

hints at a social-cognitive deficiency. Non-resolvers may fail to connect the anger they experience with their dissonant social values. This lack of insight may explain why parasuicides high in intro-punitiveness seem to benefit more from cognitive interventions (Goldberg & Sakinofsky, 1988).

Stepwise regression analysis selected baseline problem severity, powerlessness (negatively), and normlessness as 'predictive' of degree of problem resolution. Powerlessness (akin to helplessness) may act as a self-fulfilling prophecy inhibiting problem tackling, and non-resolvers might benefit from training in problem solving (D'Zurilla & Goldfried, 1971) as well as assertiveness training. The positive coefficient for normlessness suggests personal self-reliance and independence, which could favour problem solving. When problem resolution was examined as a dichotomous variable in the regression analysis, baseline problem severity again emerged, this time coupled with fewer previous episodes of self-harm, and less self-directed hostility. The latter two bespeak of a healthier, more functional personality, with a greater ability to solve problems of living.

The number of suicides so far in this sample (four) was too small to warrant seeking predictors. Hopelessness is a predictor of future suicide in parasuicides, independent of depression (Beck *et al.*, 1985). The concepts of hopelessness and powerlessness (as employed in this study) do not appear to be identical. Suicidal intent, which has been

correlated with depression (Dyer & Kreitman, 1984; O'Brien *et al.*, 1987), did not correlate significantly with initial powerlessness. In our series there was a weak correlation for suicide intent with depression for the sample as a whole (0.24), stronger in the non-resolvers alone (0.42).

The concept of 'locus of control' (Lefcourt, 1976) implies that one perceives oneself as having more or less control over one's 'reinforcements', and seems also related to powerlessness. Melges & Weisz (1971) reported that in serious suicide attempters increases in suicidal ideation had been accompanied by changes towards external control, and Goldney (1982) also found a group of female self-poisoners scored towards an external locus. In our study there were no differences in mean scores for locus of control at inception. At follow-up the mean score in resolvers had shifted toward the internal pole, that for the non-resolvers hardly changing.

There were more prior episodes of self-harm in the non-resolvers, and this also featured in the regression analysis of problem resolution as a dichotomous variable. This suggests a link between repetition and failure to solve problems. More prior episodes have been linked with future repetition of parasuicide (Kreitman, 1977). Repetition may be a substitute method of coping, previously overlearned, in those whose social competence is either inadequate or their problems insurmountable. In the succeeding paper the factors which led to repetition in our sample are explored in greater depth.

Acknowledgements, references and authors' details will be found at the end of the second paper, on pp. 404–405.

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Why Parasuicides Repeat Despite Problem Resolution

ISAAC SAKINOFSKY and ROBIN S. ROBERTS

To discover why parasuicides who resolved their difficulties repeated self-harm within three-month follow-up at the same rate as those who had not resolved problems, a group of 30 repeaters was compared with 156 non-repeaters. The repeaters had a history of more frequent episodes, beginning younger. Their problems were more severe, the acts of self-harm potentially less lethal. They experienced greater feelings of externally directed hostility, powerlessness, and 'normlessness'. A constellation of nine variables correctly predicted 81.5% of the repeaters and 77.5% of the non-repeaters. At follow-up the non-repeaters had improved on several parameters but the repeaters were essentially unchanged. The resolvers among the subgroup of repeaters were more like repeaters in the overall sample than the resolvers, which may explain why some parasuicides repeat in spite of resolving their problems.

Parasuicide (deliberate self-harm) is usually precipitated by psychosocial difficulties (Bancroft *et al*, 1979). Resolving their problems should therefore relieve the strain on these patients and eliminate their need to harm themselves. Unfortunately, this does not hold true in practice: as reported in the previous paper (this issue, pp. 395–399), an identical proportion (16%) of those who did and did not resolve their problems reported repeat episodes during three-month follow-up.

