THE EPIDEMIOLOGY OF SOCIAL STRESS

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We examine the social distribution of exposure to stress to test the hypothesis that differences in stress exposure are one factor in sociodemographic variations in mental health. We make a more comprehensive effort to estimate stress exposure than has been typical, and present data that challenge the prevailing view that differences in exposure to stress are of only minimal significance for understanding variations in mental health. We report several findings, principal among which are: Differences in exposure to stress account for substantially more variability in depressive symptoms and major depressive disorder than previous reports have suggested; the distributions of stress exposure across sex, age, marital status, and occupational status precisely correspond to the distributions of depressive symptoms and major depressive disorder across the same factors; and differences in exposure to stress alone account for between 23 and 50 percent of observed differences in mental health by sex, marital status, and occupation. These findings contrast with the prevailing view that differences in vulnerability to stress across social statuses account for social status variations in mental health.

Much of the research conducted by sociologists of mental health begins with the long established associations between mental health problems and socioeconomic status (Dohrenwend and Dohrenwend 1969; Faris and Dunham 1939; Hollingshead and Redlich 1958), marital status (Gove 1972; Gurin, Veroff, and Feld 1960; Turner, Dopkeen, and Labrecque 1970) and, more recently, gender (Al-Issa 1982; Nolen-Hoeksema 1987; Weissman and Klerman 1977). It has usually been assumed that there are important etiological messages to be found within these established links, but the exact nature of these messages has been the subject of considerable debate.

Since the pioneering work of Faris and Dunham (1939) on social class and mental illness, it has been generally acknowledged that the interpretation of social epidemiologic observations must confront two competing classes of explanation—the social causation hypothesis and the social selection hypothesis (Dohrenwend and Dohrenwend 1969; Turner and Wagenfeld 1967). The question is whether, and the extent to which, these relationships arise from variations in the environmental experiences of individuals of differing social statuses, or alternatively, they reflect the workings of a quasi-open society that sifts and sorts individuals into different social locations and positions based, in part, on physical and mental health, levels of social competence and so on. As Aneshensel (1992)
has recently noted, with the apparent exception of schizophrenia, evidence indicates that social causation processes are of greater significance than social selection processes in relationships between social class and mental health (Dohrenwend et al. 1992; Eaton 1986; Liem and Liem 1978; Wheaton 1978). A similar conclusion seems justified with respect to mental health and marital status (Gove 1972). In the case of gender, evidence supports the social causation hypothesis and is contrary to the argument that the elevated levels of distress and disorder observed among women are genetically or biologically driven (Nolen-Hoeksema 1987).

Researchers who have interpreted the available evidence to mean that social stratification and other structural factors may be causally significant for mental health have focused attention on the questions of how these structural factors influence individual health and under what circumstances such effects are made more or less intense (House and Mortimer 1990). On the assumption that patterned differences in social experiences and in the acquisition of social and developmental resources are likely to be implicated, a number of hypotheses about the role of psychosocial factors have been suggested. These hypotheses focus on differences in the social experiences and circumstances of individuals, as well as on differences in relevant personal and social resources, that could contribute to psychological distress or mental illness and that vary systematically across social statuses (e.g., sex, age, marital status, etc.).

Until a dozen or so years ago a principal focus of research on social status contingencies in mental health was on stressful life events, which had been repeatedly shown to be associated with physical and mental health (Dohrenwend and Dohrenwend 1974; Jemmott and Locke 1984; Jenkins 1976). The appealing hypothesis was that the elevated levels of psychological distress and disorder observed among people in low status groups may be substantially attributable to their greater exposure to stressful life events (Dohrenwend and Dohrenwend 1969; Kohn 1972). The plausibility of this hypothesis, then and now, rests on the assumption that variations in exposure to stress influence mental well-being, rather than the reverse. While it has been shown that mental health status can influence subsequent experiences of stressful events (Turner and Noh 1988), it is clear that a substantial proportion of this causal link is in the opposite direction—from social stress to mental health status (Thoits 1983).

This general perspective has recently been revitalized by Pearlin (1989), who compellingly argued the need for careful and comprehensive attention to the structural contexts of people’s lives. In his view, stressful events and life circumstances are rooted in these structural contexts, and thus, there is a basis for assuming that variations in exposure to stress arise substantially out of contemporaneous and developmental conditions of life. Pearlin’s treatment of the social context of stressful experiences is not limited to the realm of stressful life events, but includes the ongoing and difficult conditions of daily life that are now usually termed chronic stressors (Pearlin 1989; Pearlin and Schoeller 1978; Wheaton 1994). To the extent that important differences in stress-relevant social conditions or contexts tend to be defined by one’s gender, socioeconomic, and marital statuses, the hypothesis indeed seems to follow that observed relationships between these social statuses and mental health must, to some extent, be attributable to status variations in exposure to stress. The observation of clear associations between the levels of stress one experiences and one’s social status location would be consistent with this social causation hypothesis.

As we interpret the recent history of the study of stress and mental health, an important transition in the dominant perspective emerged during the late 1970’s and early 1980’s. This new view was apparently based on somewhat fateful interpretations of two types of evidence. First, cumulative results indicated that the correlations observed between measures of stressful life events and indices of mental health and well-being varied from less than .10 to little more than .30, suggesting that the variance accounted for by differences in stress exposure is less than 10 percent and is thus of rather trivial practical significance (Rabkin and Struening 1976; Thoits 1983). This conclusion was supported by the finding, first reported by Kessler (1979; Kessler and Cleary 1980) but later confirmed by others (Aneshensel 1992; Thoits 1987), that differential exposure to
stressful life events is substantially less important than differential vulnerability to stress in determining the relationships between mental health and social class, gender, and marital status.

These observations appropriately encouraged the ensuing widespread efforts to understand the origins of differential vulnerability to stress (Aneshensel 1992). A less propitious consequence, we believe, has been the encouragement of a widespread habit of thought that social stress is of only minimal significance for understanding variations in psychological distress and psychiatric disorder.

In our view, the hypothesis that level of social stress is an important determinant of mental health status has never been effectively tested because we have yet to adequately measure variations in stress exposure. If we are correct, the question of the relative contributions of variations in exposure to stress and differences in vulnerability to stress to the social distribution of mental health must be left open. This is because unmeasured differences in stress exposure across social statuses parade within research findings as vulnerability differences. Clearly, research is required that indexes social stress in a more comprehensive way than typical life event inventories have allowed.

**The Social Distribution of Stress**

We limit our consideration of social statuses to those that have reliably been shown to distinguish levels of risk for psychological distress and/or psychiatric disorder. As suggested above, social class, marital status and gender have been consistently linked to mental health status over decades of research on both samples of patients in treatment and of the general public. We have added age as a relevant social status dimension because of the growing consensus that, at least among community residents, age is inversely related to depressive disorder, and either inversely or curvilinearly related to psychological distress (Blazer et al. 1985; George forthcoming; Myers et al. 1984; Mirowsky and Ross 1992; Turner and Beiser 1990; Weissman et al. 1991).

