A PROPOSITIONAL PARADIGM FOR ESTIMATING THE IMPACT OF DISASTERS ON MENTAL HEALTH*

George J. Warheit
University of Florida
Gainesville, Florida 32601, USA

This paper reviews the literature on communitywide disasters and their relationships to subsequent mental health problems. In addition, it describes the theoretical notions of psychological stress which have guided past research and it outlines the dimensions of a comprehensive stress paradigm. This paradigm is based on an integration of research findings from three separate fields of inquiry: disaster research; studies of psychosocial stress; and, psychiatric epidemiology. The theoretical propositions on which the paradigm is based are outlined and offered as guidelines for future research. The paper concludes with a brief discussion of some of the problems confronting researchers interested in disasters and their mental health sequelae.

Introduction

This paper has two major objectives. It summarizes briefly the literature on disasters and their mental health consequences and it presents a number of postulates which can be used as guidelines for those doing research on the relationships between disasters and mental health.

Disaster Events and Their Mental Health Consequences: A Brief Review and Comment

The literature on disasters and their relationships to subsequent mental health problems is an extensive one. However, it includes

---

* Revised version of a paper prepared for presentation at the Annual Meeting of the American Sociological Association, San Antonio, Texas, August 31, 1984.

a great number of references to events so idiosyncratic that they cannot be regarded as disasters in a sociological sense, i.e., they do not disrupt the functioning of a community or a social system. In reviewing the literature, it was decided to delete these studies. It is recognized, of course, that the stress processes occasioned by a single life crisis event may be very similar to those which function in individuals who are significantly impacted by a community wide disaster. From a sociological perspective, however, there are important differences. Unlike events which affect only individuals or a small group, disasters affect or have the potential to affect a large percentage of a community's population. And, they are dissimilar in that disasters as commonly defined in the sociological literature have the capacity to disrupt the social structure and/or cultural subsystems on which individuals depend as they conduct their daily lives. For these reasons, this review focuses almost exclusively on collective stressors such as those identified by Barton (1970), i.e., those which impact both community systems and individuals.

The research findings on disasters and mental health can be placed into one of four categories. One group of investigators has indicated that disaster events produce widespread psychological distress and social disruptions among the general population and further that some individuals may experience a continuing state of post-disaster stress which leads to chronic psychic traumas and/or psychological disorders (cf. Tyhurst, 1951; 1957; Menninger, 1952; Rosenman, 1956; Wallace, 1956; Wolfenstein, 1957; Glass, 1959; Crawshaw, 1963; Farber, 1967; Lifton, 1967; Krystal, 1968; Kliman, 1973; Schulberg, 1974; Erikson, 1976; Lifton and Olson, 1976; Newman, 1976; Rangell, 1976; Stretton, 1976; Titchener and Kapp, 1976; Raphael, 1977; Houts et al., 1980; Gleser, Green and Winget, 1981; Baum et al., 1981; Kasl et al., 1981).

A second group has reported findings which indicate that disaster events produce only brief and self-limiting psychological stress and few if any cases of chronic psychological or psychiatric disorder (cf. Janis, 1951; Fritz and Marks, 1954; Marks et al., 1954; Form and Nosow, 1958; Iklé, 1958; Bates et al., 1963; Moore et al., 1963, Drabek and Stephenson, 1971; Drabek et al., 1973; Zusman et al., 1973; Hall and Landreth, 1975; Peipert, 1975; Dohrenwend et al., 1979; 1981; Bromet, 1980; 1981; 1982).

A third perspective which has not been extensively researched suggests that some long-term, gross psychopathologies may result from disaster related traumas but only among those with prior histories of psychiatric illness or psychological vulnerability (Fenichel, 1945; Kardiner, 1959).

A fourth group of investigators has presented data which suggest that disaster events may actually function to produce a strong sense of personal and/or social stability at least among some members of a community (cf. Janis, 1951; Fritz and Marks, 1954; Fritz, 1961; Wilson, 1962; Coleman, 1966; Quarantelli and Dynes, 1973; Quarantelli, 1979).

On the basis of a detailed analysis of the literature cited above, it is apparent that the findings regarding the relationships between disasters and mental health are fragmented, ambiguous, conflicting and inconclusive. Further, in this author's opinion, this lack of consensus is due largely to the underdeveloped theoretical models which have guided many of the research efforts. The most obvious deficiencies reflected in the literature are: 1) the lack of definitional consensus regarding the two key variables, disasters and mental health; and, 2) the absence of clearly enunciated theoretical models which specify the conditions under which disaster experiences lead to subsequent psychopathology.