Comparing parasuicides who repeated with non-repeaters, the Edinburgh research group (Kreitman, 1977) found that a diagnosis of sociopathy or alcohol abuse, previous psychiatric treatment, and previous parasuicide discriminated these two groups. To a lesser extent, belonging to social class V, dependence on drugs, criminality, and unemployment also indicated repetition. Repetition was more probable if there was a history of suicide or parasuicide in the family. Kreitman & Casey (1988) replicated the Edinburgh findings in an epidemiological study which distinguished 'minor' and 'grand' repeaters from 'first-ever' parasuicides. Morgan *et al* (1976) also found previous psychiatric treatment, previous episodes and a criminal record associated with repetition. Repeaters were more likely to have had younger mothers and less likely to have had both parents still living together by the time they were 15 (Farmer, 1980).

A picture of intertwined personal and social pathology was developed in a retrospective investigation in Toronto of parasuicides with a history of previous acts (Barnes, 1986). Male repeaters had less than eight years of schooling, more family stress, and alcohol problems more often; female repeaters were more often lonely and sexually maladjusted. After six months four (4.7%) of the repeaters (who comprised an unusually high 65.8% of this sample) and none of the first-ever parasuicides had killed themselves.

Barnes' study highlights the risk for future suicide among 'attempters'. In both Edinburgh and Chichester, 41% of detected cases of suicide had a history of parasuicide (Kennedy *et al*, 1974; Barraclough, 1987). In the Edinburgh study as well as in Oxford (Hawton & Fagg, 1988) 1% of detected parasuicides committed suicide within the year. In our study almost double this proportion of parasuicides killed themselves (previous paper), and in Verona 2.9% did so over a similar period (Siani *et al*, 1979). This proportion swells to 10.9% after 35 years (Dahlgren, 1977). Bancroft & Marsack (1977) have pointed out the increased risk with repetition of a fatal outcome. Repetition might desensitise parasuicides, permitting even greater hazards with each successive episode.

We therefore set out to investigate the reasons why even those parasuicides who had resolved their problems, and improved on several social and behavioural parameters, repeated deliberate self-harm in the same proportions as those who had not been so fortunate.

Method

The design of the original study is described in detail in the previous paper. Of the sample of 187 who were successfully followed up (82.0% of the original series), 30 patients reported at least one further episode of deliberate self-harm during the ensuing three months. In one case the information was not available. Eighteen (16.1%) of these were 'resolvers' and 12 (16.2%) were non-resolvers (see previous paper). To clarify the reasons for the similarity in repeat rates, the 30 repeaters were combined from both groups and then compared in analysis with the 156 non-repeaters. Thereafter, an analysis was carried out in the repeaters alone comparing the resolver and non-resolver subgroups.

Results

Fifty-seven per cent of the repeaters and 66% of the non-repeaters were female (not significantly different). Nor did the groups differ in diagnoses: 20 repeaters (two-thirds) were diagnosed with personality (characterological) disorders, as were 72 (46%) of the non-repeaters. Nine repeaters (30%) suffered from affective or acute adjustment disorders, and 7 (23%) from alcohol abuse. There were no patients diagnosed as having organic brain syndrome, and no schizophrenics among the repeaters (four non-repeaters, no significant difference).

Table I compares the repeaters with the non-repeaters at the inception of the study. They did not differ in mean age, years of education, prodromal duration, suicide intent, depression, locus of control, isolation (a subscale of Dean's Alienation Scale), internally directed hostility, self-esteem, sensitivity to criticism, or level of social adjustment.

On the other hand, the repeaters were significantly younger at their first episodes, had a greater number of previous attempts, and their index attempts were of lower potential lethality. They rated their initial problems as more severe than the non-repeaters, reported more externally directed hostility, and experienced greater powerlessness and normlessness (the two other subscales of Dean's Alienation Scale).

Table II compares the three-month mean scores of the two groups adjusted for baseline value by one-way analysis of covariance, the baseline value of the dependent variable being taken as the covariate. The adjusted means are estimates of what would have been observed at three months in the repeaters and non-repeaters had both groups started from the same baseline. The differences between the three-month adjusted scores and common baseline scores are thus interpretable as measures of change (Goldberg *et al*, 1986). The non-repeaters improved significantly more than the

