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The Study of Life Event Stress

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Literature and research findings describing the association of stressful life events with health states are reviewed. The hypothesis that recent life stress contributes to the aetiology of physical, mental and behavioural disorders and accident is generally supported. A lack of consensus as to the exact nature of the stress role is also noted, and the divergent views addressed.

The general hypothesis that stressful life events play an aetiological role in physical and mental disorders and social pathology is universally supported, although there is considerable disagreement among theorists and researchers as to the nature of this role. Whilst some have advocated the aetiological importance of life events as precipitators of illness onset (Holmes & Masuda, 1973; Rahe, 1975), others have relegated their role as secondary to predisposing influences (Hinkle, 1974a, 1974b). This divergence of emphasis has resulted in a concentration on methodological issues and the identification and measurement of the stressful dimensions of life events on the one hand, whilst on the other hand the focus has centred on specific events and pathological outcomes.

Life Event Stress Research: An Overview

An instrument that has largely determined the direction taken by many researchers was developed by Holmes and Rahe (1967) following many years of study beginning in 1949. Using Meyer's life chart (Lief, 1948), they studied life event clusters at disease onset of more than 5,000 patients and noted that, although event experiences varied greatly among individuals, readjustment responses always accompanied an event. Their Social Readjustment Rating Scale (SRRS) was derived in which readjustment demands of 43 events were evaluated using Life-Change-Unit (LCU) scores based on weightings assigned by large subject samples. Two categories of items, those pertaining to life style and those of events involving the individual were included.

The question of SRRS validity has been the subject of considerable debate (Sarason, Monchaux & Hunt, 1975), although the scale authors have claimed test results to be adequate (Rahe, 1975). Independent assessments by Horowitz, Schaefer, Hiroto, Wilner and Levin (1977) have reported acceptable reliability and validity for use with groups, although not as a stress index for specific individuals, whilst studies of divergent populations and cultures have yielded very high correlations on the SRRS scaling procedures (Harman, Masuda & Holmes, 1970; Horowitz *et al.*, 1977; Isherwood & Adam, 1976; Komaroff, Masuda & Holmes, 1968; Masuda & Holmes, 1967; Woon, Masuda, Wagner & Holmes, 1971).

Although other measures of life event stress have been reported (Berkman, 1971; Serban & Woloshin, 1974; Wardell, 1973), only the SRRS and scales derived from it, such as the scale used by Vinokur and Selzer (1975) and the Paykel, Prusoff and Myers (1975) instrument, have been well validated (Horowitz *et al.*, 1977). Unless otherwise indicated, where scales have been used in the studies presented below they are these well-validated instruments.

The collaborative studies of Hinkle (1974b) since 1952 have involved both retrospective and prospective data collection. Investigations have variously included refugees, migrants, political prisoners and prisoners of war, as well as relatively stable population samples. Although life events were found to be associated with the health states of some people, possible interaction effects between physical constitution and psychological states were implicated as more important. Nor could the stressfulness of an event be gauged by its apparent importance in the eyes of others, for Hinkle

noted that there were large groups of people who remained free from illness in the face of major life changes. He argued that these people appeared to be insulated by an almost sociopathic type of psychological immunity.

Similarly, with coronary heart disease patients it was not the occurrence of life events *per se*, but the individual's perceptual response to them that was found to be significant in aetiology (Hinkle, 1974b; Theorell, Lind & Floderus, 1975). This point was also made by Hudgens (1974) and Antonovsky (1974) regarding serious psychiatric disorders.

An escalation of life changes in crisis situations associated with cardiac death and myocardial infarction have been noted in the retrospective studies reported by Holmes and Masuda (1973), and with the onset of myocardial infarction by Bianchi, Fergusson and Walshe (1978). Mounting life change was shown by Holmes and Masuda (1974) to also be associated with such diverse outcomes as the beginning of pregnancy, transient diabetes and many minor health changes such as headaches, backache, stomach pain, and the common cold. Other studies have reported family life crises present at the time of leukaemia onset in children, and life changes to be associated with fractures and injury (Holmes & Masuda, 1973). The extensive investigations supervised by Rahe (1974a, 1974b) in military and naval settings over a 10 year period consistently reported definite links between life event readjustment demands and health status, and in particular with tuberculosis, diabetes and abdominal hernia.