As noted above, the literature cited did not include research which focused on events of limited community impact, e.g., hotel fires or plane crashes. Even after these events were deleted, there remained a large variety of occurrences which were labelled as disasters. These included such disparate phenomena as air raids, atomic attacks, concentration camp internment, explosions, earthquakes, hurricanes, the effects of toxic waste dumps, floods, nuclear accidents, and fires. Obviously, these events vary immensly from one another. Nonetheless, researchers often failed to define what they meant when they used the term disaster and, further, when they presented their findings they tended not to distinguish between the event they were studying and other types of disaster agents.

The lack of specificity and precision which characterizes the definition of disasters is also found when researchers described the mental health problems associated with them. Historically, investigators rarely, if ever, attempted to make a formal psychiatric diagnosis from the symptoms and dysfunctions they identified. From a contemporary perspective, the disorders most often attributed to disasters by early investigators would be seen as falling under the general rubric of a post traumatic stress syndrome although, as a formal psychiatric diagnosis, this is a new one appearing for the first time in the third edition of the Diagnostic and Statistical Manual of the American Psychiatric Association (1980). Only recently have a few researchers begun to identify with specificity the types of mental health problems they were using as their dependent variables, e.g., demoralization, anxiety, depression

and psychoneuroticism (cf. Dohrenwend et al., 1979; 1981; Bromet, 1980). It is recognized, of course, that the difficulties associated with defining mental health/illness are not unique to those working in the disaster field. The efforts of clinicians and epidemiologists are also impeded by the complexities inherent in defining and classifying mental disorders and in establishing their etiologic precursors.

As the disaster/mental health literature is reviewed, one finds that in most instances investigators have assumed that disasters serve as stressful events which produce the psychiatric symptoms and related dysfunctions found in their study populations. However, as noted, most researchers have not made explicit their assumptions regarding stress and its relationship to mental health.

The lack of definitional specificity accompanied by underdeveloped theoretical models regarding disaster related stresses and how they produce mental health problems have impeded scientific progress in the field. The reminder of this paper is devoted to a discussion of some of the ways research in the area can be strengthened.

Disasters As Stressful Life Events

The articulation of the dynamics of stress/mental health models is, in this author's opinion, a prerequisite to the development of the field. In keeping with this opinion, a brief review of the literature on stress and illness is presented and the details of a comprehensive stress paradigm are outlined.

A Brief Review of the Stress Literature

The relationships between social, psychological and environmental factors and illness have been of interest to medical and other scientists for nearly half a century. This interest has broadened and accelerated over the past three decades with investigators from a wide range of disciplines seeking to identify the processes by which stressors act as precursors to physical and/or mental disorders. And, although there have been almost as many definitions of stress as there have been researchers, a common theme has emerged. Stress has come to be conceptualized as an altered state of an organism produced by agents in the psychological, social, cultural and/or physical environments. It is assumed that this altered state, when unmitigated, has the potential to produce physical and/or mental health problems for some individuals.

The first systematic research on the realtionships between

psychological stress and illness is generally attributed to Cannon (1928) whose pioneering efforts sought to detail the relationships between emotional states, e.g., fear, anger, pain, anxiety and changes in body function. His work provided a base for much early scientific inquiry. Adolph Meyer (1951) extended Cannon's work and expanded research in the field by emphasizing the role of life events in the development of physical and mental disorders; and, Selye's (1950; 1956) research has made very important contributions to our understanding of the psychological adaptations to stress. Wolff (1950) and Hinkle (1957;1974) and their colleagues have also influenced the development of the field by focusing on the links between specific stressors and illness.

Over the past two decades, researchers have given increased attention to the qualitative and quantitative relationships between particular classes of life events and illness behavior. The research contributions of Rahe and Holmes (1967; 1968), Paykel et al. (1971;1972) the Dohrenwends (1970;1973), Myers et al. (1972) and Brown (1973) are among the most widely cited but there have been a great many others working in the area and their efforts have also added to our knowledge of stressful life events and their relationships to mental and physical health.

Stress Models

Early research on stress and illness tended to regard their relationships as direct and in many instances unicausal. (See Figure 1A.) However, as the field evolved, this simple stimulus-response type model was refined to include coping and other adaptation variables which are seen as intervening processes which buffer individuals from potentially damaging effects of stress. (See Figure 1B.) Model 1B is clearly the more inclusive one. However, both have a serious theoretical deficiency: they represent closed systems and as such do not depict the dynamic interaction of organisms as they influence and are influenced by their multiple environments. The scientific problems posed by these closed theoretical models are not confined to their conceptual weaknesses; they contain analytic ones as well. The statistical procedures widely used in the past, while perhaps appropriate for the kinds of data gathered, were frequently inadequate inasmuch as they did not or could not provide for the testing of interaction effects between stressors, coping resources and/or other adaptive responses to stressful events.

