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ABSTRACT

Despite the growing accumulation of studies attesting to the association between life events and illness, either physical or mental, a number of critical methodological and conceptual issues are considered not to permit any clear answer to the basic questions regarding the importance of the role these events play in the etiology of such disorders. In an effort to address these issues, this study focuses on the overall level and types of disturbed behaviors shown by children who differ with respect to the life events which intervened between the original and follow-up interviews with their mothers in the course of a longitudinal study. Given this and the array of sociodemographic and familial variables on which the children have also been assessed and which permit examination and control for various competing hypotheses, the etiologic role of life events for psychological disorders is deemed to be determinable. The life events studied are limited to those outside of the child's and adolescents' control and/or independent of his psychiatric condition to prevent contamination between the two sets of variables. The stressfulness of life events are examined both in terms of change and undesirability-desirability. Groups clearly differentiated as to type and number of events are studied to ascertain the risks attached to exposure to different event types. (Author/JM)

An Evaluation of the Etiologic Role of Stressful Life Events in Psychological Disorders

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An Evaluation of the Etiologic Role of

Stressful Life Events in Psychological Disorders

Stressful life events have been associated with conditions ranging from physical disabilities such as athletic injuries (Bramwell, Masuda, Wagner & Holmes, 1975) and coronary heart disease (Rahe, Romo, Bennett & Siltanen, 1974; Theorell, 1974) to symptoms of psychological distress (Dohrenwend, 1973[b]; Myers, Lindenthal & Pepper, 1974) and types of psychiatric disorder (Brown, 1974, Hudgens, 1974, Paykel, 1974). Yet despite the growing accumulation of studies attesting to the association between life events and illness, either physical or mental, a number of critical methodological and conceptual issues do not permit any clear answer to the basic questions regarding the importance of the role these events play in the etiology of such disorders.

In their incisive discussion of the inconclusiveness of the evidence on this critical question, Dohrenwend & Dohrenwend (1974, Note 1) pointed out three major reasons for the quandry. The first of these concerned the study design used in most studies, namely comparison of recent stressful life event histories between matched groups with and without a specific disorder. As they indicate, "only studies of cohorts of persons who differ with respect to the nature and number of stressful life events experienced provide information about the magnitude of the risk that illness will actually follow these events" (Dohrenwend & Dohrenwend, 1975, p. 7). While this strategy has been attempted in some studies dealing with physical health in non-patient

populations (e.g., Holmes & Masuda, 1974), presently no research has been published where this strategy has been employed in the study of types of disturbed behavior and psychological impairment serious enough to warrant intervention.

However, before any definitive statement as to the risk attached to life events is made, even when a prospective study design is used, it is necessary to rule out the possibility that different event group cohorts do not differ in psychological or physical functioning prior to the life events. As Hinkle (1974) has demonstrated in numerous studies and other research has shown (e.g. Gersten, Langner, Eisenberg, Fagan & McCarthy, Note 2), there is considerable stability or consistency among individuals in the relative amount of physical or psychological disturbance shown over time. Persons who report exposure to diverse events may differ in later psychological impairment simply because of pre-existing differences in behavioral pathology. In other words, earlier behavior would be associated with later events to the same degree as those events are associated with later behavior. Such a condition could arise because the same array of sociocultural factors which have been consistently found to relate to psychological disorder (c.f. Dohrenwend & Dohrenwend, 1969) may also be central correlates of event exposure and/or reporting. In fact, as shown by Dohrenwend (1973b) life event scores were significantly correlated with social class, sex, and ethnicity. Life events and later disturbed behaviors may correlate, therefore, because of their common association with sociocultural factors, and only by con-

trolling for both initial behavior and sociocultural factors can the potential etiological contribution of life events to later behavior be ascertained.

Additional methodological issues require attention before such a determination could be made. Previous research has often relied on event inventories where many of the events reported can as easily be construed as consequences rather than causes of pathology (Dohrenwend, 1974). In order to draw clear inferences from relations between events and psychopathology, it is necessary to avoid contamination between the two variables (Mechanic, 1975). This is achieved by limiting the event population sampled to occurrences independent of either the subject's psychiatric condition or physical health (Dohrenwend & Dohrenwend, 1974). In addition, events tapping physical illness or injury to the subject should be kept separate or at a minimum because of the regularly demonstrated relationship between physical and mental health (cf. Lipowski, 1975).

Two final issues concern the conceptualization of the attribute or quality of an event which imparts its stressfulness and the manner in which the attribute or quality is assessed. Holmes and Rahe's (1967) pioneering work focused attention on the conception that a life event is stressful as a function of the change it introduces into a person's usual activities. However, change as the critical aspect in determining stressfulness of a life event, irrespective of the quality, specifically the desirability-undesirability, of the change, has been questioned with regard to disturbed behaviors. Gersten, Langner, Eisenberg and Orzeck (1974) found that scores which reflected

the undesirability of change rather than simply change alone showed significantly higher correlations with most types of disturbed behavior in both children and adolescents. In addition, weighting the events of change by the readjustment scores developed by a panel of individuals, a technique introduced by Holmes & Rahe (1967), did not produce a significant increment in correlation.

The issue as to whether change per se or the undesirability-desirability of the change is the critical dimension along which stress is gauged is often a reflection of underlying diverse theoretical conceptions of stress (Mechanic, 1975). Viewing change as the dimension of stress usually stems from a conception of stress as a nonspecific bodily response and the life event as a stressor (e.g., Selye, 1956; Levi, 1974). In contrast, the undesirability conception often arises from a theoretical perspective that places some emphasis on stimulus parameters in its stress definition. Orientations which consider the properties of the stimulus acting on the individual vary from focusing on this stimulus as the stress itself to more complex, abstract notions which see this stimulus as only one component in a whole spectrum of interacting factors involving the response, threat-perception, and coping styles of the individual (Mason, 1975).

