorsement of NSSI behaviours occurring within the past 6 months. The non-NSSI subgroup was comprised of individuals between the ages of 17 and 26 years ($M = 19.4$, $SD = 1.5$). The NSSI subgroup included students between the ages of 18 and 26 years ($M = 19.5$, $SD = 1.8$).

Procedure

Participants were recruited through an online system that encourages students in first year psychology courses to participate in research at the University. Once students were enrolled in this system, they participated in the research studies of their choice. Upon completion of the requirements for the selected research studies, they were attributed a credit towards their final course grade.

Instruments

Demographic Variables

A standard sociodemographic questionnaire was administered to participants. For the present study the following variables were selected and explored as potential covariates: (1) gender; (2) age of participants; (3) language (French vs. English); (4) ethnicity (four groups: Caucasians, Blacks, Asians, Others); (5) socioeconomic risk (“How often (do you/does your family) have problems paying for basic necessities (like food, clothing or rent)?”); and (6) living arrangement (living with parents vs. not living with parents).

Parent–Child Relationship Dimensions

NSSI The *Ottawa Self-Injury Inventory* (OSI; Cloutier and Nixon 2003) was used to indicate the occurrence of NSSI. The OSI is a 27 item self-report measure designed to identify the frequency of NSSI thoughts and actions in the past one or 6 months, as well as the clinical and psychosocial functions of NSSI. Only information concerning NSSI actions in the previous 6 months were analyzed for

the current study. The occurrence of these actions was determined by the question “How often in the past 6 months have you actually injured yourself without the intention to kill yourself?” Responses to this question were rated as *not at all*, *1–5 times*, *monthly*, *weekly*, *daily*. These ratings were further collapsed to create a dichotomous variable of NSSI action occurring in the past 6 months with *1–5 times*, *monthly*, *weekly* and *daily* representing a “yes” category, and allowing *not at all* responses to reflect a “no” category. Test–retest reliability has been previously demonstrated (r between .52 and .74; Cloutier and Nixon 2003). Due to the lower rate of NSSI behaviours in a normative population compared to a clinical one, the presence/absence of self-injurious actions over the past 6 months was used for the present study.

Failed Protection, Anger and Fear These dimensions of the parent–child relationship were assessed by the AUAQ (West et al. 2000). The AUAQ is a 10-item self-report scale measuring current perceptions regarding childhood attachment relationship to parents, particularly the degree of resolution achieved in experiences where the parent renounces the caregiving role. The dimension of *failed protection* indicates the degree to which the parent is perceived as being unavailable during times of need, the *anger* subscale demonstrates the degree of dysfunctional anger in response to caregiver’s failure to respond, and the *fear* dimension taps into the degree to which the emotional reaction of fear was evoked in response to a lack of care and protection. Ratings are given on a 5-point Likert scale, with higher scores indicating higher ratings of unresolved attachment. The AUAQ has been shown to have good test–retest reliability, internal consistency, and discriminant and convergent validities (West et al. 2000). Internal consistency for the current study was good for all subscales, with alphas of .89 for failed protection, .80 for anger, and .81 for fear.

Parental Overprotection and Care The PBI (Parker et al. 1979) measures individuals’ perceptions of their primary caretakers’ parenting up to the age of 16 years, based on the dimensions of overprotection and care. The *overprotection/control subscale* (13 items) and the *care subscale* (12 items) measure fundamental parental styles as perceived by the participant with responses to 25 items ranging from “*very like*” to “*very unlike*” on a Likert scale. Adequate validity and reliability have been found for the PBI by several studies (see Enns et al. 2002 for a review). Reliability statistics performed for the present study on the PBI showed excellent internal consistency with the care subscale ($\alpha = .93$), and good internal consistency with the overprotection subscale ($\alpha = .89$).