The limitations of these early approaches led Warheit (1979) to formulate the Paradigm illustrated by Figure 2. This model encompasses the systemic relationships which exist between

life events, coping resources, stress and stress outcomes. Since this model embodies many of the theoretical postulates used in constructing the research guidelines outlioned later, it is important to detail its assumptions before proceeding.

The model conceptualizes *stressful events* as arising from these sources: 1) the individual's biological constitution; 2) the individual's psychological chacracteristics; 3) the culture; 4) the social structure, including interpersonal relationships; and 5) the geophysical environment. As such, it has the capacity to encompass those occurrences commonly associated with the stress and crisis event literature such as the death of a child, the loss of employment or a serious physical illness. Simultaneously, it can also account for events arising from the sociocultural environment such as the accident at Three Mile Island, a prolonged economic recession and/or the demise a a basic industry resulting from technological change. Further, it takes into consideration events whose origins are in the social realm such as civil diorders and it provides for the inclusion of occurrences in the geophysical environment, e.g., earthquakes, floods and tornadoes.

The *adaptive screens* in the model represent the coping resources available to individuals as they attempt to meet the demands placed on them by various kinds of life events. These screens encompass the unique biological and psychological

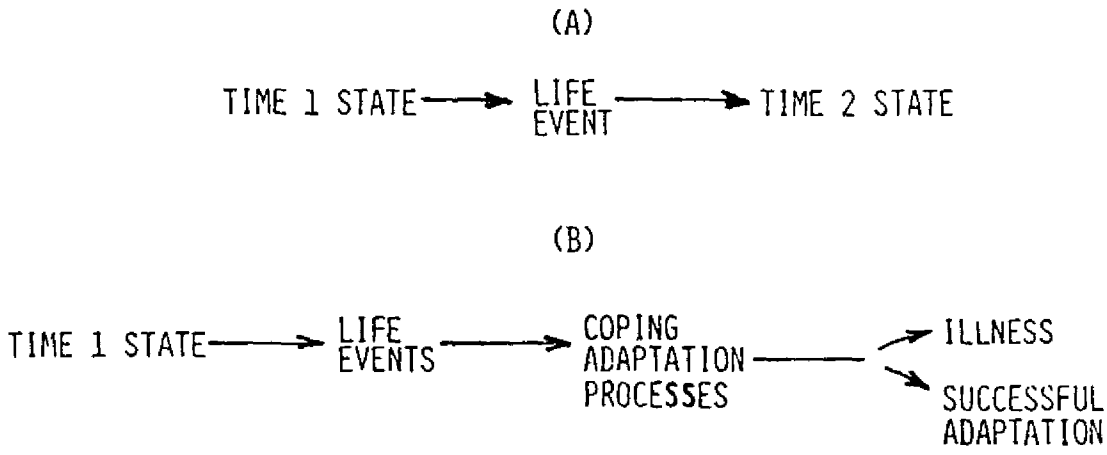
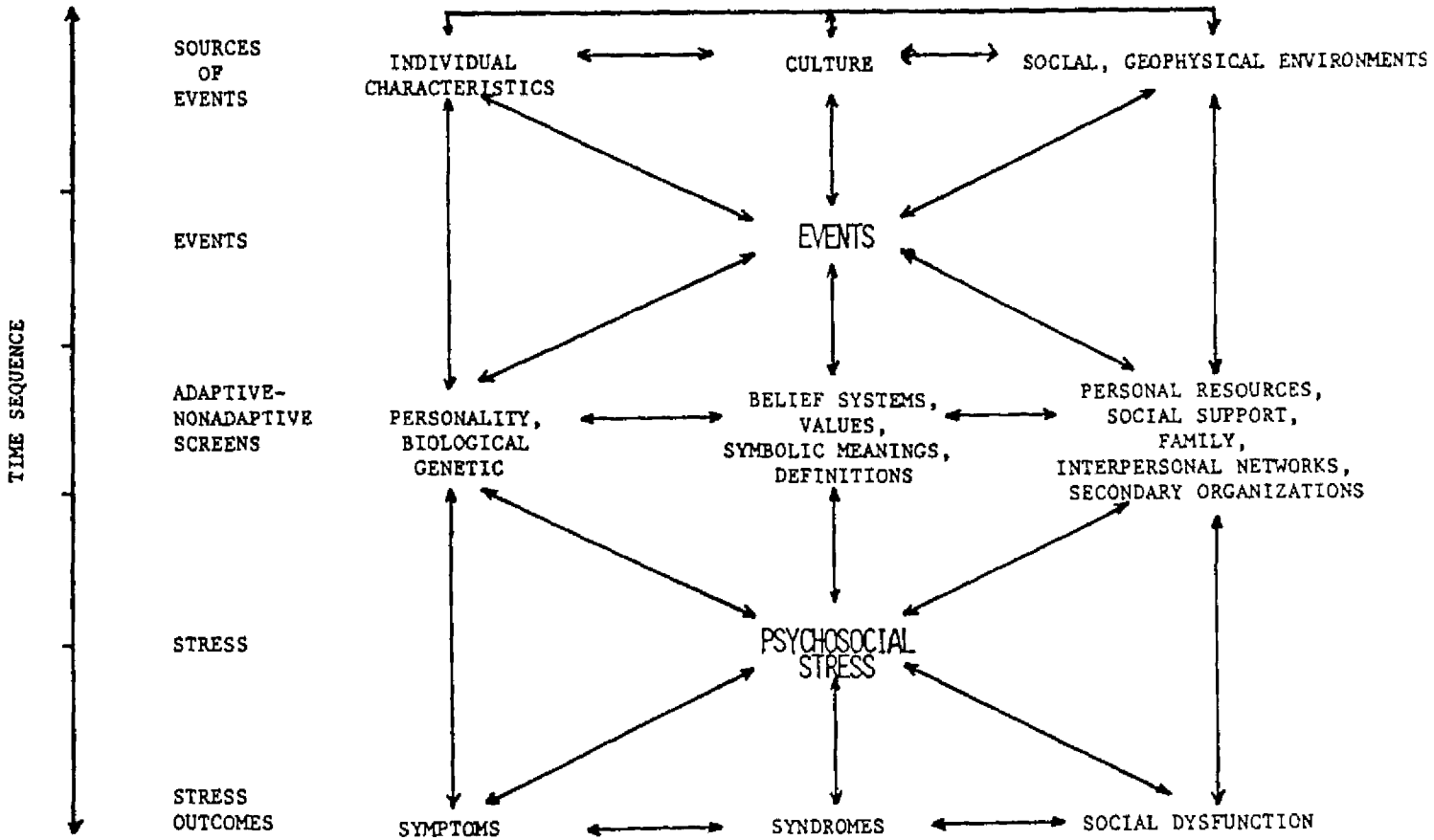