Investigations which compare the two conceptions with regard to the relationship between life events and psychological illness have immediate bearing on which theoretical perspective is more fruitful in this area. While this paper is aligned with the orientations which consider the properties of the stimulus, it is recognized that

an undesirable life event when deemed stressful is simply a stimulus with only the potential capability of producing psychological illness. Differences among individuals in terms of their perception of the undesirability of an event, their coping and defensive styles are some subject characteristics which could make an event range from very stressful to non-stressful across people.

The importance of individual perception in determining the stressful impact of a stimulus has been widely discussed (e.g. Cofer & Apley, 1964) and is an issue which requires consideration. For example, Hinkle (1974) has reported on a phenomenon he terms "emotional insulation" or the ability to experience major life changes with little health effects in some people. Alternatively, this may be seen as the ability to perceive a change as not a change. For such persons, their perception of an event has effectively rendered them a "zero" or no change group with respect to the change dimension. It is of considerable relevance to the change conception of life events to ascertain if such persons are similar in their illness behavior to persons who actually experience no events.

A "zero" group of a different nature is also possible. While researchers (e.g. Dohrenwend, 1973a; Gersten, et al., 1974) have examined undesirability in terms of a balance between undesirable and desirable events on the assumption that the latter cances the effects of the former, the small representation of desirable events on most inventories has practically assured that such balance scores are heavily weighted in the undesirable direction. In other words, true balance or the "zero" group produced when the number of desirable

events equals and cancels the numbers of undesirable events has not been investigated.

Therefore, in order to clarify these issues regarding the "stressful" nature of life events, the psychological status of clearly defined groups who differ with respect to degree and undesirability of change should be studied, with undesirability determined both by the perception or judgment of persons outside and within the subject's environment.

In an effort to address the several methodological and theoretical issues raised, this study will determine the overall level and types of disturbed behaviors shown by children who differ with respect to the life events which intervened between the original and follow-up interviews with their mothers in the course of a longitudinal study. Two assessment points for the children's and adolescents' behaviors are thus available, one prior to and one after the life events. Given this and the array of sociodemographic and familial variables on which the children have also been assessed (Eisenberg, Langner and Gersten, 1975) which permit examination and control for competing hypotheses that posit confounding relationships among life events, behavioral stability, and sociocultural factors, the etiologic role of life events for psychological disorders is determinable. The life events studied are limited to those outside of the child's and adolescents' control and/or independent of his psychiatric condition to prevent contamination between the two sets of variables. The stressfulness of life events will be examined both in terms of change and undesirability-

desirability to establish if the previous finding with regard to the superiority of the latter in predicting disturbed behaviors, (Gersten, Langner, Eisenberg and Orzeck, 1974) is supported. Additionally, the desirability-undesirability and the change impact of an event will be assessed both by external judges and by a person close to the subject. Groups clearly differentiated as to type and number of events, in particular the three "zero" groups previously discussed, will be studied to ascertain the risks attached to exposure to different event types.

METHOD

Sample

The children studied comprised a representative sample of 1,034 children aged 6 to 18 who were randomly selected from a cross-section of Manhattan households between 125th and Houston Streets. At Time I, from each health area designated by the City Planning Commission in that section of the city, a cluster of eight dwelling units was randomly selected, and every thirtieth cluster thereafter in the health area was selected. All eligible families (i.e., those that had a child 6 to 18 years of age) in a cluster were then enumerated, and a selection pattern was assigned to a cluster that gave children across clusters an equal probability of selection. This stratified systematic cluster-sampling plan resulted in a sample that was 56% white, 14% black, 29% Spanish-speaking, and 1% other. Each age group except the oldest comprised nearly one-thirteenth of the sample, and males and females were fairly evenly distributed across the 13 age

groups. At Time II, on the average five years later, the sample was followed-up. The follow-up was conducted in such a manner as to ensure constancy of the ethnic proportions at both time points. This rule set a lower bound to the follow-up, since many of the Spanish-speaking families had moved out of the city and could not be located. A total of 732 families or 71% of the original sample constituted the follow-up sample or the group of children for the longitudinal study. The follow-up sample of 732 families did not significantly differ from the original sample of 1034 families on any measures in Time I, namely age and sex of children, demographic characteristics, marital and parenting dimensions, and child behavior dimensions. The follow-up sample thus represented an unbiased subsample of the original sample. The children at Time II ranged from early preadolescence to early adulthood.

Procedure

Mothers in the selected households were interviewed at both points in time using a structured questionnaire about the child and the family. The Time I questionnaire contained items concerning the child's behaviors and development, demographic characteristics of the family, qualities of the marriage and parents' personality, and behaviors and attitudes of the parents toward the specific child. The Time II questionnaire covered those same areas and had additional questions regarding intervening life events. The ethnic background (White, Black, Spanish-speaking) of the interviewer and respondent were matched as much as possible. Since interviewing the families at

each of the two points took more than a year to complete, the two interviews were not separated by five years in all cases!

Total impairment rating and disturbed behaviors. At Time I, a computer summary of the questionnaire information dealing only with the child's behavior (654 items) was used by two project psychiatrists to rate each child on a five-point total impairment rating scale (T.I.R.) where one equalled well or minimal impairment and five equalled severe impairment. The raw rating distribution of each doctor was transformed into a standard score distribution. The reliability coefficient for the average of two psychiatrists on this rating was .84. Validity information for this rating was summarized earlier (Langner, Gersten, Greene, Eisenberg, Herson, & McCarthy, 1974).

Also at Time I and independently from their psychiatric evaluation, 287 child behavior items were factor analyzed (orthogonal varimax rotation) forming 18 dimensions using a total of 222 items. From the original pool of 654 items some items were dropped because of low frequencies or age-contingencies while 200 other items were collapsed into a set of scores (number of fears, number of illnesses, etc.). The correlations between the 18 factors and TIR were determined, the average correlation being .30. The multiple correlation between TIR and the set of 18 factors was .78. Six dimensions had zero-order correlations above the average of .30 and together had a multiple correlation with TIR (R=.73) which was only slightly lower than that found when all 18 dimensions were entered. For these reasons, these six dimensions will be used as the dependent variables of types of disturbed behavior for this study. These six factors with items of representa-

tive content, their internal consistency reliabilities at both times and their Time I correlations with actual TIR are given in Table I.

