The Life Events Inventory: re-scaling based on an occupational sample

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The objective of this study was to compare the validity of the original weightings used by the Life Events Inventory (LEI) with those obtained from a contemporary occupational sample. Fifty male and 62 female manufacturing employees (age range 16–55 years) assigned scores to each item on a slightly modified version of the LEI scale. The current sample consistently assigned higher weights to events/items than did the original sample, but there was high agreement in terms of item ranking. Some distinct age and gender differences in scoring were apparent, and are discussed further. It was concluded that when separate weightings are employed for age and gender groups, the LEI remains a useful tool for quantifying background levels of stress in both workplace stress audits and epidemiological studies where statistical control for non-occupational sources of stress is required.

Key words: Age; assessment; gender; occupational; stress.

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Introduction

An instrument for measuring the severity of psychosocial stress resulting from recent life experiences was originally developed in the 1960s by Holmes and Rahe [1]. This instrument, the Schedule of Recent Experiences (SRE), consisted of a checklist containing a list of common life events. To complete the checklist, the subject indicated which of the events had occurred during a specific time frame, usually the previous 12 months. Each event had previously been assigned a weighting score (between 1 and 100) that represented the severity of the stress that might typically be expected to result from its occurrence. Total stress was measured in terms of the sum of these scores. Original weightings were derived from the judgements of samples of people asked to assign scores to each item in terms of the amount of 'turmoil, upheaval and social readjustment' the event might be likely to cause.

The instrument had some limitations; for example, its reliance on retrospective assessment and the fact that real life events tend to interact with one another in terms of the stress they cause. In particular, it has been suggested that events cannot be viewed as objectively stressful, but that stress depends on individual perception. Despite this, however, the data suggest that people are fairly consistent in terms of their ratings of items on such scales [2], and retrospective scales have been used with some success to study the antecedents of both physical [3] and mental illness [4] in situations where psychosocial stressors were thought to play a part. The original SRE was later revised by Cochrane and Robertson [5], who felt that the number and relevance of items were rather limited and that the samples used to develop the scores were not entirely appropriate. For example, no weightings were available for psychiatric patient groups, although the scale was most often used in this context. They developed a new scale, the Life Events Inventory (LEI), which contained additional items and scores derived from three separate groups, namely psychologists, psychiatric patients and university students.

Self-administered retrospective checklists have had wide application as a standardized measure of the amount of stress potentially present in a person's life, most recently in large-scale occupational investigations of work stressors and their effects, including Jacobs and Charles [6], Cooper [7] and Ramirez *et al.* [8]. In our current

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Table 1. Weightings of LEI items for the present study and Cochrane and Robertson [5], with present study events ranked in order of the severity of weights

