The effects of divorce and separation on mental health in a national UK birth cohort

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ABSTRACT

Background. Many studies have reported a negative impact of divorce and separation on health although it is still unclear to what extent this is due to early vulnerability, the material and social consequences of divorce or to its direct emotional effects.

Method. Measures of anxiety and depression and potential alcohol abuse at age 43 were compared in 2085 participants from the MRC National Survey of Health and Development who were either married and never divorced or separated, or who had divorced or separated at least once. Analyses were adjusted for sociodemographic features, early vulnerability factors and current stressors.

Results. Divorce and separation were associated with increased anxiety and depression, and increased risk of alcohol abuse. This was the case after adjusting for educational attainment, age at first marriage, parental divorce, childhood aggression and neuroticism, and current financial hardship, lack of a confidante and frequency of social contact with friends or family. The association between divorce and risk of alcohol abuse became non-significant when the latter variable was controlled for. Associations between divorce and psychopathology were observed even though half of those separated or divorced were re-married or reunited with their spouses at the time of the analysis. There was, furthermore, no association between these mental health measures and time since first separation or divorce.

Conclusions. Divorce and separation have a specific and long-term impact on mental health.

INTRODUCTION

The adverse effects of divorce and separation (henceforth referred to simply as divorce) on health have long been recognized (Wood, 1852; Farr, 1859; March, 1912). Divorce is associated with increased mental illness (Goode, 1949; Srole *et al*. 1962; Crago, 1972; Bloom *et al*. 1978; Rodgers, 1994, 1996), physical illness (National Centre for Health Statistics, 1970, 1976; Morgan, 1980; Wyke & Ford, 1992; Ebrahim *et al*. 1995; Friedman *et al*. 1995; Gordon & Rosenthal, 1995) and injury, e.g. from motor vehicle accidents (McMurray, 1970).

Explanations for these associations have been formalized within two basic models; (1) the social causation model, according to which divorced people have fewer material resources, more stress, show more health risk behaviours and have less social support than married people; and (2) the health selection model, according to which disabled people or people in poor health are less likely to marry and, if they marry, are more likely to separate and divorce than healthy people. Concerning the social causation model, several studies suggest the role of marriage as providing social support (including provision of information, tangible resources and emotional support) as a protection against ill health (Ward & Leigh, 1993). In a direct test of the model, Wyke & Forde (1992) found that material resources (car ownership), stress and perceived social support accounted for much of the effect of marital status on health, although the direction of these associations was unclear.

Concerning the health selection model, the concept of vulnerability to psychopathology is

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of obvious relevance in modelling the likelihood of divorce and its effects on mental health. Regarding early vulnerability factors, parental divorce is an important predictor of divorce in offspring, as shown in a meta-analysis of over 30 studies (Amato & Keith, 1991). Furthermore, Rodgers (1994), using the MRC National Survey of Health and Development (NSHD), reported that women who had divorced had high levels of depression but only among those whose parents had divorced. Pathways between parental divorce and own divorce are likely to be complex and may interact with social causation factors. For example, data from the NSHD show that children of divorced parents had lower educational attainment and poorer socio-economic circumstances, in part due to lack of parental interest in their child's education (Wadsworth & Maclean, 1986). This study also reported an increased risk of psychological disturbance, such as bed-wetting, sleep problems and delinquency, in children of divorced parents (Douglas, 1970; Wadsworth, 1979) although the extent to which these factors themselves mediate subsequent divorce and its effect on mental health is uncertain.

The NSHD allows an opportunity to examine the association between divorce and mental health in the context of both early vulnerability and social causation, since this study has continuously collected medical, psychological and sociodemographic information on a large UK cohort from birth in 1946 to age 43 (Wadsworth, 1991). We wished to examine the strength of association between divorce and anxiety, depression and risk of alcohol abuse, and to assess whether this association remained after controlling for three sets of potential confounders: (1) sociodemographic, i.e. educational attainment and age at first marriage, since both are associated with parental divorce; (2) early vulnerability, i.e. occurrence of parental divorce, which is associated with own divorce, and the trait personality factors of aggression and neuroticism assessed in adolescence and chosen as potential precursors of adult psychiatric disturbance; and (3) social causal, i.e. the current stressors, at age 43, of financial hardship and absence of a confidante.