Insert Table 1 about here

To obtain the Time II measure of total impairment, a computer simulation technique was employed. The simulation used introduced age-sex standardization into an earlier simulation model (see Gersten, Langner, Eisenberg & Simcha-Fagan, 1975). Briefly, the multiple regression equation between the child factors and Time I TIR was obtained for each sex in five age cohorts (6-8, 9-11, 12-14, 15-16 and 17+). The TIR generated for a particular child was by use of his age-sex specific equation. The correlation in Time I between the distribution of actual TIR scores and the distribution of simulated TIR scores generated by 10 distinct regression equations was .81. The appropriate Time I age-sex set of regression weights were applied to Time II factor scores to develop the Time II TIR scores. The Time I continuous distribution of simulated TIR scores was cut into the five-point scale originally used by the psychiatrists when rating so as to match the marginal frequencies of those originally given by the average of the psychiatrists rating distributions. These same cutting points were applied to the Time II distribution. The TIR variable used in this paper will be either the Time I or Time II age-sex standardized simulated version.

While all of the above measures of disturbed behavior derive from the mothers' questionnaire information, the last index of disturbed behavior comes from a source independent of the mother, namely agency

data. The records of the New York City Police Department, Family Court and Special Services for Children were searched with regard to each study child. If a record was found for a child, it was coded in detail, with particular reference to delinquent and criminal behavior. After excluding all entries which did not represent juvenile-status and/or adult law violations, a dichotomous variable -- delinquent-criminal record versus no delinquent-criminal recort after the Time I interview -- was established.

Life event occurrences. During the Time II interview, a check-list of 26 events was asked of all mothers, which was introduced in the following manner: "There are many things that happen in the life of a child. Some of these things have a big influence on his life, and some make very little difference. During the past five years, have any of these things happened in your family?" Five of these 26 events were dropped because of non-independence from the child's psychological functioning. A question which asked for spontaneous comment regarding any change or event which occurred produced only one event which was not overlapping with the former instances. An additional 12 events were obtained by a review of the questionnaire for occurrences independent of the child's behavior within the five year intervening period. Each event was judged by three members of the project staff as to its undesirability, desirability or ambiguity and assigned to the category for which there was a consensus among the raters. The 34 events with their undesirability-desirability rating (U-undesirable, D=desirable; A=ambiguous) are given below.

U - 1. Mother had severe illness or accident.
U - 2. Father had severe illness or accident.
U - 3. Family had serious financial troubles.
A - 4. Family had to move.
U - 5. Parents divorced.
U - 6. Parents separated.
U - 7. Mother remarried.
U - 8. Father remarried.
A - 9. New birth(s) occurred in family.
U - 10. Death(s) occurred in family.
A - 11. Any sibling(s) left household.
U - 12. Child had severe illness or accident.
A - 13. Child changed schools.
U - 14. Mother's health worsened.
D - 15. Mother's health improved.
U - 16. Mother's moods, feelings about life in general worsened.
D - 17. Mother's moods, feelings about life in general improved.
U - 18. Father's health worsened.
D - 19. Father's health improved.
U - 20. Father's moods, feelings about life in general worsened.
D - 21. Father's moods, feelings about life in general improved.
U - 22. Child a victim of violence (mugging, rape, robbery).
U - 23. Sibling(s) dropped or flunked out of school.
U - 24. Sibling(s) in trouble because of drugs.
U - 25. Sibling(s) been arrested.
U - 26. Sibling(s) been institutionalized.
U - 27. Mother been institutionalized.
U - 28. Father been institutionalized.
A - 29. Mother in therapy.
A - 30. Father in therapy.
A - 31. Sibling(s) referred for therapy.
U - 32. Husband unemployed status made it hard to feel warm and loving to chi
U - 33. Mother unemployed status made it hard to feel warm and loving to chil
U - 34. Mother job trouble made it hard to feel warm and loving to child.

Life event measures. The objective change score was the total of the 34 events listed above. The objective undesirable score was the sum of the 23 undesirable events within the 34. For the first 13 events on the list, an evaluation of the impact of the event was obtained from the mother. The specific question asked, if the event had occurred, was "how did this affect X (the study child)? Very badly, badly, not too much, not at all, or helped him?" A set of scores reflecting the perception of the event by a person close to the child was then developed and labeled subjective scores. The sum of all events from the 13 assigned to the very badly, badly or not too much categories constituted the subjective undesirable score, where the first two designations received a weight of two and the third a weight of one. The subjective no-change score was the total of all events perceived as affecting the child not at all. The sum of all events which the mother perceived as helping the child comprised the subjective desirable score. The simple sum of these 13 events was the restricted objective change score.

Life event groups. In order to contrast people clearly different in the type of events to which they were exposed, five mutually exclusive groups were developed from the subjective and restricted objective change score in the following manner. The subjective desirable group (S. Des.) was composed of subjects for whom all events in the restricted objective change list were perceived as desirable by the mother. In other words, the restricted objective change score equalled the subjective desirable score for this group. When all

events which occurred were perceived as not affecting the child at all, or the restricted objective change score equalled the subjective no-change score, the subjects were assigned to the subjective non-change group (S. No-Chg.) Subjects whose subjective undesirable and subjective desirable scores cancelled each other constituted the subjective balance group (S. Bal.). To ensure that the undesirable group actually reflected exposure to high undesirable events, i.e. the very badly and badly categories rather than the mild and somewhat ambiguous category of not too much bad affect, only subjects whose subjective undesirable score exceeded the restricted objective change by one or more units were assigned to the subjective undesirable group (S. Undes.). The fifth mutually-exclusive group was the objective non-change group (O. No-Chg.) made up of subjects whose restricted objective change score equalled zero or none of the 13 events had occurred in the five-year interval. In order to further clarify if exposure to either a large number of life-event changes

or a large number of undesirable events as objectively determined produced a significant increment in risk for pathology, two additional groups were developed. These two groups were not mutually exclusive of either each other or the five earlier groups, in other words there was overlap in people among one of these two later groups and one of the mutually exclusive groups, except for the fifth or objective non-change group. One of these two groups was a high objective change (Hi O-Chg.) group which consisted of persons whose scores on the objective change measure were at least one standard deviation unit higher than the sample mean of that measure. The other

group, the high objective undesirable (Hi O-Undesir.), was formed by subjects scoring at or above one-standard unit from the sample mean of the objective undesirable score. The number of cases, mean, standard deviation and range of the number of events for each of these seven groups are given in Table 2.