			Present study							*Cochrane and Robertson*			
Life event	*Rank*	*Item no.*	*16–25*	*26–35*	*36–45*	*46–55*	*Male*	*Female*	*All*	*Psych.*	*Patients*	*Students*	*All*
Death of spouse	1	44	98	94	93	94	95	93	93.77	89	82	83	86
Jail sentence	2	17	93	88	91	91	92	89	90.17	81	72	72	75
Death of immediate family member	3	22	96	87	86	91	88	89	88.44	68	73	67	69
Immediate family member attempts suicide	4	20	85	86	88	89	86	89	87.45	62	73	66	66
Getting into debt beyond means of repayment	5	14	82	79	86	87	82	86	83.86	58	74	67	66
Period of homelessness (hostel or sleeping rough)	6	28	90	73	86	87	81	84	82.48				51
Immediate family member seriously ill	8	24	87	80	78	86	83	80	81.38	56	71	55	59
Unemployment (of head of household)	7	1	77	79	76	90	82	80	81.02	67	73	66	68
Divorce	9	45	82	79	78	86	81	81	80.78	78	73	70	75
Break-up of family	10	55	86	75	79	88	81	81	80.60				77
Immediate family member sent to prison	11	21	78	77	77	86	76	83	79.52	66	62	56	61
Sudden and serious impairment of vision or hearing	12	31	82	73	80	85	80	79	79.38	63	56	58	59
Death of close friend	13	23	92	77	77	81	78	80	79.28	46	69	54	55
Infidelity of spouse/partner	14	49	50	78	80	79	77	81	79.23	62	67	70	68
Marital separation	15	46	82	75	76	84	80	77	78.25	72	73	65	70
Children placed in the care of others	16	42	64	77	78	79	79	76	77.07				54
Miscarriage suffered by wife or partner	17	33	86	77	69	74	73	75	74.17				65
Serious physical illness or injury requiring hospital treatment	18	29	72	68	73	81	73	74	73.38	71	59	63	65
Abortion of child carried by wife or partner	19	34	82	71	69	74	74	70	72.19				63
Unwanted pregnancy of wife or partner	20	32	83	72	64	75	69	72	70.92				70
Involvement in physical fight	21	18	66	65	72	79	69	73	71.05	30	47	31	38
Trouble or behaviour problems in own children	22	43	64	66	70	72	70	69	69.00				49
Illicit sexual affair outside of relationship/marriage	23	47	74	73	59	71	68	67	67.751	541	66	56	61
Prolonged ill-health requiring treatment by own doctor	24	30	78	58	67	78	69	68	68.07				48
Immediate family member starts drinking heavily	25	19	58	56	65	72	61	65	63.41	63	70	63	65
Break-up of affair	26	48	68	59	61	65	58	66	62.16				47
Problems related to alcohol or drugs	27	26	54	50	68	68	56	66	61.40				59
Increase in number of arguments with spouse/partner	28	38	64	631	60	57	59	62	60.59	44	67	52	55
Income decreased substantially (25%)	29	13	57	57	64	60	61	60	60.40	61	65	60	62
Break-up with steady boyfriend or girlfriend	30	52	69	63	52	60	57	62	59.29				51
Problems related to sexual relationship	31	53	64	51	56	65	61	58	59.05	1			54
Moving house	32	8	58	56	56	67	53	63	58.95	36	46	41	42
Sexual difficulties	33	35	61	55	58	64	59	58	58.83	52	62	58	57
Marital/relationship reconciliation	34	50	44	55	51	59	52	55	53.86	44	60	53	53
Increase in number of family arguments (e.g. with parents)	35	54	62	52	49	58	54	54	53.77				43
Trouble with superiors at work	36	2	58	51	51	58	52	54	53.33	35	48	39	40
New job in new line of work	37	4	48	48	51	63	53	53	52.99	40	47	50	46
Increase in no. of arguments with other immediate family members	38	39	59	53	50	53	501	55	52.81				43
Purchasing of house (taking out mortgage)	39	9	68	50	46	52	47	54	50.85	261	58	40	40
Conviction for minor violation (e.g. speeding or drunkenness)	40	16	59	41	50	56	46	53	49.91	23	37	201	34
Marriage	41	36	50	49	50	50	50	50	49.82	50	50	50	50
Pregnancy (or of wife)	42	37	52	50	46	52	50	49	49.25	43	50	49	49
Serious restriction of social life	43	27	59	45	49	51	50	48	49.21	40	60	45	49

Table 1. Continued

Spouse/partner begins or stops work	44	51	47	48	47	46	41	52	47.11	25	42	31	34
Quarrel with neighbours	45	11	38	44	45	54	48	46	46.59	25	32	23	26
Death of a pet[a]	46	56	15	41	50	511	37	78	45.94				
Son or daughter left home	47	41	41	40	44	47	43	44	43.50	44	59	46	
Trouble with other relatives (e.g. in-laws)	48	40	40	40	43	43	36	47	42.12	35	45	28	38
Promotion or change of responsibilities at work	49	6	39	43	37	44	41	40	40.67	32	43	40	39
New job in same line of work	50	3	38	32	36	44	36	38	37.04	23	39	29	31
Gaining of new family member (immediate)	51	25	31	34	36	38	37	35	35.81	37	50	42	43
Change in hours or conditions in present job	52	5	31	27	37	28	27	35	31.34	20	40	28	31
Retirement	53	7	29	27	26	28	25	29	27.24	62	45	52	54
Going on holiday	54	15	25	22	23	281	231	25	24.18	14	35	27	29
New neighbours	55	10	16	23	19	33	24	23	23.53	18	23	16	18
Income increased substantially (25%)	56	12	5	11	9	10	9	11	10.03	25	39	35	35
Sum of items 1–56 (excluding item 46)			3465	3270	3337	3613	3339	3482	3404				2879
Mean of items 1–56 (excluding item 46)			62.992	59.45	60.672	65.697	60.71	63.306	61.89				52.3

[a]Weights for this 'new' item were not included when establishing the sums of weights for subject age and gender groups.

