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The Role of Adversity and Stress in Psychopathology: Some Evidence and its Implications for Theory and Research*

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Three lines of research—studies of extreme situations, epidemiological investigations of relations between socioeconomic status (SES) and psychiatric disorders, and a quasi-experimental test of the social causation-social selection issue raised by the epidemiological findings—provide strong evidence that environmental adversity is important in the occurrence not only of post-traumatic stress disorder (PTSD) but also of other types of psychopathology, including major depression, alcoholism, substance use disorders, antisocial personality disorder, and nonspecific distress. Leads from this triad of studies are developed into a basic proposition about the nature of the role of adversity and stress. The core of this proposition is that the likelihood of onset of the above types of disorder increases with two factors: (1) the proportion of the individual's usual activities in which uncontrollable negative changes take place following a major negative event; and (2) how central the uncontrollable changes are to the individual's important goals and values. The role of environmental adversity in bringing about these uncontrollable changes varies with gender, ethnic/racial status, and SES in our own and other modern, urban societies. The types of psychopathology that develop and their course vary with both the types of adversity (e.g., whether life threat is involved) and with the personal predispositions of the individuals who experience the adversity and stress (e.g., family history of particular types of psychopathology).

PROLOGUE

Arthur Miller's great American play, *Death of a Salesman*, opened on Broadway in 1949. It is about a traveling salesman, Willy Loman, his wife, and his two now adult, ne'r-do-well sons. In the opening scene, the stage is almost

dark when the audience first sees Willy in his doorway, an exhausted figure with two large suitcases. We hear his wife's voice from inside the house call "Willy?" and Willy answers, "It's all right. I came back" (Miller 1949:2). His wife asks "Why? Did something happen, Willy?" "No," he says, "Nothing happened" (Miller 1949:2). For the playwright, these opening lines are "the whole disaster in a nutshell" (Lahr 1999: 42). We soon learn that something has indeed gone wrong. Starting off on a sales trip to Boston, Willy unaccountably drove his car off the road a short way out of New York City. After a time, he turned around and came home, ". . . tired to the death" he tells his wife (Miller 1949:2). As the playwright comments, ". . . imagine a salesman who can't get past Yonkers. It's the end of the world. It's like an actor saying "It's all right. I can't speak" (Lahr 1999: 42).

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This year, 50 years after its debut, a major revival of *Death of a Salesman* opened in New York to positive reviews and much renewed analysis. One discussion appeared in an "Ideas and Trends" column in a recent edition of *The New York Times* (McKinley 1999). Introduced with the lead "Get That Man Some Prozac," the piece reports that the director of the new production sent the script to two psychiatrists to obtain new insights into the role of Willy Loman. Both psychiatrists said the same thing: "They said that Willy was a manic-depressive with hallucinatory aspects" (McKinley 1999:5). To this, the playwright, Arthur Miller, responded "Willy Loman is not a depressive. . . . He is weighed down by life. There are social reasons for why he is where he is" (McKinley 1999:5). I will return to this controversy and to the play later on.

Two monumental events in the history of this nation occurred in the 20 years before the original opening of *Death of a Salesman* in 1949, and these events provided important context for Miller as they do for the analysis of the role of adversity and stress in psychopathology that I will report here. One was the stock market crash in 1929 followed by the Great Depression; the other was the U.S. entrance into World War II in 1941. The Great Depression made it clear that a person could become poor for reasons other than inherited disabilities (e. g., Elder 1974), and research during World War II suggested that situations of extreme environmental stress arising out of combat and imprisonment could produce serious psychopathology in previously normal persons (Dohrenwend and Dohrenwend 1969:110–125), some of it long-lasting (Engdahl et al. 1997; Eitinger 1964; Levav 1998).

In the United States, especially, it became almost a given that environmental adversity was of paramount importance in the etiology of all of the major types of psychiatric disorder, including schizophrenia (Dunham 1955; Faris and Dunham 1939; Frank 1936; Hollingshead and Redlich 1958; Leighton et al. 1963; Srole et al. 1962). The most sweeping statement of this position said that sick and disorganized societies produced sick and disorganized citizens (Dunham 1955; Faris and Dunham 1939; Frank 1936; Leighton et al. 1963). Similar ideas were put forward about the putative causal role of lower "social class" or socioeconomic status (SES)

(Hollingshead and Redlich 1958; Srole et al. 1962).

The assumption about the primacy of environment has tended to give way over the past 25 to 30 years to a Zeitgeist favoring biological factors, especially those that trace biology to genetic inheritance (Guze 1989; Heston 1988; Plomin 1990). This most recent change has coincided with the advent of new drug treatments and the strong research results from the family, twin, and adoption studies conducted by behavioral geneticists.

While the behavioral genetics studies show that genetic factors contribute to these disorders, they also show that genetic factors alone cannot account for them (Dohrenwend 1976; Merikangas 1990; Plomin 1990). For example, even with schizophrenia—where the evidence for genetic factors is strongest—the concordance rate in monozygotic twins is far from 100 percent. For the psychosocial researcher, however, this argument by subtraction is not very satisfactory. As Gottesman and Shields put it over 20 years ago with regard to schizophrenia, ". . . the burden of proof has shifted from showing that genes are important to showing that environment is important" (Gottesman and Shields 1976:367). This challenge is not specific to schizophrenia but extends to psychiatric disorders more generally (e.g., Guze 1989; Heston 1988).

Against this background, it seems important to make a case for what we know about the role of environmental adversity and stress in psychiatric disorders and to set forth how we can build on this knowledge in terms of both theory and further research. The argument that follows is from my particular perspective, and the ideas and evidence to support it are highly selective. Others might go at the task quite differently (see, for example, Brown 1996 and Rutter 1999). I hope more will do so. Meanwhile, here is my attempt.

EVIDENCE FROM AN ENVIRONMENTAL TRIAD

I have argued that there are three sets of studies of environmental factors that provide a compelling analogy to the family, twin and adoption studies of the behavioral geneticists; taken together, the results of this environmental triad provide convincing evidence that adversity is important in the development of

major types of psychopathology (Dohrenwend 1998a). The triad consists of epidemiological research on relations between socioeconomic status (SES) and psychiatric disorders, a quasi-experimental test of the social causation–social selection issue posed by the SES differences, and investigations of the psychiatric consequences of exposure to extreme situations. I will consider each in turn.