Insert Table 2 about here

Social and familial variables. The child's sociocultural milieu was assessed by variables in three sets; socio-demographic, parental and parent-child. The development and characteristics of these variables are presented in detail in two prior publications (Eisenberg, Langner & Gersten, 1975; Langner, Gersten, Eisenberg, Greene & Herson, in press) and, for the sake of brevity, are summarized here. The socio-demographic variables are 11 of 45 such variables which showed a significant unique contribution to four measures of behavior and impairment. They include age, sex, two dummy-coded variables for the three ethnic groups, mother's education, monthly rent, Welfare status, number of addresses in New York City, number of children in the family, child always in care of natural mother, and number of natural parents in home. The parental set was comprised of eight factors obtained via factor analysis of questionnaire items dealing with parental personality and marital qualities. They were isolated parents, unhappy marriage, mother's physical and emotional illness, mother's economic dissatisfaction, parents' quarrels, unleisurely parents, traditional marriage, and unaffectionate marriage. The

parent-child set of factors dealt with parental behavior and attitudes toward the study child. The five factors obtained via factor analysis of such items were parents cold, parents punitive, mother traditional-restrictive, mother supportive-directing, and mother excitable-rejecting.

Results

Event Groups

The children considered seriously disturbed and in need of intervention were those rated as 4 or 5, i.e. markedly or severely impaired, on the total impairment rating or TIR (Langner, Gersten, Eisenberg, Greene, Herson & McCarthy, 1974). To ascertain if the five mutually exclusive event groups were significantly associated with rates of future serious impairment (4 and 5 cases = 4+), a Chi-square was done on the frequency of 4+ cases in Time II. To rule out the possibility that differential rates existed prior to the events, a Chi-square was performed on the Time I 4+ frequencies of the five groups. Chi-square was also used to determine if the number of children with a delinquent-criminal record after the Time I interview significantly differed by the event groups. One-way unweighted-means analyses of variance in which the five exclusive event groups formed the independent variable were done for each of the six disturbed behavior dimensions in both Time I and Time II to ascertain if the type of event-exposure was associated with different disturbed behaviors. The alpha level selected for these Anova's was .01. The 4+ frequencies and percentages, means, and results of all analyses at both times are given in Table 3.

In addition, the 4+ frequencies and means are presented in Table 3 for the two non-independent event groups for comparison purposes.

Insert Table 3 about here

The results in Table 3 indicate that rates of serious psychological impairment and the means of mentation problems, fighting and delinquency at the follow-up point significantly differed by the event groups. The mean delinquency scores and serious impairment rates of the event groups, however, also were significantly different at Time I prior to the events. While there was no significant difference among the event group means on mentation problems and fighting at Time I as there was at Time II, this lack of significance was primarily due to the larger within-group variance at the earlier time. If the between-groups variance found at Time I was tested using the Time II within-groups variance, significant differences among the means at Time I would occur. The event groups did not significantly differ at Time II with regard to the means on conflict with parents, regressive anxiety, and isolation or the rates of agency recorded delinquent-criminal behavior.

For those impairment variables where an overall significant effect was noted, either a set of pairwise Chi-squares or Scheffe's technique for a posterioi comparisons was applied to locate the actual groups which differed. For the two disturbed behavior dimensions significant only at Time II, the significant pairwise mean comparisons always

involved the subjective undesirable group as one of the groups. In the case of mentation problems, this group was significantly more disturbed than the subjective no-change group. The same contrast was also significant for fighting, but, in addition, the objective no-change group showed significantly less fighting than the subjective undesirable group. In other words, the only significant contrasts for both fighting and mentation problems at Time II were between the most extreme groups, i.e. the subjective undesirable group evidencing most pathology and the no-change groups the least pathology.

With regard to the variables which significantly differed among the event groups at both time points, the significant comparisons again involved the subjective undesirable groups. This group had significantly higher rates of serious impairment at Time II than each of the other four groups. At Time I, the subjective undesirable group had significantly higher impairment rates only with respect to the objective no-change group. The delinquency means significantly differed at Time II only between the subjective undesirable group and the subjective desirable group. These two groups also significantly differed at Time I, and in addition the subjective undesirable and the objective no-change group differed.

In general, then, the subjective undesirable group was at greatest risk of pathology on these disturbance variables. In fact, it evidenced the same pattern even on variables where no significant effect was found. However, and more critically, the higher scores of these subjects on level and types of disturbance existed prior to their event

exposure, that later type of event exposure having served as the basis for classification of persons into the groups. Both of the no-change groups, whether objectively or subjectively defined, evidenced least pathology, but did so both before and after event exposure. The subjective no-change group showed levels of impairment almost equivalent to the low levels displayed by the objective no-change group, despite the fact that they had experienced one to four events which the objective group had not experienced.

The issues regarding amount of change vs. undesirability and subjective vs. objective assessments of stress were addressed further by the contrasts of the subjective undesirable group with the high objective-change and high objective undesirable groups respectively. The high objective-change group were exposed to three times as many events on the average as the subjective undesirable group, yet on most measures the scores of the two groups were within tenths-of-a-point of each other. The largest difference noted, in fact, was the nearly 4% greater rate of the objective no-change with respect to the delinquent-criminal record variable. Similarly, while the high objective-undesirable group had experienced a greater average number of undesirable events, but as objectively defined, than the subjective undesirable group (5 vs. 3 respectively), the rates and means of the two groups across the set of disturbance variables were remarkably similar.

