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The Impact of Recent Undesirable Life Events on Psychiatric Disorders in Childhood and Adolescence

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The timing and number of recent stressful life events occurring in the year before onset of emotional or behavioural disorder was examined in a consecutive sample of children. Overall, events increase the relative risk of psychiatric disorder by 3–6 times. Events occur throughout the 12 months, but tend to cluster in the 16 weeks nearest onset of symptoms. The number of events influences the onset of disorder: cases with multiple events are more likely to have an event within 16 weeks of onset; cases with single events are more likely to have the event 36–52 weeks before onset. Cases whose onset occurs within 4 weeks of an event may have experienced single or multiple events. The results support the concept of additivity of recent stressful events in some cases of emotional and behavioural disorders in childhood.

Recent research indicates that recent undesirable life events which are independent of illness onset and carry a severe degree of negative impact (undesirability) may have a causal association with the onset of psychiatric disorder in children and adolescents (Goodyer *et al.*, 1985a). Studies on adults, using general population controls, consistently indicate important effects, with the risk of psychiatric illness being increased by 2–7 times in the six months after an event (Paykel, 1978; Cooke & Hole, 1983). In addition Brown & Harris (1978), in their major study on depression in women, showed that severe events lead quickly to depression—most often within 9 weeks, and for the great majority within 6 months. However, these authors suggested that severe events may have even longer-term effects.

Brown & Harris (1978) also examined the effects of experiencing single or multiple undesirable life events in the year prior to onset, and concluded that multiple unrelated events had an additive effect, thereby increasing the risk of becoming depressed. However, they pointed out that only one in five of depressed women experienced two or more such unrelated events.

Since our data (Goodyer *et al.*, 1985a) was derived from a case-control study and can be expressed in 2×2 contingency tables, we felt that: (a) use of relative risk (odds) was an appropriate and convenient way of estimating the effect that events exert on psychiatric illness in childhood and adolescence (see Appendix 1); (b) the dating of when life events occurred prior to onset would allow us to examine whether events have predominantly short or long-term effects over the 12-month period; and (c)

comparing children who had experienced single and multiple events would allow us to examine the concept of additivity.

Method

Full details of the method are available elsewhere (Goodyer *et al.*, 1985a). The study used a case-control design, and compared a consecutive sample of children attending a child psychiatry clinic with a group of community subjects drawn from the same area.

Subjects

The psychiatric sample consisted of 157 school-aged children and adolescents. The cases were classified into four mutually exclusive clinical groups according to the predominant presenting signs and symptoms obtained from the clinicians' routine assessments:

- (a) conduct disorders: presenting with predominant symptoms of antisocial behaviour such as stealing, cruelty, destructiveness, or bullying ($n = 44$)
- (b) mild emotional disorders: presenting with predominant symptoms of mild anxiety. This group includes transient states of anxiety, fearfulness and misery, adolescent rebellion, and parasuicide in the absence of other psychiatric disturbance ($n = 55$)
- (c) severe emotional disorders: presenting with predominant symptoms of depression and serious neurotic symptoms. This group includes depression, phobic and obsessional states, school refusal, and suicide attempts ($n = 32$)
- (d) somatic disorders: presenting with predominant physical symptoms. This group includes vague aches and pains, monosymptomatic hysteria, complex medical problems, (e.g. diabetes or asthma), and

secondary encopresis and enuresis occurring in the absence of any other predominant clinical features ($n=26$).

The name, sex, date of birth, and school was recorded for each case and a table of random numbers used to select 50% of this sample. These subjects were attending 36 schools from three educational areas (City of Newcastle, North Tyneside, and Northumberland).

Following agreement with each of the Directors of Education a pool of controls was obtained by asking head teachers to provide the names and addresses of three children of the same age and sex and attending the same school for each child referred to the unit. A letter was sent to the first name listed in each group requesting an interview. Of the 78 approached, 72 (92%) agreed to the interview. Four 'reserves' were obtained for the 6 refusals by writing to the second or third names listed; the control sample thus consisted of 76 children. For the analyses presented in this paper the community controls were used as a single group, so that the base rate of events in the controls remained constant in any comparisons with the clinical groups.

The control group was compared with the psychiatric group as a whole and with the four clinical subgroups for age (using Student's *t*-test), sex, and social class (using chi-squared). There were no significant differences for any of these analyses.