Trust, Communication, Alienation The IPPA (Armsden and Greenberg 1987) was used to measure certain dimensions of the quality of participants’ relationships with their parents and peers. For the current investigation, only those items pertaining to relationships with parents were of interest. The IPPA is a 28-item self-report measure using a five-point Likert scale from “*Almost never or never true*” to “*Almost always or always true*”. The items are grouped into three subscales: *trust*, *communication* and *alienation*. The instrument has shown excellent psychometric properties in previous studies with a test–retest reliability of .93. It also showed convergent validity with measures of anxiety and depression. A review of the IPPA’s validity is presented in Lopez and Gover (1993). Reliability statistics performed for the present study on the IPPA showed excellent internal consistency with the trust dimension ($\alpha = .91$), the communication dimension ($\alpha = .90$), and the alienation dimension ($\alpha = .87$).

Results

Preliminary Analyses

Relationship Dimensions Associated with Sociodemographic Variables

A multivariate analysis of variance (MANOVA) was conducted to explore the effects of gender, language, ethnicity, socioeconomic risk, and living arrangement on the eight relationship dimensions. Results showed that participants from different ethnic backgrounds did not differ significantly in their reports on the eight relationship dimensions (Wilk’s λ , $F(8, 24) = 1.24$, n.s.). However, males and females differed significantly in their responses to some of the relationship dimensions (Wilk’s λ , $F(8, 8) = 3.99$, $p < .01$, $\eta^2 = .04$). Tests of between-subjects effects showed that males reported higher failed protection ($p < .05$) and fear scores ($p < .01$) on the AUAQ than females. Similarly, French-speaking and English-speaking participants differed significantly in their reports on the relationship dimensions (Wilk’s λ , $F(8, 8) = 7.05$, $p < .01$, $\eta^2 = .07$). Tests of between-subjects effects showed that French-speaking participants reported higher fear scores ($p < .01$) on the AUAQ than English-speaking participants. Moreover, participants who reported financial difficulties differed marginally in their reports on the relationship dimensions from participants who did not report such difficulties (Wilk’s λ , $F(8, 8) = 1.87$, $p < .10$, $\eta^2 = .02$). Tests of between-subjects effects showed that participants who reported experiencing financial difficulties also reported higher anger scores on the AUAQ ($p < .05$), higher overprotection scores on the PBI ($p < .05$) and

higher alienation scores on the IPPA ($p < .05$) than participants who did not report financial difficulties. Finally, participants who reported living with their parents differed from participants who were not living with their parents (Wilk’s λ , $F(8, 8) = 4.24$, $p < .01$, $\eta^2 = .04$). Tests of between-subjects effects showed that participants who lived with their parents reported higher failed protection scores ($p < .01$), higher anger scores ($p < .01$), and higher fear scores ($p < .05$) on the AUAQ than participants who did not live with their parents. Correlational analyses revealed that participants’ age was significantly correlated only to the PBI care scale, however this association was rather modest ($r = -.14$, $p < .01$). Participants’ age was not significantly related to the other relationship dimensions (r ranging between $-.06$ and $.06$, n.s.).

NSSI in Relation to Sociodemographic Variables

Chi-square analyses were performed to explore whether the NSSI group and Non-NSSI group differed on sociodemographic variables. Results showed no significant differences for gender ($\chi^2(1238) = .16$, n.s.), language ($\chi^2(1238) = .07$, n.s.), ethnicity ($\chi^2(1187) = 7.26$, n.s.), nor for living arrangement ($\chi^2(1196) = 1.27$, n.s.). However, socioeconomic risk was significantly different between the groups ($\chi^2(1162) = 5.18$, $p < .05$), with the NSSI group demonstrating higher rates of socioeconomic difficulties. An additional t -test was conducted to explore the association between NSSI and age but the results were not significant ($t(1179) = .80$, n.s.). Based on these preliminary findings, the following variables were used as covariates in analyses: gender, language, socioeconomic risk, and living arrangement.

NSSI in Association with Parent–Child Relationship Dimensions

The main objective was to explore whether retrospective self-reports of the quality of parent–child relationship

dimensions varied between NSSI and Non-NSSI groups. A series of correlations were first run to explore whether the relationship dimensions were interrelated. Results showed that all scales were correlated in the expected direction (see Table 1).