There are, we believe, at least three important reasons for examining the epidemiology of social stress: (1) As argued above, there is a need for better information on the role that differences in exposure to stress might play in explaining the social distribution of psychological distress and psychiatric disorder; (2) the possibility that stressful events and life circumstances might be targeted as part of future prevention or intervention efforts emphasizes the need to understand their distribution in the community; and (3) the combination of structural links would support a fundamental hypothesis in sociology that differences in stress experiences arise, at least partially, from patterned differences in life circumstances that directly reflect the effects of social inequality on allocations of resources, status, and power.

Despite the plausibility of stress exposure hypotheses and the support of demographic evidence (Kohn 1973), more than a decade ago Thoits (1982) noted that "very little research has focused on the distribution of stressful life events or on ongoing strains among sociodemographic groups" (p. 341). Our own evaluation of developments since that time corresponds with Menaghan's (1990) observation that "stress research has emphasized the efforts that individuals can make to ward off distress or disturbance, but has paid much less attention to socially structured variations in exposure to stressors" (p. 108).

Nevertheless, a number of investigations have reported findings on the social distribution of stress, at least as indexed by life events. However, this body of research allows us few confident conclusions. Although several studies have reported that low status individuals experience more stressful life events than do those of high status (Brown and Harris 1978; Dohrenwend 1970, 1973; Eckenrode and Gore 1981; Kessler 1979), several others have yielded contradictory findings (Dekker and Webb 1974; Myers, Lindenthal and Pepper 1974; Uhlenhuth and Paykel 1973). Similarly, highly inconsistent observations have been reported in relation to gender, leading Thoits (1982) to assert, "[No] firm conclusions can be drawn regarding the differential occurrence of [stressful] events by sex " (p. 342). Much more consis-
tent results have emerged in relation to both age and marital status. Young subjects tend to experience more stressful events than older adults (e.g., Dekker and Webb 1974; Eckenrode and Gore 1981; Pearlman and Lieberman 1979), and unmarried people report a higher occurrence of undesirable life events than the married (e.g., Brown and Harris 1978; Eckenrode and Gore 1981; Kessler and Essex 1982).

It appears that further research is required before a defensible position can be reached on the role of exposure to stressful life events. Such research, however, is unlikely to constitute an advance unless it goes beyond the habit of equating level of social stress with a simple or weighted count from an inventory of recent stressful life events.

In this paper we employ an estimate of stress exposure that is more comprehensive than has been typical—we add indices for the presence of continuous, ongoing stressors and of exposure to major traumas over the life course, and we present distributions of stressful experiences thus indexed by sex, age, marital status, and occupational level. Before reporting findings on the epidemiology of life stress, we will present evidence that challenges the often repeated conclusion—that exposure to stress accounts for only a very modest proportion of mental health variability.

METHOD

Our data came from face to face interviews conducted in 1990 and 1991 with 1,393 adult residents of metropolitan Toronto. Eligible subjects were all individuals 18 to 55 years of age living in their principal residence, who were fluent in English and physically and mentally capable of responding to the questionnaire. This age range was selected to correspond to the ages that incur substantial risks for psychiatric and substance abuse problems, which are central dependent variables within the larger study, and to allow us to use the same assessment procedures for all subjects. The sampling process was aided by a 1989 household enumeration conducted by Statistics Canada to develop a sampling frame for the Ontario Health Study. We were provided with a nonoverlapping representative sample of addresses selected from each borough in proportion to the 1986 population census. Since our sample was of household units, we used the Kish (1965) procedure to assure the random selection of individuals from within sampled households. The resulting selection biases have been corrected by applying appropriate weights. Our success rate in interviewing the selected subjects was 77 percent which, we believe, indicates the sample is reasonably representative.

MEASURES

Life Stress

Life stress is indexed in this study in terms of stressful life events, enduring or chronic stressors, and major lifetime traumas. Stressful life events were assessed using a 34-item checklist of negative events common to many life events indices (Henderson, Byrne, and Duncan-Jones 1981; Holmes and Rahe 1967; Sarason, Johnson, and Siegel 1978). (Items are presented in Appendix A.) Because each reported event required an additional series of probing questions, we placed limits on the number of events included in the checklist to keep interviews at an acceptable length. Respondents were asked to indicate which of the 34 events they had experienced personally during the 12 months preceding the interview. For 21 of the events, they were also asked whether their spouse or partner had experienced the event. For 18 events they were also asked if their children experienced the event, and for 7 events, respondents were asked to consider other relatives and friends. Respondents indicated the month in which each stressful event began and the month in which it ended. To assist this process, a calendar for the previous 12-month period was used during the interview. Respondents were encouraged to place significant dates, such as holidays and birthdays, on the calendar and then to identify the months in which each reported stressful event began and ended. We believe that having respondents locate events in relation to other personally significant dates was very helpful.

Enduring or chronic stressors were measured by a 51-item inventory developed by Wheaton (1991, 1994; see Appendix A). The items fall into nine areas—financial issues, general or ambient problems, work, marriage
and relationship, parental, family, social life, residence, and health. These items are subjectively reported life conditions and situations. Wheaton (1991, 1994) has argued that these stressors are inherently subjective, and that measurement approaches should take this into account. The advantage of using subjective reports of chronic stress is that they allow shorthand reference to an array of possible objective social realities that would be impractical to measure directly, and more importantly, they typically reflect realities that most would consider objectively stressful. There are in fact demonstrated relationships between responses to these items and "objective" indicators of difficult social circumstances, such as household income, Dictionary of Occupational Titles (DOT) codes of noxiousness of occupations, reports of past life events that could generate chronic problems, family structure, social networks, and so on (Wheaton 1991, 1994). While subjective reports cannot be considered to be true reflections of reality, it would be just as misleading to reach the opposite conclusion: that they are illusions constructed to justify our psychological experiences.

Issues of subjectivity and the possibilities of measurement and causal confounding with outcomes have been addressed in analyses reported elsewhere (Wheaton 1991, 1994). Briefly, a series of confirmatory factor analytic models were estimated to establish the relative plausibility of one- versus two-factor models for sets of psychological distress and chronic stress items. In all cases, the two-factor model was clearly superior and justified, suggesting the measurement integrity of assuming separate concepts. In fact, in no case did the factor loading of a chronic stress item on a psychological distress factor reach as high as .30.

Wheaton (1991, 1994) also estimated a number of models to detect reciprocal causation between chronic stress and psychological distress on the assumption that the presence of psychological distress could either increase the perception of chronic stress or actually help produce higher levels of chronic stress in the respondent's environment. Reciprocal causation held for most types of chronic stress, but in all cases the effect of chronic stress on psychological distress survived and was not attenuated when compared to simpler models assuming unidirectional causation. Thus, our conclusion is warranted—some important causal component of the chronic stress–psychological distress relationship goes from chronic stress to psychological distress.

With respect to major lifetime traumas, we distinguished between those occurring before adulthood (8 items) and those that may have occurred at any time during the respondent's lifetime (12 items, see Appendix A). Items from the "any time" list were considered to be childhood/adolescent traumas when they occurred before age 23.