Empty cells in the Cochrane and Robertson column are due to non-collection of weightings for the specific occupational groups, relying only on the overall mean weights.

study, the intention was to employ the LEI to assess and thus control for background levels of stress emanating from life experiences, as opposed to those resulting from factors arising solely in the workplace. Although eight distinct items in the existing LEI are, in fact, related to occupational factors [unemployment, income decreased substantially (by 25%), trouble with superiors at work, new job in new line of work, promotion or change in responsibilities at work, change in hours or conditions in present job, income increased substantially (by 25%), new job in same line of work], these can be removed by a user who wants to focus solely on sources of stress away from the workplace.

However, use of the scale in this context raises new questions about the appropriateness of the weighting scores obtained from the samples employed by Cochrane and Robertson. Psychiatric patient groups may differ in both their experiences and responses from occupational and general population groups, which of course is precisely the reason why Cochrane and Robertson felt that separate weighting scores should be obtained. However, their 'non-psychiatric' occupational group of psych- ologists might also be viewed as atypical of other occupational groups in terms of response when dealing with aspects of mental health. Further, the use of a student sample raises other problems. Since this group were uniformly young, their actual life experiences were likely to be relatively limited. Attitudes to stress-inducing events may be determined both by real-life experience and by general cumulative stress persisting over time, regardless of whether specific events have been experienced. Hence, age may be a significant influence on weighting scores. The assumption that existing LEI units are generalizable to all sections of the population is, therefore, questionable. To help address these concerns, in the present study the LEI was administered to a more representative occupational sample than that utilized by the original LEI, with the objective of obtaining weighting scores that were both applicable to general occupational groups and updated to the present time.

Materials and methods

The 55 items from the original LEI were presented in the same order as the original (Table 1), with the following modifications. First, an additional item—'death of pet'—was included, partly on an intuitive basis as a potential source of stress, but also after reading work by Graf [9] demonstrating the long-lasting grief reactions of pet owners after the loss of animal companions. Secondly, the wording of some items was modified to include partner/relationship as opposed to only spouse/marriage. This was intended to reflect current social norms in encompassing a diversity of possible relationships. The distinction made in the original LEI for items to be completed by either 'ever married' or 'never married' respondents was removed for the same reason. A similar re-scaling had been performed on the Social Readjustment Rating Scale (SRSS) by Miller and Rahe [10], who found that gender also played an important role in the re-scaling of events/items. The LEI checklist in the current study was given to 115 workers, who, over a

period of 1 month, attended the occupational health department of a large manufacturing company in the West Midlands area of the UK. Participants were not consecutive visitors to the department and were recruited on a voluntary basis in a 'waiting room scenario'. Accompanying instructions were as follows:

> The following table contains examples of events that can happen to almost anybody in their lives. Please look at each event and think carefully about how stressful it must be. For each event, place a number between 1 and 100 into the box to show how stressful you think the event is, e.g. 100 = most stress, 1 = least stress. As a guide, the event marriage has already been given a score of 50.

Participants were assured that their responses were anonymous and that they could not therefore be identified either by occupational health staff or researchers. New mean weighting scores were derived from this sample.

Results

Three of the occupational health clinic respondents were excluded from the initial sample of 115 due to unclear or incomplete responses, leaving 112 respondents (50 males and 62 females, age range 16–55 years). Table 1 contains the items of the LEI scale with the mean weightings obtained from the 112 participants working in local manufacturing, by gender and age group, along with the weightings obtained from the original LEI study. Correlation coefficients were calculated between the rank ordered mean weightings of the contemporary sample and the original Cochrane and Robertson sample, between genders and between age groups. Correlations were uniformly high and statistically significant (Table 2).

The mean score allocated to all items by the subjects in the present sample was higher than that in the sample

Table 2. Correlation coefficients for different sample group weightings

	Present study							*Cochrane and Robertson [5]*			
	16–25	*26–35*	*36–45*	*46–55*	*Male*	*Female*	*All*	*Psych.*	*Patients*	*Students*	*All*
16–25		0.93	0.89	0.90	0.92	0.93	0.93	0.74	0.84	0.77	0.76
26–35			0.95	0.95	0.97	0.97	0.98	0.81	0.88	0.85	0.83
36–45				0.97	0.98	0.98	0.99	0.80	0.84	0.84	0.80
46–55					0.98	0.98	0.98	0.79	0.82	0.81	0.80
Male						0.97	0.99	0.82	0.88	0.86	0.84
Female							0.99	0.78	0.85	0.83	0.81
All								0.80	0.87	0.84	0.83
Psychologists									0.85	0.95	0.97
Patients										0.92	0.93
Students											0.99
All											

All correlations significant at $P = 0.000$.