Figure 1: Early Models of Life Events and Illness

Figure 2

LIFE EVENTS: SOURCES, ADAPTATIONS, AND OUTCOMES



constitution of individuals. They also include their social and economic resources, familial and other interpersonal relationships, and the secondary organizations provided by their community and society. One's culture is also perceived as a coping resource. For example, as Parsons (1951) pointed out, one of the functions of religion as a cultural institution is to transmit systems of belief which give individuals a source of explanation and meaning for events which cannot be accounted for by society's logic or science.

The model represented in Figure 2 conceptualizes life events, coping behaviors, stress and illness as highly interactive processes. When a crisis event occurs, it is hypothesized that an individual's first line of defense is his/her idiosyncratic characteristics, i.e., one's psychological, physical and genetic makeup. It is also hypothesized that when individuals lack the resources required to cope with the demands occasioned by an event, they will customarily attempt to extend their sources of support, most commonly calling for assistance from spouse, children, parents and/or other family members. When these resources are unavailable or inadequate, individuals are seen as turning to other interpersonal networks such as friends in whom they can find confide and/or from whom they can get help. The model further suggests that when a person's inidividual and personal resources are insufficient to meet life event demands, they will attempt to extend their sources of support by seeking assistance from agencies in their community or society. If all of these resources prove to be inadequate, as in the case of an incurable, terminal illness, individuals may turn to culturally provided religious beliefs, values and symbols for comfort, support and resolution. In practice, of course, when confronted with crisis related demands, individuals customarily seek to extend immediately their resources in as wide a circle as possible with coping behaviors being more complimentary than exclusive. And, simultaneously, they are seen as trying to reduce the demands being made on them in ways commensurate with their alternatives and the characteristics of the stressors.

As represented in Figure 2, stress is conceived as an altered state of an organism and it is hypothesized to occur when the demands on individuals exceeds their response capabilities. The degree of stress experienced is presumed to be a function of the number, frequency, intensity, duration and priority of the demands viewed in apposition to coping resources. The demand capability ratio is seen as dynamic (and as such fluctuating) multi-systemic and temporal. Moreover, stress is conceptualized as being different from the events which may precipitate it. Events are seen as agents; stress is preceived as an altered

state of the organism. And, importantly, stress is different than its outcomes which are viewed as symptoms, syndromes, social dysfunctions and/or successful adaptation.