TABLE I
Repetition of parasuicide in three months: comparison at inception

| Variable | Repeaters (n = 30) | | Non-repeaters (n = 156) | | P ¹ |
|--|-----------------------|-------|----------------------------|-------|----------------|
| | mean | s.d. | mean | s.d. | |
| Age: years | 27.53 | 9.15 | 30.27 | 13.47 | 0.833 |
| Education: years | 9.57 | 3.28 | 9.47 | 2.75 | 0.862 |
| Duration of prodromal disturbance: weeks | 5.07 | 3.35 | 10.57 | 19.69 | 0.143 |
| Age at first episode* | 22.55 | 8.26 | 27.89 | 13.37 | 0.040 |
| Prior acts ² * | 1.35 | 1.02 | 0.83 | 0.97 | 0.010 |
| Suicide intent | 3.07 | 2.55 | 2.92 | 2.21 | 0.740 |
| Lethality* | 1.00 | 0.00 | 1.47 | 1.07 | 0.039 |
| Problem score* | 9.61 | 3.01 | 7.52 | 3.04 | <0.001 |
| Beck depression | 21.43 | 10.85 | 18.29 | 11.36 | 0.164 |
| Locus of control | 10.30 | 4.07 | 10.32 | 4.41 | 0.985 |
| Powerlessness* | 31.93 | 5.84 | 29.11 | 6.93 | 0.038 |
| Normlessness* | 21.13 | 3.12 | 19.03 | 4.81 | 0.022 |
| Isolation | 30.73 | 5.69 | 29.11 | 5.73 | 0.156 |
| External hostility* | 17.30 | 6.53 | 14.29 | 6.07 | 0.015 |
| Internal hostility | 10.87 | 4.55 | 9.44 | 4.39 | 0.106 |
| Self-esteem ³ | 3.83 | 1.86 | 3.75 | 1.93 | 0.825 |
| Sensitivity | 1.87 | 0.97 | 1.96 | 1.02 | 0.638 |
| Social adjustment ³ | 3.67 | 0.71 | 3.58 | 0.98 | 0.657 |

*Statistically significant (subject to Bonferroni correction, see text).
 1. One-way ANOVAS, lethality analysed non-parametrically by Mann-Whitney U test.
 2. Data square-root transformed in test (assumed Poisson distribution).
 3. High score indicates low levels on these scales.

TABLE II
Parasuicides: repeaters and non-repeaters compared at three months, with adjustment for baseline values

| | Baseline | Adjusted means at three months | | P |
|----------------------------------|----------|--------------------------------|----------------------------|--------|
| | | Repeaters (n = 30) | Non-repeaters (n = 156) | |
| Problem score | 7.86 | 4.50 | 3.73 | 0.125 |
| Beck depression* | 19.05 | 17.50 | 10.50 | <0.001 |
| Locus of control | 10.39 | 10.49 | 9.54 | 0.224 |
| Powerlessness | 29.66 | 29.49 | 27.53 | 0.099 |
| Normlessness | 19.48 | 19.68 | 18.29 | 0.059 |
| Isolation* | 29.52 | 30.01 | 26.89 | 0.006 |
| External hostility* | 14.92 | 15.02 | 12.07 | 0.004 |
| Internal hostility* | 9.82 | 10.09 | 7.23 | <0.001 |
| Self-esteem ¹ * | 3.82 | 3.72 | 2.47 | 0.001 |
| Sensitivity* | 1.98 | 1.96 | 1.59 | 0.040 |
| Social adjustment ¹ * | 3.60 | 3.58 | 3.06 | <0.001 |

*Statistically significant (analysis of covariance). Refer to text for Bonferroni correction.
 1. High score indicates low levels on these scales.

repeaters on measures of depression, internally and externally directed hostility, social isolation, self-esteem, sensitivity to criticism and social adjustment. However, in view of the multiple univariate analyses, a conservative probability value of $P=0.005$ should be applied when interpreting these results (Bonferroni method) and P values greater than this treated cautiously (Kleinbaum *et al*, 1988).

In order to determine which variables were predictive of repetition within three months of an index act of self-harm, a stepwise discriminant function analysis of the 18 baseline continuous variables as well as gender was performed, using the BMDP statistical program, with repetition at three months as the dependent variable. It yielded nine 'predictor' variables (Table III) (shown in the order in which they

TABLE III
Predictors of repetition¹

| | Coefficients ² |
|----------------------|---------------------------|
| Problem score | 0.177 |
| Normlessness | 0.061 |
| Prodrome | -0.024 |
| Age at first episode | -0.089 |
| Age | 0.062 |
| Sex | -0.655 |
| Lethality | -0.256 |
| Locus of control | -0.101 |
| Powerlessness | 0.071 |

1. Stepwise discriminant function analysis.
2. Coefficients for canonical variables, order in which variables are selected.

emerged) together correctly identifying 81.5% of the repeaters and 77.5% of the non-repeaters in the sample.