Event Scores

Relations with disturbed behavior. The prior results with the event groups pointed to a number of conclusions that required further

testing. The first was that undesirability of an event as subjectively assessed was as powerful in relation to psychological impairment as total objective change or undesirable change as objectively determined, even though both of the latter involved a greater range and number of events. The second was that, in many instances, differences in behavioral pathology among people after exposure to different events appeared to stem from continuity of preexisting differences in such pathology. Additional insight into these questions was obtained by determining the correlations between the various event scores and disturbed behaviors prior to and after the events. These correlations and the variances of the event scores are given in Table 4.

Insert Table 4 about here

The pattern of correlations in Table 4 is one of weak association between any event score measure and disturbed behaviors at both time points. Using the t-test for difference in non-independent correlations (McNemar, 1969), and an alpha level of .01, it was found that no event score measure showed a significant difference between its Time I and Time II correlations with any measure of disturbed behavior. In other words, none of the 36 comparisons between the correlations of an event score with disturbed behavior prior to and after the events resulted in a significant difference. When the correlations of the subjective undesirable score and any disturbed behavior in Time II were compared with either the respective correlations of the objective total change score or the objective undesirable score, using the same t-test tech-

nique, again no significant differences were found. The total change score evidenced no significantly different, in particular greater, correlation with any disturbed behavior dimension than did the objective undesirable or subjective undesirable scores with those behaviors. Yet the total change score had nearly twice the variance as either of the other scores. For all practical purposes then, since all the comparisons between these three scores did not result in a single significant difference in correlation with Time II behaviors (or, in fact, with Time I behaviors), the correlations of these event measures with disturbed behaviors may be considered equivalent.

Relations with social and familial variables. The correlations among each of the six event score measures and the 22 sociodemographic and familial (parental and parent-child factors) variables were calculated at both times. Only correlations significant at the .05 level or better ($r \geq .07$) were considered and the pattern of significant correlation across the social and familial variables for each event score is presented in Table 5.

Insert Table 5 about here

One first notes upon inspection of Table 5 that each of the event scores evidenced a substantial number of significant correlations with the social and familial variables. The largest number of significant and strongest correlations were seen for the objective total change and undesirable scores. At least 50% of the social and familial variables were significantly correlated with these scores at both time

points. The subjective undesirable score showed nearly the same level and number of significant correlations. These three scores, the objective change, objective undesirable and subjective undesirable, were correlated with these variables at both times in the same direction. Thus, the number of total objective events, total objective undesirable events or subjectively assessed undesirable events was greater for families on Welfare, families with fewer natural parents, greater number of children, and more addresses in New York City. In addition, higher scores on unhappy marriage, mother's emotional illness, unleisurely parents, and mother's economic dissatisfaction were associated with higher scores on these three event measures at both times. The objective undesirable and change scores were also significantly related at both times to higher scores on unaffectionate marriage, parents cold and mother excitable-rejecting.

As an interesting sidelight, it was noted that the largest single correlation found between any one of these three event scores and a social or familial variable involved mother's physical and emotional illness. The objective undesirable score showed a significantly greater correlation compared to the other two scores with this measure of the mother's psychological disturbance at Time II but not Time I. The size of this correlation ($r = .42$), which was so much greater than any noted when the child's behaviors were the dependent variables, is of course inflated by the fact that for the mother the events sampled were not independent of her psychological functioning or physical health.

The subjective desirable score, while evidencing fewer significant correlations with the social and familial variables, was correlated with these variables in the same direction as the three scores just discussed. In contrast, the objective desirable and subjective no-change scores showed, in general, a pattern of correlation of opposite directionality to the four other scores. More objective desirable events occurred and more events were assessed as constituting no-change as mother's education, monthly rent and parental leisure activities increased, while mother's traditional-restrictiveness decreased.

In all, the event scores, in particular the undesirable and total change scores, show substantial correlations with a number of social and familial variables. Of particular importance, the measures of the social-familial milieu antecedent to the events are related to the occurrence of the events. While of less critical importance, the two sets of variables are also associated when assessed simultaneously.

Contribution of events. Six hierarchical multiple regressions were done in which one of the six disturbed behavior dimensions at Time II was the criterion or dependent variable. For each regression, the set of event variables was entered into the equation for the dependent variable only after the contributions of the social-familial variables and initial behavioral disturbance were controlled. Since there were 22 social-familial variables at each time point plus two age determinations and sex for a total of 47 variables, reduction of this variable complex was the first task. Variables within each set, the sociodemographic, parental and parent-child, were limited to those

which had made a significant unique contribution of 1% variance (i.e. when all other independent variables were controlled) to the prediction of any child behavior at either time point. The 32 variables which remained after this reduction-process were formed into five variable sets. These five sets were composed of the following variables and entered into the regression equation in the following order: Set 1) 3 variables - Time I and II age, sex; Set 2) 12 demographic variables - Spanish vs. Other, Black vs. Other, Time I and Time II measures of Mother's Education, Monthly Rent, Number of Natural Parents, Number of Children, Number of Addresses in New York City; Set 3) 6 Parental factors - Time I and Time II measures of three of eight parental factors, namely Mother's Physical and Emotional Illness, Parents' Quarrels, Traditional Marriage; Set 4) 10 Parent-Child variables - Time I and Time II measures on all five parent-child factors; Set 5) 1 Behavior variable - Time I assessment on behavior dimension of particular criterion variable.

The sixth or final set entered into the regression was the event score set. The intercorrelations among the six measures are given in Table 6. Due to the high level of intercorrelation among a number of

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Insert Table 6 about here

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the event scores, their similar relationships to both initial behavior and social-familial variables, and the necessity to keep the number of predictor variables at a reasonable size, four of the six event scores were selected for the set. The four were the objective undesirable

and desirable scores, the subjective desirable and subjective no-change scores. These four variables well represented the range and evaluation of events while at the same time kept variable redundancy at a minimum, so individual variables contributions could be adequately assessed if the set significantly contributed to the equation. Since the contribution of the event set is the relevant issue for this paper, the only concern at hand was the amount of variance accounted for in a particular measure of disturbed behavior before and after the introduction of the event set to the equation, after all other relevant variables were controlled or the other five sets had been entered. In other words, did the addition of the event set result in a meaningful increment in predicted variance in a specific disturbed behavior? The criterion adopted was not a statistically significant increment at the .01 level, since an unmeaningful miniscule amount of variance could produce this result due to the large sample size. Thus, the criterion was that a set add at least 1% variance to the regression, a minimally meaningful increment. The results of the hierarchical multiple regressions are presented in Table 7. The variance percentages are based on the shrunken R^2, i.e. the squared multiple correlation corrected by the number of predictor variables.