Epidemiological Research on Socioeconomic Status (SES) and Psychiatric Disorders

I will start with the epidemiological investigations reporting inverse relations between socioeconomic status (SES) and the prevalence not only of overall rates of psychiatric disorder but also of important subtypes that include schizophrenia, major depression, anti-social personality, alcoholism, substance-use disorders, posttraumatic stress disorder (PTSD), and nonspecific psychological distress (Dohrenwend 1990b; Kessler et al. 1994; Kohn, Dohrenwend, and Mirotznik 1998; Kulka et al. 1990; Link and Dohrenwend 1980). These SES results are open to alternative environmental and genetic explanations, as are the results of behavioral genetic studies showing that important types of psychiatric disorder run in families. The question raised by the SES findings is whether the inverse relations are caused more by exposure of people in low status positions to greater environmental adversity and stress or caused more by the downward selection into low status positions of genetically predisposed people with the disorders or with characteristics associated with the likelihood of developing the disorders (e.g., Dohrenwend 1990b).

A direct way to investigate this social causation–social selection issue—a classic issue in psychiatric epidemiology—would be to undertake multi-generation prospective studies in which both SES and psychiatric disorders are assessed in parents and offspring. Most research to date has consisted of more economical but inconclusive retrospective studies that have not included data on family history of disorder as a possible indicator of genetic transmission (for reviews and analyses of this research, see Dohrenwend and Dohrenwend 1969:41–48; Dohrenwend et al. 1998:286). Recently, more promising and informative longitudinal research on social mobility has been

conducted. The major advance has been provision for securing data on the history of psychiatric disorder in the parents of the index cases (Johnson et al. 1999; Rishler et al. Forthcoming). The results of this research suggest that parental educational level may be an important contributor to adverse psychiatric outcomes in offspring, especially depression. Additional research has pointed to characteristics of the respondent's own occupation that may play a part (Link, Lennon, and Dohrenwend 1998).

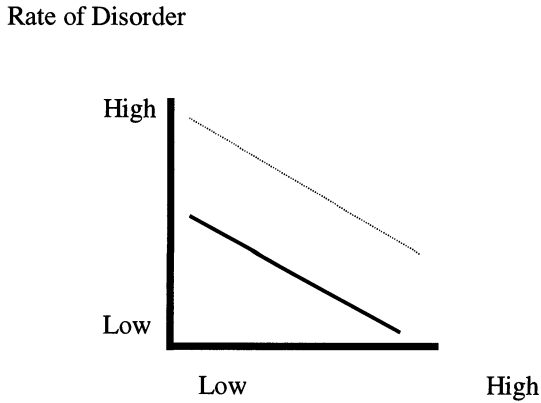
A Quasi-experimental Test of the Social Causation–Social Selection Issue Posed by Findings of Inverse Relations Between SES and Various Types of Psychiatric Disorder

Like the adoption strategy used by the behavioral geneticists, the first step in our own approach to resolving the social causation–social selection issue, has been indirect. Our approach involves the use of more readily available data than multi-generation prospective family history and social mobility studies can provide. The theoretical rationale and results have been set forth in detail elsewhere (Dohrenwend et al. 1992, 1998) and will only be briefly summarized here. The approach involves a quasi-experimental strategy that focuses on similarities and differences between ethnic/racial status and SES as they contribute to relative advantage and disadvantage in urban assimilation situations. Especially important is the fact that ethnic/racial status is clearly an antecedent source of advantage or disadvantage that is assigned at birth independently of the behavior of the individual; by contrast, the individual's SES, while also a source advantage and disadvantage, is affected in substantial part by the individual's behavior. The individual's ethnicity or race is an ascribed status; his or her SES is, partially, an achieved status.

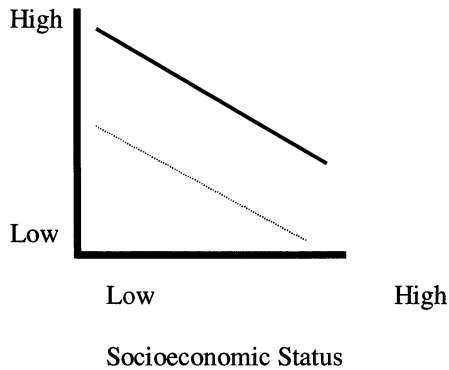
The similarities and differences between ethnic/racial status and SES lead to two contrasting predictions: summarized and somewhat oversimplified in Figure 1, the social causation prediction is that, with SES held constant, rates of disorder will be higher in members of disadvantaged ethnic/racial groups because of the increment of adversity and stress associated with ethnic/racial prejudice and discrimination. The social selection

FIGURE 1. Summary of Social Causation Versus Social Selection Predictions for Any Type of Psychiatric Disorder that is Inversely Related to Socioeconomic Status in the General Population

Social Causation Prediction:



Social Selection Prediction:



Advantaged Ethnic Group —————
Disadvantaged Ethnic Group ······

prediction, by contrast, is that rates of disorder will be higher in the advantaged ethnic/racial groups because the increment of pressure on members of disadvantaged ethnic/racial groups will confine more of their healthy members to low SES, diluting their rates of disorder compared to low SES members of advantaged ethnic groups. Our tests of these predictions to date strongly suggest that social selection processes are more important for

schizophrenia, while social causation processes are more important for major depression in women; antisocial personality, alcoholism, and substance-use disorders in men; and for non-specific distress or “demoralization” (Frank 1973) in both genders (Dohrenwend et al. 1992, 1998). By the logic of this quasi-experimental test, there is also evidence that social causation processes are more important in the inverse relationship between SES and PTSD

that has persisted for many years after exposure of U.S. male veterans of combat in Vietnam. I am referring to the higher rate of current PTSD in black and latino veterans compared to their nonlatino white SES counterparts (Kulka et al. 1990).

Replication of the Israel study with different sets of advantaged and disadvantaged ethnic groups in different assimilation settings is needed to rule out idiosyncratic cultural-historical and/or genetic factors that could affect the results in a particular setting. It must be pointed out, however, that replications of these quasi-experimental tests will not be easy to conduct for a variety of reasons. First, most members of disadvantaged ethnic groups are low in SES while most members of assimilated advantaged ethnic groups are middle or high SES—with the result that the two variables are confounded in epidemiological studies that use random sampling designs; stratified sampling, such as that used in Israel, with optimal allocation according to ethnic status and SES is required to unconfound these status variables.

Second, there has been difficulty in securing unbiased estimates of the rates of the types of disorders that are inversely related to SES in contrasting ethnic/racial groups, even when case definition is independent of treatment status to guard against problems of selective factors related to receiving psychiatric treatment. The problem may be particularly large when the goal is to obtain accurate rates for disadvantaged ethnic/racial minorities. Even in the U.S. census—which is conducted with far more resources and completed with far fewer refusals than sample surveys of households under other auspices—the undercount for African-American men has been estimated to be as high as 15 percent (Chodin 1994). The problem is not limited to the U.S.; it has been encountered as well in studies of the treated incidence of schizophrenia in African-Caribbeans who migrated to or were born in the U.K. compared to treated incidence in U.K. whites (e.g., Bhugra et al. 1997, Harrison et al. 1997).