METHOD

Participants

Participants were drawn from the Medical Research Council's National Survey of Health and Development, a longitudinal birth cohort study, initially consisting of a social class stratified sample of 5362 people randomly selected from all the 13 687 births that occurred in England, Scotland and Wales during the week 3–9 March 1946. Information about sociodemographic factors and medical, cognitive and psychological function in cohort members in their childhood was obtained 12 times from mothers, teachers and from direct medical examination. A further 11 interviews and examinations have been directly obtained from cohort members during adulthood. The last of these occurred in 1989 at age 43, when sample size consisted of 3262, regarded as a representative sample of the UK population born in the immediate post-war era (Wadsworth *et al.* 1992).

Of this sample, 3018 (92·5%, consisting of 1483 males and 1535 females) had married. Of these, 2179 (1107 males and 1072 females) had married once and were still married at age 43 (henceforth referred to as the ND group), 779 (357 males and 422 females) had been divorced at least once (henceforth referred to as the ED group), of whom 400 (171 males and 229 females) were currently divorced or separated and 60 (1·9%, 19 males and 41 females) had been widowed. Two hundred and eighteen (141 males and 77 females) had not married by age 43 and marital status was unknown for the remaining 26 participants.

Measures

1. *Dependent measures*

To assess anxiety and depression at age 43 years, participants were administered the Psychiatric Symptom Frequency scale (PSF) (Rodgers, 1994; Lindlow *et al.* 1997). This is an 18-item scale to elicit symptoms of anxiety and depression over the previous 12 months in the general population. All questions are couched in the form 'have you …? (e.g. 'have you felt on edge or keyed up or mentally tense?') and responses to all questions were graded as 0 = not in the last year, 1 = occasionally, 2 = sometimes, 3 = quite often, 4 = very often, 5 = every day. A total PSF score was calculated. In

a validity study, Lindelow *et al.* (1997) found that a cut-score of 22 adequately discriminated participants with independent evidence of emotional disturbance. Participants were, therefore, divided into high and low PSF scorers using this cut-point.

To assess risk of alcohol abuse, participants were asked the four CAGE questions (Ewing, 1984): C: Have you ever felt you ought to *cut down* on your drinking? A: Have people ever *annoyed* you by criticizing your drinking? G: Have you ever felt bad or *guilty* about your drinking? E: Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (*eye opener*)? As with the PSF, these questions referred to the past year. Participants were divided into those scoring 0 or 1 *versus* at least 2 on this measure, the latter indicating possible alcohol abuse.

2. Independent measures

Sociodemographic

The following measures were selected: (*i*) educational attainment, dichotomised into 'A' level or equivalent versus below this level; (*ii*) occupation of participants' fathers, dichotomized into manual *versus* non-manual; and (*iii*) age at first marriage.

Early vulnerability factors

Two measures were utilized: (*i*) whether or not participants' parents had divorced, up until participant age 15. Preliminary analyses indicated that, on the whole, participants who had experienced the death of a parent had similar scores on concurrent measures of mental and physical health to those with no history of a broken family. For the purpose of the present analysis, therefore, participants were divided into those whose parents had divorced by participant age 15 *versus* all others: (*ii*) the Pintner Aspects of Personality Inventory (Pintner *et al.* 1937) at age 13. This self-administered questionnaire yields summary scores for sociability, aggression and neuroticism. The latter two scores were used in the present study.

Current stressors

Participants were asked at age 43 years: (*i*) whether or not they had had to forego necessary items in the last year due to lack of money (financial hardship), coded yes or no: (*ii*) whether they felt they had enough opportunity to talk openly and share their feelings (availability of a confidante), also coded 'yes' or 'no'. This item corresponds to those used by Wyke & Ford (1992) to measure perceived intimacy. Because for some participants this confidante may be the spouse, an independent measure of social support was also used: (*iii*) frequency of social contact with friends or relatives, scored as 0–2, 3–10 or more than 11 times per month.

Unless otherwise stated, all measures were obtained by trained nurse interviewers.

RESULTS

Demographic and clinical characteristics of the ND and ED groups are shown in Table 1. A total of 873 of the 2958 participants in both these groups had missing data for at least one of the variables listed in the Method section. Preliminary tests revealed that participants with missing data were significantly older ($P < 0.04$) and had a trend towards a higher PSF score ($P < 0.057$) than participants with no missing data. There were no significant differences between those with and without missing data in any of the other measures used in this study. A large proportion of the missing data was accounted for by the Pintner scores. A sensitivity analysis was, therefore, performed using logistic regression, with the PSF and CAGE measures as dependent variables and entering all other variables except the Pintner Aggression and Neuroticism scores. Models rejecting participants with missing data on all variables were compared with models rejecting participants with missing data on all variables except the Pintner scores. Results were comparable for the PSF although education, which was not significantly associated with the CAGE score in the former case, became significant in the latter case. In the absence of clear evidence of bias resulting from missing data, all subsequent analyses were carried out on the remaining 2085 participants.