Insert Table 7 about here

It was found as seen in Table 7 that the set of event scores did not add one percent variance to the multiple regression for any of the six disturbed behavior dimensions. For four of the six dimensions,

Mentation Problems, Conflict with Parents, Fighting and Delinquency, the event scores made a unique variance contribution of zero to the prediction equation. When the progression in addition of sets was examined in order to ascertain at what point in the regression the predictive power of the event scores diminished to inconsequential levels, it was found that it occurred when only the first three sets had been entered and controlled. In other words, controls for age, sex, demographic and parental variables were sufficient to nullify any meaningful contribution from the event scores.

DISCUSSION

The question central to this investigation of life events was whether such events play an etiological role with respect to psychological disorders in adolescents and young adults. While the many associations found in earlier studies between such events and psychological disturbance suggested a potential affirmative answer to this question, a host of methodological issues required careful attention before suggestion could become demonstration.

It is an axiom at the heart of research that if some concept has an important effect on a phenomenon, then greater methodological rigor and control should be more likely to demonstrate that effect. Yet, in general, each specification and control undertaken in this research with respect to the life events - psychological disorder relationship weakened the importance attached to that association.

In the earlier study by Gersten et al. (1974) which studied life events in relation to shorter, less reliable subscales of the full

dimensions studied here, the associations found were stronger. An additional weakness in the previous study was the confounding between the independent variables or life event measures and the disturbance measures. Although the number of confounded events were minimal, they were critical when seen in the light of weaker correlations when the event population was broadened and the dependent variables were more psychometrically sound.

The proposition that undesirability rather than change is the more productive operational approach to assessing the stressfulness of life events in relation to psychological disorders was further substantiated. In no case did the simple amount of change relate to a significantly greater risk or level of disturbance. Undesirability as subjectively assessed was particularly powerful, resulting in associations and differentiation in risks for behavioral pathology as strong as those found when a greater number of objectively defined changes or undesirable events constituted the exposure. The importance of the person's perception in determining the stress value of an event was further reinforced by the fact that persons who saw an event as not constituting a threat showed no difference in behavioral disturbance from persons who experienced no events at all. Finally, exposure to the same average amount of events but a balance in those events between desirable and undesirable rather than strictly the latter type of event was associated with lower levels of disturbance.

However, these issues regarding the conceptualization and assessment of the stress impact of an event diminish in significance when

placed in the context of the further findings. One of the most striking results of this study was that disturbed behaviors and total degree of psychological impairment prior to the events was usually as strongly related to the types and quantity of events as the events were to later identical measures of disturbance. Over the average five-year interval separating the two interviews while the children and adolescents in general showed decreased levels of regressive anxiety, mentation problems and isolation, they showed constant or increasing levels of aggressive behavior, namely fighting, conflict with parents, and delinquency. (Gersten, Langner, Eisenberg, Simcha-Fagan, and McCarthy, Note 2). Yet the event scores evidenced no greater correlations with the types of behavioral disturbance which increased over time than with the type which decreased. The event scores were also consistent in that they related to both the pre- and post-measures of types of disturbance which increased or decreased.

It is highly unlikely that this pattern of correlation between events and disturbance could be ascribed to the common respondent, the mother, for the measures. While stability or consistency was found for these behaviors, the corrected stability coefficients ranged from .50-.70, leaving considerable room for variability in behaviors. The mother reported on both behavior and the intervening events at the follow-up point. But if her knowledge of the events colored her perception of the behavior or her knowledge of the behavior affected her recall and report of the events, it is stretching beyond reason to presume these same processes account for the relationships between

the events and behavior prior to their occurrence. In addition, when a variable of disturbance was studied which was independent of the mother's report, agency-recorded delinquent-criminal behavior after the time of the initial interview, no significant differences in the rates of such recorded behavior were found by types of event exposure.

On the basis of the results, the explanation for the correlation between events and disturbed behaviors at both times appears to lie in another direction. Events occur in an ongoing life situation. The characteristics of this life situation are many and may in any individual child's case consist of long-standing difficulties, as impoverished economic standing, quarreling and unhappy parents, punitive parents, a chronically ill mother, and so forth. These difficulties may be considered stressful processes to which the child is rather consistently exposed. Life events are, for the most part, discrete occurrences which happen in the context of those processes.

It has been hypothesized by others (e.g. Dohrenwend, 1973) that certain social status characteristics of the life situation may result in higher exposure to events, and this higher exposure could serve as an explanatory link between the well-documented social status and psychological disorder relationships (Dohrenwend and Dohrenwend, 1969). In like manner, other difficult life situation characteristics could produce certain occurrences labeled as events or changes. For example, an unhappy marriage results in quarrels or divorce, an emotionally and physically mother has another operation or is institutionalized, cold parents could result in a sibling leaving home or being arrested, or

living in a low rent area enhances the chances of becoming a victim of crime. A majority of the social and familial variables used to characterize the children's and adolescents' life situation were significantly correlated with the later occurrence of changes or events. Since they continue as aspects of the life situation throughout the followup interval or are what we termed stressful processes, it would be expected that they would be correlated with events throughout the course. The issue thus becomes whether these measures of changes or events contribute anything to the explanation of psychological disorders above and beyond that afforded by the social-familial milieu. The results of the multiple regression analyses were resoundingly negative. The event scores did not make a minimally meaningful contribution to any dimension of disturbed behavior after controlling for the stressful processes in the child and adolescents' life situation.