It is one thing to recognize such problems; quite another to solve them (cf. Mortenson, Cantor-Graae, and McNeil 1997). When investigators fail to do so as in, for example, the U.K. research on rates of treated schizophrenia in African-Caribbean compared to whites, it is necessary to view the results with skepticism

(Dohrenwend 1999). For our purposes, the need to solve such problems has been compelling, because our tests require unbiased estimates of rates of the disorders of interest in contrasting gender, ethnic and SES groups. Our solution was to conduct our first systematic test of the issue in Israel, which had the two things we needed: (1) the presence of second generation members of advantaged and disadvantaged ethnic groups in an urban assimilation situation; and (2) a carefully maintained Population Register from which to sample birth cohorts from these advantaged and disadvantaged ethnic groups. These resources are not widely or readily available elsewhere.

Finally, we used a two-phase procedure for arriving at psychiatric diagnoses. Our procedure involved an initial screening with carefully calibrated psychometric symptom scales and anamnestic items followed by research diagnoses made by experienced psychiatrists (Dohrenwend et al. 1992, 1998). The use of skilled clinicians to make informed ratings and diagnostic assessments on the basis of semi-structured questioning and extensive use of probes is labor-intensive, time-consuming and expensive; this procedure is not typical of most contemporary epidemiological research which uses more economical, fully-structured interviews that rely on lay interviewers (see, for example, Dohrenwend 1990a). Nevertheless, I believe that a multi-method approach such as ours—which uses procedures with different but nevertheless compelling logics for dealing with measurement error—is required when main reliance must be placed on interviews rather than highly reliable and valid laboratory tests (Dohrenwend 1990a).

Meanwhile, Bruce Link and I have been able to investigate directly one aspect of the process underlying the ethnic differences in rates of disorder found in the quasi-experimental tests of the social causation-social selection issue conducted in Israel. As noted above, we assume this process to involve greater pressure stemming from prejudice and discrimination on members of the disadvantaged ethnic group, an assumption that we checked with a study of attitudinal prejudice in the Israel research (Schwartz et al. 1991). Our further tests of this assumption have focused on the role of expectations of prejudice and discrimination in both status attainment and the occurrence of the types of disorder that

showed social causation outcomes, and we have had striking results that are consistent with, and help explain, the macro-level findings (Dohrenwend and Link 1999).

Research on Extreme Situations

The third member of the environmental triad consists of research on the psychiatric consequences of events in extreme situations created by natural and human made disasters (Giel 1998; Keane 1998; Levav 1998; Mollica, Poole, and Tor 1998). These diabolical experiments of nature and human folly produce environmental contrasts with more usual situations that are as strong as the genetic contrasts between monozygotic twins, dizygotic twins, and unrelated individuals. Results of studies of extreme situations have led me and others to conclude that serious psychopathology, including but not restricted to PTSD, develops in previously normal people exposed to the most severe events in extreme situations (e.g., Dohrenwend and Dohrenwend 1969; Dohrenwend 1998a).

This conclusion is not, however, without controversy. Some investigators have suggested that vulnerable personal predispositions may be more important than exposure to events in extreme situations in the development of PTSD. Taking this position, Yehuda and McFarlane (1995) have argued that it is time to reconsider the formulations of PTSD in DSM-III, DSM-III-R, and DSM-IV that emphasize the primacy of the stressor. In reviewing the epidemiological evidence, however, Yehuda and McFarlane (1995) fail to consider findings on dose/response relationships which show that the more severe the event to which the individual is exposed, the less the role of individual differences in personal vulnerability or protective factors in the onset, although not necessarily the persistence, of PTSD (Dohrenwend 1998a). If there is a case to be made for the importance of personal predispositions, it centers on the course of PTSD. We need far more evidence than is currently available on possible differences between the risk factors in onset and the risk factors in course of psychopathology following exposure to severe events in extreme situations.

There is considerably more skepticism about the causal role of events in more usual situations, and this skepticism is harder to

refute than questions about the primacy of the stressor in the development of psychopathology following exposure to events in extreme situations. For example, Guze published an article in 1989 titled, "Biological Psychiatry: Is There Any Other Kind?" In it, he wrote:

No one has presented convincing evidence that most individuals exposed to a particular psychologically meaningful experience develop a particular disorder. . . .

The point I am making is not that psychologically meaningful experiences are irrelevant to the development of psychiatric disorders. I remain agnostic about their ultimate importance because, in the great majority of instances, these putative causes of psychiatric disorders reflect only the usual range of human troubles that most people experience without becoming ill. (P. 317)

And in a recent review of life events research focused on major depression, Kessler (1997), a more psychosocially oriented investigator, has made the suggestion that:

Although the available evidence suggests that acute stressful life events can lead to the *recurrence* of episodes of major depression, a series of methodological problems compromise our ability to make clear causal inferences about the effects of life events on the first onset of major depression. . . . (P. 191)

Part of the dilemma is the absence of published studies of first episode cases sampled from the general population—something my colleagues and I hope to remedy soon. Another part stems from limitations in the conceptualization and measurement of stressful events whose occurrence can often be influenced by behavior related to previous disorders or to personal predispositions that are risk factors for the onset or recurrence of the disorders.

THE PROBLEM

The problem for me has been how to integrate leads from each of the three bodies of research into a coherent framework for understanding the role of adversity in the general population where (1) exposure to extreme situations involved in natural and human-made disasters is rarely encountered; (2) psychiatric disorders are not rare, with overall prevalence in the U.S. for the period of a few months to about a year estimated at between 20 percent and 30 percent (Dohrenwend et al. 1980;

Robins and Regier 1991; Kessler et al. 1994), and with a substantial additional minority that may be almost as large showing current non-specific psychological distress that is severe but does not meet criteria for a specific disorder (Link and Dohrenwend 1980); and (3) where neither psychiatric disorders nor environmental adversities are randomly distributed in the population but, rather, vary with social statuses such as age, gender, ethnic/racial background, and SES (Brown and Harris 1978; Dohrenwend and Dohrenwend 1969: 131–150; Dohrenwend 1973; Turner, Wheaton, and Lloyd 1995).

