

Parental bonding and adolescent suicide

taking behaviors and thus may not be identified by researchers or suicide prevention workers.

Traditional markers of suicidal risk may therefore not be as helpful as previously thought. Kosky et al. (15) compared suicidal depressed youths and non-suicidal depressed youths, noting that suicidal ideation was clearly associated with disturbed, hostile intrafamilial relationships. They stated: "We cannot be satisfied with symptomatological predictions of suicidal potential... If we are to predict potential suicidal behavior we should rather focus on the family interactions and be alerted by the presence of discord and hostility in the family..."

Family discord is commonly seen clinically between parent and adolescent. A method for measuring aspects of this relationship is the Parental Bonding Instrument (PBI) (21). Two main factors – care and protection – are derived from the 25 questions answered for both parents. Parker (22), reviewing the psychometric properties, quotes validity studies that suggest that the PBI measures both perceived and actual parenting "if some dissonance between the two is perceived". The instrument is stable and reliable (23), shows a sensitivity to cross-cultural issues (24) and an ability to predict remission (25) and relapse (26) in mental illness. In adults, studies of depression (25, 27) and suicide (28) have shown that parents were less caring and more protective, the affectionless control described by Parker (29).

The literature on the use of the PBI with adolescents is sparse. A large-scale study (30) provided population norms for Australian adolescents. An early study on adolescents (24) showed that the PBI could discriminate between cultural style in parenting. Rey & Plapp (31) have shown that adolescents with disruptive behavior disorders report their parents as affectionless and controlling. Burbach et al. (32), in a small study using the PBI to score parents jointly rather than separately, showed that adolescents diagnosed as having nondepressive mental disorder are more likely to have parents with affectionless control. The 12 patients with clinical depression showed a similar (nonsignificant) trend.

Adolescent suicides are potentially preventable – if you can recognize and get at the needle in the haystack. The first step is to identify with a degree of certainty the adolescents who are vulnerable; that is, those with suicidal ideation and/or deliberate self-harm and/or depression, or those with the more serious mixture of all 3. This study is one of a series into early identification and/or prediction of vulnerability. The aim was to determine whether the PBI could identify vulnerable adolescents and whether correlations exist between the subscales of the PBI and depression, self-destructive behaviors and suicidal thoughts.

Material and methods

Subjects

The study group consisted of all year 10 students (mean age 15 years) from 4 randomly chosen coeducational government schools in the southern metropolitan area of Adelaide, South Australia (total city population 1 million). Two schools serve a suburban hills population with a broad range of social class; two schools serve a defined light industrial and residential area with a bias toward lower and low middle socioeconomic background. All 4 populations are predominantly white Anglo-Saxon with about 15% Mediterranean and European influence. No school has more than 1% Aboriginal students.

Instruments

The composite questionnaire included questions about family structure, the PBI and the pre-1991 version of the Youth Self Report (YSR) (33).

The PBI for either parent resolves into a care subscale (12 items) and a protection subscale (13 items). Care is bipolar with one pole defined by expression of affection, emotional support and fair treatment and the other pole by neglect and rejection. Protection is also bipolar, with one pole labelled psychological autonomy and the other psychological control – defined by items of intrusiveness, parental direction and control through guilt.

The depressed subscale of the YSR was used as a measure of depressive thought and affect. Although questions remain regarding the subscale's relationship with clinical depression, Ritter (34) has reported on the depressed subscale in the context of high risk for suicide.

Responses to YSR questions 18 ("I deliberately try to hurt or kill myself") and 91 ("I think about killing myself") provided information on deliberate self harm and suicidal thoughts, respectively. These questions do not reflect the whole spectrum of suicidal thinking and behavior, but responses have validity and reliability (34–36).

The depressed subscale for females contains the 2 items for deliberate self-harm (Q 18) and suicidal thoughts (Q 91), and suitable adjustments were made prior to correlational analysis.

Procedure

The study was completed with ethics committee approval from Flinders University Medical School.

Questionnaires and research plan were discussed with the principal of each school, who provided consent after discussion with teaching staff and parents. An information and consent letter was sent to parents with the weekly school newsletter 2 weeks prior

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to commencement. Questionnaires were made available to parents at the schools. After discussion of the study and privacy principles, all year 10 students present on the day completed the confidential questionnaire with no discussion, in the classroom, during 1 period (about 40 min). Questionnaires were collected the same day.

Statview II[®] was used for statistical analysis on an Apple Macintosh IIci[®]. Pearson product-moment correlation, Student's *t*-test, chi-square and Spearman rank-order correlation were used according to the data type. An alpha level of 0.01 was accepted for statistical significance in view of the multiple inferential statistical analyses and the elevated probability of a Type 1 error.

Results

Completed questionnaires were returned by 681 students (response rate 92.4%). Mean age of students was 15 years ($SD \pm 0.6$, range 14 to 18 years). This is a 1-school-year sample with small variance, which may be important given that suicidal ideation and behaviors are related more to age than to other factors (37). The gender ratio was M 382:F 299 (M 56.1%:F 43.9%), with no difference in mean ages between sexes. Gender balance is clearly an important issue, given that more males succeed at suicide while more females have suicidal ideas and/or attempt suicide. Other studies using the PBI have reported on samples with a smaller proportion of females in their "normal" group (31, 32). Our study proportions are closer to those of Cubis et al. (30).

Family structure

Nearly 95% of the adolescents had been brought up by the natural mother but only 85% by the natural father. These proportions appear to be normal for this age group in an Australian population (30).

Parental bonding

All means for care were significantly higher in this sample compared with Cubis et al. (30), whether for father or mother and whether it was a male or female adolescent reporting; similarly, all protection mean scores are lower. This suggests a difference between the two Australian samples – Adelaide and Newcastle.

Subscale differences are unlikely to be due to gender, given that females score higher on care and lower on protection, and we would have needed a higher proportion of females than Cubis et al. to achieve the difference.

We hypothesized that the differences might be due to the younger age of the Adelaide sample, and an attempt was made to test this within our study by comparing 14-year-olds and 15-year-olds as two distinct subsamples. Small differences were found in the expected direction, with younger adolescents perceiving greater mean care and lower mean protection, but none of the differences reached significance. This confirms Parker's report (22) that no significant age effects have so far been demonstrated.

Our male/female maternal and paternal care mean scores are almost identical with those of normal controls (mean age 14 ± 1) reported by Rey & Plapp (31), although protection scores are significantly lower (maternal protection one sample *t*-test = -7.23 , $P < 0.001$ (2 tailed); paternal protection one sample *t*-test = -2.66 , $P < 0.01$ (2 tailed)). A similar comparison was not possible with Burbach et al. (32).

These differences suggest that, while within sample comparisons are not invalidated, caution must be exercised when comparing between samples. Despite this, and in accordance with Rey & Plapp (31), we chose to use published population means (30) as norms where relevant for further analysis.

Depression

Because the YSR depressed subscales are constructed differently for males and females, data relating to depression is presented separately.

For males the overall mean depressed subscale score was 11.49 ± 6.91 ($n = 366$). For those admitting suicidal thoughts but denying self-harm, the mean score was higher 15.15 ± 7.22 ($n = 48$); for those claiming self-harm without suicidal thoughts, the mean score was similar, 14.21 ± 6.06 ($n = 19$); for those claiming both, the mean was higher at 20.42 ± 7.70 ($n = 36$).

Since the YSR for girls aged 11–18 includes the questions on suicidal thoughts and deliberate self-harm, the scores on these questions were removed, as appropriate, prior to the relevant comparison. For females the study sample mean depressed subscale score was 17.51 ± 9.83 ($n = 296$). For those claiming suicidal thoughts without self-harm, the mean score was higher at 21.36 ± 7.33 ($n = 53$); for those claiming self-harm without suicidal thoughts, the mean score was much higher at 31.54 ± 11.55 ($n = 13$); for those admitting both, the mean was 28.84 ± 9.10 ($n = 32$). For both genders each of these mutually exclusive subgroup mean scores was significantly different to the relevant mean score for those denying either suicidal thoughts or DSH ($P < 0.001$).

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Table 1. Parental Bonding Instrument and depression subscale means (SD in parentheses)

Gender PBI subscale	Case		Not case		<i>t</i> ^a
	> mean+2 SD	<i>n</i>	< mean+2 SD	<i>n</i>	
Males					
Maternal care	20.6 (8.7)	22	27.1 (6.6)	341	-4.44**
Maternal protection	17.8 (9.5)	22	11.3 (7.2)	341	3.97**
Paternal care	19.6 (6.8)	21	24.5 (6.6)	335	-3.34**
Paternal protection	15.2 (7.8)	21	10.2 (6.0)	335	3.64**
Females					
Maternal care	21.8 (10.5)	18	29.2 (6.7)	273	-4.36**
Maternal protection	17.2 (9.4)	18	9.8 (6.9)	273	4.32**
Paternal care	18.5 (8.6)	17	26.1 (7.5)	268	-4.03**
Paternal protection	16.9 (9.6)	17	10.5 (6.6)	268	3.72**

^a Unpaired *t*-test, two tailed. ** *P* < 0.001.

Depression and parental bonding

Significant correlations exist between the YSR depressed subscale and the subscales of the PBI. Pearson product moment correlations for males reporting care are $r = -0.31$ (maternal) and -0.26 (paternal); correlations for protection $r = 0.32$ (maternal) and 0.23 (paternal). Similarly, correlations for females reporting care are $r = -0.35$ (maternal) and -0.40 (paternal); correlations for protection $r = 0.30$ (maternal) and 0.24 (paternal). Overall, this suggests that lower care and higher protection are associated with increasing levels of depression.

Clinically more important are PBI scores for those scoring highest on the depressed subscale. Twenty-three males (6.2%) scored over 2 SD above the mean, the cut-off suggested by Achenbach for definition of a case (33). Nineteen females (6.4%) scored as cases. These figures are consistent with other studies (17). Table 1 shows significant differences in scores on the PBI between those with case depression compared with those scoring less than 2 SD above the mean. Depressed adolescents score both parents as much less caring and much more protective, consistent with similar studies in adults (25, 27). Parker (29) suggested a different way of examining these data, recommending the intersection of care and protection subscales at their means to define parenting styles as quadrants – optimal parenting (high care/low protection), affectionate constraint (high care/high protection), affectionless control (low care/high protection) and neglectful parenting (low care/low protection). This representation has been used in adults by Silove et al. (38) and in adolescents by Rey & Plapp (31).

Using Cubis et al. (30) sample means to define our quadrants, Table 2 shows assignment of parents by depressed and nondepressed adolescents. Relative risk estimates are given based on an assumed relative risk of 1 for optimal parenting. Given that both males and females are assigned to the depressed group statistically, they were combined.

A significantly higher proportion of depressed

Table 2. Assignment of parents to PBI quadrants using population means (30): percentages in parentheses; relative risk estimates below

Sample	Parent assigned	Optimal parenting	Affectionate constraint	Affectionless control	Neglectful parenting	χ^2
Depression						
Case	Father	9 (22.5%)	7 (17.5%)	16 (40.0%)	8 (20.0%)	22.5**
Not case		339 (56.4%)	71 (11.8%)	93 (15.5%)	98 (16.3%)	
		1	3.47	5.66	2.92	
Case	Mother	9 (21.4%)	9 (21.4%)	17 (40.5%)	7 (16.7%)	30.3**
Not case		381 (62.3%)	62 (10.1%)	96 (15.7%)	73 (11.9%)	
		1	5.49	6.52	3.79	
Suicidal thoughts						
Yes	Father	60 (35.7%)	27 (16.1%)	51 (30.4%)	30 (17.8%)	40.5**
No		288 (60.4%)	52 (10.9%)	59 (12.4%)	78 (16.3%)	
		1	1.98	2.69	1.61	
Yes	Mother	76 (44.4%)	23 (13.4%)	43 (25.2%)	29 (17.0%)	23.3**
No		317 (65.2%)	47 (9.7%)	70 (14.4%)	52 (10.7%)	
		1	1.70	1.97	1.85	
Deliberate self-harm						
Yes	Father	38 (37.6%)	9 (8.9%)	36 (35.7%)	18 (17.8%)	31.2**
No		315 (57.5%)	68 (12.4%)	75 (13.7%)	90 (16.4%)	
		1	1.09	3.01	1.55	
Yes	Mother	34 (34.0%)	15 (15.0%)	33 (33.0%)	18 (18.0%)	35.4**
No		361 (64.2%)	57 (10.2%)	80 (14.2%)	64 (11.4%)	
		1	2.42	3.39	2.55	

** Chi-square with 3 df, *P* < 0.001.

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adolescents assign fathers to affectionless control, giving a relative risk of more than 5 times the risk of depression for those assigning to optimal parenting. Assignment of father to either affectionate constraint or neglectful parenting also carries a higher relative risk, but the combination of low father care with high control appears to have a particularly powerful effect.

Similarly, a significantly higher proportion (> 40%) of depressed adolescents assign mothers to affectionless control, giving a relative risk of more than 6 times the risk for those assigning to optimal parenting. Assignment of mother to affectionate constraint carries almost as high a relative risk for depression, suggesting that maternal overprotection may be the main issue.