When used as predictors of illness, life change indices have shown significant positive correlations in some investigations. With full complements of shipboard personnel from three navy cruisers, Rahe (1974a) reported that individuals who had high SRRS scores later reported more illness. Holmes and Masuda (1973) cite the T. S. Holmes findings that 86 per cent of a high risk group, identified by their high LCU scores, had major illness episodes during a two-year follow-up. Their study with footballers produced similar correlations with injury predictions, whilst the Rahe, Mahon and Arthur (1970) prospective study provided evidence of a linear relationship existing between SRRS scores and the mean illness rate of subjects. Seriousness of illness vulnerability and life change magnitude prior to illness onset was also found to be highly correlated when illness seriousness was rated both by groups of physicians and of laymen (Wyler, Masuda & Holmes, 1971). However, no relationship was found with onset of acute infectious diseases or specificity of disease type. Findings of this study support the concept that the greater the adaptation demands associated with life events, the more serious the illness: that is, life change does play a role in the aetiology of some illnesses. In the large scale prospective study undertaken by Theorell *et al.* (1975) the SRRS did not predict near-future myocardial infarction, although one individual life change, that of increased responsibility at work, was a significant predictor. These findings were supported by Wardell (1973) who reported no association of situational stress with myocardial infarction except for very recent happenings (within the preceding three months).

Some researchers have focused on the illness susceptibility effects of just one or two recently experienced life events. In a controlled study by Syme, Hyman and Enterline (1968) coronary heart disease was associated with residential or vocational mobility, whilst in the study of Kasl and Cobb (1970), high blood pressure was associated with job loss. Parkes, Benjamin and Fitzgerald (1969), and Maddison and Viola (1968) indicated that when compared with control samples, recently widowed spouses had significantly increased rates of illness in the 12 months following their loss. Recent separation from home was also reported to be correlated with increased illness in student nurses in the studies by both Parens, McConville and Kaplan (1966) and Cleghorn and Streiner (1975).

Just as illness rates have been found to increase following single events experienced as stressful, so it has been shown that clusters of life events produce even higher correlates with illness onset, except perhaps where specific events have been aetiological. The following more general studies of life

situations preceding illness have attempted to assess the effects of recent event clusters. As noted by Rahe (1975), a number of studies have found a direct relationship between environmental changes and the natural history of pregnancy and outcome. Prenatal problems, medical difficulties and premature delivery have also been reported by Williams, Williams, Griswold and Holmes (1975). A review by Rahe (1975) describes studies where respiratory ailments were more common among university students, solo mothers had higher than expected illness rates, sick children and gross family disorganisation were linked, and recent preceding life change situations generally predicted illness experienced in the following two years.

Life Event Stress, Psychiatric and Behavioural Disorders

The onset of serious mental disorders has been associated with specific and clustered life events in a number of retrospective studies. In a controlled comparison, Serban (1975) recorded psychologist and psychiatrist ratings of stress levels experienced by schizophrenic patients in relation to specific problem situations occurring in the six months prior to interviewing. Schizophrenics indicated significantly greater stress than the controls in dealing with life events, with chronics evidencing more stress than acutes. However, this is almost a diagnostic feature of schizophrenia and the claims of Serban to have created a reliable index have yet to be corroborated. This finding was contrary to those of the earlier Brown (1974) investigation which had reported no differences between schizophrenic or depressive patients and a psychiatrically-well control sample, except during the three weeks prior to illness onset, although during these three weeks life event occurrences in the schizophrenic group increased to four times, and in the depressive group three times the frequency for the controls. Whether these were cause or effect of impending schizophrenic or depressive episodes was not controlled for. However, even though there were no frequency differences between the groups outside of the three weeks, events labelled by Brown as severely threatening were far more common with the patient than the control group.