ADVERSITY IN EXTREME AND IN MORE USUAL SITUATIONS

The dictionary (Websters, 1961: 59) defines the adjective “adverse” as “acting against or in a contrary direction” and, more personally, as “opposed to one’s interests.” The noun, “adversity,” refers correspondingly to a “calamitous or disastrous experience.” A more inclusive synonym for adversity is “misfortune.” “Adversity” itself “applies to a state of grave or persistent misfortune” as distinguished from “mishap” which “applies to a trivial instance of bad luck.” Life events can be important representations of adversity.

Similarities and Contrasts Between Events in Extreme Situations and Events in More Usual Situations

There is strong evidence that events in extreme situations play an important causal role in a wide range and variety of psychopathology. The evidence on the role of stressful events in more usual situations is far more ambiguous. In a search for clues to developing more incisive research on the part played by such events in the occurrence and distribution of psychiatric disorders in the general population, it is useful to inquire into similarities and contrasts between events in extreme situations and events in more usual situations.

Extreme situations involve events that are negative and that represent loss rather than gain. All or most major events in extreme situations are what I have called “fateful” (Dohrenwend 1979:6) that is, the circum-

stances leading up to them and their immediate occurrence are beyond the control of the person and unaffected by his or her behavior (Dohrenwend et al. 1993). The onset of events in extreme situations is often unpredictable and would be considered so by objective observers. Some of these major events in extreme situations are life-threatening and hence central to the needs and goals of the individual. These major events in extreme situations are large in objective magnitude in that they bring about great negative changes in the usual activities of the individual. All or some of these changes are beyond the control of the individual (e. g., the casualty rate in a soldier’s company). Some of the events themselves, or the uncontrollable changes that follow them, tend to exhaust the individual physically.

Important events in more usual situations include experiencing the death of a loved one (Clayton 1998); undergoing a marital separation or divorce (Bruce 1998); losing a job (Kasl, Rodriguez, and Lasch 1998); suffering a serious physical illness or injury (Dew 1998); being a victim of child abuse (Widom 1998) or rape (Kilpatrick et al. 1998). How do such events in more usual situations that occur in the everyday lives of people compare with the characteristics of events in extreme situations?

Some of the characteristics that define major events in extreme situations occur to some degree in most of these individually targeted events in more usual situations. All of the characteristics of events in extreme situations are almost never present in these events in more usual situations, although some have most of the characteristics. For example, child abuse and neglect (Widom 1998) have many of the characteristics of events in extreme situations and strike at the most vulnerable stage of human development. Some rape events are also fateful, unpredictable, and life-threatening in ways that are not dissimilar to these features of many events in extreme situations of military combat and natural disasters (Kilpatrick et al. 1998). Life-threatening physical illnesses and injuries (Dew 1998) can have much in common with events in extreme situations (that can, of course, include life-threatening injuries) but usually lack the wider threatening circumstances of extreme situations and occur in contexts where social supports are more readily available. Like most events in extreme situations, death of loved ones such as spouse (Clayton 1998) or child is

likely to be fateful, but bereavement is usually not life-threatening to the person himself or herself. This is true of some types of unemployment such as layoffs that occur when an entire plant shuts down (Kasl et al. 1998). These contrasts and similarities are relatively clear cut. Assessing the points of similarity and contrast between events in extreme situations and events in more usual situations of individuals in the general population becomes more complicated when we look at events such as a marital separation or divorce (Bruce 1998); the full variety of events involving unemployment (Kasl et al. 1998); or some types of physical illness or injury that may not occur independently of the behavior of the individual (Dew 1998). These types of events are clearly stressful, but their objective magnitudes vary greatly and their origins may as often be in what Hammen (1991) calls the "stress generative" behavior of the individual as in the environmental conditions to which the individual is exposed. Still more frequently, such events are brought about by a complex mixture of the person's behavior and factors in his or her external environment. Moreover, how long the negative changes in usual activities that follow these events remain uncontrollable may depend more on the coping ability of the person (e.g., choosing a good lawyer prior to divorce; using a successful strategy of job search following unemployment) than on external factors in the wider environment (e.g., allied forces liberating concentration camp survivors).

Where life-threatening events in extreme situations are concerned, what I have called the "centrality" (Dohrenwend 1998b: 541–542) of the threat to the needs and goals of the individual is self-evident; all usual activities are disrupted and all of the individual's goals are in jeopardy. Some events in both extreme and more usual situations may also have an extremely high degree of centrality, even when they are not life-threatening. One possible example, as Fullilove (1996) argues, consists of events that involve threats to a physical "place" of major importance to the individual. The sources of such events differ greatly, ranging from war-created refugee populations to lesser dislocations resulting from slum clearance and job relocation. Events in more usual situations impact more selectively on particular activities of the individual and the goals related to these activities (e. g., marital separa-

tion on family but not necessarily on work). These more specific goals vary with the type of event and the particular values and beliefs of the individuals who experience the event; for example, the particular goods and services the individual needs or desires, or the particular sources of respect on which he or she relies. Often money is a convenient measure since it can be converted into many of these goods and services and serves as a proxy for goals consisting of the goods and services. These varied and sometimes subtle threats (e.g., the inability to "keep up with the Jones") can involve relative deprivation as well as absolute deprivation as the individual compares his or her plight to the circumstances of more fortunate others (Merton and Kitt 1950). There is a major job to be done in developing taxonomies of goals, aspects of various kinds of life events that carry the potential to interfere with attaining these goals, and measures of how an individual's goals vary with gender, ethnic/racial status, and SES. In the United States, these goals are embodied in broadest terms in the American Dream of life, liberty, and the pursuit of happiness and, more particularly, in its group and individual variations.

Table 1 summarizes what I believe are the main general, objective characteristics and dimensions of life events. In addition to these general features, there are event-specific characteristics that are likely to be important; for example, rape by an acquaintance in contrast to rape by a stranger and the other examples described in Table 1.

Checklist measures of life events, though economical and in wide use, are not adequate to the job of operationalizing the important dimensions of events such as fatefulness, centrality, and magnitude that I have been discussing. Moreover, in a striking pair of studies, Southwick et al. (1997) and Roemer et al. (1998) have shown that even relatively objective checklist measures are subject to strong recall biases. Southwick and his colleagues (1997) secured responses from 59 National Guard reservists to a trauma questionnaire both one month and then again two years after their return to the U.S. after service in the Gulf War. They found that a large majority of veterans, 88 percent, changed their responses to at least one of the 19 items on the checklist and fully 61 percent changed two or more responses. Most importantly, there was a significant positive correlation between number of PTSD

TABLE 1. Objective General and Specific Dimensions of Life Events**General Dimensions:**

Valence—positive/negative; gain/loss.

Fatefulness—extent to which occurrence of the event is outside the control of the individual and unaffected by his or her behavior; this is in contrast to the extent to which the occurrence of the event is a consequence of the behavior or actions of the individual.