**Indexing Social Statuses**

As noted, sex, marital status, and socioeconomic status, along with age, have been reliably linked with variations in mental health, and for decades these links have been a major basis for hypotheses and research aimed at understanding the social determinants of mental disorder and well-being.

We group our subjects into four age categories: 18–25, 26–35, 36–45, and 46–55. The rationale for these particular groupings is limited to their intuitive appeal and the need for large enough numbers in each age category to assure stable estimates of variations in both exposure to stress and mental health status. In the regression analyses, age is employed as a continuous variable, and the square of age is also included to test for curvilinear effects (Mirowsky and Ross 1992).

Three marital status categories are distinguished: never married, currently married, and previously married. "Previously married" includes a small number of widowed with the separated and divorced to achieve an adequate subsample size.

We have operationalized socioeconomic status in terms of occupational prestige level for several reasons. First, many of the classic studies that generated or maintained the long-term scientific interest in the SES–mental health relationship employed occupational level, either alone (e.g., Goldberg and Morrison 1963; Turner and Wagenfeld 1967) or as the dominant element in a composite index (e.g. Hollingshead and Redlich 1958; Langner and Michael 1963). Second, we prefer occupational prestige level to education level as an index, because average levels of
education and the meaning of any given level of education with respect to conditions of life tend to vary with the age of respondents. It has been argued that this variability can obscure or distort estimates of social status and mobility (Goldberg and Morrison 1963; Dohrenwend and Dohrenwend 1969). Moreover, our data reveal the not uncommon finding that the inverse relationship between education and psychological distress is not linear. Specifically, those who begin but do not finish a post-secondary program, whether trade school, junior college, or university, show higher levels of psychological distress than high school graduates. However, those who complete any post-secondary program are less distressed on average than high school graduates. Our uneasiness with this circumstance is associated with the likelihood that the elevated distress observed among those who start but do not complete various post-secondary programs may be more a cause than a consequence of educational attainment. Finally, we prefer using occupational prestige level to personal or family income to estimate SES because more missing data occur on income. Respondents are simply less willing to provide their income than to describe their occupations.

The jobs of all employed respondents (including those temporarily laid off) and of the spouses of currently married respondents were coded according to Hollingshead's (1957) seven occupational prestige categories. Nonemployed subjects were assigned the score for their last job held. The occupational prestige level assigned for a respondent was for either his or her own job or the spouse's job, whichever was higher. While this procedure presumably yields an elevated socioeconomic class distribution compared to other operationalizations, we believe it to be an accurate estimate of each respondent's position in the social hierarchy and the conditions of life he or she experiences. To maintain adequate subsample sizes, subjects in the semiskilled and unskilled job prestige categories were combined.

Mental Health Measures

Because of the visibility of depression in social epidemiological literature, we focus on two depression measures as primary outcomes of stress. Depressive symptomatology is assessed by administering the Center for Epidemiologic Studies Depression Scale (CES-D), a widely used and highly reliable index of depressive symptomatology (Devins and Orme 1985; Radloff 1977). Major depressive disorder was defined in terms of the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association (1987, vers. 3 rev.). The occurrence of this disorder was estimated utilizing the Michigan revision of the Composite International Diagnostic Interview (CIDI) (World Health Organization [WHO] 1990; Robins et al. 1988). Evidence of excellent inter-rater reliability (Wittchen et al. 1991) and good test-retest reliability (Wacker, Battegay, Mullejans, and Schlosser 1990) is available for the CIDI, as is evidence for validity based on concordance with clinical diagnoses (Janka, Robins, Cottler, and Early 1992; Spengler and Wittchen 1989).

RESULTS

Social Status Characteristics and Mental Health Status

Prior to examining the epidemiology of social stress, we verified that the typical distributions of mental health status we seek to understand were, in fact, observable in our data. Table 1 presents mean depressive symptom (CES-D) scores and one-year prevalence rates of major depressive disorder (the proportion of respondents experiencing the disorder over the year preceding the interview) by sex, age, marital status, and occupational prestige level. Both sets of comparisons quite uniformly replicate the distributions reported over several decades based on studies of treated and untreated populations with respect to sex, marital status, and socioeconomic status. Women report substantially higher levels of both depressive symptoms and major depressive disorder than do men, while the married, on average, experience substantially lower levels than do the never or previously married.

With respect to occupational prestige, our measure of SES, the expected linear pattern is observed. Increasing levels of occupational prestige are associated with decreasing levels of depressive symptoms and decreasing
Table 1. Mean Depressive Symptom Scores and One-Year Prevalence Rates for Major Depressive Disorder by Social Status Variables: Residents of Toronto, Ontario, Ages 18-55, 1990-1991

<table>
<thead>
<tr>
<th>Social Status Variables</th>
<th>Mean Depressive Symptom Score(^a)</th>
<th>N(^c)</th>
<th>One-Year Prevalence Rate of Major Depressive Disorder(^b) (Percent)</th>
<th>N(^c)</th>
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<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10.21</td>
<td>603</td>
<td>7.7</td>
<td>604</td>
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<tr>
<td>Female</td>
<td>13.10</td>
<td>788</td>
<td>12.9</td>
<td>789</td>
</tr>
<tr>
<td><em>p</em>-value(^d)</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td>&lt;.002</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-25</td>
<td>15.14</td>
<td>304</td>
<td>18.4</td>
<td>304</td>
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<tr>
<td>26-35</td>
<td>10.92</td>
<td>470</td>
<td>9.8</td>
<td>471</td>
</tr>
<tr>
<td>36-45</td>
<td>11.09</td>
<td>393</td>
<td>7.2</td>
<td>393</td>
</tr>
<tr>
<td>46-55</td>
<td>9.15</td>
<td>224</td>
<td>4.7</td>
<td>225</td>
</tr>
<tr>
<td><em>p</em>-value(^d)</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
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<tr>
<td>Married</td>
<td>9.98</td>
<td>673</td>
<td>6.6</td>
<td>675</td>
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<td>Previously married</td>
<td>14.22</td>
<td>171</td>
<td>11.5</td>
<td>171</td>
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<tr>
<td>Never married</td>
<td>13.70</td>
<td>547</td>
<td>15.8</td>
<td>547</td>
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<tr>
<td><em>p</em>-value(^d)</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td>&lt;.001</td>
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<tr>
<td><strong>Occupational Prestige</strong></td>
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<tr>
<td>Major professional</td>
<td>9.16</td>
<td>158</td>
<td>4.1</td>
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<tr>
<td>Lesser professional</td>
<td>10.53</td>
<td>317</td>
<td>7.5</td>
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<tr>
<td>Minor professional</td>
<td>11.14</td>
<td>257</td>
<td>8.6</td>
<td>258</td>
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<td>Clerical/sales</td>
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<td>Skilled/manual</td>
<td>10.41</td>
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<td>4.9</td>
<td>98</td>
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<td>Semi skilled/unskilled</td>
<td>14.24</td>
<td>165</td>
<td>18.3</td>
<td>165</td>
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<tr>
<td><em>p</em>-value(^d)</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11.79</td>
<td>1,391</td>
<td>10.6</td>
<td>1,393</td>
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</table>

\(^a\) Depressive symptom score is the score on the CES-D (Radloff 1977).