Thus, the competing hypothesis which posited the events-psychological disorder association as a confounded relationship received strong support. Events related to disorders in this study because both are related to aspects of the environment conceived as stressful processes. In fact, it can be seriously questioned as to whether scores based on checklists of changes or events in a person's life are in fact measuring the separate, distinct variable called changes or events in life conditions. In the multiple regression analysis, controls for certain demographic and parental, i.e. mother's personality and marital qualities, aspects of the child's and adolescent's life situation were sufficient to decrease the predictive strength of the set of life event scores to non-meaningful levels. This suggests that life event measures may derive

their associative strength for psychological disturbances because they tap in a crude way the long-standing difficulties or stressful processes of the life situation.

Two interpretations for these results can be given. One is methodological and assumes the reasonableness of the life change event-psychological disorder hypothesis and thus concludes that the independent construct of quality of change or change itself was not assessed by the measures in this study. The events used differed from those in most previous investigations in that all events which overlapped with psychological disorder were removed. The scores reflecting quality of an event were both subjectively and objectively assessed. The occurrence of the events, however, was assessed over a considerable time interval and actual time of occurrence was not addressed. However, it is difficult to see how restriction of the time span and dating of an event would in any way affect the correlations of those events with prior, pre-existing pathology and with the social and familial environment factors.

The implications of the methodological explanation are extensive. It poses a critical assessment problem for the entire research area, namely how is change to be measured in an alternative fashion. It is a problem certainly not confined to this checklist or these measures or to the examination of psychological illness. Sarason, de Monchaux, & Hunt (1975) raised the issue as to what the measures really reflected for the life change event scores derived from the schedule of recent experience (SRE) used by Rahe and his associates in extensive research

on physical illness (see Rahe, 1975). While Rahe (1975) asserts that his instrument and its derived scores do measure an independent dimension of recent life stress, his investigations have not examined them simultaneously and comparatively with the dimension of stress concurrent with those events, stressful processes in the life situation. In a similar fashion, previous investigations into the intervening, explanatory role provided by life events for social status differentials in psychological disorder (e.g. Dohrenwend, 1973b; Myers, Lindenthal and Pepper, 1974) have neglected the fact that individuals simultaneously occupy numerous stressful social statuses and are involved in many stressful processes correlated only moderately with those statuses.

The second interpretation, and the one which appears more likely in the light of the methodological precautions taken with regard to the measures, is based on considering the measures adequate operationalizations of the construct of a life change event. Given this, serious doubt is cast on the proposition that stressful life change events play an etiologic role with respect to psychological disturbances in preadolescents and young adults 11 to 23 years of age, once the stressful life processes in the life situation of those individuals have been controlled. These processes are the crucial dimension of recent life stress with potential etiologic significance for psychological disorder. As a final note, it is possible that certain types of life change events have etiologic significance only within certain complexes of stressful processes. The complex research necessary to address this question is left to the future.

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Footnotes

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[1]For the 732 children with information at both time points, 68% had their assessments separated by five years while the remaining 32% had their assessments separated by a longer and, in some few instances, a shorter interval. The range of years for the interval between interviews was three to seven years.

Table 1

Six Child Behavior Factors with representative items

the reliability coefficients of the factor at both times

(T-I & T-II) and correlation with the total impairment rating (TIR)

Factor	Content	Reliability Coefficients T-I	T-II	TIR
Mentation Problem (N=21)[a]	Mixes up words Has trouble remembering things	.87	.84	.54
Conflict with Parents (N=38)	Often blows up easily with Mother Often blows up easily with Father	.94	.93	.49
Regressive Anxiety (N=24)	Has many fears Often wakes up in a panic	.88	.85	.46
Fighting (N=21)	Teases other children Does not get along with other children at school	.90	.89	.50
Delinquency (N=19)	Smokes Plays hookey	.86	.85	.36
Isolation (=9)	Often plays alone Doesn't keep a friend a year or more	.79	.78	.42

[a]N is the number of items in the factor.

Table 2

The number of subjects, mean, standard duration and range of number of events for each event group[a]

Measure	Event Groups						
	S. Des.	S No-Chg.	O. No-Chg.	S. Bal.	S. Undes.	Hi O-Chg.	Hi O-Undes.
N	69	83	57	111	127	122	171
$\bar{X}$	1.8	1.3	0	2.9	3.0	8.9	5.1
s.d.	1.0	0.5	0	0.8	1.4	2.3	1.6
Range	1-5	1-3	0	2-6	1-6	7-20	4-13

[a]S = subjective; O = objective

Table 3

Frequencies (f) and Percentages of 4+ cases and delinquent-record cases, Means of Behavior[a], and Analytic Results for the Event Groups at Both Times

		MUTUALLY EXCLUSIVE GROUPS					RESULT		
Variable		S. Des.	S. No-Chg.	O. No-Chg.	S. Bal.	S. Undes.		Hi O-Chg.	Hi O-Undes.
4+	T-I f	8	8	3	13	24	χ^2=12.0*	25	32
	T-I %	11.6	9.6	5.3	11.7	18.9		20.5	18.7
	T-II f	4	3	2	9	23	χ^2=17.5**	23	27
	T-II %	5.7	3.6	3.5	8.1	18.1		18.9	15.8
Mentation	T-I	136.8	139.6	138.0	137.2	136.3	F=1.90	134.8	135.9
Problems	T-II	140.4	141.4	141.4	139.5	137.5	F=4.62**	137.1	137.9
Conflict with Parents	T-I	177.9	174.9	174.6	174.1	171.8	F=1.50	170.4	172.4
	T-II	170.9	172.9	174.2	167.7	167.0	F=3.21	165.1	166.4
Regressive Anxiety	T-I	112.8	116.1	113.1	113.2	112.7	F=1.85	111.7	112.6
	T-II	117.4	118.5	118.1	116.9	115.4	F=2.56	115.0	115.6
Fighting	T-I	126.4	126.5	125.9	124.6	122.9	F=2.13	122.4	123.5
	T-II	126.2	126.9	127.1	124.9	122.9	F=4.73**	122.5	123.4
Delinquency	T-I	133.2	131.4	133.3	131.4	128.7	F=4.98**	129.1	129.1
	T-II	132.1	130.1	131.3	128.4	127.2	F=4.11**	126.2	126.5
Isolation	T-I	42.1	42.2	42.1	41.5	41.3	F=0.82	41.4	41.5
	T-II	43.0	43.8	43.7	43.2	42.3	F=1.80	42.5	42.5
Delinquent Record	T-II f	8	6	4	14	19	χ^2=4.2	23	30
	T-II %	11.6	7.2	7.0	12.6	15.0		18.9	17.5

[a] The lower the factor mean, the greater disturbance.