Collection of life events

A schedule for recent life events was developed, and administered as a semi-structured interview to mothers or mother surrogates of subjects. For psychiatric cases the onset of illness was carefully established. Only events that occurred in the 12 months before illness in cases, or before

the date of interview for controls, were included. Events received two ratings according to criteria described by Paykel (1983): independence and objective negative impact, both rated on a five-point scale. Only events considered independent or probably independent of illness and carrying a moderate to severe impact were used in the analysis.

Results were expressed as the proportion of cases experiencing events over monthly periods prior to onset of disorder. We have previously reported that the numbers of specific types of events are rather low (Goodyer *et al*, 1985a); the results in this paper therefore include all events carrying a moderate to severe degree of negative impact. Where appropriate the chi-squared test has been used to look for differences between cases and controls and between clinical groups. Relative risk has been estimated where appropriate, according to the formula described by McMahon and Pugh (1970) and used by Paykel (1978) (see Appendix 1).

Results

Characteristics of the clinic sample

Of the 157 patients, 68 (43%) were girls and 89 (57%) were boys. The age range was 4.7–16.25 years (mean = 11.4, s.d. = 2.8 years). The influence of age and sex on the association between recent life events and psychiatric disorder are considered elsewhere (Goodyer *et al*, 1986).

Recall of events

One method of testing the reliability of reporting events is to examine the fall-off in the mean number of events per month

TABLE I
The monthly distribution of cases by (a) event nearest to onset of disorder, (b) cases with only one event, and (c) cases with more than one event

					Number of months from onset							
	12	11	10	9	8	7	6	5	4	3	2	1
Event nearest onset ($n=96$):%	9.3	7.3	5.2	7.3	8.3	4.2	4.2	5.2	11.5	5.2	10.4	21.9
			29.1				21.9				49	
Cases with only one event ($n=54$):%	14.8	9.3	7.4	13.0	9.3	5.5	5.5	3.7	5.5	1.85	7.4	16.7**
			44.5***				24†				31.5*	
¹ Cases with 2 or more events ($n=42$):%	2.4	4.8	2.4	0	7.1	2.4	2.4	7.2	19	9.5	14.3	28.5**
			9.6***				19.1†				71.3*	

1. Arranged by event nearest to onset of disorder.

* $\chi^2 = 15.08$, d.f. = 1, $P < 0.001$

** $\chi^2 = 2.109$, d.f. = 1, NS

*** $\chi^2 = 13.944$, d.f. = 1, $P < 0.001$

† $\chi^2 = 0.349$, d.f. = 1, NS

recalled by subjects as times further in the past are considered. In the general population such events should be randomly distributed in time. If there is a large fall-off (greater than 5% per month) there may have been a serious under-reporting of events. Taking all controls ($n=76$) as a single group, the fall-off per month in our sample was less than 1% – an acceptably low rate and in line with adult studies using interview techniques (Paykel, 1983). We conclude that it is unlikely there has been serious under-reporting of moderate to severe events.

Presence of events

Of the 157 patients, 96 (61%) experienced one or more moderate to severe events in the 12 months before the onset of illness; 54 (34%) had only one event, compared with 13 (17%) of the controls ($\chi^2=7.472$, d.f. = 1, $P < 0.01$), and 42 (27%) had two or more events, compared with 4 (5%) controls ($\chi^2=14.923$, d.f. = 1, $P < 0.001$).

If severe events make an important contribution to disorder there should be a rise in risk. Events were experienced by 27, 35, 17, and 17 patients in the groups with conduct, mild emotional, severe emotional, and somatic disorders respectively. This gives relative risk factors for these groups of 5.5, 6.1, 3.7, and 6.5 respectively.

Timing and number of events

The speed with which stressful events exert their effects on the onset of disorder cannot be established from a 2×2 contingency table, as all such events over the 12 months are included. In order to examine whether or not events exert long or short-term effects, the distribution of the events nearest onset for each case was established. However, if a patient had more than one event there was no way of deciding whether symptoms were brought on by a single-event. The distribution of cases experiencing only one event was therefore examined. Finally, if a greater proportion of cases experiencing multiple events have their final event nearer onset than cases with only one event, it may be that there is some additive effect of events. Table I shows the three distributions.