Suicidal thoughts

The YSR question 91 is answered "never", "sometimes" or "often". Clinically, those with more frequent suicidal thoughts may be at more risk for completion, but many authors believe that students with only occasional suicidal thoughts should be taken seriously. Therefore, despite the possibility of weakening statistical associations by overinclusion, we chose to combine "sometimes" and "often" as meaning yes. As a result, 25.4% ($n = 173$) of the adolescents claimed thoughts about killing themselves in the previous 6 months (8.1% ($n = 55$) often; 17.3% ($n = 118$) sometimes). Fewer males (23.0%, $n = 88$) reported suicidal thoughts than females (28.4%, $n = 85$).

Table 3 shows that higher maternal and paternal care mean scores are statistically associated with an absence of suicidal thinking for both males and females. Conversely, lower mean care scores are significantly associated with suicidal thoughts, as are higher mean scores for maternal and paternal protection.

Table 2 shows that more than 30% of those with suicidal thoughts assign their father to affectionless

control. While there is an increased relative risk of suicidal thoughts for adolescents assigning father to any quadrant other than optimal parenting, this is highest for affectionless control.

Similarly, for those assigning their mother to other than optimal parenting there is an increased relative risk, highest for affectionless control, with more than 25% of adolescents claiming suicidal thoughts assigning the mother to this quadrant.

Deliberate self-harm

The YSR question 18 is also answered "never", "sometimes" and "often". Again, we combined "sometimes" and "often". Therefore, 15% ($n = 102$) of students reported having deliberately "hurt or tried to kill themselves" at some time in the previous 6 months (4% ($n = 27$) often; 11% ($n = 75$) sometimes). There was no significant gender difference (56 males (14.9%); 46 females (15.4%)).

As might be expected, a strong association was found overall between deliberate self-harm and thoughts of suicide ($\chi^2 = 109.1$, $df = 1$, $P < 0.001$), both for males ($\chi^2 = 65.1$, $df = 1$, $P = < 0.001$) and females ($\chi^2 = 44.7$, $df = 1$, $P = 0.001$). Of those with suicidal thoughts 39.8% had also been involved in deliberate self-harm; only 32.7% claiming deliberate self-harm had not had thoughts of suicide.

Table 4 shows that lower mean maternal and paternal care is significantly associated with deliberate self-harm, for both females and males, as is higher mean maternal or paternal protection, though this does not reach significance for females reporting paternal protection. Table 2 shows that more than 35% of those claiming deliberate self-harm assign their father to the affectionless control quadrant and 33% assign their mother in this way, giving a relative risk of more than 3 times the risk compared with assignment to optimal parenting.

A combination of high protection and low care – affectionless control – is involved in increasing the

Table 3. Parental Bonding Instrument and suicidal thoughts: subscale means (SD in parentheses)

Gender PBI subscale	Suicidal thought	<i>n</i>	No suicidal thoughts	<i>n</i>	<i>t</i> ^a	<i>P</i>
Males						
Maternal care	24.5 (7.3)	85	27.4 (6.8)	280	-3.49	**
Maternal protection	14.6 (8.1)	85	10.8 (7.1)	280	4.24	**
Paternal care	21.0 (7.3)	85	25.1 (6.1)	274	-5.19	**
Paternal protection	13.8 (7.0)	85	9.5 (5.6)	274	5.82	**
Females						
Maternal care	25.7 (8.0)	85	30.0 (6.4)	207	-4.79	**
Maternal protection	12.2 (7.9)	85	9.4 (6.8)	207	3.04	*
Paternal care	22.5 (8.9)	82	26.9 (6.9)	204	-4.49	**
Paternal protection	12.5 (7.7)	82	10.3 (6.6)	204	2.41	0.02

^a Unpaired *t*-test, two tailed. ** $P < 0.001$, * $P < 0.01$.

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Table 4. Parental Bonding Instrument and deliberate self-harm: subscale means (SD in parentheses)

Gender PBI subscale	Deliberate self-harm	<i>n</i>	No deliberate self-harm	<i>n</i>	<i>t</i> ^a	<i>P</i>
Males						
Maternal care	23.6 (7.7)	55	27.3 (6.7)	314	-3.75	**
Maternal protection	14.4 (8.0)	55	11.2 (7.4)	314	2.94	*
Paternal care	20.5 (7.7)	55	24.9 (6.3)	307	-4.61	**
Paternal protection	13.8 (7.6)	55	9.9 (5.7)	307	4.45	**
Females						
Maternal care	23.3 (8.3)	44	29.7 (6.5)	249	-5.81	**
Maternal protection	13.4 (8.0)	44	9.7 (7.0)	249	3.24	*
Paternal care	21.0 (8.4)	45	26.5 (7.3)	242	-4.51	**
Paternal protection	12.0 (7.8)	45	10.7 (6.8)	242	1.08	

^a Unpaired *t*-test, two tailed. ** $P < 0.001$, * $P < 0.01$.

relative risks for depression, suicidal thoughts and deliberate self-harm in adolescents. This is true for both fathers and mothers assigned in this way.

When the mother is assigned to affectionate constraint quadrant, the relative risk for depression is as high as for the affectionless control quadrant. This is an interesting finding, suggesting that high maternal protection may be the more important element; at least it can be said that high maternal care is not as protective in the affectionate constraint group as might have been expected. For father assignment in depression, the relative risk for depression is not as high in the affectionate constraint group. Is paternal protection not as influential a factor, or is paternal care more protective here? Certainly when examining raw scores shown in Tables 3 and 4, paternal protection, particularly for females, does not have the strength of association with suicidal thoughts or behaviors.

To examine these complex interactions further, stepwise regression analyses were carried out with each of maternal care, maternal protection, paternal care, paternal protection as variables acting, in turn, on depression, suicidal thoughts or deliberate self-harm. Table 5 demonstrates the results.

For depression, paternal care was the first variable entered, accounting for 8.0% of the overall var-

iance. The last variable entered was maternal protection, accounting for a further 2.0% of the variance.

For suicidal thoughts, paternal care was, again, the first variable entered, accounting for 6.3% of the overall variance. Paternal protection accounted for 1.1% of the variance. Maternal care accounted for 0.7% of the variance.

For deliberate self-harm paternal care was, again, the first variable entered, accounting for 6.4% of the overall variance. Maternal care accounted for a further 1.8% of the remaining variance. Further analysis, subdividing the sample into male and female, supported the apparent contribution of paternal care and maternal protection for depression in both males and females. For both suicidal thoughts and deliberate self-harm, maternal care as a variable was entered at the first step for females, with paternal care entered as the second variable. In contrast, paternal protection was entered at the first step for males with paternal care as the second variable.

Discussion

This study examined the relationship between adolescents' views of their parents' care and protection, as measured by the PBI, and depression, suicidal thoughts and deliberate self-harm.

Subjects were reliable informants – the majority of questionnaires were completed fully, and close examination of responses to other questions such as exposure to murder and hard drugs (not reported here) revealed only isolated exaggerations. The response rate was good.

Confirming previous work, there were clear associations between suicidal thoughts, deliberate self-harm and depression. However, measurement problems limit our confidence in the results. Suicidal thoughts is based on responses to only one question in the Achenbach YSR. The question is explicit, in particular, that it relates to self rather than a general concept, but it is not clear whether thoughts were

Table 5. Stepwise regression analysis using 4 PBI subscales as variables

Variable entered	df	<i>R</i>	Adjusted <i>R</i> ²	<i>F</i>
Depression				
Paternal care (first)	1, 634	0.29	0.08	56.75
Maternal protection (last)	2, 633	0.32	0.10	37.05
Suicidal thoughts				
Paternal care (first)	1, 635	0.25	0.06	43.45
Paternal protection (second)	2, 634	0.28	0.07	26.32
Maternal care (last)	3, 633	0.29	0.08	19.75
Deliberate self-harm				
Paternal care (first)	1, 640	0.26	0.06	44.50
Maternal care (last)	2, 639	0.29	0.08	29.76

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fleeting on one occasion only, or part of a long-term, considered plan. Similarly, for deliberate self-harm, we cannot be clear whether such hurt is related to peer group bravado or refers to one or more suicide attempts. Despite the fact that these responses have been used before (34–36) and have validity and reliability, replication using a suicide scale for adolescents (5, 6), addressing the full range of the suicide spectrum, would clarify the meaning of these responses and increase credibility.

As far as depression is concerned, Achenbach himself (personal communication) is cautious about whether the depressed subscale measures clinical depression, although there is a high correlation with DSM-III-R. The authors were careful to take the most stringent cut-off level for caseness (over 2 SD above the mean; Table 1), but confirmatory work with a specific depression scale (39, 40) might increase confidence in these findings. There would remain the problem of caseness. Because an individual meets criteria for a case on a questionnaire, a diagnostic interview schedule, or even a clinical diagnosis within DSM-III-R, does not mean that treatment is warranted. Such a judgment continues to be related to the context and the impact on individual functioning (41).

As already noted, there are significant differences in means for the PBI between our own results and Cubis et al. (30) and Rey & Plapp (31). Our analysis does not support this being due to age, gender or

family structure. It is possible that there is a sampling error. Post hoc examination of our sample shows a broad range of socioeconomic background, and comparison with other studies in progress suggests our results are replicable. We have to conclude that the adolescent populations of Adelaide, Newcastle and Sydney may be different. This variability is of concern because it may limit the comparability between studies.

Given these concerns, we investigated quadrant assignment further using our own sample means from the current study. These are about 3 points higher for care and 3 points lower for protection than Cubis et al. (30). Comparing Table 6 with Table 2, case and non-case assignment appears to shift from optimal parenting toward the other 3 quadrants. This favours affectionless control and to a lesser degree affectionate constraint, with little change in neglectful parenting. The effect is to lower the relative risks for depression, suicidal thoughts and deliberate self-harm for father assignment but generally increase the relative risks for mother assignment.

Surprisingly, associations are reduced only slightly (apart from depression in father assignment) and retain significance; a small change overall given the apparent size of the difference in means. These results support the robustness of the underlying model. Differences aside, this study confirmed some general conclusions (30). Female adolescents score parents as more caring. Male adolescents score fathers as

Table 6. Assignment of parents to PBI quadrants using current sample means: percentages in parentheses; relative risk estimates below

Sample	Parent assigned	Optimal parenting	Affectionate constraint	Affectionless control	Neglectful parenting	χ^2
Depression						
Case	Father	5 (12.5%)	7 (17.5%)	19 (47.5%)	9 (22.5%)	15.0*
Not case		233 (38.7%)	111 (18.4%)	147 (24.5%)	111 (18.4%)	
		1	2.81	5.42	3.55	
Case	Mother	3 (7.1%)	8 (19.1%)	23 (54.7%)	8 (19.1%)	26.7**
Not case		285 (46.5%)	77 (12.6%)	163 (26.6%)	88 (14.3%)	
		1	9.03	11.87	8.00	
Suicidal thoughts						
Yes	Father	38 (22.6%)	29 (17.3%)	71 (42.3%)	30 (17.8%)	34.8**
No		198 (41.4%)	90 (18.8%)	98 (20.5%)	92 (19.3%)	
		1	1.51	2.61	1.53	
Yes	Mother	47 (27.5%)	29 (16.9%)	69 (40.4%)	26 (15.2%)	29.2**
No		244 (50.1%)	56 (11.5%)	118 (24.2%)	69 (14.2%)	
		1	2.11	2.28	1.69	
Deliberate self-harm						
Yes	Father	25 (24.8%)	12 (11.9%)	47 (46.5%)	17 (16.8%)	26.6**
No		216 (39.4%)	105 (19.1%)	123 (22.4%)	105 (19.1%)	
		1	0.99	2.67	1.34	
Yes	Mother	23 (23.0%)	11 (11.0%)	51 (51.0%)	15 (15.0%)	33.5**
No		269 (47.8%)	75 (13.3%)	137 (24.3%)	82 (14.6%)	
		1	1.62	3.44	1.96	

Chi-square with 3 df, ** $P < 0.001$, * $P < 0.01$.

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less controlling, and mothers as more controlling, than do female adolescents. Overall, fathers are less caring and marginally less controlling than mothers.

Tables 1, 3 and 4 show that the PBI is sensitive to depression, suicidal thoughts and deliberate self-harm. For both male and female cases, maternal and paternal care are rated significantly lower. Conversely, except for paternal protection in females, maternal and paternal protection are rated significantly higher. The question is whether low parental care and high parental protection create depression or other symptoms, whether depression distorts the perception of adolescents answering the questionnaire or whether both apply in some circular process? A number of studies (25, 42) note the stability of the PBI in depressed adults after recovery, suggesting that depression does not influence the response to the questionnaire – at least in adults. This result awaits replication in adolescents.

More than sensitivity, the PBI in adolescents may have predictive power. Assignment of either parent to affectionless control suggests a 5-fold increase in the relative risk for depression, a 3-fold increase in the relative risk for deliberate self-harm and a doubling of the relative risk for suicidal thoughts. These results support similar findings in adults (25, 27–29) and have implications for both clinical and preventive work in the community.