A multivariate analysis of co-variance (MANCOVA) was next conducted in order to explore differences between the non-NSSI and the NSSI groups on the relationship dimensions, with gender, language, socioeconomic risk, and living arrangement entered as covariates. Results showed that participants from the non-NSSI and the NSSI groups differed significantly in their reports on the relationship dimensions (Wilk’s λ , $F(8, 838) = 5.67$, $p < .01$, $\eta^2 = .05$). The tests of between-subjects effects performed on the eight relationship dimensions showed significant differences on all dimensions except for the anger scale of the AUAQ (see Table 2). Results presented in Table 2 revealed that participants in the NSSI group

Table 2 Relationship dimensions as a function of NSSI: means (standard deviations) and between-subject effects

Measure	Non-NSSI	NSSI	Between-subject effects (F -scores)
AUAQ			
Failed protection	7.46 (3.66)	8.71 (4.07)	7.94**
Anger	6.20 (2.69)	6.85 (2.78)	3.18
Fear	5.03 (2.85)	6.53 (3.33)	18.37**
PBI			
Care	79.18 (12.94)	74.66 (12.82)	6.40*
Overprotection	53.11 (12.48)	58.03 (12.10)	10.64**
IPPA			
Trust	40.53 (7.25)	37.05 (8.06)	14.76**
Communication	35.67 (8.30)	31.64 (8.55)	15.34**
Alienation	17.40 (6.17)	21.62 (6.59)	29.62**

* $p < .05$; ** $p < .01$

Table 1 Correlation amongst relationship dimensions

	AUAQ			PBI		IPPA		
	1. Failed protection	2. Anger	3. Fear	4. Care	5. Overprotection	6. Trust	7. Communication	8. Alienation
1	–							
2	.71**	–						
3	.68**	.60**	–					
4	-.51**	-.41**	-.36**	–				
5	.35**	.24**	.27**	-.47**	–			
6	-.58**	-.44**	-.39**	.70**	-.55**	–		
7	-.51**	-.35**	-.26**	.63**	-.39**	.80**	–	
8	.50**	.41**	.34**	-.60**	.43**	-.74**	-.70**	–

** $p < .01$

reported their relationships with parents to be characterized by more failed protection, more fear, less care, more overprotection, less trust, less communication, and more alienation than described by participants in the Non-NSSI group.

Relative Contributions of the Relationship Dimensions in the Prediction of NSSI

After showing that the majority of the parent–child relationship dimensions were associated with NSSI, the relative contribution of the relationship dimensions to the prediction of NSSI behaviours was explored using binary logistic regression. The final model was significant χ^2 (12, $N = 1238$) = 49.99, $p < .001$ with the Nagelkerke R^2 showing that 13% of the variance was explained. The first step of the model, the sociodemographic items, was not a significant predictor of NSSI, χ^2 (4, $N = 1238$) = 7.75, n.s. and the Nagelkerke R^2 statistic indicated that 2% of the variance in NSSI was being explained. The eight relationship dimensions were entered in the second step of the analysis. At the second and final stage in the model building, the block of predictors (relationship dimensions) was significant χ^2 (4, $N = 544$) = 42.24, $p < .001$ and the Nagelkerke R^2 showed an increase of 11% in the variance being explained. Results also indicated that only the fear scale of the AUAQ (χ^2 (1) = 11.39, $p < .01$) and the alienation scale of the IPPA (χ^2 (1) = 8.36, $p < .05$) contributed to the prediction of NSSI behaviours when all relationship dimensions were entered in a single model. Results from the binary logistic regressions predicting NSSI are presented in Table 3.