\(^b\) Rates of major depressive disorder are based on diagnostic algorithms derived from the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association 1987, vers. 3 rev.) and applied to responses measured using the Michigan revision of the Composite International Diagnostic Interview (CIDI) (WHO 1990).

\(^c\) Nineteen cases are missing for the occupation categories, and two additional cases are missing for the CES-D measure, due to nonresponses to the relevant questions.

\(^d\) The *p*-values shown indicate significant group mean differences in depressive symptoms according to one-way ANOVA tests, and in group-specific rates of depression according to chi-square tests. Two-tailed tests of significance are used in both sets of results.

Rates of major depressive disorder. However, this pattern is interrupted in both instances by substantially deviant scores in the skilled-manual category. Because 75 percent of subjects in this category were men, the possibility that these deviant scores may be an artifact of sex composition had to be considered. Separate analyses, however, revealed that the pattern is at least as pronounced among women as among men. It is assumed that these low levels of distress and disorder found in the skilled-manual category are real and deserve additional research. We return to this matter below. Although past reports on the connection between age and depressive symptoms have not been entirely consistent, most community studies of preretirement-age adults have
found the highest levels of depression in the youngest group (Mirowsky and Ross 1992). As noted earlier, community studies on preretirement-age adults have consistently observed an inverse relationship between age and major depressive disorder (e.g., George, forthcoming; Myers et al. 1984; Weissman et al. 1991). These patterns are clearly observed in our data. Moreover, there are generally larger reductions in average depression across younger age categories, compared to older. This tendency for depression to decrease at a decelerating rate with age closely parallels the pattern reported recently by Mirowsky and Ross (1992), at least through the age range we consider here (ages 18–55).

A second preliminary issue involved confirming that the widely reported relationship between life stress and mental health status is observed in our data set and evaluating the conventional wisdom that the quantity of stress experienced is of only minimal explanatory significance. Table 2 presents the results of bivariate correlation and multiple OLS or logistic regression analyses assessing the associations between life stress index scores and both depressive symptoms and one-year major depressive disorder. Interestingly, the correlations between "events to self" and depressive symptoms (.29) and major depressive disorder (.30) approximate the relationships typically reported in the literature and account for less than 9 percent of the variation (Rabkin and Struening 1976). However, when the independent contributions of all categories of assessed stressors are considered together, including measures of current chronic stress and past traumas, the magnitude of these associations jumps dramatically. This is especially true for depressive symptoms, where the variability accounted for is about 2.5 times the upper range of previous reports that have considered only stressful events.

With respect to chronic stress, not only are the results consistent with prior evidence linking persistent stressors to psychological distress (e.g., Liem and Liem 1978; Ross and Huber 1985), but they support the contention that chronic stress may be of primary significance (Pearlin and Lieberman 1979; Wheaton 1991). Adult trauma scores also contribute significantly and independently to depressive symptomatology, but the coefficient is negative, indicating that higher trauma scores are associated with lower levels of depression. Since these scores are not adjusted for time at risk, this apparently anomalous finding can be resolved by considering the fact that the likelihood of ever having experienced an adult trauma naturally increases with age, and age is generally related to less depression up to the age limit in our data. Although the net effect of childhood traumas is not significant,
they are clearly correlated with depressive symptoms in later life. The absence of strong direct effects suggests that the consequences of major childhood stressors tend to be transmitted by other stressors in this equation which act as intervening variables. For example, being abused by a parent or losing a parent during childhood may increase risk of interpersonal difficulties and hence relationship strains in adulthood.

It is worth emphasizing that, while it is clear that this is an unusually comprehensive effort to assess stress exposure, it cannot be claimed that we have yet adequately estimated variations in social stress. Thus, we conclude that social stress may be a considerably more powerful determinant of health and well-being than is generally assumed, and that the hypothesis that differences in stress exposure across social structures and contexts partially account for mental health differences remains a tenable one. It is to this latter issue that we now turn.

For each comparative analysis, Table 3 presents seven separate sets of distributions. Within each distribution, these scores have been standardized to a mean of 0 and a standard deviation of 1. Columns 1 through 3 present summary measures that distinguish recent stressful life events occurring to the
respondent, to significant others, and a combined total of stressful events reported for the preceding 12 months. Column 4, "operant events," reflects life event checklist data, combining reports of ongoing life events and of very recent eventful stressors. Based on evidence suggesting that event checklists may confound information on discrete stress-ful events and more chronic stressors (Avison and Turner 1988; Turner and Avison 1992), we asked respondents to provide information on the starting and ending points of each reported stressor. Operant events include those events reported as occurring in the same month or the month preceding the interview, plus all those that continued into this period, regardless of when they began.

The chronic stress distributions (column 5) are based on a count from Wheaton's (1991) 51-item inventory. This provides, we believe, the most comprehensive assessment of role-related stresses and other long-term life difficulties so far available.

Information on stressful experiences across measuring instruments is shown in columns 6 and 7. The most important of these results are in column 6, "operant burden." We believe these results represent the best and most complete estimates of contemporary (i.e., recent and ongoing) exposure to stress. These scores combine "operant events" and "chronic stress" data from the preceding two columns (standardized scores are used to achieve equal weighting). The resulting sums were then restandardized. "Cumulative burden" reflects all three domains of stress exposure. Specifically, it is the restandardized sum of standardized scores for total stressful life events, chronic stress, and lifetime traumas. The lifetime trauma score consists of the sum of standardized childhood and adult trauma scores, with the adult scores age-adjusted to control for variations in time at risk. We will comment on the results for cumulative burden following the remainder of our discussion of Table 3.

Sex and Social Stress

Most previous studies have considered only stressful events experienced personally by the respondent, sometimes including stressful events occurring to someone close to the respondent. These measurement approaches are represented in columns 1 and 3 of Table 3 and offer no evidence for a sex difference in stress exposure. However, the fact that higher levels are observed among women when only events occurring to significant others are considered is consistent with the argument that women tend to have a wider domain of social concern and that they may bear an emotional "cost of caring," as some evidence has suggested (Kessler and McLeod 1984; Turner and Avison 1989).

The central point here is that when we consider only the stressful event checklist data and treat such data in the conventional way, our findings quite closely conform to previous findings—they contradict the hypothesis that different levels of exposure to stressful events is implicated in the observed sex differences in mental health. However, where estimates of stress exposure take account of the enduring character of some eventful stressors and/or of both role-related and other long-term chronic stresses, a different picture emerges. Whether the operant events or chronic stress measures are considered separately or the two are combined into our best estimate of stress exposure (operant burden), women report experiencing significantly higher levels of recent and ongoing stress than do men. Thus, when more than the number of reported events is taken into account, the hypothesis remains tenable that gender differences in mental health status may at least partially arise from the tendency for women to experience higher levels of social stress. It is worth pointing out that gender differences are especially apparent in the area of operant burden, denoting the importance of current stresses, and are less apparent for cumulative burden.