The theoretical model described by Figure 2 reflects the systemic nature of life events, coping mechanisms, stress and stress outcomes as they occur in a temporal context. A research design based on this model would necissitate obtaining information on all of the various components contained in it and it would also require analytic procedures which would permit a testing of the relationships within and between variables. There is, of course, not a single piece of research in the scientific literature which approaches the rigor imposed by this comprehensive, integrated, systemic model. Moreover, there is not likely to be for a long time given the current state of development in a number of fields. Nonetheless, it can be used as a framework for evaluating the findings on disasters and their mental health impacts and it can provide a guide for the designing of future research projects.

Propositions For Use in Projecting Psychological Impacts Following Disasters

The research on disasters and their relationships to mental health have relied almost exclusively on the concept of stress to account for the altered psychological well-being of affected populations. This concept is a useful one but it needs to be conceptualized more clearly and modified in keeping with current developments in the field. Simultaneously, the advances made by those studying disasters should be taken into account. And, although prior research has had some serious shortcomings, it has led to the identification of a number of factors which should be considered as one attempts to assess the mental health consequences of disaster events. A review of these factors indicates that they can be placed in one of three broad categories: 1) those associated with the event; 2) those associated with community/societal structures; and, 3) factors associated with the idosyncratic characteristics of the individuals involved including their interpersonal/familial relationships. It is obvious that these three factors have interactive elements which must be considered by those designing disaster/mental health research and by those analyzing and interpreting the findings from it.

A listing of specific factors associated with each of the three categories just identified can be subdivided and put int propositional form. These, in turn can serve as tentative starting points for future research.

Propositions Regarding the Stresses Associated With the Event

1. Stress levels are increased when the onset of an event is so sudden that individuals and/or communities do not have enough time to avoid its impact and/or to plan effective respons alternatives.
2. Stress levels are increased when the threat posed by an event is so salient that an immediate response is mandated on the part of the community and its residents.
3. Stress levels are increased when the event cannot be avoided.
4. Stress levels are increased when an event poses high risk to the lives of individuals and/or represents a major threat to property, community structures and/or values and beliefs.
5. Stress levels are increased when a disaster agent persists over a long period of time.
6. Stress levels are increased when a disaster agent fluctuates in intensity, particularly when the event is a prolonged one.
7. Stress levels are increased in proportion to its pervasiveness in the population.

Propostions Regarding the Stresses Associated With Community/Societal Structures

1. Stress levels are increased when the community has had no prior experience in dealing with the disaster agent.
2. Stress levels are increased when the community lacks the organizational structures and/or other social and political resources required to mitigate the impact of the disaster event.
3. Stress levels are increased when a community's disaster relevant resources are lost or inaccessible following the onset of the agent.
4. Stress levels are increased when the event produces and/or makes manifest latent conflicts within/between the community's agencies and/or its social, ethnic, political and economic groups.
5. Stress levels are increased when those in power or authority make ambiguous or conflicting "definitions of the disaster situation."
6. Stress levels are increased when the resources of the community/society are unable to ameliorate the disruptive effects of the disaster event or to do so only after an extended period of time.

Propositions Regarding the Stresses Associated With Individual Characteristics

1. Stress levels are increased when individuals are victimized by the event, i.e., they experience the death or injury to loved

ones, are personally injured or lose personal possessions.

2. Stress levels are increased for individuals when their biological and/or psychological status is one of pre-existing vulnerability; e.g., there is a present or prior history of psychiatric disorder; they are seriously ill with an acute problem; chronically ill and/or disabled; they are so aged or inform they must depend on others to assist them in taking care of their personal needs; they have recently experienced one or more (other) life crisis events; and/or they perceive themselves or loved ones at inordinately high risk.

3. Stress levels are increased for individuals who are socially isolated, that is, when they have no family members, close friends, or other interpersonal sources of support immediately available and accessible.

4. Stress levels are increased for individuals when they lack a sense of social or cultural integration due to structural and/or emotional isolation, alienation or anomie.

5. Stress levels are increased for individuals when they have had no prior experience in dealing with situations similar to those precipitated by the disaster event.

6. Stress levels are increased for individuals when they lack or perceive that they lack the personal, interpersonal, social and/or the material resources necessary to respond successfully to the threats posed by the disaster agent.

7. Stress levels are increased when individuals realize they have lost personal, interpersonal, social or material resources which would have enabled them to cope effectively in the presence of the threatening events.