Onset of symptoms within 16 weeks of an event was experienced by 49% of all cases. The proportion of single-event cases experiencing an onset within 16 weeks was 31%, compared with 71% of multiple-event cases ($\chi^2=15.08$, d.f. = 1, $P < 0.001$); there is thus a significant association between multiple events and onset of disorder within 16 weeks of the final event.

An event occurring within 4 weeks of onset of disorder was denoted as having a 'rapid' effect. This was experienced by 21.9% of all patients. 16.7% of single-event cases experienced a rapid effect, compared with 28% of multiple-event cases ($\chi^2=2.109$, d.f. = 1, NS). Patients with an onset within 4 weeks of their last event, therefore, may equally have experienced single or multiple events in the previous 12 months.

A 'long-term' effect was defined as onset of symptoms occurring 36–52 weeks after the last event. This was experienced by 29.1% of all cases, accounted for by 44.5% of

TABLE II

The proportion of subjects experiencing one or more moderate to severe events at 4-monthly periods preceding onset of illness for cases or day of interview for controls, expressed as a percentage of cases with at least one event

	n	No. of weeks before onset					
		52–35		35–17		16–1	
	n	%	n	%	n	%	
Conduct	44	5	11	12	27	10	23
Mild mood	55	10	18	10	18	15	27
Severe mood	32	7	22	4	13	6	19
Somatic	26	7	27	5	19	5	19
Controls	76	6	8	5	6	6	8

single-event cases and 9.6% of multiple-event cases ($\chi^2=13.944$, d.f. = 1, $P < 0.001$). Patients experiencing a long-term effect from events are therefore more likely to have experienced one event only.

Examination of events occurring 17–35 weeks before onset shows that 22.9% of cases experience onset of symptoms after this period; these are accounted for by 24% of single-event cases and 19.1% of multiple-event cases ($\chi^2=0.349$, d.f. = 1, NS). Thus there is no significant association with this period and number of events.

The timing of events for all community subjects was also examined. Numbers are small: only 22% of controls experienced one or more moderate to severe events. Of these 23.5% were multiple events and 76.5% single events. Thus, division into time periods by single and multiple events is impractical. If all controls are taken together, 8% had events within 16 weeks, 6% between 17 and 35 weeks, and 8% between 36 and 52 weeks. Comparison with all cases for each time period resulted in significant differences. Thus an excess of cases experiencing one or more events occurs throughout the 12 months.

Events therefore exert long-term (over 36–52 weeks), short-term (over 16 weeks), and rapid (over 4 weeks) effects on the onset of psychiatric disorder. Short-term effects are more likely in multiple-event cases, whereas long-term effects are more likely in single-event cases. Events exerting rapid effects can occur in either single or multiple-event cases.

Specificity of events and diagnosis

The results so far consider the impact of events on all psychiatric cases. However, we have previously reported the association between events and four classes of psychiatric disorder: conduct, mild mood, severe mood, and somatic (Goodyer *et al*, 1985). We therefore divided the psychiatric sample into these four groups, to examine two questions:

- (a) is the proximity of events nearest onset different between clinical groups?

TABLE III
The proportion of subjects experiencing 'single' or 'multiple' moderate to severe events in the 12 months prior to onset of illness for cases or day of interview for controls

	n	Single event		Multiple event	
		n	%	n	%
Conduct	44	11	25	16	36
Mild mood	55	20	36	15	28
Severe mood	32	12	37	5	16
Somatic	26	12	46	5	19
Controls	76	13	17	4	5

(b) is there any specificity between multiple events and any clinical group?

Table II examines short or long-term effects for undesirable events for each clinical group. The numbers of cases are too small to present the results as in Table I, and refer to all cases in each group experiencing one or more events. The results show that events exert short and long-term effects for all four diagnostic groups. Only mild mood disorders show any increase in cases experiencing events in the 16 weeks closest to onset, where 27% have an event nearest onset compared with 18% in the previous time periods.

Furthermore, 22% of severe mood and 27% of somatic cases occur with events occurring 35-52 weeks from onset. Although this is an increase in this time period for both disorders the differences are not significant.

The relative risk was calculated for each time period (comparing cases against controls) and the odds were the same magnitude for each time period within each clinical group as compared with events over all the 12 months.

