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Citation of the final article:

This is an Accepted Manuscript of an article published by Taylor & Francis in Archives of suicide research on 8 November 2016, available at:

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Attachment, Emotion Regulation, Childhood Abuse and Assault: Examining Predictors of NSSI Among Adolescents

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Abstract

Objectives: We examined the relative risk of Non-Suicidal Self-Injury (NSSI) associated with a history of physical and sexual abuse/assault, poor attachment relationships, and poor emotion regulation among adolescents. Methods: 2,637 adolescents (aged 12–15 years) completed questionnaires at three time-points: baseline, 12, and 24 months later. Results: Across the study, 9.4% reported a history of NSSI. Each of past or recent abuse/assault, poor attachment relationships and poor emotion regulation was associated with NSSI. We also observed a potential ‘high-risk’ group among those reporting recent sexual abuse or assault. Conclusions: Knowledge of abuse history, recent sexual assault, attachment, and emotion regulatory ability will enable clinicians to assist adolescents in avoiding some of the more negative outcomes of these, including NSSI.

Keywords: attachment, childhood abuse, emotion regulation, NSSI

Non-suicidal self-injury (NSSI) includes any self-inflicted injury which lacks suicidal intent or culturally sanctioned purpose (Nock & Favazza, 2009). NSSI most often involves cutting the skin, or self-battery, and is frequently reported as having an emotion regulatory function, usually following an increase in negative emotional arousal (Klonsky, 2007, 2009; Nock & Favazza, 2009; Tracy, Klonsky, & Proudfit, 2014). Although suicide attempts are conceptually different to NSSI, risk of later suicidal behaviour is increased among those who engage in NSSI (Whitlock et al., 2013). With recent estimates suggesting approximately 10–20% of adolescents...
and young adults self-injure (Muehlenkamp, Claes, Havertape, & Plener, 2012; Swannell, Martin, Page, Hasking, & St. John, 2014), factors associated with the risk of NSSI warrant further research.

Previous research indicates that negative perceptions of parents and parenting, anxiety around primary attachment relationships, emotion dysregulation or decreased ability to modulate negative emotions, and traumatic experiences can all contribute to the onset and maintenance of this behaviour (e.g. Baetens et al., 2013; Bureau et al., 2010; Lang & Sharma-Patel, 2011; Maniglio, 2011; Tatnell, Kelada, Hasking, & Martin, 2014). By exploring these developmental antecedents to NSSI we hope to highlight specific risk factors and potential targets for prevention/intervention to help adolescents learn more adaptive emotion regulation strategies. In the present study, we explored longitudinal relationships between attachment, emotion regulation and NSSI in a large group of adolescents, comparing those reporting physical and sexual abuse to those without such a history.

**ATTACHMENT, EMOTION REGULATION AND NSSI**

Attachment theory proposes that infants are initially reliant on caregivers for emotion regulation and attenuation of negative affect. Over time, infants and young children develop their own regulatory ability, as primary caregiver(s) exemplify, encourage and validate emotional expression, and communicate affect-based language and emotion regulatory strategies to the child (Bowlby, 1969, 1973; Schore, 2001a, 2001b). Effectiveness of this self-regulation is related to the quality of attachment relationship with the primary caregiver, (secure, anxious/resistant, anxious/avoidant or disorganised) which is in turn impacted by the primary caregivers own attachment style (Newman & O’Shaughnessy, 2015).
Each of the insecure styles predicts different difficulties in self-regulation; avoidant attachment is associated with over regulation and distress avoidance, resistance reflects under regulation and a tendency to heighten distress responses, and disorganization produces undirected responses to distress where children have no fixed strategies to regulate responses (Fonagy, Gergely, Jurist, & Target, 2004). The current research focuses on attachment-related anxiety as a general construct associated with attachment insecurity, which occurs when caregiver responses are inconsistent or mismatched with infants’ emotional cues, and is associated with deficits in emotion relation development (Fonagy et al., 2004).

Early development of the hypothalamic-pituitary-adrenal axis (HPA axis) and limbic system is crucial to effective emotion regulation, and shaped by the quality of primary attachment (Schore, 2001a, 2001b). During adolescence, much of the characteristic emotional upheaval may be attributed to ongoing development of the frontal lobe and prefrontal cortex, cortical areas associated with executive functioning and cognitive control (including emotional understanding; Giedd, 2008; Riediger & Klipker, 2014). Yet, while there have been studies examining associations between adult romantic attachment, parenting behaviours, and NSSI (Baetens et al., 2013; Bureau et al., 2010), the relationship between attachment experiences and NSSI in adolescence is rarely researched. Given attachment anxiety is a characteristic feature of all insecure attachment styles, and that emotion regulation continues to develop throughout adolescence (Gullone et al., 2010), we chose to explore relationships between these factors and NSSI among adolescents, to better understand why some adolescents self-injure while others do not.