Main Analyses Conducted with Males and Females Separately

Because some studies (e.g., Gratz 2006; Gratz and Chapman 2007; Laye-Gindhu and Shonert-Reichl 2005; Ross and Heath 2002; Whitlock et al. 2006) on NSSI in normative populations showed important gender differences, the previous analyses have also been conducted separately for males and females. In the male sample, the MANCOVA did not reveal a significant effect of NSSI on the relationship dimensions (Wilk's λ , $F(8, 203) = 1.39$, n.s., $\eta^2 = .05$). Similarly, the binary logistic regression revealed that the relationship dimensions did not predict NSSI behaviours in males: the final block (relationship scales): χ^2 (11, $N = 351$) = 12.86, n.s.) with the Nagelkerke R^2 showing an increase of 9.5% in the explained variance over sociodemographic variables.

Results from the female sample were highly similar to results obtained from the overall sample. First, the MANCOVA revealed a significant effect of NSSI on the relationship dimensions (Wilk's λ , $F(8, 624) = 5.82$, $p < .01$, $\eta^2 = .07$). A between-subject effects analysis showed that the NSSI group differed significantly from the Non-NSSI group on all relationship dimensions except the anger scale of the AUAQ. All differences were in the expected direction. Similar to results obtained from the overall sample, the binary logistic regression revealed that the relationship dimensions significantly predicted NSSI behaviours in females: the final block (relationship scales): χ^2 (11, $N = 887$) = 44.20, $p < .001$ had the Nagelkerke R^2 showing an increase of 15% in the explained variance over sociodemographic variables. The fear scale of the AUAQ

Table 3 Relationship dimensions as predictors of NSSI behaviours (binary logistic regression)

Step predictors	Step 1		Step 2	
	Wald χ^2	OR (95% CI)	Wald χ^2	OR (95% CI)
Gender	.16	.89 (.51–1.55)	.01	1.03 (.57–1.87)
Language	.01	1.02 (.56–1.86)	.09	.90 (.45–1.78)
SES risk	2.94	1.62 (.93–2.80)	.02	1.04 (.57–1.90)
Living arrangement	4.03*	1.72 (1.01–2.93)	7.36**	2.18 (1.24–3.84)
AUAQ: failed protection			1.10	.95 (.85–1.05)
AUAQ: anger			1.07	.94 (.82–1.06)
AUAQ: fear			11.39**	1.22 (1.09–1.37)
PBI: care			1.72	1.02 (.99–1.05)
PBI: overprotection			2.38	1.02 (1.00–1.04)
IPPA: trust			.88	1.03 (.97–1.01)
IPPA: communication			3.05	.96 (.91–1.01)
IPPA: alienation			8.36**	1.10 (1.03–1.17)
Model χ^2		7.75		49.99
Nagelkerke R^2		.02		.13

$N = 1238$; * $p < .05$; ** $p < .01$

($\chi^2(1) = 9.21, p < .01$), the communication scale of the IPPA ($\chi^2(1) = 5.90, p < .05$) and the alienation scale of the IPPA ($\chi^2(1) = 8.71, p < .01$) significantly predicted NSSI behaviours in females.

Discussion

Previous research has identified that various dimensions of the parent–child relationship are influential in the development of NSSI in young adults. However, these investigations did not compare the relative contributions of individual relationship dimensions in the prediction of NSSI. The current study endeavoured to build upon existing literature by assessing an inclusive model of prediction, including the influence of multiple relationship dimensions simultaneously.

The first objective of this study was to replicate the basic associations shown in previous research (e.g., Gratz 2006; Gratz and Chapman 2007; Gratz et al. 2002; Hilt et al. 2008) between young adults' reports of parent–child relationship quality and NSSI behaviours in a normative population. Results showed that young adults who reported using NSSI behaviours in the last six months, also described childhood relationships with parents as characterized by feelings of failed protection and fear related to parents' abdication of their roles, more control exerted by parents, and increased feelings of alienation from parents. They also described their parents as less caring, less trustful and more difficult to communicate with. These results are consistent with previous research (e.g., Gratz 2006; Gratz and Chapman 2007; Gratz et al. 2002; Hilt et al. 2008), and also with the theoretical concept that parents who forego their parenting role may create an invalidating environment for the child (Linehan 1993), which then affects the child's ability to self-regulate experiences of stress and anxiety, potentially leading to use of maladaptive coping strategies. Of course, due to the retrospective nature of self-report measures used in this and previous studies, it is impossible to rule out the possibility that the current state of mind of self-injurious young adults may bias their perception of past relationships with their parents. Nonetheless, it may be more clinically relevant to assess the current perception of a given relationship rather than an objective assessment of what occurred in the past, as current outlooks are most likely to affect coping mechanisms such as self-injury. Longitudinal studies including behavioural observation of the quality of relationships at different developmental stages are needed to answer this question.