Table III shows subjects divided into single and multiple event groups. The proportion of cases experiencing single events are highest for somatic disorders (46%) and lowest for conduct disorder (25%), with mild and severe mood showing similar rates (36% and 37%). The proportion of cases experiencing multiple events are highest for conduct disorders (36%) and lowest for severe mood (16%) and somatic disorders (19%) with mild mood in between (28%). All four clinical groups show significantly higher rates of both single and multiple events compared with the community controls. However, there are no significant differences in rates between the clinical groups. Thus there appears to be no specificity between multiple events and type of disorder.

Discussion

The results suggest that life events carrying a moderate to severe degree of negative impact (undesirability) exert effects of some importance. Thus the risk (odds) of developing a psychiatric disorder presenting with conduct/emotional symptoms is

increased by a factor of 3-6 in the 12 months after exposure to an event. The lowest risk appears to be for severe mood disorders; however, the proportion of cases with severe mood disorder is only 10% less than for other cases. It may be that events exert a smaller degree of risk for severe mood disorders compared with other clinical groups, but this statement requires confirmation.

The distribution of events in the 12 months prior to onset is of interest for two reasons. Firstly, events occur throughout the 12 months, indicating that moderate to severely undesirable events exert long-term, short-term, and rapid effects on the onset of psychiatric disorder. Secondly, there are different associations between events and disorder according to the timing and the number of events. Thus nearly three-quarters of multiple-event cases experienced an event in the short-term (i.e. 1 to 16 weeks before onset of symptoms) compared with only one third of single-event cases. Clearly, not only multiple-event cases experience a short-term effect; however, the findings suggest that previous recent stresses increase the likelihood of experiencing an event in the 16 weeks before onset of illness. This suggests that for some cases (19% in this study) an additive effect is occurring between recent events over the 12-month period.

When considering rapid effects of events, the number of recent events appears unimportant. Thus in acute crises (i.e. symptoms occurring immediately and up to four weeks after an event) symptoms are partially or totally dependent on the effects of a single event but occur in multiple-event cases.

Interestingly, single-event cases occur throughout the 12 months period, with almost half of the cases experiencing their event 36-52 weeks before onset, i.e. a long-term effect. Furthermore, long-term effects are more likely to be associated with experiencing a single event and few multiple-event cases (less than 10%) experience their event nearest onset in this time period.

These results suggest that the mechanisms by which events exert their effects are likely to be different and depend to some extent on their number and timing. Possible mechanisms can be considered according to the three differences in timing already described. Thus, for the long-term effects of single events:

- (a) the effects may be a result of buffering factors antedating the event and influencing its impact. Such buffering factors may occur in the child's social supports or family relationships (Rutter, 1985)

- (b) the nature of the event may be such that protective factors are activated subsequent to the event, e.g. serious illness, family loss, or death may mobilise support for the child
- (c) the salience of the event may be important. Thus, an event may not be fully understood at the time of occurrence and its personal meaning and impact may not become explicit until later.

These potential mechanisms merit further study.

As indicated, the short-term effects of multiple events suggest an additive effect. Whether this additivity is a non-specific quantitative effect or contains qualitative factors is not clear. In studies on adult depressed women Brown & Harris (1978) found evidence for additivity only for unrelated events (i.e. events of different type and nature). Are multiple events experienced by children related or unrelated, and how does this effect the appraisal of such events? Brown & Harris (1978) considered four ways in which events might 'add': 'mechanical additivity', which may occur independently of the meaning of events, implying a threshold of stress above which psychiatric disorder is likely; 'general appraisal', where, although events are perceived as 'unrelated', the subject feels unable to cope with any further personal stressors; 'specific appraisal', where events have particular meaning and implications for the subject which indicates that one event may be related to another; and 'symbolic appraisal', where the first event influences the second through individual personal significance, unrelated to contextual information, but reflecting intrinsic psychological associations made by the subject. All four types of additivity can be usefully considered for childhood and adolescence.

The present results suggest that for conduct disorders events may exert a degree of mechanical additivity, as they exert effects independent of the nature of social context (Goodyer *et al*, 1985a). However, for the other three groups of mood and somatic presentations there seems likely to be a more qualitative appraisal. Whether this is general, specific, or symbolic for one or all of the groups cannot be clearly stated from the findings.