Age and Social Stress

As noted earlier, previous research has shown considerable consistency on the distribution of social stress by age. Almost all previous studies have found younger subjects to experience higher levels of stressful life events. Table 3 supports this conclusion, whether only stressful life events are counted or more comprehensive estimates of stress exposure are employed. Interestingly however, the magnitude of the elevation of stress observed among the young is most pro-
nounced where only event counts are used as estimators (columns 1 and 3), and only minimal differences occur among the remaining age categories. In fact, the age differences in exposure to stressful life events look strikingly similar to the negative decelerating curve we observed for age differences in depression. In contrast, when chronic stress is considered, age differences in stress are more linear: There is a more modest elevation in life stress for the young, along with evidence that those in the oldest age grouping (46–55) experience significantly lower levels of stress than their younger counterparts (p < .05). This same pattern is also observed for operant burden (chronic stress and operant events combined, column 6), although the stress advantage found for the oldest category falls slightly short of the usual criterion for statistical significance (p < .10).

This set of results is consistent with both prior evidence and expectations based on age variations in mental health status. As shown in Table 1, high levels of depressive symptoms and major depressive disorder are most frequent in the youngest age group and least frequent among respondents over 45, precisely matching the observed age distribution of stress exposure. We note that regression analysis of the relationship of age to depressive symptoms revealed significant curvilinearity, similar to the left half of a U-shaped curve. This distribution generally corresponds, at least through age 55, with those reported recently by Mirowsky and Ross (1992) based on a national sample and a large community survey.

The observed age distributions of social stress, variously indexed, suggest, but do not demonstrate directly, the potential utility of stress exposure differences in understanding age differences in mental health. Our results are also consistent with the suggestion from prior research that the relative impact of stressors may vary across the life course. Turner and Noh (1988) found chronic stress to more powerfully predict psychological distress among older subjects, while acute stress was more important at younger ages.

**Stress and Marital Status**

As in the case of age, the typical finding that married persons have a significant advantage with respect to stressful life events, is mirrored in our data (columns 1 and 3). Moreover, the estimates that take account of more enduring stresses or life difficulties (columns 4 to 6) provide additional support for this widely accepted association. However, the uniformity of findings on married persons, regardless of how stress exposure is estimated, is not matched in the various contrasts between the previously married and never married persons. While the life event data reveal little difference in stress exposure across these two categories, a clear difference is displayed for chronic stress, on operant events where account is taken of more enduring stressful occurrences, and when these two stress assessments are combined (operant burden, column 6). Based on these measures, the previously married report substantially higher levels of social stress than do the never married. While this difference may arise partially from the tendency for older individuals to experience more chronic stressors, it also reflects, we believe, the fact that separated and divorced individuals tend to confront a disproportionate number of persistent life problems.

Whatever the relative exposure to, and significance of, eventful versus chronic stresses across marital statuses, it is clear that the consistently observed association between marital status and risk for both depressive symptoms and depressive disorder is replicated by its association with level of social stress. The conclusion is therefore warranted that differences in exposure to stress may contribute to the documented differences in mental health risk by marital status.

**Social Class and Social Stress**

The bottom portion of Table 3 presents the indices of stress exposure by occupational prestige level. The results in columns 1 and 3 suggest one explanation for the inconsistency of prior reports on the association between stressful life events and socioeconomic status. Both distributions of stressful life events for self and total stressful events are generally linear, with the lowest stress levels found in the highest occupational category, but the contrasts based on events to self are statistically significant, while those for total stressful events are not. The hypoth-
esized linear distribution by social class is observed for the operant burden index (column 6) and is generally found where only the Wheaton (1991) chronic stress index is used (column 5). Notwithstanding the ambiguity of findings when only stressful life events are considered, these results support the conclusion that exposure to stress tends to occur differentially for those differently situated in the social hierarchy. Moreover, they are consistent with the criticism of findings on social class for failing to consider the tendency for many stressors in the lower class to be more enduring or chronic in nature (Liem and Liem 1978). Thus, the hypothesis that stress differences contribute to class differences in mental health status remains tenable.

Earlier we noted that the observed linear pattern of depressive symptoms and depressive disorder by occupational status were interrupted by substantially deviant results in the skilled-manual occupational category. The absence of a similar deviation within the social stress distribution indicates that stress differences are unlikely to be implicated in those deviant scores. Parenthetically, we have shown elsewhere that the SES distribution of both social support and self-esteem precisely mirror those for depressive symptoms and disorders, including the deviation from linearity at the skilled-manual level (Turner 1992; Turner and Marino 1994). Apparently, differences in stress mediators rather than differences in levels of stress exposure account for this distinctive observation.

Cumulative Stress Burden

So far, we have not commented on column 7 of Table 3, which presents estimates of social stress that include total stressful life events, chronic stress, and a lifetime trauma score. We call this “cumulative burden.” This operationalization of stress exposure differs from the others in its focus on cumulative, rather than contemporary, stressful experiences. The similarity of these cumulative burden distributions in column 7 with the operant burden distributions in column 6 suggests some degree of stability and continuity in stress experiences over the life course. Presumably, the social contexts or roots that are associated with elevated risk for major traumas are also relevant to eventful and enduring stress experiences.

Stress Exposure and Mental Health

The results presented to this point have addressed the plausibility of the hypothesis that differences in exposure to stress play a significant role in explaining epidemiological variations in mental health status. We have suggested that if distributions of social stress complement established distributions of depressive symptoms and depressive disorder preliminary support for this hypothesis would be established. Such support is clearly revealed in Table 3. Our results also lend credibility to the two assumptions that largely motivated these analyses: (1) that variations in exposure to social stress substantially arise out of developmental and contemporary conditions of life; and (2) that one’s gender and age and one’s occupational and marital statuses effectively define important differences in such conditions of life. However, we have not yet provided an estimate of the magnitude of the contribution that stress exposure makes toward variance in mental health status. It is to this issue that we now turn.

Given the current visibility of the differential vulnerability hypothesis and the tendency for researchers to favor such explanations, we must account for possible social status variations in responsiveness to social stress. A direct assessment of this issue involves testing interactions between exposure to stressful life events and social status and, where interactions are found, decomposing status differences in mental health into portions attributable to differences in stress exposure, and to differential vulnerability to the same level of exposure by sex, age, marital status, and occupation (Iams and Thornton 1975; Jones and Kelley 1984).

We tested interactions between each of the four status dimensions and our most complete estimate of recent and ongoing stress exposure (operant burden) for both depressive symptoms and major depressive disorder. Of the eight interactions tested, only the one between sex and operant burden in predicting depressive symptoms was significant at the .05 level. Repeating these analyses with controls produced the same result—
only the interaction with sex was significant. Thus, in seven of the eight cases, and regardless of whether the other social status variables were controlled, our results fail to support the differential vulnerability hypothesis. This is notable in the context of the tendency of researchers to focus primary attention on ascertaining the determinants of differential vulnerability to stress (Aneshensel 1992).