Related to this first objective, which was to explore whether the different relationship dimensions discriminated between the NSSI and Non-NSSI groups, it should be noted that the dimension of anger in response to the parent abdicating their role did not significantly distinguish the

two groups. Intuitively, this finding is puzzling, especially when combined with results from previous studies of the hostility model of NSSI, which posits that an inability to emotionally express anger and hostility to the appropriate source results in the individual redirecting their anger towards a more acceptable target, the self, resulting in NSSI (Bennum 1984; Herpertz et al. 1997). However, differences in the measurement of anger in the current study (based solely on anger directed towards parents) and hostility in previous investigations (e.g., Ross and Heath 2003) may account for such differences. To date, no studies of NSSI risk factors have directly assessed the influence of the anger associated exclusively with parents. Thus, further studies are needed to better understand the lack of association identified in the current study.

The second objective of the present study was to explore the relative contributions of the different dimensions of the parent–child relationship in the prediction of NSSI behaviours. It was expected that the dimensions indicative of a “relational trauma” (Schuder and Lyons-Ruth 2004), such as fear, failed protection, anger and alienation, would account for more variance in NSSI than dimensions reflective of a more general lack of intimacy, such as lack of care, lack of trust, communication problems and issues with parental control. This hypothesis was partially supported as results showed that the dimensions of fear and alienation were the only significant predictors of NSSI when shared variance between the various dimensions was taken into account. Although such dimensions should not be considered indicators of parental abuse, they are certainly indicative of dysregulation within the parent–child relationship. One may speculate that feelings of fear and alienation develop in the context of frightening (Hesse and Main 2006) or highly atypical parental behaviours (Lyons-Ruth et al. 1999) rather than in a context where parents show a more general lack of sensitivity. Attachment research has demonstrated that children raised in a context of atypical parenting generally develop disorganized attachment behaviours marked by signs of fear and anxiety toward their parents (van IJzendoorn et al. 1999). These disorganized behaviours have been repeatedly shown to predict various adolescent psychopathologies (Carlson 1998; Dutra et al. 2009; Ogawa et al. 1997). As they mature, these children with disorganized attachment generally also represent the relationship with their parents as being marked by fear, chaos, violence and an absence of family unity (Solomon et al. 1995). In this context, it is not surprising that reports of feelings of fear and alienation in the parent–child relationship are associated with maladaptive coping strategies such as NSSI behaviours.

As mentioned previously, this is the first study to explore the relative contributions of different parent–child relationship dimensions in the prediction of NSSI behaviours. Taken together, the results of the present study indicate that

although nearly all dimensions discriminated between a group of young adults reporting NSSI behaviours and young adults who did not report such behaviours, only some of them significantly contributed to engaging in NSSI. In fact, all dimensions were significantly correlated to each other, necessitating the control of their shared variance. These findings represent an original contribution to our understanding of NSSI behaviours and, although there is growing consensus that the quality of parent–child relationships is an important factor in the etiology of NSSI behaviours, it is both clinically and empirically relevant to clearly identify which aspects of these relationships are influential, and should thus be primary targets of early intervention. Further research is needed to consolidate the present findings.