Finally, rapid effects occur independent of the number of events. This mechanism is not a function of additivity. Since the time period between event and onset of symptoms is short this may reflect a direct effect of an event on well-being; whether this is a result of qualities of the event, for example its severity, or of particular types of appraisal by certain children is unclear.

Perhaps certain types of children are more likely to

respond with rapid effects to undesirable events. Factors which make them liable to do so may be intrinsic (temperament, organic factors) or extrinsic (family, social factors). Adverse experiences in the past or persisting as ongoing difficulties (Brown & Harris, 1978) may also contribute but were not examined in this study.

We hoped to provide some answers to four questions from this research. The first three have been addressed: events carry an increased risk of psychiatric disorder; they exert long-term, short-term, and rapid effects dependent to some extent on the number of events; and there is additivity of events in some cases, principally increasing the likelihood of a short-term effect.

The fourth question concerned the specificity between timing and number of events and type of disorder. Overall the proportions of cases reporting events is similar between the clinical groups, with a half to two-thirds of all cases experiencing one or more events. The distribution of events over time indicates little specificity between clinical group and type of effect (long-term, short-term or rapid).

The number of events for each clinical group shows that only conduct disorders have more multiple-event than single-event cases. We have previously shown that events carrying no or mild negative impact are associated with conduct disorder but no other group (Goodyer *et al*, 1985a). Since these mild events are not included in this analysis we may have underestimated the effects of multiple events for conduct disorder.

The small numbers in the clinical groups prevent firm statements about the specificity of timing and numbers of events. However, there is a suggestion that conduct disorders are the least likely to experience long-term effects and the most likely to experience multiple events. On the basis of the results this finding is what one might predict, as multiple events are more associated with short-term effects and we have already speculated that mechanical additivity of events may be more likely in conduct disorder.

The lack of specificity between timing and number of events and diagnosis may be a function of sample size, but may also be improved by further clarifying the nature of life events. For example, the findings of Finlay-Jones & Brown (1981) suggest that dangerous events are more associated with anxiety and loss events with depression.

A number of methodological issues require comment. Firstly, we previously indicated that there are likely to be advantages in obtaining life event data from children, particularly as the personal appraisal of stressors by children requires considerable further research (Goodyer *et al*, 1985a). Secondly, we cannot

be sure that the effects exerted by life events on disorders are not simply a function of some other factor not accounted for in this research. Thus a spurious association between events and disorder, while unlikely in our opinion, may be present. Clearly the relative contribution of events to disorder requires examination. We have already indicated that some 30% of cases did not experience a recent severe life event and 17% of community subjects did. Thus recent events carrying a moderate to severe degree of negative impact may be sufficient in some instances but clearly not necessary in all for the development of psychiatric disorder in young people.

Although these methodological issues must be addressed in future studies the results presented here do indicate that recent stressful events exert different effects on emotional and behavioural disorders, according to their number and timing.

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Appendix

'Relative risk' measures the association between a particular factor and risk of a certain outcome, and is the ratio of the rate of disease among those exposed to the rate among those not exposed. This measure of magnitude depends on a precise enumeration of the

number of cases in the general population or sub-groups of it in order to estimate incidence rates in exposed and non-exposed populations. This presents difficulties in psychiatry, and it is not possible to estimate incidence rates in exposed and unexposed populations from a retrospective design. However, an approximation of relative risk can be made from a case control study using a 2×2 contingency table. The assumption made is that instead of representing cases and controls the entries reflect the true proportions of the population with and without the disease and with and without the cause. Calculation of relative risk from a 2×2 contingency table constructed from a case-control study can be made as follows:

Suspected cause	Cases	Controls
Present	A	B
Absent	C	D

Therefore:

Risk of disease in those with cause = $A/(A+B)$

Risk of disease in those without cause = $C/(C+D)$

Relative risk = $(A/(A+B))/(C/(C+D))$

If the proportion of the population affected by the disease is relatively small compared with those unaffected then:

$B \approx A+B$

$D \approx C+D$

and the formula reduces to AD/BC .

If the proportion of the population affected by the disease is relatively large, the ratio is a useful measure of disease risk between groups and is best termed 'relative odds', i.e. the ratio of affected to unaffected individuals is one divided by the same ratio in another group.

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