Of further interest is the increased relative risk for depression when adolescents assign parents to affectionate constraint. This supports the idea that protection (intrusiveness and overcontrol), particularly from mothers, has powerful effects on self-esteem (27). From the regression analysis paternal care was confirmed as contributing most to the variance in each of depression, suicidal thoughts and deliberate self-harm. This confirms in adolescents Parker's conclusion that paternal care was the best discriminator between depressed adult patients and controls (29). In adolescence, maternal protection also clearly contributes to depression, given that it contributed to the variance for both genders. We would have less confidence regarding the contribution of other factors. Paternal protection appears to contribute as a secondary variable to both suicidal thinking and deliberate self-harm in males whereas, for females, maternal care seems more important. Further work is necessary to confirm these findings.

The findings regarding paternal care and protection are of particular interest given the resurgence of interest in the fathering role. Many studies of suicide mention the high level of parental loss (43, 44) or divorce (1, 45) but do not investigate implications of father or mother loss separately. One exception is a study by Paffenbarger & Asnes (46) of former college students who carried out suicide later in life, quoted by Garrison (4). Little or no work seems to

have been done looking at fathering style and its implications for adolescent suicide. This is an important area for further study.

Conclusion

Within the limitations of this study, the PBI can demonstrate differences between cases and non-cases of depression, suicidal thoughts and deliberate self-harm. Assignment by adolescents of their parents to the affectionless control quadrant of the PBI increases the relative risks for each of this lethal triad. The PBI can play an important role in assisting the identification of vulnerable adolescents. Further, it elucidates aspects of the dimension of adolescent-parent interaction and points toward possible fruitful areas for intervention with at-risk adolescents.

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The association between family functioning and NSSI in adolescence: The mediating role of depressive symptoms

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Non-suicidal self-injury (NSSI) refers to socially unacceptable behavior causing intentional and direct injury to one's own body tissue without conscious suicidal intent. Recent literature has highlighted the importance of examining the interaction between intrapersonal (e.g. coping, psychopathology) and interpersonal risk factors (e.g. psychopathology in family, family abuse, parenting), for enhancing our understanding of NSSI. The present study adds to this by investigating the association between NSSI, adolescent depressive feelings, and perceived family functioning. A sample of 358 adolescents was assessed by means of self-report measures for (1) NSSI behavior (NSSI-AT), (2) depressive symptoms (CDI-NL), and (3) perceived family functioning (FAD-NL). The prevalence rate of NSSI was 14.29%. Data suggest that general dysfunction of the family as a whole, poor affective involvement, and excessive behavioral control uniquely distinguished between adolescents engaging in NSSI and adolescents not engaging in NSSI. The association between family functioning and NSSI was partially mediated by depressive symptoms. The implications of the findings for further research, prevention, and intervention of NSSI are discussed.

Keywords: NSSI; prevalence; depressive symptoms; family functioning; mediation

Non-suicidal self-injury (NSSI) refers to socially unacceptable behavior causing intentional and direct injury to one's own body tissue without conscious suicidal intent (Nock & Favazza, 2009). Among adolescents in the community, NSSI lifetime prevalence ranges from 7% to 24% (Baetens, Claes, Muehlenkamp, Grietens, & Onghena, 2011; Jacobson & Gould, 2007; Martin, Swannell, Hazell, Harrison, & Taylor, 2010), with a mean lifetime prevalence of 18% in nonclinical samples of adolescents (Muehlenkamp, Claes, Havertape, & Plener, 2012). NSSI research has received increased attention over the last decade due to its association with significant psychological morbidity, including psychopathology, severe chronic NSSI, suicide attempts, and completed suicide (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). Recent literature (e.g. Baetens, Claes, Onghena, et al., 2014; Whitlock & Selekman, 2014) has highlighted the importance of examining NSSI from a biopsychosocial perspective, and mapping interaction patterns between intra- and interpersonal factors in relation to NSSI behaviors. Unique relationships between NSSI and several intrapersonal risk factors (e.g. depressive symptoms, coping, psychopathology, temperament, emotional reactivity, suicidality) are increasingly well documented and understood in the study of NSSI. New research findings underline the fact that interpersonal/family factors are significantly associated with onset (e.g. Baetens, Claes, Martin, et al., 2014; Brausch & Gutierrez, 2010),

continuation (Baetens, Claes, Onghena, et al., 2014), and cessation of NSSI (Rotolone & Martin, 2012; Tatnell, Kelada, Hasking, & Martin, 2013). More specifically, support from family is identified as the most salient predictor of NSSI cessation (Tatnell et al., 2013), while lack of support is significantly related to the onset of NSSI (Baetens, Claes, Martin, et al., 2014). Regrettably, most research on associations between NSSI and family factors lacks a clear conceptual model of family functioning and/or uses poorly validated instruments (e.g. Baetens, Claes, Martin, et al., 2014; You & Leung, 2012). Only two studies exist as yet, regarding interactions between intrapersonal and interpersonal risk factors, framed in a biopsychosocial model (Baetens, Claes, Onghena, et al., 2014; Tatnell et al., 2013).

In the present study, we broaden our insight into associations between NSSI and family factors by using a clear conceptual model of family functioning and a comprehensive and well-validated questionnaire to assess family functioning. Interactions between the most salient intrapersonal factor (depressive feelings) and interpersonal factor (family functioning) are examined to broaden our understanding of NSSI in adolescence.

Family functioning associated with NSSI

Most research examining the role of family factors related to NSSI lacks a sound theoretical model for examining

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influences of family variables. The present study presents a clear conceptual model of the family of how the family is organized as a family unit (Epstein, Baldwin, & Bishop, 1983), based on the process model (Steinhauer, Santa-Barbara, & Skinner, 1984) and the McMaster Model (Epstein, Bishop, Ryan, Miller, & Keitner, 1993) of family functioning. This model provides indices of family strengths and weaknesses of the family as a whole (beyond the child–parent dyad, the parental dyad, and sibling relationships). The model gives an overview of major tasks of the family system, important to maintain and achieve a family unit, providing reasonable security, ensuring sufficient cohesion, and making the family able to adapt to life cycle transitions and function as part of society (Rasheed, 2010). Family functioning identifies six important domains of family functioning, namely problem solving, differentiation of roles, effective communication, affective responsiveness, affective involvement, and behavioral control. Family functioning has been shown to have a central influence on the onset and continuation of emotional and behavioral problems in children and adolescents (Epstein et al., 1983; Hetherington & Martin, 1986). Several studies in the context of adolescent NSSI have examined one or two aspects of family functioning. Family communication was examined by Tulloch, Blizzard, and Pinkus (1997). Baetens, Claes, Martin, et al. (2014) examined parental behavioral control, and report higher levels of parental behavioral control to be associated with NSSI in adolescence. The role of affective responsiveness (mostly focusing on expressed emotions) and affective involvement (conceptualized as warmth and support) has been more thoroughly examined (see for example, Baetens, Claes, Martin, et al., 2014; Baetens, Claes, Onghena, 2014; Bureau et al., 2010; Crowell et al., 2008; Gratz, 2006; Marchetto, 2006; Wedig & Nock, 2007). Research findings consistently report dysfunctional levels of affective responsiveness (e.g. high parental criticism) and low affective involvement (i.e. warmth and support). Nock and Mendes (2008) reported a significant association between NSSI and social problem solving, but familial problem solving has never been investigated. Further, the relationship between NSSI and differentiation of roles has never been studied. In summary, some of the six main domains of family functioning are mapped, but current research lacks an overview of all family functioning tasks, in relation to each other in the context of adolescent NSSI.

The combination of low affective involvement (indicating emotional coldness and rejection) and high behavioral control (indicating intrusiveness and overprotection), coined as ‘affectionless control’, has been suggested as a key indicator of dysfunctional/unhealthy family functioning, increasing the risk for psychopathology of family members drastically. For example, research has shown a significant association between affectionless

overcontrol and adolescent depression (Parker, 1983; Patton, Coffey, Posterino, Carlin, & Wolfe, 2001) and suicidality (e.g. Freudenstein et al., 2011). Freudenstein et al. (2011) reported that affectionless overcontrol significantly differentiated between adolescents with high versus low suicidality. With regard to ‘deliberate self-harm’ (i.e. including both suicidal and non-suicidal self-injury), Martin and Waite (1994) reported that self-harming participants perceived their parents as less caring and more controlling than their non-self-injuring peers, suggesting a relative risk of NSSI more than three times the risk of those reporting optimal parenting. However, this early study did not distinguish between NSSI and suicide attempts, which makes it difficult to assess whether affectionless control is related to NSSI alone. Similar findings have been found within other studies examining self-harm behaviors (e.g. Coll, Law, Tobias, Hawton, & Tomás, 2001). Only one study to date (Baetens, Claes, Martin, et al., 2014) examined the role of affectionless control in NSSI, but only as an index of parenting (not the family as a whole) and they used a poorly validated instrument. The present study focuses specifically on the role of affectionless control, as well as other domains of family functioning, with regard to development of adolescent NSSI.

Family functioning, depressive symptoms, and NSSI: Associations and mediation

By examining the interaction between key intra- and interpersonal factors, insight into the complex nature of NSSI can be further developed (e.g. Baetens, Claes, Martin, et al., 2014; Whitlock & Selekman, 2014). A literature review shows that, as stated above, family functioning can be identified as an important interpersonal risk factor. With regard to intrapersonal risk factors, depressive symptomatology can be considered as a key correlate of NSSI in adolescence (e.g. Baetens et al., 2013; Jacobson, Muehlenkamp, Miller, & Turner, 2008). Internalizing symptoms are indeed highly correlated with NSSI behaviors in youth (e.g. Nock et al., 2006). Looking at the interaction between intra- and interpersonal risk factors, it is hypothesized (in line with e.g. Adrian, Zeman, Erdley, Lisa, & Sim, 2011; Baetens et al., 2013) that depressive symptoms are a possible mediator between NSSI and family factors: growing up in a dysfunctional family environment (in the broad sense), increases the risk for the development of depressive symptoms in adolescents, which in turn might increase the chance for engaging in NSSI as a way of coping with negative feelings. No study thus far has examined the mediating role of depressive symptoms in the relationship between general family functioning and NSSI, and no study thus far has examined whether or not depressive symptoms can explain all variance, above and beyond associations with interpersonal factors.

The aims of the present study were therefore fourfold. First, we investigated differences between adolescents with and without NSSI in all six main domains of family functioning. Second, we focused on the role of affectionless control in relation to NSSI. In line with previous studies (e.g. Baetens, Claes, Martin, et al., 2014), it was hypothesized that adolescents with NSSI would more often report the combination of poorer affective involvement and higher control compared to non-self-injuring peers. Third, the interactional pathway between the intrapersonal factor (i.e. depressive symptoms) and the interpersonal factor (i.e. general family functioning) was investigated. Following Baetens et al. (2013), we hypothesized that depressive symptoms would mediate the relationship between family functioning and NSSI (aim 3). But even taking into account the variance explained by intrapersonal key risk factors (such as psychopathology and depression), we hypothesized that general family functioning remains to play an important role in NSSI behaviors (aim 4).

Method

Participants

In total, 358 adolescents from three Belgian secondary schools (two catholic and one government) participated in this study. Participants were aged 12–20 years (*Mean age* = 16.07 years, *SD* = 1.12) with an even distribution of gender (48% female; 52% male). The sample was almost exclusively Caucasian (96%).

Measures

Brief non-suicidal self-injury assessment tool (BNSSI-AT Whitlock & Purington, 2013 – BNSSI-AT-NL (Dutch version); Baetens & Claes, 2011)

BNSSI-AT is a self-report measure asking participants ‘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 nine NSSI behaviors: scratching, carving, cutting, burning, biting, hitting, banging, preventing wound healing and pulling out hair or eye lashes. Responses were dummy-coded with ‘0 = no’ and ‘1 = yes’ for each of the nine NSSI-methods separately. Supplementary questions followed a positive response on at least of one the nine listed NSSI methods, and assessed NSSI characteristics, including age of onset and cessation, lifetime frequency, psychological function (e.g. stress relief), motivation for initiating NSSI (e.g. 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 by a mental health professional). We intended to

exclude any adolescent who reported NSSI behavior *with* suicide intent, but none of the adolescents reporting NSSI behavior affirmed suicidal intent as the primary reason for their NSSI. Individuals only reporting NSSI forms ‘preventing wound healing’ and/or ‘pulling out hair or eye lashes’ were omitted from the NSSI group. In the BNSSI-AT-NL (Baetens & Claes, 2011), number of days within the past year that the individual has intentionally injured him-/herself is not examined, so we are unable to compare results with DSM-V criteria. Reliability and validity of the questionnaire in adolescent and young adult samples has been shown to be satisfactory, with Cronbach’s alphas ranging from .65 to .84 (Whitlock, Exner-Cortens, & Purington, 2014). The Cronbach’s alpha of the seven NSSI items in the current sample is .77.

Psychopathology

Respondents were asked whether they ever received a formal diagnosis of an emotional, behavioral, or developmental disorder (e.g. depression, anxiety, mental retardation, autism, ADHD). The presence of any psychiatric disorder was dummy-coded with ‘0 = no disorder’ and ‘1 = at least one disorder present’.