Extensive interview evidence provided no convincing cause-effect connections between life events and disabling psychiatric illness Hudgens, 1974) or the onset of manic depressive psychotic episodes (Hudgens, Morrison and Barchha, 1967). On the other hand, in one of the few recorded prospective studies (Clum, 1976), although life changes were not found to correlate with psychopathology when rated by a significant other person in the life of the patient (spouse, family member, friend), patient-rated stress (in LCUs) was related to symptom factors. Hinkle (1974b) has also reported differences in rated stressfulness between physically and psychologically healthy persons and those experiencing frequent illness, the latter reporting similar events as more demanding. The issue of idiosyncratic versus group perceptions of stressful events raises important questions as to whether the events themselves or their perceived stressfulness are related to aetiology. Recent investigations have found that self-ratings of stressfulness identified large groups of suicide attempt, driver accident, and control subjects more accurately than global indices (Isherwood, Adam & Hornblow, 1981).

Strong positive correlations of life change with the onset of organic syndromes, psychosis, neurosis, alcoholism, personality disorders and situational reaction have been reported by Smith (1971). But as the method used for symptom diagnosis provided only crude indicators, interpretation was limited. Furthermore, events were frequently observed to be a consequence of illnesses as well as preceding their onset.

The Gersten, Langner, Eisenberg and Orzek (1974) followup study of children found more desirable than undesirable events were reported overall, with life-change scores significantly correlating with regressive anxiety, self-destructive tendencies, conflict with parents, mentation problems, fighting, delinquency, and isolation. An index balance score of undesirable items was found more highly correlated with the dependent variables except for anxiety, which was a similar finding to that of Vinokur and Selzer (1975). However, use

of a balance stress index is questionable as it is hardly acceptable that a desirable event will cancel the stress associated with an undesirable event.

In an attempt to identify predisposing factors Dohrenwend (1973a) found low social status individuals were disproportionately exposed to stressful life events, which in turn were significantly correlated with psychiatric impairment, although these findings were not supported by the Markush and Favero (1974) investigations. On the other hand, the earlier large-scale study by Coates, Moyer and Wellman (1969) had indicated that event occurrences were related to mental illness, with the high symptom group bimodel by age, and with more females, lower income, less educated and less skilled occupation individuals than expected, a similar finding to Dohrenwend (1973a) for social status, but not for sex status.

Although the Coates *et al.* (1969) and Dohrenwend (1973a) findings for socio-economic status were not supported by Berkman (1971) or Smith (1971) except for job loss, Myers, Lindenthal and Pepper (1971) did report significant relationships between measures of psychiatric impairment and a patterning of change demands, undesirability and frequency of life events (in the preceding year) in a large population sample. Socio-cultural factors such as role expectations and values appeared to be associated with outcome. A two-year follow-up indicated that higher psychiatric symptoms in the lower socio-economic groups were related to the disproportionate distribution of undesirable change events experienced. These results tenuously support the Dohrenwend (1973a) hypothesis that psychological status is linked to social milieu, although when controlled for both event frequency and change, as opposed to loss and undesirability, the relationship between symptoms and social class disappeared (Myers *et al.*, 1971, 1974).

In the Dohrenwend (1973b) studies life change was a better measure of stress than an undesirability valence, both with and without loadings of the SRRS magnitudes. But the apparent superiority of change over undesirability of life event stress measures may stem from the use of dependent variables that reflect anxiety. As Gersten *et al.* (1974) has noted, anxiety is the first result of any life change, whether it is positive or negative.

A comparison of life event properties using desirability versus undesirability based on cultural norms found that undesirable events were also correlated with depressive illness, although there were no differences when compared with controls on desirable events (Paykel, 1974a, 1974b). Their follow-up study confirmed this relationship, with depressed patients having three times the frequency of undesirable events as matched controls, and in particular loss events such as recent bereavement and marital separation. Similarly, the thorough investigation undertaken by Vinokur and Selzer (1975) found that undesirable events were highly correlated with self-reported tension and distress, depression, paranoid disturbances, suicidal thoughts, drinking and traffic accidents. But these correlations did not hold for desirable life events, suggesting that the critical determinant of stress experienced is event undesirability not change. The Paykel group also investigated other diagnostic groups and found schizophenic patients had one-third fewer event occurrences than depressives, although still significantly more than the controls. With mixed outpatient psychiatric groups, the majority with neurotic disorders, there was a linear relationship between amounts of stress and symptom severity. Although the development of depression and other psychiatric disorders was not assessed as being wholly determined by the event occurrence, but also from interaction with predisposing vulnerability, in the case of depression the evidence suggested that event occurrences increased the risk six-fold (Paykel, 1974a, 1974b).