Predictability—likelihood that most people would expect the event to occur.

Magnitude—the amount of change in the usual activities of most individuals who experience a similar event.

Centrality—relation of the affected activities to maintaining or achieving the most important goals of most people who experience a similar event; for example, events involving life-threat involve all goals and are likely to have the highest degree of centrality.

Physical impact—likelihood that the changes would be physically exhausting for most individuals who experience similar events.

Specific Dimensions:

In addition to the above general dimensions or characteristics of events, there are specific characteristics of events that are also likely to contribute to their impact. Examples of these event-specific characteristics are involvement in atrocities during combat; severe neglect contrasted with physical battering in child abuse; known versus unknown assailant in rape and assault; untimeliness of bereavement; and whether child custody issues are involved in marital separation and divorce.

symptoms at the two year follow-up and the number of responses changed from “no” to “yes” on the trauma questionnaire. A similar study by Roemer and her colleagues (1998) of 460 U.S. soldiers who had served in the peace-keeping mission in Somalia obtained much the same results. Both sets of investigators note that the apparent dose/response relationship was attributable in part to recall bias. As Roemer et al. (1998: 604) conclude, “Any significant contribution of symptom severity to retrospective accounts of exposure calls into question the commonly assumed unidirectional relationship between appraisal of the frequency and severity of war-zone exposure and PTSD and thus has important implications for research in this area.”

The categories on the checklists used by Southwick et al. and by Roemer et al. were thought by the investigators to be objective as well as highly traumatic. For example, those that showed the greatest percent of changed responses between Time 1 and Time 2 in the study by Southwick et al. were as follows:

- Extreme threat to your personal safety
- Bizarre disfigurement of bodies as a result of wounds
- Mines and booby traps

Morgan (1997) reinterviewed 36 of the Gulf War veterans and confronted them with the discrepancies. He found that the veterans were completely surprised by the apparent contra-

dictions and could supply no coherent explanations of why they changed their responses. Morgan concluded that the veterans were reinterpreting the meaning of terms in the checklist items in the context of contemporary situations, including respondents having obtained from the media and from discussions with other veterans additional and often different information about the war during the two-year interval between measures. However, this changed context does not explain why terms like “extreme threat” were reinterpreted differently by veterans with more PTSD symptoms compared with those with fewer PTSD symptoms at Time 2, thereby introducing substantial systematic bias. This evidence of bias toward a built-in dose/response relationship between stressor and symptoms is the most devastating indication to date of the inadequacy of checklist approaches to measuring stressful life events (see additional criticism in Dohrenwend et al. 1993).

Less widely used alternatives to checklists are labor intensive and lack the economy of checklist approaches (e.g., Brown and Harris 1978; Dohrenwend et al. 1993). But labor intensive procedures are required. With intensive interviewing using semi-structured probes, it is possible to elicit detailed accounts or narratives of what actually led up to an event and what happened during the event (e.g., Dohrenwend et al. 1993). These narratives can be rated by trained judges on the important

objective general and specific dimensions of the events summarized in Table 1. This combination of intensive interviewing and ratings by trained researchers are, I believe, the best way to avoid the problem of the changing meaning of fixed alternative responses (e.g., yes/no) to structured questions so dramatically illustrated by the research of Southwick and his colleagues (1997) and by Roemer et al. (1998).

What I mean by a "narrative" is not dissimilar to establishing the facts through testimony in a court of law as a "readily digestible account of what happened, how it happened and, if possible, why it happened" (Weitz 1987: 202). The assumption, as in a court of law, is that truth is in the details. Here are some illustrations from a pilot study my colleagues and I conducted with both qualitative and quantitative data from a major investigation of U.S. veterans of the war in Vietnam (Kulka et al. 1990)—data that I will be working with for the next three years. The data, edited to preserve anonymity, come from structured interviews and from audiotapes of more open-ended clinical interviews with three veterans who experienced more and less severe exposure to war zone adversity. We plan to cross-check and expand the accounts with detailed data from military records on the war-zone experiences of the company units to which the men were assigned.

Veteran 1 registered for the draft at age 18 and was classified 1A. He was drafted and entered active duty in the Army, serving for two years. His last eight months of active duty were in Vietnam from 1967 to 1968. He was stationed outside Saigon in a combat support supply unit and received an appropriate Vietnam service medal and combat pay.

He described his exposure to combat as "heavy" rather than "light" or "moderate" and reported being under enemy fire "more than 50 times." This included small arms and sniper fire as well as incoming fire from enemy artillery, rockets, and mortars. He said he was "very often" (more than 50 times) in danger of being killed or wounded and was very often near combat situations, though not actually involved in combat. He replied "no" both to the general question, "Did you ever go on combat patrols or missions, or have other dangerous duty?," and to specific questions about particular types of dangerous situations, such as flying helicopter missions, river patrol, or being ambushed, or "any other life threatening

situation" that he was given a chance to describe. He also said "no" to the question, "Did you ever fire a weapon (in or around Vietnam)?" and he rarely saw Americans being wounded and never saw them being killed. However, he responded to a separate question that he had friends who were killed or wounded.

He told us that the frequent, incoming mortar from the enemy frightened him at first but that he could quickly get into a shelter and got used to it. He also provided an account of his unit shelling a village across a river and observing the villagers burying children who had died as a result. He affirmed that this event "seriously (emotionally) upset or frightened" him.

When asked whether he had "ever volunteered for any special jobs, such as medic, special forces, LRRP, or something else," he replied that he had volunteered to be a helicopter gunner but did not get the job. When asked how often in Vietnam he was "physically fatigued or exhausted"—with the alternatives being "very often, often, sometimes, rarely, or never"—he replied "rarely."

Veteran 2 enlisted for four years in the Air Force in the summer of 1968 and started his tour of duty in Vietnam in the summer of 1971. He served there for eight months and was deactivated in 1972. During this time, his unit was stationed in the North at Da Nang. Like *Veteran 1*, his role was combat support, and he did not go out on patrols and was rarely near situations of actual combat. Also like *Veteran 1*, he replied that he "rarely" felt physically fatigued or exhausted. Unlike *Veteran 1*, he never volunteered for more dangerous assignments. However, his location in the North, much nearer to North Vietnam, brought him into considerably more danger than *Veteran 1*.

Like *Veteran 1*, *Veteran 2* reported that his exposure to danger was "frequent" and that his unit often received "sniper fire and/or sapper attacks." Unlike *Veteran 1*, he reported "often" firing his weapon at the enemy, although he responded to a closed question that he himself was never in a situation in which he was sure that he, personally, had killed enemy personnel. Unlike *Veteran 1*, he "sometimes" witnessed Americans being killed and "often" saw the bodies of dead Americans. Like *Veteran 1*, he reported that personal friends were killed or wounded and recalls a particu-

larly upsetting experience of seeing a friend get part of his body blown off.