The utility of the propositions just presented is limited, of course, by the relative availability of the data. Ideally, one would have quantitative information on each of the variables. This is, of course, not possible given their nature and the existing state of the art in a number of fields of inquiry. Nonetheless, these postulates can serve as a general model for guiding research on disasters and their relationships to mental health.

Summary and Comment

A review of the literature on disasters and their mental health effects reveals an overall lack of consensus. There is enough agreement, however, to conclude that some persons in an impacted population are likely to experience some deleterious psychological consequences as the result of a disaster experience. The types of problems and their duration, while not clearly discernible from existing research, would appear to be confined

largely to those associated with what Frank (1973) labels demoralization. There is little in the research on community disasters which supports the contention that they engender psychotic type disorders. In this author's opinion, disaster events may, at most, serve as a precipitating event for a psychotic episode on the part of those with a prior history of such disorders. Even here, however, the evidence is limited and inconclusive. For example, Bromet et al. (1982) found that there were no significant differences between the anxiety and depression levels of psychiatric patients in the Three Mile Island area and those of a sample of patients from a control site.

In short, although there is general agreement that disaster events have the capacity to produce psychosocial stress and perhaps in some instances to produce a psychiatric state which would meet one of the diagnostic categories outlined in the DSM-III (APA, 1980), there is still a great deal of disagreement among researchers regarding the impact that they have on the mental health of a population. Moreover, it is unlikely that there will be any consensus forthcoming until a number of basic issues have been successfully resolved. These issues include but are not limited to the following.

1. The development of a typology of disaster events and definitions; an operational definition of mental health on which researchers can agree; and, a stress/illness model which is comprehensive enough to integrate the findings from both disaster research and psychiatric epidemiology.

2. The development of baseline information on the mental health status of differeing subpopulations residing in varying sized communities, regions and countries. This presumes the development of epidemiologic field survey instruments and the testing of them for reliability and for content and construct validity with differing social and demographic subgroups. Without empirically derived baseline data on the prevalence and incidence of mental health problems in the general population, disaster/mental health researchers will be limited in their ability to interpret the findings from their studies which are largely *ex post facto* in design.

3. Mechanisms must be available whereby researchers can begin their work immediately after a disaster has occurred. When long delays are experienced, as in the case of the accident at Three Mile Island, the best that investigators can do is to attempt to reconstruct the magnitude and duration of altered emotional states, e.g., fear, anxiety, depression and/or the problems in living encountered by the population.

4. Research on community structures and their interrelationships to individuals, families, and the wider society

is necessary inasmuch as these coping structures represent the core of what Barton (1962) refers to as the emergency social system. This system often constitutes a primary buffer between individuals and the disaster impacts and it is a crucial agent in the reconstruction process which leads to a restoration of both systemic and individual equilibrium/well-being.

5. Disaster researchers must continue working on theoretical models which integrate what is known about disasters and their relationships to psychosocial stress. A disaster experience is most logically conceived of as a life crisis event and the literature on these events and the stresses associated with them can be of great value.

6. A number of quasi-experimental research efforts designed to test specific hypotheses are necessary before significant advances can be made in our understanding of disasters and their mental health sequelae.

The relationships between disasters and the mental health problems occasioned by them are extremely complex and defy simplistic, unicausal aexplanations. Presently, there are enough data to suggest that there are some associations between the two classes of phenomena. These data can serve as beginning points for further research without which the field will continue to be plagued by the persistence of myths, inconsistent findings and partial truths.

References

American Psychiatric Association
1980 Diagnostic and Statistical Manual of Mental Disorders. Third edition. Washington, D.C.: American Psychiatric Association.

Barton, A.
1962 "The Emergency of Social Systems." Pp. 222-267 in G. Baker and D. Chapman (eds.), Man and Society in Disaster. New York: Basic Books.

1970 Communities in Disaster: A Sociological Analysis of Collective Stress Situations. New York: Doubleday.

Bates, F., et al.
1963 The Social and Psychological Consequences of a Natural Disaster: A Longitudinal Study of Hurricane Audrey. Washington, D.C.: National Academy of Sciences.

Baum, A., R. Gatchel, R. Fleming, and C. Lake
1981 Chronic and Acute Stress Associated with the Three Mile Island Accident and Decontamination: Preliminary Findings of a Longitudinal Study. Unpublished draft report submitted to the Nuclear Regulatory Comission.

Bromet, E.
1980 Three Mile Island: Mental Health Findings. Pittsburgh, Pennsylvania: University of Pittsburgh and Western Psychiatric Institute.