For the single statistically significant interaction, we decomposed the observed sex difference in mean depressive symptom scores using a technique that distinguishes three components: differences due to group membership (the intercept), differences due to stress exposure, and differences due to differential vulnerability by sex. This procedure differs somewhat from those described and compared by Jones and Kelley (1984) for two reasons. First, in our view their recommendation that intercept differences be collapsed with differential vulnerability cannot easily be reconciled with substantive considerations in this area of research. Gender differences in psychological distress tend to be observed, even where stress is absent or low, and these differences may reflect the influence of factors that are quite distinct from vulnerability to stress per se. Second, previous studies that have decomposed gender differences in psychological distress (Kessler and McLeod 1984; Turner and Avison 1989) have employed the procedure suggested by Iams and Thornton (1975). Thus, using this method allows comparisons with previous findings on the same issue. In computing effects this way, the “interaction” component of the decomposition is averaged and allocated equally to the stress exposure and vulnerability components.

We transformed our stress measures so that 0 on the operant burden scale would conform to 0 on the raw scale scores, but we left standard deviation units intact. As Jones and Kelly (1984) point out, the choice of 0 point affects the decomposition, which in this case should refer to stress as an accumulating burden with a theoretically defined 0 point. The total sex difference of .307 resolved into the three components as follows: an intercept difference of .077, a stress exposure difference of .07, and a vulnerability difference of .16. This means that differences between men and women in exposure to stress account for 23 percent of the total gap and 31 percent of that part of the explanation attributable to stress exposure and vulnerability combined. In comparison, vulnerability differences account for over 50 percent of the total gap.

Two points are worth emphasizing in relation to the decomposition results. First, even in this one instance where evidence for the relevance of differential vulnerability was observed, the significance of stress exposure remains obvious and substantial. Second, these results contrast rather clearly with those from other decomposition analyses. Kessler and McLeod (1984) found that the gender difference they observed was almost totally attributable to differential vulnerability when “total events” were considered, and Turner and Avison (1989) found that stress exposure differences accounted for only 14 percent of the gap. Since both of these studies estimated stress exposure only in terms of recent stressful life events, differences in findings may illustrate a point made earlier—that unmeasured differences in stress exposure tend to appear within our results as vulnerability differences.

Table 4 summarizes estimates of the magnitude of the contributions of stress exposure toward explaining observed social status distributions of depressive symptoms and major depression. Depressive symptoms and major depressive disorder were regressed on the four social status variables. We then estimated equations in which each component, and then the combined components, of the operant burden of stress were added separately. This procedure allows examination of whether and how current chronic stress and still operant stressful life events combine in their effects as total operant burden. In addition, it reveals the extent to which either chronic stress or operant life events offers the principal explanation for variations in mental health across each status variable. As noted earlier, we regard operant burden as the best estimate of contemporary stress exposure, but there may be instances in which one type of stress is most clearly implicated in status differences in mental health, and our analyses should be sensitive to this possibility.

The left panel of Table 4 shows the results of bivariate analyses of each social status variable with controls for stress added in each successive equation. These results are
Table 4. Metric Coefficients for Regression of Depressive Symptoms\(^a\) (OLS) and Major Depressive Disorder (Logistic) on Social Status Variables and on Combinations of Recent Exposure to Stress: Residents of Toronto, Ontario, Ages 18–55, 1990–1991

<table>
<thead>
<tr>
<th>Social Status Variables</th>
<th>Bivariate (1)</th>
<th>Controlling for Stress as Measured by:</th>
<th>Other Social Status Variables Controlled (5)</th>
<th>Controlling for Other Social Status Variables and Stress as Measured by:</th>
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<td>Chronic Stress (2)</td>
<td>Operant Events (3)</td>
<td>Operant Burden (4)</td>
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<td></td>
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<td></td>
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<tr>
<td>Female</td>
<td>.31***</td>
<td>.25***</td>
<td>.27***</td>
<td>.24***</td>
</tr>
<tr>
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<td>−.10***</td>
<td>−.10***</td>
<td>−.10***</td>
</tr>
<tr>
<td>Age(^2)</td>
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<td>.001***</td>
<td>.001***</td>
<td>.001***</td>
</tr>
<tr>
<td>Previously married</td>
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<td>.20(^*)</td>
<td>.38***</td>
<td>.22**</td>
</tr>
<tr>
<td>Never married</td>
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<td>.34***</td>
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<tr>
<td>Occupational prestige</td>
<td>.15***</td>
<td>.10***</td>
<td>.13***</td>
<td>.10***</td>
</tr>
<tr>
<td><strong>Major Depressive Disorder</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>.57**</td>
<td>.51**</td>
<td>.50**</td>
<td>.47(^*)</td>
</tr>
<tr>
<td>Age</td>
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<td>−.15(^*)</td>
<td>−.16(^*)</td>
<td>−.16(^*)</td>
</tr>
<tr>
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<td>.001</td>
<td>.002</td>
<td>.002</td>
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<tr>
<td>Previously married</td>
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<td>.21</td>
<td>.47</td>
<td>.23</td>
</tr>
<tr>
<td>Never married</td>
<td>.98***</td>
<td>.93***</td>
<td>.97***</td>
<td>.95***</td>
</tr>
<tr>
<td>Occupational prestige</td>
<td>.38***</td>
<td>.33***</td>
<td>.36***</td>
<td>.33***</td>
</tr>
</tbody>
</table>

\(^*\)p < .05 \(^**\)p < .01 \(^***\)p < .001 (two-tailed tests)

\(^a\) From standardized CES-D scores.

of particular interest because most previous studies have considered only one of these mental health correlates at a time. Thus, this panel indicates the extent of the contribution of exposure to stress in accounting for the relationships at issue as they have most typically been observed. The right panel shows the results when the effects of the other social status variables are considered simultaneously, with controls for stress added in the same sequence. In each analysis, first chronic stress is controlled, then operant stressful events, and finally the combination of the two as operant stress burden. Comparisons between the left and right panels indicate the effect of controlling on other social status variables. Thus, Table 4 allows us to evaluate the effect of each risk factor, controlling for both stress exposure differences and the effects of prior or intervening risk factors.

The top left panel shows a female-male difference on depressive symptoms (CES-D scores) of .31 standard deviations, quite typical of such differences in the existing literature. Controlling in turn for chronic stress, operant events, and operant burden shows that both chronic stress and operant events contribute to the explanation of male-female differences. The effect drops to .25 when controlling for chronic stress only, to .27 when controlling for operant events only, and to .24 when controlling for total operant burden. This latter figure, and that shown in column 8 where other demographic factors are controlled, were estimated by means of the decomposition procedure described above which controlled for differential vulnerability. This reduction in effect indicates that operant stress burden explains about 23 percent of the sex difference in depressive symptoms.