Table 3. Top 10 most stressful events for the present study and Cochrane and Robertson [5]

Present study			*Cochrane and Robertson*		
Rank	*Event*	*Weight*	*Rank*	*Event*	*Weight*
1	Death of spouse	93.77	1	Death of spouse	86.00
2	Jail sentence	90.17	2	Break-up of family	77.00
3	Death of immediate family member	88.44	3	Jail sentence	75.00
4	Immediate family member attempts suicide	87.45	4	Divorce	75.00
5	Getting into debt beyond means of repayment	83.86	5	Unwanted pregnancy of wife or partner	70.00
6	Period of homelessness (hostel or sleeping rough)	82.48	6	Marital separation	70.00
7	Immediate family member seriously ill	81.38	7	Death of immediate family member	69.00
8	Unemployment (of head of household)	81.02	8	Unemployment (of head of household)	68.00
9	Divorce	80.78	9	Getting into debt beyond means of repayment	66.00
10	Break-up of family	80.60	10	Immediate family member attempts suicide	66.00
Total of top 10 weights		849.95	Total of top 10 weights		722.20
Mean of top 10 weights		84.99	Mean of top 10 weights		72.20
Total of LEI weights		3356	Total of LEI weights		2879
Percentage of total LEI weights		25.32	Percentage of total LEI weights		25.08

Table 4. Top 10 most stressful events for the male and female samples (present study)

Males			*Females*		
Rank	*Event*	*Weight*	*Rank*	*Event*	*Weight*
1	Death of spouse	94.66	1	Death of spouse	93.03
2	Jail sentence	91.70	2	Jail sentence	88.92
3	Death of immediate family member	88.30	3	Immediate family member attempts suicide	88.61
4	Immediate family member attempts suicide	86.00	4	Death of immediate family member	88.56
5	Immediate family member seriously ill	82.90	5	Getting into debt beyond means of repayment	85.54
6	Unemployment (of head of household)	82.10	6	Period of homelessness (hostel or sleeping rough)	83.52
7	Getting into debt beyond means of repayment	81.80	7	Immediate family member sent to prison	82.82
8	Period of homelessness (hostel or sleeping rough)	81.20	8	Divorce	80.77
9	Divorce	80.80	9	Infidelity of spouse/partner	80.73
10	Break-up of family	80.70	10	Break-up of family	80.52
Total of top 10 weights		850.16	Total of top 10 weights		853.02
Mean of top 10 weights		85.01	Mean of top 10 weights		85.30
Total of male LEI weights		3305	Total of female LEI weights		3406
Percentage of total LEI weights		25.72	Percentage of total LEI weights		25.04

Table 5. Significant differences in weights between male and female samples using non-parametric Mann–Whitney *U*-tests (sum of ranks in parentheses)

Item	*Rank position*	*Male mean rank*	*Female mean rank*	*U*	*P*
Problems related to alcohol or drugs	M 32	48.23 (2411)	62.37 (3804)	1136	0.021
	F 26	$n = 50$	$n = 61$		
Trouble with other relatives (e.g. in-laws)	M 50	46.46 (2323)	63.82 (3893)	1048	0.004
	F 56	$n = 50$	$n = 61$		
Wife/partner begins or stops work	M 46	48.01 (2400)	61.74 (3704)	1125	0.024
	F 42	$n = 50$	$n = 60$		
Death of a pet	M 48	14.16 (354)	24.86 (174)	29	0.007
	F 15	$n = 25$	$n = 7$		

used by Cochrane and Robertson (3356 total, mean per item 61.01, and 2879 total, mean per item 52.34, respectively). However, there was considerable homogeneity between the contemporary sample and the original sample in terms of item ranking, particularly in relation to highly ranked items. Table 3 shows the 10 most stressful items ranked for both samples, with seven shared events featuring in the top 10 for both studies. For both samples, the top 10 stressful events account for ~25% of their total weights of the complete LEI list (25.32% for the contemporary sample and 25.08% for Cochrane and Robertson's original sample). In the contemporary sample, the mean score for all items expressed by males ($n = 50$) was 3305 (mean per item 60.09). For females ($n = 62$), this was 3407 (mean per item 61.92). Males and females shared eight events in their respective top 10 stressful events, and for both genders the top 10 stressful events accounted for ~25% of their total scores (25.72% for males and 25.04% for females), as in Table 4. However, there were significant differences in the weights given to four items by males and females when subject to appropriate non-parametric tests (problems related to alcohol or drugs, trouble with other relatives, partner starts or stops work, death of a pet), which were all rated significantly higher by females, as shown in Table 5.