Life Event Stress and Suicide Attempt

Recent crises have long been accepted as important catalysts in suicide attempt. Despite this recognition, very few controlled studies have been reported where random expectations of the event occurrence in the general populace has been established. In retrospective non-controlled studies Birtchnell (1970) obtained a definite association

between recent parental death and suicide attempt in a psychiatric population, whilst Levi, Fales, Stein and Sharp (1966) found similar results regarding recent separations. From the New Zealand investigations by Werry and Pedder (1976) the conclusions were that suicide attempt was more associated with recent marital conflicts, family disharmony and other interpersonal disturbances, than with serious illness, financial disaster or even recent bereavement. In a study that examined a variety of events using controls from the general population, Paykel *et al.* (1975) assessed stress experiences in the six months prior to a suicide attempt using a 32-item scale derived from the SRRS. Two control samples, one of depressive patients, the other from a population study, were matched for sex, age, marital status, social class and race with 53 suicide attempt patients. The suicide attempt group reported four times as many events as the population sample, and half again as many as the depressives. Event experiences peaked in the month prior to the suicide attempt when one-third of the total events occurred. Attempters reported more of every type of event (particularly those author-designated as being of a threatening nature) than either of the control groups, except for desirable events and some work related episodes. As in an earlier study (Paykel, Myers, Dienelt, Klerman, Lindenthal & Pepper, 1969) the depressives reported three times the number of events as the population control subjects. When events were author-categorised as being in or out of the control of the individual, based on event subjective versus objective properties, occurrences of non-controlled events were significantly more prevalent in the suicide attempt group. Overall, the results from both these controlled comparison studies indicated a strong association between suicide attempt and frequency, recency, and undesirability of life events (Paykel *et al.*, 1969, 1975).

Life Event Stress and Automobile Accident

From their exploratory studies Selzer (1969) and Selzer, Rogers and Kern (1968) found that when retrospectively matched with controls, a fatal accident group reported more events during the previous 12 months and had also experienced acutely disturbing events within six hours of death. Furthermore, they had a much higher incidence of psychopathology, including depression, paranoia, suicidal ideation, aggression, and alcoholism. But the possibility that both the life events and the accidents were a function of the drivers' psychopathology was dismissed when it was found that two-thirds of the non-alcoholic at-fault drivers did not manifest significantly more psychopathological symptoms than the controls.

Contrary to the findings of McDonald (1964) and Jeffrey, Foley and Waller (1972) that crash victims had been under serious stress shortly before their fatal accidents, the Tabachnick, Litman, Osman, Jones, Cohn, Kasper and Moffat (1966) investigations revealed that most drivers killed in accidents had no traumatic episodes immediately prior to their deaths, but had experienced very stressful relationship episodes and increased work-related responsibilities during the previous twelve months. In contrast, of the subjects in the Tabachnick *et al.* (1966) comparison group of self-inflicted gunshot deaths, most had suffered the loss of a significant other person immediately prior to death.

Persons in the process of being divorced were also reported to have had twice the expected number of automobile accidents during the six months before and after the divorce decree according to McMurray (1971). Time of highest accident likelihood was the three month period immediately following the filing for a divorce.

A large-scale investigation of possible links between stressful life experiences and driver accidents was undertaken by Selzer and Vinokur (1975). They obtained data from four groups of accident drivers using each subject's LCU estimations from events personally experienced in the previous 12 months. The four groups included a control group, two alcoholic driver groups, and a group sent to a driver safety school from the traffic courts. Although not quite reaching statistical significance, for each group high life event scores were associated with accidents in the previous 12 months. However, when the two alcoholic groups were combined and the two non-alcoholic groups were combined, the correlation

between life change and accidents was highly significant. Interestingly, none of the personality and psychopathology variables were demonstrated to be related to accident involvement except for aggression, which contrasts with the McDonald (1964) findings where three-quarters of the accident subjects manifested psychological problems or character disorders. Nor were demographic factors associated with accidents except for income, and that was negatively correlated in the non-alcoholic sample only.