In the absence of evidence for other differential responses to estimated levels of operant stress burden, all other entries in Table 4
simply reflect the effect of each social status variable when various indices of stress exposure are controlled. There is a large difference in depressive symptoms between previously married respondents and the currently married (b = .45). While both types of stress have some role in explaining this difference, it is primarily chronic stress differences that account for the higher depressive symptoms among the previously married. This is consistent with hypotheses focusing on the built-in strains and difficulties of this role. Note that stress exposure differences account for about 50 percent of the effect (b = .22 in the final model). The picture for never married respondents is quite different: Much less of the difference between them and married respondents is due to stress exposure (b = .32 when controlling for chronic stress; b = .40 when uncontrolled). Still, controlling for chronic stress leads to a 20 percent reduction in effect. It is clear from looking at the right panel that much of the difference in depressive symptoms between never married and currently married respondents disappears when considering all social status variables simultaneously, even before controlling for stress (b = .12, not significant). This indicates a probable influence of age differences on the initial bivariate findings. That is, most of the initial difference in depressive symptoms may be due to the fact that never married respondents tend to be younger than currently married respondents, and increased depression is associated with youth. Thus, controlling for age is crucial for understanding the importance of marital status to mental health. With age controlled, the previously married—currently married difference persists.

For occupational status, differences in stress exposure account for 33 percent of the initial uncontrolled effect on depressive symptoms and 38 percent when other risk factors are controlled. Again, chronic stress plays a strong role in explaining these differences since the addition of operant events yields no further reduction in the coefficient.

Age differences in depressive symptoms are more independent of stress exposure than any other social status variable. Table 4 shows that controlling for stress does nothing to explain differences by age. This is, in effect, consistent with the conclusion in Mirowsky and Ross (1992) that there are life cycle influences on mental health.

In summary, then, for depressive symptoms, differences in levels of exposure to stress account for between 23 and 50 percent of observed differences in mental health by sex, marital status, and occupation. Stress exposure did not account for differences in depressive symptoms by age.

The right panel of Table 4 shows that controlling for other social status variables has little influence on the impact of sex, age, and previous marriage on depressive symptoms, but has a large impact on the influence of being never married (as noted above) and of occupational prestige. About 50 percent of the differences in depressive symptoms by occupation disappears when controls for other social status variables are used. This indicates, we believe, the joint associations of age with higher occupational levels and lower depression. This is because as we scored occupational prestige it is not confounded with gender, and its relationship with the previously married versus currently married comparison is minimal. Significantly, then, controlling for age differences may be crucial in properly specifying the effects of other social status variables.

The bottom panel of Table 4 reports our results for major depressive disorder. In general, these results resemble those for depressive symptoms, except that the influence of exposure to stress is generally somewhat less. Still, variations in operant burden clearly contribute toward explaining sex differences in major depressive disorder, and explain some of the differences by occupational prestige and marital status, where chronic stress plays a primary role. It is interesting that in comparison to the results for depressive symptoms, results for major depressive disorder show that the effects of occupational prestige persist somewhat more clearly when other status variables are controlled. For major depressive disorder only about 31 percent of the effect of occupation is explained by other status variables. This suggests that occupational status is at least as important for understanding differences in the occurrence of more serious mental health problems as it is for understanding differences in psychological distress.
SUMMARY AND CONCLUSIONS

We have addressed two hypotheses—that social stress is an important determinant of mental health status and that sex, age, marital status, and social class affect mental health and well-being partly because of social status differences in exposure to stress. We argued that the stress hypothesis has not been effectively tested because wholly adequate measurement of stress exposure remains to be achieved. For the same reason, we suggested that the importance of stress itself for explaining the epidemiology of mental health has been prematurely foreclosed by researchers in favor of focusing on social status differences in vulnerability to stress.

Our purpose has not been to disprove or even to challenge the differential vulnerability hypothesis. Rather, we simply proposed that social stress may be substantially more important as a determinant of mental health than currently supposed and that the role of stress in explaining variations in mental health by sex, age, marital status, and socioeconomic status remains to be established. We made a more comprehensive effort to estimate stress exposure than has been typical, and argued that findings indicating that the social distribution of stress complements the distributions for depressive symptoms and major depressive disorder would provide preliminary support for the stress exposure hypothesis.

Based on “operant burden,” which we believe to be the best available estimate of current and recent stressful experiences, we found that stress distributions corresponded very closely with those observed for depression across sex, age, marital status, and occupation. These findings are consistent with the hypothesis that differences in mental health arise, at least in part, from systematic differences in the quantity and/or nature of stress experienced by individuals differentially situated in the social system. Evaluation of the magnitude of the contributions of stress to these distributions indicated substantial effects of stress on differences in mental health by occupational status, large effects relating to the risk status of previously married, and at least a notable contribution to the gender-mental health relationship.

Aneshensel’s (1992) recent review and critique of theory and research on stress provides a compelling and useful context within which to view these results. She has called for a conceptual reorientation away from viewing stress as an isolated risk factor and toward its consideration as a link in a causal chain that begins with social conditions and ends with differences in risk for emotional distress and psychiatric disorder. She makes a distinction between random stressors and systemic stressors. Random stressors are not embedded in social locations or social experiences over the life course—they occur with equal probability across all social groups used to designate differences in risk for psychiatric disorders. Random stressors are important only as predictors of the overall risk of disorder; they do not help explain the links between social conditions and risk of disorder. Systemic stressors are tied to social locations and/or social group experiences, and thus are directly relevant to understanding the ties between the social conditions of life and psychiatric disorders. There is, no doubt, a need to identify stressors that are socially random so that the issue of the social embeddedness of stress is studied properly. One consequence of such random stressors, however, is that they will undermine relationships between status characteristics and measures of stress exposure if they are considered together with systemic stressors, as is common.

In demonstrating clear connections between stress exposure and social status variables, our results appear to support Aneshensel’s view, emphasizing the potential significance of systemic stressors for understanding observed distributions of depressive symptoms and major depressive disorder. Our results suggest that an important portion of the variance in stress exposure is crucially located in the ongoing conditions of social life and in accumulated traumatic life experiences.

Although we found differences in vulnerability to stress contribute more in accounting for gender differences in depressive symptoms, stress exposure differences were also important. With respect to all other associations implicated in the epidemiology of depressive symptoms and disorder, our findings suggest that the widely held conclusion
that social status differences in vulnerability to stress are more consequential than differences in levels of stress exposure may be premature. We argue that the importance of differential vulnerability has been overestimated to the degree that differential exposure to stress has been underestimated, because unmeasured group differences in stress exposure parade within research findings as vulnerability differences. Our results suggest that differential exposure to stress by social status deserves renewed attention, with the provision that a broader array of stressful experiences must be measured.

R. Jay Turner is Professor of Sociology at the University of Toronto and a Health Canada National Health Scientist. His current research projects include a study of the co-occurrence of mental health and drug/alcohol problems and the psychosocial risk factors for such problems, and several studies examining the mental health of mothers and children within the family context. He will join the Department of Sociology at the University of Miami in the summer of 1995.

Blair Wheaton is Professor of Sociology at the University of Toronto, recently Senior Research Fellow of the Ontario Mental Health Foundation, and a continuing member of the Consortium for Research in Stress Processes (funded by the W. T. Grant Foundation). His current research concerns the life course consequences of childhood traumatic experience, and the effects of paternal and maternal work situations and work histories on the mental health of children.