The final objective of this study was to explore whether the associations between the parent–child relationship dimensions and NSSI differed between genders. Results showed that, for males, none of the relationship dimensions were associated with NSSI behaviours. For females, results were similar to those from the general sample, with both fear and alienation predicting NSSI behaviours. An additional finding for females was that poor communication within relationships with parents also predicted NSSI behaviours. These results are intriguing, as they may suggest the importance of an interpersonal, communicative component in the development of NSSI behaviour in females, but no similar importance in males. This is consistent with literature on gender differentiation (Maccoby 1998), suggesting that girls are expected to be more affected by the quality of interpersonal relationships and by communication with close relatives. Thus, if these relationships are perceived as being problematic, females may be more likely to develop maladaptive coping strategies such as NSSI in response to relational anxieties. It should be noted that this result may also simply be a reflection of the disproportionate number of participants in both gender groups.

Limitations

While the present study represents a valuable addition to the sparse current literature, there are nonetheless limitations. First, data from this study were gathered using electronic self-report measures. Although self-report measures have commonly been used, they present potential social-desirability issues, often resulting in underreporting the extent of the studied behaviours. Although the OSI was presented among a variety of other questionnaires, potentially alleviating the stigma attached to NSSI behaviours, a distortion of the information provided by participants is still possible. On the other hand, the anonymity provided by use of electronic surveys might have enticed some individuals to reveal information that would not have

otherwise been obtained. A second limitation is with regard to self-report measures as the only method of data collection. In further investigations, it would be pertinent to combine self-report measures with individual interviews in order to generate a further and more accurate understanding of participants and of the etiology of their NSSI. A combined approach such as this might also eliminate possible comprehension errors regarding question formulation.

A third limitation pertains to the use of retrospective measures of the parent–child relationship dimensions. The measurement of past relationships with parents requires the use of retrospective measures, which may yield modified and interpreted perceptions of actual past events; nonetheless, it is the individual's perception of these experiences that is ultimately relevant.

Finally, in order to respect the original format of questionnaires used in the present study, and to be consistent across the various measures, participants were asked to respond concerning the relationship with both their parents. It would be interesting in future studies to distinguish between fathers and mothers in order to explore whether the relation with one parent is more influential in the development of NSSI behaviours.

Clinical Impact

The growing body of information on NSSI risk factors may be used concurrently to shape preventive and intervention models in normative populations, thus increasing our understanding of the behaviour and, subsequently, our ability to appropriately and accurately educate the general population. Results from this study combined with previous studies exploring the impact of close relationships on NSSI behaviours (e.g., Gratz 2006; Gratz and Chapman 2007; Gratz et al. 2002; Hilt et al. 2008; Yates et al. 2008) emphasize the importance of young adult perceptions of poor communication, particularly for females, and feelings of fear and alienation in their relationships with parents in the etiology of NSSI behaviours. Clinicians, school personnel, and parents witnessing these behaviours in adolescents or young adults should be sensitive to the impact of relational components in the development of such problems. Therapy focusing on improving the quality of interpersonal relationships may be particularly useful in the treatment of NSSI. Finally, assuming that retrospective self-report of relationship quality is indeed rooted in the childhood relationship with parents, and not biased by current relational issues, results of the present study add to the long list of empirical evidence underlying the importance of preventive programs aiming at supporting parents, and at helping them develop adequate parenting skills and establish secure relationships with their children.

Conclusions

NSSI behaviours are a phenomenon that receives increasing attention from both clinicians and researchers. Development of preventive and curative treatment is a crucial task requiring a better understanding of various related risk factors and their interplay in the development and maintenance of these behaviours. The present study contributed to our knowledge of the different dimensions of the parent–child relationship predicting NSSI behaviours in young adults. Findings from the current study showed that, although most dimensions of parent–child relationships discriminated between young adults who self-injured and those who did not, the dimensions of fear and alienation were most predictive of NSSI when the shared variance was accounted for. Moreover, the results demonstrated that these dimensions were more influential in the development of NSSI in females than in males. This study represents an important and original contribution to our knowledge regarding NSSI as it shows that dimensions of the parent–child relationship which reflect more serious disruptions in the relationship rather than a more general lack of intimacy, or poor quality of relationship are most influential in the development of NSSI. These findings also support the notion that different developmental pathways of NSSI may be evident between males and females.

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