Family assessment device (FAD-NL (Dutch version); Wenniger, Hageman, & Arrindell, 1993)

The FAD is a 60-item questionnaire with seven subscales assessing family functioning (problem solving, effective communication, differentiation of roles, affective responsiveness, affective involvement, behavior control, and general functioning). The extra subscale ‘General functioning’ is not a composite score; it is a separate subscale assessing overall health/pathology of the family. Scores of all seven subscales were summed so that higher scores represent higher levels of dysfunctioning. Reliability and validity in adolescent samples are satisfactory. Internal reliability of the FAD in prior research shows Cronbach’s alphas ranging from .74 to .92 (Epstein et al., 1983). In the present study, Cronbach’s alphas were .68 for problem solving, .67 for communication, .69 for roles, .72 for affective responsiveness, .60 for affective involvement, .63 for behavioral control, and .89 for general functioning. To correct for the low alpha coefficient of the subscale affective involvement item 5 was deleted, based on the reliability analysis. After removing item 5, the Cronbach’s alpha of the affective involvement subscale becomes .70.

Child depression inventory (CDI-NL Timbremont & Braet, 2002)

CDI-NL is a well-known tool measuring severity of depressive symptoms in children and adolescents.

Participants were asked to select a statement best describing their feelings in the past two weeks (e.g. I never feel sad – I sometimes feel sad – I always feel sad). The Cronbach's alpha in the present study for the 27-item questionnaire was .87.

Procedure

School approval and parental passive informed consent were obtained before data collection. Participation was voluntary and no incentives were given. Adolescents present on the day of questionnaire administration completed questionnaires during class time, without discussion, in one teaching period (50 minutes). At least one researcher was available to provide assistance if necessary and ensure independent responding. Efforts were made to safeguard the welfare of the adolescents (e.g. informing the schools about NSSI in adolescents as well as providing participants with phone numbers and e-mail addresses of professional and informal help centers). The study was approved by the Ethics board of the first author's university.

Data analysis

Results of a correlation matrix can be found in Table 1. All main variables were significantly correlated, at a 0.05 significance level. To examine whether categorical variables (i.e. formal psychopathological diagnoses) were significantly associated with the presence of NSSI, the Pearson Chi Square statistic was used. A binary logistic regression was conducted to explore which family functioning subscales differentiated between the two focal groups (Model 1). Those not engaging in NSSI were used as the control group. The interaction between affective involvement and behavioral control was examined following procedures described by Preacher, Curran, and Bauer (2006) and using their SPSS macro.

Further, we examined the effect of family functioning above and beyond the effect of depressive symptoms (Model 2) in a follow-up binary logistic regression. Finally, to formally investigate the mediating role of

depressive symptoms between perceived family functioning and NSSI, we used the model described by MacKinnon and Dwyer (1993) (Herr, 2006), to investigate mediation of a third variable between an interval-scaled independent and a dichotomous dependent variable. In order to be considered mediation, reduction in variance explained by the independent variable (after controlling for the mediation variable) must be significant as determined by the Sobel test. The Aroian version of the Sobel test, as suggested in Baron and Kenny (1986), was used.

Results

Rates and correlates of NSSI

Of the 358 adolescents included in the analyses, 51 reported having self-injured at some point in their lives (14.29%), with 9.8% (35/358) reporting NSSI within the last 12 months. In total, 39.22% (20/48) of those who self-injured reported using one method of NSSI. The most prevalent methods of reported NSSI were scratching to the point of bleeding or until marks remained on the skin (6.70%; 24/358), punching or hitting objects to the point of bruising or bleeding (6.42%; 23/358), carving (6.15%; 22/358), and cutting (5.03%; 18/358).

The average age of NSSI onset was 12.77 years ($SD = 2.56$), ranging from 5 to 20 years, with 50.98% (26/51) indicating they initiated NSSI between the ages of 13 and 15; 7.84% (4/51) starting at age 8 or younger.

With regard to disclosure, 54.90% (28/51) of the NSSI sample reported that no one knew about their NSSI activity. Eight percent reported seeking medical treatment for injuries. Adolescents who engaged in NSSI had more frequently visited a professional expert, compared to those who had not engaged in NSSI ($\chi^2(1) = 35.05$, $p < .01$), although only 39.60% of all self-injurers had been in contact with a professional. Also, self-injurers did not receive significant more psychological treatment than adolescents who did not self-injure, $\chi^2(1) = 1.63$, $p = .20$. Only 3.70% of all self-injurers reported having received a psychological treatment.

Table 1. Correlation matrix.

	1	2	3	4	5	6	7	8	9
NSSI 0/1	–	–.24**	–.20**	–.20**	–.19**	–.24**	–.13*	–.28**	.37**
Problem solving		–	.70**	.56**	.55**	.44**	.50**	.71**	–.35**
Communication			–	.61**	.65**	.48**	.61**	.76**	–.38**
Roles				–	.50**	.59**	.60**	.67**	–.41**
Affective responsiveness					–	.42**	.58**	.66**	–.25**
Behavioral control						–	.57**	.57**	–.33**
Affective involvement							–	.69**	–.39**
General functioning								–	–.48**
Depressive symptoms									–

Note: * Correlation is significant at 0.05 level (two-tailed); ** correlation is significant at 0.01 level (two-tailed).

Family functioning and NSSI

A binary logistic regression with all FAD subscales (Model 1; see Table 2 for a summary of results) revealed that poor general family functioning, low affective involvement, and high behavior control had the strongest significant association with presence/absence of NSSI (Model 1). All other family functioning scales failed to contribute to the model when taking into account affective involvement, behavioral control, and general family dysfunctioning.

Family functioning and NSSI: above and beyond psychopathology and depressive symptoms

The results of a chi-square test showed that NSSI was significantly associated with presence/absence of a formal psychopathological diagnosis, $\chi^2(1, N = 358) = 25.08, p \leq 0.001$. Although the proportion of adolescents engaging in NSSI who report a formal psychopathological diagnosis was significantly higher than adolescents without NSSI, not all adolescents who reported NSSI had a formal psychopathological diagnosis (77.10% no diagnosis versus 22.90% formal psychopathological diagnosis). To account for variance of psychopathology, formal psychopathological diagnoses were entered in all logistic regression models (see Table 2), always being a significant contributor to the model at 0.001 level.

When adding depressive symptoms (positively associated with NSSI relative to non-NSSI) into the model (Model 2; see Table 2), general functioning and low affective involvement remain statistically significant ($p \leq .01$), suggesting main effects of family functioning above and beyond depressive symptoms. The predictive power of behavioral control diminished when taking into account depressive symptoms.

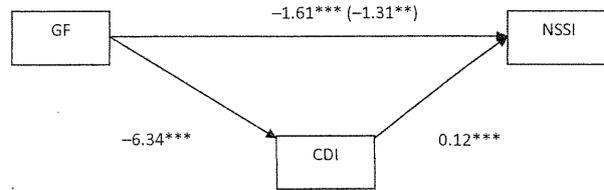


Figure 1. Mediation model in the prediction of NSSI with depressive symptoms as mediator. Note: GF, general family functioning (FAD); CDI, depressive symptoms; NSSI, presence/absence of NSSI. Path values represent unstandardized regression coefficients. The value outside the parentheses represents the total effect of general family functioning on NSSI prior to inclusion of the mediating variable depressive symptoms. Value in parentheses represents the direct effect of family functioning on NSSI after the mediators are included. ** $p \leq .01$ *** $p \leq .001$.

The association of general functioning via the hypothesized mediator depressive symptoms to NSSI is shown in Figure 1. An Aroian test confirmed that depressive symptoms partially mediated the relationship between general functioning and NSSI, but did not explain all variance in the relationship between poor general family functioning and NSSI ($Z = -3.76, p \leq .001$).

Discussion

The prevalence rate of NSSI in the current sample was 14.30%, in line with international prevalence rates in European countries (for review, see Muehlenkamp et al., 2012). The current study shows that only a very small percentage of self-injurious adolescents reported having received psychological or medical treatment (see also Evans, Hawton, & Rodham, 2005). To increase the

Table 2. Descriptive information and follow-up logistic regression for FAD-NL and CDI.

	Non-NSSI	NSSI		Model 1	Model 2
	<i>M (SD)</i>	<i>M (SD)</i>	<i>t</i>	<i>OR (95% CI)</i>	<i>OR (95% CI)</i>
Formal psychopathological diagnoses (0/1)				0.10 (0.03–0.31)**	0.18 (0.05–0.69)**
Age (months)				1.01 (0.98–1.04)	1.03 (1.00–1.07)
Family Assessment Device (FAD-NL)					
Problem solving	2.84 (0.41)	2.53 (0.47)	4.54**	0.97 (0.24–3.58)	0.62 (0.13–2.98)
Communication	2.88 (0.39)	2.65 (.36)	3.81**	0.66 (0.12–3.85)	0.84 (0.12–5.79)
Roles	3.01 (0.35)	2.79 (0.39)	3.71**	0.94 (0.19–4.51)	1.66 (0.32–8.62)
Affective responsiveness	2.83 (0.46)	2.56 (0.60)	2.97**	1.06 (0.36–3.12)	0.83 (0.26–2.68)
Affective Involvement	3.02 (0.48)	2.84 (0.50)	2.34**	3.47 (1.05–11.44)*	4.98 (1.32–18.74)
Behavioral control	3.20 (0.35)	2.94 (0.43)	4.58**	0.28 (0.73–1.09)*	0.41 (0.08–1.92)
General functioning	3.22 (0.47)	2.81 (0.52)	5.39**	0.17 (0.04–0.66)**	0.18 (0.04–0.84)
Child Depression Inventory (CDI-NL)					
Depressive symptoms	8.57 (5.46)	15.88 (9.69)	-7.06**	–	1.13 (1.05–1.22)**

Note: * $p \leq .05$, ** $p \leq .01$; Model 1, family functioning factors; Model 2, family functioning factors adjusted for depressive symptoms.

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opportunity for help seeking, teachers and professional health-care workers should be aware of signs of NSSI, from early adolescence onwards. Given the mean age of NSSI onset was 12.77 years, ranging from 5 to 20 years, it may be suggested that it is important to begin prevention and screening for NSSI symptoms as young as ages 10–12.

The current study furthered the limited knowledge we have regarding perceived family functioning and NSSI. In the context of a comprehensive model of family functioning, low affective involvement, higher behavioral control, and general family dysfunctioning were significantly related to NSSI; whereas the other family functioning scales were not. As no other study has examined all domains of family functioning in relation to each other, this study expanded insight into the interpersonal component of NSSI in adolescence. In line with Baetens, Claes, Martin, et al. (2014), results showed that both high behavioral control and low affective involvement are significantly related to NSSI behaviors. As general functioning, affective involvement, and behavioral control explain most of the variance, future research should focus on this specific aspect of family functioning (rather than the whole model of family functioning). Furthermore, on top of variance explained by psychopathology and depressive symptoms, general family dysfunction and low affective involvement remained significant. Also, depressive symptoms only partially mediated the relationship between general family functioning and NSSI. These findings suggest that interpersonal factors, such as dysfunction of the family as a whole, are important to map when examining NSSI in adolescence, above and beyond intrapersonal risk factors. This cross-sectional study provides some preliminary evidence on the role of family functioning, but longitudinal research is needed to determine whether the factors explored in this study represent correlates, causes, or consequences of NSSI (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). In line with Baetens, Claes, Onghena, et al. (2014) and Hilt, Cha, and Nolen-Hoeksema (2008), it might be hypothesized that family functioning/climate alters in a reaction to NSSI acts, rather than it would be a cause of NSSI. No interpretation on direction of results can be made, as this study was based on a cross-sectional design. Caution should also be applied when generalizing the results given our sample is not representative of adolescents in Belgium, and may not be representative of adolescents elsewhere. Also, results of this study are based on self-report questionnaires, and only describe the perspective of adolescents with regard to the role of family functioning. Perspectives of other family members, as well as differential impact of fathers versus mother, may be addressed in future research to entangle the complex interplay between NSSI and several inter- and intrapersonal factors. As a fourth limitation, the internal consistencies of some of the FAD subscales should be addressed. Some of

the subscales have less than ideal internal consistency (e.g. Cronbach's alpha for behavioral control = .63), so results of this study should be interpreted with caution. Due to low internal consistency and lack of support of impact of all domains of family functioning in relation to NSSI, other family scales (such as Family Adaptability and Cohesion Scale IV) and theoretical models (such as circumplex model) may be examined in future research. Another limitation of our study is that our results may be biased, given we did not explicitly account for possible clustering, even though we did examine whether focal groups differed based on possible cluster variables (e.g. gender, age, year level, classroom) and did not find significant differences. Consequently, there may be increased chance of Type 2 error in the data.

In summary, we believe that these findings present meaningful information with regard to the role of family functioning, and interactions between intrapersonal and interpersonal risk factors in adolescent NSSI. This study extends our understanding of adolescent NSSI and provides a conceptual theoretical framework to guide future research exploring family links to this behavior.