In the contemporary sample, comparison by age group showed that the oldest age group (46–55) allocated the highest total score, followed by the youngest age group (16–25), with the two remaining age groups (36–45 and 26–35) following in that order. There was much less homogeneity between ranking in the four age groups, with only four events appearing in the top 10 of all groups (death of spouse, death of immediate family member, jail sentence, family member attempts suicide). However, once more, for all age groups, ~25% of the total score was accounted for by the top 10 items, as in Table 6.

Discussion and conclusion

The weighting scores given to individual items by the

Table 6. Top 10 most stressful events for the four age groups (present study)

Rank	Event	*16–25 years*	Rank	Event	*26–35 years*
1	Death of spouse	98.11	1	Death of spouse	93.71
2	Death of immediate family member	95.56	2	Jail sentence	87.74
3	Jail sentence	93.20	3	Death of immediate family member	86.94
4	Death of close friend	91.67	4	Immediate family member attempts suicide	86.11
5	Period of homelessness (hostel or sleeping rough)	90.33	5	Immediate family member seriously ill	79.85
6	Immediate family member seriously ill	87.00	6	Unemployment (of head of household)	79.17
7	Miscarriage suffered by wife or partner	86.11	7	Divorce	78.91
8	Break-up of family	85.56	8	Getting into debt beyond means of repayment	78.80
9	Immediate family member attempts suicide	85.00	9	Infidelity of spouse/partner	78.29
10	Unwanted pregnancy of wife or partner	82.78	10	Immediate family member sent to prison	76.77
Total of top 10 weights		895.32	Total of top 10 weights		826.24
Mean of top 10 weights		89.53	Mean of top 10 weights		82.62
Total of 16–25 years weights		3464.56	Total of 26–35 years weights		3269.76
Percentage of total LEI weights		25.84	Percentage of total LEI weights		25.26

Rank	Event	*36–45 years*	Rank	Event	*46–55 years*
1	Death of spouse	92.50	1	Death of spouse	93.93
2	Jail sentence	90.76	2	Death of immediate family member	91.43
3	Immediate family member attempts suicide	87.87	3	Jail sentence	91.25
4	Getting into debt beyond means of repayment	86.18	4	Unemployment (of head of household)	90.29
5	Period of homelessness (hostel or sleeping rough)	85.89	5	Immediate family member attempts suicide	89.11
6	Death of immediate family member	85.89	6	Break-up of family	88.39
7	Sudden and serious impairment of vision or hearing	80.11	7	Getting into debt beyond means of repayment	87.32
			8	Period of homelessness (hostel or sleeping rough)	86.61
8	Infidelity of spouse partner	79.86	9	Immediate family member sent to prison	86.43
9	Break-up of family	78.68	10	Divorce	86.25
10	Divorce	78.42			
Total of top 10 weights		846.16	Total of top 10 weights		891.01
Mean of top 10 weights		84.61	Mean of top 10 weights		89.10
Total of 36–45 years weights		3336.94	Total of 46–55 years weights		3613.33
Percentage of total LEI weights		25.35	Percentage of total LEI weight		24.65

contemporary occupational sample were consistently higher than those given by any of Cochrane and Robertson's three groups. Because we do not have scores from a current sample of psychologists or students, it is not possible to say whether this discrepancy is due to differences in the nature of the occupational group or to changes occurring over time. It is interesting to note that the mean weightings for the contemporary sample are closer to those of the former psychiatric patients in the original study than to those of the students or psychologists. Discussion of stress has a much higher profile and a greater degree of acceptability than was the case nearly 30 years ago when the original LEI was developed, which may account for the shift in weightings.

Despite the generally higher scores, the ranking of items was very similar to that obtained from the Cochrane and Robertson samples, both in terms of the similarity of items that feature in the top 10 list (seven in common) and the relative magnitude of the scores of those items. For both the original and present samples, the top 10 items accounted for ~25% of the total overall score. Thus, the relative importance that people attach to certain events has remained fairly consistent over time and between groups.