The signs of the canonical coefficients suggest higher problem scores, a tendency to be male, older, with an earlier history of previous parasuicide, shorter prodromes, index attempts of lower potential lethality, more internal loci of control, and greater feelings of powerlessness and normlessness. It is noteworthy that, after normlessness was selected (in the second step), the '*F*-to-enter' values for powerlessness, external and internal hostility dropped sharply, suggesting a relationship between these variables and normlessness. Ultimately, powerlessness was also selected in the analysis, but only at the ninth step, and the hostility variables not at all.

At follow-up the repeaters did not report experiencing a significantly greater number of new stressful events during the interval than non-repeaters. However, the non-repeaters described significantly more improvements ($\chi^2 = 12.43$, d.f. 3, $P = 0.006$), largely in respect of personal change, but improvements in financial situations, marriages, family and

work each occurred in about twice as many of the non-repeaters as in the repeaters.

The next series of analyses examined the possibility of differences within the group of repeaters between the resolvers and non-resolvers among them. There were no significant differences at inception in any of those continuous indicators listed in Table I. A one-way analysis of covariance was carried out on the repeaters, comparing the resolvers and non-resolvers among them, with the baseline values of the dependent variables as the covariate in each instance. As described in the previous paper, three-month scores were adjusted to a common baseline so that change is interpretable from the difference between baseline and adjusted three-month means (Table IV).

As expected by definition the resolver-repeaters decreased their problem scores more than the non-resolver-repeaters. The non-resolver-repeaters emerged twice as depressed as the resolver-repeaters and had become more internally hostile, with lowered self-esteem, increased sensitivity to criticism, and poorer social adjustment. There were no significant differences between resolver-repeaters and non-resolver-repeaters on the mean number of stresses or improvements experienced by members of these subgroups. The 18 resolvers experienced 29 new stresses (1.61 per person) and the 12 non-resolvers 17 (1.42 each). New improvements were 0.89 per resolver and 0.58 per non-resolver.

Discussion

The main finding of this study is that certain clinical and psychological factors distinguish parasuicides who repeat episodes within three months from those who do not. Even when one separates the repeaters into resolvers and non-resolvers of their precipitating problems, the subgroups are similar at the time of the index episodes. In the overall follow-up sample

TABLE IV
Parasuicide repeaters: resolvers and non-resolvers compared

| Baseline | Adjusted three-month mean | | P | |
|---------------------------------|------------------------------------|--|-------|--------|
| | Resolvers ¹ (n = 18) | Non-resolvers ¹ (n = 12) | | |
| Problem score* | 9.61 | 3.56 | 7.08 | <0.001 |
| Beck depression* | 21.62 | 13.94 | 25.97 | 0.001 |
| Locus of control | 10.59 | 10.11 | 10.96 | 0.326 |
| Powerlessness | 32.10 | 29.72 | 31.90 | 0.069 |
| Normlessness | 21.17 | 20.44 | 20.54 | 0.528 |
| Isolation | 30.93 | 29.78 | 32.21 | 0.178 |
| External hostility | 17.76 | 17.11 | 15.32 | 0.584 |
| Internal hostility* | 11.00 | 9.06 | 13.35 | 0.001 |
| Self-esteem ² | 3.89 | 2.86 | 5.04 | 0.015 |
| Sensitivity* | 1.90 | 1.67 | 2.34 | 0.025 |
| Social adjustment* ² | 3.67 | 3.45 | 3.83 | 0.049 |

*Significant *P* values. However, refer to text for Bonferroni correction.

1. Adjusted mean scores of dependent variables at three months (analysis of covariance).
2. High scores indicates low levels on these scales.

($n = 187$) the resolvers had fewer prior episodes, shorter prodromes, less powerlessness, and less internal hostility than non-resolvers (previous paper). Yet in the subset of 30 repeaters, the resolver-repeaters were like non-resolver-repeaters on these measures.