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The stability of the Parental Bonding Instrument over a 20-year period

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ABSTRACT

Background. The Parental Bonding Instrument (PBI) measures the perception of being parented to the age of 16 years. Low scores on the care dimension and high scores on the overprotection dimension are considered to be risk factors of depression. While the PBI has been shown to be a reliable and valid instrument, the stability of the PBI over extended periods (taking into account individual characteristics and life experience) needs to be demonstrated.

Method. The PBI was measured in a non-clinical cohort on four waves between 1978 and 1998, along with a series of self-report measures including state depression and neuroticism. Differences in PBI change over time were examined by gender, lifetime major depression diagnosis, and life event variables, as well as by scores on neuroticism and state depression.

Results. Acceptable retest coefficients on PBI scores over the 20-year study were found for the cohort. No differences were found in PBI scores over time on the variables examined, including sex and depression measures.

Conclusions. The results indicate long-term stability of the PBI over time. The influences of mood state and life experience appear to have little effect on the stability of the perception of parenting as measured by the PBI. The present study increases confidence in the PBI as a valid measure of perceived parenting over extended time periods.

INTRODUCTION

The Parental Bonding Instrument (PBI) is a self-report questionnaire developed to measure the subjective experience of being parented to the age of 16 years (Parker *et al.* 1979). It is the most consistently used measure of parenting style (Enns *et al.* 2002) in a range of clinical and non-clinical subject groups (Parker, 1983; Silove *et al.* 1991; Mak, 1994). Scores on the measure have been shown to be associated with an increased risk of several psychiatric disorders, particularly certain expressions of depression and anxiety (Parker, 1983), and have allowed

the role of parental style to be accurately examined and quantified.

The reliability of the PBI has been tested in a number of studies over brief intervals (ranging from 1–34 weeks) (Richman & Flaherty, 1987; Plantes *et al.* 1988; Mackinnon *et al.* 1989). One study reported longer-term reliability (Gotlib *et al.* 1988) for the PBI in depressed and non-depressed women, rated in the post-partum period and again 2–4 years later (mean maternal care scores at time 1 and time 2 as 28.2 *v.* 26.7 for non-depressed and 17.3 *v.* 17.6 for depressed, and mean maternal overprotection scores as 9.6 *v.* 8.7 for non-depressed and 22.0 *v.* 23.5 for depressed). A study of 10-year test–retest reliability (Wilhelm & Parker, 1990) also found a consistency of care and overprotection scores (maternal care, 26.3 *v.* 26.3, $r=0.63$; maternal

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overprotection, 14.8 *v.* 13.8, $r=0.68$; paternal care, 21.9 *v.* 21.4, $r=0.72$; paternal overprotection, 13.0 *v.* 11.9, $r=0.56$).

Consistent PBI scores over extended periods argue against attitudinal change due to life experience or fluctuations in mood influencing recollections of earlier parental environment. We sought to examine the long-term reliability of the PBI with a cohort who had first completed the measure more than two decades previously and to consider factors which may have affected PBI scores over time, including gender, number of life events, depression history, current mood and neuroticism level.

While the importance of early parenting experiences in the development of adult depression has been well established (Perris, 1966; Raskin *et al.* 1971), the effect of depression on perceptions of parenting has been less researched. Most studies investigating the relation between depression and perceptions of parenting have involved a single assessment, which does not allow the direction of causality to be determined. One longitudinal study which sought to disentangle the effect of mood on perceptions of parenting (Gotlib *et al.* 1988) hypothesized that depressed individuals negatively distorted perceptions of their environment (Beck *et al.* 1979) that facilitated the perception and recall of negative information (Bower, 1981). However, they found that stable perceptions of early parenting did not appear to be affected by depressed mood (Gotlib *et al.* 1988). Neuroticism has been found to be a more stable construct than state depression (Wilhelm & Parker, 1990) but changes in neuroticism levels have been linked to current symptoms of depression (Farmer *et al.* 2002) and repeated episodes (Wilhelm *et al.* 1999).

In the present study, comparisons of PBI scores over time between those with and without a lifetime history of major depression, and fluctuations over time in mood and neuroticism levels, have been assessed. Intra-individual variations were reported by the use of change measures (assessing individual variations in scores at each study wave) applied to mood and neuroticism scores. As life events were recorded for the period between initial assessment and final assessment of the PBI, the relationship between the total number of life events in this designated period and changes in parental

perceptions over time could be ascertained. The life event of whether or not cohort members had become a parent was considered separately. The extended period includes assessment of the PBI at times when cohort members not only became parents themselves, but had also parented teenage children. As the PBI assesses perceptions of being parented to the age of 16 years, the time span allowed an opportunity for the cohort to revisit the experience of being parented after they had viewed the experience 'from the other side'. Lastly, gender differences were considered as previous studies had found that women were more consistent reporters of both their depressive episodes over time (Angst & Mikola, 1984; Wilhelm & Parker, 1994) and their perception of the quality of their parents' marital relationships (Wilhelm *et al.* 2000).

In summary, we hypothesized that the passage of time would have no effect on perception of parental care; second, that as cohort members had children of their own and more life experience, any changes in perception of their own parenting would be reflected in relation to control and overprotection; third, that those who had experienced multiple life events may show a greater amount of change in parental perceptions over the study period than those with less life events experienced; fourth, that depression and neuroticism would not affect parental perceptions over time, and lastly, that women were likely to be more consistent reporters of their early experience of being parented than men.

METHOD

We have detailed the study extensively in previous publications (Wilhelm & Parker, 1989, 1993, 1994), and here only summary details are provided. In 1978, students completing a 1-year postgraduate teacher-training programme were invited to participate in a longitudinal study. The 170 (114 women and 56 men, mean age 23 years) who gave informed consent and completed baseline data formed the study cohort, and have been followed up at 5-yearly intervals. At each follow-up assessment (1983, 1988, 1993, 1998), participants completed a series of self-report questionnaires as part of a semi-structured interview, which covered physical

and mental health including depression, and aspects of lifestyle, work and social support.

The PBI was administered on three of the four follow-up assessment waves (1983, 1988, 1998) in addition to baseline assessment. PBI data was obtained from 164 in 1983, 163 in 1988, and 144 (93 females and 51 males) in 1998, consisting of 85% of the original cohort. Specifically, complete maternal PBI data at all four waves were obtained for 144 participants, and for paternal PBI data, 138 participants. The six remaining participants with incomplete paternal PBI data, due to such reasons as death of the father or lack of contact with the father, were not included in the paternal PBI analysis of the present study. Those who were followed up in 1998 significantly differed from the baseline sample only on the maternal care score of the PBI, with the 1998 sample having a significantly higher maternal care score (mean = 26.6, s.d. = 6.9) than the sample who were no longer part of the cohort [mean = 23.3, s.d. = 7.4; $t(163) = -2.0$, $p = 0.04$]. The magnitude of the differences in the means, using guidelines proposed by Cohen (1992), was small to moderate (Cohen's d effect size = 0.46).

Two other administered self-report questionnaires relevant to the present study measure neuroticism and 'state depression'. Neuroticism was measured using the Eysenck Personality Inventory (Eysenck & Eysenck, 1964) at baseline and all four follow-up assessments. State depression was measured using the Wilson-Lovibond state depression measure (Wilson, 1979) at baseline and the first two follow-up assessments (1978, 1983, 1988).

The presence of DSM major depressive episodes was assessed on all four follow-up assessments, using the Diagnostic Interview Schedule (DIS; Robins *et al.* 1981) in 1983 and 1988, and later the Composite International Diagnostic Interview (CIDI; Robins & Helzer, 1988) in 1993 and 1998. A lifetime major depression diagnosis was made using an 'add-on' strategy. Those who met criteria for major depression in the initial 1983 assessment remained 'cases', and new 'cases' were added as they were newly identified in subsequent assessments (i.e. those who had their first depressive episode in the preceding interval since their last assessment). This strategy was employed as we have previously demonstrated that more stable

assessments of depressive episodes are made closer to the time of their occurrence (Wilhelm & Parker, 1994).

As part of the comprehensive semi-structured interview at 15-year and 20-year follow-up assessments, the occurrence of a range of significant life events between the years 1978 and 1998 was recorded on life charts. The 20-year follow-up served as a verification of previously identified life events and the years of their occurrence, in addition to reporting on new life events that had occurred in the recent 1993–1998 interval. A wide range of events with differing qualities, severities and types were recorded, including positive life events such as having a child or being promoted, and negative life events such as marital breakdown and death of parent. This method of eliciting life events, similar to that used by Brown & Harris (1978) is both a comprehensive and highly specific account of each participant's experience of life events. Lastly, information was obtained at each assessment on whether the cohort had become a parent, as well as the ages of their respective children. This variable was considered separately in the analyses.

Statistical analyses

Stability and change in mean levels of the PBI were tested using repeated-measures ANOVA over the four assessments. Results for both the linear and quadratic trends in scores over time have been reported. Interactions between gender and time were also tested in a between-subjects repeated-measures ANOVA design.

In order to observe differing patterns in scores between subgroups of the sample (i.e. lifetime history of major depression; becoming a parent; and total number of reported life events between 1978 and 1998), separate repeated-measures ANOVAs for each of these variables were conducted, and interaction effects with time were examined. For these variables, mean PBI scores at baseline were compared to mean PBI scores at the 20-year follow-up in 1998 (i.e. only scores on these two occasions were compared), as the variables relate to events or diagnoses that may have occurred at any time during the 20-year period. The variable for the total number of reported life events experienced over the 20-year period was found to closely resemble a normal distribution, and remained as a continuous variable for the analyses.

Table 1. Means and standard deviations on the Parental Bonding Instrument (PBI) subscales over the 20-year period

PBI subscale	Mean score (s.d.)				Linear or Quadratic ^b	F	p
	1978	1983	1988	1998			
Maternal care (n = 144)	26.6 (6.9)	26.4 (8.6)	26.9 (8.2)	26.7 (7.8)	L	0.12	0.73
Maternal OP ^a (n = 144)	14.5 (7.4)	13.7 (8.3)	13.9 (8.5)	13.6 (7.9)	Q	0.00	0.99
					L	2.49	0.12
Paternal care (n = 138)	21.9 (8.9)	21.6 (9.5)	21.7 (8.9)	21.3 (8.9)	Q	0.55	0.46
					L	1.09	0.30
Paternal OP (n = 138)	13.5 (7.5)	12.3 (7.3)	11.9 (7.6)	12.6 (8.2)	Q	0.00	0.96
					L	2.14	0.15
					Q	9.81	0.002

^a OP, Overprotection.

^b Linear (L) and quadratic (Q) trends are both reported (i.e. within-subjects polynomial contrasts).

The stability in PBI subscales over the 20-year period of the study was tested by comparing data from the various time points, using Pearson product-moment correlations. The correlations were repeated for each gender, and for those with and without a lifetime history of major depression.

To observe for the possible effects of intra-individual variations, change scores were generated by subtracting individual PBI scores at each assessment time with those at other assessments. These change scores were then correlated with change scores generated for state depression and neuroticism, at the same time comparison.

An α -level of 0.05 was used for all statistical analyses performed. Power restraints of the statistical tests due to the modest size of the sample would increase the likelihood that a Type II error would occur (i.e. failing to reject the null hypothesis when it is, in fact, false). To compensate for the size of the sample, the α -level has been set to 0.05 for the present statistical tests, without the use of Bonferroni adjustments. This decision also appears appropriate in light of the nature of the present hypotheses, which propose that PBI scores do not change significantly over time.

RESULTS

Stability and change in mean levels over time: repeated-measures analyses

Table 1 summarizes the repeated-measures ANOVA results on the four subscales of the PBI, on four time intervals over the 20-year

study period. There were no significant differences in linear trends over time for the cohort.

In general, mean care scores appeared to be more stable over time than overprotection scores. When quadratic trends in scores were considered, paternal overprotection scores revealed a significant trend over time [$F(1, 137) = 9.81, p = 0.002$]. Mean overprotection scores for the cohort's fathers lowered over the time interval between baseline and 10-year follow-up (i.e. between the mean ages of 23 and 33 years), and then rose at 20-year follow-up. At this time the mean age of the group was 43 years, and 80% of the cohort had become a parent, with most having a teenage child (mean age of oldest child = 14.1, s.d. = 5.0 years). Separately, maternal overprotection scores appeared to gradually decline over time, although this trend was not significant.

When examining for gender differences in a between-subjects repeated-measures ANOVA, no significant interaction effects between gender and time were found [maternal care, $F(1, 142) = 2.77$; maternal overprotection, $F(1, 142) = 0.94$; paternal care, $F(1, 136) = 0.01$, paternal overprotection, $F(1, 136) = 0.83$].