Results from the research of Selzer and Vinokur (1974, 1975) have provided an important challenge to some previously held views that personality, demographic, and social maladjustment factors should be the focus of empirical investigation into accident causation. They report that replication studies and prospective investigations in their quest for an actuarial prediction model and instrument are planned.

Life Event Stress and Alcoholism

Although alcoholism has been frequently found to be intertwined with other indicators of stress, including life changes (Schmidt, Shaffer, Zlotowitz & Fisher, 1977; Selzer, 1969; Selzer & Vinokur, 1975; Smith, 1971), only one study specifically relating life events to alcohol addiction has been reported to date. Using the Holmes and Rahe SRRS, Mules, Hague and Dudley (1977) calculated event frequency as well as self-rated LCU values of subjects and found that high life-change scores were associated with alcohol addiction. But when compared with the SRRS magnitudes the self-rated stressfulness of events was greatly attenuated. Mules *et al.* (1977) believed that the alcoholic's failure to evaluate event impact when compared with normative samples did not imply actual reduction of impact, but was a reflection of the disease condition. They hypothesised that an 'overloading' effect of high life change may lead to physical and mental adaption failure as well as being an indicator of the disease process.

Predisposing Influences and the Response to Life Event Stress

Whilst acknowledging that recent stress plays a precipitating role in illness onset, a number of authors such as Brown (1974), Hinkle (1974b), and Hudgens (1974), relegate it as secondary to that of predisposing personality factors, psychopathology, social pathology, and contributing biographical and physical states.

Many studies have identified certain groups as particularly vulnerable in responding to specific events (such as bereavement) with suicidal behaviour. For example, the work of Adam (1973) has shown a link between childhood parental loss and later suicidal behaviour. On the other hand, from a review of many accident studies, Selzer and Vinokur (1975) reported that apart from alcohol overuse (which has been unequivocally shown to be related to suicidal behaviour) the psychosocial factors associated with accident proclivity do not appear to remain stable across different time periods for the same people.

In an assessment of the contextual significance of life event stress, Dohrenwend (1973a) found that persons of lower social status groups, particularly women, were disproportionately exposed to stressful situations. This was related to subsequent psychological distress as measured by symptom scores on the Langner (1962) psychiatric impairment inventory.

Markush and Favero (1974) have noted that depression and anxiety are associated with stressful events preceding illness onset. However, it may well be that many events are really symptoms of an illness, rather than an antecedent. If this is so, relationships shown between life events and illness may be spuriously inflated. The relationship of social instability and certain types of psychopathology, such as psychopathy, are well known. Such individuals manifest an abundance of life changes and instabilities, and the untangling of what is cause or effect has yet to be achieved. It has also been argued that for some people life event stress may not lead to illness but to illness behaviour. That is, to treatment-seeking behaviour where any symptoms present are the ones used as 'calling cards' for professional help following stressful episodes (Spilken & Jacobs, 1971).

Comment and Summary

Investigations presented in this review have mostly claimed to demonstrate an

association between life stress and the onset of physical, mental, and behavioural disorders, or the subsequent worsening of disorders either already present or underway. Some studies have also attempted to account for selected biographical, personality, and sociocultural influences. However, as the SRRS records facts that are tangible and easy to score and evaluate, most studies have focused on the assessment of life event stress properties using the SRRS or similarly derived measures. Because of the low baseline rate of the occurrence of many events in the general population, most of the investigations have been retrospective. A major criticism of such an approach is that other events may well result as a consequence of the criterion, physical, mental, or behavioural disorder. Recall inaccuracies may exist where the significance of distant events change over time, as well as distortions resulting from denial, interviewer effects, plaintive set, effort after meaning and social desirability responses. On the positive side, the few prospective studies have generally found in the same direction as the wealth of retrospective investigations. However, confirmation through large-scale longitudinal studies in the future is needed.

To date the research and literature overwhelmingly supports the general hypothesis that the contribution of life event stress is significant in the aetiology of physical, mental and behavioural disorders.

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