Bromet, E., and L. Dunn
1981 "Mental Health of Mothers Nine Months After the Three Mile Island Accident." Urban and Social Change Review 14:12-14.

Bromet, E., H. Schulberg, and L. Dunn
1982 "Reactions of Psychiatric Patients to the Three Mile Island Nuclear Accident." Archives of General Psychiatry 39:725-730.

Brown, G.W., T.O. Harris, and J. Peto
1973 "Life Events and Psychiatric Disorders. Part 2: Nature of Causal Link." Psychological Medicine 3:159-176.

Cannon, W.B.
1928 "The Mechanism of Emotional Disturbance of Body Function." New England Journal of Medicine 198:877-884.

Coleman, J.
1966 "Community Disorganization." Pp. 553-605 in R. Merton and R. Nisbet (eds.), Contemporary Social Problems. New Yoprk: Harcourt, Brace and World.

Crawshaw, R.
1963 "Reactions to Disaster." Archives of General Psychiatry 9:157-162.

Dohrenwend, B.S.
1973 "Social Status and Stressful Life Events." Journal of Personality and Social Psychology 28:225-235.

Dohrenwend, B.S., and B.P. Dohrenwend
1970 "Class and Race as Status-Related Sources of Stress." In J. Levine and N. Scotch (eds.), Social Stress. Chicago: Aldine.

Dohrenwend, B.P., B.S. Dohrenwend, S. Kasl, and G. Warheit
1979 Report of the Task Force on Behavioral Effects of the President's Commission on the Accident at Three Mile Island.

Dohrenwend, B.P., et al.
1981 "Stress in the Community: A Report to the President's Commission on the Accident at Three Mile Island." Annals of the New York Academy of Sciences 365:159-174.

Drabek, T., and J. Stephenson
1971 "When Disaster Strikes." Journal of Applied Social Psychology 1:187-203.

Drabek, T., et al.
1973 Longitudinal Impact of Disaster on Family Functioning. Denver, Colorado: University of Denver.

Erikson, K.
1976 "Loss of Community at Buffalo Creek." American Journal of Psychiatry 133:302-305.

Farber, I.
1967 "Psychological Aspects of Mass Disasters." Journal of the National Medical Association 59:340-345.

Fenichel, O.
1945 The Psychoanalytic Theory of Neurosis. New York: Norton.

Form, W., and S. Nosow
1958 Community in Disaster. New York: Harper and Row.

Frank, J.
1973 Persuasion and Healing. Baltimore: John Hopkins University Press.

Fritz, C.
1961 "Disaster." Pp. 651-694 in R. Merton and R. Nisbet (eds.), Social Problems. New York: Harcourt, Brace and World.

Fritz, C., and C. Marks
1954 "The NORC Studies of Human Behavior in Disaster." Journal of Social Issues 10:26-41.

Glass, A.
1959 "Psychological Considerations in Atomic Warfare." U.S. Armed Forces Medical Journal 7:625-638.

Gleser, G., B. Green, and C. Winget
1981 Prolonged Psychosocial Effects of Disaster. New York: Academic Press.

Hall, P., and P. Landreth
1975 "Assessing Some Long Term Consequences of a Natural Disaster." Mass Emergencies 1:55-61.

Hinkle, L.E. Jr.
1974 "The Concept of 'Stress' in the Biological and Social Sciences." International Journal of Psychiatry and Medicine 15:335-357.

Hinkle, L.E. Jr., and H.G. Wolff
1957 "Health and the Social Environment." Pp. 105-137 in A.H. Leighton, J.A. Clausen, and R.N. Wilson (eds.), Explorations in Social Psychiatry. New York:Basic Books.

Holmes, T.H., and R.H. Rahe
1967 "The Social Readjustment Rating Scale." Journal of Psychsomatic Research 11:213-218.

Houts, P., et al.
1980 Health-Related Behavioral Impact of the Three Mile Island Nuclear Incident. Report submitted to the TMI Advisory Panel on Health Research Studies of the Pennsylvania Department of Health. Hershey, Pennsylvania.

Iklé, F.
1958 The Social Impact of Bomb Destruction. Norman, Oklahoma:University of Oklahoma Press.

Janis, I.
1951 Air War and Emotional Stress. New York: McGraw-Hill.

Kardiner, A.
1959 "Traumatic Neuroses of War." In S. Arieti (ed.), American Handbook of Psychiatry (Vol. 1). New York: Basic Books.

Kasl, S.V., R.F. Chisholm, and B. Eskenazi
1981 "The Impact of the Accident at the Three Mile Island on the Behavior and Well-Being of Nuclear Workers." American Journal of Public Health 71:472-495.