Interaction effects between the following variables and time were each investigated separately in a repeated-measures ANOVA design: lifetime history of major depression, becoming a parent, and total number of reported life events between 1978 and 1998. There were no significant interaction effects between lifetime history of major depression and time [maternal care, $F(1, 142) = 0.38$; maternal overprotection, $F(1, 142) = 0.07$; paternal care, $F(1, 136) = 0.33$;

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Table 2. Stability coefficients (95% CI) of the Parental Bonding Instrument (PBI) over four review intervals

PBI subscale	Retest correlations (95% CI)					
	1978 with 1983	1978 with 1988	1978 with 1998	1983 with 1988	1983 with 1998	1988 with 1998
Maternal care ($n=144$)	0.75 (0.63–0.86)*	0.64 (0.51–0.77)*	0.73 (0.62–0.84)*	0.83 (0.74–0.92)*	0.80 (0.70–0.90)*	0.78 (0.68–0.88)*
Maternal OP ^a ($n=144$)	0.75 (0.64–0.86)*	0.67 (0.55–0.80)*	0.69 (0.57–0.81)*	0.77 (0.67–0.88)*	0.70 (0.58–0.82)*	0.74 (0.63–0.85)*
Paternal care ($n=138$)	0.82 (0.72–0.91)*	0.74 (0.63–0.85)*	0.75 (0.64–0.86)*	0.81 (0.71–0.91)*	0.79 (0.69–0.90)*	0.79 (0.68–0.89)*
Paternal OP ($n=138$)	0.74 (0.63–0.86)*	0.62 (0.49–0.75)*	0.59 (0.45–0.73)*	0.67 (0.54–0.79)*	0.68 (0.56–0.81)*	0.78 (0.67–0.89)*

^a OP, Overprotection.* $p < 0.01$.

paternal overprotection, $F(1, 136) = 0.03$, and becoming a parent and time [maternal care, $F(1, 142) = 0.95$; maternal overprotection, $F(1, 142) = 0.20$; paternal care, $F(1, 136) = 0.20$; paternal overprotection, $F(1, 136) = 0.29$]. Lastly, there were no significant interaction effects between total reported life events over the 20-year period and time [maternal care, $F(1, 140) = 1.73$; maternal overprotection, $F(1, 140) = 2.17$; paternal care, $F(1, 134) = 1.61$; paternal overprotection, $F(1, 134) = 0.91$].

Stability in individual PBI ratings: retest correlations

Table 2 reports retest correlations on the PBI over the four time intervals; with all retest correlations being significant at the $p < 0.01$ level. PBI scores were stable across time, with retest coefficients in the range of 0.64–0.83 for maternal care, and 0.74–0.82 for paternal care. Maternal overprotection coefficients were in the range of 0.67–0.77, and paternal overprotection scores 0.59–0.78.

There was no evidence of confounding effects of gender or lifetime history of major depression on PBI subscales. For gender, retest correlations for men were in the range of 0.63–0.85 for the care dimension, and 0.43–0.80 for the overprotection dimension, and for women 0.64–0.83 for care and 0.62–0.78 for overprotection. For those with a lifetime history of major depression, retest correlations were in the range of 0.52–0.83 for care, and 0.58–0.83 for overprotection, and for those with no history of major depression, 0.69–0.86 for care and 0.54–0.80 for overprotection.

Intra-individual variations over time: relationships with self-report measures

To quantify the relationship between changes in PBI scores over time and changes in other factors such as mood state, intra-individual variations on the PBI were correlated with intra-individual variations on two self-report measures; state depression (measured by the Wilson–Lovibond measure) and neuroticism (measured by the Eysenck Personality Inventory). Correlations between intra-individual variations, measured by change scores (i.e. the subtracted difference between two time measurement intervals), were all small, ranging from $r = -0.24$ to 0.16 for the state depression comparisons, and from -0.22 to 0.22 for neuroticism.

DISCUSSION

The results of this study indicate that perceptions of parental care and overprotection, as measured by the PBI, remained relatively stable over two decades. The stability of the PBI over an extended period of time further attests to its validity as a measure of perceived parental characteristics to the age of 16 years (Parker *et al.* 1979). The stability of the PBI is well supported in the literature (Plantes *et al.* 1988; Mackinnon *et al.* 1989), and this is the first known study to show its stability over two decades.

While both the care and overprotection scales are robust, the findings support our hypothesis that the care scale appears the more stable dimension. The non-significant decrease in maternal overprotection scores over the two decades may reflect a 'mellowing' in attitudes,

as the cohort moved further away in time from their adolescence and became more reflective. No significant linear relationships were found, but the paternal overprotection scores showed a significant quadratic trend. Paternal overprotection scores decreased over the first 10 years for the cohort (between the mean ages of 23 and 33 years), and then rose again at 20-year follow-up (when the mean age was 43 years and most parents had at least one teenage child). Although the significance of this finding is not clear and may be due to Type I error, it may also reflect some identification with fathers' overprotection during the years when their own children were entering adolescence. These findings may be worth exploring further in another population.

The present findings suggest that recollections of one's parental environment are not substantially influenced by gender, depression history and life experience and that subjects' perceptions do not shift with fluctuations in depressed mood or neuroticism level. The present study allows for an extended analysis of perceptions on the PBI over two decades. The study has maintained an excellent retention rate (85%), even two decades after the study. A further strength of the study to assess the stability of perceptions in parenting as measured by the PBI is the non-clinical basis of the initial recruitment into the study. As the PBI was administered at the commencement of the study (in 1978), followed by subsequent administrations 5, 10 and 20 years later, an examination of the potential influence by such factors as mood state and depressive episodes can be more adequately explored. This leads to the consideration of the generalizability of findings to the wider population.

First, this study observes a well-educated cohort, in which subjects have been conscientious in completing a number of measures over 20 years, and which may produce greater stability than could be expected in a non-volunteer or clinical sample. Also, retention bias may exist, with significantly lower baseline maternal care scores being found for those who were not successfully followed up 20 years later. The cohort has previously been found to be reliable reporters of their own experience in earlier reports from the study (Wilhelm & Parker, 1990, 1994), and to be similar to Angst's larger Swiss cohort

(Angst & Mikola, 1984). The group has been shown to have rates of depression and anxiety that are similar or greater to those in the general community (Wilhelm *et al.* 1997), but they may be more able to articulate and identify their own experiences compared to those who lead more chaotic lives (Morgan *et al.* 1993).

A second potential limitation of the present study is the modest sample size of the cohort, limiting power in statistical tests performed. The possibility of an increase in likelihood of a Type II error occurring (i.e. failing to reject the null hypothesis when it is, in fact, false) was compensated for by maintaining an α -level of 0.05 for the analyses. However, the possibility that the non-significant results obtained in the present analysis may be the result of a Type II error cannot be dismissed, and further studies supporting the findings, with larger sample sizes, would increase confidence.

The present study reports on the reliability of the perception of parenting over time, rather than necessarily actual parenting. We did not independently verify actual parenting behaviour with the parents of this cohort. Moderate agreement has been found between the parents and children on the quality of the parenting experience in previous validity studies (Parker, 1983; Wilhelm *et al.* 2000). However, it can also be argued that it is the individual's perception of parenting, rather than necessarily the actual parenting behaviour, that holds the greatest risk for subsequent psychopathology. Given the stability of scores on the PBI over time and the limited influence of factors that may abstract perception such as mood state, the PBI can arguably approximate actual parenting behaviour.

In conclusion, the PBI has gained wide acceptance as a robust measure of perceived parenting which renders it a useful instrument in risk factor research. The current findings of the reliability of perceptions over two decades further increase confidence in the instrument.

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The stability of the Parental Bonding Instrument

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DECLARATION OF INTEREST

None.

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Giving up Self-Injury: A Comparison of Everyday Social and Personal Resources in Past Versus Current Self-Injurers

Cassandra Rotolone and Graham Martin

Self-injury represents a common yet perplexing set of behaviors, considered difficult to treat. The current study aimed to identify social and personal resources that may aid in cessation of self-injury. A community sample of 312 participants completed an online questionnaire. In line with Brown and Williams (2007), we compared all self-injurers (current and past) (106, 34%) with those who had never self-injured (206, 66%), and then current (38, 12.2%) with past self-injurers (68, 21.8%). Overall, self-injurers reported significantly lower levels of perceived social support, social connectedness, resilience, self-esteem, and life satisfaction compared to those with no such history. Further analysis indicated that family support, self-esteem, resilience, and satisfaction with life were significantly better for past compared to current self-injurers (at the $p < 0.01$ level). Logistic regression suggested that self-injurers could be distinguished from non self-injurers on Self-esteem and Social Connectedness. A further logistic regression suggested that past self-injurers could be distinguished from current self-injurers by their level of Resilience. The research has important preventive and clinical implications.

Keywords cessation, life satisfaction, protective factors, resilience, self-esteem, social connectedness, self-injury

INTRODUCTION

Self-injurious behavior, or self-injury, remains one of the most perplexing problems facing psychological scientists today (Nock, Prinstein, & Sterba, 2009). Although recent research has provided valuable information about prevalence, risk factors and functions of self-injury (Martin, Swannell, Hazell et al., 2010), little is

known about what factors prevent at-risk individuals from turning to self-injury at times of heightened emotionality. This omission in the literature mirrors a general trend in mental health research of focusing on pathology and risks rather than on protective strengths and resilience (Heisel & Flett, 2004). Social environment can improve both physical and psychological outcomes for other health domains

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(Hefner & Eisenberg, 2009), and this has led to suggestions that impact of social factors on self-injury warrants further examination (Heath, Ross, Toste et al., 2009).

The current study investigated perceived social support, social connectedness, resilience, life satisfaction, and self-esteem in relation to self-injury. We hypothesized that levels of these social and personal resources would differ between current and past self-injurers. If this could be demonstrated, the factors alone or in combination might be implicated in cessation, or inform self-injury prevention programs.

For this study self-injury is defined as “the direct, deliberate destruction of body tissue in the absence of conscious, lethal intent” (Nock & Favazza, 2009), that is *non-suicidal* self-injury (also called NSSI in other literature). This definition differentiates self-injury from other forms of self-harming—suicide attempts, piercings, tattoos, repeated/multiple surgeries and other culturally sanctioned activities (Favazza, DeRosear, & Conterio, 1989). Self-injury is a direct act resulting in immediate physical consequence (e.g., a cut) and providing a sense of relief or anxiety reduction (Claes & Vandereycken, 2007; Messer & Fremouw, 2008); eating disorders, substance abuse, and sexual risk-taking were excluded from our study.

Many models have been created to explain self-injury, but few include social support and connectedness. Klonsky and Muehlenkamp (2007) conclude that seven models—affect-regulation, anti-dissociation, anti-suicide, interpersonal boundaries, interpersonal-influence, self-punishment, and sensation-seeking—may be important. Research most consistently supports the affect-regulation model which suggests self-injury controls negative emotions including tension, anxiety, anger at oneself or others (hostility), and feelings of not being real or lacking identity (depersonalization) (Crouch & Wright, 2004). The

anti-dissociation model stems from the fact that many self-injurers report dissociation, perhaps from feelings of abandonment or isolation (Messer & Fremouw, 2008); self-injury reminds them of their existence (Miller & Bashkin, 1974). Many suggest self-injurious acts are an attempt to avoid or replace urges to suicide (Claes & Vandereycken, 2007; Messer & Fremouw, 2008); a means of expressing suicidal thoughts without risking imminent death (Klonsky & Muehlenkamp, 2007). Another model suggests damaging skin accentuates boundaries, protecting against fear of loss of identity (Klonsky & Muehlenkamp, 2007). Self-injury may influence or manipulate others (Messer & Fremouw, 2008). In this model the environment may unknowingly reinforce self-injurious behaviors (Klonsky & Muehlenkamp, 2007; Suyemoto & MacDonald, 1995). Linehan (1993) suggests self-injurers have learned from their environments to punish or invalidate themselves. Finally, self-injury may defeat boredom through generating feelings of exhilaration (Klonsky & Muehlenkamp, 2007).

Social support has long been considered a key factor in protecting individuals from negative consequences of unfortunate life experiences, both physiological and psychological (Uchino, Cacioppo, & Kiecolt-Glaser, 1999). Structural support refers to the existence and quantity of relationships, whereas functional support refers to perceived quality of social relationships (Kawachi & Berkman, 2001). Both facets are under-researched in terms of what effect, if any, they have on self-injurious behaviors (Hefner & Eisenberg, 2009).

Family function has been studied in adolescent suicide models; those reporting more family dysfunction and less family cohesion show increased suicidal ideation and behaviors (e.g., Garber, Little, Hilsman et al., 1998; Martin, Rozanes, Pearce et al., 1995). Little research has considered

specific self-injury samples (Brausch & Gutierrez, 2010). One recent study suggested adolescent self-injurers report less social support and less satisfaction with it (Wichstrom, 2009), but another found frequency of self-injury and amount of social support were not correlated (Heath, Ross, Toste et al., 2009). Another recent study found self-injurers reported higher levels of parental support than suicidal individuals but there were no differences in peer support (Hefner & Eisenberg, 2009). Perceived parental criticism and alienation have been shown to predict self-injury, but research on the effect of perceived social support in populations other than adolescence remains limited (Yates, Tracy, & Luthar, 2008).

Social connectedness is conceptualized as a “global” aspect of self-reflecting a wide range of beliefs and attitudes about proximal and distal relationships with family, friends, peers, acquaintances, strangers, communities and societies (Lee, Draper, & Lee, 2001; Williams & Galliher, 2006), an aggregate of all social experiences, gradually internalized to provide the individual with a social lens through which to perceive the world (Lee & Robbins, 1998). High social connectedness seems to protect against a range of symptoms indicating psychological distress (Williams & Galliher, 2006), yet the current study is the first to investigate the impact of social connectedness on self-injurious behaviors. We also set out to investigate trait resilience (Waugh, Fredrickson, & Taylor, 2008), life satisfaction (Heisel & Flett, 2004), and self-esteem (Brausch & Gutierrez, 2010; Fliege, Lee, Gro et al., 2009).