* $p \leq .05$
** $p \leq .01$

Table 4

Variances and Correlations of Event Scores with Disturbed Behaviors Prior to (T-I) and After (T-II) the Events[a]

Event Scores	σ^2	Disturbed Behaviors: Mentation Problems T-I	Mentation Problems T-II	Conflict with Parents T-I	Conflict with Parents T-II	Regressive Anxiety T-I	Regressive Anxiety T-II	Fighting T-I	Fighting T-II	Delinquency T-I	Delinquency T-II	Isolation T-I	Isolation T-II
Objective:													
Total Change	7.7	.12[b]	.17	.13	.17	.10	.16	.15	.16	.15	.18	.05	.08
Desirable	0.5	-.06	.03	.14	.05	.12	.16	.08	.09	.04	.03	.00	.02
Undesirable	4.0	.14	.18	.07	.14	.05	.14	.11	.14	.18	.19	.04	.09
Subjective:													
Desirable	3.4	.18	.10	.01	.06	.02	-.02	.01	.00	-.01	.05	.06	.04
Undesirable	3.6	.11	.18	.07	.13	.06	.14	.11	.17	.17	.17	.05	.09
No-Change	0.5	-.04	-.07	.06	-.01	.01	.03	.04	-.01	-.03	-.11	.01	-.03

[a]A positive correlation indicates a direct relationship, i.e. the higher the event score, the greater disturbance of that type.

[b]$r = .08$, $p = .05$; $r = .10$, $p = .01$.

Table 5

Significant Correlations of each Event Score with

Social and Familial Variables at Times I & II

Social and	Objective Scores						Subjective Scores					
Familial	T-C[a]		U		D		U		D		N-C	
Variables	T-I	T-II	T-I	T-II	T-I	T-II	T-I	T-II	T-I	T-II	T-I	T-II
Spanish	-	-	-	-	-.20	-	.10	-	-	-	-.07	-
Black	.09	-	.09	-	-	-	-	-	-	-	-	-
Years Mother's Education	-	-	-.08	-	.23	.21	-.08	-.09	-.09	-.08	.12	.12
Monthly Rent	-	.07	-	-	.19	.19	-.07	-	-	-	.08	.13
On Welfare	.16	.24	.17	.24	-	-	.12	.22	.14	.15	-	-
Number of Parents	-.13	-.23	-.16	-.24	-	-	-.10	-.19	-	-.08	-	-
Number of Children	.28	.25	.23	.18	-	-	.17	.10	.17	.19	-	-
Number of Addresses	.12	.18	.10	.11	-	-	.14	.16	-	.10	-	-
Natural Mother's Care	-	-.08	-	-.09	-	-	-	-	-.09	-	-	-

[a]T-C = Total Change; U = Undesirable; D = Desirable; N-C = No-Change

- Continued -

Table 5 (Continued)

Significant Correlations of each Event Score with

Social and Familial Variables at Times I & II

Social and Familial Variables	Objective Scores						Subjective Scores					
	T-C[a]		U		D		U		D		N-C	
	T-I	T-II	T-I	T-II	T-I	T-II	T-I	T-II	T-I	T-II	T-I	T-II
Isolated Parents	-	-	.10	.08	-.07	-.08	.10	-	-	-	.08	-
Unhappy Marriage	.16	.26	.16	.30	-	-	.12	.20	-	.07	-	-
Mother's Emotional Illness	.18	.32	.20	.42	-	-	.14	.30	.13	.12	-	-.08
Unleisurely Parents	.07	.11	.11	.15	-.11	-.07	.13	.11	.07	.18	-.07	-.12
Mother's Econ. Dissatisfaction	.09	.12	.08	.16	-	-	.07	.09	-	-	-	-
Parents' Quarrels	.14	.13	-	-	.18	.20	-	-	-	-	.08	.07
Unaffectionate Marriage	.10	.16	.14	.20	-	-	-	.15	-	-	-	-
Traditional Marriage	.10	-	-	-	-.13	-.15	-	-	-	-	-	-
Parents Cold	.13	.16	.10	.15	-	-	-	.08	.11	.10	-	-
Mother Traditional Restrictive	-	-	.10	.12	-.25	-.21	.12	.08	-	.11	-.12	-.13
Parents Punitive	-	-	-	-	-	-	.08	-	-	-	-	-
Mother Supportive-Directing	-	-	-	-	.07	.10	-	-	-.07	-	-	-
Mother Excitable-Rejecting	.15	.21	.07	.17	.18	.13	-	.16	-	-	-	-

[a] T = Total Change; U = Undesirable; D = Desirable; N-C = No-Change

Table 6

Intercorrelations among the Six Event Scores

	1.	2.	3.	4.	5.	6.
1. Objective Total Change	1.00	.35	.85	.30	.56	.22
2. Objective Desirable		1.00	.04	.04	.06	.13
3. Objective Undesirable			1.00	.23	.60	.05
4. Subjective Desirable				1.00	-.13	-.12
5. Subjective Undesirable					1.00	-.03
6. Subjective No-Change						1.00

Table 7

Percent of Variance Accounted for in Disturbed Behaviors at Time II Before and After Addition of Event Set to Equation

Disturbed Behaviors	Percent of Variance (R^2) Before Events Added	After Events Added
Mentation Problems	30.5	30.5
Conflict with Parents	52.4	52.2
Regressive Anxiety	41.7	42.4
Fighting	43.0	43.0
Delinquency	34.1	35.0
Isolation	17.7	17.4