Student's *t* tests revealed that participants who had divorced had married at a significantly younger age than those had not divorced. There was no difference between the ND and ED groups in the total Pintner Aggression score at age 13 years but women who had ever divorced scored significantly higher on the Pintner Neur-

Table 1. *Sociodemographic and clinical features for the ND (married, never divorced) and ED (ever divorced or separated) groups (standard errors in parentheses)*

		ND	ED	*P*
Sample size	M	793	261	—
	F	736	295	—
High PSF score at age 43 (%)	M	6·7 (0·59)	13·4 (1·10)	0·0007
	F	12·2 (1·04)	23·4 (1·74)	< 0·0001
> 2 CAGE items at age 43 (%)	M	9·8 (0·84)	15·7 (1·26)	0·009
	F	3·5 (0·33)	9·5 (0·83)	0·0001
Age at 1st marriage	M	24·3 (0·14)	23·0 (0·23)	< 0·001
	M	22·1 (0·13)	21·2 (0·18)	< 0·001
Non-manual background (%)	M	45·3 (2·35)	45·2 (2·35)	0·99
	F	42·5 (2·37)	38·1 (2·29)	0·19
Advanced education (%)	M	44·8 (2·35)	37·5 (2·22)	0·04
	F	29·3 (2·01)	21·4 (1·63)	0·009
Parental divorce (%)	M	4·2 (0·38)	8·4 (0·73)	0·007
	F	6·4 (0·58)	7·8 (0·70)	0·42
Pintner Aggression at age 13	M	6·3 (0·09)	6·4 (0·15)	0·40
	F	5·3 (0·09)	5·6 (0·15)	0·07
Pintner Neuroticism at age 13	M	3·5 (1·0)	3·8 (0·17)	0·12
	F	4·2 (0·10)	4·7 (0·18)	0·01
Financial hardship at age 43 (%)	M	8·2 (0·71)	16·5 (1·31)	0·0001
	F	6·8 (0·62)	22·0 (1·66)	< 0·0001
No confidante at age 43 (%)	M	8·8 (0·76)	10·0 (0·85)	0·58
	F	6·7 (0·61)	11·5 (0·99)	0·009
Social contact* at age 43 (%)	M	23·0 (1·68)	31·8 (2·06)	0·02
	F	21·6 (1·64)	33·2 (2·15)	0·0005

* With friends or relatives, 11 or more times per month.

oticism score than women who had never divorced. Chi-square tests showed no difference in social class (manual or non-manual) of family of origin between the two groups. However, participants who had divorced had significantly lower educational attainment and higher likelihood of experiencing parental divorce before age 16 (males only) than those who had not divorced. Divorced participants also had a higher frequency of contact at age 43 years with friends or relatives yet a lower likelihood of having a confidante (females only) and a higher likelihood of financial hardship, also at age 43 years, than those who had not divorced. Chi-square tests also showed that ever divorced participants had significantly higher PSF and CAGE scores at age 43 years than never divorced participants.

Logistic regression was then used to examine the association between divorce and the PSF and CAGE measures. A model was built up in stages. To begin with, the ND–ED grouping variable was entered alone. In line with the preliminary chi-square tests, Table 2 shows that

divorce was significantly associated with both PSF and CAGE measures. Next, education and age at first marriage were entered to control for sociodemographic influences. Table 2 shows that these variables did not significantly modify the effect of divorce on the two outcome variables, with the exception of the CAGE in females. The latter occurred because education was positively associated with risk of alcohol abuse in females (see Table 3).

To control for the potential effects of early vulnerability, parental divorce and the Pintner Aggression and Neuroticism scores at age 13 were then entered. Again, these did not significantly modify the effects of divorce. This was also the case when a teacher's rating of aggressive behaviour at age 13 was substituted for the Pintner Aggression score. Then the adult stressors of financial hardship and absence of a confidante at age 43 were entered. With the exception of the CAGE score in men, these variables reduced the effect of divorce. However, divorce remained significantly associated with both outcome measures, as shown in Table 2.