Furthermore, unlike the group of resolvers as a whole, resolver-repeaters' scores on powerlessness and external hostility did not improve more than those of the non-resolvers at three months (Table IV). In other words, the resolver-repeaters are more akin to other repeaters on these indices than to other resolvers in the overall sample, which helps to explain why even those parasuicides who resolve their problems may attempt suicide again.

Which parasuicides are more likely to repeat within three months of an index episode, the period of greatest risk? The factors that emerged on discriminant function analysis suggest a tendency to perceive problems as more severe, to be more dissonant socially ('normlessness'), less able to tolerate frustration or adversity (shorter prodromes), younger at first episode, older, male, less potentially lethal index acts, more internal locus of control, and greater powerlessness. This combination of variables carries a sensitivity of 81.5% and a specificity of 77.5%.

Kreitman & Casey (1988) also found that their 'grand' repeaters tended to be males and older. A diagnosis of personality disorder, alcohol abuse, drinking within four hours of the act, habitual drug use, divorce, unemployment, and living alone were some of the other variables they found associated with repetition, all of them compatible with ours.

The sensitivity attained in the present study is comparable with that in a study by Siani *et al* (1979), but the specificity achieved in ours represents a considerable improvement over their 35%. However, our predictors require prospective replication. The importance of improving specificity without loss of sensitivity lies in directing scarce and expensive resources only to those parasuicides who really are at greater risk.

Despite similar scores on suicide intent, the index acts of the repeaters were less potentially lethal than the non-repeaters', suggesting an intended outcome other than death. Repeaters did not differ from non-repeaters in levels of formal education, so that it is unlikely that they were simply less knowledgeable. Worden & Sterling-Smith (1973) also found low lethality and younger age at first episode in repeaters referred to the Massachusetts General Hospital. Probably the acts of our repeaters were expressive (cathartic) or communicative in intent, i.e. the 'attempts' were well versed pantomimes of death,

signalling the parasuicide's predicament in a semaphore well understood by his/her own subculture (Stengel & Cook, 1958; Farberow & Shneidman, 1961; Kreitman *et al*, 1970). (The futility of this behaviour as a coping device is underscored in Table II: the non-repeaters, not the repeaters, substantially improved on measures of depression, isolation, self-esteem, sensitivity to criticism, external and internal hostility, and social adjustment.)

Manifest hostility has been recognised in parasuicides, externally directed hostility seeming most characteristic (Weissman *et al*, 1973; Farmer & Creed, 1986; Farmer, 1987). Greater external hostility at baseline was a feature distinguishing our repeaters, and at three months their levels had not changed, while the non-repeaters were significantly less hostile, indicating that it is presumably state-related. Although it did not emerge in the discriminant analysis as a predictor of repetition, continued external hostility and its related variables, normlessness and powerlessness, clearly predispose to it, whether or not the individual manages to resolve his/her problems.

Any biopsychosocial model of repetition in parasuicide should also consider the possible effects of learning and the recent work on neurotransmission. Maladaptive learning based on reinforcement from the immediate subculture (Kreitman *et al*, 1970), with behaviour becoming autonomously self-perpetuating, is suggested by the earlier age of onset in repeaters and their histories of more frequent attempts.

Several studies, summarised by Asberg *et al* (1986), have suggested a link between low serotonin turnover in the brain and impulsive self-destructive acts. Roy *et al* (1988) have found a significant negative correlation in normal volunteers between 5-hydroxyindoleacetic acid (5-HIAA) in the cerebrospinal fluid and scores on the "urge to act out hostility" subscale of Foulds' hostility questionnaire. (This study, however, should be repeated, as the questionnaires were completed much later than the time of the spinal taps.)

These biological investigations help to explain the failure of psychosocial programmes of intervention in preventing recurrence of parasuicide even when these improve some of the social conditions of these patients (Chowdhury *et al*, 1973; Gibbons *et al*, 1978; Hawton *et al*, 1981, 1987; Hirsch *et al*, 1983). The time may well be "ripe for double-blind controlled studies to determine whether or not medicines that increase central serotonin turnover will prevent further suicidal and impulsive behaviour among individuals who have already exhibited them" (Roy & Linnoila, 1988).

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