Despite the wish to distinguish clearly between self-injury and suicide attempts, we acknowledge there is sometimes overlap. Accepting this, we sought to explore whether those who only self-injure differ significantly from those who have in the past self-injured with intent to suicide.

METHOD

Participants

Following ethical approval from the University of Queensland, Australia, 312 participants (97 males, 215 females) were recruited through an introductory psychology course scheme (participants received course credit in exchange for participation), word-of-mouth, and flyer advertisements placed throughout the University community. Participants ranged from 16–50 years ($M 20.8 \pm 4.3$), identified as university students (96.2%), and listed English as their primary language (95.2%). Half the participants were single (50.8%), 13.2% in a casual relationship, 31.4% in a committed relationship, and 4.5% married. Additionally, 36.7% of respondents identified as religious, 48.7% non-religious, and 14.6% unsure.

Procedure and Measures

The questionnaire was developed and hosted online through Qualtrics Survey Software (The University of Queensland). Student participants were required to meet the researcher in person to allow discussion regarding aims, purpose, and possible risks of the research (as per the university’s ethical guidelines).

Demographic Information. Participants recorded age, gender, country of birth, primary language spoken at home, marital status, current occupation, religiousness, and whether they attended religious worship regularly.

Participants were asked four questions regarding characteristics of their social support network (e.g., “In the past 12 months, how often did you talk to a family member, including phone calls and emails?”), rated on a 5-point scale from 5 (*at least once a day*) to 1 (*not at all*); high scores indicate

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stronger support. Items were analyzed individually.

Deliberate Self-Injury Questionnaire. This included a self-injury definition, then asked: "Have you ever engaged in deliberate self-injury?" (Yes/No). We then sought responses about frequency, purpose, types of behavior, and self-injury cessation. "Suicide intent" was measured with: "Was the purpose of your self-injury ever to suicide?" (Yes/No).

Based on Brown and Williams (2007), a "current" self-injurer was defined by self-injury during the previous 12 months; a "past" self-injurer was someone who had not self-injured for over 12 months. A "No" response to the initial "ever self-injured" question led to automatic online forwarding to the standardized scales without viewing remaining self-injury questions.

The Multidimensional Scale of Perceived Social Support. The Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet et al., 1988) is a 12-item scale that assesses perceived social support on three subscales (four items each, 7-point Likert scale), family (e.g., "my family really tries to help me"), friends (e.g., "I can count on my friends when things go wrong") and significant other (e.g., "there is a special person in my life who cares about my feelings"). Reliability, validity, and factor structure of the MSPSS have been examined for university students (Dahlem, Zimet, & Walker, 1991) and community adolescents (Canty-Mitchell & Zimet, 2000). Overall alpha coefficient for the current sample was .91. Alphas for subscales were "family" .90, "friends" .93, and "significant other" .93.

Social Connectedness Scale – Revised. The Social Connectedness Scale – Revised (SCS-R) (Lee, Draper, & Lee, 2001) is a 20-item scale assessing individual feelings of interpersonal closeness and belongingness (to

friends, peers, the community, and society) as well as difficulty establishing and maintaining this (Williams & Galliher, 2006). Ten positively worded items (e.g., "I am in time with the world") and 10 negatively worded items (e.g., "I don't feel I participate with anyone or any group") seek responses on a 5-point scale. Higher overall scores indicate more connectedness. Overall internal consistency for the current study was .94.

The Resilience Scale. The Resilience Scale (RS-14) (Wagnild & Young, 1993), includes 14 positively worded items (e.g., "I usually take things in my stride" and "my belief in myself gets me through hard times") responded to on a 7-point scale. For the current study, the internal consistency coefficient was .92.

Rosenberg Self Esteem Scale. The Rosenberg Self Esteem Scale (Rosenberg, 1965) has test-retest correlations from .82 to .88 and internal consistency coefficients between .77 and .88 (Blascovich & Tomaka, 1993). Five negatively worded items (e.g., "At times I think I am no good at all") and 5 positively worded items (e.g., "I take a positive attitude toward myself" seek responses on a 4-point scale. For the current study, internal consistency was .87.

Satisfaction with Life Scale. *The Satisfaction with Life Scale (SWLS)* (Diener, Emmons, Larsen et al., 1985) has 5 items reflecting an individual's global life satisfaction and subjective wellbeing. Each item (e.g., "In most ways my life is close to my ideal") is responded to on a 4-point scale. Internal consistency coefficient for the current study was .88.

RESULTS

There were 38 Current self-injurers, 68 Past self-injurers, and 206 who had never self-injured. The three groups did not significantly differ on age ($F(2, 299) 0.46,$

$p=0.63$), ethnicity ($\chi^2(50) 49.39, p=0.50$), marital status ($\chi^2(6) 5.81, p=0.45$) and religious worship attendance ($\chi^2(2) 1.47, p=0.48$). They did significantly differ on gender (females more likely to self-injure ($\chi^2(2) 10.11, p=0.007$) and religiosity (self-injurers less likely to consider themselves religious ($\chi^2(4) 11.12, p=0.025$)).

Self-Injurious Behavior

Overall, self-injury was reported by 34% ($n=106$). Sixteen (5.1% sample, 15.1% self-injurers) had at some time self-injured with suicidal intent. Females (39.3%; $n=84$) were more likely to report self-injury than males (22.7%; $n=22$). Among self-injurers 46.2% did so frequently (daily, weekly, or monthly), 14.2% at least once every 3 months, 15.1% at least twice a year, while 24.5% had self-injured only once. Cutting ($n=68$) was the most common method, followed by "punching oneself" ($n=31$), "skin carving" ($n=28$), and "burning" ($n=18$). Other self-injury included "punching walls," "scratching," "poisoning," "purging," and "picking open wounds." Twenty-four self-injurers (22.9%) consulted a general practitioner and 15 (14.2%) had required urgent assistance from a hospital emergency department.

Mean self-injury frequency was similar between current and past self-injurers ($\chi^2 4.133, p=0.53, NS$). Six current (15.8%), and 20 past self-injurers (29.4%) had self-injured only once ($\chi^2 1.85, p=0.15, NS$). Similarly there was no difference between current and past self-injurers requiring medical practitioner ($\chi^2 1.85, p=0.17, NS$) or emergency department help ($\chi^2 .89, p=0.35 NS$).

Functions of Self-Injury

Participants reported self-injury alleviated acute negative affect or aversive

affective arousal; "to feel as bad physically as they did emotionally," "to vent frustrations," "to put emotional pain into physical pain," and "to express anger and sadness" (affect regulation). Other reasons included "I wanted to hurt myself because I deserved it" (self-punishment), "I wanted to make someone notice me," "I wanted to know if someone cared" (attention), "to feel alive," and "I was bored" (sensation-seeking).

Self-Injury Cessation

Over half (61.4%, $n=68$) with a lifetime history of self-injury claimed it had been over a year since the last act of self-injury. Of these 37 (54.4%) had sought therapy or counseling for self-injury, 29 (78.4%) reporting it as helpful in reducing/discontinuing. Other helpful factors included having support from a significant other ($n=36$), from family and friends ($n=24$), finding a meaning in life ($n=29$) and having a problem resolve ($n=15$). Other factors included "learning new ways to cope" and "realizing it didn't improve anything."

Group Comparison Analysis

Inter-correlations between all dependent variables were significant, though each was below 0.8 suggesting no multicollinearity. Significant differences were found (one-way ANOVAs) between the three groups on all dependent measures (Table 1).

Significant findings were followed up using pairwise comparisons (Table 2). A conservative level of significance was adopted for all tests at $p < .01$ to reduce Type 1 and family-wise error. Preliminary data checks indicated the sample violated the ANOVA assumption of homogeneity of variances; Welch's F was therefore tested for significance and reported for all main comparisons.

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TABLE 1. Overall Group Comparisons and Effect Sizes

Variables	Never Self-injured	Group means		F	<i>p</i>	Effect size
		Past SI	Current SI			
Perceived Social Support						
Overall	6.09	5.59	5.15	18.95	.001	.37
Family Support	6.01	5.28	4.53	22.03	.001	.42
Friend Support	6.06	5.56	5.23	10.00	.001	.27
Significant Other Support	6.21	5.93	5.68	3.39	.040	–
Social Connectedness	3.92	3.61	3.17	17.58	.001	.36
Resilience	5.86	5.69	4.85	16.55	.001	.40
Self-Esteem	3.04	2.82	2.47	26.90	.001	.39
Satisfaction With Life	3.60	3.30	2.66	22.14	.001	.35

Note. SI stands for self-injury.

Perceived social support explained 37% of the total between groups variance ($F(2,76) 18.95, p < 0.001, \eta(37)$). Follow-up planned comparisons showed individuals with no history of self-injury reported significantly more overall social support than self-injurers – either current or past ($t = 6.95, p < 0.001, r .50$). Differences between current and past self-injurers ($t = 2.61, p = 0.039, r .23$) on overall perceived social support did not reach significance at $p < 0.01$. Given 15.1% self-injurers ($n = 16$) claimed “sometime suicide intent,” a comparison of social support between

self-injury ($M 5.46 \pm 1.08$) and self-injury with suicide intent ($M 5.22 \pm 1.09$) was completed; this was not significant ($t = 0.81, p = 0.43$).

Significant differences in perceived family support existed between the three focal groups, explaining 42% of the between groups variability ($F(2, 74) 22.03, p < 0.001, \eta(42)$). Planned contrasts revealed that self-injurers overall reported significantly less family support than those with no history of self-injury ($t = 6.67, p < 0.001, r .57$). Current self-injurers reported less family support than past

TABLE 2. Follow up Planned Contrasts for Significant Findings

Variable	Never self-injured vs Current SI plus Past SI			Current SI vs Past SI		
	<i>t</i>	<i>p</i>	Effect size	<i>t</i>	<i>p</i>	Effect size
Overall Perceived Social Support	–6.95	.001	.50	2.61	.039	.23
Family Support	–6.67	.001	.57	3.32	.016	.23
Friend Support	–4.46	.001	.38	1.24	.220	–
Significant Other Support	–2.60	.011	.24	0.89	.376	–
Social Connectedness	–5.88	.001	.36	2.73	.008	.31
Resilience	–5.43	.001	.50	4.30	.001	.48
Self-Esteem	–7.04	.001	.38	3.72	.001	.21
Satisfaction with Life	–6.16	.001	.33	3.89	.001	.33

Note. SI stands for self-injury.

self-injurers ($t=3.32$, $p=0.016$, $r=.23$). However, no difference was evident between self-injury *with* a history of suicide intent ($M 4.84 \pm 1.42$), and self-injury with no such history ($M 5.03 \pm 1.49$), ($t=0.48$, $p=0.636$).

Friendship support accounted for 27% of between groups variability ($F(2, 75) 10.00$, $p < 0.001$, $\eta(27)$). Individuals with no history of self-injury reported significantly more support from friends than self-injurers either past or current ($t=4.46$, $p < 0.001$, $r=.38$). No significant differences existed between current and past self-injurers ($t=1.24$, $p=0.22$), or between self-injurers and self-injurers *with* a history of suicide intent ($t=0.58$, $p=0.57$).

No differences in perceived other support were found between the three groups ($F(2,37) 3.29$, $p=0.40$, $\eta(.17)$), or between self-injury and self-injury *with* a history of suicide intent ($t=0.92$, $p=0.36$).

Social connectedness accounted for 36% of total between groups variability ($F(2,78) 17.58$, $p < 0.001$, $\eta(36)$). Self-injurers (current and past) reported less social connectedness than those with no history ($t=5.88$, $p < 0.001$, $r=.36$). Current self-injurers reported significantly lower social connectedness than past self-injurers ($t=2.73$, $p=0.008$, $r=.31$). Those with self-injury alone ($M 3.53 \pm 0.77$) reported significantly higher social connectedness than self-injurers *with* a history of suicide intent ($M 3.04 \pm 0.82$), ($t=2.75$, $p=0.006$, $r=.16$).

Resilience explained 40% of between groups variance ($F(2,16) 16.55$, $p < 0.001$, $\eta(.40)$). Self-injurers (current and past) reported significantly lower levels of resilience ($t=5.43$, $p < 0.001$, $r=.50$). Current self-injurers indicated significantly lower resilience than past self-injurers ($t=4.30$, $p < 0.001$, $r=.48$). The difference in resilience between self-injury alone ($M 5.48 \pm 0.93$) and self-injury *with* a history of suicide intent ($M 4.92 \pm 1.2$), was not significant ($t(18)=1.77$, $p=0.093$).

Non-self-injurers reported significantly higher self-esteem ($F(2,304) 26.90$, $p < 0.001$, $\eta(.39)$) than self-injurers overall. Past self-injurers reported significantly higher levels than current self-injurers ($t=3.72$, $p < 0.001$, $r=.21$). Differences between self-injurers and self-injurers *with* suicide intent ($t=1.89$, $p < 0.059$) were non-significant.