**EXPERIENCE OF ABUSE AND NSSI**
Child abuse is associated with poor emotion regulation, negative views of self and others, and an anxious relationship with the primary attachment figure even when the abuser is not a member of the family. Alexander (1992) suggested that in familial abuse, an insecure attachment most frequently preceded abuse, whereas when an abuser was extra-familial, a previously securely attached child may become insecure as a result. A history of childhood abuse (physical, sexual, and emotional) is related to NSSI (Lang & Sharma-Patel, 2011; Maniglio, 2011), however the link between childhood sexual abuse and NSSI is small and tends to dissipate when related variables (e.g. dissociation, hopelessness) are considered (Klonsky & Moyer, 2008).

Much research has examined the impact of childhood abuse on the onset of NSSI (see reviews by Klonsky & Moyer, 2008; Lang & Sharma-Patel, 2011), however few have examined the relationship between recent (i.e. within 12 months) sexual abuse/assault and NSSI. Jaquier, Hellmuth, and Sullivan (2013), reported a moderate relationship between experience of intimate partner sexual assault within the preceding 6 months and NSSI.

**THE CURRENT STUDY**

We adopted a developmental approach, examining the associations between NSSI and distal risk factors including perception of parental attachment as well as experience of physical or sexual abuse more than 12 months prior to participation. We also examined relationships between emotion regulatory style, and physical or sexual abuse or assault within the past 12 months. We hypothesised that experience of abuse, attachment anxiety and expressive suppression would be associated with NSSI and that cognitive reappraisal would be negatively associated with NSSI. We aimed to identify those at highest risk of engaging in NSSI in order to highlight potential prevention and intervention strategies to decrease use of NSSI by adolescents.
METHOD

Participants

Participants were 2,637 adolescents (844 male), aged 12–18 years ($M = 13.93$, $SD = 0.99$), recruited from 40 independent or religion-based schools across Australia, who participated as part of a larger study on adolescent coping. Participants were invited to complete follow up questionnaires 12 and 24 months later. Most participants (89.2%) were born in Australia, were from metropolitan areas (90.2%), with 8.5% from regional and 1.3% from remote communities. Diagnosis of a mental illness was reported by 6.3% of the sample (most commonly mood disorders = 2.1%, anxiety disorders = 1.7%, and ADHD = 1.1%). Of the participating schools, 62.7% were Catholic. Females were over-represented as 44.1% of participating schools were single sex girls’ schools. Metropolitan areas of higher socio-economic status were also over-represented in the sample (Australian Bureau of Statistics (ABS), 2008).

Attrition over the course of the study was largely due to absence of students at one or more testing sessions (Time 2 $n = 471$ [15.11%], Time 3 $n = 529$ [16.97%]), but also transfer to another school ($T2 n = 107$ [3.43%], $T3 n = 237$ [7.60%]), school withdrew from the study ($T2 n = 129$ [4.14%]), parent or student withdrawal ($T2 n = 25$ [.80%], $T3, n = 32$ [1.03%]), student deceased ($T2, n = 1$ [.03%]), or ‘not recorded’ ($T2 n = 56$ [1.80%], $T3 n = 98$ [3.14%]).

Materials

Self-Harm Behaviour Questionnaire (SHBQ; Gutierrez, Osman, Barrios, & Kopper, 2001)

NSSI engagement was assessed using Part A of the SHBQ. Participants were informed that self-injury was to “hurt yourself on purpose without trying to die”, then asked “Have you ever hurt
yourself on purpose”. Participants responding in the affirmative were then asked about methods, age of onset, recency, frequency and medical severity of their injuries, reasons for NSSI, history of suicidal ideation and attempts. Only those who engaged in direct self-injury with no suicidal intent were considered as engaging in NSSI.