Donald A. Lloyd is a Ph.D. student at the University of Toronto. He is involved in research on the role of stress and mental health in the developmental process. His dissertation (in progress) examines the social status attainment consequences of early onset psychiatric disorders.

Appendix A. Social Stress Indicators

I. LIFE EVENTS

Each life event index is a simple count from the number of positive responses to the following 34 items. Events to self-occur events that occurred to the respondent during the preceding 12 months. Events to others are the number from subsets of these events that occurred to the respondent’s spouse or partner, children, and relatives or close friends.

A. I’d like to ask about some things that happened to you or to anyone close to you (that is your spouse/partner, children, relatives or close friends). Please tell me which of the following experiences happened to you or someone close to you in the past 12 months.

1. Was there a serious accident or injury?
2. Was there a serious illness?
3. Did a child die?
4. Did a spouse/partner die?
5. Was there trouble with the law?
6. Did anyone have something taken from them by force (robbed)?
7. Was anyone beaten up or physically attacked?

B. Now, I’d like to ask you just about your family. Please tell me which of the following occurred to you, your spouse/partner, or children in the past 12 months.

8. Was there an unwanted pregnancy?
9. Was there an abortion or miscarriage?
10. Did a close friend die?
11. Was there a marital separation or divorce?
12. Lost a home due to fire, flood, or other di-
saster?
13. Was fired or layed off?
14. Had a business that failed?
15. Had a major financial crisis?
16. Was accused or arrested for a crime?
17. Failed school or training program?
18. Dropped out of school?
19. Experienced a change of job for a worse one?
20. Was demoted at work or took a cut in pay?
21. Was sued by someone?
22. Went on welfare?
23. Went on strike?
24. Found out partner was having an affair?
25. A romantic relationship ended?
26. A close relationship ended?
27. Partner found out about affair?
28. Increased arguments with your partner?
29. Moved to a worse residence or neighborhood?
30. Moved out of city or area?
31. Had drivers license taken away?
32. Had your house or car broken into?
33. Had a child move back into the house?
34. Had a child move out of the house?
II. CHRONIC STRESS

Some of the following 51 items form multi-item indices for chronic stress experienced in specific social roles or domains of life. Following the results of factor and internal reliability analyses of the intended subscales, five standard scores based on empirically-selected items (themselves scored: not true = 0; somewhat true = 1; very true = 2) were calculated. The 23 remaining items, dichotomized between not true (scored 0) and somewhat true or very true (scored 1) were individually standardized to Z-scores. The restandardized sum of the 28 standard scores forms a final estimate of chronic stress that equally weights contributions from the spectrum of roles and situations reflected in the items below.

Now, I'll describe some situations that sometimes come up in people's lives. I'd like you to tell me if these things are not true, somewhat true, or very true for you at this time.

1. You're trying to take on too many things at once.
2. There is too much pressure on you to be like other people.
3. Too much is expected of you by others.
4. You don't have enough money to buy the things you or your kids need.
5. You have a long-term debt or loan.
6. Your rent or mortgage is too much.
7. You don't have enough money to take vacations.
8. You don't have enough money to make a down payment on a home.
9. You have more work to do than most people.
10. Your supervisor is always monitoring what you do at work.
11. You want to change jobs or career but don't feel you can.
12. Your job often leaves you feeling both mentally and physically tired.
13. You want to achieve more at work but things get in the way.
14. You don't get paid enough for what you do.
15. Your work is boring and repetitive.
16. You are looking for a job and can't find the one you want.
17. You have a lot of conflict with your partner.
18. Your relationship restricts your freedom.
19. Your partner doesn't understand you.
20. Your partner expects too much of you.
21. You don't get what you deserve out of your relationship.
22. Your partner doesn't show enough affection.
23. Your partner is not committed enough to your relationship.
24. Your sexual needs are not fulfilled by this relationship.
25. Your partner is always threatening to leave or end the relationship.
26. You wonder whether you will ever get married.
27. You find it is too difficult to find someone compatible with you.
28. You have a lot of conflict with your ex-spouse.
29. You don't see your children from a former marriage as much as you would like.
30. You are alone too much.
31. You wish you could have children but you cannot.
32. One of your children seems very unhappy.
33. You feel your children don't listen to you.
34. A child's behavior is a source of serious concern to you.
35. One or more children do not do well enough at school or work.
36. Your children don't help around the house.
37. One of your children spends too much time away from the house.
38. You feel like being a housewife is not appreciated.
39. You have to go to social events alone and you don't want to.
40. Your friends are a bad influence.
41. You don't have enough friends.
42. You don't have time for your favorite leisure time activities.
43. You want to live farther away from your family.
44. You would like to move but you cannot.
45. The place you live is too noisy or too polluted.
46. Your family lives too far away.
47. Someone in your family or a close friend has a long-term illness or handicap.
48. You have a parent, a child, or a spouse or partner who is in very bad health and may die.
49. Someone in your family has an alcohol or drug problem.
50. A long term health problem prevents you from doing the things you like to do.
51. You take care of an aging parent almost every day.

III. MAJOR TRAUMATIC EVENTS

We distinguish two phases of the life course to estimate exposure to major life events: childhood and adulthood. These events are not limited to occurrence within the year before interview. Simultaneously considering the distinct lists of childhood and lifetime traumas below, we counted all occurrences prior to the age of 23 as the number of childhood traumatic events, and items endorsed as occurring at age 23 or later were counted as adult traumas. Each score represents a simple count of these events that last occurred in one or the other life phase.

A. Childhood Traumas

Now, I'd like to ask about some things that may have happened to you while you were a child or a teenager, before you moved out of the house.

1. Did you ever have a major illness or accident that required you to spend a week or more in the hospital?
2. Did your parents get a divorce?
3. Did you have to do a year of school over again?
4. Did your father or mother not have a job for a long time when they wanted to be working?
5. Did something happen that scared you so much you thought about it for years after?
6. Were you ever sent away from home because you did something wrong?
7. Did either of your parents drink or use drugs so often or so regularly that it caused problems for the family?
8. Were you regularly physically abused by one of your parents?

B. Lifetime Traumas

Now, I'd like to ask you about some events that could have happened at any time in your life. Please tell us if any of these things have happened, and how old you were.

1. Have you ever been divorced or ended a relationship with someone you were still in love with?

2. Has one of your parents died?
3. Has a spouse, child or other loved one died?
4. Have you ever seen something violent happen to someone or seen someone killed?
5. Have you ever been in a major fire, flood, earthquake, or other natural disaster?
6. Have you ever had a serious accident, injury, or illness that was life threatening or caused long-term disability?
7. Has one of your children ever had a near fatal accident or life-threatening illness?
8. Have you ever been in combat in a war, lived near a war zone or been present during a political uprising?
9. Have you ever discovered your spouse or partner in a close relationship was unfaithful?
10. Have you ever been physically abused by your current or a previous spouse or partner?
11. Has your spouse, partner, or child been addicted to alcohol or drugs?

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