He provided an account of a harrowing experience that occurred during the build-up for the Tet offensive at a time that he was under fire night after night at "Monkey Mountain" several miles north of Da Nang. He reports that the first couple of weeks there were the worst because the enemy attacks coincided with a typhoon that caused a blackout of the area. When the typhoon took the roof off the building he was in, he thought at first that the damage was done by an enemy shell. The night before he left, he thought that he himself was hit by enemy fire; it turned out to be the man behind him.

Veteran 3 was drafted into the Army and began his tour in Vietnam late in the summer of 1967. He served in several places to the West and South of Saigon before being medically evacuated for wounds. He is a highly-decorated hero of the war.

Veteran 3 served mainly in combat units and described his exposure to danger as "constant." He replied affirmatively to all of the closed questions describing combat-related experiences reported by *Veteran 2*, plus many others. Unlike *Veterans 1* and *2*, *Veteran 3* "often" (more than 50 times) "went on combat patrols or missions, or had other very dangerous duty." He replied that he was "often" or "very often" involved in such activities as "patrolling the countryside outside of American bases," flying helicopter missions, being "part of a river patrol or gunboat crew," and encountering "anti-personnel weapons such as (land) mines and/or booby traps." He responded "sometimes" to the question of "was your unit (patrol) ambushed?" Moreover, vehicles in which he traveled were "often" disabled by enemy fire, his unit (patrol) "very often" engaged "the North Vietnamese Army (NVA) or other organized military forces in a fire-fight," he very often had "to do certain particularly dangerous tasks (e.g., walk point, check out bunkers or tunnels)," and, in response to the question, "Did you find yourself in *any other* life threatening situations, he responded affirmatively, "crossing the rivers." When asked about "being physically fatigued or exhausted," he replied "very often."

Veteran 3 described wounds he received on two different occasions that have led to his receiving 50 percent disability payments from the VA. He also related an incident in which a

close friend had part of his face blown away and died in his presence.

Veteran 3 was asked whether he ever volunteered for special assignments. Like *Veteran 2* and unlike *Veteran 1*, he said he never did volunteer. When asked whether he volunteered for the kinds of activities that won him his high military honor for valor, he said that they just pick you for what they want you to do. "I didn't ask for it," he said.

All three veterans served in their war-zone situations in Vietnam for roughly similar periods of time. The place and type of war-zone assignment (i.e., the prelude to the events they experienced) and the immediate occurrence of the negative events in these situations described above (e.g., incoming enemy fire) were largely outside their control and unaffected by their behaviors. All three veterans, therefore, experienced fateful negative events. These events were also central for all three in that the events involved life threat. All three veterans would probably check many of the same items included in commonly used combat experience checklists such as the one in the study by Southwick et al. (1997). But the specific experiences involved and the contexts in which the experiences occurred were clearly, in the narratives presented above, very different.

As the narratives show, the frequency, magnitude, and predictability of the fateful negative events differ sharply among the three veterans. The wide variety of dangerous situations faced by *Veteran 3* led to experience with more unpredictable negative events than were experienced by the other two. Moreover, the objective magnitude of the fateful negative events experienced by *Veteran 3* (e. g., being seriously wounded) is greater, leading to more changes in usual activities than the events experienced by the other two veterans. The difference is less sharp between *Veteran 1* and *Veteran 2* than between either of them and *Veteran 3*. Unlike *Veteran 3*, for example, neither reports having often been physically exhausted. However, there are clear differences between *Veteran 1* and *Veteran 2* that are epitomized by *Veteran 2's* account of his experience with the typhoon and the beginning of the TET offensive while he was on Monkey Mountain. There was no similarly unpredictable and disruptive situation faced for so long a period of time by *Veteran 1*.

There was another difference that cannot be set forth here without giving too many possible clues to the identity of Veteran 3. He participated in positive, nonfateful, legitimate war activity that further differentiates him from the other two Veterans. This activity is, however, an important part of the research narrative that will be rated on the important objective general and specific dimensions on fully detailed narratives. Meanwhile, if we had only the above narrative material, it is clear that Veterans 1, 2, and 3 could be readily and convincingly allocated to relatively low, medium, and high exposure to war-zone stressors, respectively, as measured on the theoretically important dimensions of fatefulness, predictability, centrality, magnitude and potential to exhaust the individual physically. While my colleagues and I have developed a more satisfactory general approach to measuring life events (Dohrenwend et al. 1993) and have shown that this approach can lead to important substantive findings on the role of recent events in episodes of major depression (Shrout et al. 1989; Stueve, Dohrenwend, and Skodol 1998) and nonaffective psychotic disorders (Stueve et al. 1998), we have not yet constructed ratings—other than one of life threat—that would assess the relation (e.g., congruence and incongruence) of events, and of changes in usual activities following them, to valued goals. Others have been working on the problem as well. George Brown (1998), for example, and Peggy Thoits (1995) are developing ideas along these lines.

TOWARD THEORETICAL INTEGRATION

As emphasized earlier, negative events in extreme situations have in common with negative events in more usual situations the fact that both can lead, albeit often by different routes, to uncontrollable negative changes in one's ongoing goal-directed activities. For example, in extreme situations such as exposure to combat, fateful negative events are frequently the main if not the sole determinants of uncontrollable negative changes. In this respect, extreme situations resemble stress experiments with animals in which omnipotent experimenters create uncontrollable negative changes in the lives of their subjects (e.g., Foa, Zinbarg, and Rothbaum 1992). As I have pointed out, the nature and effects of many

major negative events in more usual situations in general populations in times of peace are usually quite different. In such situations, the events often do not have the life-threatening quality of negative events in extreme situations, are of lesser objective magnitude, and are more likely to occur in some part as a function of the behavior and actions of the individual. Personal predispositions, therefore, are more likely to be involved in both the occurrence of the events in more usual situations and in vulnerabilities that contribute to consequent uncontrollable negative changes in the individual's usual activities. It seems reasonable to assume, therefore, that the uncontrollable negative changes are the common path that leads to two sets of psychological consequences: the first consists of what various theories of coping have described as a sense of loss of personal control (Mirowsky and Ross 1990); lack of mastery (Pearlin and Schooler 1978); or fatalism (Wheaton 1980). The second consists of the pointless, purposeless, and irrational behaviors that, as Horwitz (1982: 28) has emphasized, typically characterize psychiatric disorders.