**Adolescent Attachment Questionnaire (AAQ; West, Rose, Spreng, Sheldon-Keller, & Adam, 1998)**

The 9-item AAQ assesses anxiety surrounding the adolescent-parent relationship, answered referencing the parent/caregiver to whom a participant feels closest. Statements include six positive (e.g. I’m confident my parent will try to understand my feelings; reverse scored) and three negative items (e.g. I get annoyed at my parent because it seems I have to demand his/her caring and support). Responses are made on a five-point Likert scale - 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate poorer relationship quality and increased anxiety. Test-retest reliability is high, and construct and convergent validity are excellent (West et al., 1998). The measure demonstrated sound internal consistency in the current sample ($\alpha = .87$).

**Emotion Regulation Questionnaire (ERQ; Gross & John, 2003)**

The 10-item ERQ has two subscales examining expressive suppression (four items e.g. I keep my emotions to myself) and cognitive reappraisal (six items e.g. I control my emotions by changing the way I think about the situation I’m in). Responses are made on a seven-point Likert scale - 1 (strongly disagree) to 7 (strongly agree). Gross and John (2003) report Cronbach’s alphas of .79 for the reappraisal subscale and .73 for the suppression subscale. The ERQ has high test-retest reliability and satisfactory convergent and discriminant validity (Gross & John, 2003). In the current sample Cronbach's alphas were .83 (reappraisal) and .76 (suppression).
The Adolescent Life Events Scale (ALES; Rodham & Hawton, 2006)

Two items from the ALES directly address physical and sexual abuse and assault asking “Have you been seriously physically abused” and “Has anyone forced you (i.e. physically or verbally) to engage in sexual activities against your will?” Response options provided were: never, yes more than a year ago, and yes within the past 12 months.

Procedure

Ethics approval was obtained from both Monash University (CF09/0722 – 2009000302) and University of Queensland (2009001085) Human Research Ethics Committees, and all relevant educational jurisdictions. Of 115 schools invited to participate (selected with the aim of recruiting a geographically representative sample), 41 initially accepted (one later withdrew) and were provided information regarding aims, and intended use of study results, along with consent forms for all students in the first 3 years of high school and their parents ($n = 14,841$). Adolescents who received parental consent ($n = 4,119$) provided their own written consent to participate ($n = 3,117$) and later completed the questionnaire during school hours. While only 28% of parents consented to participation, this is in line with previous Australian school based studies addressing NSSI (Hasking et al., 2010). Participants completed the questionnaire again at 12 and 24 months, ($T_1 \ n = 2637$, $T_2 \ n = 1973$, $T_3 \ n = 1424$). Each participant received a unique code establishing confidentiality but allowing matched responses. Participants were informed that their responses were confidential, but that they could be identified if they were at imminent risk of harm. Upon completion participants received an information pack containing mental health resources.

Data Analysis
As participants provided repeated measures over time, two multivariate random effects logistic regressions were selected to model the propensity to report NSSI; these were conducted using STATA v13.1. Physical abuse and sexual abuse were accounted for in separate models. The outcome variable, reporting NSSI, was modelled as a function of age, change in age while under observation in the study (to assess whether participants were more likely to report NSSI as a function of growing older), reported history of abuse (none, more than 12 months prior to assessment, and within the last 12 months), and concurrent levels of reported attachment anxiety, cognitive reappraisal and expressive suppression. To assess whether recent abuse contributed to reporting NSSI over and above growing older, the interaction between change in age during the study and recency of abuse was also modelled. Random effects modelling utilises all available data, so while data were missing at some time points for some participants, cases were not excluded as a result.