Table 2. *Effect of background variables on the association between divorce and the PSF and CAGE (relative risk ratios and 95% confidence intervals)*

	Divorce only	+education and age at marriage	+parental divorce and early personality	+financial hardship and no confidante at age 43
PSF				
M	2·16 (1·38–3·39)	2·08 (1·31–3·29)	2·02 (1·27–3·22)	1·84 (1·15–2·97)
F	2·19 (1·55–3·10)	2·21 (1·55–3·16)	2·09 (1·46–3·00)	1·67 (1·14–2·44)
CAGE				
M	1·71 (1·14–2·56)	1·59 (1·05–2·41)	1·57 (1·03–2·36)	1·55 (1·02–2·36)
F	2·86 (1·65–4·95)	3·08 (1·75–5·37)	2·89 (1·63–5·10)	2·49 (1·38–4·48)

Table 3. *Full logistic regression model for all variables and the PSF and CAGE*

		PSF	CAGE
Divorce	M	1·74 (1·08–2·83)	1·45 (0·95–2·20)
	F	1·72 (1·17–2·53)	2·83 (1·57–5·16)
Education	M	1·16 (0·71–1·90)	1·04 (0·68–1·57)
	F	0·75 (0·47–1·18)	2·13 (1·12–4·06)
Age at marriage	M	0·97 (0·91–1·03)	0·94 (0·89–1·00)
	F	1·04 (0·99–1·09)	1·01 (0·93–1·10)
Parental divorce	M	1·42 (0·59–3·35)	1·12 (0·50–2·51)
	F	2·66 (1·46–4·81)	2·14 (0·84–5·47)
Aggression at age 13	M	1·09 (0·98–1·21)	1·00 (0·92–1·10)
	F	0·99 (0·90–1·07)	0·92 (0·80–1·05)
Neuroticism at age 13	M	1·04 (0·94–1·14)	1·03 (0·95–1·12)
	F	1·11 (1·04–1·18)	1·16 (1·04–1·30)
Financial hardship at age 13	M	2·71 (1·52–4·81)	1·10 (0·59–2·03)
	F	3·10 (1·95–4·90)	2·39 (1·16–4·90)
No confidante at age 43	M	2·55 (1·40–4·62)	1·26 (0·66–2·39)
	F	3·00 (1·77–5·05)	1·34 (0·57–3·19)
Social contact* at age 43	M	1·64 (0·89–3·06)	2·30 (1·31–4·06)
	F	0·91 (0·54–1·55)	0·23 (0·09–0·61)

* With friends or relatives, 11 or more times per month.

Finally, frequency of social contact with friends and family was entered. While divorce remained significantly associated with the PSF, risk ratios were modified in opposite directions, i.e. lowered for men and increased for women. This was also true for the CAGE, where the association with divorce was no longer significant for men (see Table 3).

The full logistic regression model is presented in Table 3. In addition to the effects of divorce already noted, it can be seen that for all females, education was significantly associated with the CAGE, parental divorce was associated with the PSF and neuroticism was associated with both PSF and CAGE. Financial hardship and absence of a confidante was strongly associated with the PSF in both males and females but the former was only associated with the CAGE in females. Frequency of social contact with friends and family was positively associated with the CAGE in men but negatively associated with this outcome for women.

To examine whether the association between divorce and the PSF was mediated by alcohol abuse (i.e. a risk behaviour, with reference to the social causation model), the full logistic regression model was re-run for the PSF, entering the CAGE as a predictor variable. Divorce remained significantly associated with the PSF after adjusting for all other variables (RR = 1·69 (1·04–2·72) for males and RR = 1·72 (1·17–2·53) for females). Similar patterns of association to those in Table 3 were found for all the other variables in the model. The CAGE was significantly associated with the PSF for males (RR = 1·81 (1·01–3·25)) but not females (RR = 0·97 (0·46–2·01)).

To assess whether the strength of association

between divorce and the PSF and CAGE was dependent on time since divorce, the full logistic model was again re-run, contrasting participants who happened to be divorced at age 43 with participants who were married at that time, regardless of previous marital history. For men, divorce was no longer significantly associated with either the PSF (RR = 1·71 (0·96–3·03)) or the CAGE (RR = 1·67 (1·00–2·77)) but for women the association was strengthened for the PSF (2·15 (1·39–3·35]) and reduced (although remaining significant) for the CAGE (2·64 (1·38–5·05)).