Kliman, A.
1973 The Corning Flood Project: Psychological First Aid Following a Natural Disaster. White Plains: Center for Preventive Psychiatry.

Krystal, H. (ed)
1968 Massive Psychic Trauma. New York: International University Press.

Lifton, R.
1967 Death in Life: Survivors of Hiroshima. New York: Random House.

Lifton, R., and E. Olson
1976 "The Human Meaning of Total Disaster: The Buffalo Creek Experience." Psychiatry 39:1-18.

Marks, E., et al.
1954 Human Reactions in Disaster Situations. Chicago: University of Chicago, National Opinion Research Center.

Menninger, W.
1952 "Psychological Reactions in an Emergency." The American Journal of Psychiatry 109:128-130.

Meyer, A.
1951 The Life Chart and the Obligation of Specifying Positive Data in Psychopathological Diagnosis." In E.E. Winter (ed.), The Collected Papers of Adolf Meyer. Volume III. Baltimore: John Hopkins Press.

Moore, H.
1963 Before the Wind. A Study of the Response to Hurricane Carla. Disaster Study No. 19. Washington, D.C.: National Academy of Sciences.

Myers, J.K., et al.
1972 "Life Events and Mental Status: A Longitudinal Study." Journal of Health and Social Behavior 13:398-406.

Newman, J.
1976 "Children of Disaster: Observations at Buffalo Creek." American Journal of Psychiatry 133:306-312.

Parsons, T.
1951 The Social System. New York: Free Press.

Paykel, E.S., et al.
1971 "Scaling of Life Events." Archives of General Psychiatry 25:340-347.

Paykel, E.S., and E.H. Uhlenhuth
1972 "Rating and Magnitude of Life Stress." Canadian Psychiatric Association Journal, Special Supplement II:93-100.

Peipert, J.
1975 Mental Health Studied During Irish Violence. Columbus Dispatch (Ohio), June 5, B-12.

Quarantelli, E.
1979 The Consequences of Disasters for Mental Health: Conflicting Views. Preliminary Paper No. 62, Disaster Research Center. Columbus, Ohio: The Ohio State University.

Quarantelli, E., and R. Dynes
1973 "When Disaster Strikes." New Society, January 4:5-9.

Rahe, R.H.
1968 "Life Change Measurement as a Predictor of Illness." Proceedings of the Royal Society of Medicine 61:1124-1126.

Rangell, L.
1976 "Discussion of the Buffalo Creek Disaster: The Course of Psychic Trauma." American Journal of Psychiatry 133:313-317.

Raphael, B.
1977 "The Granville Train Disaster - Psychological Needs and Their Management." Medical Journal of Australia 1:303-305.

Rosenman, S.
1956 "The Paradox of Guilt in Disaster Victim Populations." Psychiatric Quarterly Supplement 30:181-221.

Schulberg, H.
1974 "Disaster, Crisis Theory and Intervention Strategies." Omega 5:77-87.

Selye, H.
1950 The Psychology and Pathology of Exposure to Stress. Montreal: Acta.

1956 The Stress of Life. New York: McGraw-Hill.

Stretton, A.
1976 The Furious Days - The Relief of Darwin. Sydney and London: William Collins Publishers.

Titchener, J., and F. Kapp
1976 "Family and Character Change at Buffalo Creek." American Journal of Psychiatry 133:295-299.

Tyhurst J.
1951 "Individual Reactions to a Community Disaster: The Natural History of a Psychiatric Projective Phenomenon." American Journal of Psychiatry 107: 764-769.

1957 "Psychological and Sociological Aspects of Civil Disaster." Canadian Medical Association Journal 76:385-393.

Wallace, A.
1956 Tornado in Worcester: An Exploratory Study of Individual Community Behavior in an Extreme Situation. Disaster Study No. 3, Washington, D.C.: National Academy of Sciences.

Warheit, G.
1979 "Life Events, Coping, Stress and Depressive Symptomatology." American Journal of Psychiatry 136:502-507.

Wilson, R.
1962 "Disaster and Mental Health." Pp. 124150 in G. Baker and D. Chapman (eds.), Man and Society in Disaster. New York: Basic Books.

Wolfenstein, M.
1957 Disaster: A Psychological Essay. Glencoe, Illinois: Free Press.

Wolff, H.G., S. Wolf, and C. Hare (eds.)
1950 Life Stress and Bodily Disease. New York: Association for Research in Nervous and Mental Desease.

Zusman, J., et al.
1973 Project Outreach: Final Report to the National Institute of Mental Health. Buffalo: Community Mental Health Research and Development Corporation.