**RESULTS**

**Preliminary Analyses**

At baseline, 249 (9.4%) reported a history of NSSI. This rate remained relatively consistent over time (9.1% at time 2; 9.6% at time 3). Of participants reporting NSSI, 73.45% reported cutting, 13.27% scratching, 12.83% self-battery, 7.52% burning and 14.16% reported ‘other’ methods. Approximately half (51.33%) of participants reporting NSSI stated that their injury was usually not serious at all, while 45.13% needed first aid. Only 5.31% stated that they had needed medical attention for NSSI. Affect regulation was the most commonly reported reason for NSSI (68.58%), followed by self-punishment (15.04%), sensation-seeking (5.75%), feeling generation (4.42%). The remaining 7.96% reported interpersonal influence, unknown or ‘other’ reasons.
Participants reporting NSSI were more likely to have considered $\chi^2(1) = 265.12, p < .000, \phi = .434$ and attempted $\chi^2(1) = 96.79, p < .000, \phi = .262$ suicide, compared to participants who never hurt themselves. Those who engaged in NSSI were older, reported higher levels of attachment anxiety, less use of cognitive reappraisal, and greater use of expressive suppression at all time points (Table 1). In the later phases of the study self-injurers were less likely to be male (Table 1). At all three time points, a history of either physical or sexual abuse was more likely to be reported by self-injurers than those with no history of NSSI (Table 2). Data from seven participants were excluded due to inconsistency in reporting gender across time suggesting potential for other inconsistencies or erroneous reporting among these participants. Adolescents who did not provide data at all time points did not differ from those who continued with regard to gender $\chi^2(1) = .547, p = .460, \phi = .023$, NSSI $\chi^2(1) = 3.302, p = .069, \phi = -.054$, or reported abuse (physical $\chi^2(2) = .714, p = .700, \phi = .023$; sexual $\chi^2(2) = 1.277, p = .528, \phi = .031$). Additionally, there were no differences between those lost and those retained on cognitive reappraisal $t(1269) = -1.136, p = .256, d = -.046$, or emotion suppression $t(1319) = .375, p = .707, d = .014$. However, adolescents who remained in the study reported higher attachment anxiety at baseline than those who discontinued or were absent at subsequent testing sessions; $t(1283) = 2.680, p = .007, d = .107$.

**Main Analysis**

The pattern of associations was the same whether physical or sexual abuse was accounted for: older participants, and individuals as they grew older, reported more NSSI. Participants reporting abuse, either past or recent, were more likely to report NSSI than those reporting no abuse. Female gender, higher attachment anxiety, lower reappraisal scores, and higher suppression
scores all increased the likelihood of NSSI, after ageing and reporting of abuse were taken into account (Table 3).

While all participants were more likely to report NSSI as they grew older, participants also reporting recent sexual abuse were almost seven times more likely to report NSSI than participants reporting no sexual abuse or past sexual abuse. This pattern did not occur in relation to the reporting of physical abuse (Table 3).

**DISCUSSION**

We examined the contribution of a variety of explanatory variables to the outcome of engaging in NSSI over a 2 year period across a large group of adolescents. In this sample, in line with some previous work (Lang & Sharma-Patel, 2011; Maniglio, 2011), experience of physical or sexual abuse (either past or recent) was strongly associated with NSSI. Separately, and in support of previous findings, anxiety around relationships with the closest parent (Baetens et al., 2013; Bureau et al., 2010), and use of expressive suppression rather than cognitive reappraisal as a strategy of emotion regulation also significantly increased likelihood of reporting NSSI (Andrews et al., 2013; Hasking, Momeni, Swannell, & Chia, 2008, Turner, Chapman, & Layden, 2012; Voon, Hasking, & Martin, 2014). Notably, we also found that while risk of NSSI increased over time, this effect was considerably stronger for adolescents who reported sexual abuse or assault within the previous 12 months, potentially indicating a group at ‘high risk’ for NSSI.

During adolescence, maturation of cognitive, emotional and behavioural response systems constitute a period of specific vulnerability for increased rates of depression, anxiety, substance abuse and increased risk taking behaviour in normative development (Steinberg, 2005). That more recent abuse posed significant risk suggests that this vulnerability may be increased among those
experiencing traumatic events such as sexual abuse or assault in adolescence. It is likely that experience of sexual abuse in both childhood and adolescence would further increase risk of NSSI; however with our chosen measures we were unable to examine cumulative effects of multiple instances of abuse. Future work should examine a dose-response effect of sexual abuse and assault on NSSI.

Despite small effect sizes, our findings provide some support for the proposition that anxiety around attachment relationships in adolescence and poor emotion regulation increase risk of NSSI, while use of cognitive reappraisal might be protective. We draw a link to Schore’s (2001a) psychoneurobiological model, which indicates that those with insecure attachments in infancy are less able to develop effective emotion regulation skills. Developmental research examining the impact of early attachment, resultant emotion regulation, and abuse on later psychopathology and NSSI will highlight developmentally appropriate points for intervention. Clinically, working with at risk parents (i.e. those with their own history of relational trauma, mental health concerns, drug and alcohol abuse etc.) to assist in the development of secure attachment in the infant may promote improved emotion regulation ability in adolescence, reducing likelihood of both abuse and NSSI. Additionally, awareness of current levels of emotional development, past and recent experiences of abuse, physical, and in particular recent sexual abuse may highlight those at risk of NSSI.

