

Parental bonding and vulnerability to adolescent suicide

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Part of a series of studies into early detection in adolescent suicide, this study investigated relationships between parenting style and suicidal thoughts, acts and depression. Students (mean age 15 years) from 4 randomly chosen high schools completed self-report questionnaires containing the Parental Bonding Instrument (PBI) and the Youth Self Report, which provided information about suicide ideation, deliberate self-harm and depression. Significant differences for mean scores on the PBI subscales were noted between cases and noncases of depression, suicidal thoughts and deliberate self-harm. Assignment by adolescents of their parents to the “affectionless control” quadrant of the PBI doubles the relative risk for suicidal thoughts, increases the relative risk for deliberate self-harm 3-fold and increases the relative risk for depression 5-fold. It seems that the PBI may play a role in identification of vulnerable adolescents; further, it both elucidates aspects of adolescent-parent interaction and points toward areas for intervention with at-risk adolescents. We recommend the use of the PBI in early detection studies of adolescent suicide.

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There has been a worldwide increase in suicide in adolescence (ages 15–19) over the last 30 years, with the rate doubling in the United States (1). In Australia, the rate for girls has remained stable but has doubled for boys (2). Fortunately, completed suicide is still relatively uncommon with a frequency of 16 per 100,000 adolescent population, but suicidal thoughts, attempts and other self-destructive behaviors occur more often.

The rate of adolescent attempts in relation to each death from suicide has been estimated at between 50:1 and 120:1, though these may be underestimates, being derived from special samples (such as those admitted to hospitals) (3). In contrast, school population surveys of suicidal behaviors suggest that attempters make up 10–11% of high school students, few of whom ever seek professional help (3). The frequency of suicidal thinking is higher still (4).

The major goal of studies in non-psychiatric environments is prevention of completed suicide. An underlying assumption is that a continuum exists from suicidal thoughts through wishes to threats, attempts and completion (5, 6) and that early detection of, and intervention with, adolescents who have suicidal thoughts or have made threats or plans may reduce the rate of completed suicide. Support for the assumption comes from psychological autopsies of

suicide, which have shown that most children and adolescents who commit suicide have previously verbalized their wish to die threatened suicide and, in 40% of adolescents who carry out suicide, have previously made a suicide attempt (7, 8).

In the search for possible predictors of suicide, many factors have been discovered to be associated with the spectrum of suicide. These include depression, poor self-esteem, hopelessness, drug and alcohol abuse, risk-taking behaviors, antisocial behavior, experience of another's suicide, locus of control and music preference (2–12). Of these, depression is the most frequently cited accompaniment of both suicidal thinking and acts of deliberate self-harm (5, 13–16). Depression in adolescents may exist separately from suicidal behaviors (17, 18), but it remains the best predictor of recurrence of suicidal thoughts and acts (19). The combination of depression with reported suicidal thoughts and a history of deliberate self-harm indicates serious vulnerability to suicide. One further finding consistently reported as characteristic of suicidal youth is a disturbed family life (20), sometimes in the absence of other signs or symptoms. Stephens (12) suggested that there is a population at risk, characterized by adolescents with greatly disturbed family environment who do not act out, do not get involved in alcohol, drugs and risk-

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

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 ($P < 0.001$).

Parental bonding and adolescent suicide

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.

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	n	No suicidal thoughts	n	t ^a	P
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.

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

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, ** $P < 0.001$, * $P < 0.01$.

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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