There was, however, a lack of homogeneity between the scores and rankings of different age groups. Cochrane and Robertson did not report data categorized by age. In the current sample, the older age group (46–55) allocated the highest total score for all items, followed by the youngest age group (16–25). In addition, only four items appeared in the top 10 events for all four age groups. The youngest age group allocated the highest percentage of their total score to the top 10 items. These findings suggest that age is an important determinant of weight-

ing scores. The fact that younger people with less life experience allocated the second highest scores suggests that scores are not necessarily linked to actual experience of events. Have respondents in the older age group had longer to accumulate persistent stress and a set of (acute) discrete events, while the youngest group generally have only had the opportunity to acquire a set of (acute) events? Although one can only speculate about the reason for differences between age groups, these data do point to the need for age-specific reference data with this scale.

Gender appears to have less of an influence on the allocation of scores. Again, Cochrane and Robertson do not report data for males and females separately. However, in the current sample, there were no significant differences between genders in terms of the total scores, ranking of items or the percentage of total score accounted for by the top 10 items. One point of note, however, is that for four items (alcohol/drugs problem, in-law trouble, partner starts/stops work, death of a pet) female ratings were significantly higher than those of males. This does point to the need for separate weighting scores for males and females, and also supports the usefulness of the additional item (death of a pet).

This study has demonstrated that there are generally good correlations between previous and current weighting scores on the LEI, despite the fact that previous data were gathered almost 30 years ago and on a somewhat atypical occupational group. People's perceptions of what is likely to cause them stress do not appear to have changed markedly. Those who are critical of the use of checklists for providing measurements of life events, such as Brown and Harris [11], state that life events are only reliably measured with an interview-based method. However, such interview methods are more readily applicable to clinical and case studies than to larger-scale epidemiological investigations and surveys, and the superiority of reliability of interviews over checklists needs to be weighed against the costs involved [12]. Brugha *et al.* [13] further recommend that when methodology or economics dictate the use of checklists and inventories, brief lists are preferential to longer ones. With the proviso that separate weighting scores should be employed according to age and gender, the LEI scale appears to retain its usefulness as a research tool in larger-scale studies of stress and mental health where interview methods are not practical for assessing stressful life events.

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References

1. Holmes TH, Rahe RH. The social readjustment rating scale. *J Psychosom Res* 1967; **11:** 213.
2. Bhugra D, Desai M, Baldwin DS. Attempted suicide in west London. Rates across ethnic communities. *Psychol Med* 1999; **29:** 1125–1130.
3. Theorell T, Rahe RH. Psychosocial factors and myocardial infarction. An inpatient study in Sweden. *J Psychosom Res* 1971; **15:** 25–31.
4. Thomson KC, Hendrie HC. Environmental stress in primary depressive illness. *Arch Gen Psychiatry* 1972; **26:** 130–132.
5. Cochrane R, Robertson A. The Life Events Inventory: a measure of the relative severity of psychosocial stressors. *J Psychosom Res* 1973; **17:** 135–139.
6. Jacobs TJ, Charles E. Life events and the occurrence of cancer in children. *Psychosom Med* 1980; **42:** 11–24.
7. Cooper CL, ed. *Psychosocial Stress and Cancer*. Chichester: Wiley, 1984.
8. Ramirez AJ, Craig TK, Watson JP, Fentiman IS, North WR, Rubens RD. Stress and relapse of breast cancer. *Br Med J* 1989; **298:** 291–293.
9. Graf S. The elderly and their pets. Supportive and problematic aspects and implications for care. A descriptive study. *Pfelge* 1999; **12:** 101–111.
10. Miller MA, Rahe RH. Life changes scaling for the 1990's. *J Psychosom Res* 1997; **43:** 279–292.
11. Brown GW, Harris T. Social origins of depression: a reply. *Psychol Med* 1978; **8:** 577–588.
12. Bebbington P, Tennant C, Sturt E, Hurry J. The domain of life events: a comparison of two techniques of description. *Psychol Med* 1984; **14:** 219–222.
13. Brugha T, Bebbington P, Tennant C, Hurry J. The list of threatening experiences: a subset of 12 life event categories with considerable long-term contextual threat. *Psychol Med* 1985; **15:** 189–194.