Self-injurers (past and current) were significantly less satisfied with life than non-self-injurers ($t=6.16$, $p < 0.001$, $r=.22$). Current self-injurers reported significantly lower life satisfaction than past self-injurers ($t=3.89$, $p < 0.001$, $r=.33$). Differences in life satisfaction between self-injurers and self-injurers *with* a history of suicide intent were not significant ($t(306)=1.73$, $p=0.085$).

Logistic Regression

Given shared variance between measures predicting self-injury group membership, two binary logistic regressions were performed to further assess their relative importance. The first model contained all five predictors—overall social support, social-connectedness, resilience, self-esteem and life satisfaction—aiming to distinguish individuals with a lifetime history of self-injury from those with no such history. The full model was statistically significant ($\chi^2 52.32$, $p < 0.001$), explaining 21.8% (Nagelkerke R squared) variance in self-injury behavior, correctly classifying 71.5% of cases.

Only two dependent variables made a unique statistically significant contribution to the model (Table 3). The strongest predictor of self-injury was low social support (OR 0.54, CI 0.36–0.79), suggesting that for every 1 unit decrease in social support, an individual was 3.51 times more likely to have engaged in self-injurious behaviors. Self-esteem was the other significant predictor of self-injury (OR 0.29, CI

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TABLE 3. Logistic Regression Predicting Likelihood of Reporting Self-Injury

	B	SE	Wald	df	p	exp b	95% C.I for exp b	
							Lower	Upper
Self Esteem	-1.25	.47	7.03	1	.008*	.29	.11	.72
Social Connectedness	-.06	.31	.05	1	.83	.94	.51	1.72
Satisfaction With Life	-.04	.21	.04	1	.84	.96	.64	1.44
Resilience	.13	.25	.27	1	.61	1.14	.70	1.86
Perceived Social Support	-.62	.20	9.77	1	.002*	.54	.36	.79
Constant	6.24	1.22	26.28	1	.000	514.71		

Note. *Significant at $p < .01$.

0.11–0.72) indicating that for every 1 unit decrease in self-esteem, odds of self-injuring increased by a factor of 1.87, controlling for other factors in the model.

A second logistic regression was conducted to investigate if any predictor could uniquely distinguish between current and past self-injurers. The full model containing all predictors was statistically significant ($\chi^2 23.03$, $p < 0.001$), explaining 27.1% (Nagelkerke R squared) of variance within self-injury behavior, correctly classifying 65.8% of cases. The only dependent variable to make a unique, statistically significant contribution to the model was Resilience, the odds ratio (OR 0.32, CI 0.13–0.76) indicating that for every 1 unit increase in resilience, an individual was 3.13 times more likely to have given up self-injurious behaviors.

DISCUSSION

The study aimed to identify key personal and social resources distinguishing self-injurers from non self-injurers and, more importantly, current from past self-injurers. Results fulfilled both aims. Several protective factors—social support, self-esteem and resilience—appeared to have a unique ability to predict self-injury status.

Lifetime prevalence for non-suicidal self-injury for this predominantly student

sample, at 34% is high compared to other university-based research—ranging from 17–41% (Gollust, Eisenberg, & Golberstein, 2008; Gratz, 2002; Hasking, Momeni, Swannell et al., 2008; Whitlock, Eckenrode, & Silverman, 2006). We used a definition of self-injury which included cutting, skin carving, burning, wound picking, hitting parts of the body and needle use. Our prevalence rate could have been biased by recruitment advertisements specifically encouraging students with a history of self-injury to take part.

Some studies have recently questioned female gender bias for self-injury, suggesting it may be due to the way questions are asked (Brausch & Gutierrez, 2010; Martin, Swannell, Hazell et al., 2010; Tyler, Whitbeck, Hoyt et al., 2003). Our current findings support other studies suggesting females are more likely to self-injure (Cleary, 2000; Hooley, 2008; Yates, Tracy, & Luthar, 2008). However, this result may have been biased by the type of advertising or by female predominance in psychology courses.

Functions of self-injury in our study concur with previous literature (Martin, Swannell, Hazell et al., 2010; Nock & Mendes, 2008), participants most frequently reporting “emotion regulation” as the motivation, with comments such as “I wanted to turn emotional pain into physical pain.” This supports the affect-regulation

model (Favazza, 1992). Other functional models were also supported including self-punishment (Linehan, 1993) (e.g., “I wanted to hurt myself because I deserved it”), interpersonal-influence (Chowanec, Josephson, Coleman et al., 1991) (e.g., “I wanted to make someone notice me”; “I wanted to know if someone cared”) and sensation-seeking (Klonsky & Muehlenkamp, 2007) (e.g., “to feel alive”; “I was bored”). We found no evidence for the interpersonal boundaries model (Claes & Vandereycken, 2007), anti-dissociation (Miller & Bashkin, 1974) or anti-suicide (Klonsky & Muehlenkamp, 2007).

The literature is inconclusive regarding the role of social support and has been limited by small sample sizes as well as predominantly adolescent and suicidal samples (Brausch & Gutierrez, 2010). Results from our community-based sample strongly suggest that self-injurers have lower levels of overall social support, family support, and peer support, compared to individuals who have never self-injured – supporting clinical observation. Perceived low social support was the strongest predictor of self-injury, in line with Wichstrom (2009) who suggested self-injurers report less supportive social environments compared to members of the general population.

We have shown meaningful differences between current and past self-injurers. Current self-injurers reported significantly lower levels of overall social and family support compared to those who had given up self-injury. While further work is necessary, increasing social support may be a valuable strategy in both therapy and preventive programs aimed at reducing self-injury. Improved family support in particular may be critical in helping current self-injurers to cease. The support of peers and significant others although significantly different between those who self-injure and those who do not, showed little difference between current and past self-injurers. This supports work suggesting these two types

of support are not as important as family support in cessation (Hefner & Eisenberg, 2009).

Past research suggests having a persistent global inability to bond with the social world is related to a range of negative and dysfunctional symptoms associated with psychological distress (Williams & Galliher, 2006). The current study seems to be the first to investigate social connectedness and its relationship with self-injury, with results suggesting self-injurers (current or past) perceive significantly less social connectedness than those with no history of self-injury. In addition, significant differences existed between current and past self-injurers. Despite modest effect sizes, social connectedness had no unique discriminating ability, possibly due to inter-correlations between social connectedness and other variables in the model. However, non-suicidal self-injurers reported significantly more social connectedness than those who had self-injured at some time *with* suicidal intent. This finding is unique for social connectedness; no other variable in our study produced significant differences between self-injury and those with suicidal intent. Although Lee and Robbins (1995, 1998, 2000) have shown that social connectedness is distinct from variables such as loneliness and belongingness, further research is required to confirm our findings, and investigate how best to maximize feelings of social connectedness in clinical and community settings.

Our study is apparently the first to specifically investigate resilience in self-injuring individuals, although research has suggested that resilient individuals adapt more effectively to a range of stressors (Vaughn et al., 2008) and traumatic experiences (Florian et al., 1995). Both past and current self-injurers had significantly lower levels of resilience compared to non self-injuring peers. Current self-injurers reported significantly lower resilience than those who had ceased, and resilience was

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the only variable in logistic regression to significantly distinguish current self-injurers from past self-injurers. This provides preliminary evidence that actively increasing aspects of resilience may assist cessation of self-injurious behaviors. The question remains regarding what skills and techniques can be utilized in treatment settings to build or re-build resilience in self-injurers.

Self-injuring individuals overall reported significantly lower self-esteem, and this remained significant when all other variables were taken into account. Current self-injurers reported significantly lower self-esteem than those who had ceased. These findings are in line with studies showing suicidal self-injurers demonstrate low self-efficacy, a higher tendency towards self-blame and more self-derogation than those who do not self-injure (Fliege, Lee, Grimm et al., 2009). Our findings suggest improving self-esteem may assist cessation of self-injury. Different studies have shown that high levels of self-criticism are linked to disturbed and dysfunctional interpersonal relationships (Glassman, Weierich, Hooley et al., 2007). It is plausible that low self-esteem exacerbates lack of social support, maintaining use of self-injury as an emotion-regulation tool.

Finally, our results extend previous research on life satisfaction and its relationship with suicidal ideation (Heisel & Flett, 2004). As predicted, findings indicated that self-injurers overall report significantly lower life satisfaction. In addition, current self-injurers are less satisfied than past self-injurers. Heisel and Flett (2004) found that increasing life satisfaction could protect against suicide ideation in a clinical sample. Again, further research is required to explore practical ways in which life satisfaction may be increased in both the clinical and community settings of self-injurers.

In summary, this appears to have been the first study to directly assess social connectedness and resiliency in self-injurers.

Where past research has been limited to adolescent and clinical suicidal samples the current study was based on a community sample, albeit of psychology students, cross-sectional, and with acknowledged flaws in sampling. Despite these limitations, we believe the study takes the first steps in filling a number of gaps in the literature and provides important information for both clinicians and those developing preventive programs for self-injury.

AUTHOR NOTE

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ESSAYS
*On Prevention
In Mental Health*

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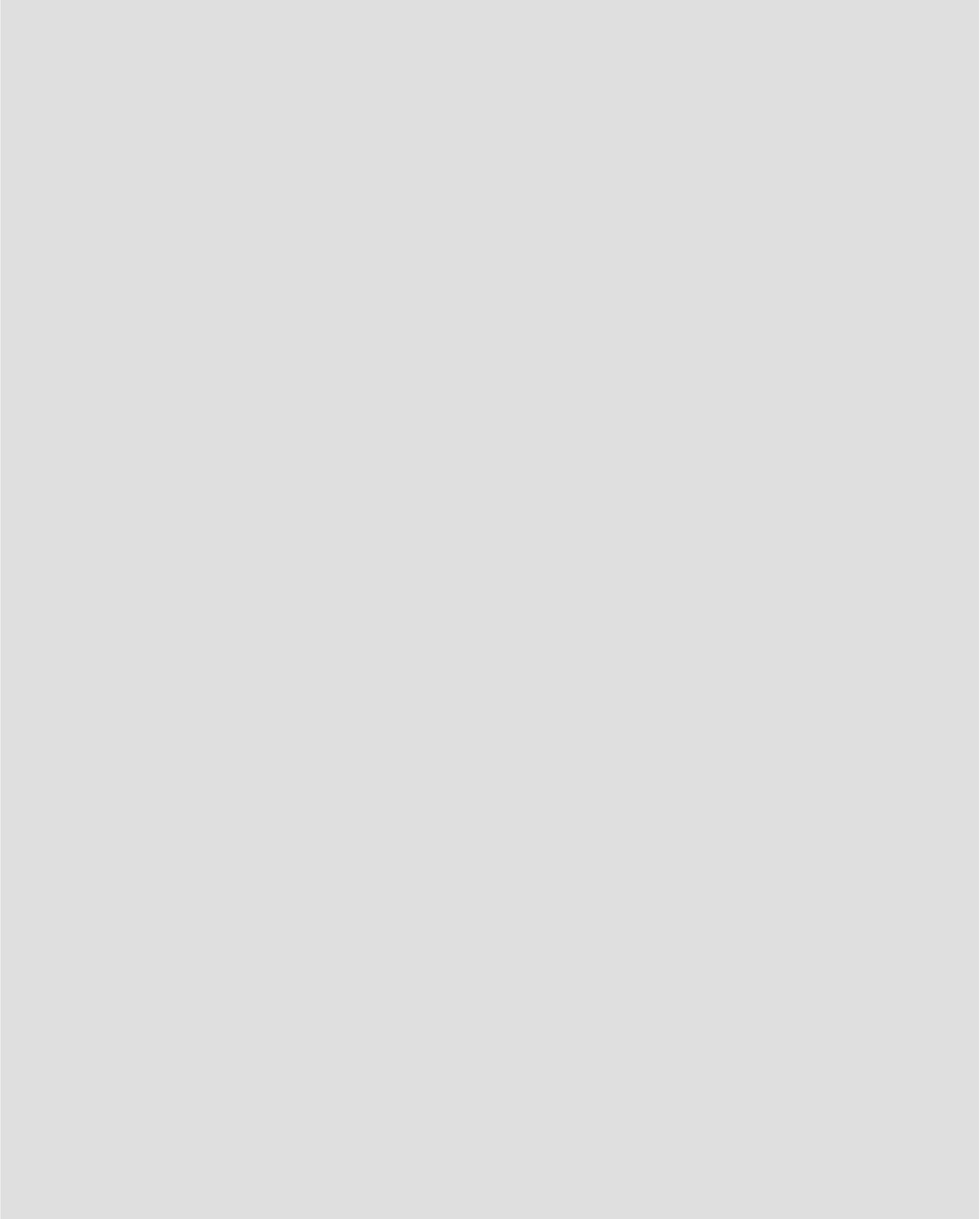


EXHIBIT 306

Pages 183 through 335 redacted for the following reasons:

The remainder of this document has been redacted in accordance with the Confidentiality Protocol published by the Commission 12 October 2015 and the Order made by the Commissioner on 15 October 2015.