This assumption about the role of uncontrollable negative changes can now be used to help integrate the leads from our analyses of the three sets of studies described at the outset—the epidemiological research on SES, the quasi-experimental test of the social causation–social selection issue posed by the SES findings, and research on extreme situations, especially exposure to combat—for purposes of investigating adversity, stress, and psychopathology in the general population. The resulting central, integrative proposition is as follows:

The greater the uncontrollable negative changes in the ongoing situation (in terms of the centrality and proportion of usual, goal-directed activities affected) following the occurrence of a negative event, the greater the likelihood that disorder will develop. Ongoing situations become uncontrollable by different routes in which adversity is involved to greater or lesser extent. The uncontrollable negative changes in the ongoing situation are thus a final common pathway by which the different environmental and predispositional sources lead to psychiatric disorders. It is in the different environmental and predispositional sources of uncontrollability in extreme and more usual situations that adversity plays its

part. These sources vary with gender, ethnic/racial status, and SES in modern, urban societies.

My focus up to now and in this proposition has been on the role of life events. They are the triggers of the processes leading to uncontrollable changes. When the life events are fateful, they are approximations of experimental manipulations. However, unless they are negative, fateful and unpredictable, and central in the sense of being life-threatening or otherwise disruptive of the usual activities and major goals of the individual, many other variables contribute to whether or not uncontrollable changes occur following a negative event. Figure 2 provides an idea of what I think these other variables are and of the complex relationships among them (see also Dohrenwend 1998b for more detail).

It is evident in Figure 2 that I have used the broad terms "positive change in functioning and health," "no substantial change," and "adverse change in functioning and health" to describe the outcomes. I do this as a reminder to me and to others that my exclusive focus on psychiatric disorders is somewhat parochial, a function of the limitations of my research experience and expertise. I have not done much work on problems of physical health or their relation to psychiatric disorders (see Dohrenwend et al. 1999), but they demand attention (see Dew 1998; Dohrenwend 1998c).

As mentioned earlier and shown in Figure 2, the fact that personal predispositions can contribute to the occurrence of many types of events has implications for understanding the complex processes through which these types of events contribute to onset and course. To the extent that personal predispositions lead to stress-generative actions by the individual that bring about the occurrence of negative events, these events are nonfateful. A nonfateful negative event may, therefore, reflect vulnerability factors in these personal predispositions—hence the bi-directional arrow in Figure 2. Moreover, these personal predispositions may reflect the influence of prior adversity or genetic inheritance or both on personality. To the extent that the predispositions reflect genetic inheritance, the occurrence of the nonfateful negative events may themselves be under genetic control (Kendler 1998). Since such predispositions tend to be persistent over time, the negative, nonfateful events are likely to contribute not only to the initial onset of dis-

order but also to its persistence or recurrence. In sum, nonfateful negative events and many positive events can be, in varying degrees depending on the magnitude of the role of personal predispositions in their occurrence, proxies for personal predispositions. As such, these events themselves have vulnerability/protective and what a number of investigators (Bremner, Southwick, and Charney 1995; Figley 1978; Solomon 1995) have termed residual stress/stress evaporation functions.

Figure 3 builds on Figure 2 by incorporating these added distinctions about protection/vulnerability in relation to onset and stress evaporation/residual stress in relation to course. Assume that the term "disorder" in Figure 3 applies to the types of psychopathology that are inversely related to SES among males or females, especially those that showed social causation outcomes in the macro-level experimental test of the social causation–social selection issue that I summarized earlier. One set of questions about the relationships in Figure 3 has to do with similarities and differences between factors in initial onset and factors in course. Another set of questions are about the role of event characteristics and of personal predispositions in determining the types of disorder that develop. My attempt to deal with these questions has been set forth in more detail elsewhere (Dohrenwend 1998b).

IN CONCLUSION

By and large, psychosocial approaches emphasizing investigation of the role of environmental factors and behavioral genetics approaches emphasizing investigation of the role of heredity have tended to run on parallel tracks. The powerful twin and adoption strategies of the behavioral geneticists do not vary environmental conditions sharply; for example, even monozygotic twins separated at birth are rarely if ever reared in high SES in contrast with low SES environments. And for psychosocial researchers investigating the impact of sharply contrasting environmental conditions, there is no current measure of genetic vulnerability other than family history—an imperfect surrogate for which environmental alternative explanations are not easy to rule out. Few would argue against the need for integration of psychosocial and behavior genetic approaches. Integration will be easier to

FIGURE 2. Relationship of Proximal Life Events, Personal Predispositions, and the Ongoing Situation to Wider Environment, Biological Background, Appraisal and Coping Processes, and Health Outcomes