**Limitations**

Although garnering support for the relationships between childhood abuse, attachment, emotion regulation and NSSI our results are not without limitations. While we were fortunate in our large sample, generalizability is limited as we were unable to access government schools
(approximately 74% of Australian schools), or students from relatively disadvantaged backgrounds, and the sample was largely drawn from Catholic schools. In addition, our participants were all self-selected volunteers, which may introduce biases that we are unable to estimate; as a result, care should be applied when applying these findings to other populations.

We assessed attachment anxiety reported by adolescents; while evidence suggests that attachment does not vary greatly over time (Main, Hesse, & Kaplan, 2005), there is also evidence to suggest that traumatic events (abuse, poor home environment, loss, parental divorce; Alexander, 1992; Lewis, Feiring, & Rosenthal, 2000; Weinfied, Whaley, & Egeland, 2004) may change an individual’s attachment style. Of particular interest, those with disorganised attachment would be expected to have more negative outcomes, but we were unable to establish this. Future studies should consider using the adult attachment interview (Crowell & Treboux, 1995; Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010) to assess attachment styles, or longitudinal cohort studies from infancy to adolescence to more accurately determine whether there is a developmental path from early attachment styles, through later emotion regulation to NSSI.

Our method included single item measures of abuse. Whereas more information about abuse, including age, perpetrators and extent of abuse would have been beneficial to the study, we deemed it ethically inappropriate to pose these questions to adolescents in large groups, where individualised follow-up support may be limited. In addition, much of the available literature indicates emotional abuse has similar or more negative effects than either physical or sexual abuse (e.g. Glassman, Weierich, Hooley, Deliberto, & Nock, 2007; Rallis, Deming, Glenn, & Nock, 2012). Future work could usefully study emotional abuse. Finally, the reliance on self-report data means that all responses are by nature subjective, and subject to change and forgetting (Fergusson,
Horwood, & Woodward, 2000). Future examinations of attachment, abuse and NSSI should consider the addition of collateral reports from parents.

**Summary and Implications**

Our study provides important information regarding NSSI and its relationship with childhood abuse in a large sample of Australian adolescents, and suggests avenues for future research and implications for theory and practice. Concerning prevention, a primary caregiver’s awareness of their own attachment style may help them to understand how to foster a secure attachment with their infants; targeted interventions with at risk mother-infant dyads may be valuable. In addition, clinicians could help adolescents learn to regulate their emotional state in more positive ways, teaching emotion regulation strategies. This work implies that attachment-based family therapy may be of use for adolescents who self-injure, particularly for those who also identify past abuse, as it enables adolescents to identify and express emotions to parents, and re-establish the attachment relationship (Kissil, 2011). Importantly, practitioners can be aware of the increased risk of NSSI among those reporting recent sexual abuse or assault. Detection of early abuse and those who experience later sexual assault will highlight groups as greater risk of engaging in NSSI. Understanding attachment styles and capacity for emotion regulation will enable clinicians to assist adolescents in avoiding some of the more negative outcomes of these, including NSSI.

**Acknowledgments**

We thank Sophie Aitken, Tori Andrews, Emily Berger, Teryn Callaway, Lauren Friend, Cassandra Rotolone, Alicia Tanner and David Voon for data collection and entry. Funding was provided by the Australian Research Council.
Funding

This work was supported by a grant from the Australian Research Council [grant number: DP0985470].

References


Table 1. Summary statistics for age, attachment anxiety, reappraisal, suppression and gender distributions at 3 time points for those reporting and not reporting self-injury. CI for mean difference

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chi², df, Cramer’s V
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NB: **p < .01; ***p < .001.
Table 2. Percentages reporting abuse among those reporting and not reporting NSSI, over time

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<th>Time</th>
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<th>( \chi^2 )</th>
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NB: **p < .01; ***p < .001.
Table 3. Random effects logistic regressions predicting the propensity to report self-injury

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<th>Regression 2: accounting for reporting sexual abuse</th>
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<td>Change within participants</td>
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<tr>
<td>Recency of reported abuse</td>
<td>Mor e than 12 mont hs ago</td>
<td>With in the last 12 mont hs</td>
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<td>6.12*** 3.0 12.6 8.15*** 3.3 20.1</td>
<td>5.94** 2.0 17.6 7.65*** 3.1 18.9</td>
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**Note:** Table entries indicate statistical significance levels. **p < 0.05, ***p < 0.001.
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<th>Attachment anxiety</th>
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<th>1.2</th>
<th>1.17***</th>
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<th>1.2</th>
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<td>Suppression score</td>
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NB: **p < .01; ***p < .001.