Finally, there were no significant differences between low and high PSF and CAGE scorers in age at divorce (age at first divorce if more than one). For men, mean age (standard error in parenthesis) at divorce was 33·29 (0·43) for low PSF scorers and 33·29 (1·03) for high PSF scorers (P = 1·00) and 33·39 (0·43) for low CAGE scorers and 32·79 (0·96) for high CAGE scorers (P = 0·57). For women, these ages were 31·80 (0·45) for low PSF scorers and 33·19 (0·86) for high PSF scorers (P = 0·14) and 32·02 (0·42) for low CAGE scorers and 33·07 (1·46) for high CAGE scorers (P = 0·43). However, women in the ED group who were currently divorced at age 43 had higher PSF scores compared to those from this group who were either re-united or re-married at this age (P = 0·004).

DISCUSSION

In a large representative sample of people born in the immediate post-war era of the UK, men and women who had ever divorced showed a significantly elevated risk of anxiety and depression at age 43, after controlling for educational attainment, age at first marriage, history of parental divorce, adolescent aggression and neuroticism, and current risk of alcohol abuse, financial hardship, lack of a confidante and frequency of social contact with friends or family. Similarly, an association between divorce and risk of alcohol abuse itself was demonstrated in women after controlling for these factors, and in men when all factors except frequency of social contact were controlled, although the association between divorce and the CAGE in men became non-significant when this last variable was added to the model. To put these findings into perspective, it is worth noting that

the early forties are normally viewed as a relatively stable, healthy and mature time of life (Friedman *et al.* 1995).

The most simple, and most important question raised by these findings is the extent to which anxiety, depression and alcohol abuse are a cause or an effect of divorce, or rather, marital breakdown, for which divorce is only a proxy. Concerning the former possibility, although divorced women had elevated adolescent neuroticism scores, which were in turn associated with psychopathology at age 43, there was little evidence from the logistic regression model that adolsecent aggression and neuroticism played an important role in the risk of divorce in adult life. A thorough exploration of the potential causal effect of psychopathology on divorce would require the comparison of symptoms at an optimal time point before divorce (e.g. at, or before, marriage) between ever and never divorced participants. Unfortunately, the NSHD did not employ sufficient repeated measures of psychopathology to enable such a comparison.

What of the second possibility, that divorce has a causal effect on psychopathology? This is plausible because the putative cause (divorce) preceded (or, in the case of 20 participants who divorced at age 43, was contiguous with) the measurements of psychopathology, one of the necessary criteria for demonstrating a causal effect (Susser, 1991). Less clear, however, is the reason for the effect. In so far as we were able to control for material discomfort and loss of social support, our results do not support the social causation model, with the exception of potential alcohol abuse in men. However, our data on social support was limited; divorce often involves loss of the family in-law network and friends who have closer ties to the spouse (Ward & Leigh, 1993). Even if these networks are in part replaced through remarriage, there may be persistent negative effects of the original loss which are not addressed by questions about absolute numbers of current social contacts or about quality of current social support. It could be argued, however, that emphasis on these indirect pathways between divorce and ill health potentially overlooks the direct effects of divorce. For many, if not most people, marital breakdown is an intensely emotional experience of conflict and loss of a love object. Indeed, Weiss

(1976) compared the bond between marital partners to that described by Bowlby (1969) between children and parents; in both cases, separation involves rage, anxiety, pining for the lost person and persistent efforts at reunion. Subtle and complex disturbances in self-identity have also been reported. For example, Hetherington *et al.* (1977) referred to a feeling of rootlessness in divorced men and a feeling of unattractiveness in divorced women. It may be against this background that social causal factors exert their influence.

An unexpected finding was the lack of a clear relationship between time since first divorce and likelihood of high scoring on the PSF or CAGE. Either this points to the long-term effect of a putative vulnerability factor or it suggests that the psychopathological effects of divorce are remarkably tenacious. With regard to the latter, Weiss (1976) reported consistent evidence of a strong attachment between separated partners, even after love and other positive feelings had faded and alternative relationships had been established. In this context we note that the negative impact of divorce on mental health in the present study was found even though almost half of those ever divorced were remarried at the time of analysis. As Friedman *et al.* (1995) suggest, the buffer that marriage can provide against stress may not eliminate the detrimental effect of previous divorce.

If so, there are likely to be serious prospective effects of divorce on physical health. Many studies have reported an association between divorce and physical illness. In view of the relationship reported here between divorce and risk of alcohol abuse we might anticipate an increased incidence of cardiovascular, hepatic and gastrointestinal disorders among divorced people in this cohort, which would be consistent with data from the US National Centre for Health Statistics (1970). There is, therefore, a crucial need to continue investigating these trends.

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