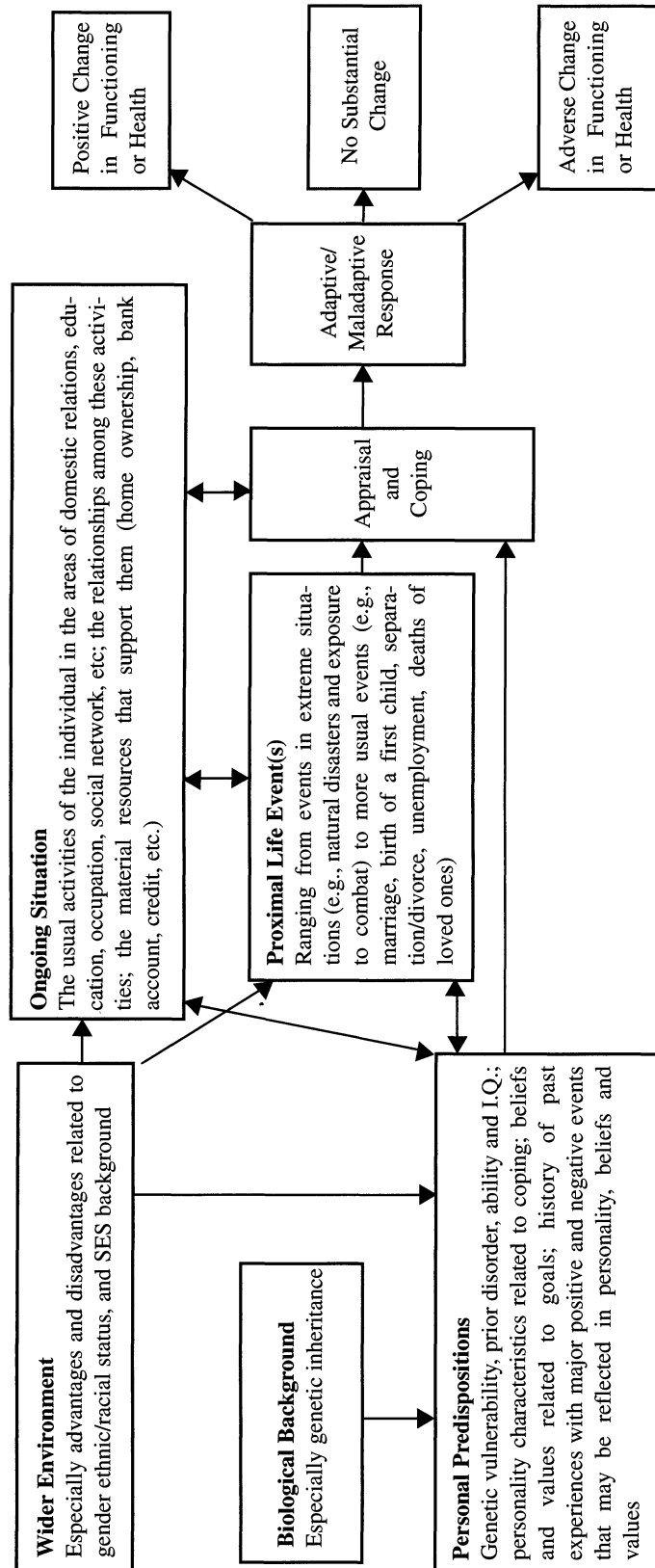
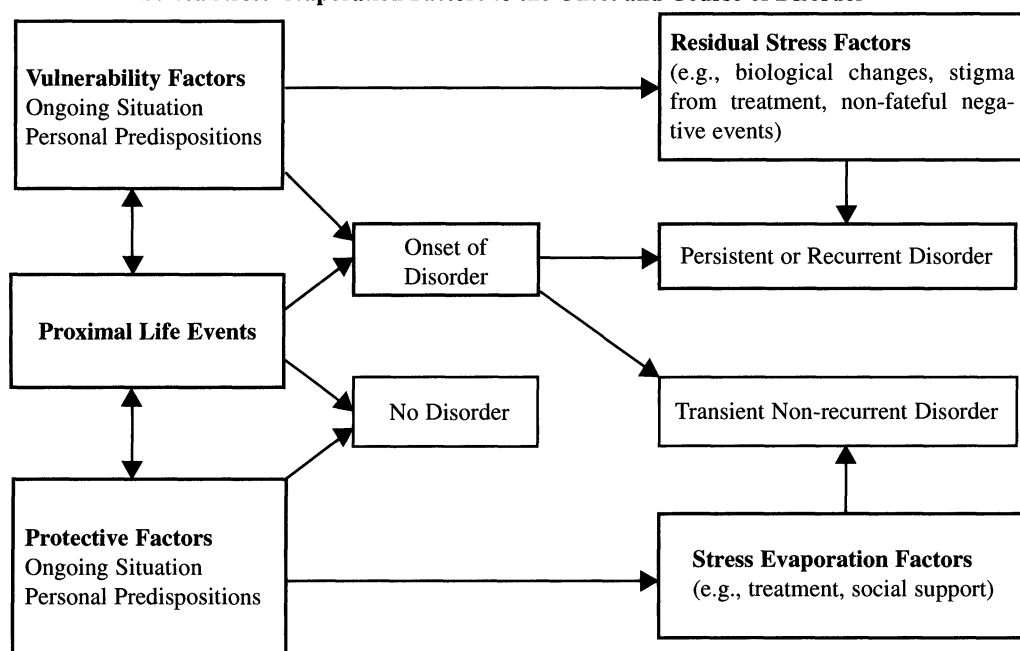


FIGURE 3. Relations Among Proximal Life events, Vulnerability/Protective Factors, and Residual Stress/Stress Evaporation Factors to the Onset and Course of Disorder



achieve, however, with further advances in research on processes and mechanisms within the two traditions. I offer the theory and research described above as a step toward this goal within a psychosocial tradition that gives main emphasis to the investigation of environmental factors. The framework I have presented is not, however, one in which Willy Loman, from *Death of a Salesman*, would be seen as a pure pawn of social forces.

At the end of the Prologue to this paper, we left Willy Loman standing in his doorway, weighted down by the two heavy suitcases filled with samples of the product he was selling. He had returned home exhausted after his car went off the road at the start of a sales trip to New England. Here are more of the facts of Willy's experiences, but not so many that the drama will be spoiled for those who have not yet seen the play.

Willy has spent his life as a traveling salesman, being paid for his work by salary plus commission, in pursuit of the ever-receding American dream of wealth and respect. Before we meet him, he recently has been taken off salary and is working on a pure commission basis—"like a beginner," as his wife says. In the course of the play, two flashbacks illustrate

the complicated intermingling of personal predispositions and environmental adversity in Willy's life. In the events of the first flashback, Willy is seen being caught by his adored and adoring older son, then a star high school athlete, in an extramarital affair that betrays his loyal and loving wife. In the second flashback to a chilling, unrelated incident, Willy is shown being fired by his boss to whom he had gone to ask for a salaried position that would not require him to travel; the boss is his son's age and is, in fact, the son of the former owner of the business for whom Willy has worked for 34 years. These two events vary in the extent to which their occurrence is fateful or the result of Willy's stress-generating behaviors. Each is followed, however, by major negative changes in Willy's usual activities both with members of his family and at work, changes Willy cannot control. At the age of 60, Willy has no job, no money, many debts, and he is alienated from his sons. He is, however, unable to question, much less abandon his dreams of material success and respect. The play is about how he came to this predicament and how he tries to escape it.

Assume with me for a moment that, somehow, a clone of Arthur Miller's Willy Loman

was captured in an epidemiological sample from the general population in which we were studying adversity, stress, and psychopathology. Assume further that we were using the kinds of measures, briefly discussed above, that would not obscure the important characteristics of the events and their psychological correlates so vividly portrayed by the playwright. Examined in terms of the central proposition advanced in this paper, the negative changes in Willy's life that have gone out of his control would be seen as something more than a predicament caused by social factors, and his frantic and irrational reactions to the predicament as something more than a psychiatric problem that can be cured with Prozac. The explanation of his plight, perhaps like the explanation for the occurrence of much of the serious psychopathology in the general population, would be sought in sets of relationships in which he would be seen as both victim and creator of his fate.

To understand the role of adversity and stress in the occurrence of psychopathology in the general population, I believe that it will be necessary to use appropriate measures to investigate the central proposition set forth above. This basically simple proposition focuses on uncontrollable negative changes in the lives of individuals. The sources and consequences of these changes, like those in Willy's life, are often extraordinarily complex.

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